

Port Spencer Grain Export Facility

Amendment to Public Environmental Report

Response Document



Document history and status

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Table of Abbreviations

Term / Acronym	Definition
EPBC	Environment Protection and Biodiversity Conservation
PER	Public Environmental Report
MAROPs	Marine Operations Plan
BACI	Before/After Control /Impact
CEMP	Contractor's Environmental Management Plan
OEMP	Operational Environmental Management Plan
SEB	Significant Environmental Benefit
ILUA	Indigenous Land Use Agreement
ASX	Australian Stock Exchange
EPLGA	Eyre Peninsula Local Government Association
MMO	Marine Mammal Observation
SGEDI	Spencer Gulf Ecosystem and Development Initiative
SRWMP	Southern Right Whale Management Plan
DOEE	Department of Energy and Environment
DAWE	Department of Agriculture, Water and the Environment
DPTI	Department of Planning and Transport Infrastructure
PIRSA	Primary Industries and Regions South Australia
DCTB	District Council Tumby Bay
RDAWEP	Regional Development Australia Whyalla & Eyre Peninsula
DEW	Department of Environment and Water
EPA	Environment Protection Authority
AAR	Aboriginal Affairs and Reconciliation
HAZOP	Hazard and Operability (HAZOP)
CAPEX	Capital Expenditures
OPEX	Operational Expenditures
AQIS	Australian Quarantine and Inspection Service
FEL	Free Eyre Limited

1 BACKGROUND

The Port Spencer Stage 1 Project by Centrex Metals (the Evaluated Project) received provisional development authorisation in December 2012, after being the subject of a Public Environmental Report (PER) under the Major Development process (pursuant to sections 46-48 of the Development Act 1993). The proposal was for the development of a multi-user bulk commodity port, with the primary focus on the export of iron ore and grain.

The Evaluated Project comprised a deep-water marine port, capable of accommodating Panamax and Cape class vessels, suitable for export of up to 2 million tonnes of ore per annum and up to 1 million tonnes of grain. At this time, Free Eyre Limited (FEL) was the preferred grain supplier and were involved in assessing the potential grain export demand for the project. The Proposed Amendment removes the storage and export of iron ore from the Evaluated Project and seeks to reconfigure the site for efficient grain storage, handling and export.

FEL and Peninsula Ports have experience in grain bulk handling and have established a team with the necessary credentials to deliver a grain export terminal. The economics of grain export are well established on Eyre Peninsula, whereas the economics of bulk commodity export for other commodities on Eyre Peninsula are less clear. For these reasons FEL and Peninsula Ports are focussed on delivering a new grain export terminal for Eyre Peninsula, which will aid in protecting the clean and green reputation of the industry on Eyre Peninsula and significantly improve the competitiveness of the industry in reaching global markets.

The provisional development authorisation granted to Centrex Metals in 2012 was extended in December 2014 and currently remains active at the site. Peninsula Ports (a subsidiary company of Free Eyre) is now the owner of the subject land and the existing approval has also transferred with the land. Peninsula Ports is seeking to make a variation to the existing authorisation for a modified design of the marine and land-based infrastructure. The focus of the proposal is now the export of grain, with a capacity of 1 million tonnes/year.

Peninsula Ports is seeking to amend the existing authorisation under Section 47 of the Development Act. To provide clarity, it is also sought to extend the period of the authorisation in accordance with Section 48(11)(b) of the Development Act. The amendment process is required to take account of alterations to the Evaluated Project and to update the PER due to the length of time that has passed since the PER was originally prepared. The delegate for the Minister advised via public notice that Peninsula Ports had prepared an Amendment to the PER for the Port Spencer Grain Export Facility, which by way of that notice, was released on public consultation from 16 January until 21 February 2020.

This report provides a response to the submissions received in response to the Amendment to PER.

Following submission of the response document on 23 March 2020 further questions and clarifications were sought by several state agencies through DPTI. The additional questions and responses to these questions and additional information are provided as a separate attachment to this document (Attachment 5 and referenced additional documents).

2 SUBMISSIONS RECEIVED

At the conclusion of public consultation period, DPTI has provided Peninsula Ports with 12 submissions received from government and the public. In total, 7 submissions were received in response to the Amendment to PER from the following sections of government and regional authorities:

1. Primary Industries and Regions South Australia (PIRSA),
2. District Council Tumby Bay (DCTB),
3. Regional Development Australia Whyalla & Eyre Peninsula (RDAWEP),
4. Department of Environment and Water (DEW),
5. Environment Protection Authority (EPA),
6. Aboriginal Affairs and Reconciliation (AAR), and
7. Department of Planning and Transport Infrastructure (DPTI Transport).

In total five public submissions were received in response to the Amendment to PER as outlined in table below:

1. Tumby Bay Residents and Ratepayers Association Inc
2. Ann Baillie
3. Karen Baines
4. Lisa Graney
5. Peter Swaffer

Most of the questions and areas of concern raised in the public submissions and by Government agencies have been addressed in this Response Document.

The collection of responses was analysed to get a sense of the key issues raised by government (local council and state departments) and non-government authorities (RDA) and by members of the public. Peninsula Ports has collated those submissions into the following key themes:

The main themes from the public submissions are summarised as follows:

- 1) Marine environment;
 - a) construction of the causeway / sedimentation, erosion, turbidity/ sand movement and exposure of historic wreck,
 - b) seagrass wrack/seagrass loss and SEB offset,
 - c) impact on fauna / marine mammals,
 - d) impact of grain dust,
 - e) impact of a waste discharge (e.g. spill or ballast water),
 - f) dredging.
- 2) Traffic / Roads,
- 3) Air quality (Grain dust/ diesel emission),

- 4) Use of chemicals / fumigants,
- 5) Economic modelling,
- 6) Noise,
- 7) Fire Risk, and
- 8) Social impact (impact on local community / tourism).

For ease of reading, this response document has been prepared to address the government and non-government submissions first to directly address the issues raised by each submission. Where appropriate, some of the issues raised, for example by the EPA, Council DEW may be similar, for example on a common concern regarding seagrass loss. In this instance, some of the Peninsula Ports responses may be somewhat repeated for consistency in addressing the key issue. This may also be the case in addressing some of the concerns raised in the five public submissions, which are addressed against the themes above.

Additional details in relation to impact assessments and engagement taken place (either since the Amendment to PER lodgement in early November 2019 or since the public notification period) has also been attached as follows:

- Attachment 1: Roads Impacts Discussion Paper,
- Attachment 2: Future ranger program,
- Attachment 3: Revised Site Layout concept to reduce concentration of dust sources,
- Attachment 4: Marine Operation Plans (MAROPS),
- Attachment 5: Supplementary Questions and Answers following agency review of Response Document dated 23 March 2020,
- Attachment 5A: Document attached to email response dated 11th May 2020
- Attachment 6: Free Eyre Information Memorandum for investors,
- Attachment 7: Bardavcol PMP (including standard work instructions),
- Appendix 8: Southern Right Whale Management Plan as approved by minister's delegate

Peninsula Ports also commits to continue working with authorities and stakeholders to provide positive outcomes and looks forward to this opportunity should development approval for the Port Spencer Infrastructure be obtained.

2.1 RESPONSE TO AGENCIES SUBMISSIONS

In preparing this response document Peninsula Ports has considered whether the comments had already been raised and addressed in the original approval granted to Centrex or whether the comments relate to the requested changes to the existing approval.

Following submission of the response document on 23 March 2020 further questions and clarifications were sought by several state agencies through DPTI. The additional questions and responses to these questions and additional information are provided as a separate attachment to this document (Attachment 5 and referenced additional documents).

2.1.1 PIRSA

Peninsula Ports provide the following responses to the issues raised by the PIRSA in their response letter dated 25 February 2020:

Item 1: *The cumulative risks for regional fishing and aquaculture (related to access, navigational safety and biosecurity) as result of additional port facilities and associated vessel movements in this section of coastal waters.*

The development of the Construction Environmental Management Plan and the Operational Environmental Management and Monitoring Plan (OEMMP) should include a Biosecurity Plan with a marine pest component (covering prevention, surveillance and monitoring, and response). These plans should be developed in consultation with PIRSA and the Eyre Peninsula Natural Resources Management Board.

Proponent response: Agreed- plan will be prepared.

Item 2: *Observed changes to regional port capacity and demand since the original approval, and the potential business consequences (for port operators, clients and end-users) of an additional port in this new context.*

We note that the Commonwealth Government has recently announced its support of the nearby Cape Hardy multi-use port project, including \$25 million in funding. The Cape Hardy port facility will also support grain export, as well as export of other commodities, which should be taken into consideration with this Amendment to the PER.

Proponent response:

Regarding the Cape Hardy development, we note the following:

“Iron Road is applying for a variation approval in order to use the port for grain export as well.” was reported in the Port Lincoln Times on January 10, 2019. Despite this public acknowledgement, multiple stakeholders have continued to state publicly that Cape Hardy has all necessary approvals ...it does not;

Iron Road does not appear to have lodged the necessary “variation approval” documentation for grain export, whereas the Port Spencer project has submitted the amended approvals documentation as directed by DPTI for the proposed changes at the Port Spencer site. The existing approval for Port

Spencer had already allowed for grain as a secondary commodity but without large on-site grain storage, one of the main causes for a variation to the approval to be required.

In the Native Title Tribunal register the Indigenous Land Use Agreement (LUA) for Iron Road is stated to have the following purpose for the Central Eyre Iron Project:

- “a) applying for and obtaining the Grant to it of any Ancillary Approval/Contract, any Extractive Minerals Lease and/or any Mineral Lease;
- b) acquiring any Land Interest in relation to the CEIP Mining Lease, the Accommodation Village, the Rail Line, the Powerline, the Water Borefield & Pipeline and/or the Port;
- c) obtaining the Grant to it of any Land Interest by the State; and
- d) undertaking Operations, within the ILUA area during the Term which relates directly or indirectly in any way to the Project....

‘Project’ means the Central Eyre Iron Project and includes the CEIP Mine, the Accommodation Village, the Rail Line, the Port, the Powerline and the Water Borefield & Pipeline”

The extract from the Native Title Register does not make any mention of grain. Peninsula Ports has recently executed an ILUA with the Barngarla, following a unanimous vote at the authorisation meeting, for the express purpose of grain exports from Port Spencer.

In the absence of Iron Road preparing and submitting variation approval documentation to DPTI to date the ability of Cape Hardy to be ready to receive grain in the 2021 harvest appears unlikely, whereas if the Port Spencer project receives a timely approval for its submitted approval variation request it is in a position to be ready to serve the grain industry for the 2021 harvest.

Peninsula Ports is fully in support of multi commodity ports and port precincts and consider that Cape Hardy and Port Spencer could comprise a ports precinct for the region.

Department of Agriculture, Water and the Environment (DAWE) (formerly AQIS) has indicated to Peninsula Ports that there are no ports in Australia where grain and iron ore are exported on the same wharf.

Regarding the potential for additional commodities at Port Spencer we note the following:

The existing land area is sufficient for the accumulation and export of grain and does not have spare room for other commodities. In the future additional commodities could be considered and would need to follow the steps below:

- In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
- Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered.
- Identify land near the site suitable for storing / managing the product;
- Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design it does have spare capacity to add new conveyors and other facilities to a reasonable degree.
- Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.

- Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

2.1.2 DISTRICT COUNCIL TUMBY BAY (DCTB)

Overall submission – Peninsula Ports comments

The response to the submission by DCTB should be read in conjunction with a resolution DCTB passed regarding Cape Hardy on which its proponent (Iron Road), at the time of the resolution, had informed its shareholders via Australian Stock Exchange (ASX) release of its “Grain First” strategy.

From DCTB meeting minutes dated 9 July 2019:

“CEO 4/719 Cape Hardy – In Principle Support

4c/72019 Moved – Cr Trenberth Seconded – Cr Kroemer

That the District Council of Tumby Bay:

- 1. adopts a position of support for the development of Cape Hardy as a multi-commodity, multi-user, deep water port on the Eyre Peninsula and related infrastructure; and*
- 2. conveys this position of support to the Federal and State Governments with a request for the development of the proposed port to be considered by both governments in a timely and coordinated manner.*

Cr Lawrie called for a Division

For: Cr Allen-Jordan, Cr Trenberth, Cr Kroemer

Against: Cr Lawrie, Cr Randall

CARRIED”

It is clear in the Eyre Peninsula Local Government Association (EPLGA) Freight Strategy that was current at the time of this council meeting that the presence of a grain port in the east coast of Eyre Peninsula, whether at Port Spencer or Cape Hardy or both, triggers the “Regional Transport Issues” referred to in Council’s submission to the Port Spencer PER.

What is not clear to Peninsula Ports is why Council voted to support Cape Hardy in Principal with no reference to any concern regarding “Regional Transport Issues”, at a time when the proponents of Cape Hardy had not lodged the approval variation required to include grain at Cape Hardy.

“Iron Road is applying for a variation approval in order to use the port for grain export as well.” was reported in the Port Lincoln Times on January 10, 2019. Despite this public acknowledgement, DCTB has, as we understand it, publicly stated that Cape Hardy has all necessary approvals...it does not.

The resolution of DCTB regarding Cape Hardy appears to be in contrast to now not supporting Port Spencer in Principal at a time when Peninsula Ports not only quantified the potential impacts, but also put to the District Councils of Tumby Bay, Cleve and Lower Eyre Peninsula a proposed Road Maintenance Fund mechanism. This mechanism proposed that the project could directly support Council road maintenance issues. The attached discussion paper refers to the context around this Road Maintenance Fund (Please refer to Attachment 1).

Peninsula Ports remains committed to continuing the engagement with the Councils on Eyre Peninsula regarding Regional Transport Issues, including DCTB, as has been the case since July 2019.

Specific response to issues raised by DCTB now follow:

Item 1: Land Use / Form of Development;

- a) *Council notes that the facility is proposed to be modified from a multiple commodity port to a single commodity port focused on grain export.*
- b) *Council would seek that further detail and analysis is provided as to whether the facility retains the ability to export other commodities in future, and if so, how this would be accommodated on the subject site and adjacent land.*
- c) *Council would seek that further detail and analysis is provided as to the implications of the limitations for export of mineral commodities from the facility if and when the export of such commodities becomes an economic proposition in future.*
- d) *In particular and having regard to the analysis of alternative port locations contained in the document, consideration how would the export of significant additional quantities of mineral commodities be accommodated (e.g. through the upgrade of existing ports or the development of new ports).*
- e) *Further, if the export of significant additional quantities of mineral exports would require the development of additional ports, what effect would these have on the operation of the proposed facility if those additional ports also have the ability to export grain as a secondary commodity.*

Proponent response:

- a) The essential nature of development in the Amendment to PER is still that of a bulk storage and shipping facility, albeit with less ancillary infrastructure and on a smaller scale than that of the Evaluated Project.
- b) The existing land area is sufficient for the accumulation and export of grain and does not have spare room for other commodities. In the future additional commodities could be considered and would need to follow the steps below:
 - In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
 - Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered.
 - Identify land near the site suitable for storing / managing the product.
 - Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design it does have spare capacity to add new conveyors and other facilities to a reasonable degree.
 - Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.
 - Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

- c) As above.

- d) As above.
- e) As above – note also that Peninsula Ports has sought guidance from DAWE (formerly AQIS) regarding what sites in Australia have iron ore and grain being exported from the same wharf, and Department of Agriculture and Water Resources were unable to provide any examples.

Item 2: Technical Assessment of Impacts;

- a) *Council's comments in respect of impacts are provided in the context of the amendment to the previous approval.*
- b) *In respect of acoustic performance, Council considers the proposal appropriate, however would wish to see acoustic modelling of the final design, prior to construction and verification of the acoustic performance of the facility once in operation.*
- c) *In respect of acoustic performance, Council notes that any change in the number of vehicles accessing the site may have the potential to alter the modelled acoustic outcomes.*
- d) *In respect of air quality, Council notes that operational measures are required to achieve guideline criteria in respect of PM10, PM2.5 and deposition at sensitive receiver SR1, and would seek that an appropriate management regime is implemented to ensure that the operational measures are complied with at all relevant times.*
- e) *In respect of ecological impacts, Council notes that these, particularly the marine ecological impacts require detailed assessment by relevant agencies to determine their acceptability.*
- f) *Most specifically, the amendment from a piled jetty structure to a causeway results in significant change to the potential ecological impacts.*
- g) *Having regard to Council often being the first point of community concern expressed during construction and operation, Council seeks reserved matters/conditions which provide it with the ability to have input into the development of a Construction Environmental Management Plan (CEMP) and Operational Environmental Management Plan (OEMP).*

Proponent response

- a) Noted.
- b) Noted.
- c) Noted.
- d) Having reviewed this issue, including comments from Council and EPA, Peninsula Ports has developed an alternative alignment of bunkers and therefore truck unloading and dust source locations to distribute these locations more broadly across the site. The revised modelling, once complete, is expected to indicate that either no operational response will be required and hence an engineering response has been confirmed as per the attached amended concept layout, or that the operational constraints can be managed via the commitment to implement dust monitoring as suggested by EPA in their submission.
- e) Noted.
- f) Noted.
- g) We welcome constructive engagement with Council regarding the CEMP and OEMP irrespective of whether these become reserved matters or not.

Item 3: Access and Regional Transport Network;

- a) *Council is extremely concerned that the project, as currently proposed, will have deleterious impact on the condition of the Council road network, which will cause Council to incur*

substantial additional capital and operational costs in the upgrade, maintenance and replacement of its infrastructure.

- b) Council does not accept the proposition that there is no responsibility for it to be compensated for impacts on its road network west of the Lincoln Highway.*
- c) The modelling undertaken to support the transport impacts of the proposal is insufficient to adequately quantify the impact on the Council road network.*
- d) Council considers it to be absolutely critical that the potential impact on Council roads is adequately considered and resolved prior to approval being granted, given the currently undefined quantum of potential financial impacts on Council.*
- e) Further modelling must be undertaken prior to approval being granted to better define the source of grain, how it will be transported to the facility and the impacts of that transport on the condition of the road network.*
- f) The modelling should include financial modelling of the costs of necessary road upgrades, additional maintenance and replacement of the road network over the life cycle of the port facility.*
- g) A suitable arrangement between Council, the State Government and the proponent in respect of the maintenance and upgrade of the road network shall be entered into prior to the commencement of construction.*

Proponent response

- a) This is at odds with the unqualified support provided to Cape Hardy's "Grain First" strategy as noted above.
- b) The Roads discussion paper that was presented to Council prior to the PER being published did include a proposed Road Maintenance Fund that would address this issue in part. In the discussion paper the need for state and federal funding for a strategic E-W freight route on EP was identified and Peninsula Ports has been engaging at a state and federal level to seek support for such investment (Please refer to Attachment 1).
- c) Council was consulted regarding the basis of the modelling completed prior to the modelling being done and did not raise objections at the time.
- d) This is at odds with the unqualified support provided to Cape Hardy's "Grain First" strategy. The actual sources will depend on market dynamics and may not improve the reliability of forecasting. Also, Council was consulted on the basis of modelling as presented and at the time considered the modelling approach used to be reasonable.
- e) This is at odds with the unqualified support provided to Cape Hardy's "Grain First" strategy. The actual sources will depend on market dynamics and may not improve the reliability of forecasting. Also, Council was consulted on the basis of modelling as presented and at the time considered the modelling approach used to be reasonable.
- f) Out of scope at this stage of the project which is essentially the concept design and once approved it goes to detailed design.
- g) Peninsula Ports is available to meet with Council to progress this, consistent with engagement with Council since July 2019. The initial requirement will be maintenance of Lipson Cove Road during construction for which preliminary discussions were held at the officer level with Council on 2nd March 2020 at which it was confirmed that the project would be financially responsible for additional maintenance intervention caused by construction traffic. The discussion paper attached covers broader issues including the potential establishment of a Road Maintenance Fund (Please refer to Attachment 1).

Item 4: Tenure over coastal land

- a) *Coastal land is important public land, and public access to the coast should be preserved wherever possible.*
- b) *It is recognised that the proposed development will restrict access to some coastal land, and that this is unavoidable if the project proceeds.*
- c) *Notwithstanding this, public access to the coast should be preserved to the maximum extent possible.*
- d) *Council does not believe that granting exclusive tenure to the coast adjacent the entirety of the land-based site is appropriate.*
- e) *Council doesn't believe that a case is made out in the documentation submitted that indicates that the areas of the coastal reserve where there is no physical infrastructure is required to provide a suitable buffer.*
- f) *The proposal will sever the ability for north-south access along the coastal reserve where the causeway is located.*
- g) *Given this, Council believes that a coastal access route needs to be maintained to link the coastal reserve north and south of the allotment, with the identification and funding of works and infrastructure required to facilitate such access.*

Proponent response

- a) Agreed.
- b) Noted.
- c) Agreed and the proposed amendment does this.
- d) N-S passage will be maintained and is a condition of the ILUA. Exclusive tenure of the entire current parcel has not been sought and a new title for only a 100m portion of the existing title will be established for the purpose of the lease.
- e) Agreed and it was never proposed to lease the entire strip. Council was informed about this issue including the proposed extent, however information from DEW had some ambiguity in that it only referred to the parcel in its entirety. This misperception from Council is understandable given what it received from DEW for consultation and will be addressed through the Crown Lease title establishment process. The ILUA only refers to the smaller portion.
- f) The severance of access, for safety reasons, will be temporary during construction only. Following completion of construction access will resume largely as normal and the conveyor will be elevated above ground level so pedestrians can safely walk under it.
- g) Agreed. Access route will be maintained, noting that the current road reserve adjacent to the subject land does not include a made road at this time and a new road is not proposed.

2.1.3 REGIONAL DEVELOPMENT AUSTRALIA WHYALLA & EYRE PENINSULA (RDAWEP)

Overall submission

The submission from RDAWEP should be reasonably interpreted as a direct request for the state government to interfere in market competition by seeking to delay one project in favour of another project. Any such interference in market competition is entirely inconsistent with current state government policy and if it were to occur would send a very disturbing message to investors regarding sovereign risk in South Australia.

More broadly regarding RDAWEP's bias towards the Cape Hardy development we note the following:

- “Iron Road is applying for a variation approval in order to use the port for grain export as well.” was reported in the Port Lincoln Times on January 10, 2019. Despite this public acknowledgement, RDAWEP has continued to state publicly that Cape Hardy has all necessary approvals...it does not;
- Iron Road does not appear to have lodged the necessary “variation approval” documentation for grain export, whereas the Port Spencer project has submitted the amended approvals documentation as directed by DPTI for the proposed changes at the Port Spencer site. The existing approval for Port Spencer had already allowed for grain as a secondary commodity but without large on-site grain storage, one of the main causes for a variation to the approval to be required.
- In the Native Title Tribunal register the ILUA for Iron Road is stated to have the following purpose for the Central Eyre Iron Project:

“(a) applying for and obtaining the Grant to it of any Ancillary Approval/Contract, any Extractive Minerals Lease and/or any Mineral Lease;

(b) acquiring any Land Interest in relation to the CEIP Mining Lease, the Accommodation Village, the Rail Line, the Powerline, the Water Borefield & Pipeline and/or the Port;

(c) obtaining the Grant to it of any Land Interest by the State; and

(d) undertaking Operations, within the ILUA area during the Term which relates directly or indirectly in any way to the Project....

‘Project’ means the Central Eyre Iron Project and includes the CEIP Mine, the Accommodation Village, the Rail Line, the Port, the Powerline and the Water Borefield & Pipeline”

The extract from the Native Title Register does not make any mention of grain. Peninsula Ports has recently executed an ILUA with the Barngarla, following a unanimous vote at the authorisation meeting, for the express purpose of grain exports from Port Spencer.

In the absence of Iron Road preparing and submitting variation approval documentation to DPTI to date the ability of Cape Hardy to be ready to receive grain in the 2021 harvest appears unlikely, whereas if the Port Spencer project receives a timely approval for its submitted approval variation request it is in a position to be ready to serve the grain industry for the 2021 harvest. It seems clear that the RDAWEP’s submission is aimed entirely at delaying the amended approval for Port Spencer thereby drawing government into market competition matters.

The EPBC approval for Port Spencer has already been transferred to Peninsula Ports and the dates amended by the Commonwealth to reflect the later construction commencement.

Specific response to individual items raised by RDAWEP follows:

Item 1: Economic Development and Population Growth

- a) A multi-use, multi-user, deep seaport is integral to the region’s economic and social future. Port Spencer does not address this region’s most fundamental economic and social issue and poses an unnecessary risk to the region’s future by ignoring the above fundamental needs and principles.*

- b) *we ask that further independent analysis to be undertaken regarding the social and environmental value of the collective site of Rogers Beach to Lipson Cove, including the subject site together with a comprehensive analysis of the likely impact on the current and future value of the visitor/tourism economy. Employment comparisons should be central to this analysis together with consideration of the ability to retain and grow the advantages of the Lipson Cove-Rogers Beach tourism precinct and establish grain exports further up the coast, and out of sight, at Cape Hardy.*
- c) *Free Eyre, Peninsula Ports and their consultants have undertaken what, in our view, has been very limited public consultation and have quite unapologetically declared that this will be a 'grain only port'. Grain producers on Eyre Peninsula need other industries and the people and skills that they bring, to be able to have active healthy communities and service support adequate to sustain their farming business and family needs.*
- d) *In our view, it will delay the expansion of existing and future industries and projects and eventually force duplication of infrastructure causing inefficiency and unnecessary costs, both in time and money. Rapidly evolving future industries that the region and the state have a natural competitive advantage in, but a limited window of opportunity in terms of economic cycles and timing, such as low carbon energy production being used to develop and export Hydrogen and Ammonia, can be lost to the State for all time.*

Proponent response

- a) We do not disagree with multi commodity ports; however, we are cognisant of the clean and green reputation that Eyre Peninsula grain enjoys and would not do anything to compromise this reputation. While we remain open to other future considerations should there become a realistic future opportunity, any future proposals for additional commodities at Port Spencer would consider the following:

The existing land area is sufficient for the accumulation and export of grain. In the future additional commodities would need to follow the steps below:

- In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
- Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered.
- Identify land near the site suitable for storing / managing the product.
- Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design the wharf does have spare capacity to add new conveyors and other facilities to a reasonable degree.
- Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.
- Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

Note also that Peninsula Ports has sought guidance from DAWE (formerly AQIS) regarding what ports in Australia have iron ore and grain being exported from the same wharf, and they were unable to provide any examples.

- b) Regarding the impact on tourism the proposed amendment involves lesser number of vessels and the vessels are smaller than the current approved project. Peninsula Ports has also proposed to Council that the native revegetation works at the site, including the ILUA-agreed role of a Land Management Officer from the Barngarla community can be expanded to improving the land management adjacent to the site if Council is interested in the project doing so. Note also that Cape Hardy is acknowledged at <https://www.australiancampsites.com.au/cape-hardy-beach> as having 50 camp sites, whereas Lipson Cove is stated as having 40-50 camp sites.
- c) As noted above there is a pathway for additional commodities to be accommodated at Port Spencer, however at this time the only commercially viable commodity for a new deep seaport appears to be grain. The level of consultation for what is a requested change to an existing approval is considered to be reasonable and proportionate to the scope of change to the existing approvals.
- d) As stated above:

We do not disagree with multi commodity ports; however, we are cognizant of the clean and green reputation that Eyre Peninsula grain enjoys and would not do anything to compromise this reputation. While we remain open to other future considerations should there become a realistic future opportunity, any future proposals for additional commodities at Port Spencer would consider the following:

The existing land area is sufficient for the accumulation and export of grain. In the future additional commodities would need to follow the steps below:

- In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
- Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered.
- Identify land near the site suitable for storing / managing the product.
- Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design the wharf does have spare capacity to add new conveyors and other facilities to a reasonable degree.
- Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.
- Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

Item 2: Flawed Assessment of Alternative Ports

Under the Criteria: Economic Impact section of Table 1.2 Volume 1 of the amended PER, Cape Hardy is marked as “Not Suitable” for grain exports on the basis that “the site does not provide suitable land (available to Peninsula Ports) for large scale grain accumulation within economic distance of the wharf for materials handling” and “Berth slots at the project would be limited due to proposed mining activity. The currently proposed development at Cape Hardy is not economic on a grain only basis”.

The amended PER should not rely upon these statements. They should be thoroughly independently reviewed and tested by the Department and the Minister.

Proponent response

Peninsula Ports is not able to purchase enough land close enough to the Cape Hardy port to make its use of Cape Hardy economic on a grain only basis, as Iron Road had stated to Peninsula Ports that it requires the nearest land to be reserved for iron ore management. In Iron Roads' publicly stated reduction of scope for the CEIP this would include material stockpiles, vehicle movement for Dual Powered Road Trains (now that Iron Road has abandoned its plans for a rail connection to the mine).

Further, DAWE (formerly AQIS) has confirmed to Peninsula Ports that they are not aware of any location in Australia where iron ore and grain are exported from the same wharf. This indicates that there are significant challenges that need to be overcome regarding potential contamination of grain with iron ore dust that do not have a current precedent technical solution to the knowledge of Peninsula Ports or Department of Agriculture, Water and the Environment in Australia.

Item 3: Significant Change in Heavy Vehicle Movements

Jacobs estimate 860 to 980 grain truck movements per day, a truck entering and exiting every two minutes and an increase in excess of 12 times the original estimate in 2012. This amount of grain would be required to be attracted to this port with or without the Eyre Peninsula rail network being in operation. The impact of this amount of heavy vehicle traffic on the peak visitation period of the tourism economy associated with this precinct will be quite disastrous and is at best very understated in the amended PER.

Proponent response

Port Lincoln is a larger tourist area with similar or greater frequency of heavy vehicle movements, not just during harvest.

Regarding the impact on tourism the amended project involves lesser number of vessels and the vessels are smaller than the current approved project. We have also proposed to Council that the native revegetation works at the site, including the ILUA-agreed role of a Land Management Officer from the Barnagarla community can be expanded to improving the land management adjacent to the site if Council is interested in the project doing so.

Note also that Cape Hardy is acknowledged at <https://www.australiancampsites.com.au/cape-hardy-beach> as having 50 camp sites, whereas Lipson Cove is stated as having 40-50 camp sites.

Item 4: Significant Change - Property Acquisition

Lipson Cove Road is a 'one (1) Chain Road', a width incapable of being utilised safely for intense heavy vehicle movements and this issue is further exacerbated by the existing caravan and camping recreational vehicle use. Acquisition of private properties along the length of Lipson Cove Road (approximately 6 kms) will be required.

Proponent response

We have been consulting with both DPTI and Council since July 2019 and can confirm that we have assessed Lipson Cove Road as a safer location for a major intersection than the original approved

location of Swaffers Road. Principally it is the long sight lines at Lipson Cove Road that makes it a safer location for intersections of this type and will have longer heavy vehicle queuing provisions than other similar locations around Eyre Peninsula, such as at Tumby Bay itself. This will occur due to current design standards being applied to the intersection that may not have been the same when the Tumby Bay site was established.

We have committed to ongoing community engagement regarding road design and will continue to do so jointly with both Council and DPTI.

Item 5: Significant Change – Cumulative Impact

This submission has primarily focussed on the substantial change to the original application of being a single commodity port and not a multi-commodity port. The original PER was completed way back in 2012. Since that date Cape Hardy has been approved as a multi-commodity port. This amended PER should identify and address potential impacts to the region's economy, society and environment if both ports are built? Free Eyre and Peninsula Ports have submitted this PER amendment in the full knowledge of the approved Cape Hardy project but does not appear to address this issue at all, which is a standard DPTI assessment requirement – 'Cumulative Impacts'.

Proponent response

The existing approval secured by Centrex included grain export. The proposed amendment removes iron ore export from Port Spencer and thereby reduces the cumulative impact relative to Iron Road's Cape Hardy development, as it would no longer compete against Cape Hardy as an iron export terminal.

Iron Road has previously been reported in the media as confirming that it requires an amendment to its existing approval to include grain at Cape Hardy, hence RDAWEP should be aware that the onus would be on Iron Road to address the cumulative impacts if and when they formally seek approval to export grain from Cape Hardy.

Item 6: Significant Changes to Jetty Design and Construction

- a) *This protrusion will interrupt the natural sedimentary flow along the gulf and will also trap substantial amounts of seaweed. This will result in change. Some of this has been addressed in the report, but it worthy of further independent review based upon long term local observation, including reasonably regular weather and storm events that can quickly erode several centre meters of sand (up to 1.5m) and deposit it elsewhere.....*
- b) *By way of limited comparison, the Port Neil boat ramp has a relatively short causeway acting as a breakwater. It is partly built upon a naturally existing rock reef. The water depth is shallower than Port Spencer. However, as a small-scale comparison this may be a useful point of reference as there has been observable change to the sea floor within the bay that has in all probability also affected marine life and patterns of behaviour from a relatively minor breakwater intrusion.*
- c) *The significant amendment of removing the 'T' section of the jetty designed for cape-size ship berth, approximately one kilometre offshore, removes the wind and wave barrier formed by ships that may have berthed on the 'T' section. Centrex was proposing to export less than two million tonnes of iron ore per annum in cape-size vessels capable of carrying in excess of 220,000 tonnes per ship which translates to the 'T' section being vacant for 80% of the time. This effect is reported to have a greater effect on sedimentary movement than the imposition of the rock causeway. This needs independent verification of impact.*

Proponent response

- a) EPA and DEW have raised concerns regarding seaweed wrack and Peninsula Ports have responded. Please refer to those responses within this Response Document. Comments regarding sediment transfer – refer to similar DEW concern and Peninsula Ports response. With reference to the total extent of seagrass impacts for all construction and operational activities, Peninsula Ports undertook disturbance calculations using a buffer to allow for the construction of the causeway and associated impacts including sedimentation as well as impacts from operational activities. The native vegetation clearance and Significant Environmental Benefit (SEB) calculations (presented in Table 6-4 of Volume 1 of the Amendment to PER submission) accounts for presence of seagrass in both the Seagrass Zone and the Sandy Substrate as identified in the baseline marine ecology report (Appendix K of the PER).

The EPA raised a similar concern about the accuracy of the predicted total disturbance area. Peninsula Ports responded to the EPA with the following:

Within Section 3.1 of the Amendment to the PER and Section 3.1.1 of Volume 2 (Review of Evaluated Project), the potential for indirect losses of benthic habitats (primarily seagrass) as a result of indirect impacts associated with light attenuation from shading and temporary suspended solids from the causeway construction is acknowledged. The benthic habitat loss calculations presented within Appendix E took into consideration a buffer zone (i.e. an area larger than the actual project footprint) to accommodate for the potential indirect impacts associated with construction and operations (i.e. temporary increases in nearshore suspended solids or sediment resuspension and shading). Due to the nature of the proposed construction methodology (i.e. no dredging or continuous reclamation point source) it is not thought feasible to undertake a robust hydrodynamic modelling at a resolution fine enough to account for the localised temporary resuspension of sediments from the placement of the causeway materials by the project machinery. Therefore, it was deemed more appropriate to nominate a likely indirect buffer zone around the proposed project infrastructure to account for these potential indirect losses.

In consultation with DEW, Peninsula Ports will develop appropriate monitoring and reporting procedures (within the CEMP and OEMP for Ministerial approval) to safely determine the full extent of disturbed marine vegetation.

- b) That site is not a relevant comparison as the seabed geometry appears very different to Port Spencer where it deepens very quickly.
- c) The impacts of the T section configuration of Jetty with the combination of both iron ore and grain vessels were assessed by Centrex in the Evaluated Project.

Item 7: Community Support

- a) *Volume 1 of the amendment to the PER refers to Stakeholder and Community Engagement activities and states that “The project has received positive local government and stakeholder support”. RDAWEP is unaware of the project receiving positive local government support but is aware of positive local government support for a multi-use deep seaport at Cape Hardy made evident by the following resolution of the EPLGA – (extract from the minutes dated 27/02/2018).*
- b) *Further, RDAWEP has attended Port Spencer local consultation meetings and witnessed hostility being expressed towards the project far in excess of any visible support for the project and in most of these instances the hostility has been directed by grain growers that*

are shareholders of Free Eyre. What level of support for Port Spencer has formally been sought and granted by the shareholders of Free Eyre? How many of its shareholders formally approve of this project?

- c) *Considering the above, a question in need of an answer is, is there any or much credible level of support for this project outside of the Boards of Free Eyre and Peninsula Ports? RDAWEP understands that the level of financial support garnered from existing farmer shareholders of Free Eyre is extremely limited to date and that related meetings with growers have been very poorly attended.*

Proponent response

- a) Peninsula Ports has not suggested that Cape Hardy lacks local support.
- b) This personal opinion is not consistent with the overall sentiment in the meetings. In any public meeting there can understandably be emotional response to the impacts that come with development. Regarding formal support Free Eyre holds shareholder meetings as required and listens to its shareholders.
- c) The financial arrangements for the project are not relevant to the Amendment to PER submission and are confidential.

Item 8: Decrease in job numbers

This change poses a high risk to hundreds of new jobs associated with the emerging industries and opportunities highlighted above. The decrease in job numbers and the change in the ratio of seasonal to full time positions as a result of this amendment illustrates this very point (removal of the ore jobs reduces the operational workforce from 70 to between 10 to 30 for grain only with the majority being employed seasonally for about 8 weeks only). The amendment to a grain only seaport further consigns businesses and communities in the region to a tightening downward spiral associated with the decrease in population and workforce discussed above, except if the regional economics are strong enough to support the duplication of port infrastructure within a few kilometres of each other. In either instance the impacts, including cumulative impacts, need to be identified and measured in a full EIS.

Proponent response

There is no evidence provided that would support the assertion that this project would be detrimental to emerging industries.

We do not disagree with multi commodity ports; however, we are cognisant of the clean and green reputation that Eyre Peninsula grain enjoys and would not do anything to compromise this reputation. We note that when asked to provide an Australian example where Iron Ore and Grain are exported from the same wharf, DAWE (formerly AQIS) were unable to provide an example.

While we remain open to other future considerations should there become a realistic future opportunity, any future proposals for additional commodities at Port Spencer would consider the following:

The existing land area is sufficient for the accumulation and export of grain. In the future additional commodities would need to follow the steps below:

- In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
- Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered.
- Identify land near the site suitable for storing / managing the product.
- Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design the wharf does have spare capacity to add new conveyors and other facilities to a reasonable degree.
- Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.
- Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

Item 9: Development Process

Centrex Metals received provisional development consent in December 2012 (Government Gazette dated 20 December 2012, p. 5629) with a two-year time frame to substantially commence works at the site. Centrex applied for a further extension of time which was subsequently approved in December 2014 (Government Gazette dated 18 December 2014, p. 6779), with a date of 20 December 2016 to substantially commence works.

While the approval remains in place unless the Government cancels the authorisation, RDAWEP questions how a three-year gap between 'expiry' and PER variation is acceptable, particularly given the change in proponent, the change in industry and the significant change in proposed use.

Proponent response

Peninsula Ports sought guidance from DPTI regarding the approval's pathway and the submission of the variation to the existing approval, which would also deal with the timing issues, was the pathway stated by DPTI. Peninsula Ports is following the process of seeking a formal approval to vary an existing approval in the same manner that Iron Road would need to seek formal approval to be able to export grain or other commodities from Cape Hardy.

Item 10: Conclusion

- a) The proposed amendments fundamentally change the original project so greatly that it is barely recognisable. It is essentially a new project. It has enough change and complexity to require the proper scrutiny and analysis of a full Environmental Impact Statement (EIS) as opposed to a PER.*
- b) This submission has highlighted that, where there is demand and opportunity for generational change in infrastructure provision, it must assist strategically in the reversal of population decline and workforce challenges, enable new industry development and not prevent it.*
- c) An analogy has been drawn of a single commodity port in the context of this region's infrastructure needs as being akin to providing NBN and telecommunications services to grain growers only rather than to any industry that it can assist.*

- d) *It misses the opportunity to optimise the development of shared infrastructure to enable essential economic diversification, associated widespread jobs growth, truly sustainable global competitiveness in primary industries and the ability to transform export industries from price takers to price makers.*
- e) *RDAWEP is confident, based on the financial modelling that it has seen, that a grain export facility, supported by growers, that creates market competition within the status quo is warranted and can be viable. However, to provide one as a grain only facility and to pose high risk to a multicommodity facility, transport intermodal and industrial hub, is unacceptable.*
- f) *Clearly the circumstance of having two port projects within such close proximity to each other compromises every principle of best practice, planning and development. It presents the real risk of duplication in essential infrastructure (such as roads, power, water, telecommunications), increases capital and operational costs, compounds negative environmental impacts and significantly compromises the integrity and purpose of precinct-based development. Peninsula Ports CAPEX budget and potential OPEX, without the realisation of these types of efficiencies, and without detailed transport network and essential service costs draws into question the financial sustainability of this project.*
- g) *The significant changes to the design and construction of the jetty and addition of the causeway require independent assessment that should be included in a full EIS.*
- h) *This submission has questioned the real level of community support for this amended project and provided an example of what real Local and Federal Government support should look like.*
- i) *The extent of change poses high risk to the future financial sustainability of the District Council of Tumby Bay from unplanned, un-costed and unbudgeted capital and ongoing operational works such as for roads. It also has high risk implications for road safety, particularly on Lipson Cove Road, and for visitation and quiet enjoyment of Lipson Cove, Lipson Island Conservation Park and Rogers Beach.*
- j) *All Eyre Peninsula primary industries and producers urgently require the improved margins and new market opportunities that a multi-use deep seaport can potentially provide them. Regretfully this amendment provides for a grain only port which is materially different to the original proposal and should not be approved without full examination of the issues raised herein and satisfaction of the principles expressed.*
- k) *RDAWEP recommends that Peninsula Ports be required to re-advertise a full Environmental Impact Statement providing further information and evidence relevant to all changes.*

Proponent response

- a) Peninsula Ports sought guidance from DPTI regarding the approval's pathway and the submission of the variation to the existing approval, which would also deal with the timing issues, was the pathway stated by DPTI. Peninsula Ports is following the process of seeking a formal approval to vary an existing approval in the same manner that Iron Road would need to seek formal approval to be able to export grain or other commodities from Cape Hardy.
- b) RDAWEP makes an unfounded opinion that this project in some way blocks new industry. Such opinion is not supported by any facts or research.
- c) RDAWEP clearly does not understand the difference between telecommunications infrastructure and bulk commodity logistics infrastructure by making this comment.
- d) We do not disagree with multi commodity ports; however, we are cognisant of the clean and green reputation that Eyre Peninsula grain enjoys and would not do anything to compromise this reputation. While we remain open to other future considerations should there become

a realistic future opportunity, any future proposals for additional commodities at Port Spencer would consider the following:

The existing land area is sufficient for the accumulation and export of grain. In the future additional commodities would need to follow the steps below:

- In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
- Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered.
- Identify land near the site suitable for storing / managing the product.
- Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design the wharf does have spare capacity to add new conveyors and other facilities to a reasonable degree.
- Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.
- Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

- e) This statement is evidence of RDAWEP's bias in favour of one project over another in a competitive market, with the clear implication that RDAWEP is seeking state government interference in market competition.
- f) RDAWEP provides no justification for this position. To illustrate, the roads discussion paper that Peninsula Ports presented to Councils confirms that a strategic E-W road freight connection would benefit both Port Spencer and Cape Hardy. In the absence of DAWE (formerly AQIS) or indeed RDAWEP being able to provide any examples nationally of iron ore and grain being exported from the same wharf it could appear that the real multi-commodity potential at Cape Hardy may not end up being technically achievable if iron ore is included in the commodity mix. This statement is evidence of RDAWEP's bias in favour of one project over another in a competitive market, with the clear implication that RDAWEP is seeking state government interference in market competition.
- g) Peninsula Ports sought guidance from DPTI regarding the approval's pathway and the submission of the variation to the existing approval, which would also deal with the timing issues, was the pathway stated by DPTI. Peninsula Ports is following the process of seeking a formal approval to vary an existing approval in the same manner that Iron Road would need to seek formal approval to be able to export grain or other commodities from Cape Hardy.
- h) This statement is evidence of RDAWEP's bias in favour of one project over another in a competitive market, with the clear implication that RDAWEP is seeking state government interference in market competition.
- i) We have been consulting with both DPTI and Council since July 2019 and can confirm that we have assessed Lipson Cove Road as a safer location for a major intersection than the original approved location of Swaffers Road. Principally it is the long sight lines at Lipson Cove Road that makes it a safer location for intersections of this type and will have longer heavy vehicle queuing provisions than other similar locations around Eyre Peninsula, such as at Tumby Bay itself. This will occur due to current design standards being applied to the intersection that may not have been the same when the Tumby Bay site was established.

We have committed to ongoing community engagement regarding road design and will continue to do so jointly with both Council and DPTI. We have proposed to Council the establishment of a Road Maintenance Fund to help to support any local government impacts that cannot be fully modelled at this time and acknowledge the condition that was placed on Centrex to negotiate relevant agreements with Tumby Bay Council. Regarding the impact on tourism the amended project involves lesser number of vessels and the vessels are smaller than the current approved project. We have also proposed to Council that the native revegetation works at the site, including the ILUA-agreed role of a Land Management officer from the Barngarla community can be expanded to improving the land management adjacent to the site if Council is interested in the project doing so.

- j) This statement is evidence of RDAWP's bias in favour of one project over another in a competitive market, with the clear implication that RDAWP is seeking state government interference in market competition. As noted above there is a pathway for additional commodities to be accommodated at Port Spencer, however at this time the only commercially viable commodity for a new deep seaport appears to be grain. Note also that Peninsula Ports has sought guidance from Department of Agriculture and Water Resources regarding what sites in Australia have iron ore and grain being exported from the same wharf, and Department of Agriculture and Water Resources were unable to provide any examples.
- k) Decision made by others is out of the scope of this response document. DPTI recommendation and minister decision was for an Amendment to PER.

2.1.4 DEPARTMENT OF ENVIRONMENT AND WATER (DEW)

Item 1: *The amended design which proposes a substantial rock causeway will likely have a significantly greater impact on the near-shore and marine environment than the original open jetty design. The amended proposal does not align with the stated commitment to "ensure a sustainable outcome is achieved that minimises environmental, social and economic impact". The justification for the selection of the rock causeway compared to a piled structure is considered inappropriate, e.g. Vol 1, p. 15 of the Amendment to the PER. The amended design of the jetty is intended to reduce the cost of the development, but this should be considered against the increased impacts on the environment.*

The development of the Construction Environmental Management Plan and the Operational Environmental Management and Monitoring Plan (OEMMP) should include a Biosecurity Plan with a marine pest component (covering prevention, surveillance and monitoring, and response). These plans should be developed in consultation with PIRSA and the Eyre Peninsula Natural Resources Management Board.

Proponent response:

The EPA raised a similar concern and Peninsula Ports have responded with the following:

It has been acknowledged within the project documentation (both within the amendment documentation and associated appendices) that the revised causeway design will result in a significantly higher level of benthic habitat loss (primarily seagrass) than the Evaluated Project (an estimated increase in loss from the Seagrass Zone from 4,702 m² to approximately 11,108 m²). The discussion regarding the significant reduction in piling associated with the amended project was outlined in the context of providing a comparative assessment of the cumulative impacts associated with amended project. It is understood that a reduction in underwater noise impacts cannot be

directly 'traded-off' against the predicted increased impacts to seagrass. Such impacts (and all marine habitat) will be offset through the Native Vegetation Act SEB offset process.

The Amendment to PER identified a residual high risk for introduction of marine pests. During operations a number of management measures were committed to, including:

- All vessels to comply with Australian Ballast Water Management Requirements (now 2017) and the Australian Quarantine Regulations 2000.
- A Management and Monitoring program will be developed to identify potential marine pest species and appropriate management measures.
- A control and monitoring program for the present Asian Date Mussel will be developed for the Port.

These plans will be developed in consultation with PIRSA and the Eyre Peninsula Natural Resources Management Board, requiring Ministerial approval prior to construction.

Item 2: Impact on Seagrass

- a) It is stated that 1.11 ha of seagrass will be impacted by the development. The Native Vegetation Council will seek confirmation that this is likely to be the total extent of impacts, including any impacts from sedimentation (from construction and subsequent altered sediment transfer) or future maintenance or operational activities. The NVC would expect an appropriate level of monitoring and reporting to be undertaken to confirm the full extent and degree of impacts on seagrass. The final determination of the full extent of impacts will potentially substantially change the required SEB. The NVC would expect an appropriate level of monitoring and reporting to be undertaken to confirm the full extent and degree of impacts on seagrass.*
- b) Table 6-5 'Land disturbance and vegetation clearance' – 'Marine disturbance' – this should include monitoring for marine vegetation adjacent to the causeway and jetty (e.g. to identify loss from smothering, loss due to water quality, etc.).*

Proponent response:

With reference to the total extent of seagrass impacts for all construction and operational activities, Peninsula Ports undertook disturbance calculations using a buffer to allow for the construction of the causeway and associated impacts including sedimentation as well as impacts from operational activities. The native vegetation clearance and SEB calculations (presented in Table 6-4 of Volume 1 of the Amendment to PER submission) accounts for presence of seagrass in both the Seagrass Zone and the Sandy Substrate as identified in the baseline marine ecology report (Appendix K of the PER).

The EPA raised a similar concern about the accuracy of the predicted total disturbance area. Peninsula Ports responded to the EPA with the following:

Within Section 3.1 of the Amendment to the PER and Section 3.1.1 of Volume 2 (Review of Evaluated Project), the potential for indirect losses of benthic habitats (primarily seagrass) as a result of indirect impacts associated with light attenuation from shading and temporary suspended solids from the causeway construction is acknowledged. The benthic habitat loss calculations presented within Appendix E took into consideration a buffer zone (i.e. an area larger than the actual project footprint) to accommodate for the potential indirect impacts associated with construction and operations (i.e. temporary increases in nearshore suspended solids or sediment resuspension and shading). Due to the nature of the proposed construction methodology (i.e. no dredging or continuous reclamation

point source) it is not thought feasible to undertake a robust hydrodynamic modelling at a resolution fine enough to account for the localised temporary resuspension of sediments from the placement of the causeway materials by the project machinery. Therefore, it was deemed more appropriate to nominate a likely indirect buffer zone around the proposed project infrastructure to account for these potential indirect losses.

In consultation with DEW, Peninsula Ports will develop appropriate monitoring and reporting procedures (within the CEMP and OEMP for Ministerial approval) to safely determine the full extent of disturbed marine vegetation.

Item 3: Changes to sediment transfer caused by the causeway-

- a) *As described in the amended PER and ECoast Marine Consulting and Research report, monitoring locations should be defined on the northern side of the proposed structure and the southern end of the beach to the north. Trigger levels for remediation actions should be defined in line with acceptable levels of shoreline erosion or ecological considerations.*

Proponent Response:

Agreed. Recommendations (as per the Amendment to PER) will be incorporated into CEMP and OEMP in order to provide a BACI monitoring scheme (Before/After Control /Impact) before works begin.

- b) *Impact of sediment accumulation against the causeway on the intertidal and benthic environment does not appear to have been adequately addressed, including the potential extent of the accumulation footprint over time, triggers for removal if necessary, removal methodology, impact of removal on coastal environments, etc.*

Proponent Response:

Trigger levels for the management of changes to the sediment transport regime are to be set based on the monitoring data, since they cannot be established in the absence of information such as the rate of accumulation to the south of the causeway and the rate of sand loss (Rogers Beach). Monitoring of the accumulation will also provide information the potential effects of the accumulation footprint, which could potentially be a trigger level; e.g. based on the proximity of the accumulation footprint to potentially effected ecological communities. Consideration of the local ecology during the monitoring will also provide information of the impacts of sediment removal and placement, and how these can be mitigated, if required. It is important to note that there is a significant seasonal across-shore sediment transport regime, that is, during the winter months sediment is pulled offshore and then is moved shoreward potentially displacing nearshore benthic communities, while mobile sandy beaches are relatively low in biodiversity and abundances of organisms due to the mobile and abrasive nature of the habitat.

As noted in the proposed Beach Monitoring and Management Plan for Port Spencer:

- [beach monitoring will incorporate] 6-monthly surveys to begin with, with the potential reduce to yearly following a 2-year review, which will also provide information on setting of trigger levels.
- [potential] trigger levels for the removal of sand from the southern side of the wharf causeway to the southern end of Rogers Beach – 2x triggers, for example a) beach

erosion/retreat detected at Rogers Beach, and b) the sand on the southern side of the wharf causeway is accumulating to 100 m south of the structure (whether there is any indication of erosion or not).

- c) *In Table 3-30 the evaluated project estimated accretion rates south of the structure to be up to 0.3m over 50 years but states a reduced erosion rate of 0.121m/year. There may be an error in those data/calculations as multiplying the annual rate by 50 years does not give 0.3m? Is there any possibility that errors in the original impact assessment/data were carried over into the current modelling?*

Proponent Response:

The discrepancy is noted. These figures were taken directly and verbatim from the evaluated project PER document. The modelling that has been undertaken for the Proposed Amendment is independent of the previous modelling for the PER, without the ability for any original errors to be carried over, and confirms that the “pocket beach to the south shows predicted post-development accretion of between 0.01 m/year and 0.04 m/year (i.e. 0.5-2 m in 50 years) in places.”

- d) *The ability of a silt curtain to effectively contain construction sediment for a development of this scale and in the required depths, in this particular marine environment, should be quantified by the proponent.*

Proponent Response:

The original Port Spencer (Centrex) proposal estimated a total marine construction period of 18 months. Peninsula Ports propose the total marine construction period of approximately four months. Given the substantial reduction in the length of construction time, the reduction of scale from the existing approval (less approximately 670m of jetty, and 160 fewer piles) and therefore reduction of marine disturbance the use of silt curtains to contain sediment, while not quantified in either proposals is still considered to be an effective step towards containing sediment generated by from construction.

- e) *Potential accumulation of wrack against the causeway and around the near-shore environment has not been addressed, including potential extent of the accumulation footprint, factors leading to accumulation and natural dispersal, triggers for removal if necessary, removal methodology, impact on nearshore ecology if not removed, etc.*

Proponent Response:

The Review of Evaluated Project (Jacobs, 2019), page 90, section 3.11.2.2 Seagrass Wrack Accumulation on the Proposed Causeway addresses potential accumulation of wrack against the causeway and around the near-shore environment, with the following text and excerpt from that section:

“It is known that seagrass wrack suspended in the water column can be transported in surface waters and washed up on to the shore by waves, tides and winds. Build-up is expected to occur when currents have an onshore component, or in the context of Port Spencer, during periods of southerly winds. Therefore, there is the potential for seagrass wrack to accumulate on the southern side of the causeway (Greer & O’Neill 2019). It should be noted that beach-cast seagrass wrack is a natural process within an important ecological function, providing food and habitat to beach

communities along shorelines (birds and invertebrates) (Oldham et al. 2014). Seagrass wrack can also negatively impact beachside communities as a result of visual amenity and odour impacts as the wrack accumulates and subsequently degrades. However, due to the remote location of the proposed causeway (approximately 20 km from the nearest town centre) and subsequent low population of the surrounding area, direct impacts on the local community beach access or tourism are not predicted. Furthermore, it is proposed that any seagrass wrack is monitored as part of the proposed coastal processes/beach monitoring programme to be implemented during operations. If seagrass wrack accumulation is seen to be an issue, then management measures such as the removal and disposal of the wrack may be implemented.

Studies have demonstrated that seagrass wrack is not likely to smother intertidal benthic communities, with Oldham et al (2014) demonstrating that seagrass washed back into marine waters gets rewetted and stays positively buoyant for a number of hours, circulating back to the beach. It has been noted that as seagrass wrack decomposes on the beach it releases nutrients, altering sediment chemistry. Under oxic conditions, the main by-product of decomposition is carbon dioxide (CO₂), an odourless gas and under anoxic conditions, a range of gaseous by-products occur, including methane and hydrogen sulphide (H₂S) (Oldham et al. 2014)."

Therefore, as stated, Peninsula Ports will monitor seagrass wrack accumulation and would work with DEW in the event seagrass wrack accumulation is seen to be an issue, to then develop necessary remediation measures.

- f) If the proposal is approved, inclusion of specific conditions around how the monitoring and management of accretion and erosion of sediment will occur would be required.*

Proponent Response:

Agreed and will be developed in consultation with DEW and other relevant agencies.

Item 4: Management of Invasive species

- a) Over-abundant Silver Gulls are a serious management issue for the ecology of local native species, in particular nesting sea and shorebirds, of which a number are EPBC listed. Silver gull populations tend to increase in areas where there are people. Silver gull populations at the project site should be monitored so management can be initiated if appropriate.*
- b) It is also recommended that the proponent/operator works with PIRSA Biosecurity to ensure a management plan is put in place for the management of Asian mussels at the site.*

Proponent response:

Peninsula Ports will work with DEW to implement appropriate management measures to reduce the risk of Silver Gull impact on nesting sea and shorebirds if monitoring has identified an increased number of Silver Gulls in the project area. Construction and Operational management strategies will need to include strict control of food and waste that attracts Silver Gulls, which predate on the hatchlings, as well as a monitoring regime such as quarterly photographic records during key times.

The Centrex Metals PER refers to waste management as the main tool for addressing the risk of Silver Gulls on native species.

Peninsula Ports will work with PIRSA to develop a plan for the management of Asian mussels at the Project site as discussed in response to Item 1.

Item 5: Management of threatened species

- a) While not directly impacted by the development a number of EPBC listed shorebird species roost/breed nearby on beaches including Hooded Plovers. While the PER describes these areas as “protected by a development exclusion zone” the access by staff and contractors to these areas will need to be well managed.
- b) Table 6-6 ‘Operational phase – ‘Interaction with Natural Resources – fauna interactions’ – ongoing monitoring of fauna needs to be included.

Proponent response:

Agreed. The access by staff and contractors to these areas will be well managed, inducted and communicated.

Through the ILUA the site will be the base for a future indigenous ranger program by the Barngarla, which will require support from the Commonwealth government. Irrespective of the timing of the indigenous ranger programme a Land Management Officer will be put in place during construction and operations. One of the key responsibilities will include environmental management of the locality, fauna monitoring (including Marine Mammal Observer role under the Southern Right Whale Management Plan) and can include monitoring of the exclusion zone.

2.1.5 ENVIRONMENT PROTECTION AUTHORITY (EPA)

Item 1: Marine Water Quality: Requirement for Applicant; *The risk assessment and conclusions should be amended to state that there will be significantly more loss of marine habitat as a result of this proposal compared to the original approved development. Trading off between underwater noise and seagrass loss (or any other process) is not considered appropriate.*

Proponent response

It has been acknowledged within the project documentation (both within the amendment documentation and associated appendices) that the revised causeway design will result in a significantly higher level of benthic habitat loss (primarily seagrass) than the Evaluated Project (an estimated increase in loss from the Seagrass Zone from 4,702 m² to approximately 11,108 m²). The discussion regarding the significant reduction in piling associated with the amended project was outlined in the context of providing a comparative assessment of the cumulative impacts associated with amended project. It is understood that a reduction in underwater noise impacts cannot be directly ‘traded-off’ against the predicted increased impacts to seagrass. Such impacts (i.e. loss of marine habitat due to the project) will be offset through the Native Vegetation Act SEB offset process.

Item 2: Water Quality Effects due to Construction of the Causeway: Requirement for Applicant; *The Response Document should acknowledge that this type of development is not consistent with other approved developments of a similar scale and environmental conditions particularly noting the environmental impacts highlighted in the EPA’s comments in Issue #1.*

The previous major development approval of Iron Road Ltd’s proposed port at Cape Hardy (in 2016) incorporated a small modular offload facility extending ~80m and investigations stated that there would be a less than 1% change in hydrodynamics for coastal processes. More recently, Kangaroo Island Plantation Timber Ltd revised the design of the Smith Bay major development major development proposal to remove the use of a causeway due to the potential impacts to the marine environment.

The amended Port Spencer proposal is likely to cause a greater adverse impact on the marine environment than these other two proposals.

Proponent response

The EPA's comment concerns the following statement from Section 3.11.2.1 of Volume 2 – Review of Evaluated Project which relates to water quality effects from the construction of the causeway. The full sentence is re-produced below:

"It is acknowledged that sedimentation and turbidity effects due to the placement of fill and rock armour was not contemplated by the Evaluated Project; however, this type and scale of construction is consistent with other approved developments of similar scale and environmental conditions, and the level of turbidity effects for the Proposed Amendment are expected to be localised and short term."

The Project description in the approved (Iron Road) EIS for **Cape Hardy** is:

"Marine infrastructure:

*A 900 m long jetty (incorporating **200 m of causeway**)*

A 400 m long wharf at the end of the jetty with two berths

Module offloading facility

Tug harbour"

Based on the approved scale and type of marine infrastructure approved at Cape Hardy, the comparison from the perspective of turbidity generated from placement of fill and rock armour is considered valid.

Given that Cape Hardy was approved with the abovementioned infrastructure the Minister has established the precedent that this form of development is considered appropriate with suitable conditions of approval.

The use of a nearshore causeway structure with a trestle wharf is a common engineering solution within the Spencer Gulf with examples of such solutions evident at the Whyalla Marina, the Whyalla iron ore Storage & Handling Export Facility, Port Lincoln grain terminal and Port Lincoln Slipway. The proponents acknowledge the specific environmental sensitivities associated with the development and has proposed a design which seeks to mitigate environmental impacts, while providing a practical and economically feasible design solution for the project.

The EPA's comment with respect to Kangaroo Island Plantation Timber is acknowledged, however that project is somewhat different due to the extent of dredging that it had proposed.

Item 3: Marine Ecology: Requirement for Applicant; *Currently, the proposed causeway construction method is likely to cause indirect loss of seagrass over a wide area but is currently undescribed in the amendment to the PER. The Response Document needs to include the predicted area impacted as a result of the causeway construction, including the native vegetation clearance associated with the direct and indirect loss of seagrass. Modelling needs to be undertaken to demonstrate the predicted turbidity generated by the construction of the causeway, and the evaluation of indirect loss on seagrass and algal reef habitats. The modelling needs to take into account unmitigated predictions given the unlikely ability to use silt curtains in deeper, moderate to high, energy environments.*

Proponent response

Current methods proposed for the causeway construction include using skeleton buckets to load the run of quarry material to be used for the core.

Within Section 3.1 of the Amendment to the PER and Section 3.1.1 of Volume 2 (Review of Evaluated Project), the potential for indirect losses of benthic habitats (primarily seagrass) as a result of indirect impacts associated with light attenuation from shading and temporary suspended solids from the causeway construction is acknowledged. The benthic habitat loss calculations presented within Appendix E took into consideration a buffer zone (i.e. an area larger than the actual project footprint) to accommodate for the potential indirect impacts associated with construction and operations (i.e. temporary increases in nearshore suspended solids or sediment resuspension and shading). Due to the nature of the proposed construction methodology (i.e. no dredging or continuous reclamation point source) it is not thought feasible to undertake a robust hydrodynamic modelling at a resolution fine enough to account for the localised temporary resuspension of sediments from the placement of the causeway materials by the project machinery. Therefore, it was deemed more appropriate to nominate a likely indirect buffer zone around the proposed project infrastructure to account for these potential indirect losses.

Item 4: Marine Ecology: Requirement for Applicant; *The Response Document should amend the conclusions in 3-28 to reflect impacts on the marine environment at the local scale impact, not the gulf-wide scale.*

Proponent response

The predicted impacts on the marine environment, particularly benthic habitats, have been assessed at a local scale. Section 3.1.1 of Volume 2 (Review of Evaluated Project) specifically outlines the predicted impacts to local benthic habitats. The reference to gulf-wide marine ecosystems, particularly in relation to seagrass communities has been provided to contextualise the predicted loss of such habitats in the context of the broader Spencer Gulf ecosystem. Contextualising the predicted impacts within the broader environment is important in assessing cumulative impacts. It does not seek to minimise local scale impacts; however, it does provide the necessary context for the EPA to assess the acceptability of the proposal.

Item 5: Surface Water Quality: Requirement for Applicant; *Any flows that are discharged from the site are considered site flows. Clarity about the major flow path that is proposed to pass through the site is required as this would be considered contaminated site runoff. It is recommended that all upstream runoff flow generated outside the site and major upstream flow paths are diverted around the site. If an upstream flow passes through the site and has inflow and/or outflows through the site detention basin, then indicate how this flow would be protected from contamination from site activities, and how runoff would be treated to remove any contaminants. This should include the volume that is proposed to pass through the site and therefore be exposed to potentially polluted inflows and require treatment. All flows generated on site to be contained onsite, as indicated with zero site runoff to the ocean, need to be clearly demonstrated. Ensure all figures clearly illustrate all flow paths, pollution prevention measures (including treatment to remove pollutants from stormwater) and all stormwater infrastructure, including detention/attenuation basins.*

Proponent response

Given the phase of the proposal, a refinement of the site layout (Please refer to Attachment 3) has recently been identified to improve the earthworks required for stormwater management. Volumes and treatment options will need to be considered during detailed design and are therefore not currently available. However, prior to construction, bunding specifications and management plans pertaining to the abovementioned EPA guideline will be submitted for approval.

Stormwater management on site will also need to be assessed and managed in accordance with the EPA Water Quality Policy. Essentially where stormwater is expected to flow it will need to be managed to avoid erosion and scour and contamination. Procedures will be developed to detail where stormwater is collected it will need to be in a bunded area, tested for contamination and collected and disposed of off-site by a licenced contractor where contamination is found.

To minimise the visual impact on surrounding landowners and visitors Peninsula Ports will be establishing trees surrounding the site and will require water to irrigate the plantings during establishment and subsequently to encourage rapid growth. The collection of 100% of on-site stormwater will be used for this and other site uses.

Item 6: Surface Water Quality: Requirement for Applicant; *All fuels and chemicals must be stored in bunded areas in accordance with the EPA Guideline Bunding and Spill management noting that bunding should be at least 120% of the net capacity of the largest tank or for flammable liquids, at least 133% of the net capacity of the largest tank. All bunding details and locations need to be indicated in the Response Document.*

Proponent response

Acknowledged. Detailed design of the facility will accord with the requirements of the EPA Guideline: Bunding and Spill Management.

Given the phase of the proposal, equipment has not been selected and therefore specifications for bunding is not available. However, prior to construction, bunding specifications and management plans pertaining to the abovementioned EPA guideline will be submitted for approval.

Item 7 Noise: Requirement for Applicant; *Ensure all noise mitigation measures are implemented as specified in Section 4.1.5 of the Noise Assessment (SONUS Report S613C64, Appendix I, pages 11 – 12).*

Proponent response

Correct. Peninsula Ports will adopt all noise mitigation measures as specified in the Sonus report S613C64 'Port Spencer Grain Handling and Export Facility, Environmental Noise Assessment, October 2019', including general and night-time operations.

Item 8 Noise: Requirement for Applicant; *Adopt the general mitigation measures for both the Construction Phase and the Operational Phase for the proposed development, as presented in the PER (Jacobs, IW219900-0-NP-RPT-0003 | 2, Volume 1, section 6.3.3).*

Proponent response

Peninsula Ports will adopt the measures committed to in the PER as referenced above. These measures will be captured in all construction and operational plans to be approved by the Minister before construction can commence.

Item 9 Air Quality: Requirement for Applicant; *Comparative assessment of the meteorological year used in the model against the 2009 dataset (either locally obtained or derived using an appropriate model) needs to be undertaken to determine if there is a level of increased risk that may need consideration.*

Proponent response

To provide background information regarding the selection of an appropriate modelling year, 2017 was identified by Jacobs following the analysis of Bureau of Meteorology (BoM) data from Port Lincoln AWS for recent years 2012 – 2018. Year 2017 had the highest frequency of low speeds winds blowing in the direction which is most likely to impact sensitive receptor sites around the Port Spencer grain facility boundary. From experience of a previous study carried out by Jacobs in SA last year, Jacobs understood that it was acceptable to the EPA for years other than 2009 to be selected if the selected model year was justified. The advantage of using data from most recent years is the availability of hourly meteorological data from BoM stations (to assist in driving models if required), as well as dust monitoring data from EPA stations which is collected for the same years. In addition, Jacobs would expect general improvements in monitoring technology mean that more recent data should be of a higher quality. There can also be a perception by reviewers, or a reader from the general public, that a more recent year is more relevant.

To address this action, assessment of meteorological data for the proposed Port Spencer site (using meteorological modelling) will be carried out for year 2009 and a comparison of the outputs with those from the 2017 model year will be made. This will enable an assessment of any change in risk levels which may require further analysis prior to finalising mitigation measures for the OEMP.

Item 10 Air Quality: Requirement for Applicant; *The following two alternatives should be considered:*

- a) *Either the development of a monitoring system with a minimum of three monitoring locations (north, west and south) to provide an integrated active monitoring programme that can be used to provide real-time data for the monitoring of PM_{2.5}, PM₁₀, TSP and methyl bromide. This also needs to be included in a Trigger Action Response Plan to ensure no exceedances occur of any of the parameters at any sensitive receivers at any time; or*
- b) *Reconsideration of the engineering aspects of the facility to better capture dust during activities that have a significant dust raising potential (in particular, grain unloading and ship loading), as well as a method to ensure that the emission rate of methyl bromide is considerably lower than currently predicted and does not risk impacting the nearest sensitive receivers. These changes should also be reflected in a remodelling of the predicted emissions (using a 2009 meteorological dataset).*

Proponent response

In considering further engineering controls that Peninsula Ports may be able to feasibly implement, a re-alignment of the bunkers is proposed so the truck receipt points are spread out along the western side of the site rather than being concentrated to the northern end of the site. Peninsula Ports propose to implement this re-design as per the sketch at Attachment 3 within the existing bunker footprint and note that it will reduce the level of earthworks required for on-site stormwater management. Peninsula Ports will conduct modelling as requested by the EPA, to demonstrate predicted emissions.

If the re-modelling is unable to demonstrate a clear reduction in air quality parameters at the closest sensitive receivers under normal operating conditions, Peninsula Ports commits to the implementation of an air quality monitoring system as part of the Operational Environmental Management Plan.

2.1.6 ABORIGINAL AFFAIRS AND RECONCILIATION (AAR)

Peninsula Ports provides the following responses to the issues raised by the RDAWEP in their response letter dated 25 February 2020:

Item 1: *Peninsula Ports should refer to Attachments 2 and 3 for factsheets and protocols that will assist it in meeting its obligations under the Act. AAR is also available to provide an Aboriginal heritage legislative awareness session for Peninsula Ports' employees and contractors free of charge. This session would increase attendees' awareness of the Act, heritage risk management processes and Aboriginal heritage more generally.*

Proponent response

Peninsula Ports has engaged very constructively with the Barngarla as Traditional Owners of the land and water at Port Spencer since July 2019.

An ILUA has been agreed with the Barngarla as follows:

- On 16-02-2020 in Port Lincoln, the Barngarla community voted unanimously to authorise the ILUA for the project.
- On 17-02-2020, ILUA executed by the Barngarla Determination Aboriginal Corporation (BDAC), Peninsula Ports and Free Eyre.
- On 21-02-2020, ILUA executed by South Australian Native Title Services Ltd (SANTS) and hand delivered to the State government for execution by the relevant ministers.
- Media release confirmed that Barngarla will be direct shareholders in PP through the ILUA, marking this ILUA as representing a significant milestone in the constructive relationship that can be achieved between traditional owners and project developers.
- The ILUA includes detailed processes regarding Aboriginal Cultural Heritage and induction of all personnel into the Barngarla cultural heritage significance of the site and the processes agreed in the ILUA.

2.1.7 DEPARTMENT OF PLANNING AND TRANSPORT INFRASTRUCTURE (DPTI TRANSPORT)

Item 1: *DPTI supports the proposal and the proposed road network improvements detailed in the Traffic Impact Assessment prepared by Jacobs. The upgrade of the Lincoln Highway/Lipson Cove Road junction will need to be undertaken to the satisfaction of DPTI, with all costs being borne by the proponent. The site entry and exit points from and to Lipson Cove Road and the proposed sealing of Lipson Cove Road will need to be undertaken to the satisfaction of the District Council of Tumby Bay, with all costs being borne by the proponent.*

Proponent response:

Agreed and note that this is consistent with consultation with District Council of Tumby Bay since July 2019, during which the intention of not leaving DCTB with unfunded road maintenance liabilities has been a consistent intention.

Item 2: *The proposed upgrade of the Lincoln Highway/Lipson Cove Road junction is supported in-principle by DPTI. This involves the provision of a channelised right turn treatment for vehicles turning right from Lincoln Highway onto Lipson Cove Road, with storage for two Road Trains; a channelised left turn treatment for traffic turning left from Lincoln Highway onto Lipson Cove Road and a*

channelised left turn treatment from Lipson Cove Road to Lincoln Highway to enable left turning vehicles to safely merge with the through traffic on Lincoln Highway.

Proponent response:

Acknowledged.

Item 3: *The proposed upgrade of the Lincoln Highway/Lipson Cove Road junction will need to be designed and constructed in accordance with Austroads Guides/Australian Standards and to DPTI's satisfaction. This upgrade should occur prior to construction commencing to safely manage the traffic impacts for the construction and operational phases of the proposal.*

Proponent response

Agreed and note that this is consistent with consultation with District Council of Tumby Bay since July 2019

Item 4: *In the event that Restricted Access Vehicles (including oversize and over mass components) are proposed to be utilised, the proponent must ensure that all necessary approvals/permits are obtained from the National Heavy Vehicle Regulator (www.nhvr.gov.au).*

Proponent response

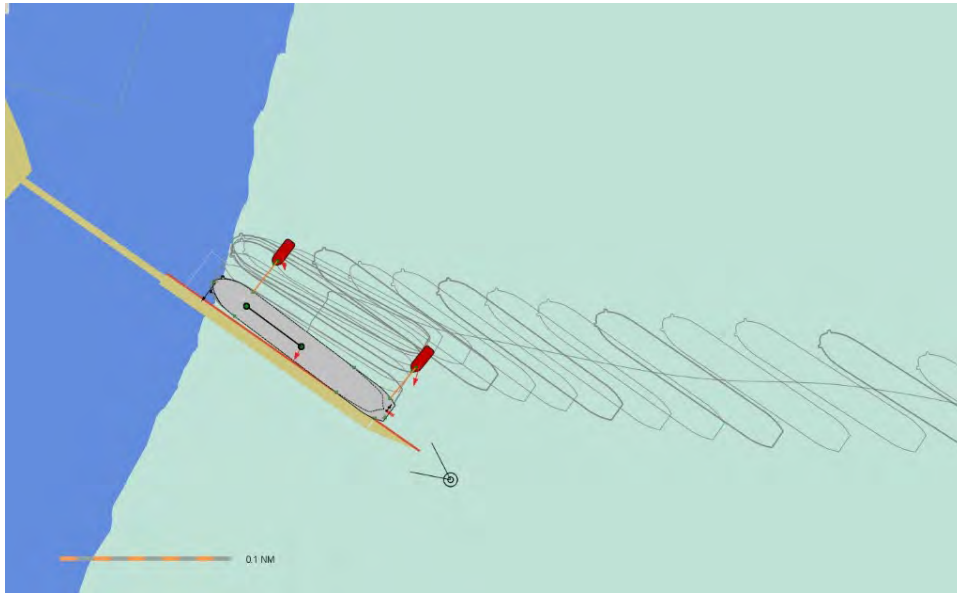
Acknowledged.

Item 5: *A copy of the Marine Operations Plan (Operations Marine and Shipping Plan) should be included in the proponent's Response document.*

Proponent response

Marine Operation Plans (MAROPS) documents are attached (Please refer to Attachment 4) – note however that to minimise the risk of propeller wash causing scour in the seabed, the Panamax Vessels that have a design Under Keel Clearance of only 1m and the western (land) end of the berth will be berthed with stern to the sea where much deeper water is present (approximately 5m under keel).

The port simulation modelling at Smart Ships in Brisbane has been re-run to check this arrangement and it has been confirmed that berthing with the stern to sea poses no problems for arrivals or departures compared with the current arrangements. An extract from the simulation modelling is provided below for illustration – this scenario was for 38knots cross wind – well above the operating limit for berthing of 27knots in the MAROPS plan, confirming an appropriate operating margin for safety.



A further benefit identified in this modelling is that the vessel can be positioned approximately 20m closer to shore as the bow is trimmed to be 0.5m shallower than the stern, which means the potential through detailed design to shorten the wharf and further reduce the number of piles. This potential will be examined during detailed design and fewer piles used if feasible.

2.2 RESPONSE TO PUBLIC SUBMISSIONS

The five public submissions have been reviewed and comments grouped into 8 main themes for ease of addressing the common concerns. The largest number of issues raised by five individual public submissions were raised by the Tumby Residents and Ratepayers Association, with a submission of 96 pages. Although we note the number of members is unclear, with constituents made up of non-residents or non-rate payers (as per the TBRARA website). The remaining four public submissions generally related to the use of Lipson Cove and Rogers Beach (by locals and tourists), road upgrades (east-west corridor, cost, safety and access), operational noise, permanent impacts of the causeway (movement of sand, seagrass and erosion), community and stakeholder engagement and a preference for a multi-user port (reasons such as more land and transport accessibility). On a positive note, one submission made mention that *'the grains industry certainly does need to plan for 'life after Port Lincoln'...due to the poor town planning of Port Lincoln.'*

Where possible, Peninsula Ports has summarised the public submission comments, with a cross-reference to where the submission was made as per Table 1 below for further clarity.

Table 1. Public submission responses to Amendment to PER.

No.	Name	Interests
1	Tumby Bay Residents and Ratepayers Association Inc.	Number of members not known. May also include associates that are not residents or ratepayers.
2	Ann Baillie	Concerned resident
3	Karen Baines	Grain growing farmer
4	Lisa Graney	Concerned resident
5	Peter Swaffer	Concerned resident

The main themes were summarised as follows:

- 1) Marine environment;
 - a) construction of the causeway / sedimentation, erosion, turbidity/ sand movement and exposure of historic wreck,
 - b) seagrass wrack/seagrass loss and SEB offset,
 - c) impact on fauna / marine mammals,
 - d) impact of grain dust,
 - e) impact of a waste discharge (e.g. spill or ballast water),
 - f) dredging.
- 2) Traffic / Roads,
- 3) Air quality (Grain dust/ diesel emission),
- 4) Use of chemicals / fumigants,
- 5) Economic modelling,
- 6) Noise,
- 7) Fire Risk, and
- 8) Social impact (impact on local community / tourism).

Of those, 72 raised issues relating to marine construction and its environmental impact, 44 comments were related to traffic impacts and road upgrades, 16 comments were related to air quality, 6 comments were related to the impact of chemical use, 11 comments were related to Noise impact, 4 comments were related to fire risk and 13 comments related to social impact of the Project. The remaining comments did not express any concerns or issues with the Project and mostly were out of the scope of Amendment to PER.

A response to each of the 8 themes is provided in the following sections.

2.2.1 MARINE ENVIRONMENT

a) Comments related to causeway construction incl. sedimentation, erosion, turbidity, sand movement & exposure of historic wreck.

Applicant Response

The net sediment transport in this region is from south west to north east along the coast. The effect of the causeway will be to interrupt this movement and cause accretion to the south west of the causeway and erosion to the north east. The effect will decrease with distance from the causeway. The effects of the causeway are expected to be reduced towards Lipson Cove and Roger's Beach, although a monitoring and mitigation strategy has been proposed in order to detect any impacts and manage them appropriately through sand transfer. These are presented in detail in the modelling report and monitoring and management reports.

The modelling aims to quantify the net movement of sediment to identify the effects of the proposed structure over time on the sediment transport regime. Seasonal erosion and accretion around the wreck is due to cross shore movement of sediment rather than due to along shore movement; the majority of beaches worldwide experience seasonal cross-shore sediment fluctuations due to the difference in wave steepness (wave height to period ratio). The modelling considers the longer-term impact that the development has the potential to have, which is with respect to the influence the along shore sediment transport regime; i.e., sediment trapping on the southern side of the proposed causeway. The effects of the causeway on sediment transport are considered in detail in the sediment transport modelling study. The movement of sand around the shipwreck are seasonal and are likely to be due to cross shore movement which will be less affected by the presence of the causeway than the along shore sediment transport regime. Also, the impact on the Three Sisters shipwreck can be ascertained from the results of the sediment transport modelling.

It is noted that Dr Mead from eCoast (reviewer of the modelling report and author of the Beach Monitoring and Management Plan) visited the site in mid-2010 and supervised the data collection used for model calibration.

In this type of system where the net movement of sediment is along the coast in one predominant direction, northward due to prevailing winds. In this case, the accreting sand to the south west of the proposed structure will come from the coast to the south. This has the potential to impact on the coast/beaches to the north, rather than from the island and Lipson Cove to the south, which is why the monitoring and adaptive management plan is proposed, to transfer the sand captured on the southern side of the structure to the beach to the north where it was previously moving to. It is

important to note that sediment transport rates are relatively low along this coast, which means that impacts are likely to occur relatively slowly.

Sediment transfer (via pumping or trucking) is a common mitigation strategy used worldwide to replace natural sediment transport where it has been interrupted by a structure, dredged channel, etc., and is applied all around Australia's coasts. From the point of view of sediment transport, a causeway and a groyne are synonymous as they represent a solid structure interrupting the along shore sediment transport flow.

While aspects of the development maybe similar to those in Adelaide, the metocean climate in Adelaide is very different to that of the present study site and likely has a very different sediment transport regime. In addition, the potential impact of the structure has been evaluated and quantified, and a beach monitoring and management plan has been developed to mitigate these impacts.

The beach monitoring and management plan document was provided with recommendations for monitoring and an adaptive mitigation strategy for changes to the sediment transport regime due to the proposed development. The plan includes a BACI (Before/After Control/Impact) methodology to assess the impact of the proposed development and differentiate it from the effects of natural variability.

Lipson Island Conservation Park is not a Marine Park and the effects of the development will decrease with distance from the structures. The modelling indicates that the effects of the development will be much reduced in the vicinity of Lipson island.

Finally, the level of sediment builds up now proposed is less than the level of sediment build up that was modelled for the Cape Size vessels approved for the Centrex project. This improvement, even with a causeway being present in the amended project, is due to the shielding effect that the cape size vessels had of the wave action at the site. Sediments are only mobile at this site due to wave action as the tidal velocity is low. Hence the impacts of cape size vessels on blocking sediment movement were found to be greater than the impact of the causeway. Also, Coastal modelling confirms that the only mechanism for sediment transfer is through wave action mobilising sediment and then tidal movement allowing lateral movement. Having said this, a management plan has been included in the PER documentation in recognition of the importance of this issue.

b) Comments related to seagrass wrack/seagrass loss – SEB offset

Applicant Response

With reference to the total extent of seagrass impacts for all construction and operational activities, Peninsula Ports undertook disturbance calculations using a buffer to allow for the construction of the causeway and associated impacts including sedimentation as well as impacts from operational activities. The native vegetation clearance and SEB calculations (presented in Table 6-4 of Volume 1 of the Amendment to PER submission) accounts for presence of seagrass in both the Seagrass Zone and the Sandy Substrate as identified in the baseline marine ecology report (Appendix K of the PER).

Within Section 3.1 of the Amendment to the PER and Section 3.1.1 of Volume 2 (Review of Evaluated Project), the potential for indirect losses of benthic habitats (primarily seagrass) as a result of indirect impacts associated with light attenuation from shading and temporary suspended solids from the causeway construction is acknowledged. The benthic habitat loss calculations presented

within Appendix E took into consideration a buffer zone (i.e. an area larger than the actual project footprint) to accommodate for the potential indirect impacts associated with construction and operations (i.e. temporary increases in nearshore suspended solids or sediment resuspension and shading). Due to the nature of the proposed construction methodology (i.e. no dredging or continuous reclamation point source) it is not thought feasible to undertake a robust hydrodynamic modelling at a resolution fine enough to account for the localised temporary resuspension of sediments from the placement of the causeway materials by the project machinery. Therefore, it was deemed more appropriate to nominate a likely indirect buffer zone around the proposed project infrastructure to account for these potential indirect losses.

In consultation with DEW, Peninsula Ports will develop appropriate monitoring and reporting procedures (within the CEMP and OEMP for Ministerial approval) to safely determine the full extent of disturbed marine vegetation.

c) Comments related to impacts on marine mammals and fauna

Applicant Response

Where the project is located is not the primary breeding, calving and etc of whales and the likelihood of impact is low. The draft Southern Right Whale Management Plan (SRWMP) has been prepared and peer reviewed by independent experts at University of Adelaide as well as the Spencer Gulf Ecosystem and Development Initiative (SGEDI). The SRWMP was submitted to the Department of Environment and Energy (DoEE) end of January. EPBC approval was transferred to Peninsula Ports in October 2019.

The ILUA respects the Barngarla as Traditional Owners of the land and water that the project is proposed to be built on. The Barngarla had previously been awarded exclusive native title over the coastal area of Crown Land and an important aspect of the agreement is the use of the facility as a base for future Barngarla Ranger programmes and includes the permanent establishment of a Land Management Officer, who will also be a trained Marine Mammal Observer for monitoring the presence of whales. Commitment of the land management officer as MMO goes beyond construction into operation. MMO(s) play a key role in the safe arrival of the 20-30 vessels per annum. Note that as the number of vessels is lower and the size of vessels smaller than the Centrex approved project the risks to the whales is materially reduced. Port Simulation modelling has used a maximum final approach speed of 3knots in the Port Area and whilst Panamax vessels do take some time to slow and stop there is ample time for a whale to respond and move whilst the vessel is slowing if one does come up unexpectedly.

Moreover, Golder 2011 has completed an underwater noise modelling which has been attached to SRWMP.

d) Comments related to impacts of grain dust

Applicant Response

The original approval allowed for the export of grain from this site, so the matters related to potential grain spillage in the sea should be considered to have been dealt with under the original approval. The current proposal does not seek to modify these aspects and will be using risk mitigation measures as required by relevant industry guidelines, state and national regulations.

It is acknowledged that the use of the site as a harvest receival site does differ from the Evaluated Project and the impacts have been assessed and the response to the EPA comments deal with the relevant aspects.

In requesting the transfer of the EPBC approval to Peninsula Ports and seeking the extension to the timing in the EPBC approval Peninsula Ports provided all amended PER documentation to the Commonwealth.

e) Comments related to impacts of waste discharge (spill/ballast water)

Applicant Response

DAWE requires all ballast water in Australian Waters to be managed as per Acts, Legislations and Regulations. Both domestic and international vessels are included in DAWE's requirements.

Peninsula Ports will meet the requirements of DPTI and DEW regarding marine waste.

f) Comments related to dredging

Applicant Response

Operational dredging is not required or proposed – nothing is stated in the construction method as dredging will not be used.

As for the Evaluated Project, the Proposed Amendment will not require operational dredging and therefore many of the significant environmental marine impacts of port management would be avoided.

2.2.2 TRAFFIC/ROADS

Applicant Response

The Traffic Impact Assessment has been undertaken by Jacobs on behalf of Peninsula Ports, as required by the PER guidelines. It is acknowledged that the use of Lipson Cove Road instead of Swaffers Road for heavy vehicle traffic is a point of difference between the Evaluated Project and the Proposed Amendment. The Traffic Impact Assessment (Volume 3) of the Amendment to PER includes an assessment of the effects of increased traffic movements and identifies proposed road improvements including intersection treatments.

Peninsula Ports established and has been consulting with a Technical Working Group that includes Tumby Bay, Lower Eyre Peninsula and Cleve Councils that is focussed on roads issues. A discussion paper was provided to these councils that included a proposal for the establishment of a Road Maintenance Fund – an initiative that no existing operators have put in place to date. This fund, if established, does not address all issues and federal/state government funding is required to address a number of long-standing strategic freight issues including E-W connectivity. The roads discussion paper that was presented to the Technical Working Group identified the Dog Fence Road alignment as the logical choice for a new strategic E-W freight link. This link would be required whether grain is exported from Port Spencer, Cape Hardy or both, which was confirmed in the discussion paper to the councils.

We have been consulting with both DPTI and Council since July 2019 and can confirm that we have assessed Lipson Cove Road as a safer location for a major intersection than the original approved location of Swaffers Road. Principally it is the long sight lines at Lipson Cove Road that makes it a safer location for intersections of this type and will have longer heavy vehicle queuing provisions than other similar locations around Eyre Peninsula, such as at Tumby Bay itself. This will occur due to current design standards being applied to the intersection that may not have been the same when the Tumby Bay site was established. We have committed to ongoing community engagement

regarding road design and will continue to do so jointly with both Council and DPTI. The landowners we have engaged with have indicated a preference to avoid the need for land acquisition.

At this stage we have not identified any need for any road widening reserve. Lipson Cove Road needs to be upgraded to a sealed road to aid dust suppression and provide strengthened road pavement, and localised vegetation trimming undertaken to improve sight lines.

The Traffic Impact Assessment (Volume 3 of Amendment to PER) has found that despite the estimated increase in freight volumes converging to Lincoln Highway and Lipson Cove Road of up to 980 total two-way movements at the Lincoln Highway / Lipson Cove Road intersection (or up to 860 two-way CV movements) per day during the seasonal peak harvest period, the roads will still operate under capacity.

However, upgrades to the road network are proposed to improve safety on the surrounding road network during site operations, noting the large number of heavy vehicles attracted to Port Spencer. The issue of vehicular access to the site for employees and members of the public will be well defined.

2.2.3 AIR QUALITY (GRAIN DUST/ DIESEL EMISSIONS)

Applicant Response

Lipson Island Conservation park is not a marine park.

The Amendment to PER has been submitted within the context of an existing approval for a grain and iron ore export facility at the site. The effects of the Amended Proposal, including air quality and sediment transport have been assessed and a comparison of these effects with the Evaluated Project has been made.

It is acknowledged that some of the impacts and risks are expected to differ (e.g. due to seasonal nature of grain delivery, increased grain storage capacity, use of Lipson Cove Road and inclusion of a causeway structure).

No negative air pressure facilities exist in this project. The facilities will be similar to the current facilities on Eyre Peninsula including Tumby Bay and Port Neil, as well as Port Lincoln which is located within the township.

2.2.4 USE OF CHEMICALS

Applicant Response

All grain treated with fumigants will be applied as regulated ensuring compliance to industry and Australian standards are complied with, this also includes Food Standards Australia New Zealand's and Australian Pesticide and Veterinary Medicines Authority. The Centrex approval allowed for grain export. Grain export in Australia requires the use of fumigants to comply with export regulations.

The Department of Agriculture and Water Resources has "*Mandatory methyl bromide fumigation is used for quarantine purposes in Australia to meet importing country quarantine requirements*".

Peninsula Port will be following the requirements relating to exporting grain as legislated by the Department of Agriculture and Water Resources.

2.2.5 ECONOMIC MODELLING

Applicant Response

The Amendment to PER documentation was sent to Commonwealth ahead of their decision to transfer the EPBC approval and extend its validity period.

DAWE (formerly AQIS) has confirmed to Peninsula Ports that they are not aware of any location in Australia where iron ore and grain are exported from the same wharf.

Regarding the potential for Port Spencer to take additional commodities in future:

The existing land area is sufficient for the accumulation and export of grain and does not have spare room for other commodities. In the future additional commodities could be considered and would need to follow the steps below:

- In all cases a commodity other than grain will require a variation to the existing ILUA to be agreed as well as any statutory approvals.
- Any commodity would need to be compatible with the primary purpose of grain export at the site. This can pose significant technical and operational challenges that need to be considered. This requires commodity specific assessment and design.
- Identify land near the site suitable for storing / managing the product;
- Confirm the infrastructure changes required – note that due to construction loading governing much of the wharf structure design it does have spare capacity to add new conveyors and other facilities to a reasonable degree.
- Additional fenders could be added to the South side of the wharf to berth Panamax vessels on both sides.
- Should additional commodities in future require Cape Size vessels a significant extension of the wharf would be required.

In short, additional commodities in future require significant design, environmental and operational considerations as well as commercial, ILUA and approvals steps.

It is noted that this project aims to provide a competitive alternative to the current near monopoly for grain on Eyre Peninsula.

2.2.6 NOISE

Applicant Response

As for the Evaluated Project, modelling undertaken for the Proposed Amendment indicates compliance with the Noise Policy.

The detailed comparison is presented in vol 2 and the supporting technical report is attached.

As the proposed amendment involves a lesser number of smaller vessels, with loading by smaller ship loading equipment and smaller power generation equipment, overall, the noise impacts are not worse than the Evaluated Project. There is an acknowledged difference in the harvest timing of vehicles making deliveries to the site, which is a well-known and understood dynamic on Eyre Peninsula.

2.2.7 FIRE RISK

Applicant Response

Fire engineering studies are a normal part of the detailed design process for any facility and are tightly regulated through mandatory compliance with the Australian Building Code and other regulatory requirements.

There will be areas within the facility in which intrinsically safe electrical hardware must be used as a result of the risks specific to grain dust. The detailed assessment of these and other safety related matters follow a Safety in Design and Hazard and Operability (HAZOP) assessment process as required by national building guidelines. The PER is not the document where this level of detail is required.

The requirement to retain all water on the site means that a large volume of water will be reliably be available for use on site including for firefighting. In the unlikely event that the water storage falls below a level that is adequate to meet firefighting requirements it will be replenished via importing potable water to the site via tankers.

2.2.8 SOCIAL IMPACT

Applicant Response

Please refer to Appendix F: Socio-Economic Assessment, Volume 3 of PER.

The study area comprises those communities that have potential to experience changes due to the construction and operation of the proposal.

During construction, potential changes in socio-economic benefits and impacts of the Proposed Amendment would mainly be associated with increased demand by construction workers for rental housing and temporary visitor accommodation in towns near the construction works, such as Tumby Bay, Port Neill and Port Lincoln.

The FIFO component will relate to the specialised marine construction workforce that will be required for a term of approximately 12 months.

Use of local subcontractors will be maximised when the local capability and capacity exists e.g. Geotech investigations in 2019 by Cave Quarries.

The PER submission acknowledges that due to the reduced workforce requirements, an accommodation village at Tumby Bay is not considered necessary for the Proposed Amendment. This has also been considered in the Socio-Economic Assessment included in Volume 3 of the Amendment to PER.

The location of the construction workforce does not require a construction village and will be shared around multiple local communities, increasing economic opportunities for those communities during construction.

3 CONCLUSION

FEL and Peninsula Ports have experience in grain bulk handling and have established a team with the necessary credentials to deliver a grain export terminal. The economics of grain export are well established on Eyre Peninsula, and this project will provide significant benefits. For these reasons FEL and Peninsula Ports are focussed on delivering a new grain export terminal for Eyre Peninsula, which will aid in protecting the clean and green reputation of the industry on Eyre Peninsula and significantly improve the competitiveness of the industry in reaching global markets.

We appreciate the time and effort taken by individual community members to provide a submission to the Amendment to PER. There is some overlap between the community submissions and agency submissions, and we are proposing in response to the agency submission some further actions and commitments, particularly in relation to dust.

Peninsula Ports has also acknowledged the desire of its Board to establish new plantings of trees around the perimeter of the site to further reduce visual amenity impacts for neighbours and visitors to the area. The Board is also very excited to have executed the ILUA with the Barngarla community in which the Barngarla will themselves be shareholders in Peninsula Ports, which sets a new benchmark in recognition of Traditional Owners in a port facility in South Australia.

Port Spencer will not only be a significant grain export terminal, it will also be the operational base for a future Indigenous Ranger Program of the Barngarla, who will be working closely from the outset with Peninsula Ports to use the site as a best practice example of coastal native revegetation and land management (more detail is provided at Attachment 2).

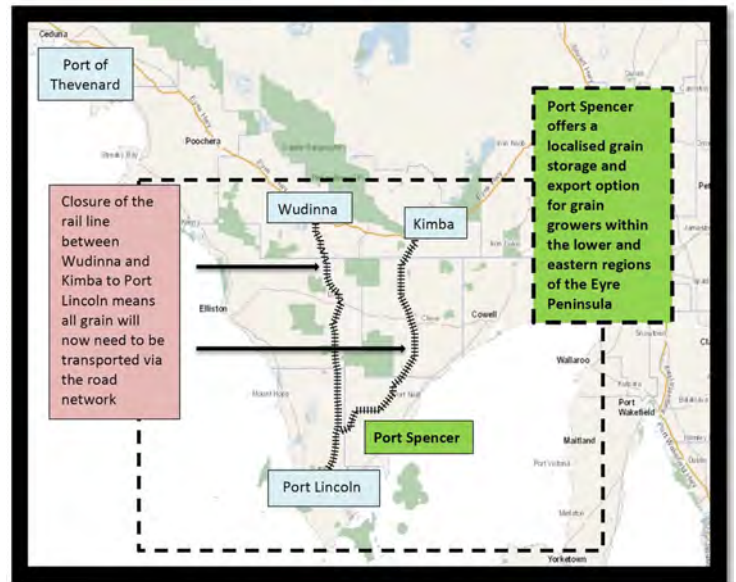
ATTACHMENT 1: ROADS IMPACTS DISCUSSION PAPER

Roads Impacts Discussion Paper

Traffic impact assessments

Early traffic assessments indicate that Port Spencer will help distribute traffic from the DPTI road network away from Port Lincoln. Further detail is available in the formal traffic assessment report.

Following engagement by Peninsula Ports with the Technical Working Group, comprising representatives from the District Councils of Tumby Bay, Cleve and Lower Eyre Peninsula, it has been confirmed that the key issues regarding traffic impacts on Eyre Peninsula related to any new grain port on the East Coast of Eyre Peninsula, one of which Port Spencer, include:



- Changing mode of heavy vehicle movement from N-S to E-W for significant freight volumes in lower and central EP;
- Local upgrades immediately adjacent to port; and
- Secondary effects due to redistribution of medium mass vehicles due to high road train concentrations on main freight routes.

Road upgrades

The first dot point above, which has been quantified by the Traffic Impact Assessment for Port Spencer as completed by Peninsula Ports, has confirmed the order of traffic volumes that could be expected generally along the alignment of Dog Fence Road. E-W roads in this area have been identified by the EPLGA for future monitoring should significant E-W movements become realised. Both capital and maintenance budgets do not exist at the council level to provide such a strategic E-W freight link. A review of state and federal funding priorities, in which Peninsula Ports is seeking to support the EPLGA, is required to realise the potential to reduce the significant increases in N-S movements due to the rail line closure. This issue falls mostly within the Tumby Bay council area, however can have secondary effects to other councils outside that immediate area.

The second point above, in the case of Port Spencer, relates to the proposal to use Lipson Cove Road as the vehicle access. Peninsula Ports will work with council to deliver an upgrade to this road to an appropriate sealed standard, acknowledging that Council does not have the budget to contemplate such investment itself. It is acknowledged that the party best placed to provide

ongoing maintenance of such a road would be DPTI, so Peninsula Ports will support Council in seeking to address the ongoing ownership and maintenance liabilities.

Road maintenance impacts

The third point above relates to a potential traffic behaviour that cannot be modelled, but in the experience of the councils on EP can and will occur. Routes that have high volumes of road trains either during harvest or during the shipping season are not attractive to smaller commercial vehicles that are not governed by load restriction. These smaller heavy vehicles can tend to find “rat runs” along the unsealed council road networks. The Traffic Impact Assessment for Port Spencer is not able to quantify this and as a result it is not possible now to quantify what impacts will occur to what maintenance budgets.

What Peninsula Ports is suggesting that could address these uncertainties is the establishment of a **Road Maintenance Fund**. Suggested features of such a fund could include:

- Confirmation of which councils will require access to the fund;
- Establishment of a governance group, including Peninsula Ports, that oversees the distribution of funds;
- The potential for the fund to accumulate a growing fund balance across a number of years if the governance group intends to utilise the funds for periodic rather than annual maintenance;
- Peninsula Ports to pay a levy linked to number of road trains or tonnage of grain delivered to Port Spencer into the fund;
- Transparent reporting in individual council budgets of the contribution of the fund to each council.

In the absence of being able to quantify the potential secondary impacts at this time, Peninsula Ports proposes that a reasonable value to place on each road train through the gate at Port Spencer could be in the range of \$3-7 per vehicle. This is reflective of the concept of a shadow toll on a particular class of heavy vehicles which is amongst a range of options being considered across multiple jurisdictions nationally to help fund road maintenance. It is noted that this would not address the strategic E-W link or Lipson Cove Road direct costs, each of which requires separate consideration.

Peninsula Ports welcomes the opportunity to discuss these concepts with the District councils of Tumby Bay, Lower Eyre Peninsula and Cleve, all of whom are represented on the Technical Working Group.

ProManage Australia chairs the Technical Working group through the Project Director, Mark Wilson. Contact details for Mark are: m.wilson@promanage.com.au and 0411 486 499

For general project updates the website will be regularly updated as the project progresses at: www.peninsulaports.com.au

ATTACHMENT 2: FUTURE RANGER PROGRAM

A key aspect of the ILUA for the Port Spence Project is a significant ongoing partnership towards the establishment of a future Indigenous Ranger Program. Information about such programs can be found at the link below and are described at that site as follows:

<https://www.niaa.gov.au/indigenous-affairs/environment/indigenous-rangers-working-country>

“Indigenous ranger projects were first funded in 2007 through the former Working on Country Program and create meaningful employment, training and career pathways for Aboriginal and Torres Strait Islander people in land and sea management. Indigenous ranger funding has created more than 2100 full-time, part-time and casual jobs for First Australians around the country.”

Specific actions that are included in the ILUA that will help the Barngarla, through the Barngarla Determination Aboriginal Corporation (BDAC) to establish a ranger program include:

- providing a dedicated operational base within the ILUA Area, which means the Port Spencer site will also be the operational base;
- Use of facilities at Port Spencer including equipment maintenance, internet and telecommunications connections, IT support, office cleaning, printing and other office support, to assist in establishing and co-ordinating the program;
- advocacy support in respect of the program, including by providing letters of support for funding applications and assisting with facilitation of meetings with government bodies and other relevant organisations.

Another key aspect of the ILUA is the employment of a Land Management Officer at Port Spencer on a full-time basis. This role will be important in managing the flora and fauna on and around the Port, including having a role as a Marine Mammal Observer in accordance with the Southern Right Whale Management Plan as specified in the EPBC approval.

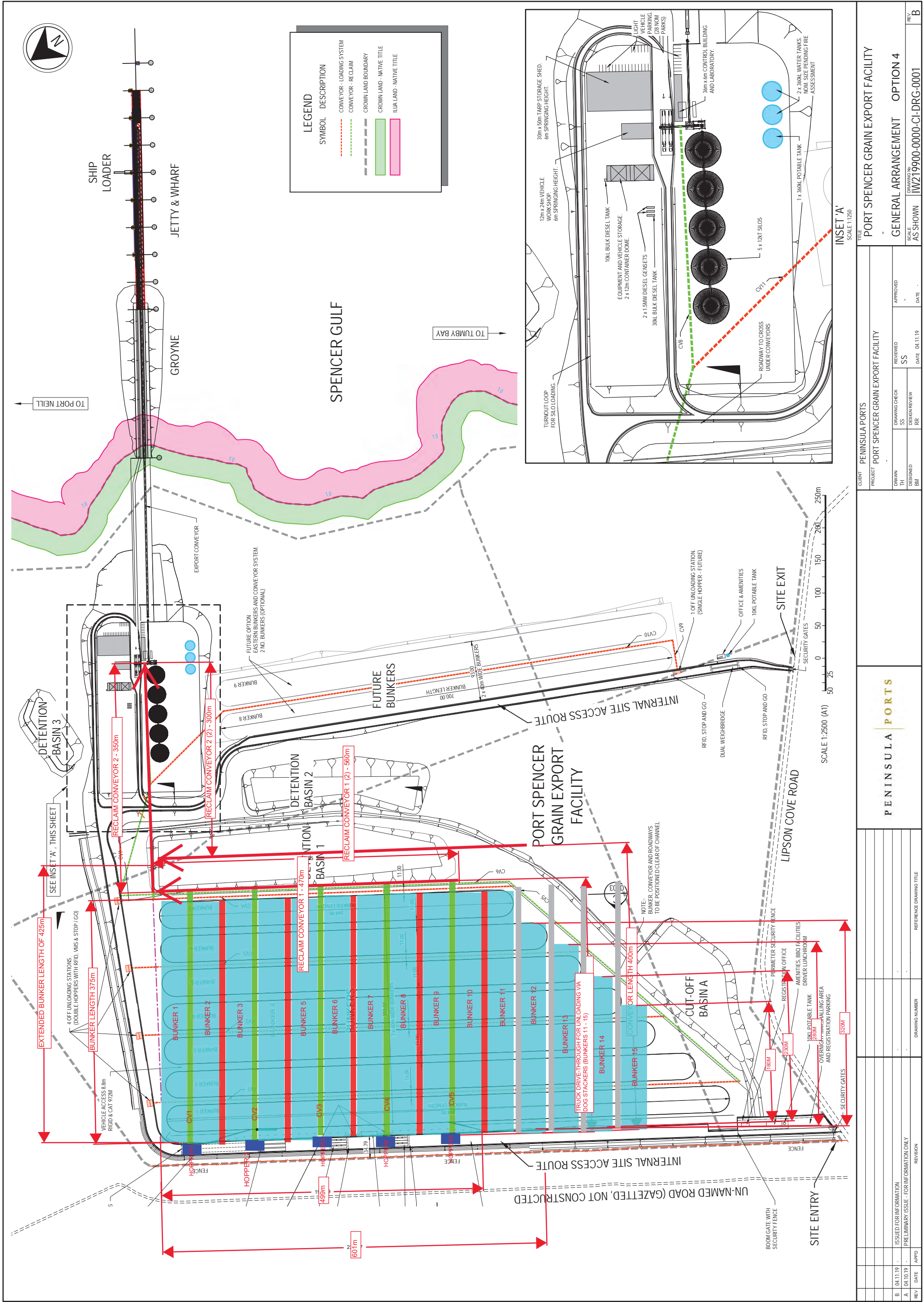
Through this role Peninsula Ports and the Barngarla will together:

- Establish native revegetation buffer areas between site infrastructure and the Rogers Beach area;
- Expand this native revegetation approach over time to the ridge line south of the proposed silos, which should further reduce the visual impact from Lipson Cove;
- Establish exclusion zones for vulnerable native shore birds including induction of all site personnel and monitoring of exclusion zones on site;
- Subject to agreement with District Council of Tumby Bay, expand the native revegetation towards Lipson Cove with a view to improving the amenity of the camping grounds.

Through all of the actions above the aim is to leverage the Port Spencer site into a best practice example site for coastal remediation that can be used as the anchor point for future indigenous ranger projects to be funded by the Commonwealth Government.

In this way Peninsula Ports is paying respect to the deep connection of the Traditional Owners, the Barngarla, to the land and sea at and around Port Spencer.

**ATTACHMENT 3: REVISED SITE LAYOUT CONCEPT TO REDUCE CONCENTRATION OF
DUST SOURCES**

[illegible]

ATTACHMENT 4: MARINE OPERATION PLANS (MAROPS).

10 JANUARY 2020



MARINE OPERATIONS PLAN

(OPERATIONS MARINE & SHIPPING MANAGEMENT PLAN)

PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Anthony Stanton	John Kavanagh	
1.1	Ryan Norval	John Kavanagh	For Consultation and instructions Pacific Maritime Lawyers & Consultants

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1.0 Introduction

1.1. Purpose of this Plan

This Marine Operations plan (MAROPS Plan) describes the proposed maritime operations in Port Spencer (the Port) at a strategic level. The MAROPS Plan contains information for the guidance of all users of the Port, including ship's masters, owners, agents and other marine users operating in or near the Port.

The MAROPS Plan is to be read in conjunction with the following Peninsula Ports - Port Spencer (PP-PS) documents:

- Vessel Traffic Management Plan, which details the port procedures for marine operations;
- Aids to Navigation Plan, which details the establishment and maintenance of Aids to Navigation;
- Emergency Response Plan, which details the local, regional and national integration in response to an emergency;
- Ship Sourced Marine Pollution Management Plan, which details the possible impact from ship generated pollution;
- ANNEX 1 – First Strike Response Plan – Oil Pollutants, which details the assessment and actions at a local level oil spill.

The MAROPS plan also describes how Peninsula Ports (PP) complies with its legislative obligations but is not to be construed as legal advice.

This Plan and its requirements may be overridden by any specific instructions from the SA Department of Planning, Transport and Infrastructure (D-PTI), Peninsula Ports or the Harbour Master.

Nothing in the MAROPS Plan is intended to relieve any vessel, owner, operator, charterer, master, or person directing the movement of a vessel from the consequences of any failure to comply with any applicable law or regulation or of any neglect of precaution which may be required by the ordinary practice of seamanship, or by the special circumstances of the case.

Hard copies of this document are considered uncontrolled. Please refer to the Peninsula Ports website for the latest version – www.peninsulaports.com.au

Information contained in this MAROPS Plan is based on information available as at the latest date in the document control sheet at the start of this Plan. Although every care has been taken to ensure that this information is correct, no warranty, expressed or implied, is given in regard to the accuracy of all printed contents. Peninsula Ports shall not be responsible for any loss or damage resulting from or caused by any inaccuracy.

1.2. Port Spencer

Port Spencer is a newly established grain export port, comprising of a single trestle and conveyor-fed loader. The trestle and port approaches are designed for Panamax and post Panamax bulk carriers.

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

Port Spencer is operated by Peninsula Ports, and the Port is gazetted pursuant to the *Harbours and Navigation Act 1993 (SA)*.

1.3. Contact Details

The Harbour Master

For operational maritime questions, marine incidents, pilotage, buoy moorings, navigation aids and towage requirements, please contact the Harbour Master's office.

The Harbour Master's office is located at: *(to be determined in future)*

Street address:

Phone:

Fax:

Email:

Port VTS

The Port Control Centre is situated at the Harbour Master's office. For ship traffic scheduling, pollution incidents and reporting defective navigation aids, please direct initial enquiries to the Port Control centre.

VHF Call sign is 'Port Spencer VTS' and the service is provided by Peninsula Ports during expected and scheduled operations, arrivals and departures.

The contact details are:

VHF Radio: VHF channels 12 and 16

Phone: *(to be determined in future)*

Fax:

Email:

In the event of a maritime emergency, Port Control (VTSO) will activate the appropriate response as detailed in the Port Spencer Emergency Response Plan.

Peninsula Ports

The operator of the Port is Peninsula Ports, and all questions relating to the port responsibilities, including security, services, and facilities are to be directed as follows:

Phone: *(to be determined in future)*

Fax:

Email:

1.4. Datum

All water depths refer to the 'lowest astronomical tide' height (LAT). All positions in this Plan are in WGS84, however, Australia uses the Geocentric Datum of Australia (GDA94) coordinate system. All directions are referenced to True North.

1.5. Scope

The port is operated in accordance with all laws in force in South Australia and any applicable Commonwealth or International laws. Further compliance information is summarised later in this MAROPS Plan. The relevant legislation referenced includes but is not limited to:

- *Navigation Act 1912 (Cth)* and supporting Marine Orders
- *Harbors and Navigation Act 1993 (SA)*
- *Environment Protection Act 1993 (SA)*
- *Maritime Services (Access) Act 2000 (SA)*
- *Customs Act 1901 (Cth)*
- *Quarantine Act 1908 (Cth)*
- *Occupational Health, Safety and Welfare Act 1986 (SA)*, including the Code of Practice for managing risks in Stevedoring
- *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*
- *South Australian Ports (Bulk Handling Facilities) Act 1996*
- *South Australian Ports (Disposal of Maritime Assets) Act 2000*
- *Recreational Access to Commercial Wharves Agreement*

2.0 Abbreviations and Definitions

ABS	American Bureau of Shipping
AMSA	Australian Maritime Safety Authority
APVMA	Australian Pesticides and Veterinary Medicines Authority
BC	Bulk Carrier
BLF	Bulk Load Facility
BLU Code	Code of Practice for the Safe Loading and Unloading of Bulk Carriers adopted by IMO Resolution A.862 (20) as in force from time to time.
BP	Bollard Pull
BV	Bureau Veritas
CTV	Crew Transfer Vessel
ECS	Electronic Chart System
GPV	A general-purpose high-speed vessel <12m suitable for the transfer of personnel and small volumes of stores.
IMO	International Maritime Organization
LM	Load Master
LOA	Length Overall
MT	Metric Tonnes
STCW95	Standards of safety training certification & watch keeping
NSCV	National Standard for Commercial Vessels
POB	Pilot on board
PP	Peninsula Ports
PP-PS	Peninsula Ports – Port Spencer
Terminal Operator	A person who has responsibility for operations conducted by the terminal or facility for the vessel.
Trimmed	for grain — see A 10.2 of the International Grain Code and trimming (loading cargo) in 1.12 of the BLU Code.
Port Spencer VTS	Port Spencer Vessel Traffic Services
VTSO	Port Spencer Vessel Traffic Services Operator
PEC	Pilot Exemption Certificate

3.0 Operational Plan for Development Phase

The following section outlines the key dates and operational activities comprising the Port Spencer development.

3.1 Key Dates and Phases *[TBC on confirmation of program schedule]*

Phase	Description	Intended Start Date
Mobilisation	<ul style="list-style-type: none"> Site establishment on land and commencement of bulk earthworks 	March 2020
Causeway Construction	<ul style="list-style-type: none"> Commence construction of causeway into the water 	June 2020
Wharf Construction	<ul style="list-style-type: none"> Commence piling for construction of wharf using incremental launch method (no barges) 	TBC Nov 2020
Installation of ship loader	<ul style="list-style-type: none"> Install ship loader onto wharf 	June 2021
Construction completion	<ul style="list-style-type: none"> Complete construction activities 	July 2021
Operational proving	<ul style="list-style-type: none"> End to end wet commissioning of infrastructure 	August 2021
Production	<ul style="list-style-type: none"> Receive grain into land-side bunkers 	October 2021
Shipping	<ul style="list-style-type: none"> Shipment of first grain from wharf 	November 2021 (TBC)

4.0 Port Operation Procedures

4.1 Overview of Operational Activities

The operational phase for Port Spencer Bulk Loading consists of four main activities:

- Arrival of bulk carrier at anchorage;
- Transit to terminal and berthing;
- Loading bulk grain;
- Unberthing and departure from the terminal.

The details of each activity are set out below.



Diagram 1 – Port Spencer Location

The Port Limit and Pilotage Area is set at a 2nm radius from the jetty head and terminates at the shore as shown in Diagrams 2 and 3 below.

The pilotage area is described as waters bounded by an imaginary semi-circle line drawn (see overleaf drawing):

- starting at 34° 14.607' S 136° 16.177' E on the Shoreline, a line drawn on bearing 050 (T) to a point at 34° 13.436' S 136° 17.844' E as a northerly border;

- *then*, a line extending in an arc from 34° 13.436' S 36° 17.844' E with a radius of 2 nautical miles centered on the end of the jetty at 34° 15.090' S 136° 16.480' E extending southwards to 34° 16.980' S 136° 17.290' E;
- *then* from the point at 34° 16.980' S 136° 17.290' E, draw a line on a bearing of 330 (T) to the point on the shoreline at 34° 15.110' S 136° 15.974' E as a southerly border.

Port Spencer Harbour Description – DGA94 Coordinates

Commencing at a point being the intersection of the median high-water mark with a straight line connecting a point defined by Latitude 34.2435400 degrees south and Longitude 136.2696767 degrees east with a point defined by Latitude 34.2239333 degrees south and Longitude 136.2974000 degrees east.

Thence in a north easterly direction to the second point defined.

Thence following an arc with a radius of 2 nautical miles (3704.1 metres) from the end of the jetty at 34.2515000 degrees south and longitude 136.2746667 degrees east in a generally south easterly, southerly and south westerly to a point defined by latitude 34.2830000 degrees south and longitude 139.2881667 degrees east.

Thence in a straight line on a bearing of 330 degrees true to the intersection with the median high-water mark.

Thence generally northerly along the median high-water mark to the point of commencement.

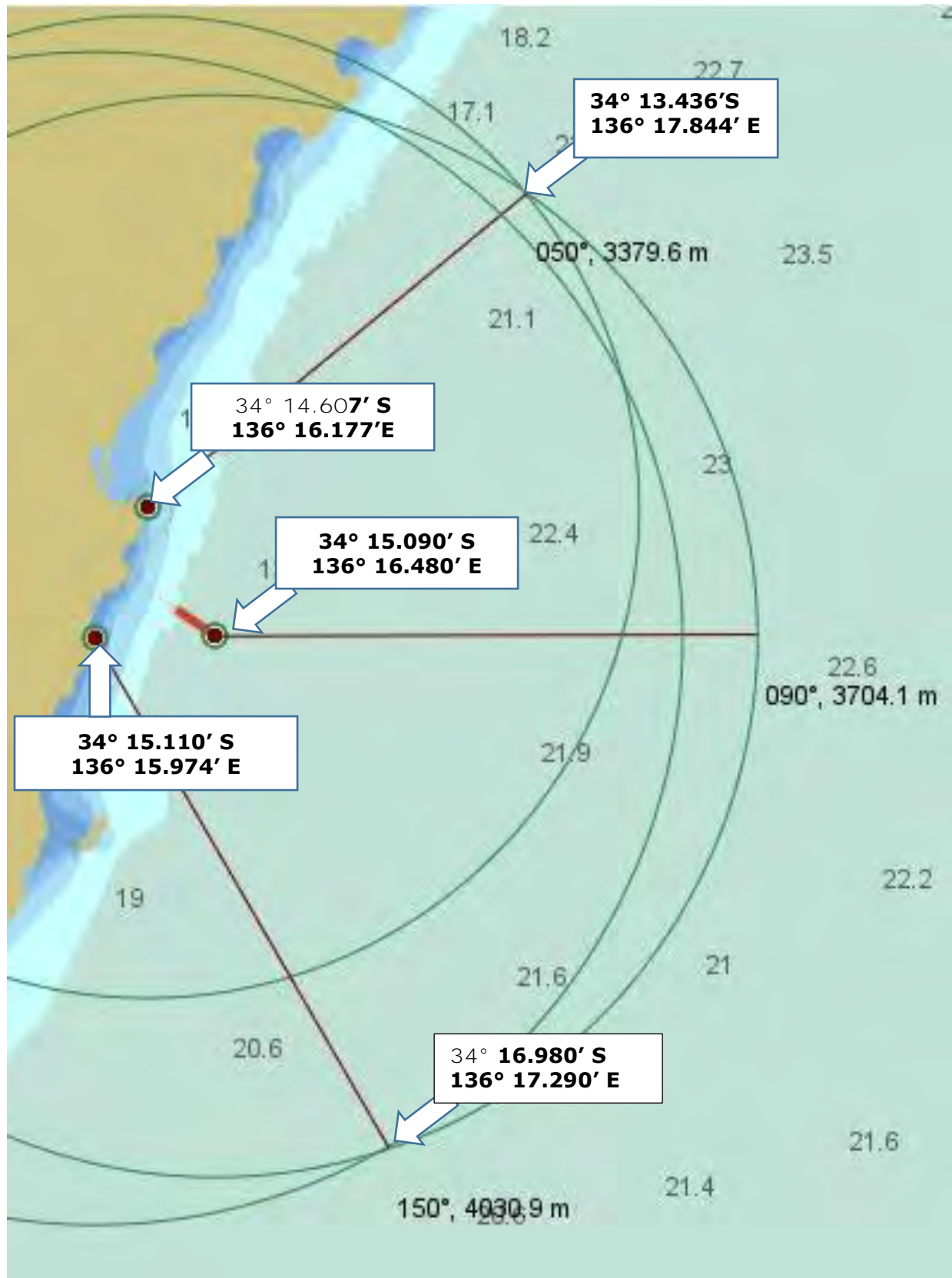


Diagram 2 – Proposed port limits

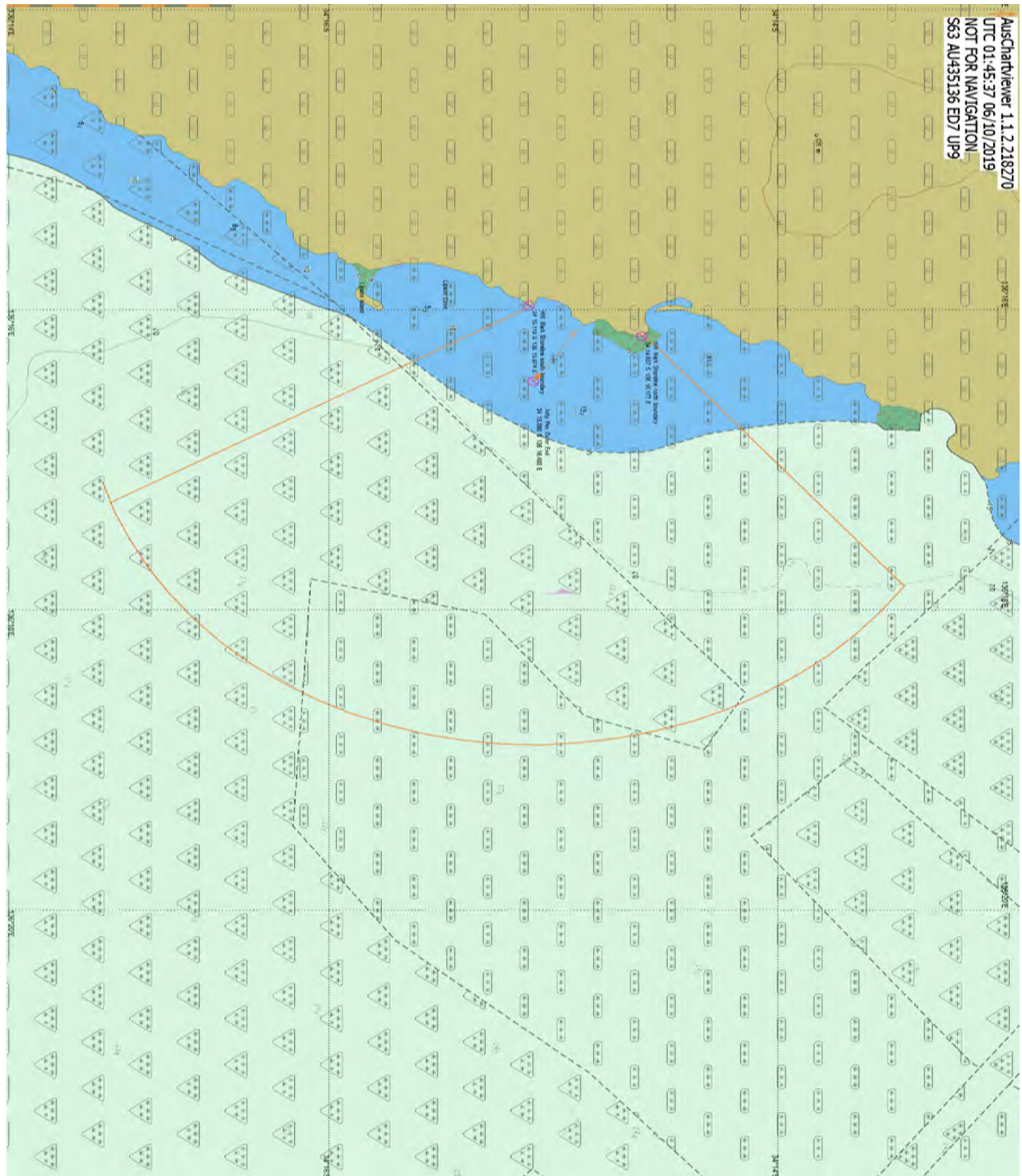


Diagram 3 – Proposed Port Spencer Port Limits – ENC AU45136

Notes: The Blue sounding line is set at a 15m sounding. True North is to the top of the Diagram. Category Zones of Confidence are indicated by the number of asterisks. Category C (three asterisks) or A2 (5 Asterisks) within the Diagram. The sounding confidence for Category C is $\pm 2\text{m} + 5\%$ of depth. Therefore, at 15 m sounding, the Zone of Confidence at Category C is $\pm 2.75\text{m}$. The sounding confidence for Category A2 is $\pm 1\text{m} + 2\%$ of depth.

4.1.1 Arrival check list

When	Who	What
96 hours before arrival	Master/owner	Customs notification
Not more than 96 hours or less than 12 hours before arrival	Master/owner	Quarantine notification
48 hours before arrival	Master/owner	Arrival Notification to Port Spencer Harbour Master
24 and 12 hours before arrival	Master	Arrival information update to Port Spencer VTS
2 hours before arrival	Master	VHF notification to Port Spencer VTS
2 hours before arrival	Peninsula Ports	All arrival preparations complete including pilotage and mooring arrangements

4.1.2 Departure Check List

When	Who	What
12 hours before departure	Master/owner	Confirm Departure information to Harbour Master
2 hours before Departure	Master/owner	Update Port Spencer VTS
2 hours before Departure	Peninsula Ports	All departure preparations complete, including pilotage and mooring arrangements
On completion of loading	Master/owner	Call Port Spencer VTS to inform that loading is complete and to confirm the departure drafts

4.1.3 Arrival of bulk carrier at anchorage

Port Spencer VTS

- Channel 16 Calling - Distress & Safety Channel 67 for Distress & Safety
- Channel 12 Vessels should monitor VHF at all times in Port Limits for information
- Ship/Shore/Ship Operations Transit advices/messages and information.
- Channel 6 or 8 Tug operations Primary channel - 6
- Channel 12 Port Spencer communications and Emergency Exercise/Response

All radio communications within the port will be conducted in standard marine navigation vocabulary as specified in the "Radio Telephone Ship Station Operators Handbook" (available from the Australian Communications Authority). Communication must be preceded by the identification of the channel the operator is using.

The first operational phase is the arrival of the bulk carrier and the handling of the bulk carrier.

The bulk carrier will arrive at anchorage and take up a position as directed by Peninsula Ports (through Port Spencer VTS), approximately 3nm from the end of the Jetty, East.

While at anchorage the ship will be inspected by grain surveyor/loadmaster and authorized officer, and any other contractors as necessary to obtain arrival clearance.

The anchorage is outside port limits, at location 34° 15.33' S / 136° 19.90' E, approximately 3 nm East of the jetty.

Once the jetty operations are ready for receiving the bulk carrier, a Port Spencer Marine Pilot will come aboard at the boarding ground (3nm from end of jetty, East) who will bring the ship to the loading jetty.

Tug escort will be provided by Port Lincoln tug contractor under the direction of a suitably qualified master and operating under the vessel's SMS.

Two 60 TBP tugs will be required to manage a Panamax size vessel into safe berthing.

Personnel will be transferred from BLF to ship and return by General Purpose Vessel (GPV). The GPV will be moored on the Southern side of the Jetty.

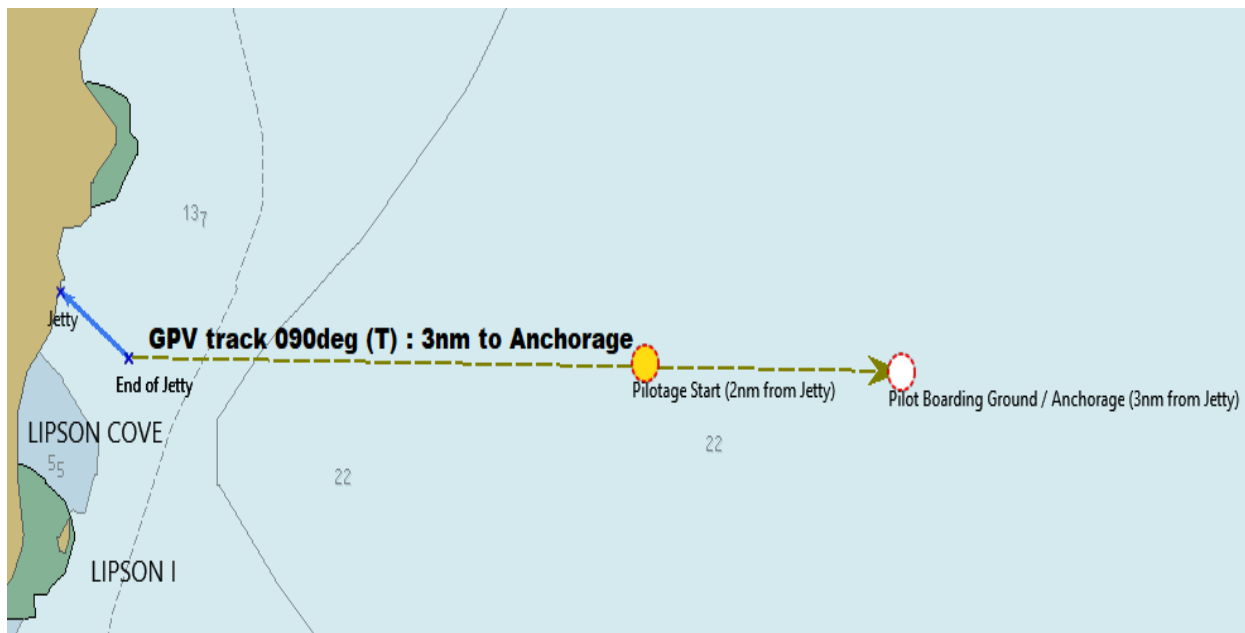


Diagram 4 – Relationship of Port Spencer anchorage and Pilot Boarding Ground to Jetty

Whenever an alternative/emergency anchorage is required, the BC vessel will seek guidance from the Harbour Master but noting that the responsibility for the safety of the Vessel at all times lies with the Master. Once conditions are favourable for berthing at Port Spencer, the BC vessel will steam to the designated “Pilot Boarding Ground / Anchorage” area.

4.1.4 Transit to terminal and berthing

Once cleared for arrival, the bulk carrier will be allocated a POB and berthing time by Port Spencer VTS.

A marine pilot will be transferred to the ship by GPV. The pilot will con the ship from port limits to the berth, until the last line is secured, in accordance with the legislative requirements for compulsory pilotage in port limits.

On boarding a vessel, the pilot will discuss a passage plan with the Master, review the ship's pilot card and exchange the normal pilot/master information. Once satisfied the pilot will then commence the pilotage passage (inward/outward).

Tugs, 60 TBP ASD (one or two, depending on size of ship and current/forecasted weather) will meet the bulk carrier on the inbound passage, assist the bulk carrier to berth on the Northern side with bow facing towards the Gulf, and stand by for emergency assistance within port limits.

BLF lines team (two teams of two each) will secure the ship from the shore side

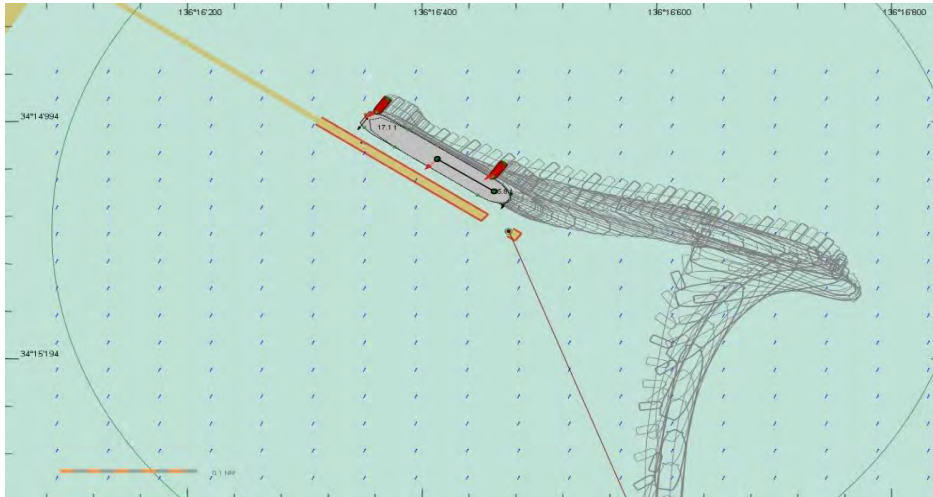


Diagram 5 – indicative SmartShip berthing manoeuvre for illustration purposes only – not to be used for navigation

4.1.5 Loading bulk grain.

Once all requirements of Maritime Orders are satisfied, master and terminal operator will agree to commence loading according to the load plan, under the supervision of the grain surveyor/load master.

Traveling ship loader with effective load rate of 2000MT/hr will see most ships loaded within 48 hrs from arrival.

The relevant Authorised officer (grain surveyor/loadmaster) will clear ship for departure with master and terminal operator agreement.

4.1.6 Precautions for berthing/unberthing

Jetty cranes and loaders will be positioned, boom up, amidships, or clear of the vessels bow/stern as determined by the Pilot.

Whilst a vessel is berthing no crane or loader movements will occur until the vessel is securely moored alongside.

When a vessel is departing no crane or loader movements will occur until the vessel is clear of the jetty.

Cranes and loaders will remain unmanned whilst a vessel is manoeuvring on, off or along the jetty.

4.1.7 Unberthing and departure from the terminal

Ship will be allocated a POB and departure time by Port Spencer VTS.

Lines teams and tug(s) will be in attendance to assist unberthing under pilot's direction.

Pilot will con ship from berth to port limits under escort of tugs.

On leaving port limits, tugs will return to BLF or deploy to assist incoming bulk carrier; and pilot will be either transferred to incoming bulk carrier or returned to BLF by GPV.

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4.2 Table of Key Processes, Equipment, Personnel, Regulation and Procedures

Serial	Process	Serial	Sub processes	Port Spencer Equipment	Port Spencer Personnel	Principal standard or regulation	Procedures
1	Arrival of ship at anchorage	1.1	Ship/shore exchange of information	Nil	VTSO Grain surveyor	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Port Procedures Manual	
		1.2	Drop anchor	Nil	Nil	Port Procedures ISM Code	
		1.3	Transfer grain surveyor to ship for hold inspection	GPV	GPV crew Grain surveyor VTSO	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 Marine Order 504	
2	Transit to terminal and berthing	2.1	Transfer pilot to ship	GPV	GPV crew Pilot VTSO	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 Marine Order 504 SOLAS Chapter V Regulation 23 Pilot Transfer Arrangements	

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		2.2	Tugs transit to anchorage to escort ship for inbound passage	Tugs	Tug crews	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012	
		2.3	Ship transits inbound under pilotage	Tugs	Tug crews	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 ISM Code	
		2.4	Ship secures to berth	Tugs Bollards	Tug crews Lines crews	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 Managing Risks in Stevedoring Code of Practice 2018 ISM Code	
3	Loading bulk grain	3.1	Pre-loading steps		Grain Surveyor Loadmaster	As below	
		3.2	Load bulk grain	Ship loader	Grain Surveyor Loadmaster	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Managing Risks in Stevedoring Code of Practice 2018	

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		3.3	Final trim and pours	Ship loader	Grain Surveyor Loadmaster	ISM Code Marine Order 33 Marine Order 34 BLU Code IMSBC Code Managing Risks in Stevedoring Code of Practice 2018 ISM Code	
		3.4	Post-loading steps		Grain Surveyor Loadmaster Terminal Operator	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Managing Risks in Stevedoring Code of Practice 2018	
4	Departure of ship	4.1	Exchange of departure information and documents	Nil	Grain Surveyor Loadmaster Terminal Operator VTSO	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Port Procedures Manual	
		4.2	Unberthing	Tugs	Tug crew Pilot Lines crews	Port Procedures Manual Marine Order 21 Transport Operations (Marine Safety) Act 2016 Managing Risks in Stevedoring Code of Practice 2018 ISM Code	

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		11.3	Transit to port limits	Tugs	Tug crew Pilot	Port Procedures Manual Navigation Act 2012 Transport Operations (Marine Safety) Act 2016 ISM Code	
		11.4	Pilot and tugs depart	Tugs GPV	Tug crew GPV crew Pilot	Port Procedures Manual Navigation Act 2012 Transport Operations (Marine Safety) Act 2016 Marine Order 504	

4.3 Loading at BLF

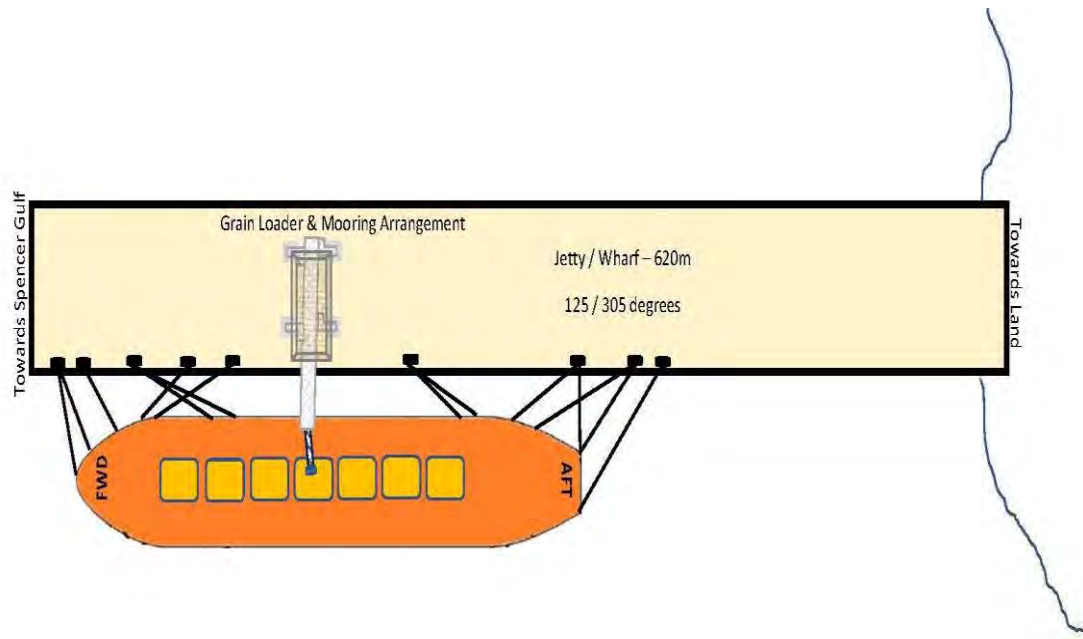


Diagram 6 – indicative berthing arrangement for illustration purposes only – not to be used for mooring

4.3.1 Securing to the BLF

The bulk carrier will moor securely at the loading position on the Northern side of the Jetty, bow out (east), alongside the Jetty before any loading activities commence.

Mooring shall be to the satisfaction of the master. The master shall ensure that mooring operations are carried out in a safe manner and the following items are correctly addressed:

- Suitable planning and supervision
- Approved communication
- Competency of personnel
- Sufficient members in the mooring lines team, comprising of 3 shore personnel and the mooring party on board the docking BLF vessel
- Familiarity with any specific shore requirements relating to shore moorings, passing traffic and tidal/weather conditions

All mooring equipment and practices shall comply with Peninsula Port safe working requirements. All reasonable directions from Peninsula Ports and the Harbour Master are to be complied with by Master.

Any unsafe situations shall be identified, evaluated and recorded in the vessels log. Corrective actions shall be implemented as necessary.

4.3.2 Mooring Operating Parameters

The master shall ensure that all factors affecting safe mooring of the vessel throughout the duration of the stay are monitored and recorded.

These may include:

- Weather conditions, both present and forecasted
- Tide and Current ranges
- Traffic movement in the vicinity (as applicable)
- Interval of mooring patrols depending upon above factors

4.3.3 Safety of crew during mooring operations

The master shall ensure that the safety of crew is maintained during all anticipated mooring arrangements and equipment use.

The ship's crew shall be thoroughly trained in all anticipated mooring patterns used at the loading terminal and the required preparation on board with emphasis on:

- Clear layout on deck prior to operations commencing
- The use of proper personal protective equipment
- Identification and monitoring of dangerous zones during mooring operations
- Quick and closed loop communication between stations

Where a new and different mooring pattern / arrangement is anticipated, a formal risk assessment for each type shall be carried out, to assess and minimize risk to crew associated with the operation.

Such risk assessments shall be reviewed prior to similar subsequent operations and any additionally identified risks suitably managed and recorded.

4.3.4 Cargo / Grain Loading

Cargo loading activities at Port Spencer shall be the responsibility of the grain surveyor as representative of the terminal operator. Prior to loading bulk grain in Australia, a ship must be inspected by a grain surveyor to ensure that the ship is suitable to carry the intended grain. The inspection is to determine that the ship is free from conditions that could result in contaminating, wetting or imparting an odour to the grain.

The master of a vessel must ensure that grain in bulk is loaded onto the vessel only if the master and the terminal representative have agreed on a plan for loading that complies with the BLU Code.

A plan for loading or unloading and any amendments of it must be lodged with the terminal representative at the port of loading or unloading and a copy kept on board the vessel throughout the voyage.

However, before any loading activities commence, it is the **master's** responsibility to ensure the ship is safely secured and ready in all respects for loading activities.

The master shall have overriding authority to direct all loading/unloading activities to ensure adequate stability of the vessel and safety of crew and personnel aboard is maintained. To that end, the master or a designated ships officer shall maintain a continuous watch of all loading activities on the bulk carrier, which may be carried out by the masters appointed loadmaster.

4.3.5 Safety of crew during Loading Activities

The master shall ensure that all **ship's** crew remain clear of all loading areas during loading activities. Should any of the **ship's** crew be required to enter a loading zone area of the ship or quayside, they shall first gain permission from the master.

However, in the case where a crew member may be required to take immediate action regarding an emergency issue relating to the stability of the vessel or safety of crew and personnel aboard, the crew member should take the appropriate action as required. Nevertheless, they should make their best efforts to advise the master of the issue at hand and their intended action.

4.4 Transit Voyages Between Port Spencer BLF and Bulk Carrier

4.4.1 Readiness for Departure

The tug or GPV prior to departure shall assess the prevailing weather conditions. This assessment shall take regard of relevant operating restrictions of the vessel. The vessel shall not depart in adverse weather unless the master is satisfied that it is safe to do so. At all times, the highest priority of the master shall be the safety of the crew.

The master shall ensure that the vessel is secured, and all ship's crew members and passengers are to be accounted for aboard prior to departure.

4.4.2 **Master's Presence on Bridge**

Due to a short passage time, the Master shall be personally in control of the vessel during transits, but particularly during the following conditions:

- when there is reduced visibility;
- when it is expected to arrive at and depart from the bulk carrier;

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- when entering and leaving port;
- at any time when the vessel is in danger or potentially in danger.

4.4.3 Navigation Procedures

All tugs and GPVs are to be navigated at all times in strict compliance with the International Regulations for the Prevention of Collision at Sea and any local regulations relating to navigation in the Spencer Gulf.

Any necessary actions, such as altering course or reducing speed, especially if the vessel is the vessel giving way, should be positive and taken in sufficient time.

5.0 Personnel Involved

5.1 Designated Person (Ashore) for PP Vessels

As per *Marine Order 504* and the *ISM Code*, the owner has designated a person with direct access to the owner to be responsible for monitoring the safety and pollution prevention of all vessel's involved in marine operations operated by the Port and ensuring appropriate resources and shore support are provided to the vessel.

Designated Person Contact Details	
Name	TBA
Address	
Phone	
Email	

5.2 Owner

The effective owner of all marine assets involved in the port is Peninsula Ports Pty Ltd (ABN: 18 124 308 041).

Owner Contact Details	
Name	Mark Rodda
Address	Level 1, 33 Hutt Street, Adelaide, South Australia, 5000
Phone	+61 8 8232 9266
Email	info@peninsulaports.com.au

5.3 Organisational Chart

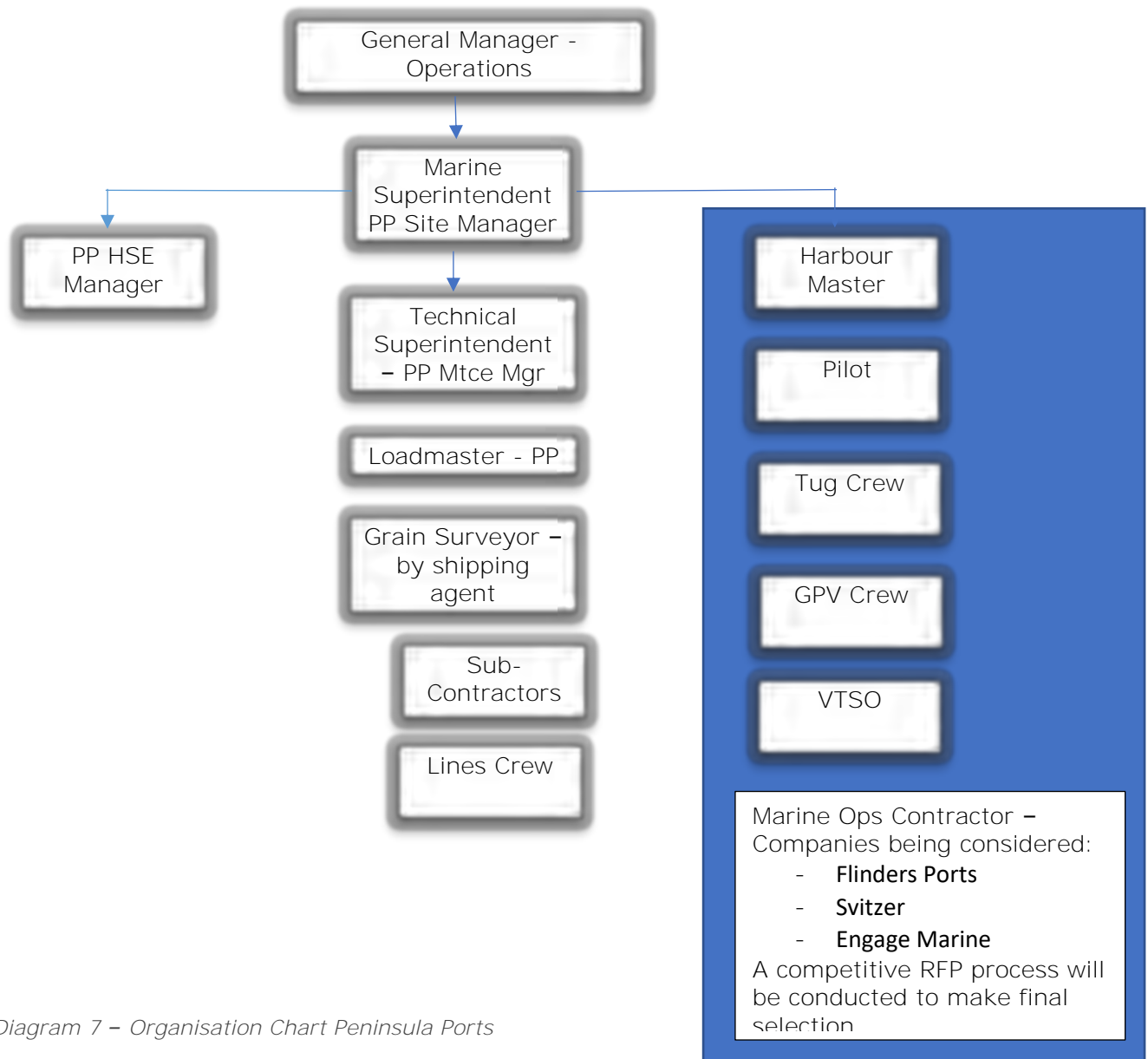


Diagram 7 – Organisation Chart Peninsula Ports

The general principle in populating the organisation chart for the export facility is that a specialist contractor will be contracted to manage all aspects of bringing vessels safely alongside and returning them to sea. Peninsula Ports will have primary responsibility for engagement with grain traders, shipping agents and others in the commercial chain of commodity management such that the right ship is loaded with the right grain to meet export regulation requirements.

A third party managing the marine operations at a port is well established at locations such as Whyalla, where both Flinders Ports and Svitzer are involved in aspects of service delivery.

5.4 Corporate Key Roles

Company Name	Registration	Company Number	Directors	Management	Assets

5.5 Operational Key Roles

Role	Key responsibilities	Incumbent	Status
Port Operator	<ul style="list-style-type: none"> • Owner's obligations under all marine regulations and law • Employer of workers • Party to service contracts 	Peninsula Ports Pty Ltd (PP)	Australian Proprietary Company
General Manager	<ul style="list-style-type: none"> • Overall responsibility for terminal and marine operations • Corporate governance • Company director 		Employee of PP

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Role	Key responsibilities	Incumbent	Status
Marine Superintendent/Harbour Master [depending on whether HM is internal to Port Operator]	<ul style="list-style-type: none"> • Designated Person Ashore for ISM purposes • Designated Person for National Law purposes • In charge of all marine activities at Port Spencer • Responsible for SMS and compliance of marine assets • Directs day to day marine activities • Point of contact for all external stakeholders, including BC, VTSO, AMSA 		Employee of PP
Technical Superintendent	<ul style="list-style-type: none"> • Implements planned maintenance schedule • Manages repairs • Manages testing and certification of equipment 		Employee of PP
Pilot (role may be combined with load master/surveyor)	<ul style="list-style-type: none"> • Conduct of all ship arrivals and departures within port limits 		Employee/contractor of PP
Grain Surveyor/Loadmaster	<ul style="list-style-type: none"> • Supervises loading and unloading BC • Completes draft surveys • Ensures compliance with cargo MO 33, MO 34, BLU and IMSBC Codes • Point of contact for BC C/O 		Employee/contractor of PP
ASD Tug Master	<ul style="list-style-type: none"> • Command ASD tug • Ensure vessel compliance with MAROPS plan and 		Employee/contractor of PP

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Role	Key responsibilities	Incumbent	Status
	SMS		
GPV Master	<ul style="list-style-type: none"> • Command GPV • Ensure vessel compliance with MAROPS plan and SMS 		Employee/contractor of PP
Vessel Crew	<ul style="list-style-type: none"> • Operate and maintain marine assets in accordance with SMS and directions of Marine Superintendent 		Employee/contractor of PP
Lines Crew	<ul style="list-style-type: none"> • Handle lines on berthing and unberthing 		Employee/contractor of PP

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5.6 Fatigue management plan

Whilst a bulk ship is in port, the BLF is intended to be a 24-hour operation.

In creating the roster below, regard has been had to the Guide for Managing Fatigue in the Workplace, published by Safe Work Australia.

Application of the roster will be fully compliant with the requirements of Marine Order 28.

An indicative roster is presented below:

	DAY 1		DAY 2		DAY 3		DAY 4		DAY 5		DAY 6		DAY 7	
	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06
Team 1	ON	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
Team 2	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
Team 3	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
	Roster: x2 Dayshifts, x2 Nightshifts, x2 Days off (12-hour shifts) Hours worked over 7 days (avg) = 56 Hours away from work over 7 days (avg) = 112													

Diagram 8 – Fatigue management roster

5.6.1 Day Hand roster

The key management positions are Monday to Friday day hands, on call on weekends. They will manage their time and fatigue levels accordance to work demands and priorities.

5.6.2 Pilot roster (if distinct from loadmaster/surveyor)

The Pilot is required 2 hours before arrival or departure.

Fatigue management is critical for this role.

5.6.3 Grain Surveyor Roster

The Grain Surveyor is required to visit the BC at anchorage and before departure.

The Loadmaster, as the ships representative, will always be on site while the vessel loading, or unloading is being undertaken.

Fatigue management is critical for this role, and adequate personnel must be available to fulfill this role.

5.6.4 Marine Crew Roster

The Marine Crew roster provides

- Four teams for each vessel on rotation, comprising of;
 - Lines crew, multi-purpose functions (x3 personnel)
- 12 on (day shift) 12 off (night shift) for 28 days
- then 28 days rest

Due to the infrequency of the berth being occupied, this function may be contracted out on an ad-hoc basis.

5.6.5 Record Keeping

All staff and crew are required to keep a record of hours worked. These records are to be kept in electronic format for an indefinite period and will be available for inspection by the relevant authorities.

6.0 Departure and Arrival Points

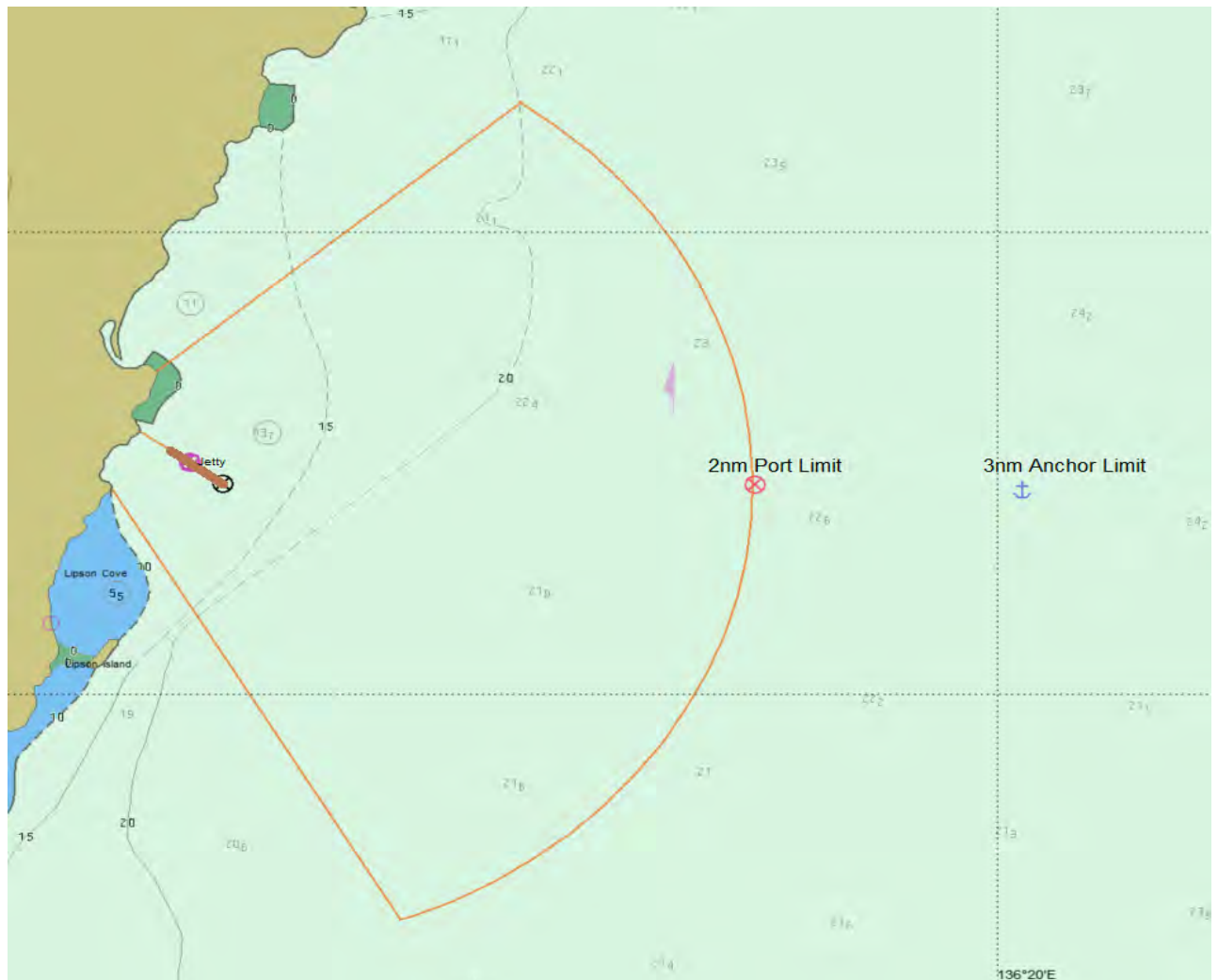


Diagram 9 – Port Limits and anchorage (indicative only)

Departure Point	Location	Nature of departures	Authority
BLF	• Jetty / Jetty		
Tug berth	• Port Lincoln		
GPV berth	• Jetty Southside		
Anchorage	• 3nm to E from Jetty		
Storm Mooring	• BLF Master decision / Port Lincoln Harbour		

7.0 Adherence to Key Government Documents

7.1 Marine Order 32 [Cargo Handling Equipment]

Section	Requirement	Adherence
18	Drawings and operational instructions for handling gear must be available on ship	
19	SWL to be determined and marked on lifting gear	
22	Equipment can only be used if inspected and certified by competent person i.e. manufacturer	
23	Certificate of test must be completed for material handling equipment	
24	Loose gear must be inspected before each use and record of inspection	
25	Register of materials handling equipment must be maintained	
26	Certificates of test and records of inspection must be kept on ship	
28	Power must not be supplied to handling equipment unless sufficient qualified personnel available to maintain watch over the equipment	
29	Repairs to handling equipment must be done by competent person properly equipped	
30	Restriction on return of service of repaired equipment – must be examined by competent person and logged	
Sch 1 Clause 2	At least 50 lux lighting in cargo working areas	
Sch 1 Clause 4	Guardrails on upper deck working spaces	
Sch 1 Clause 7	Protection on cargo handling moving parts	
Sch 2 Clause 5	Escape from bulk cargo space	
Sch 2 Clause 13	Vertical ladders not more than 6m	
Sch 3 Clause 2(2) and various	All cargo handling equipment other than wire ropes, nets and slings to be tested and examined every 5 years by competent person, and every 12 months by survey organisation	
Sch 4 Various	All cargo handling equipment to be marked with SWL if load bearing	
Sch 5 Clause 8	Grabs to be marked with SWL, tare mass and cubic capacity	
Sch 6 Div 2 Clause 3	Crane must be marked with SWL, including reductions per outreach	

Section	Requirement	Adherence
Sch 6 Div 3 Clause 1	Placement of controls must not place operator in danger but allow clear view of equipment. Must be clearly labelled	
Sch 6 Div 3 Clause 3	Must be an emergency isolating switch for electrically operated loading equipment	

7.2 Marine Order 33 (International Grain Code)

Section	Requirement	Adherence
9(2)	Master of BC must ensure grain loading documents are carried: <ul style="list-style-type: none"> - Doc of authorization - Grain stability data - Proposed loading plan - Grain stability calcs - Shear force and bending moment calcs 	
9(3)	Terminal Operator may only allow grain to be loaded in accordance with this order	
11	There must be a loading and unloading plan agreed between the terminal and vessel. Plan must be kept for 6 months	
12	Master and Terminal Operator must ensure loading is in accordance with plan	
12(3)	Master can suspend loading if plan not followed and must advise AMSA if so suspended. Loading can resume after corrective action	
13	Shipper must give at least 72 hours' notice to AMSA of intention to load grain in bulk	
14	The master of a vessel must not permit grain to be loaded on the vessel if: <ul style="list-style-type: none"> (a) the notice required has not been given; or (b) stability calculation information requested not been given; or (c) an inspector has told the master that an inspection of the vessel is required, and this has not yet occurred; or (d) an inspector has conducted an inspection and has not given 	

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Section	Requirement	Adherence
	approval after the inspection for the grain to be loaded.	
17	If the master of a vessel intends fumigation of a cargo space of the vessel when the vessel is in port, the master must, within 72 hours before arriving in the port, give report of intention to AMSA	
18	Fumigation must be carried out in accordance with <i>IMO recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds</i>	
19	The agent must give 72 hours' notice to AMSA of intended in transit fumigation	
20	The master must give notice of an in-transit fumigation taking place 72 hours before arriving at an Australian port	
21	The master must ensure that only an approved fumigant is used	
21(3)	Fumigation must be conducted in accordance with the IMO Code above	

7.3 Marine Order 34 (BLU and IMSBC Codes)

Section	Requirement	Adherence
11(1) and (3)	Solid bulk cargo must be loaded, trimmed, carried and unloaded in accordance with Parts A and B, Chap VI of SOLAS, the IMSBC Code, the BLU Code and this order	
11 (2)	Vessel must carry documents on board to demonstrate compliance with Clause 11	
12	There must be a loading and unloading plan agreed between the terminal and vessel. Plan must be kept for 6 months	
13	Loading and unloading must be in accordance with the plan	
13(3)	Master can suspend loading if plan not followed and must advise AMSA if so suspended. Loading can resume after	

Section	Requirement	Adherence
	corrective action	
16	Shipper must give at least 48 hours' notice to AMSA of intention to load bulk vessel. Notice must include IMO number of ships, port and berth and information in 4.2 of IMSBC Code	
18(1)	Before loading bulk cargo, shipper must advise the Master of Information in 4.2 IMSBC Code	

7.4 Marine Safety (Domestic Commercial Vessels) National Law 2012

Section	Requirement	Adherence
12	Owners to ensure safety of vessels, equipment and operations	SMS compliant with Marine Order 504 for all DCVs
16	Masters to ensure safety of vessels, equipment and operations	SMS compliant with Marine Order 504 for all DCVs
Div 2	Requirement for certificate of survey	CoS held for all DCVs over 7.5m
Div 3	Requirement for certificate of operation	CoO held for all DCVs
Div 5	Unique identifiers to be displayed	All DCVs so marked
88/89	Obligation to report marine incidents	MAROPS Plan describes reporting system

7.5 Standard for Marine Construction Activities within the Port Spencer Marine Construction Activity Area

Section	Requirement	Adherence
Part 3	General recommendations are put forward for all vessel operations in the PSMCAA	
Part 4	Vessels over 10m must have AIS B fitted and an electronic chart system Passenger transfer vessels over 6m must have an electronic chart system	
4.2	Recommended min crew of 2 for all vessels	
4.2.3	Passenger transfer vessel must: <ul style="list-style-type: none"> - Display yellow flashing light while underway - Not to exceed 25 knots - Have a Passenger Numbers Verification Procedure 	

Section	Requirement	Adherence
4.2.4	All tugs must provide load test results to HM for tow hook/winch quick release	
Part 5	Ships over 50m must have a PEC master, procedure for obtaining per this section	
5.3	<p>Masters must:</p> <ul style="list-style-type: none"> - Hold correct certificate - Be familiar with AMCAA - Hold a PEC (>50m) - Ensure crew can use radios in emergency <p>Barge masters:</p> <ul style="list-style-type: none"> - Qualified per SMS <p>Deckhands:</p> <ul style="list-style-type: none"> - Hold OHS training - Hold RMDL - Hold current first aid cert - Be competency trained in vessel and radio 	
Part 6	<p>All vessels must establish and maintain comms with VTS on Channel 12</p> <p>All vessels to advise VTS of any intended movement before commencing movement, and follow any instructions from VTS in relation to that movement</p> <p>Must maintain listening watch on channel 16</p>	
6.2	Must have passenger number verification procedure	
6.3	Must have an evacuation plan	
6.4	Must have an extreme weather contingency plan	
6.5.1	Ships >35m must have SOPEP plan and kit	
6.5.2	Ships > 400GT must have Oil Record Book	
6.5.3	Sewage restrictions	
6.5.4	<p>Vessel >12m display sign re garbage restrictions</p> <p>Vessel >35m have a shipboard waste management plan</p>	
6.5.5	<p>Current and appropriate level insurance re pollution clean-up and salvage must be held</p> <p>>15m and >35m</p> <p>Certificate of currency must be carried on board</p>	
6.6	Incident reporting requirements for Nav Act vessels and DCVs	

Section	Requirement	Adherence
6.7	Marine Pollution Reporting requirements as per PP Emergency Response Plan	
6.10	Buoy moorings must be authorized by HM and marked with yellow flashing lights	

7.6 Managing Risks in Stevedoring Code of Practice 2018

Section	Requirement	Adherence
1.1	PCBU has duty of care that workers are not exposed to health and safety risks	
1.2	Workers must be consulted	
1.3	Workers must be provided information and trained	
2	Hazards must be identified, assessed and resultant risks controlled	
2.4	Controls must be assessed and reviewed	
3.1	Appropriate planning must be undertaken before the arrival of a ship	
3.2	Emergency situations must be planned for	
4	Vessel and plant must be inspected before loading or unloading	
5.1	Gangways must be safe and in good condition	
5.2	Good housekeeping must be observed	
5.3	All work areas must be adequately lit	
5.4	Air quality in all workspaces, particularly confined spaces must be safe	
5.5	The risk posed by varied weather conditions must be assessed	
5.6	Any moving traffic on land must be part of a traffic management plan, including separation of pedestrians and vehicles	
5.7	Appropriate precautions against falls are to be taken Appropriate precautions against injury from falling objects are to be taken	
5.8	Noise levels in work areas are to be assessed and abated or mitigated where possible	

Section	Requirement	Adherence
5.9	Fatigue of workers is to be managed	
6	Appropriate precautions are to be taken specific to nature of cargo and its stowage	

7.7 Harbours and Navigation Act 1993

- Part 4, Div 1 - Establishment and maintenance of Navigations aids (as per AtoN plan)
- Part 5, Div 1 - Control and management of harbors and ports including port operating agreements – role of this MAROPS plan as part of the port operating agreement
- Part 5, Div 2 – Port Management Officers – Peninsula Ports employees
- Part 5, Div 2A – powers of direction – this Marops plan to be construed as if it were a standing direction to a person in charge of a vessel in or near the port
- Part 5, Div 3 – harbour improvement work, including dredging
- Part 5, Div 4 – harbour charges
- Part 5, Div 5A – licensing, duties and immunity of pilots -
- Harbours and Navigation Regulation 2009

8.0 Public Facilities Used

There will be no public access to the wharf structure.

9.0 Navigation Equipment on Board as Required

Vessel and ID	Description	AIS B	ECS	Radar
Tug A	ASD tug – 60TBP	Yes	Yes	Yes
Tug B	ASD tug – 60TBP	Yes	Yes	Yes
GPV A	GPV <12m	Yes	Yes	No

10.0 GPV Passenger Counting Procedure

The GPV SMS specifies completion of the following manifest for each passenger/crew transfer. Records will be kept on onboard the GPV and available for inspection.

Personnel Transfer Sheet

Date	Time	Departing from	Number of Passengers on	Destination	Number of Passengers off	Sign

11.0 Vessel and Equipment Specifications

11.1 Vessels

The below table summarises key vessel particulars and compliance status.

Vessel and ID	Description	LOA and Power	Survey	Operation	Insurance
Tug A	ASD Tug	60 TBP	Class		
Tug B	ASD Tug	60 TBP	Class		
GPV A	RIB <12m	12m; x2 60HP Outboards	Class		

11.2 BLF Equipment

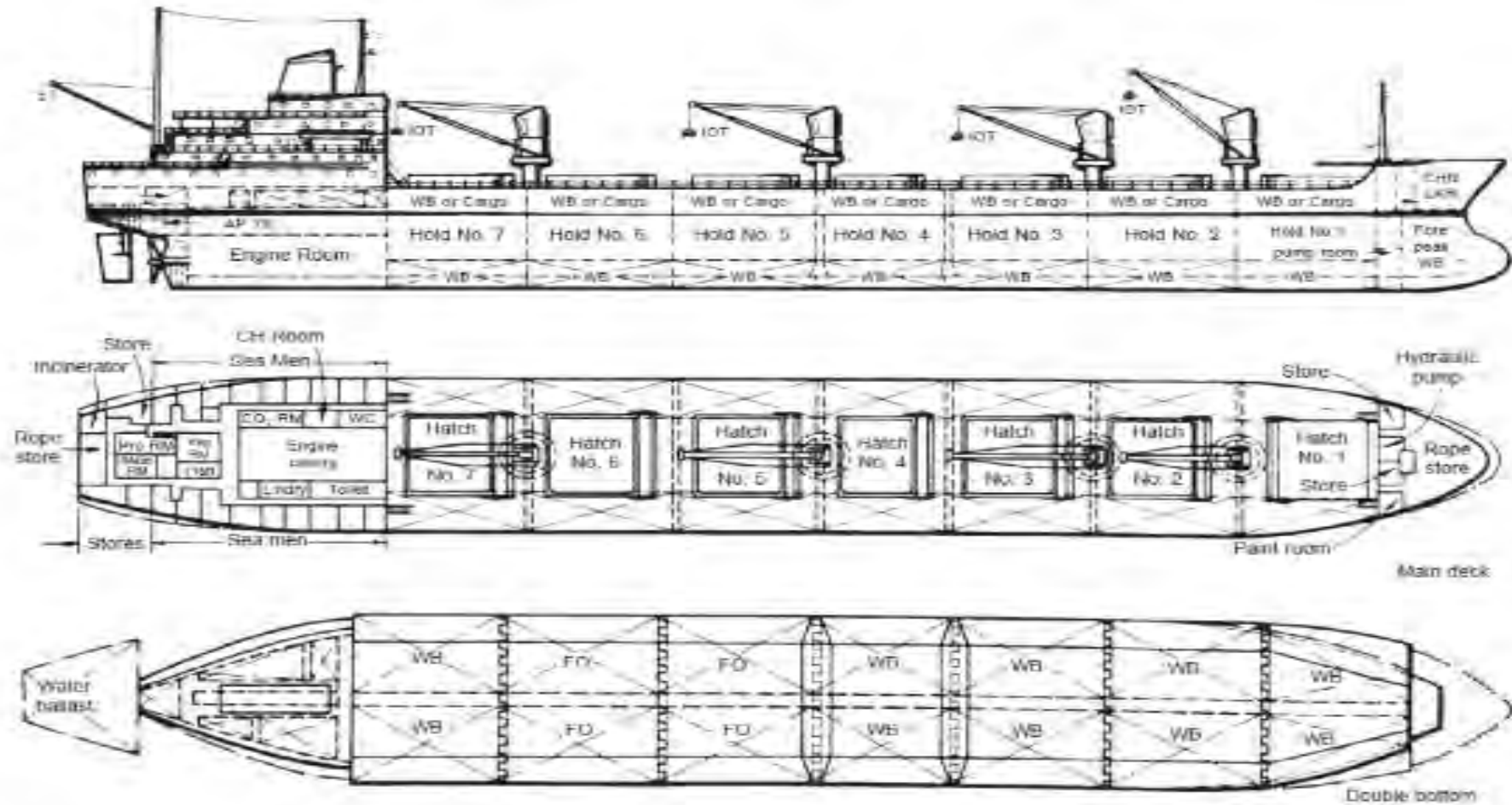
The below tables summarise key cargo handling equipment and present compliance status.

[Sample data in table]

Equipment	Description	DOM	Manufact
Hopper/Feeder	Truck fed hopper located on shore	11/2015	Thomas Manufacturing
Grasshopper 1 No. THVFCF1112015	25m Conveyor linking Hopper to Grasshopper 2 on ST47	11/2015	Thomas Manufacturing
Grasshopper 2 No. THVFCF2112015	25m Conveyor linking Grasshopper 1 to Grasshopper 2 on ST47	11/2015	Thomas Manufacturing
Grasshopper 3 No. THVFCF3112015	25m Conveyor linking Grasshopper 2 to Grasshopper 3 on ST47	11/2015	Thomas Manufacturing
Telestack TS 842 No. 1001660414	Radial telescopic conveyor linking Grasshopper 3 on ST47 to Cargo hold on IRONCLAD 1	2014	Telestack Limited, Ireland
Generator No. 87336144	130 KVA, provides power to 4 x Conveyors above	2012	AKSA
Hopper/feeder	Hopper/feeder/conveyor on IRONCLAD 1 linking cargo hold to Flip over stacker	09/2013	Thomas Manufacturing
Telestack TC 424 No. 5041R	Flip over stacker linking hopper/feeder to BC cargo hold	12/2014	Telestack Limited, Ireland

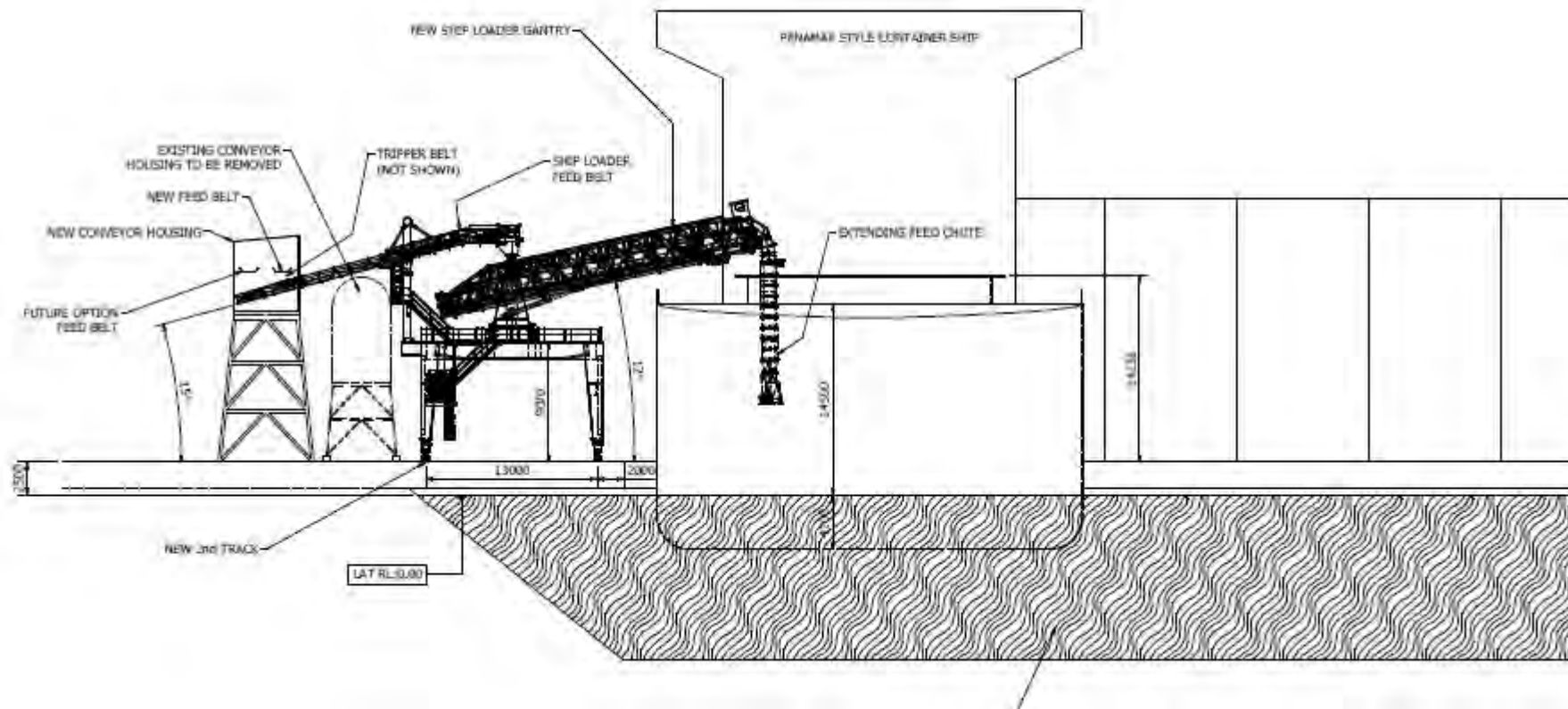
Travelling ship-loader and conveyor at 2000 tonnes per hour with reach for Panamax vessel.

11.3 General Arrangement – Typical Panamax Export Bulk Carrier



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11.4 Arrangement of Materials Handling Equipment – BLF



1

PANAMAX SHIP

LQA: 245m

BEAM 32.31m

DUT: 50.00UT

10500

HAT: TBA +0.950

LAT: TBA -0.950

—R.L. TBA 6000

AND 0.000

SECTION A-A

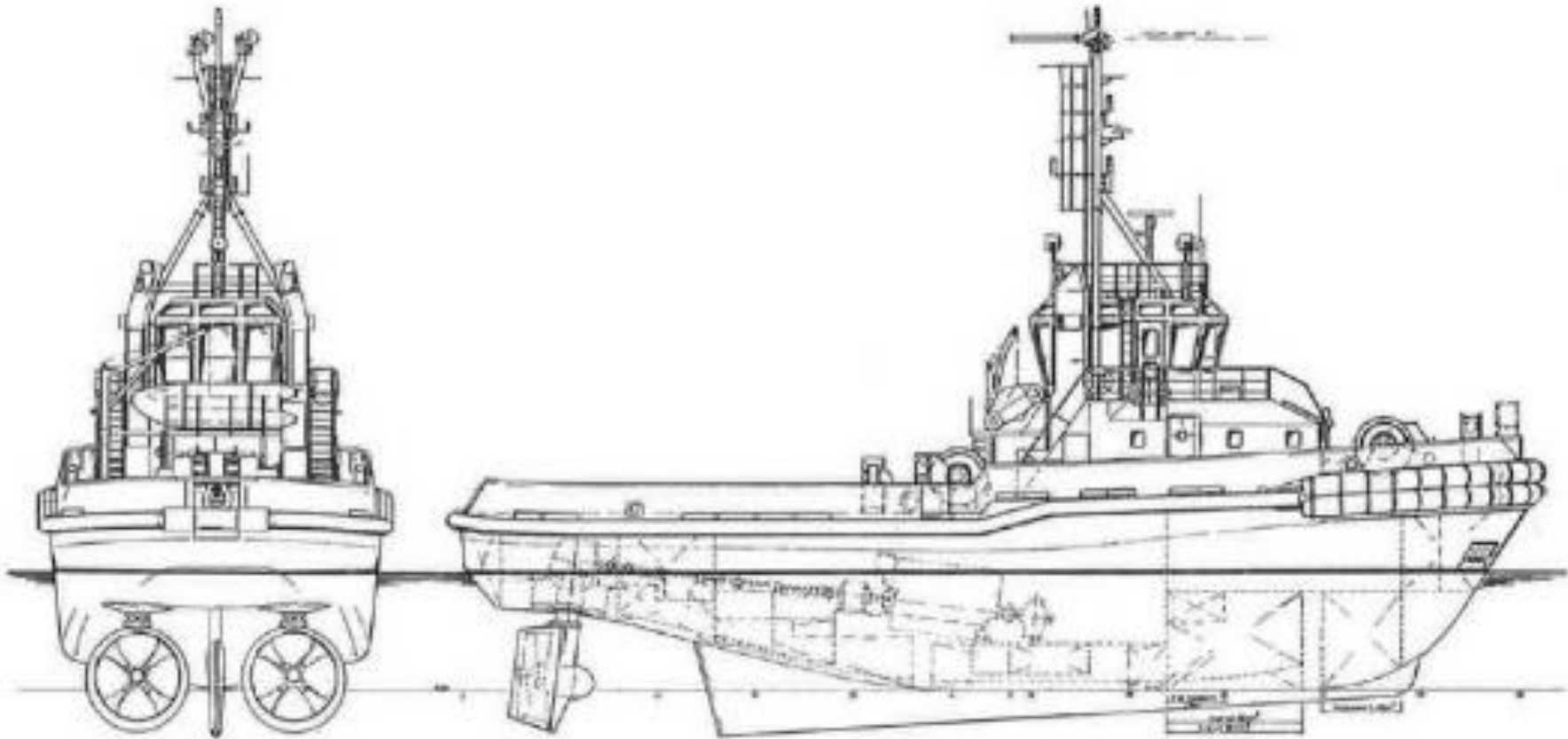
SCALE: 1:80

CONCEPTUAL DRAWING

NOT FOR MANUFACTURING

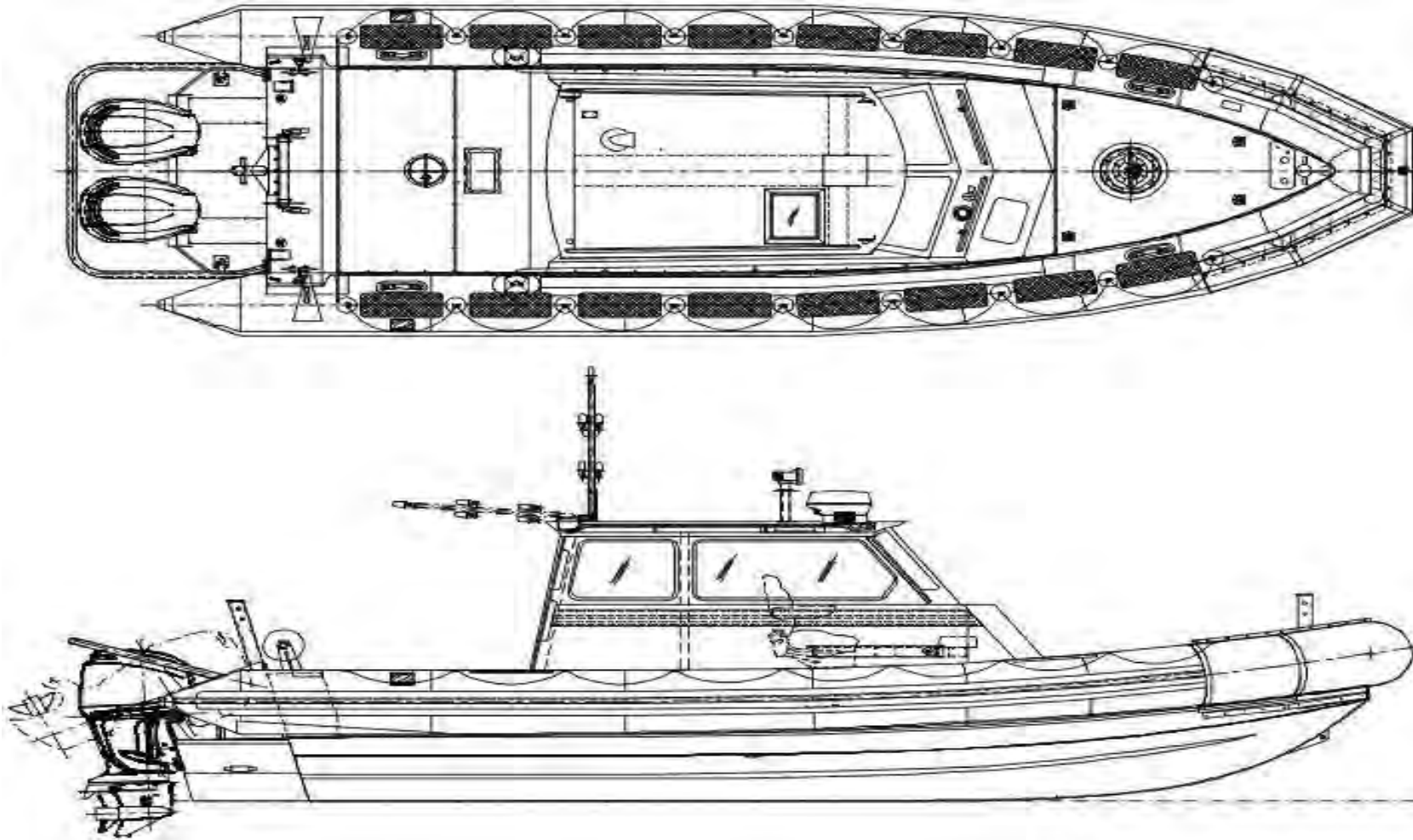
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11.5 Azimuth Stern Drive (ASD) Tug



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11.6 General Purpose Vessel (GPV)



12.0 Crew Qualifications

	ASD Tugs	GPV
Flag	Australia	Australia
Regulatory	Australia	DCV
Master	Master <35m NC	Coxswain <12m NC
Mate	Nil	Nil
Chief Engineer	MED1	Nil
Deckhand	STCW Deck AB or Integrated Rating	RMDL + first aid
Deckhand /Operator	Nil	RMDL + first aid
Total Crew	3	2

[note – all DCV crew qualifications under review by AMSA as part of a re-write of MO 505 presently under consultation. Changes to be implemented in 2020:
<https://www.amsa.gov.au/about/regulations-and-standards/marine-order-505-certificates-competency-national-law>]

13.0 Manoeuvring plan

13.1 Table of Timings and Frequency

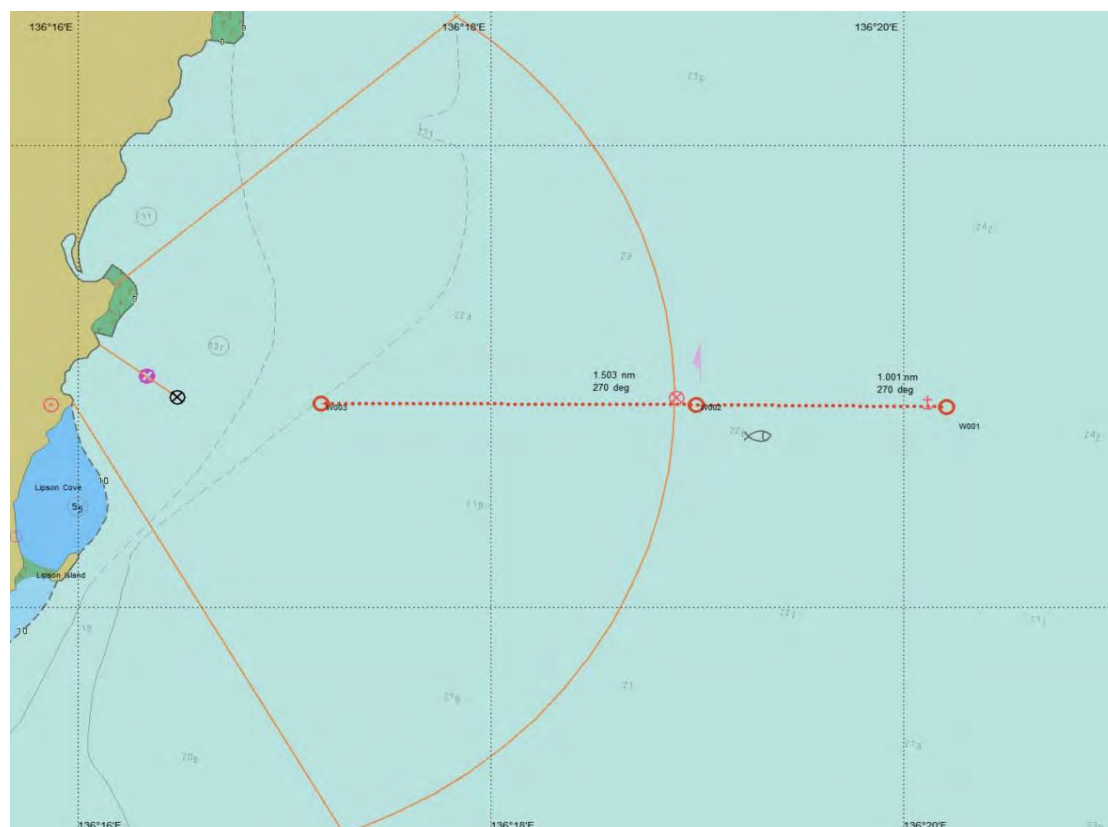
The following table and following chart-lets summarise vessel movements – to be completed during simulation and revised with experience.

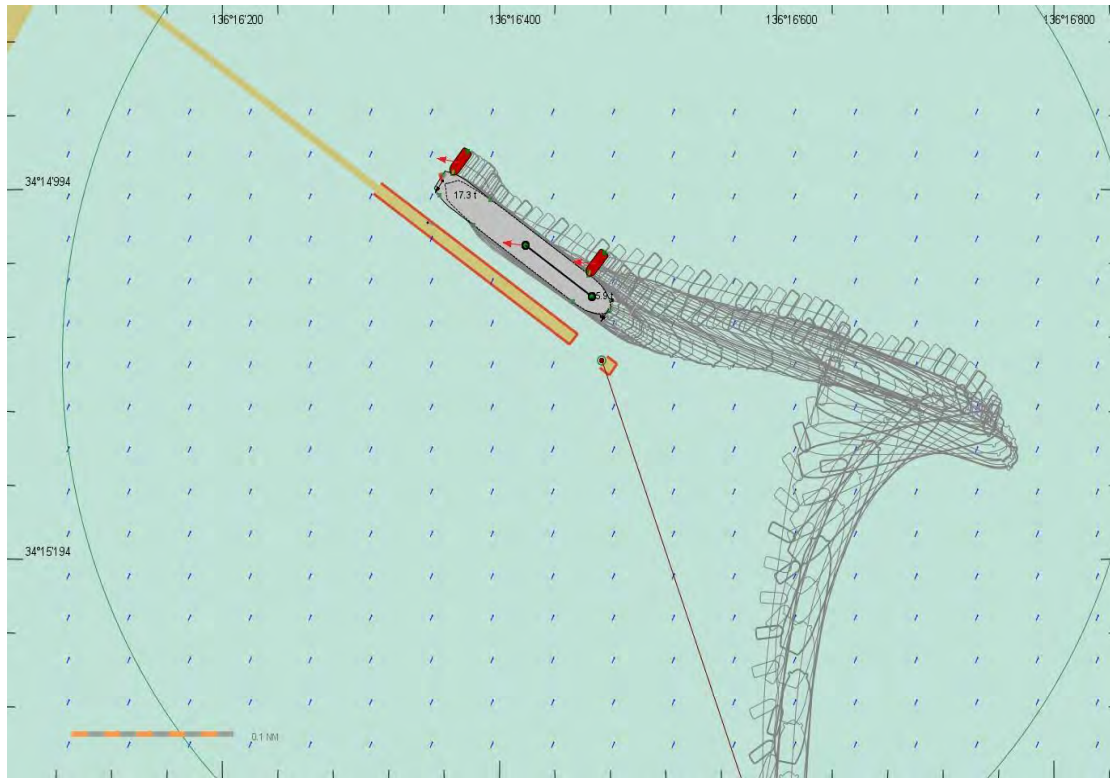
Vessel	Transit	Voyage time	Frequency
BULK CARRIER	Anchorage to BLF		
BULK CARRIER	BLF to port limits		
GPV	BLF to Anchorage and return		
GPV	Draft surveys		
GPV	Line handling		
GPV	BLF to storm mooring		
Tug	BLF to inbound escort point		
Tug	Escort inbound to BLF		
Tug	BLF to Port Lincoln storm mooring		

13.2 Bulk Carrier Approach Plan

13.2.1 Approach plan to jetty

Departure plan is the reverse of the Approach plan as shown below.





13.3 Scheduling and Port Requirements

13.3.1 Pilots

Pilots will be provided by the Port Operator. Pilots will board via the 12m GPV or tug.

13.3.2 PEC Masters

Vessel masters with a Pilot Exempt Certificate (PEC) will be required to have a PP appointed pilot on board within the harbour boundaries at all times.

13.3.3 Ship Scheduling

The movement of the bulk vessels will be facilitated through the Port Spencer VTS. Notification of pre-arrival will be given 48 hours prior to arrival at the port and updated again at 24 hours and 12 hours before arrival. Arrival information will be sent to the Harbour Master.

13.3.4 Administration of Ship Movements

The movement of all vessels of LOA 35 m or more arriving at Port Spencer is controlled by Port Spencer VTS.

Shipping agents submit booking information to the VTSO in accordance with the

reporting requirements and record their requisitions for tugs, pilot and linesmen.

The ancillary services respond to acknowledge the booking and allocate their resources

The movement is then confirmed.

A software program will be adopted so that port service providers, agents, government agencies and the general community are able to view scheduled movements at Port Spencer in real time.

13.3.5 Local Vessel Traffic Interactions

Approximately 25 bulk carrier calls per year will be required to load grain cargo within Port Spencer. Port Spencer VTSO (harbor master?) will co-ordinate the bulk vessel movements so they do not impede on existing vessel movements.

13.4 Tides and weather

13.4.1 Low tide restrictions on loading BLF

A minimum UKC of 10% of loaded draft will be maintained. The tide and draft will be calculated by the loadmaster and master at each loading.

- Air drafts – no overhead restrictions foreseen.

The seabed in the BLF has been sounded by ASR Ltd in 21 October 2011), therefore calculating an accurate UKC is possible.

A minimum UKC of 10% will be maintained. The tide and draft will be calculated by the loading master and vessel master at each loading.

13.4.2 Tidal restrictions on bulk ship transits

- Inbound drafts
- Outbound drafts

Inbound drafts are as per marine safety port Procedures. No air draft restrictions under the PP but ballast draft is as per PP: "Ships should be ballasted or loaded in order to have an even keel or trimmed by the stern with the forward draft not less than 2% LOA and the propeller fully submerged".

13.4.3 Weather restrictions on operations

Provided preparations have been made, the appropriate risk assessment has been completed and all other factors considered and found favourable, the following weather limits are recommended for conducting bulk transfers at the

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BLF:

- Wind < 25 knots
- Seas < 2.5 meters (significant wave height)
- Current <0.5knots
- Visibility > 1 mile

Arrangements shall be made for the provision of regular weather forecasts, including adverse weather warning to the vessel. Voyage plans, for movements outside Port Spencer, shall always have contingency for avoidance of adverse weather. Support Vessels are not to operate outside Port Spencer limits under normal operations.

During adverse weather the Marine Superintendent/Pilot will maintain close contact with the Harbour Master and will seek guidance when to suspend operations.

14.0 Port Spencer VTS

Vessels must have radio communications established with Port Spencer VTS at all times. Port Spencer VTS is the primary point of contact for Peninsula Ports and the Harbour Master.

Port Spencer VTS is an Information Service only (in accordance with IMO resolution A.857(20)). That is, Port Spencer VTS will, on request, transmit essential and timely information to assist in the onboard decision-making process, which may include: position, identity and intentions of other traffic, hazards and other factors which may affect a vessels transit.

During the time that a vessel is operating in the vicinity of another vessel or loading facility, a dedicated radio channel must be maintained between the vessel and the facility deck crew at all times, whether cargo is being worked or not.

With regards to marine traffic, taking into consideration current shipping movements currently employed and known future development plans expected for Port Spencer, the movements required to complete the establishment phase will not impact the port significantly.

The tugs will abide by instruction received from the Port Spencer VTS and will monitor VHF channels 12 & 16.

All Port Spencer support vessels will have AIS fitted and operational to assist them with intentions from other vessels and shipping at all times the vessel masters will abide by COLREGS.

15.0 WASTE MANAGEMENT AND POLLUTION

15.1 Ship Sourced Pollution Management

The detailed oil spill response plan is contained in separate PP-PS documents:

- Ship Sourced Pollution Prevention Management Plan
- Emergency Response Plan
- ANNEX 1 – First Strike Response Plan

Possible sources of pollution from Port Spencer operations are:

- oil and oily residues or mixtures (including diesel fuel, and bunker fuel)
- chemicals and chemical residues
- sewage
- garbage (including food wastes, paper products, rags, glass, metal, bottles, crockery, fishing gear, nets, bait boxes, deck sweepings, paints, wood products and all plastics).

It is an offence to discharge pollutants (either deliberately or negligently) into coastal waters and severe penalties apply.

All support vessels (tugs/GPV) are to carry the applicable pollution prevention

documentation and hold insurance to the relevant limits for pollution clean-up, vessel salvage and wreck removal.

15.2 Oils and Chemicals

A high proportion of the ship sourced oil and chemical pollution that enters the water comes from refuelling, vessel maintenance and bilge discharges. Operators must ensure that they use and dispose of all on board oil and chemicals correctly and safely.

Keeping bilges clean helps to reduce pollution from oil and chemicals. Use absorbents to mop up excess oil or fuel, wash bilges with biodegradable degreasers or detergents and dispose of any cleaning residue ashore.

If oil does spill into the water, use absorbents to mop it up and let the VTSO know so that it can be cleaned up as soon as possible. Do not use dispersants or other cleaning chemicals because they can increase the toxic effects of oil spills.

There are several specific oil and chemical requirements that operators must adhere to, including:

- having a shipboard oil pollution emergency plan (SOPEP) on board—applies to all ships that are more than 35 meters in length overall, or more than 24 meters in length overall, carrying oil as cargo or a vehicle that is carrying more than 400 litres of oil as cargo
- having an oil record book on board — applies to the following ships:
 - a ship that is an oil tanker of 150 gross tonnage or more
 - a ship, other than an oil tanker, of 150 gross tonnage or more that carries oil in
 - a portable tank with a capacity of 400 litres or more
 - a ship, other than an oil tanker, of 400 gross tonnage or more

Tugs will have SOPEP plans in place together with appropriate spill kits, and will have oil record books available for inspection.

15.3 Bunkering

Bunkering involves the transfer of substances between the shore and a ship.

There are no bunkering facilities for visiting bulk carriers at Port Spencer.

Fuel for terminal machinery and vehicles will be delivered by road.

Tugs will refuel at their home port – Port Lincoln and the GPV will refuel from portable fuel tanks, either at Tumby Bay, onshore or at the Port Spencer jetty.

15.4 Sewage

Port Spencer will not accommodate the discharge of sewage.

15.5 Summary of Pollution Prevention Documents

Port Spencer vessels carry documentation applicable to their type in relation to various aspects of pollution prevention, including:

- Shipboard Oil Pollution Emergency Plan (SOPEP)
- Oil Record Book
- Shipboard Sewage Management Plan
- Sewage Disposal Record Book
- Sewage Treatment System Documentation, System Service Manual and Service Records
- Placard about garbage disposal requirements
- Shipboard waste management plan (garbage)

16.0 Incident reporting

16.1 Marine incidents

The *Harbors and Navigation Act 1993* requires any accident resulting in the loss of life or personal injury or in damage to property to be reported as soon as reasonably practicable.

The *Marine Safety (Domestic Commercial Vessels) National Law Act 2012* requires an incident involving the following to be reported:

- the death of a person
- serious injury to a person
- the loss of a vessel
- the loss of a person from the vessel
- significant damage to a vessel

The *Navigation Act 2012* requires the following incidents to be reported:

- the vessel is involved in a marine incident that has affected, or is likely to affect, the safety, operation or seaworthiness of the vessel
- the death of a person
- serious injury to a person
- the loss of a vessel
- the loss of a person from the vessel
- significant damage to a vessel
- loss of cargo of a vessel

The *Transport Safety Investigation Act 2003* requires any of the following incidents to be reported to AMSA:

- breakage of gear or injury to any person during cargo work
- damage or defect to ship, machinery or equipment
- peril or a close quarters situation
- stranding or disappearance
- death, serious injury or a dangerous occurrence
- a birth.

Forms 18 and 19 will be used to report incidents.

Initial incident alerts will be sent within 4 hours of the incident.

Full reports will be sent within 48 hours of the incident.

16.2 Local procedures

When an employee becomes aware of an actual or potential incident, that employee is to notify their immediate supervisor, who will then report it to upper management and the authorities.

For this section, incidents include a dangerous occurrence (i.e. a near miss), which occurs at or near the workplace.

All incidents and near misses shall be recorded in incident data management system and made available to external regulatory bodies;

All HSE and Marine related incidents must be reported to the appropriate Regulatory Authority as soon as possible after the event.

All incidents within Port Spencer must immediately be reported to:

The Harbour Master via Port Spencer VTS (24 hours) on:

VHF radio: Channel 16, 12, 10

Phone: XXXXXXXXX

And by email: XXXXXXXXXX

16.3 Marine pollution

Any discharge or probable discharge will be reported without delay to the VTSO.

VHF radio: Channel 16, 12, 10

Phone: XXXXXXXXX

And by email: XXXXXXXXXX

The Marine Unit Coordinator for AMSA can be contacted on:

Phone: +1800 641 792 (24 hours)

17.0 Maintenance plan

All vessels and cargo handling assets are provided with a preventative maintenance plan.

The plan includes pre-start checks, scheduled servicing of key equipment per manufacturers recommendation and periodical slipping and inspection.

18.0 Evacuation procedure – Ship based

On hearing any signal or alert, all hands are to muster at the muster station for a head count and further instructions before going on duties.

<u>EMERGENCY SIGNAL:</u>	Seven short blasts followed by one long blast
--------------------------	---

ABANDON SHIP SIGNAL: By word of mouth from the Master

PREPARE TO ABANDON SHIP: One short one long minimum three times

Evacuation procedure	
1.	Master or delegate to make the decision to abandon ship
2.	Sound abandon ship alarm using the horn one short one long minimum 3 times and crew to advise by word of mouth
3.	Crew to distribute and put on life vests
4.	Master or delegate to ensure distress kit is collected
5.	Master call mayday on channel 16 advising location, emergency and POB
6.	All crew to muster at davit area Port side aft
4.	Head count to be completed
5.	Launch life raft
6.	Evacuate to life raft

19.0 Extreme Weather contingency procedure

The storm contingency procedure is outlined in the *Port Spencer Vessel Traffic Management Plan*.

20.0 Security

20.1 General

The International Ship and Port Facility Security Code (ISPS) is administered in Australia by the Department of Infrastructure, Transport, Development and Local Government (DITRD LG).

A ship's master, prior to entering the port, must report directly to the port authority, or via their respective ship agency, the following:

- International Ship Port Facility Security Code compliance number
- current ship security level, or any change to the ship security level, whilst in port
- ship security officer contact details
- list of expected visitors/contractors
- nominated provedore
- crew list and identification
- any security incident (as defined under the International Ship Port Facility Security Code or Maritime Transport Security Legislation) whilst in port.

20.2 Security levels

The Federal Government determined, and will declare when necessary, three security levels:

- Level 1 — minimum appropriate protective security measures will be maintained at all times.
- Level 2 — appropriate additional protective security measures will be enacted because of heightened risk of a security incident.
- Level 3 — further specific protective security measures maintained for limited times when a security incident is probable or imminent, although it may not be possible to identify the specific target.

Unless otherwise advised the port will operate on Level 1.

In addition to normal security measures undertaken, additional security measures on the land and water may be implemented:

- If directed by the Australian Office of the Department of Infrastructure, Transport, Development and Local Government.
- The current ship security level is higher than security level 1 or the port/port facility security level.

Additional security measures will include:

- increased number of maritime security guards
- controlled access to the waterside security zone and/or additional security waterside patrols
- controlled access to the ship security zone and landside restricted zone
- random or compulsory inspection of all baggage/stores and vehicles.

Responsibility for the implementation of the additional security measures will be agreed via a declaration of security between the ship and the port facility operator. The port security officer must be consulted and agree with the security measures proposed to be implemented.

20.3 Port security contacts

Port security officer (Port Spencer)
Telephone: +61

Port Control (VTSO) (24 hours)
Telephone: +61

Port Spencer Bulk Grain Terminal
Telephone: +61

20.4 National security

In line with the Government's recent publications to do with the reporting of any possible terrorist activity, these procedures are to be followed.

Contact the National Security 24-hour hotline if you have any information of possible terrorist activity or have seen or heard something suspicious that may need investigating by the security agencies.

24-hour Hotline 1800 123 400

Email: hotline@nationalecurity.gov.au

21.0 Health and Safety Commitment

PP is committed to protecting the health and safety of all persons in the workplace including employees, contractors and other visitors.

PP, employees, contractors and visitors have a duty of care including; the responsibility to work safely, to take all reasonable care for their own health and safety, and to consider the health and safety of other people who may be affected by their actions.

PP will take all reasonable and practical steps to improve work safety conditions and will strive to uphold its core values of safety, knowledge, integrity and leadership in order to achieve its goal of zero harm. PP is committed to:

- Complying with all applicable health and safety laws, regulations, standards and other.
- Providing safe plant and equipment, for controlled work.
- Implementing risk and hazard management systems that are relevant and suitable **for the organisation's risk exposure as well as identify, promote and continuously improve health and safety performance.**
- Ensuring all managers remain directly responsible and accountable for the health, safety and welfare of their employees and provide adequate resources to assist managers in this cause.
- Provision of appropriate Health and Safety Training to all relevant persons.
- Maintaining relevant policies, procedures, systems, information, training, and organisational structures to support and communicate effective health and safety practices throughout the company.
- Utilising appropriate internal and/or external expertise when required in all related activities.
- Establishing clear targets and objectives on a biennial basis to improve health and safety in the workplace.
- Maintaining a positive safety culture through encouraging active participation, consultation and cooperation of all employees, contractors and visitors in promoting and developing measures to improve health and safety at work.
- Actively responding to and investigating all incidents, and ensuring injured employees are returned to suitable work at the earliest possible opportunity through equitable claims management and rehabilitation practices.

PP will implement and maintain these systems, inclusive of standards, policies and procedures. These standards will be monitored regularly to ensure their integrity and effectiveness to facilitate continuous improvement.

22.0 Terminal Superintendent/Loadmaster Instructions

Stage	Instruction	Responsibility
Pre – arrival next vessel	<ul style="list-style-type: none"> • Obtain loading sequence and pre stowage plan from vessel, • Check SF BM, max departure drafts, check for any peculiarities, • Max air draft should be less than 9m • Send back a suggested loading sequence to vessel if provided one is not acceptable • Check clear EDN / usually done by agent • Prepare and Set up and the SOF and loading log spreadsheet, • Ensure vessel is reporting ETA, and that the agent is aware, and services are booked 48 hours prior to arrival, • AMSA format Shippers Declaration issued by PP, chase for it if required • A copy of shipper's declaration must also be given to the Terminal • TML / moisture analysis certificates all in order, in case owners / masters require further info, • Find out anticipated max loading draft from port authority/VTS • Documentation / BL instructions orders from PP • Liaise with agent regarding berthing time and booking pilot and services (tentative booking must be 48 hrs in advance) • Arrange for when first barge is required • Arrange boat if required for initial draft survey • Lines boat can be used to read the drafts after it has moored the lines on the buoy • Go on the tug and observe the arrival 	
Upon boarding prior to commencing loading	<ul style="list-style-type: none"> • Take everything with you that you will need for the shift • Board vessel as soon as pilot is off • Meet the C/O and read the initial drafts, • Turn on shore radio, check communications with barge, and request they stand by to commence loading, 	

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Stage	Instruction	Responsibility
	<ul style="list-style-type: none"> • Meet with C/O and confirm sequence and request first loading hatch is opened, • Inspect the first hatch for cleanliness, to ensure fit to load, dry, clear of debris, and bilge dry and covers in, take photos if required, • Complete the ship / shore safety checklists with C/O • Complete the vessel safety inspection toolbox • Guide the barge into the first hatch • Coordinate to commence loading as soon as possible after boarding/all fast time • Give copy of sequence and shippers declaration to barge • complete initial draft survey calculations after commencement of loading – no rush 	
Commencement of loading	<ul style="list-style-type: none"> • Position loader into hatch and commence loading as soon as possible when ship confirms ok • Report commence loading time and ETC to agent / concerned parties / arrival report, • In arrival message to concerned parties include: <ul style="list-style-type: none"> - Times, POB, anchor aweigh, all fast, commence loading etc - Tonnage master is requesting to load, and to what MSD draft - Arrival condition, FO, DO, FW and drafts - ETC • Set up and update the SOF and loading log spreadsheet 	
During loading	<ul style="list-style-type: none"> • Load pours in one of the corners, then next one diagonal, • Depending on barge load size, determine which corner to load next barge, • At end of each sequence try and have the cargo reasonably well distributed in the holds, • Always follow the agreed loading sequence, consult with C/O if you wish 	

P E N I N S U L A | P O R T S

Stage	Instruction	Responsibility
	<ul style="list-style-type: none"> to change • Check on the barge moorings and the conveyor clearance from time to time, to ensure no changes due to tide, wind etc., • Perform draft surveys from time to time to cross check figures • Regularly update the various tabs in the SOF loading log spreadsheet, and print out the load log once per day and give to C/O, • Send Daily report / progress report to the concerned parties, 	
Approaching trimming survey and pours	<ul style="list-style-type: none"> • Confirm max sailing draft with VTS as per VTSO/VTS instructions well before trimming pours, and advise to vessel and concerned parties • Ensure boat is on standby to read drafts, • Check vessel has completed stripping, get ballast figure ready, • Vessel must be upright, • Make sure shore radio is charged to avoid breakdown in comms with ship loader, • If you and or the C/O has the opportunity, do a draft survey at some stage nearing completion to get the ship/shore difference, • If ship/draft survey figure is heavy as compared to the shore figure the final pours prior to the interim/trimming draft survey will need to be reduced, • Put the C/O on notice that it must be very careful not to overload the vessel, the MSD is final, • Put the C/O on notice that he must be ready to quickly calculate his tonnage requirements for final trimming pours as soon as possible to avoid any delay, 	
Completion	<ul style="list-style-type: none"> • If possible, start putting a few hundred tonne into the trimming hatch while chief officer completes trimming hatch requirement calculations, • Double check the C/O trimming hatch calculations, • For last hatch you can often already being in the boat watching • Note, when the final trimming pour tonnages are advised by the C/O, you nearly always arrive at the draft 	

P E N I N S U L A | P O R T S

Stage	Instruction	Responsibility
	<p>sooner and load less</p> <ul style="list-style-type: none"> • Ensure vessel is upright, at completion of cargo, • If vessel does not end up upright, you can get it upright with the excavator trimming in the finals holds, • Upon declaration of completion of loading take finals drafts, • Calculate final draft survey figure, • Organise the excavation of the final trimming hold asap, allow about 3 hours in each, including crane handling times, • If any delays, remember to let the pilot and services know, • If any change/cancellation made less than 2 hours prior the booked POB sailing time then there are financial penalties, manage your services closely !! • Make hatch wise stowage plan with draft survey adjusted figures, • Finalise statement of facts and departure report, 	
Documentation at completion of loading	<ul style="list-style-type: none"> • Send draft documentation (Mates receipt, Manifest ect) to shipper, so they can confirm the details are correct, and the banks can be very strict on all this for LC requirements etc. • The agent arranges the customs clearance and sends it direct to the master, • Documentation at end of loading, do 4 originals of each document , 2 originals to Master, and 2 originals . Sign the NOR with note "received as per the terms of conditions of the governing charter party" and do not write a time and date on it, as per usual practice, • If the master gives any other documents for you to sign, make a note on them "for receipt only, without prejudice". • Arrange for the printing out of documentation (if no printer on board) at completion of loading and excavator trimming, and for the boat to bring it out, • Send a scanned copy of cargo docs to the shippers, agent and NOBP etc. upon completion of loading, • Distribute original cargo docs as 	

P E N I N S U L A | P O R T S

Stage	Instruction	Responsibility
	required, • Send departure report to concerned parties, advising the completion time, total loaded, drafts, FO, DO and FW.	

end of document

10 JANUARY 2020



VESSEL TRAFFIC MANAGEMENT PLAN

(MARINE TRAFFIC)
PORT SPENCER

Version	Drafted	Checked	Approved
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1.0	Ryan Norval	John Kavanagh	
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1.0 Introduction

1.1 General

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

Ships, tugboats and port control use VHF radio to communicate (channels 6, 8 and 12).

The Spencer Gulf lies within South Australian State Waters.

1.2 Purpose

This document defines the standard procedures to be followed in the pilotage area of Port Spencer — it contains information and guidelines to assist ships' masters, owners, and agents of vessels arriving at and traversing the area. It provides details of the services and the regulations and procedures to be observed.

Nothing in this document is intended to relieve any vessel, owner, operator, charterer, master, or person directing the movement of a vessel from the consequences of any failure to comply with any applicable law or regulation or of any neglect of precaution which may be required by the ordinary practice of seamanship, or by the special circumstances of the case.

Should errors or omissions in this publication be noted, it would be appreciated if advice of these could be forwarded to:

The Harbour Master (Port Spencer)

Postal address: x

Phone:

Facsimile:

Email:

1.3 Datum

All water depths refer to the 'lowest astronomical tide' height (LAT). All positions in this Plan are in WGS84, however, Australia uses the Geocentric Datum of Australia (GDA94) coordinate system. All directions are referenced to True North.

All directions are referenced to true north.

1.4 Definitions

Australian Maritime Safety Authority (AMSA)

The Australian Maritime Safety Authority is the commonwealth authority charged with enhancing efficiency in the delivery of safety and other services to the Australian maritime industry.

The Australian Ship Reporting System - MASTREP

The Australian Ship Reporting System established under Section 7 of AMSA Marine Order 63.

Australian Standard – AS 3846 – 2005

AS 3846 defines the requirements for the transport and handling of dangerous goods in port areas in Australia.

Bridge Resource Management (BRM)

An internationally recognised style of interaction between the pilot and the bridge team aimed at optimising the use of the personnel resources available to assist in the safe pilotage of the ship.

Gross registered tonnage (GRT)

The measurement indicated on the international tonnage certificate of a ship. This value is used in the calculation of conservancy fees.

International Maritime Organization (IMO)

The world organisation charged with enhancing efficiency in the delivery of safety to the whole maritime industry.

International Maritime Dangerous Goods Code (IMDG Code)

This code is published by the International Maritime Organization with the purpose of providing information for the safe carriage, packing, handling, classing and transporting of dangerous goods.

Lowest astronomical tide (LAT)

This is the zero value from which all tides are measured.

Manager (pilotage services)

The person responsible for the service delivery of pilotage services within Port Spencer.
Subject to Organisational Structure Decisions

Manager Vessel Traffic Management

The person responsible for the management of the VTS Centre
Subject to Organisational Structure Decisions

Maritime Safety South Australia

The state government agency responsible for the VTS services, pollution response and the administration of all aspects of vessel registration and marine safety in the state of South Australia.

Overall Length (LOA)

The LOA refers to the extreme length of a vessel.

Peninsula Ports

Peninsula Ports is a privately-owned corporation charged with overseeing the commercial activities in the port, including the maintenance of the port infrastructure and provision of pilotage for the Port Spencer. The primary function of Peninsula Ports under the *Harbors and Navigation Act 1993* is to establish, manage and operate effective and efficient facilities and services within the port, while maintaining appropriate levels of safety and security.

Harbour Master

The person authorised to give direction under the relevant provisions of the *Harbors and Navigation Act (2003) & Regulations (2009)*.

Sailing time

The scheduled sailing time is the time of the last line.

Vessel Traffic Service Operator (VTSO)

A person, suitably qualified, delegated by the Harbour Master to monitor the safe movement of vessels and to give direction under the relevant provisions of the *Harbors and Navigation Act (2003) & Regulations (2009)*.

Vessel Traffic Service (VTS)

(The Port Duty Officer can also be the VTSO)

A VTS is any service implemented by a competent authority, designed to maximise the safe and efficient movement of water borne traffic

1.5 Contact information

1.5.1 The Harbour Master

For operational maritime questions, marine incidents, pollution, pilotage, buoy moorings, navigation aids and towage requirements please contact the Harbour Master's office located at:

Physical address:

Postal address:

Phone:

Facsimile:

Email:

1.5.2 VTS centre

(There is a decision point as to whether to describe the Port Radio as a 'VTS' as the latter has a technical meaning under Marine Orders and requires audit and accreditation. This is a decision that needs to be made once operations are imminent.)

The VTS centre, (call sign 'Port Spencer' operated by PENINSULA PORTS) is situated at the harbour master's office in Port Spencer.

For ship traffic scheduling, pollution incidents and reporting defective navigation aids please direct initial enquiries to the VTS Centre. The service is provided by Peninsula Ports and provides a 24 hour, 7 days a week marine operations service to the port community. They are contactable on:

Postal address:

VHF radio: VHF 16 or 12

Phone:

Email:

In the event of an emergency, the VTS Centre is the key notification and communications facility that will activate the appropriate response agencies.

1.6 Rules and regulations

1.6.1 General

The rules and regulations in the port contribute to the safe, efficient and environmentally responsible handling of shipping traffic. The international rules of the International Maritime Organization, such as the SOLAS convention and its amendments (for example, the IMDG code) and state, national and local port authority regulations are in force in the port.

1.6.2 Applicable regulations

The procedures outlined in this document are designed to satisfy the requirements of the following instruments and legislative requirements:

- *Harbors and Navigation Act 1993 (SA) & Regulation 2009*
- *Navigation Act 2012 (Cth)*
- *Marine Safety (Domestic Commercial Vessel) National Law Act 2012 (Cth)*
- *Environment Protection Act 1993 (SA)*
- *Maritime Services (Access) Act 2000 (SA)*
- *Customs Act 1901 (Cth)*
- *Quarantine Act 1908 (Cth)*
- *Occupational Health, Safety and Welfare Act 1986 (SA)*
- *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987 (SA)*
- *South Australian Ports (Bulk Handling Facilities) Act 1996 (SA)*
- *South Australian Ports (Disposal of Maritime Assets) Act 2000 (SA)*
- *Recreational Access Agreement to Commercial Wharves Agreement*
- *International Maritime Dangerous Goods Code (IMDG Code)*
- *Australian Standard — AS3846 — 2005. (Defines the standards to be observed by Masters, berth operators and consignors involved with the transport and handling of dangerous goods in port areas in Australia.)*
- *Maritime Transport and Offshore Facilities Security Act 2003 (Cth) and Regulations 2003.*

1.6.3 Authority

Peninsula Ports Authority's appointed Port Management Officers (appointed under Section 29 of the *Harbors and Navigation Act 1993* by the port operator) will manage the port waters in accordance with the Act.

1.6.4 Exemptions and permits

The Harbour Master may grant exemptions from specific regulations. Permission is required for special activities such as repairs, hull cleaning and painting, engine immobilisation and so on.

A. CONSTRUCTION PHASE

2.0 Description of Works

2.1 General

Building of the jetty will be conducted using incremental launching method without the need for barges at the work site - $34^{\circ} 15.090' S / 136^{\circ} 16.480' E$. This method involves the construction of a rock groyne from land to a length of approximately 230m, followed by driving pairs of piles from the partially completed superstructure of the wharf. On completion of each pair of piles the superstructure is launched 42m to recommence piling operations from the new position.



2.2 Construction

Marine traffic for construction will be limited to a small tender for establishing silt curtains and other similar controls, and is proposed to commence in early June 2020 and is expected to continue until late April 2021. Hours of work for marine traffic purposes during construction are 06:00 to 23:59:00 Monday - Friday, and 06:00 - 22:00 Saturday and Sunday.

Construction will generally involve the following:

- Installation of a causeway (using earthmoving equipment from land).
- Installation of steel piles.
- Installation of a steel jetty substructure and superstructure.
- Decking and associated materials handling and finishing works.
- Delivery of construction materials by road.

2.3 Vessel Particulars

All vessels are to have current certificates in accordance with their classification as either Regulated Australian Vessels (RAV) under the *Navigation Act 2012* or Domestic Commercial Vessels (DCV) under the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*. Tugs and barges will operate under their individual safety management systems (SMS) as per the relevant legislation.

Dumb barges, where applicable, will operate under the towing tugs SMS and in accordance with tug owners and tow surveyor's requirements.

2.3.1 Tugs

This is subject to change based on prevailing operational requirements, however it is not intended for tugs to be used during construction, unless required for mooring of Heavy Lift Vessels, once the wharf is complete, for positioning of the ship loader

2.3.2 Heavy Lift Vessel

Following completion of the wharf structure a Heavy Lift vessel may be used to deliver the travelling ship loader and install it onto the rails on the wharf.

The heavy lift vessel (HLV) is a vessel with a specific crane that has a large lifting capacity of up to thousands of tonnes, suitable for the job at hand.

This vessel would be moored at the wharf during this lifting operation.

2.4 Mobilisation

The PENINSULA PORTS Yard at Sheep Hill will be the primary offsite load out and set down area for the material transported to the site for construction. Piles and other steel members for the construction stage will be delivered by road to the development site and transported along the partially launched wharf superstructure .

The incremental launch method means that no barges are required for construction, other than the potential for a Heavy Lift Vessel to deliver the ship loader. It is not envisaged that any barge will be used at the Port Spencer development site.

The main plant proposed to be used are as follows:

- 400T crawler crane (assembly yard)
- Favco M2480 crane (launched with superstructure)
- Pile top drill rig with RCD and DTHH drilling hammers and air compressors.
- S280 piling hammer and vibro hammer
- Gantry crane (within fabrication shed)

- Semi-trailer (flatbed)
- Semi-trailer with mounted grout mixing and pump spread.
- Light towers
- Generators incl. welding generators, wire feeders and other welding equipment
- 20T Franna crane (assembly yard)
- 8T slew crane (minor wharf works)
- SPMTs
- Punt (rescue boat)

PENINSULA PORTS will implement and abide by the conditions as set by the State.

2.5 Vessel Movements

Note: dates and times are subject to change based on site conditions, weather conditions and State requirements.

There will be shore-side delivering of the steel piles and modules for the port project at the Port Spencer development site. Piles and steel modules will be transported along the partially launched wharf superstructure, which will then be utilised for construction.

Tugs will only be required at the site, if necessary, for the berthing of the Heavy Lift Vessel for the delivery of the ship loader.

2.5.1 Mooring specifications

Mooring arrangements for work-vessels – initially at a buoy, by anchoring, or once jetty has sufficient completion, at the Southern side of the incomplete jetty. The Heavy Lift Vessel will only berth at the completed structure.

2.6 Communication

The Site Supervisor is to email each day's work schedule to Port Spencer Vessel Traffic Service (VTS), the PENINSULA PORTS Senior Site Manager and Engineering Structures Foreman the day before the works.

The Site Supervisor will have the mobile phone number of the Tender Coxswain and Supervisor for communication as required.

Communication and radio watch between Port Spencer VTS, construction teams and any vessels will take place on VHF Channel 12, with all switching over to the working channel specified by VTS at the required time. Distress watch will also take place on VHF Channel 16.

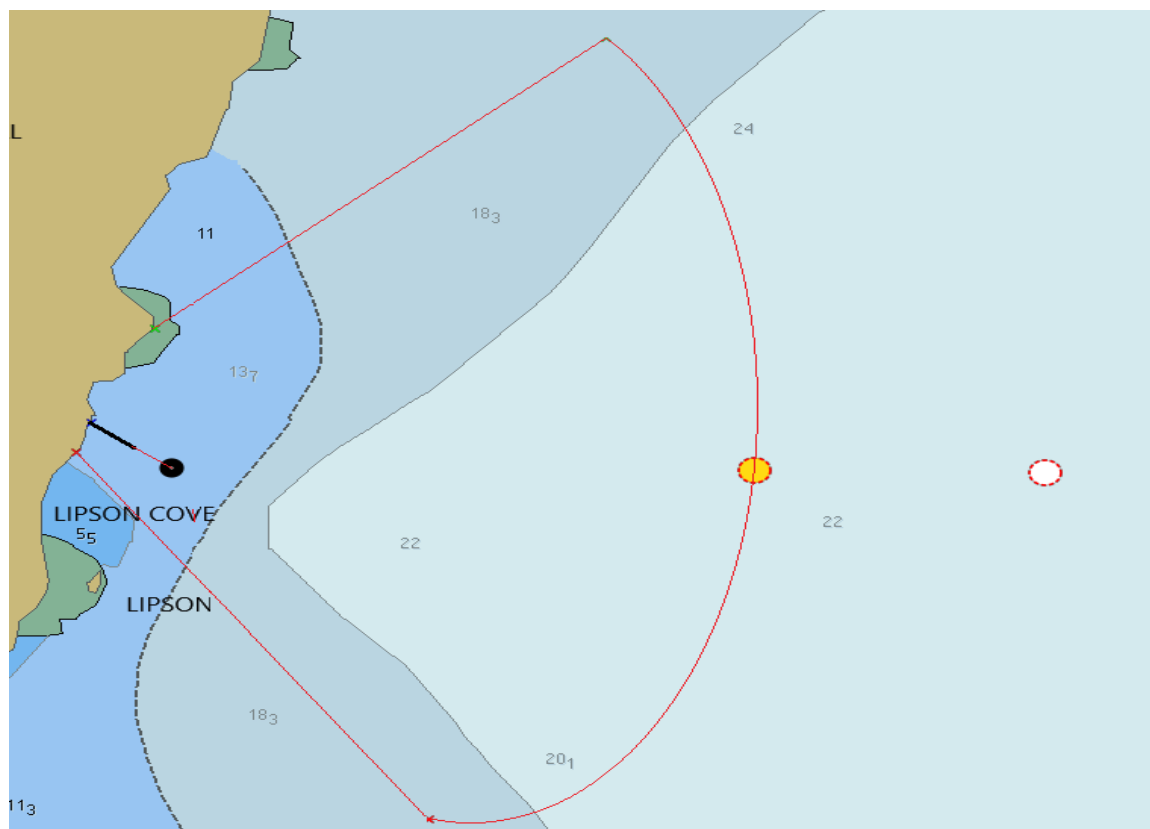
2.7 Marine Traffic Controls

2.7.1 Exclusion Zone

PENINSULA PORTS may request an Exclusion Zone to be declared from time to time during the construction phase. Such exclusion zone to be published on the South Australia Port Authority Website and broadcasted daily by Vessel Traffic Services (VTS). Exact dates and times for the VTS including onsite vessel manoeuvring involving mooring arrangements will be confirmed as per Notice to Mariners, although not envisaged.

Aus 139 is the primary chart affected by the port development works.

The boundary of the exclusion zone will be confirmed after deployment. The proposed port limits with a distance of 2 nautical miles from the end of the jetty (due East) – yellow circle) has been chosen to be consistent within development and mooring arrangement, minimise the impact on vessels navigating around the Spencer Gulf, reduce any impact to environmental attributes, and to minimise confusion with backscatter from other possible special marker lights at night.



A. Special Markers

Yellow special marker buoys with 2 nm yellow flashing lights will be deployed to mark the exclusion zone boundary, as shown below. These will be spaced at approximately 500m intervals and held in place with 1 t biscuit moorings:



B. Diving Operations

The dive vessel and dive team will be engaged to assist during the construction phase as required. The vessel will be in 2D Survey and will be navigated by a Coxswain. All divers have ADAS Diver qualifications with the Dive Supervisor qualified as an ADAS Dive Supervisor.



2.7.2 Collision Prevention

2.7.2.1 Collision Regulations

All vessel operations will comply with the relevant safety management systems for the vessel, as well as all relevant controls in the *International Regulations for the Prevention of Collisions at Sea*, Harbour Masters Directions and the practice of good seamanship.

2.7.2.2 Impact on Spencer Gulf Shipping Operations

Given the proximity of the site and exclusion zone to set up for the development zone marked by yellow special marker buoys with flashing lights, there will be little to no impact on current shipping operations within the Spencer Gulf.

The main shipping lane in the Spencer Gulf is used by bulk vessels to access Onesteel Whyalla operations. There would be no impact on these shipping lanes.

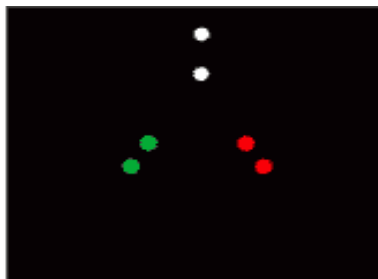
There are occasional / seasonal movements of aquaculture pens past the site that will require coordination with the Harbour Master, but otherwise be as per normal maritime navigation and operations.

2.7.2.3 Impact on recreational vessels

The route plan for the project will not impact on recreational vessels between nearby ports and the Port Spencer development outside of the Exclusion Zone.

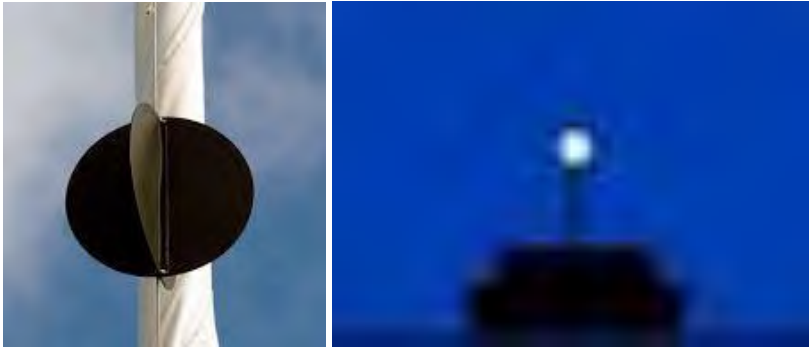
2.7.2.4 Navigational Lights and Day Shapes

If use of the tender or any other vessel is required at night or in restricted visibility, the tug will display port and starboard steaming lights, a stern light, a masthead light and an additional towing light for a tow <50 m, with the barge displaying port and starboard lights, as shown below (head on view).



P E N I N S U L A | P O R T S

Any other vessel will display a black ball in daylight hours and an all-round white light between dusk and dawn, as shown below.



2.7.2.5 Anchor Watch

Anchor watch is not expected to be required while the tender is in operation

2.8 Vessel Safety Management Systems

All operational and emergency procedures described in vessel Safety Management System are to be followed.

2.9 Weather Forecasting

BOM weather forecasts will be monitored throughout the works via the internet and VHF Channel 16.

All lifting operations will take place within the cranes wind operating limits.

2.10 Operational and Emergency Procedures

All work vessels are to have compliant Safety Management Systems, featuring procedures for all onboard operations, as well as emergency procedures for the following:

- Man Overboard
- Fire
- Collision / Grounding
- Flooding
- Abandon Ship
- Fuel / Oil Spill
- Injury on board

All work vessels are to have firefighting equipment, first aid equipment and emergency spill kits applicable to the relevant vessel survey requirements available.

B. OPERATIONAL PHASE

3.0 Port description

3.1 General

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. The port is managed by PENINSULA PORTS and operated by PENINSULA PORTS; the wharf is approximately 300m metres in length and is connected to shore via a short jetty and 230m long rock causeway.

The seawater depth for the jetty berthing box is approximately 13.6m (*confirm against Jacobs document*) and drops to 20 m at 500m offshore which then continues to slowly increase to a depth of 27m.

3.2 Pilotage area

The pilotage area is described as Waters bounded by an imaginary semi-circle line drawn (see *overleaf drawing*):

- starting at 34° 14.607' S 136° 16.177' E on the Shoreline, a line drawn on bearing 050 (T) to a point at 34° 13.436' S 136° 17.844' E as a northerly border;
- then, a line extending in an arc from 34° 13.436' S 136° 17.844' E with a radius of 2 nautical miles centered on the end of the jetty at 34° 15.090' S 136° 16.480' E extending southwards to 34° 16.980' S 136° 17.290' E;
- then, from the point at 34° 16.980' S 136° 17.290' E, draw a line on a bearing of 330 (T) to the point on the shoreline 34° 15.110' S 136° 15.974' E as a southerly border.

3.3 Port Spencer Harbour Description – DGA94 Coordinates

Commencing at a point being the intersection of the median high-water mark with a straight line connecting a point defined by Latitude 34.2435400 degrees south and Longitude 136.2696767 degrees east with a point defined by Latitude 34.2239333 degrees south and Longitude 136.2974000 degrees east.

Thence in a north easterly direction to the second point defined.

Thence following an arc with a radius of 2 nautical miles (3704.1 metres) from the end of the jetty at 34.2515000 degrees south and longitude 136.2746667 degrees east in a generally south easterly, southerly and south westerly to a point defined by latitude 34.2830000 degrees south and longitude 139.2881667 degrees east.

Thence in a straight line on a bearing of 330 degrees true to the intersection with the median high-water mark.

Thence generally northerly along the median high-water mark to the point of commencement.

PENINSULA PORTS

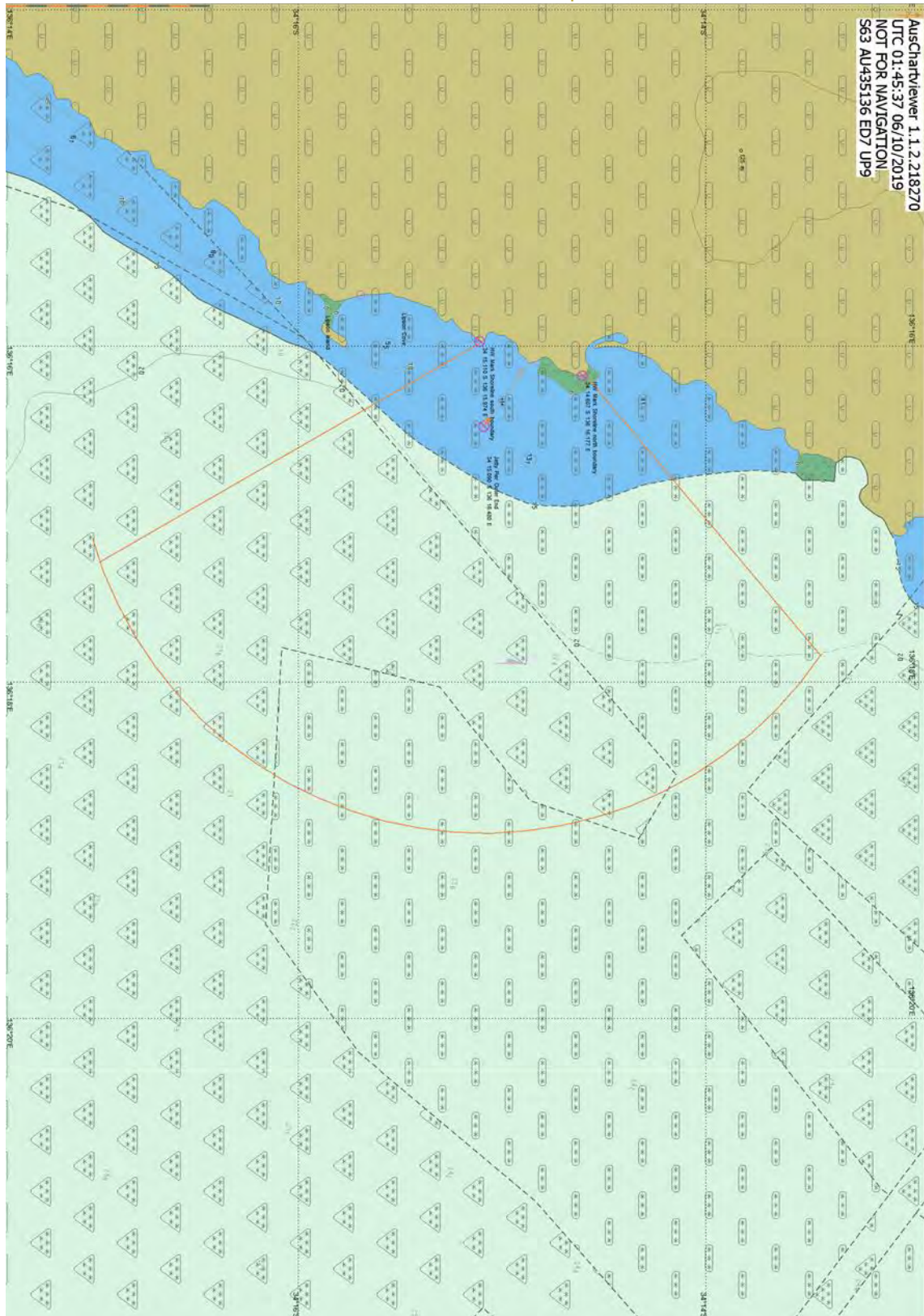


Diagram – Proposed Port Spencer Port Limits – ENC AU45136

3.4 Load lines

Port Spencer is in the Summer Zone for purposes of international load lines.

3.5 Maximum vessel size

Maximum Length overall:

- 229m with Beam of 40m (*ref: Jacobs Design Vessels 22 Aug 2019*)

Maximum berthing displacement:

- 31,000 t Maximum displacement during loading (*requires Jacobs confirmation*)
- 85,000 t Maximum displacement at departure (*requires Jacobs confirmation*)

Vessels with LOA greater than 229 metres may be considered upon written application to the Harbour Master, provided the maximum berthing displacement does not exceed that stated above. 31,000 mt.

The berth is not designed to accept vessels over 295 metres. Individual cases may require extra tugs to ensure safe berthing and is subject to Harbour Master direction.

3.6 Trim requirements

Several factors affect ship response. The following operating procedures will ensure safe and efficient use of the Port Spencer facility:

Ships should be ballasted or loaded in order to be trimmed by the stern or even keel with:

- the forward draft not less than 2% overall length; and
- the propeller fully submerged.

Ships not meeting this requirement may experience considerable delays until a solution is identified and implemented.

Ships trimmed by the head or listing may be subject to restrictions. The Manager (Pilotage Services) and Harbour Master are to be informed when bookings are made.

Ships must advise their berthing displacement, in addition to the fore and aft draught, at least 24 hours prior to arrival.

Masters should pay special attention to their loading/ballasting plans to ensure that their ships are suitably trimmed and able to put to sea at short notice.

3.7 Partly loaded conditions

Partly loaded ships must declare their berthing displacement in addition to the fore and aft draught at least 24 hours prior to arrival. Additionally, due to the capacity of the fender system and current tug power, the;

- Berthing displacement must not exceed that stated above, and

- Draughts should be adjusted for ships in ballast; and
- Trim by the stern is not to exceed 2.5 metres.

4.0 Port infrastructure

4.1 Berth Information

Approach depth to the berth is 14 metres and the depth alongside is 14.5 metres (*ref: Jacobs Design Vessels 22 Aug 2019*).

Note that depths are subject to change; please consult Notices to Mariners for latest information.

- The jetty (combination of rock causeway, jetty and wharf) is 604 metres in length and orientated in a 125°/305° (T) direction with six fender points 42 metres apart at the northern end/side.
- Mooring dolphins are situated 42 metres from each end of the wharf not recessed behind the quay line.
- The maximum wind speed for a vessel to remain alongside the berth is up to a steady 25 knots (*Jacob specifications may alter this limit*).
- The travelling grain loader installed, when in the horizontal position, has a 12-metre clearance above the jetty decking. When stowed it is recessed 4.6 metres from the jetty face.
- The jetty decking is approximately eight metres above datum (lowest astronomical tide). The distance from lowest astronomical tide to the horizontal boom is 20.7 metres.
- Maximum outreach to the centre of the telescopic chute is 17.48 metres and the average net loading rate is 2,000 tonnes per hour.

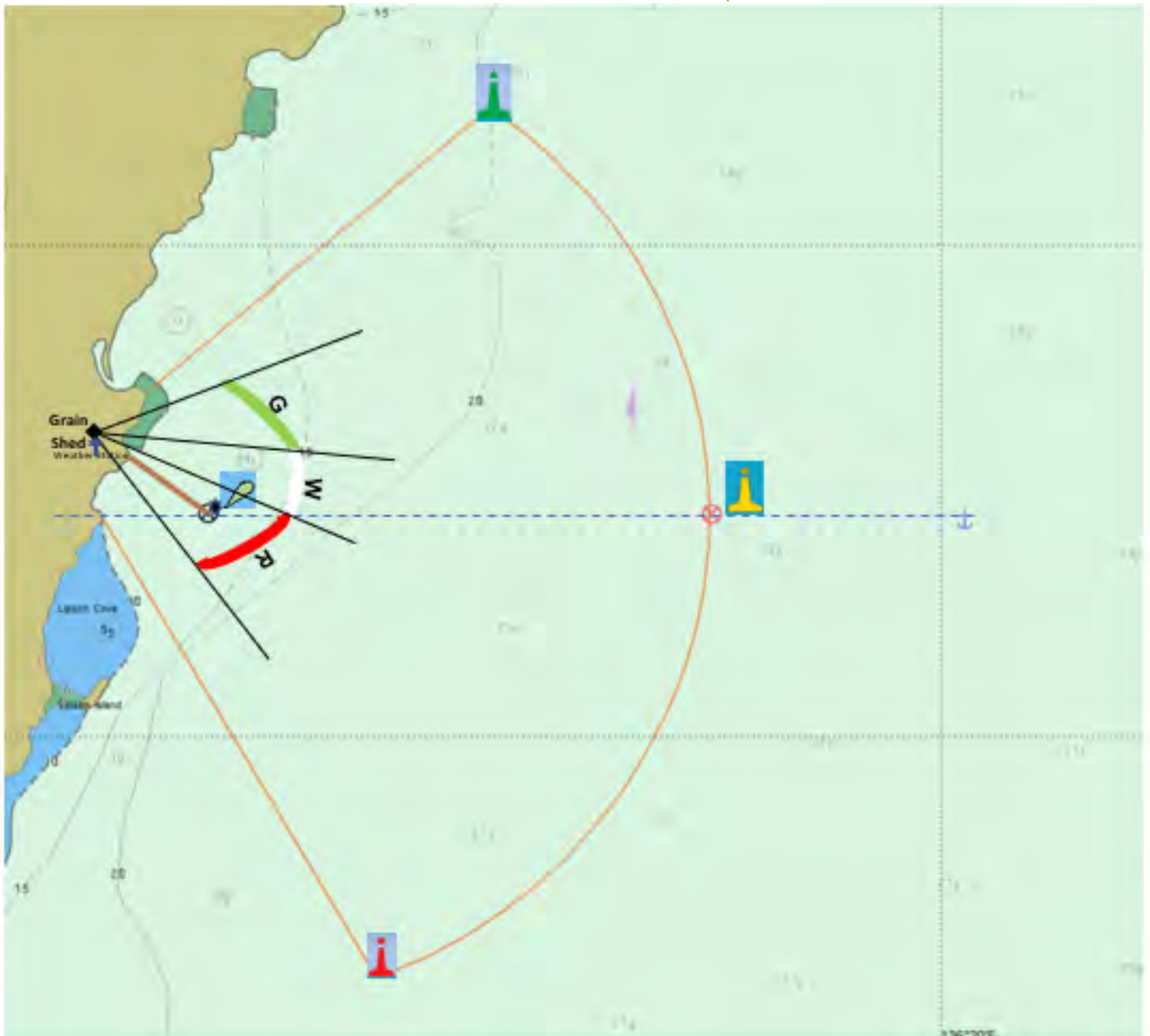
4.2 Navigation aids

For notification of navigation light defects refer to Notices to Mariners.

Aside from the sector light, all AtoN proposed to be virtual AIS AtoN:

<https://www.amsa.gov.au/safety-navigation/navigation-systems/visual-and-electronic-navigation-tools>

PORTS



4.3 Anchorage area

Vessels should anchor at least one nautical mile due east of the pilot boarding ground in approximately 20 metres of water depth. Ships are to anchor outside the pilotage area where safe to do so. Upon anchoring, ships are to advise Port Spencer VTS of their anchoring time and position.

All ships at anchor must maintain a continuous anchor watch and report if vessel is observed to be dragging anchor. Ships at anchor are to maintain a continuous listening watch on VHF channels 16 and 12.

5.0 Frequency of vessel movements inbound/outbound for port

It is estimated that 25 vessels will visit the port per year – approximately one every 18 days. With a loading rate of 2,000 tonnes per hour, a Panamax size vessel will be loaded within two days (24-hour operation).

6.0 Time zone

- UTC + 9:30 hours from April to October (Australian Central Standard Time)
- UTC + 10:30 hours from October to April (Australian Central Daylight Time)

7.0 Working hours

Port Spencer is a private port and arrivals and departures will dictate the operating hours for the port.

8.0 Charts and books

For navigation in pilotage areas, masters should refer to the nautical charts produced by the Australian Hydrographic Office and Admiralty Sailing Directions NP15 (Australian Pilot Volume III/V). Relevant charts of the area include:

- AUS 139 Plans in South Australia
- AUS 485 Spencer Gulf and Gulf St Vincent

9.0 Differential Global Positioning System (DGPS) Service

AMSA will discontinue its DGPS service on 1 July 2020 as the accuracy of GPS exceeds the accuracy provided by AMSA's DGPS service.

The Australian Maritime Safety Authority provides a network of DGPS radio beacons that improve the accuracy and integrity of the Global Positioning System (GPS) in critical areas of Australia's coastline.

A network of 16 stations are remotely controlled and monitored 24 hours a day.

10.0 Shipping announcements

A. Notices to Mariners

Maritime Safety South Australia circulates marine safety information to mariners, organisations and other interested parties, in the form of Notices to Mariners. The Notices to Mariners for South Australia are posted on the website:

https://www.dpti.sa.gov.au/latest_news/notice_to_mariners

Notices to Mariners and Advices to Mariners advise of:

- navigation warnings and hazards (such as aids to navigation which may have been destroyed, missing or unlit);
- changes to the uniform buoyage system (which assists with the correction and updating of marine charts);
- navigation depths (necessary when navigating in channels with depth restrictions); and
- any other works which may affect the safe navigation of vessels in South Australia coastal waters and ports (such as dredging operations and construction works).

11.0 Arrival and departure procedures

11.1 General

For a quick reference of what and when to report, please consult the tables below.

Masters of vessels arriving at, staying in or departing from the port are obliged to make previous notification on a variety of subjects, ranging from health to immigration to dangerous goods. This section lists all the requirements for notifying the port authorities.

11.2 Arrival check list

When	Who	What
96 hours before arrival	Master/owner	Customs notification
Not more than 96 hours or less than 12 hours before arrival	Master/owner	Quarantine notification
48 hours before arrival	Master/owner	Arrival Notification to Port Spencer Harbour Master
24 and 12 hours before arrival	Master	Arrival information update to Port Spencer VTS
2 hours before arrival	Master	VHF notification to Port Spencer VTS
2 hours before arrival	Peninsular Ports	All arrival preparations complete including pilotage and mooring arrangements

Table 1 — Arrival check list

11.3 Departure check list

When	Who	What
12 hours before departure	Master/owner	Confirm Departure information to Harbour Master
2 hours before Departure	Master/owner	Update Port Spencer VTS
2 hours before Departure	Peninsular Ports	All departure preparations complete, including pilotage and mooring arrangements
On completion of loading	Master/owner	Call Port Spencer VTS to inform that loading is complete and to confirm the departure drafts

Table 2 — Departure check list

All agents must lodge arrival reports by email to the VTS, at least 48 hours prior to the movement as required under *Harbors and Navigation Regulation 2009*. Request for the supply of a pilot, tugs and linesmen must also be made via the email notification

All agents must lodge departure reports by email to the VTS, at least 24 hours prior to the movement as required under *Harbors and Navigation Regulation 2009*.

Request for the supply of a pilot, tugs and linesmen must also be made via the online booking facility.

11.4 Ballast water information

Ships with ballast water from ports that are considered a high risk for introduced marine species and that have not exchanged water ballast in mid ocean are now forbidden to discharge this ballast into Australian waters. Vessels that do not need to discharge ballast in Australian waters are exempt from these requirements.

The Department of Agriculture (Biosecurity) provides a Ballast Water Management summary sheet for use by Masters/Agents which can be found at the following link:

<http://www.agriculture.gov.au/biosecurity/avm/vessels/ballast/australian-ballast-water-management-requirements>

11.5 Quarantine

The Australian Department of Agriculture, Fisheries and Forestry require vessels from overseas to submit their documentation no more than 96 hours and no less than 12 hours prior to arrival:

Contact details for the Australian Quarantine and Inspection Service Adelaide:

Phone: +61

Fax: +61

Postal address: GPO Box

The *Australian Quarantine and Inspection Service* (AQIS) requires information in relation to cabotage issues where foreign registered ships have a single or continuing voyage permit to move domestic cargo between Australian Ports. All cargo moved within Australia under these arrangements is subject to Quarantine in accordance with *Section 74D of the Quarantine Act 1908* (which relates to directions to the movement of goods subject to quarantine).

11.6 Customs (Australian Border Force)

Vessels arriving from overseas must submit their documentation 96 hours prior to the nominated date of arrival. If the voyage from the last port is likely to take less than 96 hours, the following timeframes will apply –

- 72 hours or more but less than 96 hours – submit documentation 72 hours prior
- 48 hours or more but less than 72 hours – submit documentation 48 hours prior
- 24 hours or more but less than 48 hours – submit documentation 24 hours prior

11.7 Arrival/Departure Report

The notification via email to the VTS is mandatory for notification of the impending arrival and subsequent movements of a vessel.

Owners or masters who are not using an agent are required to complete an arrival/departure report and lodge it with Port Spencer VTS 48 hours before a vessel's arrival.

The report is the base document for the raising of port dues and pilotage fees. The report is to be emailed to Port Spencer VTS at: vtso@peninsulaports.com.au (to be confirmed)

11.8 Dangerous goods

Dangerous goods must not be brought into or handled in the pilotage area until notification has been sent to the Harbour Master in the approved form at least 48 hours prior to arrival in port limits.

11.9 MASTREP

Participation in the Modernised Australian Ship Tracking and Reporting System (MASTREP) is designed to contribute to safety of life at sea and is operated by the Australian Maritime Safety Authority (AMSA) through the Rescue Coordination Centre (RCC) Australia in Canberra.

Participation in MASTREP is mandatory for certain vessels but others are encouraged to participate.

The Commonwealth of Australia *Navigation Act 2012* and Marine Orders Part 63 makes the provision of Position Reports mandatory for certain vessels, the following vessels must report to MASTREP:

- Foreign from the arrival at its first port in Australia until its departure from its final report in Australia; and Section 11.
- All regulated Australian vessel whilst in the MASTREP area.

Domestic commercial vessels fitted with Global Maritime Distress and Safety System (GMDSS) and AIS technology are also encouraged to participate in the system as MASTREP assists AMSA in carrying out SAR activities.

To assist Master /Agents, the MASTREP and Australian Mandatory Reporting Guide can be found on the AMSA website.

11.10 Security

All commercial vessels with a gross tonnage of 500 tonnes or more and passenger ships are required to report their security information to Peninsula Ports.

12.0 Movement notification and traffic procedures

12.1 General

Maritime Safety South Australia, through the authority of the Harbour Master, has jurisdiction over the safe movement of all shipping within the pilotage area.

The scheduling of ship movements is initiated by the agent submitting movement details for a vessel to the Harbour Master's office email in accordance with this section.

12.2 Vessel Traffic Service (VTS)

Vessel traffic service is the principal tool by which the Harbour Master manages the safe and efficient movement of vessel traffic approaching, departing and operating within the Port Spencer pilotage area.

VTS is delivered from the VTS centre at Port Spencer and is manned by trained and qualified vessel traffic service operators, under the management of the Marine Superintendent, PP Site Manager.

12.2.1 VTS role

Port Spencer VTS does not maintain a delineated formally declared VTS area pursuant to IMO Resolution A.857(20) for Port Spencer, however Port Spencer VTS will:

- interact with vessel traffic by VHF radio;
- interact with port services (tugs, pilots, loadmaster lines crew etc);
- inform participating vessels of current traffic and safety information pertaining to the pilotage area;
- communicate the directions of the Harbour Master or delegate;
- monitor compliance with the *Harbors and Navigation Act (2003)* and *Harbors and Navigation Regulation 2009*;
- record the details of shipping movements in the online portal inside the 24-hour lockout period;

- maintain a situational awareness of traffic in the pilotage area to the extent of the available information;
- participate in emergency procedures.

12.2.2 Port VHF communications

Ships intending to navigate within the pilotage area must establish two-way communications with Port Spencer VTS on marine VHF channel 16 or VHF channel 12. The designated port VHF channel is to be used for the communication of all routine operational and safety information.

VHF channel	Call sign	Service
VHF channel 16	Port Spencer pilots or Port Spencer VTS	Initial calling & Emergencies
VHF channel 6	Port User	Pilot and tugs
VHF channel 12	Port Spencer VTS	Pilot and tugs

Table 3 - Port VHF communications

12.2.3 Language

The English language is to be used in all communication. International Maritime Organization's Standard Marine Communication Phrases (SMCP) 2001 will be used.

12.2.4 Logging of voice communications

All voice communications with the VTS Centre and all radio communications on the channels monitored, are logged and kept for at least seven years thereafter. recorded against a date and time stamp.

12.2.5 Harbour contact details

Organisation	Telephone	Alternate	Email
Port Spencer VTS	1	VHF channel16/12	
Port Superintendent	+61		
Port Spencer Grain Terminal	+61		
Harbour Master	+61		
VTSO	+61	Fax: +61	

Table 4 — Harbour contact details

12.3 Prior notification of movements

Action	Minimum notice	Approved form
Prior notification of movement in	48 Hours prior to entry	Notification via email to VTSO
	24 hours prior to removal or departure	
Transport of dangerous goods in pilotage area	48 hours prior to entry	Dangerous cargo report
	Three hours prior to departure	

Table 5 — Prior notification of movements

12.4 Booking a vessel movement

When agents are advised by their principals that a ship is bound for Port Spencer then that agent shall book-in the ship arrival via email at least 48 hours prior to the movement as required under *Harbors and Navigation Regulation 2009*. Request for the supply of a pilot, tugs and linesmen may also be made via the same email notification.

The use of email notification is mandatory for the impending arrival and subsequent movements of a vessel unless exceptional circumstances preclude this.

Details of the departure movement shall be submitted at least 24 hours prior to the start time in a similar manner to the above.

Arrival advice shall be confirmed to the Marine Superintendent, Site Manager 24 hours prior to the start of the movement.

12.5 Reporting defects

The *Harbors and Navigation Regulation 2009* requires the master of a ship that is;

- underway and entering, or about to enter a pilotage area; or
- navigating a ship from a berth or anchorage

must report to the area VTS by VHF radio details of damage to, defects and deficiencies in, the ship that could affect the safety of the ship, a person or the environment;

- VTS will notify the harbour master and AMSA of the damage to, defects and deficiencies.
- In addition, Australian Maritime Safety Authority (AMSA) requires notification of any deficiencies or suspected deficiencies on ships visiting Australian ports.
- AMSA 18 – incident alert
- AMSA 19 – incident report
- AMSA 355 - Report of suspected non-compliance with Navigation Act or safety/pollution conventions

12.6 Movement scheduling

12.6.1 Schedule changes

Changes requested by the master/agent to scheduled movements must be made via email to the VTSO as soon as practicable after learning of such change. Changes within 24 hours of the scheduled start time must be communicated to VTS by phone.

12.6.2 Pilotage delays

A delay fee is payable if the programmed ship movement is delayed by more than 30 minutes but not more than one hour for the first hour. If the ship is delayed for more than one hour but not more than two hours, then for each of the first two hours; a delay in excess of two hours constitutes a cancellation. And thereby a fee for the cancelled service – fatigue issues become a concern if there is only one pilot.

12.7 Anchoring

Ships are to anchor outside the pilotage area where safe to do so, at least 3 nm from the end of the jetty, East, in an area named “mooring grounds”. Upon anchoring, ships are to advise VTS of their anchoring time and position. Ships at anchor must maintain a continuous listening watch on VHF channel 16. All ships at anchor must maintain a continuous anchor watch and report if the vessel is observed to be dragging anchor.

Ships are not permitted to immobilise engines at anchor without the written approval of the Harbour Master

12.8 Arrival reporting requirements

The master of a ship entering, or about to enter the pilotage area must report to Port Spencer VTS by VHF radio according to the following table:

	Report	Information to report
1	Ship master to Port Spencer VTS Two hours prior to entry into the pilotage area	Ship's name, position, ship's fore and aft draught, changes to ship details, defects, estimated time of arrival to pilot boarding ground
2	Port Spencer VTS/pilot to ship master Confirmation of pilot transfer and instructions for the ship	Instructions will include, boarding side, course, speed, estimated time of arrival and anticipated conditions
3a	Ship master to Port Spencer VTS On anchoring	Ship's name and anchor position
3b	Ship master to Port Spencer VTS Departing anchorage	Ship's name, anchor aweigh time

4	Pilot to Port Spencer VTS Pilot transfer (when the pilot transfer has been completed)	Ship's name, pilot onboard, pilot onboard time, pilot name, ship's fore and aft draught, changes to ship details
5	Pilot to Port Spencer VTS Vessel secure alongside	Time of first line and when secured alongside, berth and direction.

Table 6 — Arrival reporting requirements

12.9 Departure and removal reporting requirements

Masters of all vessels are to call VTS 3 hours prior to ETD to confirm readiness to depart with final sailing draughts.

The master of a ship that is departing or moving within the pilotage area must report to Port Spencer VTS by radio according to the following table:

Report		Information to report
1	Ship Master to Port Spencer VTS	Call VTS 3 hours prior to ETD to confirm readiness to depart with final sailing draughts
2	Ship master to Port Spencer VTS—clearance prior to movement	Ship's name, radio check, destination port/anchorage, ship's fore and aft draught, changes to ship details
3	Pilot to Port Spencer VTS Pilot onboard and ship ready to depart	Ships name, pilot onboard time, pilot name, fore and aft draught, changes to scheduled movements
4	Pilot to Port Spencer VTS	Time Last line
5	Ship master to Port Spencer VTS	Ships name, pilot disembarked, pilot off time

Table 7 — Reporting requirements

12.10 Access to Harbour Master

For ordinary business, and issues arising in relation to ship scheduling, agents are to contact the Port Spencer VTS Centre (Peninsula Ports Building). Agents continue to have full access to the Harbour Master on any subject should circumstances warrant, however outside normal working hours this should be restricted to emergencies.

13.0 Weather information

13.1 General

The SSE winds may blow strongly at times, making it difficult to berth. In these conditions it is prudent for the pilot, ship's master, tug masters and berth operator to liaise in order to determine whether berthing should be attempted.

Further operational limitations to be verified by SmartShip simulation on final wharf design

Weather conditions do not normally affect departures, however, a current of 0.5 knots running against the berthing location makes mooring difficult when associated with a large swell.

The Harbour Master, pilot and berth operator will jointly decide when it is not safe for a ship to be alongside.

13.2 Severe Weather Event

In the event of an extreme weather event threat the Harbour Master will take the following action:

- restrict the movement of vessels if necessary
- direct and oversee the evacuation of the port or specific areas of the port or other affected areas if applicable
- close and reopen the port if necessary.

The Harbour Master will also:

- advise mariners of relevant warnings and response requirement
- seek compliance with the response requirements.

These actions will be enacted over four distinct phases that allows for the development of appropriate responses to the threats faced.

13.2.1 Phase 1: Extreme weather event - Prevention.

An extreme weather event watch will be issued when an extreme weather event or developing event is likely to affect the area within 48 hours, but not expected to impact the area within 24 hours. This phase is a critical time for masters and owners to plan and prepare for the impact of the event.

13.2.2 Phase 2: extreme weather event – Preparedness.

An extreme weather event warning will be issued when an extreme weather event or developing event is likely to affect the area within 24 hours. This phase is critical for masters and owners to

complete all preparations in an orderly manner prior to the event occurring.

13.2.3 Phase 3: Actual extreme weather event – Response

By this phase, all vessels are expected to have enacted their vessel safety plans noting that the port may be closed and/or vessel movements restricted depending on the threat to safety of vessel movements or the environment. Mariners should note that it is likely to be too late to consider the safety of your vessel and that extreme weather conditions may limit the ability of emergency services to assist you should you run into difficulties. Your actions should be directed towards your own personnel safety.

If the port is closed, no vessel movements are expected.

13.2.4 Phase 4: After the extreme weather event has passed – Recovery

The Harbour Master will assess residual risks and determine the actions needed to be addressed. Do not assume that as the extreme weather event has passed, and it is now safe to move your vessel.

Vessels are not to leave their severe storm moorings until the official all clear is given by the Harbour Master.

Mariners should maintain a listening watch on the key VHF channels 16, 12, 11 and 6

Owners and masters of vessels should be aware that aids to navigation may be affected by the extreme weather event.

Owners and masters should reference notices to Mariners for the latest updates.

Furthermore, port infrastructure will need to be inspected to ensure that facilities are fit for purpose.

13.2.5 Port closure

The Harbour Master may close the port, wholly or in part, or restrict the movement of vessels in the pilotage area, depending on the threat to the safety of shipping or the environment. This can occur at any time prior to the event.

The closure of the port or restriction on vessel movements will, as far as practical, be implemented in consultation with key authorities and in a timely manner in order to minimise risks.

13.2.6 Reopening of the port

The pilotage area will not be re-opened until the Harbour Master is satisfied that all danger has passed, and the pilotage area is safe for vessels to re-enter and following inspections and surveys to critical maritime infrastructure (for example navigational aids, jetties) as well as clearance of navigational hazards.

The Vessel Traffic Services Centre will coordinate the safe movement of vessels following the opening of the pilotage area in accordance with normal practice.

Berths will be re-opened, and operations resumed when wind and sea conditions are within operational limits.

13.2.7 Communication

The successful implementation of this plan relies on high quality communication of information and directions.

The Vessel Traffic Services Centre will implement the *extreme weather event contingency plan* on behalf of the Harbour Master by acting as the central communications point for the duration and aftermath of the extreme weather event.

The Vessel Maritime Control Centre call sign is *Port Spencer VTS*.

VHF channels 16, 12, 13 and 14 will be continuously monitored before and during the extreme weather event. Extreme weather watches, warnings and any directions will be issued on these channels.

If the plan requires for actions such as port evacuation or closure will be coordinated by the Peninsula Ports VTS

Key Contacts are listed below:

Contact	Telephone
Harbour Master -	+61
Port Spencer VTS	+61
Water Police	+61
Peninsula Ports	+61

Table 8 – Key Contacts

13.3 Tidal information

Predicted tide heights are available from the Bureau of Meteorology website.

<http://www.bom.gov.au/australia/tides/#!/sa-tumby-bay>

Currents at the berth are made of tidal and wind generated components; the tidal component will dominate under normal conditions.

Port Spencer is NOT a standard port in the Tide Tables. The closest tide location is for Tumby Bay, located approximately 10km south of Lipson Island.

The tidal times and height predictions for standard South Australia ports are available in the South Australia Tide Tables.

Tidal stream predictions for standard South Australia ports are available upon request through the Harbour Master's office.

14.0 Port navigation and movement restrictions

14.1 Under keel clearance (UKC)

The depth alongside at datum is 14.5. metres; there are no dredged channels or swing basin leading to the berthing box.

Vessels must maintain a minimum UKC of 10% of the draught at all times alongside.
The draught on sailing must allow for an Under-Keel Clearance (UKC) of 10% of deepest draught.

Maximum departure draught = (approach depth + tide) divided by 1.06

14.2 Approaches to pilot boarding ground (AUS 259)

There are no known dangers and there is good holding everywhere between the berth and the anchoring area. Ships waiting for pilots should anchor 1 nautical mile E of the jetty on the line of the Port Spencer Point leads in the vicinity of position 34° 15.320'S, 136° 19.910'E.

14.3 Berthing requirements

Pilot and port operator will liaise on conditions (for example, weather and tide) and other factors of safety prior to berthing;

- Ships will berth starboard side to alongside facing the Spencer Gulf at the jetty.
- Two 60 TBP ASD tugs will be used for swinging the vessel and berthing.
- Ships should ensure that engines are ready and fully operational, that mooring lines with heaving lines are ready for use, and that anchors are cleared and ready.
- Cranes and derricks are to be stowed and lashed to provide clear vision forward of the bridge wings and wheelhouse.
- Gangways are not to be broken out until the ship is moored alongside.
- Discharge outlets in the vicinity of tug lashing points are not to be used unless absolutely essential to berthing operations.
- During periods of unsuitable wind and sea conditions, further restrictions may be imposed in the interests of safety.

14.3.1 Position at berth

Ship position at the berth should enable loading of all hatches of the ship (unless agreed otherwise by the terminal operator and Harbour Master)):

- ship position at the berth should limit overhang past the outermost fenders in contact with the

ship to less than 25% of the ship's LOA;

- ship position at the berth must achieve acceptable angular contact with fender frames, particularly those in contact with the flare of the ship's stern and bow;
- ship's crew must not allow mooring lines to slacken (due to tidal range and loading rate, moorings can become slack allowing the ship to shift out of position);
- at all times that a ship is alongside, the number of tugs required for departure will remain on standby within the port limits or be released as prevailing and predicted weather circumstances dictate.

14.3.2 Guidelines for berthing and departing of vessels

Due to the unprotected nature of the berth and the working limitations of the tugs following guidelines shall be adhered to:

1. Prior to commencing a berthing or departure manoeuvre the Pilot shall conduct a risk assessment and, in the process, if wind speed and swell are deemed to exceed safe working limits a vessel shall not proceed with the berthing or departure manoeuvre.

In general, the safe working conditions for the existing tugs are steady wind speeds not exceeding 20 knots and/or gusting 25 knots, as determined by simulation modelling and may be amended in future. In exceptional circumstances it may be necessary for a departure manoeuvre to be considered in conditions exceeding those described above. The departure may proceed provided a comprehensive risk assessment process has deemed it safe and practical.

2. When a strong wind warning has been forecast for the area and a vessel is expected to be alongside during that period, generally a vessel shall not berth. If the wind and swell have not exceeded safe working limits of the terminal, the Master and Bulk Terminal may, after conducting a risk assessment decide to berth a vessel. The following considerations must form part of the risk assessment process leading up to the decision.
 - The vessel may not depart with one tug if wind and swell exceed safe working limits.
 - The availability of a 2nd tug on standby to assist if the vessel is required to depart.
 - The maximum wind limitation imposed by Bulk Grain Terminal for a vessel to remain at the berth is steady winds speed 25 knots.
3. If a vessel is already alongside and a strong wind warning is forecast for the area, the Master and Bulk Grain Terminal must make arrangements for the vessel to depart the berth prior to wind speed and swell exceeding the safe working limits of the terminal. The Master and Bulk Grain Terminal may conduct a risk assessment and decide to let the vessel remain at the berth.
4. The Master must consider the unprotected nature of the berth in deciding the quantity of ballast to retain on board during berthing and loading to ensure safety of vessel and berth at all times.
5. During the entire duration of ship's stay alongside, 2 tugs with adequate bollard pull to assist

and/or sail the vessel in emergency standby within port limits.

The tugs shall always remain contactable on VHF channel 16 .

15.0 Pilotage

15.1 General

A Port pilot must be employed for all shipping movements to and from the Port Spencer bulk grain jetty terminal.

The Port Spencer pilotage area is the area of 2 nautical mile from the end of the jetty as described by the port limits.

15.2 Pilotage

The port is open for pilotage with prior arrangement.

Pilot boarding is restricted by the ability of the pilot vessel to safely transport a pilot across to the Bulk Carrier vessel. VTS in conjunction with Pilotage services will provide tidal windows for Pilot on Board (POB) times on request by shipping agents.

15.2.1 Request for pilot

Port Spencer provides a pilotage service for ship arrivals, under contractual arrangements with Peninsula Ports as Port Operator. All pilot transfers are carried out by pilot launch utilizing the Multi-Purpose Vessel or available tugs.

15.2.2 Notice required

Ships requiring the services of a pilot are required to submit arrival, removal and departure notices no less than 48 hours prior to the desired movement.

Updates to the pilot boarding time should be sent at 12 hours and six hours prior to arrival.

15.3 Pilot boarding place

Boarding position: Latitude 34° 15.306'S, Longitude 136° 18.714'E approximately 1.0 nautical miles from the berth (34° 15.090'S, Longitude 136° 16.480'E).

15.3.1 Pilot Transfers

Pilot transfer instructions will be given by Port Spencer VTS to the ship prior to pilot boarding. The instructions shall include:

- Pilot boarding time
- Restrictions/Requirements (by the Harbour Master)

Boarding and disembarkation is generally undertaken with the ship underway proceeding at a Safe speed and providing a good lee. The Pilot vessel may contact the ship directly with instructions to assist safe transfer, if required.

The Pilot ladder must be rigged in accordance with International Regulations,

- 1.5 metres above the water, and
- with two Man ropes, and
- a heaving line standing by, and
- At night, a forward-facing light is required to illuminate the ladder in accordance with IMO requirements and IMPA recommendations;
- If the ship has freeboard of 9 metres or greater, a combination ladder must be rigged.

15.4 Passage planning – bridge resource management (BRM)

The master and pilot should exchange information regarding navigational procedures, local conditions and rules and the ship's characteristics. This information should be a continuous process that generally continues for the duration of the pilotage.

The proposed manoeuvre should be well discussed with the master and any doubts/queries he/she may have should be resolved prior to commencement of pilotage. The exchange of information should include at least:

- The presentation of a completed standard pilot card (by ship). In addition, information should be provided on rate of turn at different speeds, turning circles, stopping distances and, if available other appropriate data.
- General agreement on plans and procedures including contingency plans for the anticipated passage (Pilotage – Port Spencer passage plan)
- Discussion of any special conditions such as weather, depth of water, tidal currents and marine traffic that may be expected during the passage.
- Discussion of any unusual ship-handling characteristics, machinery difficulties, navigational equipment problems or crew limitations that could affect the operation, handling or safe manoeuvring of the ship.
- Information on berthing arrangements; use, characteristics and numbers of tugs and other external facilities.
- Information on mooring arrangements.
- Confirmation of the language to be used on the bridge (normally English) and with external parties.

Any passage plan is a basic indication of preferred intention and both pilot and Master should be prepared to depart from it when circumstances so dictate.

15.5 Master/pilot responsibilities

Masters and owners of vessels are responsible for due compliance with the provisions of the *Harbors and Navigation Act (2003) & Regulations (2009)*.

When a vessel is under the direction of a pilot, the pilot is responsible for due compliance with the provisions of the *Act and Regulation*, however the responsibility of the pilot does not relieve the master and the owner of a vessel of their responsibility. Arising from these responsibilities is the obligation of persons directing the navigation of vessels to comply with directions of the Harbour Master.

15.6 Fatigue management

Professional pilotage services are maintained for the port. The service is on an 'on-demand' basis. A pilot fatigue management plan is followed to ensure that adequately rested pilots are assigned to ships.

15.7 Alcohol consumption

The Harbors and Navigation Act (2003) stipulates that persons in charge of ships have a zero-blood alcohol level reading. The Water Police may periodically conduct random breath tests of masters and pilots on ships arriving at Port Spencer, or about to depart; severe penalties apply to infringements.

15.8 Pilotage delays

A delay fee is payable if the programmed ship movement is delayed for more than 30 minutes but not more than one hour for the first hour. If the ship is delayed for more than one hour but not more than two hours, then for each of the first two hours; a delay in excess of two hours constitutes a cancellation.

16.0 Tug procedures

16.1 General

All Port Spencer visiting ships will require two tugs for berthing and unberthing.

Towage services are provided by Port Lincoln Tugs (*to be confirmed*); their base of operation being in Port Lincoln, and servicing Port Spencer on an *ad-hoc* basis.

16.2 Vessel Particulars

	Bollard pull	H.P.	Steering system
Name TBA	60t	3600	Azimuth Screw Directional propellers
Name TBA	60t	3650	Azimuth Screw Directional propellers

Table 9 – Tug details

Company Name	
Company	
Physical	
Phone:	
Email	

Table 10 — Tug company contact information

16.3 Notification of Tugs

Generally, the vessel's agent will requisition tug services via the Tug office at Port Lincoln; amendments to booking times should be made by phone to the booking office by the ship's agent.

The operations email address is monitored from 0800 to 1800 daily.

16.4 Communicating with tugs

Port Spencer tugs call up on VHF channel 16 and use VHF channels 6 and 12 for communicating with ships during berthing operations.

16.5 Tug availability during vessel's stay in port

During the entire duration of ship's stay alongside, 2 tugs with adequate bollard pull to assist and/or sail the vessel in emergency will remain within port limits. The tugs shall always remain contactable on VHF channel 16.

17.0 Work permits

17.1 General

In order to be able to perform certain work on ships in the port masters, owners or their agents must first apply for and obtain the necessary permits before that work can proceed:

- Immobilising main engine/s — the immobilisation of ship's engines whilst alongside the Port Spencer berth or whilst at anchor within port limits is not permitted by the Harbour Master.
- Repair and maintenance work — due to the exposed nature of the berth, routine engine repairs and maintenance are not permitted. Where special circumstances create a necessity for hot work to be carried out, the master must submit a written application to Port Spencer Bulk Grain prior to any work being carried out.
- Lifeboat drills — the agent is required to notify the Harbour Master and Australian Customs Service (Australian Border Force) prior to any boat being lowered into the water.

18.0 Dangerous cargo

18.1 General

Although not envisaged, the port authority, Peninsula Ports, is responsible for the management of dangerous cargo in port, including the loading and unloading of ships alongside and movement across the jetty.

The Harbour Master will assist the port authority in controlling traffic movement in the port, maintaining on-water safety distances, and responding to any emergency situation.

Maritime Safety and other relevant authorities operate under the codes and guidelines of:

- International Maritime Organisation — IMDG Code
- International Chamber of Shipping Oil Companies, International Marine Forum
- Society of International Gas Tankers and Terminals (ISGOTT)
- Australian Maritime Safety Authority — Australian annex to the IMDG Code – Marine Orders Part 41
- AAPMA — Dangerous Substances Guidelines.

18.2 Dangerous cargo events

A dangerous cargo event is defined as the loss, or likely loss, of the cargo from a ship into South Australian waters; the report should contain the following information:

- correct technical name or names of goods
- UN number or numbers
- IMO hazard class or classes
- names of manufacturers of goods when known, or consignee or consignor
- types of packages including identification marks. Specify whether portable tank or tank vehicle, or whether vehicle or freight container or other cargo transport unit containing packages. Include official registration marks and numbers assigned to the unit
- an estimate of the quantity and likely condition of the goods
- whether lost goods floated or sank
- whether loss is continuing
- cause of loss

- a breach, or danger of a breach, of the containment of the cargo that could endanger marine safety
- anything else involving, or that could involve, the cargo that causes risk of explosion, fire, a person's death, or grievous bodily harm of a person
- for a cargo that is a material hazardous only in bulk (MHB) – an event that causes risk of explosion, fire, a person's death, or grievous bodily harm to a person.

The master and/or the person-in-charge of a place where a dangerous cargo event has occurred is required to report the event immediately to the VTS centre or relevant authority.

A full written report is to be submitted on the Dangerous Cargo Event Report – Form F3220 to the Harbour Master as soon as reasonably practical.

19.0 Emergency, pollution, marine incidents

19.1 General

The aim of this section is to alert the port community for an initial response in the event of dangerous incidents, emergencies, terrorist acts and disasters.

All marine incidents report regardless of the regulatory agency must be reported to the Harbour Master/VTSO.

Initial reports should be conveyed through to Port Spencer VTS:

Telephone: +61
VHF channel: 12 or 16

Written reports must be submitted within the relevant timeframes as specified in the respective regulations in the appropriate format to:

Harbour Master
Email:

Port Spencer Emergency Response Plan and ANNEX 1 – First Strike Response Plan are the applicable documents outlining the appropriate responses.

19.2 Authorities

The Marine Operations Group of Transport SA is responsible for the management of the National Plan in South Australia and for ensuring that State plans are maintained to deal with oil spills wherever they occur in State waters.

PENINSULA PORTS has published an emergency response plan for Port Spencer which details the required response to an emergency within the port. All emergencies should be reported to Port Spencer VTS on VHF channel 16 or 12, who will activate the emergency response plan and by calling the appropriate emergency response service fire/police/ambulance on 000.

19.3 Fire

Call the South Australia Fire and Rescue Service and notify Port Spencer VTS on VHF 16 or 12.

South Australia Fire and Rescue Service is the lead agency when the ship is at the berth and Maritime Safety South Australia when the ship is off the berth. The Harbour Master, in consultation with PENINSULA PORTS, will make the decision if the vessel is to be removed from the berth for the safety of the port.

There are fire hydrants and hose reels that are located at the berth fed by saltwater pumps. The tugs are equipped with firefighting equipment.

19.4 Marine pollution

The *Protection of Marine Waters (Prevention of Pollution from Ships) Regulations (2013)* is designed to protect South Australia's marine and coastal environment by minimising deliberate and negligent discharges of ship-sourced pollution.

Discharges of oil, noxious liquid substances, packaged harmful substances, sewage and garbage (MARPOL Annexes I, II, III, IV and V) from ships are prohibited in South Australia coastal waters and pilotage areas.

Maritime Safety South Australia has the authority to detain any vessel suspected of causing marine pollution and to intervene where there is imminent danger to the coastline. Ships should dispose of all waste ashore using the waste reception facilities available.

The Port Spencer *Ship Sourced Pollution Management Plan* contains more information on the prevention of pollution from ships.

19.4.1 Reporting a pollution incident

A prescribed incident must be notified to the State Marine Pollution Controller by means of a telephone message, a telex message, a radio message or a fax message.

The following details should be provided in a report of marine pollution to the State Pollution Controller:

1. Name and contact details (telephone, address etc) of the person requested to furnish report, being the relevant person with duty to notify of the pollution incident or discharge occurrence:
 - If ship— Master of the ship:
Where Master unable to comply, the owner, charterer, manager or operator of the ship or their agents.
2. Please tick the relevant occurrence and provide the relevant source information:
 - Pollution incident for ships

Note: Pollution incident for a ship includes damage, failure or breakdown of a ship of 15 metres in length or more that—

- (i) affects the safety of the ship, including collision, grounding, fire, explosion, structural failure, flooding and cargo shifting; or
 - (ii) results in impairment of the safety of navigation, including failure or breakdown of steering gear, propulsion plant, electrical generating systems or essential shipborne navigational aids.
- Discharge from ship

For pollution incident or discharge from ship—provide name, radio call-sign, flag of ship and type of ship (e.g. oil tanker, chemical tanker, dry cargo ship), gross tonnage and condition of ship.

- Discharge from vehicle

Provide type of vehicle and number plate.

- Discharge from apparatus (includes a pipeline, structure on land, oil rig, or any equipment used for the exploration, recovery or storage of oil) Provide type of apparatus.

3. Location of pollution incident or discharge

- If ship—latitude and longitude and also provide position, course and speed of the ship at the time of pollution incident or discharge: If vehicle or apparatus—location on water or land of the discharge, where it was reasonably likely oil or mixture would flow into State waters (latitude and longitude, if known)

4. Date and time of pollution incident or discharge (specify which time status used, e.g. UTC, CST, daylight savings)

5. Brief description of the pollution incident or discharge (what, how and why incident/discharge occurred, what damage was sustained, condition of ship/vehicle/apparatus, if any other ship/vehicle/apparatus involved etc):

6. Type and origin of discharge including the technical name (or, where the technical name is not known, the trade name), UN number, Classification in the International Maritime Dangerous Goods (IMDG) Code (where applicable), name of manufacturer, quantity and concentration, of the harmful substance discharged, or likely to be discharged

7. Volume/quantity of discharge

8. Is the discharge ongoing and/or has been contained?

9. Weather, sea and current conditions in the vicinity of the pollution incident or discharge

10. Estimated direction of discharge movement and surface area of the discharge
11. What actions have been taken since the pollution incident or discharge to contain the discharge (including any equipment that has been used)?
12. What assistance (if any) is required or has been provided?
13. Any known sensitive areas nearby (e.g. Lipson Island, power station inlets, marine parks, conservation parks, Native title or cultural significance to the Indigenous populations etc)?

19.5 Marine incidents

All vessels involved in a marine incident in Australian waters need to make a report.

Reporting involves a two-step process.

1. Submit an incident alert

As soon as reasonably practicable* after becoming aware of the incident, you must either:

- complete the incident alert form 18 and submit to AMSA online, or
- download form 18 and email the completed form to reports@amsa.gov.au

Domestic commercial vessels can provide this alert by any means such as:

- using incident alert form 18
- email reports@amsa.gov.au
- phone
- in person at your local AMSA office.

* Under *Marine Order 1 (Administration) 2013*, regulated Australian vessels and foreign vessels must submit an incident alert within 4 hours.

2. Submit an incident report

Within 72 hours after becoming aware of the incident, you must:

- complete the incident report form 19 and submit to us online, or
- download form 19 and email the completed form to reports@amsa.gov.au

All marine incidents occurring in the Port Spencer Region must be reported immediately (as soon as safe and practical) the Harbour Master through Port Spencer VTS:

Telephone: +61

VHF channel: 12 or 16.

19.6 Marine incident reporting

19.6.1 Ships under port pilotage

In addition to reporting incidents as required to AMSA, where a marine incident or a near miss occurs during the pilotage, the pilot must, in accordance with Part 11 *Harbours and Navigation Act 1993 (SA)*:

- I. As soon as practical notify Port Spencer VTS of the situation, requesting assistance as required; and
- II. Within 48 hours of the incident or near miss submit a written report to the Harbour Master providing details of the incident or near miss;
- III. Report the accident to the Chief Executive of DPTI

19.6.2 Domestic Commercial Vessels (Ships regulated under the Marine National Law Act 2012)

Under the *Marine Safety (Domestic Commercial Vessels) National Law Act 2012 (National Law)*, a *marine incident* means any of the following:

- (a) a death of, or injury to, a person associated with the operation or navigation of a domestic commercial vessel;
- (b) the loss or presumed loss of a domestic commercial vessel;
- (c) a collision of a domestic commercial vessel with another vessel;
- (d) a collision by a domestic commercial vessel with an object;
- (e) the grounding, sinking, flooding or capsizing of a domestic commercial vessel;
- (f) a fire on board a domestic commercial vessel;
- (g) a loss of stability of a domestic commercial vessel that affects the safety of the vessel;
- (h) the structural failure of a domestic commercial vessel;
- (i) a close quarters situation;
- (j) an event that results in, or could have resulted in:
 - (i) the death of, or injury to, a person on board a domestic commercial vessel; or
 - (ii) the loss of a person from a domestic commercial vessel; or
 - (iii) a domestic commercial vessel becoming disabled and requiring assistance;
- (k) the fouling or damaging by a domestic commercial vessel of:
 - (i) any pipeline or submarine cable; or
 - (ii) any aid to navigation within the meaning of the *Navigation Act 2012* of the Commonwealth;
- (l) a prescribed incident involving a domestic commercial vessel.

The *Marine Safety (Domestic Commercial Vessels) National Law Act 2012* (National Law) requires that both the owner and master of a Domestic Commercial Vessel that is involved in a marine incident, report the incident within the time frames provided for by the National Law, to the National Regulator.

As soon as possible and within 4 hours after becoming aware of the incident, you must complete and submit incident alert form 18.

You can either complete the online form below to submit an incident alert or download form 18 and email the completed form to reports@amsa.gov.au.

It is important that incidents are reported so that AMSA can analyse the occurrence and, if necessary, take steps to improve vessel safety.

19.6.3 Marine incident reporting – Australian Maritime Safety Authority

Under section 19 of the *Transport Safety Investigation Act 2003* any incident involving a ship in Australian waters including:

- breakage of gear or injury to any person during cargo work
- damage or defect to ship, machinery or equipment
- peril or a close quarters situation
- stranding or disappearance
- death, serious injury or a dangerous occurrence
- a berth.

These must be reported to the Australian Maritime Safety Authority (AMSA) using form 18 incident alert within four hours of the incident occurring. A detailed incident report must be submitted to the Australian Maritime Safety Authority, Canberra on form 19 within 72 hours of the incident occurring.

Reports are to be submitted by fax: +61 2 6230 6868 or 1800 622 153 or email: reports@amsa.gov.au

Complete details of these requirements are available on the Australian Maritime Safety Authority website.

19.6.4 Procedures subsequent to serious marine incidents

In the case of a vessel grounding or if structural damage has occurred, the vessel is to be removed to a position of safety. Immediate advice from the Harbour Master and the manager (pilotage services) should be sought in this instance.

The vessel is to be surveyed by the appropriate authority (Australian Maritime Safety Authority or classification society) to ensure the seaworthiness of the vessel before it leaves port limits.

19.6.5 Port community responsibilities

As a responsible member of the maritime community, any person witnessing an incident which was/or is capable of becoming an emergency is obliged to report the matter to the Harbour Master's office and/or the emergency response agencies of police, fire or ambulance.

The Australian Maritime Safety Authority requests pilots, stevedores, Peninsula Ports officers and others to notify them of suspected deficiencies on ships.

20.0 Port state control inspections

Australian Maritime Safety Authority (AMSA) conducts Port State Control (PSC) inspections to ensure that foreign vessels visiting Australian ports comply with the relevant international regulations are seaworthy, do not pose a risk of pollution and provide a safe working environment; accordingly, under the *Navigation Act 2012*, the Australian Maritime Safety Authority surveyors may board a vessel at any time to conduct an inspection.

Cargo ships may be inspected every six months and tankers over 15 years old may be inspected every three months.

Inspections are based on resolutions of the International Maritime Organization and the International Labour Organisation (ILO). All required certificates and documentation and areas of critical safety, for example, lifeboats, engine room firefighting equipment and cargo gear, may be inspected in accordance with a Ship Inspection Record (SIR) book which contains guidelines.

In all cases a *Form A* is completed stating that an inspection has been carried out and if any deficiencies are noted a *Form B* is issued.

Critical deficiencies can lead to a ship being detained from sailing until the problems are rectified. Details of all detentions are forwarded to the International Maritime Organization, the relevant flag state and the classification society.

Vessels that are intending to use their cargo gear to load stores or handle cargo should ensure that they comply with Marine Orders Part 32. This requires all individual pieces of cargo handling equipment to be certificated (test certificate) and clearly marked with the identifying mark and the safe working load (SWL) as stated in the certificate. This applies to all gear; shackles, chains, sheave blocks, bins, tubs rings and so on.

Periodical inspections must be entered in the cargo gear register or else the cargo gear cannot be used.

21.0 Port services

21.1 General

The nearest medical, banking and shopping facilities are located at Tumby Bay, approximately 25 kilometres to the south.

21.2 Bunkering

There are no bunkering facilities available at this port.

21.3 Fresh water

Fresh water is not available at this port.

21.4 Waste

It is an offence for a person to discard, dispose of or leave rubbish, refuse, and sewage waste of any kind (including galley waste), wastewater or other liquid waste.

There are no facilities available at Port Spencer for the collection of waste materials and all should be retained on board in covered receptacles.

end of document

10 JANUARY 2020



ANNEX 1 - FIRST STRIKE RESPONSE PLAN

(MARINE INCIDENTS)
PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	
1.1	Ryan Norval	John Kavanagh	

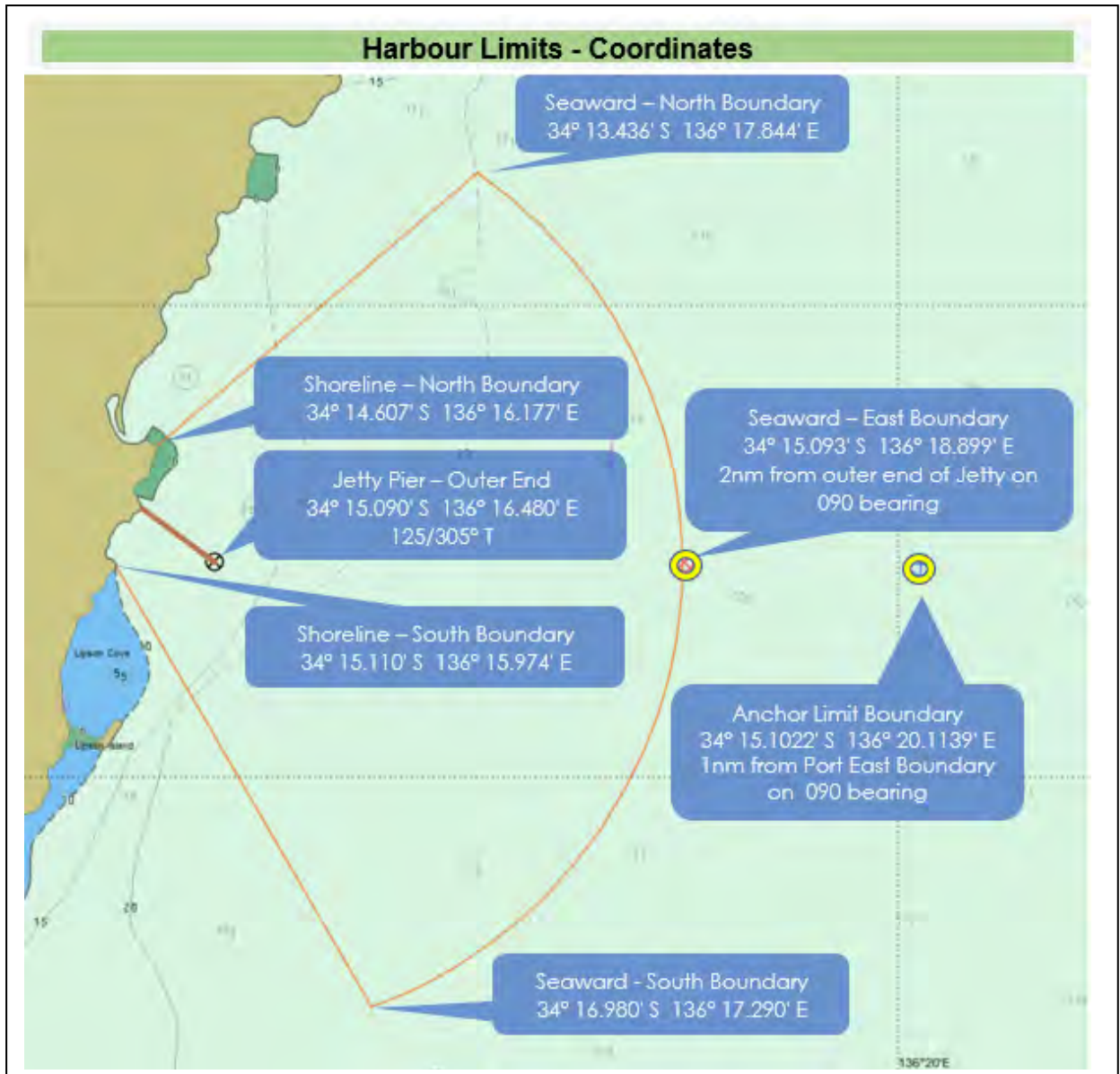
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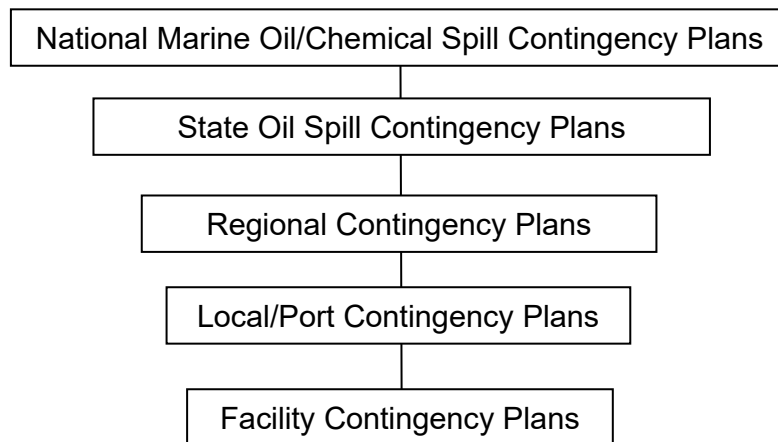
1.1 Objective

This First Strike Response Plan has been developed for the Port of Port Spencer to provide a response system proportional to the Oil Spill Risks identified within Port Limits from ships and other marine sources.

NOTE: Peninsula Port Authority – Port Spencer should be alerted to any incident involving marine pollution by oil to ensure immediate response on their behalf as well as appropriate support relating to the first strike plan.



1.2 National Plan – Hierarchy



1.3 Roles and Responsibilities

The roles and responsibilities for first strike response to oil spills within the port limits of Port Spencer are defined as follows:

- Maritime Safety South Australia (DPTI) is both Statutory and Combat Agency for ship sourced oil spills that impact South Australia Coastal waters and is the pre-designated Incident controller for all incidents within the scope of this plan.
- The port operator, PENINSULA PORTS is responsible for ensuring that an adequate first-strike oil spill response capability is maintained within the port limits of Port Spencer.
- Local councils generally assume responsibility for clean-up of oil impacted shorelines outside of National Parks. Depending upon the geographical location of stranded oil the District of Tumby Bay may be requested to undertake shoreline clean-ups operations following an oil spill within the port.
- The South Australian Marine Spill Contingency Action Plan (SAMSCAP) is

managed by DPTI.

- The Marine Operations Group of Transport SA is responsible for clean-up of oil from beaches within National Parks.

Details of the roles and responsibilities may be found in Appendix 1 to the Inter-Governmental Agreement on the National Plan.

The DPTI is the nominated SA Control Agency for oil spills in SA State marine and inland waters and will assume overall direction of emergency management activities in an emergency. Authority for control carries with it the responsibility for tasking and coordinating other organisations in accordance with the needs of the situation. The *Emergency Management Act 2004* (SA) identifies the SA Police as the coordinating agency for all emergencies.

The State Coordinator is the person for the time being holding or acting in the position of Commissioner of Police, therefore, the arrangements in SA will be;

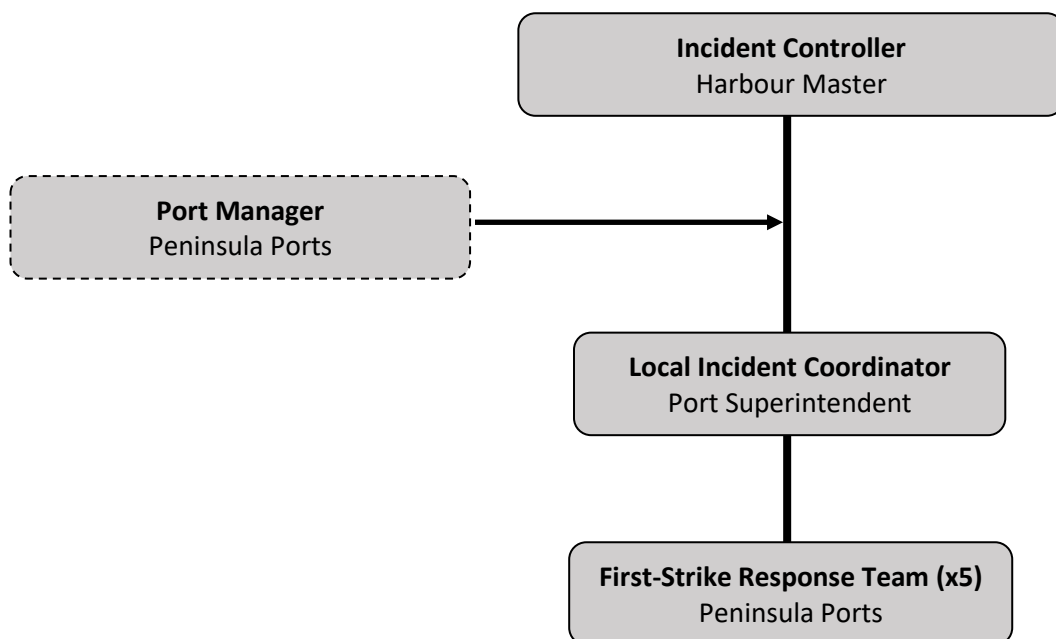
- SA Police will become the Coordinating Agency for any spill incident;
- DPTI will become the Control Agency for a spill within 3nm;
- DPTI provides the SMPC;
- DPTI will plan & execute the State arrangements for the incident within 3nm;
- DPTI will plan & execute the State shoreline arrangements for the incident within 3nm;
- DPTI will integrate the Port Spencer resources within its own command structure;
- DPTI will integrate the Port Spencer technical expertise within its own command structure

PENINSULA PORTS acknowledge that the responsibility for clean-up of a spill associated with its activities remains with PENINSULA PORTS and in the event of State or Commonwealth assistance all reasonable costs incurred will be recoverable.

The South Australia Marine Spill Contingency Action plan (SAMSCAP) is used as the basis for management of all oil spills outside port limits. This will also include an oil spill within the port limits if assessed as in excess of 10 tonnes, or otherwise agreed with the Port Spencer Incident Controller.

Port Spencer scope focuses on Level 1 marine oil spills (up to 10 tonnes) that occur.

1.4 Response Team Structure (trained personnel pursuant to



1.5 Constraints

The *Marine Parks Act 2007 (SA)* and the *Marine Parks (Zoning) Regulations 2012 (SA)* prohibit entering or engaging in any activity in a restricted access zone and prohibit certain activities in marine park zones (Lipson Island).

The regulations do, however, allow for a number of exemptions from prohibitions and restrictions, including for persons acting in the course of emergency. The definition of emergency provided in the regulations includes an event that causes or threatens to cause harm to the environment, so a

permit may not be required. If Peninsula Ports is directed by the State to undertake spill response activities in a marine park zone, Peninsula Ports will only undertake these activities once permit requirements are confirmed.

1.6 Scope

This plan describes the specific actions to be taken in the event of a spill from any of the identified high-risk incident locations identified within the port limits.

The Basic components of this first strike plan are as follows:

- Predictions of oil trajectory, impact areas & weathering processes (predetermined);
- Response protection priorities (predetermined);
- Response strategies e.g. contain & recover with booms and skimmers (predetermined);
- OH&S involved in the operation, including hazards & control measures;
- Waste Management;
- Personnel - number of responders needed;
- Equipment – the type of equipment and the ancillaries and logistics required;
- The expected realistic timing for the operation; and
- Clear communications for the response operation.

1.7 Overview of response systems in Port Spencer

The four key response strategies considered most effective for the perceived risks at Port Spencer are,

- Stop the spill at its source
- Monitor and evaluate (Helicopter)
- Protection of key resources using containment boom (Jetty, Port shoreline)
- Containment and Recovery (on water collection and skimmer)

systems as soon as practicable)

- Shoreline clean-up (outer port beaches – Rogers beach, Lipson Cove beach)

The strategies were considered as most appropriate considering the brevity of available time to commence a **response facility's proximity** to immediate assistance and sensitive environmental areas close by.

These above selected strategies were also deemed appropriate in consideration of the constant changing profile of the Port waterways during the construction of new facilities.

1.8 Environmental Protection Priorities

No FSRP can guarantee complete protection of the marine environment from an oil spill. The FSRP provides a realistic response system designed to protect the key resources identified as being under threat from a marine oil spill event within Port Limits.

1.9 Threat assessment

The most likely type of pollution incidents to occur within the port are small operational discharges from the tugs and multi-purpose vessel. However, there is also a chance of larger operational discharges of fuel oil or waste oil from the visiting bulk carriers at the berth and/or significant spills of heavy fuel oil resulting from contact incidents within the port.

1.10 Possible Spill Scenarios

The types of incidents most likely to occur within the port are small spills of petrol, diesel fuel or bilge oil from operational vessels operating in the port.

Spills of up to:

- 300 tonnes of heavy fuel oil and other oil products from Bulk Carriers involved in serious striking or grounding incidents within the port;¹
- 10 tonnes of bunker fuel or bilge oil during ships' internal transfer operations;²

¹ See for example Pacific Adventurer bunker spill in 2009: <https://www.amsa.gov.au/marine-environment/incidents-and-exercises/response-pacific-adventurer-incident-strategic-issues>

² See for example Global Peace Bunker spill in Gladstone in 2006: <https://www.amsa.gov.au/marine->

- 50 litres of diesel fuel or bilge oil from operational vessels could also occur in the port.

Large spills of fuel oil and other oil products and from road tankers or other land-based sources are also possible.

1.11 Response and Handover Arrangements

Early first-strike response action should include an assessment of the time and resources required to effectively manage each incident. Where a response is likely to be prolonged or exceed the port's first-strike response capacity, Port Spencer should request assistance from Maritime Safety South Australia. When determining the need for assistance or hand-over of the response Port Spencer should consider the number and availability of local trained response personnel, their ability to work safely without the need for excessive work hours, and the capacity of the ports' first-strike response equipment. Requests for assistance should be made as soon as possible and preferably in the first or subsequent SITREPs.

Level one spills might require dispersant spraying, although approval will be sought from the State Marine Pollution Controller (SMPC). Only Prescribed officers under SAMSCAP and the National Plan may authorise the use of Dispersants.

In the first instance following a spill, Peninsula Ports Response Team and Vessels (including tugs as appropriate) may be utilised for:

- Deployment of boom
- Containment of any surface oil
- Monitoring and reporting of oil type, quantity and extent of surface coverage
- Initial clean-up response; and
- If instructed by SMPC, application of dispersants.

If approved, the surface application of dispersants may be an effective response tool on hydrocarbons, as long as they can be applied to fresh oil and during the dispersant “window of opportunity”.

1.12 Peninsula Ports Incident Control Centre

Port Spencer VTS will, in the first instance for a tier 1 oil spill, act as the Incident Control Centre and communications hub for Peninsula Ports. If required, and subject to guidance from the SMPC, an Incident Control Centre may be upgraded or transferred to another location for an ongoing or higher-level Tier 2/3 response.

1.13 Initial Assessment

All Oil spills reported to the VTS should be assessed immediately and the appropriate response plan activated. The initial assessment should determine if:

- Is it safe to respond? (MSDS)
- Can we stop the spill at its source?
- Has the discharge stopped?
- Where is it going? (Ebb or Flood Tide)
- When will it get there?
- Which prepositioned system should be deployed first? (flood tide)
- What receptors will be impacted outside the harbour? (ebb tide)
- Is it safe to employ those response strategies?

1.14 Lipson Island Fauna Conservation Reserve

Lipson Island Fauna Conservation Reserve is a Category III Natural Monument or Feature (based on the International Union for the Conservation of Nature or ‘IUCN’ categorisation). The Primary objective of the Lipson Island Fauna Conservation Reserve is to protect the outstanding natural features and associated biodiversity and habitats in and near to Lipson Island. IUCN Category III is related to the conservation of the natural feature itself, in this case, Lipson Island and its immediate vicinity.

The Lipson Island Fauna Conservation reserve, established in 1967, is centred on Latitude 35.2638 S Longitude 136.2658 E, is 8 ha in area, and is primarily a

PENINSULA | PORTS

marine reserve.

Any spill response must give proper attention to the protection of the Lipson Island Fauna Conservation Reserve and its natural environment.



Diagram for oil spill planning and training purposes

1.15 Response considerations and options

Location	Monitor	Contain & recover	Protect Resources	Shoreline Cleanup	Apply Dispersant
Jetty	Yes	If practicable	If practicable	If practicable	If authorised
Lipson Island Fauna Conservation Reserve	Yes	If practicable	YES	YES	NO
Shoreline	Yes	If practicable	If practicable	If practicable	If authorised

1.16 Response Level Determination

Response Level Indication	Level3	Level2	Level1
Spill Details			
Release Volume	> 300m ³	10m ³ – 300m ³	< 10m ³
Continuous release	Yes	No	No
Hydrocarbon has high persistent component	Yes	Yes	No
Resolution likely to take	> 2 weeks	48hrs to 2 weeks	< 48hrs
Spill Impact			
Actual or potential threat to, or	Yes	No	No
Adverse impact on public or	Yes	Possible	No
Oil will reach the shoreline	Yes	No	No
Media coverage likely	International	National	Local
Likely Resources Required			
International resources required, International agencies and government involved	Yes	Possibly	No
Regional resources required; multiple agencies involved	Yes	Yes	No
Peninsula Ports resources on hand will be sufficient	No	No	Yes

1.17 Oil Spill Response Mechanism Overview

1.17.1 Appropriate Equipment

PPA-PS has oil spill response equipment which:

- Is capable of containing and recovering oil rapidly in accordance with the expected response time available;
- Able to contain and recover a 120-tonne spill of Heavy Fuel Oil within 2 hours of deployment
- Is able to store and transfer up to 150 tonnes of Heavy Fuel Oil recovered to two 50t storage bladders as well as two 10t towable storage bladders
- Has a dedicated first response vessels (M P V) used for towing booms into position and skimming
- Equipment for a team of 20 shoreline responders.

1.17.2 Training

The Port Spencer Port Authority has in place a targeted training regime which provides a training pathway for responders to develop their skills in mounting a first strike response with the available equipment.

1.17.2.1 Training Regime & Exercises

Table 1 is the training regime developed to prepare sufficient personnel for the required response operations as shown in the First Strike Plans.

TABLE 1 TRAINING REGIME			
TRAINING OR QUALIFICATION	NUMBER REQUIRED	PURPOSE OF TRAINING	REVALIDATION FOR TRAINED PERSONNEL
Restricted Coxswain	2	Meet legal obligations and ensure safety	As required by National regulations
Introduction to oil spills	all	Provide all site-based personnel with an understanding of oil spill response operations	2 basic courses every year
Shoreline assessment and clean-up	2	To lead an assessment team and commence clean-up operations	2 years
Aerial observers course	2	To gain skills required to make an assessment of spill location and extent	2 years
Equipment Operator	6	Capable responders to deploy on-shore and off-shore equipment in accordance with the First Strike Plans.	1 year
Oil Spill Team leader	2	Able to plan a response operation and manage offshore operations	Ongoing training provided up to 3 sessions per year

TABLE 2 TRAINING EXERCISES			
EXERCISE TYPE	PERSONNEL TO ATTEND	TESTING RESPONSE OPERATIONS	FREQUENCY
Desktop and planning	PPA- PH	Planning and cooperative	Annual
PPA-PS	Restricted Coxswains, Operators and Team Leaders	Continuous improvement of deployment operations	Annual

1.17.3 Responsibilities / Actions

Standard Work Instructions (SWI) have been formalized for all likely deployments of the leased oil spill response equipment by PPA-PS. This gives responders a prompt sheet to reference at any time rather than waiting for plans and instructions to be given. These are located at the site of the equipment as well the intranet and in the VTS office.

1.18 Floating Oil

The risk assessment, local experience and trajectory modelling all show that spilled oil will only be adrift for a few hours within the port before it enters the shoreline and beaches.

It is likely that oil emanating from all the high-risk incidents listed, could impact receptors in less than 1 hour.

First Strike response for floating oil:

Contact VTS immediately and request an on-water response operation to recover floating oil. Deploy MPV to commence skimming of floating oil, utilise MPV to tow booms into position from the Response Container.

1.19 Oiled Shorelines

The sandy shorelines provide an opportunity to recover oil which travels

with the currents running parallel with the shorelines.

First Strike response for risk to or already oiled shorelines:

PPA-PS will deploy their stock of shore sealing booms and GP booms to establish several collection points on the identified beaches and to protect Lipson Island. The collection points identified also require oil recovery and storage equipment and access for servicing the equipment.

1.20 Oiled Wildlife (Shoreline Clean-up)

Only trained personnel in wildlife capture and cleaning should attempt to collect oiled wildlife.

At this stage the prompt notification of a spill and identified impact areas should be transmitted ASAP to DAW personnel to respond appropriately to the identified risks.

The highest risks to wildlife have been identified in the risk assessment as:

- Sea Birds

The OWRP will specify the estimated numbers of oiled birds, and the capture, transport, cleaning and rehabilitation of the animals.

1.21 Stopping the spill at the source

It may be possible to place a boom on the hull of the ship to capture leaking oil. This should only be attempted in close consultation with the Harbour Master and the ships Master and Chief Engineer. This should be done only after the appropriate equipment has been deployed to protect the jetty, beaches and environmental sensitive areas.

It is always a good idea to place a boom around the damaged area of a ship even if the leak has stopped in case of a secondary release; however, time does not permit this to be done prior to other protection systems in the case of Port Spencer. As with all response systems, this should be exercised and tested.

1.22 Response Plans

The following response plans specify the potential of a spill to a particular location, along with response tactics and resource options.

1.22.1 Containment in Port Limits

Purpose: The purpose of the primary containment procedures is to reduce the likelihood of oil impacting the Port Limits.

The MPV is located at the Jetty able to capture and recovery of oil entering the Jetty area.

Response Tactics: Direct oil into the skimmer catchment area using the on-board booms, blower and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: The resources required for this operation are in the Response Container

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the Jetty.

1.22.2 Containment at Lipson Island

Purpose: To reduce the opportunity for oil to enter Lipson Island and reduce the impact.

Response Tactics: Direct the oil using the on-board booms (tugs) and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: Resources required are on board the MPV and Tugs

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the spill site.

1.23 EQUIPMENT LIST

Response Container Content

RESOURCES FOR CONTAINMENT	
RESOURCES	QTY
General Purpose Boom - Flex	300m
Land Sea Boom Kit (boom, pump & blower)	600m
Weir Skimmer Kit (skimmer & spate pump)	1
Flexi-Dam recovered oil storage container - 25 tons approx. - each	2
Anchor Kit	1
Sorbent Boom	120m
Sorbent Pads	500
Sorbent Mops	120
Bag of rags	1
Box of ear plugs	1
Sunscreen	1
Gloves	5
Hand cleaner	1
Tool bag	1
Inflatable life jackets	5
Box of spares	1
First aid kit	1
Shade tent	1

end of document

10 JANUARY 2020



AIDS TO NAVIGATION MANAGEMENT PLAN

(ATNMP)

PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	
0.3	Ryan Norval	John Kavanagh	
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P E N I N S U L A | P O R T S

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The contents of this ATNMP are entirely subject to review as a result of simulation input from experienced pilots

1.0 Introduction

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Australian Maritime Safety Authority (AMSA) manages a network of navigational aids around Australia's coastline assisting mariners to make safe and efficient passages. The network includes traditional lighthouses, beacons, Differential Global Positioning System (DGPS) and Automatic Identification System (AIS) stations, broadcasting tide gauges, etc. AMSA will discontinue its DGPS service on 1 July 2020 as the accuracy of GPS exceeds the accuracy provided by **AMSA's DGPS service**.

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

The waters of the Spencer Gulf are internal to the State of South Australia. Collectively, the Harbour Master and Peninsula Ports (the port authority) have responsibility for managing the safe and efficient operation of the port.

PENINSULA PORTS, as the port authority for Port Spencer, will be responsible for developing and managing the Port.

Navigation aids are physical and electronic means of assisting mariners to navigate safely, and include a lighthouse, beacon, buoy, structure, marker, device or apparatus. Navigation aids will be referred to as NavAids. NavAids are used for marking safe navigational channels, hazards and foul ground in a systematic manner to mitigate risk. When constructed, Port Spencer will have an established network of NavAids marking safe shipping channels and boundaries with hazards.

Australia follows the International Association of Marine Aids and Lighthouse Authorities (IALA) marks, buoyage and lights system for IALA Area-A.

1.1 Purpose

The purpose of this Aids to Navigation Management Plan is to describe the changes that need to be made to Port Spencer's operational plans as a result of the port development.

In the context of increased shipping activities and movements that will accrue from the development project, it is recognised that management controls and actions for shipping and maritime activities in Port Spencer will have to be in place in order to safely facilitate marine navigation in and near to the newly established port facility.

Peninsula Ports is to ensure that:

- a review of the adequacy of the NavAids network is undertaken annually;
- a risk-based approach in the identification and establishment of new NavAids is used;
- annual planned maintenance is carried out on all NavAids;
- the *Harbours and Navigation Act 1993* NavAids approval process is complied with; and
- regular visual inspections for defective or damaged NavAids takes place during pilotage operations; and
- a system for reporting and rectifying any defects with Nav Aids is in place.

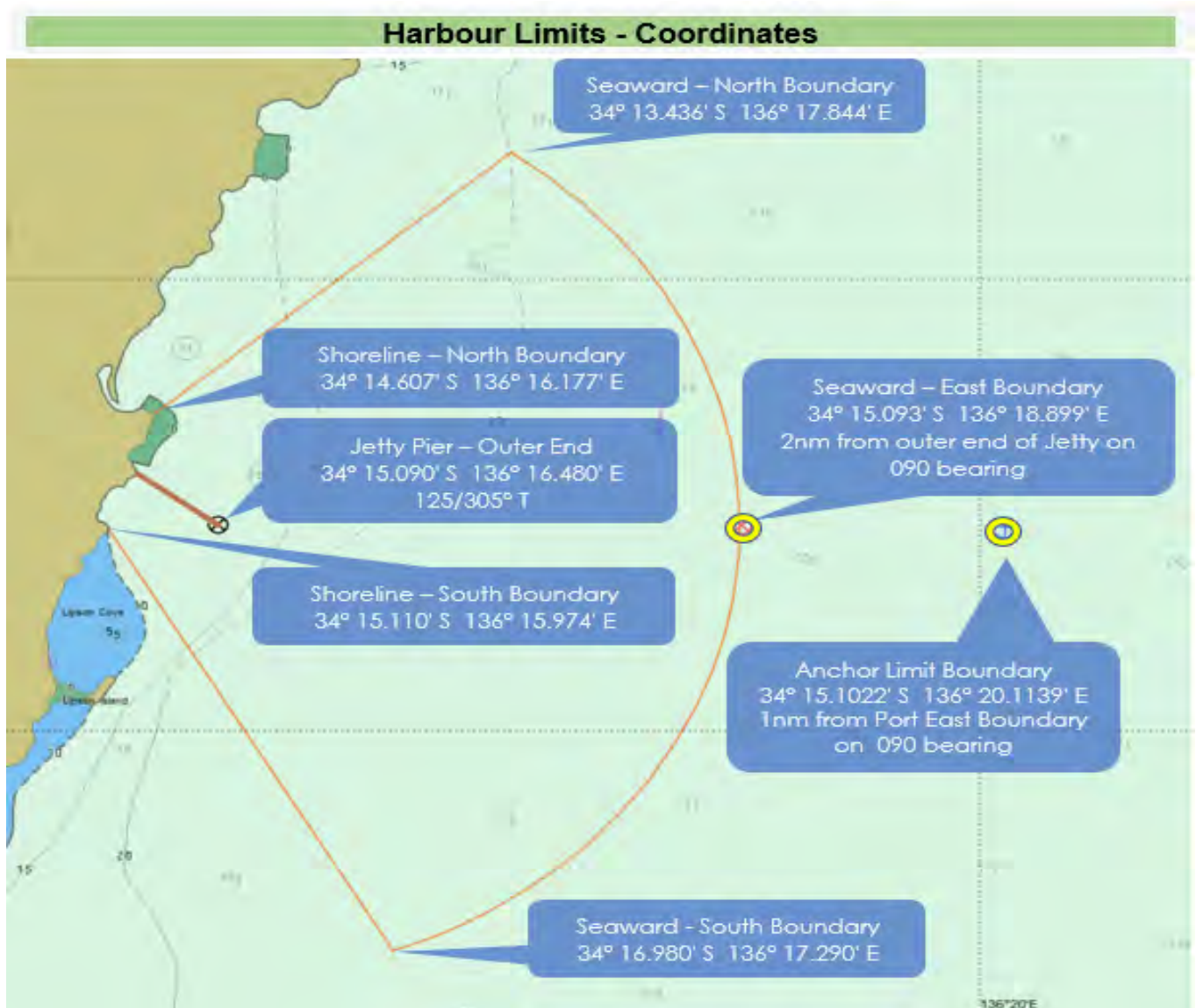
1.2 Datum

All water depths refer to the 'lowest astronomical tide' height (LAT). All positions in this Plan are in WGS84, however, Australia uses the Geocentric Datum of Australia (GDA94) coordinate system.

All directions are referenced to True North.

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2.0 Harbour Limits - Coordinates



Port Spencer Harbour Description – GDA94 Coordinates

Commencing at a point being the intersection of the median high-water mark with a straight line connecting a point defined by Latitude 34.2435400 degrees south and Longitude 136.2696767 degrees east with a point defined by Latitude 34.2239333 degrees south and Longitude 136.2974000 degrees east. Thence in a north easterly direction to the second point defined.

Thence following an arc with a radius of 2 nautical miles (3704.1 metres) from the end of the jetty at 34.2515000 degrees south and longitude 136.2746667 degrees east in a generally south easterly, southerly and south westerly to a point defined by latitude 34.2830000 degrees south and longitude 139.2881667-degree east.

Thence in a straight line on a bearing of 330 degrees true to the intersection with the median high-water mark. Thence generally northerly along the median high-water mark to the point of commencement.

3.0 Aids to Navigation Management Plan

The Port Spencer project will require new placement and maintenance of navigational aids. There are no existing NavAids in the vicinity.

NavAids will be established in two phases:

1. Construction Phase
2. Operations Phase.

During Construction Phase, it is envisaged that the use of 'special marks' in conjunction with notices to mariners, will sufficiently alert mariners of the works being undertaken in the vicinity to ensure safety.

During Operations phase, NavAids will be established suitable to ensure the safety of navigation in and near to the port for both bulk ships and other marine users. The precise NavAids required will be established by simulation report on the final port design when that is available. Presently, it is envisaged that the NavAids used will comprise a combination of:

- Physical NavAids displaying lights and sectors for safe approach to the jetty
- Virtual NavAids, used to show Pilot Boarding ground, points of no return, and limits of approaches.

Given there is little to no dredging required for the approaches to the jetty, a physically marked channel is unlikely to be required.

A comprehensive risk assessment for the final placement NavAids will be compiled once simulation of preferred lines of approach and departure is conducted.

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Peninsula Ports will ensure these requirements are addressed and met for the activities to be carried out within Port Spencer controlled areas, consistently with any existing procedures, guidelines or permits.

3.1 OBJECTIVES:

Element	Aids to navigation
Potential impacts	Ship collisions with potential human safety, damage to property and environmental consequences.
Performance objective	To design, install, maintain and manage navigation aids to support safe and efficient navigation within port limits.
Performance indicators	Safe navigation for shipping Safe navigation for boating including recreational, tourism and commercial fishing.
Monitoring and reporting	Navigation aids to be regularly monitored and maintained to ensure they are fully functional as intended Any navigational aid that is damaged, broken or not operating as intended to be reported to Port Spencer Harbour Master.

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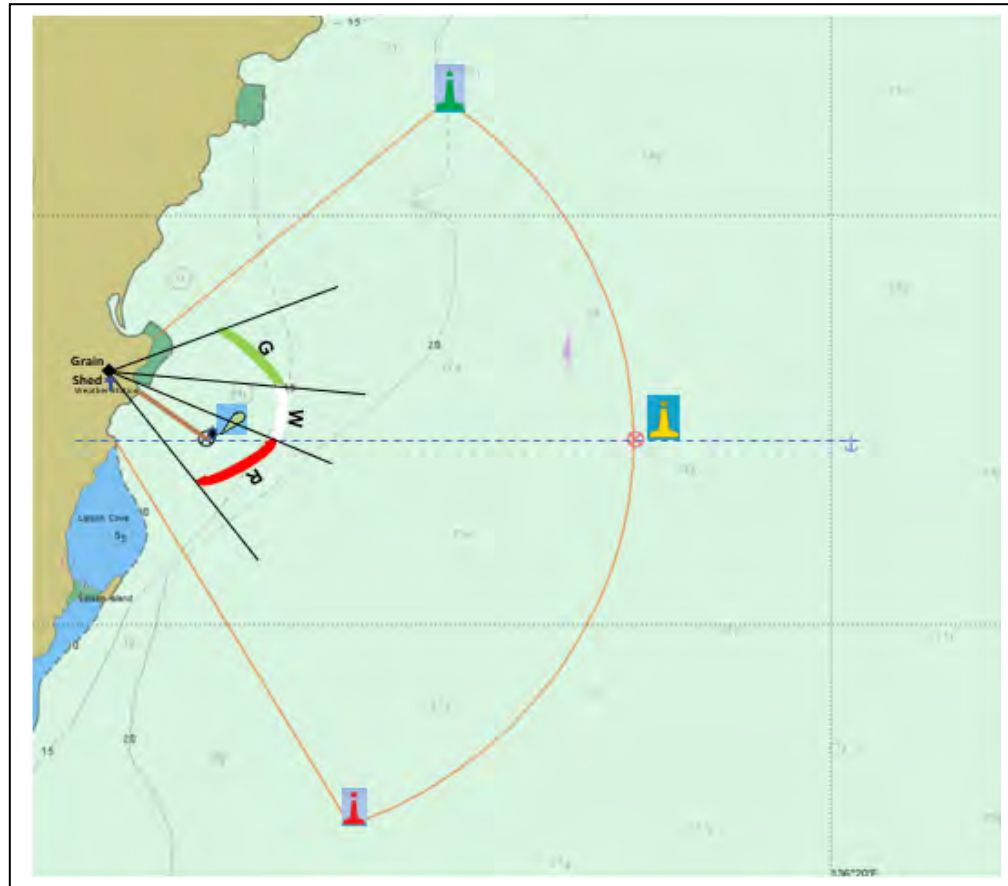
Management actions	Responsibility	Timing	Corrective actions
Design of navigation aids to be undertaken in consultation with HM, DPTI, AMSA and in accordance with IALA Guidelines.	PENINSULA PORTS appointed Contractor.	During detail design and prior to construction start of the project.	Design review/verification.
Virtual NavAids approved in accordance with AMSA requirements. Physical Nav Aids approved in accordance with SA DPTI requirements	PENINSULA PORTS.	During detail design and prior to construction start of the project.	Design review/verification.
Update DPTI, AMSA and AHO to support the revision of marine charts and Notice to Mariners by providing detailed drawings with coordinates of new navigation aids.	PENINSULA PORTS.	As soon as possible following any installation of new or removal /relocation of any navigation aids.	Re-survey of navigation aids location.
New sector light on grain shed for the inner port.	PENINSULA PORTS	Prior to completion of the project.	Review location and type.
New weather station	PENINSULA PORTS	Prior to completion of the project.	Review location and type.
Install Virtual marker buoys to demarcate the Northern and Southern port limits.	PENINSULA PORTS	Prior to completion of the project.	Review number, location and type of marker buoys.

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Regular inspection and maintenance of navigation aids.	PENINSULA PORTS	Prior to the provision of maintenance works or any	Undertake audit to identify any gaps.
Install temporary navigation aids and markings around port limits where required following RHM's assessment of navigation aid requirements	PENINSULA PORTS	During detail design and prior to construction start of the project.	Design review/verification.

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4.0 Harbour and Port Lights/Buoys - indicative only



5.0 Maintenance & Repair

Regular visual inspections for defective or damaged NavAids takes place during pilotage operations.

NavAids have been characterised into categories that prioritise response time in the repair of defective or damaged aids.

- Category 1 – 6 hours
- Category 2 – 24 hours
- Category 3 – Next working day

Where a safety risk is foreseen due to tides or weather conditions the NavAid will be repaired at the most reasonably practicable time thereafter.

NavAids are inspected and maintained by the Peninsula Ports Facilities Department.

NavAids management, including the maintenance scheduling and record keeping extend between the programmed maintenance management system (MEX) and a locally managed NavAid Register. The inspection and maintenance schedules are available to the Harbourmaster.

Information maintained in the *NavAids Information register* is available to the Harbourmaster and gathered as below.

NAME	Generally named after the mapped area that its located
POSITION	Coordinates
NUMBER	Numeric or alpha/numeric dependent on the positioning area
CATEGORY	Priority of response to initiate permanent or temporary repair
RESPOSNIBILITY	Which department has ownership of NavAid
DESCRIPTION	Details exactly what the NavAid looks like
CHARACTERISTIC	Details sequence/synchronisation of light
TYPE OF LIGHT	Model of light
DEPTH	Lowest Astronomical Tide (LAT)
RISER	Details of chains & connections to secure NavAid

CLUMP	Detail on concrete weight and connections to secure NavAid
DATE OF INSPECTION	Most recent inspections
COMMENTS	History and Records of NavAid
NEXT INSPECTION DATE	Date of next inspection

Peninsula Ports will provide the relevant authority (DPTI/AMSA) with a written request to establish, alter or remove a Navaid where safety or convenience of marine navigation is affected within the Port limits. Peninsula Ports will not act on a request until written approval of the relevant authority is received.

The Harbourmaster or their delegate have power to enter any land, including aboriginal land (without a permit) and transport goods through or over it to erect, inspect or maintain a NavAid that may be affecting safety or convenience of marine navigation within Port Spencer.

6.0 Mooring at Navigational Aids

A person must not moor, make fast or attach a vessel to an aid in Port Spencer.

7.0 Differential Global Positioning System (DGPS)

AMSA will discontinue its DGPS service on 1 July 2020 as the accuracy of GPS exceeds the accuracy provided by AMSA's DGPS service.

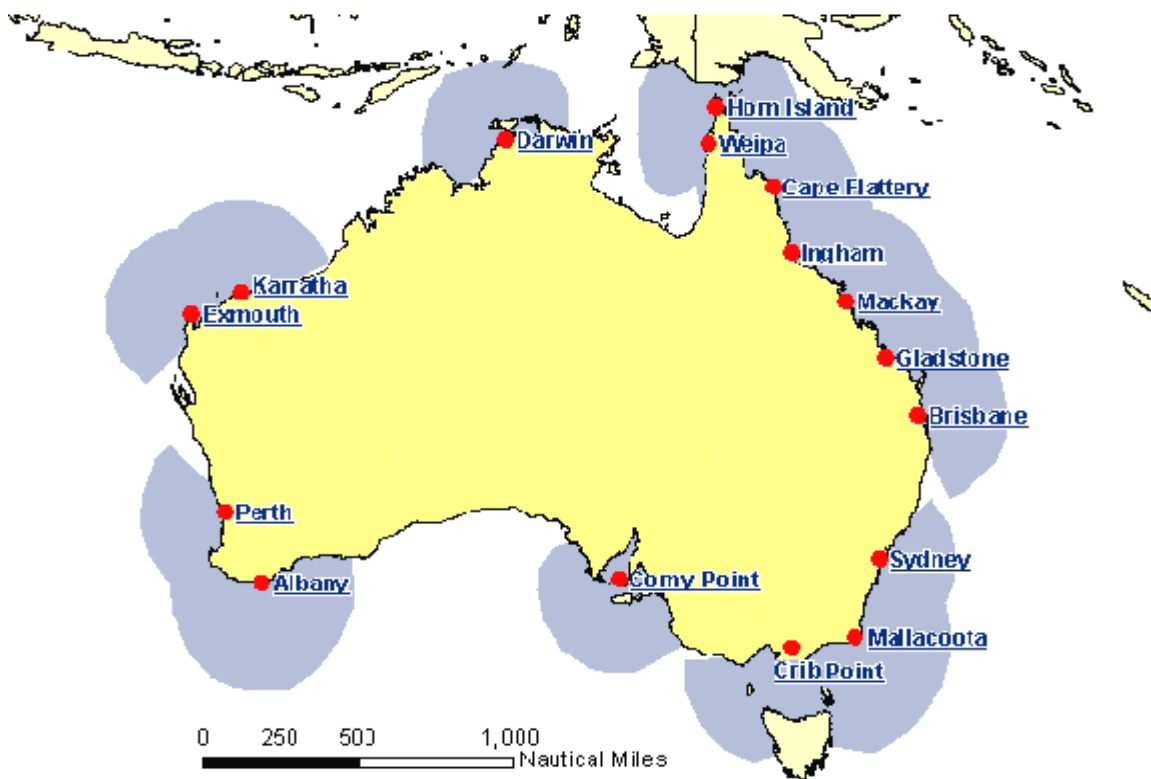
7.1 DGPS Sites and Location

Use of DGPS data enables mariners to improve positional accuracy with a GPS receiver to better than 5 meters. The DGPS broadcasts also provide a continuous check on the integrity of GPS.

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Australian DGPS Sites are located as follows:

- Sydney (NSW) on 308 kHz;
- Mallacoota (NSW) on 318 kHz;
- Crib Point (VIC) on 314 kHz;
- Corny Point (SA) on 316 kHz;
- Albany (WA) on 315 kHz;
- Perth (WA) on 316 kHz;
- Exmouth (WA) on 297 kHz;
- Karratha (WA) on 304 kHz; and
- Darwin (NT) on 294 kHz.



The data format for all stations conforms to international standards for the transmission of DGPS data in the maritime radio navigation band which is 285 to 325 kHz in the Australian region. Further details are available on the AMSA website:

<http://www.amsa.gov.au/navigation/services/dgps/index.asp>

When navigating on GPS and DGPS, it must be remembered that most Australian charts will require corrections to geographical position. Older charts in particular may contain errors of position, and users are advised to carefully read the Notes and Cautions on the chart.

When navigating with an Electronic Charting System (ECS) and GPS, prudent mariners must still monitor their position in relation to their surroundings using traditional methods, such as bearings and ranges.

7.2 Carriage and use of ECDIS

According to Regulation 19, Chapter V (Safety of Navigation) of SOLAS, ships must have nautical publications and nautical charts for the planning and the display on them the route of the intended voyage and the plotting and monitoring positions throughout the voyage. An electronic chart display and information system (ECDIS) with adequate back-up arrangements is accepted as it meets these up-to-date chart carriage requirements.

The IMO resolution MSC.282(86) has amended SOLAS Regulation V/19 to include a new paragraph (19.2.10) detailing a mandatory carriage requirement of ECDIS on certain kinds of ships engaged on international voyages depending on ship type, size and construction date. For example, cargo ships, other than tankers, of 50,000 gross tonnage and upwards constructed before 1 July 2013 must be fitted with an ECDIS not later than the first survey on or after 1 July 2016.

The 2010 Manila Amendments to the STCW Convention and Code have introduced several additional specific competencies in the use of ECDIS for masters and officers in charge of a navigational watch serving on ECDIS-fitted ships. Training requirements in accordance with the 2010 Manila Amendments become effective on 1 July 2013.

7.3 Carriage and use of AIS

The requirements for carrying an automatic identification system (AIS) are specified in Marine Order 27 made under the *Navigation Act 2012*.

AIS application includes:

- regulated Australian vessels
- foreign vessels in an Australian port
- entering or leaving an Australian port
- in the internal waters of Australia and in the territorial sea of Australia other than in the course of innocent passage.

Carriage of appropriate AIS is required for the effective use of Virtual NavAids as well as for collision avoidance.

AMSA will discontinue its DGPS service on 1 July 2020 as the accuracy of GPS exceeds the accuracy provided by AMSA's DGPS service.

How the discontinuation of DGPS by AMSA will affect you

For the vast majority of maritime users, discontinuation of DGPS should not impact the accuracy of satellite positioning or the safety of navigation.

There will be no impact on Stand-alone GNSS. However, GNSS receivers that have an integrated DGPS/DGNSS receiver, will no longer receive AMSA's DGPS corrections and may alert or alarm. This will be no different to what happens today as the receiver moves out of range of a DGPS stations.

The effects can be summarised as follows:

1. For GPS and DGPS capable receivers older than or fitted before 2003:
 - If your receiver is DGPS enabled, the receiver will no longer receive AMSA's DGPS signal. It will continue to receive GPS information. This information is likely to be accurate to better than +/- 10 metres.
 - Receivers that are older than or fitted before 2003 may not include an integrity monitoring capability. This means that they are unlikely to alert or alarm if integrity of the satellite signal is degraded.
 - If your GPS receiver is not DGPS enabled, then its performance will not change. For pre 2003 receivers, you should be aware that there is no integrity monitoring function built into your equipment.
2. For GPS, GNSS or DGPS receivers newer than and fitted after 2003:
 - If your receiver is DGPS enabled, the receiver will no longer receive AMSA's DGPS signal but will continue to receive GPS information. This information is likely to be accurate to better than +/- 10 metres.
 - Receivers newer than and fitted after 2003, will monitor the integrity of GPS information as received from GPS satellites. The receiver will alert or alarm if integrity of positional information is degraded.

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SHIP SOURCED POLLUTION PREVENTION MANAGEMENT PLAN

(MARINE POLLUTION)
PORT SPENCER

Version	Drafted	Checked	Approved
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1.0 Introduction

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

The waters of Spencer Gulf are internal to South Australia. Collectively, the Harbour Master and the port authority have responsibility for managing the safe and efficient operation of the port.

PENINSULA PORTS, as the port authority and owner for Port Spencer, will be responsible for developing and managing the project.

This Ship-Sourced Marine Pollution Prevention Plan is not intended to operate in isolation, it is to be read integrates with the:

- South Australian Marine Spill Contingency Action Plan (SAMSCAP)
- National Plan for Maritime Environmental Emergencies (National Plan)
- Port Spencer Emergency Response Plan
- Port Spencer ANNEX 1 – First Strike Response Plan

This plan should be interpreted for consistency with SAMSCAP and the National Plan, and in the event of any inconsistencies, SAMSCAP is to prevail.

2.0 Ship Sourced Pollution Prevention Management Plan Overview

This section identifies specific environmental management measures including strategies, timing and actions related to the shipping activities of the project which have potential impacts on the marine environment. In most cases, management actions need to be integrated in the broader site-based management plans, documentation and any conditions of approval imposed on the project.

PENINSULA PORTS will address and meet these requirements for the activities to be carried out within Port Spencer controlled areas, consistent with any existing procedures, guidelines or permits.

2.1 Introduction of Exotic Marine Organisms (Ballast Water)

Element	Introduction of exotic marine organism
Potential impacts	Harm to marine ecosystems Incursion of marine pests through ballast water or hull fouling
Performance objective	To reduce the potential for prohibited releases of ballast water to occur To reduce the potential for environmental harm to marine environments as a result of release from shipping, or translocation on foreign arriving vessels engaged for construction phase of the project through implementation of appropriate contingency measures.
Performance indicators	No incidents of environmental harm involving ballast water releases associated with commercial ships using Port Spencer Ballast summary sheets to be provided to Maritime National Coordination Centre for relevant shipping.

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Monitoring and reporting	<p>Ballast water movements must be recorded in ship manuals for verification consistent with Department of Agriculture and Water Resources (DAWR)/ Australian Maritime Safety Agency (AMSA) requirements</p> <p>Identification of exotic or foreign species in port waters will be recorded in PENINSULA PORTS's database and advise given to DAWR/Biosecurity South Australia accordingly.</p> <p>PENINSULA PORTS to continue to facilitate access by agency staff (Biosecurity SA, Department of Agriculture and Water Resources, etc.) to enable such staff to conduct their inspections and monitoring for the presence of marine and terrestrial pests as part of routine border protection surveillance</p> <p>PENINSULA PORTS to maintain existing surveillance for potential new incursions through its existing marine pest settlement plate program, and the annual SAP process as required under NAGD or other such programs as they come into effect under agency requirements.</p>
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Management actions	Responsibility	Timing	Corrective actions
International vessels are to comply with DAWR reporting requirements for ballast water exchange/discharge and biofouling.	Ship owner/operator, DAWR and Biosecurity SA.	Prior to entry into port.	DAWR to recommend necessary corrective or disciplinary actions as required.
Full ballast water exchange to occur outside Australian territorial waters and the Spencer Gulf.	Ship owner/operator to ensure only the following approved methods are used: Sequential exchange (empty/refill) method Flow through exchange method Dilution exchange method.	Prior to entering Australian territorial waters. No exchanges in the Spencer Gulf. International ships cannot exchange ballast water until in international waters (12 nautical miles from the edge of the SPENCER GULF). Ballast water cannot be exchanged in the Spencer Gulf.	AMSA carry out audits of ballast tanks to confirm that the ships have complied with these conditions. IMO rules are to be implemented: http://www.imo.org/Pages/home.aspx
Tank-to-tank shipboard ballast water exchanges to be outside Australian territorial waters.	Ship owner/operator.	Prior to entering territorial waters. Tank to tank transfers are permissible in territorial waters, however, it is ideal they are conducted at the maximum distance possible from land.	Transfer is to stop if unauthorised discharge occurs in Australia waters. Authorities are to be notified and will advise of the next appropriate action commensurate with the level of risk.
Sediment discharges in ballast water to occur outside Australian territorial waters.	Ship owner/operator to ensure that no sediment is discharged in Australian waters.	Ongoing.	Sedimentary material from ballast tanks may be landed as quarantine waste in some Australian ports, or it can be dumped back into the sea in deep water, which is at least 200m deep and outside the 12nm limit, but preferably beyond 200nm from land.

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Only permanent vessel pumps used for ballast tank stripping.	Ship owner/operator to ensure ballast tank stripping is only undertaken via permanent vessel pumps.	Ongoing.	If ship does not have pumps capable of stripping ballast, they will be unable to dump ballast. No portable pumps can be used due to potential contamination.
Ballast Water Management Plans to be carried by vessels.	Ship owner/operator to ensure vessels carry Ballast Water Management Plans.	Ongoing.	Australian Ballast Water Management Requirements are enforceable under the Cth <i>Biosecurity Act 2015</i> . Ships without a Ballast Water Management plan may be refused entry.

2.2 Release of Shipping Waste

Element	Release of shipping waste
Potential impacts	<p>Harm to marine life through entanglement and/or ingestion</p> <p>Harm to recreation and tourism through degradation of visual amenity</p> <p>Harm to human health through release of sewage</p> <p>Potential marine pollution as a result of accidental discharge from vessel within port limits</p> <p>Damage to environmental management reputation of PENINSULA PORTS.</p>
Performance objective	To prevent or reduce the release of shipping waste into the marine environment.
Performance indicators	<p>Waste releases into the marine environment are in accordance with relevant laws and standards</p> <p>No complaints from public or government agencies regarding noticeable waste, as a result of shipping activities.</p>
Monitoring and reporting	<p>Regular visual inspections of wharf areas</p> <p>Any complaints or waste release incidents will be recorded in PENINSULA PORTS's database in order to identify areas for actions or improvement.</p>

P E N I N S U L A P O R T S

Management	Responsibility	Timing	Corrective actions
Vessels are to carry and maintain Garbage Record Books.	Ship owner/operator. MARPOL requires ships of ≥ 400 gross tonnage and every ship certified to carry ≥ 15 persons to have a garbage record book to record disposal and incineration operations. The date, time, position of ship, description of the garbage and the estimated amount incinerated or discharged must be logged and signed.	Ongoing. The Garbage Record Book must be kept for a period of two years after the date of the last entry.	PENINSULA PORTS and AMSA to notify ship owner/operator of obligations.
Commercial vessels required to carry a Garbage Management Plan.	Ship Owner/operator. All ships of ≥ 100 gross tonnage and every ship certified to carry ≥ 15 persons. The Garbage Management Plan designates the person responsible for carrying out the plan and is in the working language of the crew. The Garbage Management Plan is to include written procedures for collecting, storing, processing and disposing of garbage, including the use of equipment on board.	Ongoing.	PENINSULA PORTS and AMSA to notify ship owner/ operator of obligations. Garbage Management Plans are subject to inspection by State or Commonwealth officials.

P E N I N S U L A P O R T S

<p>No discharge of sewage at sea unless at appropriate distance from land.</p> <p>No discharge of ground food waste within 3nm of the SPENCER GULF boundary</p> <p>No discharge of non-ground food waste or cargo residues within 12 nm of SPENCER GULF boundary.</p> <p>The treatment, quality and distance requirements for different vessel types are stipulated by SPENCER GULFA and SA MARINE SAFETY requirements.</p>	<p>Ship owner/operator and SA MARINE SAFETY.</p> <p>The regulations in Annex IV of MARPOL and the requirements of SA MARINE SAFETY prohibit the discharge of sewage into the sea within a specified distance of the nearest land, unless they have in operation an approved sewage treatment plant.</p>	<p>Whenever discharging sewage to sea.</p>	<p>Ships seeking to discharge sewage must move to the appropriate offshore distance prior to discharge, in accordance with MARPOL, SPENCER GULFA, SA DEHP and SA MARINE SAFETY requirements.</p>
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P E N I N S U L A P O R T S

Management actions	Responsibility	Timing	Corrective actions
Non-Cargo Liquid Transfer Notifications to be prepared for the transfer of any non-liquid cargo.	Ship owner/operator. Notification to be submitted to the RHM's office.	Must be submitted to the RHM's office prior to conducting non-cargo liquid transfer operations in the port. It is the responsibility of the vessel's Master to notify Port Control and VTS prior to commencing transfer and at completion of transfers.	If no notification occurs, then no liquid waste transfer can legally occur. If the transfer is still required, the RHM must be notified.
Inspections of Non-Cargo Liquid Transfer operations.	SA MARINE SAFETY.	Prior to undertaking non-cargo liquid transfers. Inspections, if required, will be arranged one hour before the start of transfer operations by SA MARINE SAFETY contacting the ship's Master.	Undertake inspections for non-cargo liquid transfers.
No wastes to be discharged to port waters.	PENINSULA PORTS, ship operators and DAWR.	Ongoing.	Informal surveillance and reporting of nonconformities. Garbage record book checks by DAWR.
Provision of port side bins.	PENINSULA PORTS.	Ongoing.	Review port side waste bin types and quantities and rectify.
Provision of quarantine waste bins.	PENINSULA PORTS and ship operator.	Ongoing.	Review requirements for quarantine waste generation and amend provided facilities as necessary.

2.3 Ship Sourced Spills and Pollution

Element	Spills
Potential impacts	<p>Impacts on water quality</p> <p>Mortality or long-term impacts on sea birds, marine mammals and coastal and marine habitats</p> <p>Damage to commercial fishing resources</p> <p>Impacts on tourism and recreational activities</p> <p>Economic loss at both the regional and national level</p> <p>Impacts to public health.</p>
Performance objective	<p>To eliminate or reduce spill of any substance into the marine environment from shipping traffic generated by the port</p> <p>Prevent impacts to the marine environment as a result of pollution from shipping activities.</p>
Performance indicators	<p>Accidental releases of any substance into the marine environment are avoided or promptly managed to avoid impacts</p> <p>No complaints from public or government agencies regarding noticeable spills as a result of shipping activities and port operations.</p>
Monitoring and reporting	<p>Opportunistic visual inspection of PENINSULA PORTS's controlled areas</p> <p>Any complaints or spill release incidents will be recorded in PENINSULA PORTS's database immediately in order to identify potential adverse impacts</p> <p>Spills to be reported to environmental and public health authorities, in accordance with legislation and port notices, incident reporting requirements.</p>

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Management actions	Responsibility	Timing	Corrective actions
Review stochastic modelling during spill event which is beyond First-Strike Response Plan to aid understanding of potential spill area and trajectory to determine appropriate management responses.	PENINSULA PORTS, SA MARINE SAFETY, DEHP and AMSA.	Immediately on identification of a spill event beyond First-Strike Response Plan.	Update spill response actions. AMSA to calibrate model based on observed spill behaviours and whether to refine for future events.
All dangerous goods in the port to be handled in accordance with the International Maritime Dangerous Goods (IMDG) Code.	PENINSULA PORTS, Ship owner/operator, tenants and transport companies.	Ongoing.	If handling of dangerous goods is not in accordance with IMDG then handling procedures to be ceased and reviewed. Handling can commence when procedures are in accordance with the code.
A Notification of Transporting and Handling Dangerous Goods (Marine) required for dangerous goods transfers.	Ship owner/operator.	Form is to be lodged at the RHM's office no later than 48 hours before the vessel's estimated time of arrival.	If the form has not been obtained, signed and lodged appropriately, further handling and transport of the goods cannot take place until a legitimate form has been obtained.
Bulk Fuel Transfer Checks to be undertaken for all bunkering.	Ship owner, supplier.	48 hours prior to bunkering.	Bunkering cannot take place until approved.
A Non-Cargo Liquid Transfer Notification is required for the transfer of non-cargo liquids.	Ship owner/operator.	Must be submitted to the RHM's office prior to conducting non-cargo liquid transfer operations in the port. It is the responsibility of the vessel's Master to notify Port Control and VTS before commencing transfers and at completion of transfers.	PENINSULA PORTS to maintain a register of approved operators and conduct appropriate audits.

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Refuelling to be undertaken by licensed refuelling operators with appropriate emergency response equipment.	PENINSULA PORTS and port operators/tenants to ensure licensed refuelling operators are used.	Prior to and during refuelling event.	Report breaches to appropriate regulatory authorities. PENINSULA PORTS to maintain a register of approved operators and conduct appropriate audits.
Follow incident response procedures.	PENINSULA PORTS implement appropriate incident response measures (First-Strike Response Plan). Port users in accordance with mooring agreements for common	During and following incident.	Review incident response measures to ensure effectiveness.
Australian system for pilotage to be adhered to for ships requiring pilotage.	Ship owner/operator.	Ongoing.	Report breaches to appropriate regulatory authorities. PENINSULA PORTS to consider issuing penalties as per Port Notices.
Mandatory recording of shipping movements.	SA MARINE SAFETY VTS.	Ongoing.	Systems to be reviewed to ensure shipping movements are recorded. Internal and external audits may be required to identify deficiencies.
Shipping activities to consider the prevailing weather conditions.	Ship operator and SA MARINE SAFETY.	Ongoing.	Shipping activities to be reviewed, reduced or stopped during weather warning periods.

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Port Spencer Emergency Response Plan to be activated in the event of a major spill, as defined under that plan.	PENINSULA PORTS, SA MARINE SAFETY and DEHP.	Ongoing.	Review and revise triggers for activation of Emergency Response Plan if current triggers are considered insufficient for changing port conditions.
South Australia Coastal Contingency Action Plan may be activated.	PENINSULA PORTS, SA MARINE SAFETY and DEHP.	Ongoing.	Review and revise triggers for activation of Contingency Action Plan if current triggers are considered insufficient for changing port conditions.
No discharge of bilge water at any time. (Bilge water discharge classified as oil spill).	Ship owner/operator.	Ongoing.	PENINSULA PORTS to ensure vessels are advised of bilge water management requirements.
Spoiled cargos and cargo residues to remain on- board ships for removal to onshore.	Ship owner/operator.	Ongoing.	Licensed waste service company to remove soiled cargos.
No discharge of any other substance from any ship unless to licensed contractor.	Ship owner/operator.	Ongoing.	SA MARINE SAFETY to investigate and implement corrective action as necessary.

PENINSULA PORTS

Management actions	Responsibility	Timing	Corrective actions
Reduction of accidental cargo loss through implementation of appropriate cargo storage and handling.	Ship owner/operator.	Ongoing.	Mechanisms for securing cargo to be reviewed by tenants and upgraded as necessary.

3.0 Prevention of ship-sourced pollution

3.1 Introduction

The Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987 and Protection of Marine Waters (Prevention of Pollution from Ships) Regulations 2013 outline the requirements for ship-sourced pollution management in South Australia coastal waters. This legislation also implements the International Convention for the Prevention of Pollution from Ships (MARPOL).

For commercial ships in South Australia, the major ship-sourced pollutants, from an operational perspective, are:

- oil and oily residues or mixtures (including diesel fuel, petrol and oil products)
- chemicals and chemical residues
- sewage
- garbage (including food wastes, paper products, rags, glass, metal, bottles, crockery, fishing gear, nets, bait boxes, deck sweepings, paints, wood products and all plastics).

It is an offence to discharge pollutants (either deliberately or negligently) into South Australia coastal waters and severe penalties apply. All pollution incidents must, by law, be reported to South Australia Maritime Safety, as soon as practicable, to ensure the response will minimise the effects of the pollutant.

All ships operating in South Australia waters must carry the applicable pollution prevention documentation.

A summary of the overall requirements for ship-sourced pollution management is provided in this document.

For complete details on the requirements for ship-sourced pollution management in South Australia; operators should refer to the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* and *Protection of Marine Waters (Prevention of Pollution from Ships) Regulations 2013*.

The National Standard for Commercial Vessels (NSCV) is the standard prescribed in the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*. It was developed as an upgrade and amendment to the Uniform Shipping Laws (USL) Code. NSCV Part E, formerly prescribed operational requirements for on board fuelling and oil pollution, bilge pumping, waste oil disposal, disposal of sewage and disposal of garbage procedures. Part E focuses primarily on safety of operations, leaving environmental standards now resting with state legislation.

3.2 Purpose

The purpose of this section is to provide guidance on preventing ship-sourced pollution, including information on requirements for the handling of oil, chemicals, sewage and garbage and to provide guidance on the safe transfer of bunkers in South Australia coastal waters.

It is intended that this document may be utilised to assist ship's masters, ship's agents, ship management companies, bunker barges and port development proponents to carry out their responsibilities with regard to preventing ship-sourced pollution.

3.3 Definitions

Terms, abbreviations and acronyms	Meaning
Berth	Any dock, pier, jetty, quay, wharf, marine terminal or similar structure, (whether floating or not) connected to the shore, at which a ship may tie up. It does not include floating plant,
Bunkering	The act of taking in fuel on board a ship.
Bunkers	Fuel such as oil stored in tanks and used for running ship's machinery
Bunker barge/ship/vessel	A self-propelled vessel or a self-propelled barge designed for the purpose of transferring bunkers. It does not include a
Coastal waters	The coastal waters of the State and includes other waters within the limits of the State that are subject to the ebb and
Dumb barge	A barge not fitted with propulsion machinery.
Emergency	Any circumstance which causes, or gives rise to a risk of, serious injury or damage to a person, property or the environment
Independent testing entity	An entity that is accredited by NATA as competent to perform analyses and performs, in Australia, analyses.
In test	The certificates validating the compliance of the equipment with the relevant Australian Standard(s) are current.
Marina	A buoy mooring, jetty or pile mooring or combination of them where, for a fee or reward, a ship is, or may be, anchored, berthed or moored
MARPOL	International Convention for the Prevention of Pollution from Ships
Master	A person having command or charge of the vessel.

NATA	The National Association of Testing Authorities, Australia (ABN 59 004 379 748)
National Law	<i>Marine Safety (Domestic Commercial Vessel) National Law Act 2012 (Cwlth)</i>
Oil Tanker	A vessel intended primarily for the bulk carriage of cargo in liquid form (including oil, chemicals and liquefied gas), and listed in column 6 (Ship type) of Lloyd's Register of Ships, as a tanker.

Terms, abbreviations and acronyms	Meaning
Prescribed ship (for sewage only)	<p>A ship that is engaged in an international voyage with a:</p> <ul style="list-style-type: none"> • gross tonnage of at least 400; or • gross tonnage of less than 400 and certified to carry more than 15 people. Note: See Annex IV to MARPOL, chapter 1, regulation 2.
Save-all	A receptacle or enclosure around air vent heads of oil tanks or around machinery such as a windlass or winch, to contain minor leakages.
Service Records	<p>Records for a treatment system, containing the following particulars about the maintenance or assessment of the treatment system.</p> <ul style="list-style-type: none"> • For maintenance of the treatment system: <ul style="list-style-type: none"> – the name of the authorised service provider that conducted the maintenance; and – the date the maintenance was carried out and any significant maintenance required to the treatment system. • For an assessment of the treatment system: <ul style="list-style-type: none"> – the name of the independent testing entity that conducted the assessment; and – the date and results of the assessment.
Sewage treatment system	<p>A system, installed on a ship, for treating sewage that:</p> <ul style="list-style-type: none"> • is able to reduce the levels of sewage quality characteristics in sewage to not more than the levels for treated sewage; and • conforms with the standard prescribed under a regulation. <p>Note: A sewage treatment system that has an International Maritime Organization (IMO) type approval and the relevant supporting documentation is deemed to comply with the South Australia requirements for a Grade A sewage treatment system.</p>

Ship (for oil record book only)	<ul style="list-style-type: none"> • A trading ship proceeding en-route on an intrastate voyage: <ul style="list-style-type: none"> – a ship, other than a Commonwealth ship under the Commonwealth <i>Navigation Act 2012</i> or a fishing vessel, that is used for or in connection with any business or commercial activity; and includes a ship that is used wholly or principally for: • the carriage of passengers or cargo for hire or reward; or • the provision of services to ships or shipping whether for reward or otherwise. • An Australian fishing vessel proceeding en route on a voyage other than an overseas voyage: <ul style="list-style-type: none"> – a vessel that is registered or entitled to be registered in Australia or in relation to which an instrument under the <i>Fisheries Management Act 1991</i> (Cwlth), section 4(2) is in force. • A pleasure vessel: <ul style="list-style-type: none"> – a vessel used wholly for recreational or sporting activities and not for hire or reward.
Slops	A mixture of oil and water resulting from the cleaning of tanks on board an oil tanker.
Sludge	Oily residue and or liquid waste taken from engine room and/or other bilge areas on a ship.
SOPEP	Shipboard Oil Pollution Emergency Plan

Terms, abbreviations and acronyms	Meaning
System documentation	<p>Documentation from the treatment system's manufacturer or supplier that states:</p> <ul style="list-style-type: none"> the treatment system's performance specifications under normal operating conditions; and the following information about the independent testing entity that performed the analyses of the sewage after it has been treated in the treatment system: <ul style="list-style-type: none"> the name and address of the entity; and the date and the results of the entity's assessment; or documentation equivalent to the documentation for the treatment system's performance specifications under normal operating conditions.
System service manual	<p>A manual for a treatment system that states the following particulars for the treatment system:</p> <ul style="list-style-type: none"> operating instructions maintenance schedules and requirements authorised service providers.
Transfer operations	<p>The transfer between a ship and a barge or other ship; or between the shore and a barge or ship, including all activities preparatory and incidental to the transfer, of the following:</p> <ul style="list-style-type: none"> flammable and combustible fuel for main propulsion and auxiliary operations lubricating and hydraulic oil for machinery waste oils, sludge and residues slops and tank washings grey water and sewage.
Ullage	The height of space in the bunker tank above the fuel contained therein.
Vessel	A Ship, as defined under the Domestic Commercial Vessel, as defined under the "National Law".
VTSO	Vessel Traffic Services Official

4.0 Oil and chemicals

4.1 Introduction

It is an offence to discharge oil or chemicals (either deliberately or negligently) into South Australia coastal waters. Under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*, severe penalties apply. Oil and chemicals that are generally carried aboard ships can include:

- petrol
- gear box oil
- motor oil
- two-stroke oil
- diesel
- hydraulic oil
- cooling system additives
- cleaning agents
- degreasers
- acid and paints

A high proportion of the ship-sourced oil and chemical pollution that enters the water comes from refuelling, vessel maintenance and bilge discharges. Operators must ensure that they use and dispose of all on board oil and chemicals correctly and safely.

Keeping bilges clean helps to reduce oil and chemical pollution. Use absorbents to mop up excess oil or fuel, wash bilges with biodegradable degreasers or detergents and dispose of any cleaning residue ashore.

If oil does spill into the water, use absorbent pads to mop it up or boom to contain the spill and let the State Marine Pollution Controller, marina manager or port authority know so that it can be cleaned up as soon as possible.

Note: Do not use dispersants or other cleaning chemicals on oil in the water because they can increase the toxic effects of oil spills.

4.1.1 Other requirements

There are several specific oil and chemical requirements that operators must adhere to:

A. SOPEP

(1) Having a shipboard oil pollution emergency plan (SOPEP) on board for all

ships that are:

- (a) more than 35 metres in length overall; or
 - (b) more than 24 metres in length overall carrying oil as cargo or a vehicle that is carrying more than 400 litres of oil as cargo
- (2) The SOPEP must be in the approved form, in the English language and include the following particulars:
- (a) a detailed description of the action to be taken by persons on board to minimise or control any discharge of oil from the ship resulting from the reportable incident
 - (b) the procedure to be followed by the ship's master, or someone else having charge of the ship, in notifying a reportable incident that is a discharge or probable discharge of oil involving the ship
 - (c) a list of the entities to be notified by persons on board if the reportable incident happens
 - (d) the procedure to be followed for coordinating with entities notified about the reportable incident
 - (e) the name of the person on board through whom all communications about the reportable incident are to be made

B. Oil Record Book

(3) Having an Oil Record Book on board for the following ships:

- (a) oil tankers of 150 gross tonnage or more
- (b) other than oil tankers, of 150 gross tonnage or more that carry oil in portable tanks with a capacity of 400 litres or more
- (c) other than oil tankers, of 400 gross tonnage or more.

The oil record book must comply with the requirements for an 'oil record book' under the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*. Entries must be made by the ship's master for all prescribed (recordable) operations or prescribed (recordable) events.

C. Prescribed Operations

For the purposes of section 11(5) of the Act—

- (a) each of the following operations (being a machinery space operation) is a *prescribed operation* in relation to a ship (including an

oil tanker):

- (i) the ballasting or cleaning of an oil fuel tank;
 - (ii) a discharge of dirty ballast or cleaning water from an oil fuel tank;
 - (iii) a disposal of oil residues (sludge);
 - (iv) a discharge overboard or other disposal of bilge water that has accumulated in any machinery space; and
- (b) each of the following operations (being a cargo or a ballast operation) is a prescribed operation in relation to an oil tanker:
- (i) the loading of oil cargo;
 - (ii) an internal transfer of oil cargo during a voyage or in port;
 - (iii) the unloading of oil cargo;
 - (iv) the ballasting of a cargo tank or a dedicated clean ballast tank;
 - (v) the cleaning of a cargo tank (including crude oil washing);
 - (vi) a discharge of ballast from a tank other than a segregated ballast tank;
 - (vii) a discharge of water from a slop tank;
 - (viii) the closing, after an operation referred to in subparagraph (vii), of all applicable valves or similar devices;
 - (ix) the closing, after an operation referred to in subparagraph (vii), of valves necessary for the isolation of a dedicated clean ballast tank from cargo and stripping lines;
 - (x) a disposal of residues.

Prescribed operations include the disposal of oil residues that are sludge and the discharge overboard or another disposal of bilge water that has accumulated in any machinery space.

D. Prescribed Occurrences

For the purposes of section 11(5) of the Act, each of the following occurrences is a *prescribed occurrence* in relation to a ship (including an oil tanker):

- (a) the discharge into the sea of oil or an oily mixture from the ship for the purpose of—
 - (i) securing the safety of the ship; or
 - (ii) saving life at sea;

- (b) the discharge into the sea of oil or an oily mixture in consequence of damage to the ship or its equipment;
- (c) the discharge into the sea of substances containing oil for the purpose of combating specific pollution incidents;
- (d) the failure of the ship's oil discharge monitoring and control system;
- (e) the discharge into the sea of oil or an oily mixture, being—
 - (i) a discharge for an exceptional purpose other than a purpose referred to in paragraph (a) or (c); or
 - (ii) an accidental discharge other than a discharge referred to in paragraph (b).

E. Recordable Events

Recordable events include:

- (a) a discharge into coastal waters of a noxious liquid substance necessary for the purpose of securing the safety of a ship or saving life at sea
- (b) a discharge into coastal waters of a noxious liquid substance resulting from damage to a ship or its equipment
- (c) a discharge into coastal waters of a noxious liquid substance, approved by an authorised officer, to combat specific pollution incidents to minimise the damage from pollution
- (d) a discharge exempted under section 22 or 27 of the *Protection of Marine Waters (Prevention of Pollution from Ships) Regulations 2013*.

4.2 SOPEP requirements

4.2.1 Spill response procedures

Spill response procedures outlined in the SOPEP should include:

- (1) method of raising the alarm
- (2) responsibilities of personnel on board
- (3) action to minimise or control the spill

- (4) method of cleaning up the spill
- (5) equipment to be used in controlling and cleaning up the spill
- (6) method of informing appropriate personnel and agencies of the spill and subsequent action taken.

4.2.2 Ship oil spill response equipment

All ships should maintain on board sufficient oil spill response equipment to respond effectively to the most likely types of spills that could occur during normal operations. An adequate number of personnel to assist in deployment of emergency equipment must also be available.

Oil spill dispersants cannot be used without prior approval from the relevant State Marine Pollution Controller.

4.3 Reporting

Under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*, the master of a ship must report a discharge or probable discharge of any pollutant without delay to the State Marine Pollution Controller. Pollutants are defined as harmful substances and include oils, chemicals, sewage and garbage. Even minor instances of marine pollution must be reported.

The local Vessel Traffic Service Centre is the means by which the relevant State Marine Pollution Controller should be advised of any pollution incident and can be contacted by VHF on the primary VHF communication channel 12 or 16.

Notification via VHF is to be followed by the completion of a POLREP (Pollution Report).

5.0 Safe transfer of bunkers

5.1 Introduction

Bunker transfer is not envisaged or catered for at the port of Port Spencer.

To ensure the transfer of bunkers in South Australia waters is completed in a manner that is safe and does not result in the discharge of pollution, adequate planning and preparation must be undertaken. In addition, certain limitations exist on the timing of transfer operations and the areas where this may occur along the South Australia coast. To ensure a safe standard of operation is maintained, the following considerations should be

considered when planning for bunkering.

5.1.1 Night transfer operations

The *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* places restrictions on transfers of oil or fuel between ships, between sunset and sunrise. In exceptional circumstances night transfer operations may be undertaken, subject to written approval from an Authorised Officer via the relevant State Marine Pollution Controller office and provided that the transfer operations take place in accordance with the conditions stated in the approval.

5.1.2 Double hull requirement

All oil tankers, including bunker barges that carry heavy fuel oil must be of double hull design. This requirement under MARPOL, which is administered by the Australian Maritime Safety Authority.

5.2 Planning for bunkering operations

The following aspects of the operations must be planned and communicated to all parties involved, including the relevant Harbour Master, not less than 24 hours prior to commencing bunkering.

Transfer of bunkers between ships at anchor may be undertaken provided:

- (1) the ship with greater length overall is anchored
- (2) both ships maintain their propulsion machinery ready for immediate departure.

Transfer of bunkers between ships moored alongside may be undertaken provided:

- (1) the bunker barge is securely moored to the ship using approved mooring points
- (2) both vessels are securely moored with respect to interaction from passing vessels
- (3) the deck watch maintains moorings.

A. For all bunkering operations:

- (1) weather conditions are appropriate, and moorings are adequate for anticipated weather throughout the operation; any weather limitations must be identified

- (2) moorings are adequate for predicted tidal conditions (height and current) and are tended (both ships) throughout the operation; any tide or current limitations must be identified
- (3) means of access ship to ship is maintained, whether at anchor or alongside
- (4) individual responsibilities of personnel involved in monitoring the transfer are clearly understood
- (5) all transfer apparatus to be used, including equipment, tanks and pipeline systems, should be checked to be in good working order
- (6) briefing with the fuel supplier should include the method of communication, pump rates and emergency stop procedures.

5.3 Transferring procedures

5.3.1 Preparation by ships receiving bunkers

Ships receiving bunkers should ensure the following preparations are completed:

- (1) plug scuppers to prevent spills from entering the water
- (2) check ullage and confirm volume to be supplied
- (3) check tanks, pipe system and pumps are set up and confirm any ship internal transfer processes
- (4) organise blank flanges where necessary
- (5) clean drip trays and save-alls
- (6) ensure emergency spill equipment is ready to contain and clean up any accidental spill
- (7) ensure no ignition sources are within 25 metres of any bunker flange and/or vent pipes associated with the transfer operation
- (8) ensure a visual watch is maintained throughout the entire transfer

operation

- (9) ensure all areas remain clean and spill free
- (10) the bunker hoses are well supported and are of sufficient length to allow for movement of the ship
- (11) any cargo handling in progress will not hinder bunker transfer operations.

5.3.2 Preparation by ships delivering bunkers

Ships delivering bunkers should ensure the following preparations are completed:

- (1) the bunker hoses are in good condition and are “in test” in accordance with the appropriate Australian standard, and the test certificate is available on request
- (2) the bunker hoses are well supported and are of sufficient length of allow for movement of the ship
- (3) the bunker connection has a good seal
- (4) there is a well tightened bolt in every bolthole of the bunker pipe connection flange
- (5) any hose spanning the water must be of a continuous length containing no joins or connections.

5.4 Responsibilities for ship and bunker supplier

A. Preparation

Prior to commencement of bunkering:

- (1) a bunker checklist must be completed (see Appendix A – example checklist)
- (2) spill and emergency management procedures must be agreed upon.
Once bunkering has commenced:
 - a) no smoking, naked flame or hot work is permitted
 - b) a constant visual watch is maintained throughout the entire

transfer operation, especially during start up and topping off

- c) weather and sea conditions must be constantly monitored, and moorings appropriately tended
- d) sufficient absorbent spill material is available on site to deal with any accidental spillage
- e) action must be taken to stop or contain any spill and the relevant port authority is immediately notified
- f) visual check of waters around ships to identify any spills.

5.5 Communication arrangements

During transfer operations there should be regular communication maintained between the ship and supplier. Once the method of communication is initially established, the following information should be exchanged:

- (1) confirm transfer starting and stopping procedures
- (2) confirm transfer rates, pressures and quantities
- (3) confirm emergency stop procedures
- (4) confirm method of raising the alarm in the event of an emergency.

5.6 Emergency procedures

Procedures for handling all emergencies may vary but should include as a minimum:

- (1) method of raising the alarm
- (2) responsibilities of key personnel
- (3) action taken by employees to ensure their own safety and the safety of those around them
- (4) action taken by employees to minimise the damage to property and environment
- (5) method of cleaning up a spill
- (6) method of informing Port Managers, government agencies, owners, charterers and their agents.

All ships involved in bunker transfers should maintain on board sufficient oil spill response equipment to respond effectively to the potential size of spill

that could occur during bunkering operations. An adequate number of personnel to assist in deployment of emergency equipment must also be available during the bunker transfer.

5.7 Reporting

All instances of marine pollution must be reported:

- (1) immediately to the State Marine Pollution Controller via the local VTS; and
- (2) this notification must be followed by the completion and submission of a POLREP form.

6.0 Sewage

It is an offence to discharge sewage (either deliberately or negligently) into nil discharge waters.

6.1 Requirements

There are also several specific sewage requirements that operators must adhere to, including:

- (1) All ships must be fitted with a macerator that cannot be bypassed
- (2) All declared ships must:
 - (a) be fitted with a sewage holding device (Note: The owner or master of a declared ship must not operate the declared ship in nil discharge waters for treated sewage or untreated sewage from a declared ship, unless the declared ship is fitted with a sewage holding device and each fixed toilet on the declared ship is connected to a sewage holding device.)
 - (b) carry a sewage disposal record book
 - (i) entries in the sewage disposal record book are to be made:
 - every time sewage in the ship's sewage holding device is discharged into a disposal facility
 - by the ship's master or other person in control of the discharge.

(ii) entries in a sewage disposal record book must:

- state the date, time, place and volume, in litres, of each discharge
- be made in the English language
- be signed by the ship's master or other person in control of the discharge.
- have a shipboard sewage management plan that must:

(iii) be written in the English language and state the following particulars:

- name, registration number and class of ship to which the plan applies
- size and type of the ship
- how the plan provides for the management of shipboard sewage and prevents the unlawful discharge of sewage from the ship
- waters, if any, where the ship may lawfully discharge sewage
- equipment the ship is fitted with for holding or treating sewage
- operating and maintenance instructions for the equipment
- how the equipment is operated to prevent the unlawful discharge of sewage into the waters where the ship is operating
- how the equipment is maintained and checked to ensure the

equipment is in proper working order.

- (3) All ships fitted with a sewage treatment system must:
 - (a) keep the sewage treatment system in proper working order
 - (b) ensure that the sewage treatment system conforms to the following minimum standard:
 - (i) include system documentation
 - (ii) include a comprehensive and durable system service manual
 - (iii) have a durable label attached to it, stating the manufacturer's name and address and the type and model number of the treatment system
 - (iv) be installed in accordance with the manufacturer's instructions
 - (v) be fitted with an indicator to indicate if the treatment system is malfunctioning
 - (vi) if sewage entering the treatment system is not macerated before it enters the treatment system—be fitted with a macerator before the treatment system's main treatment process starts to treat the sewage
 - (c) ensure that the sewage treatment system is:
 - (i) maintained, at least, at the intervals and in the way required by the treatment system service manual
 - (ii) assessed by analysing the sewage after it has been treated in the treatment system, as outlined below:

- the assessment must be performed by an independent testing entity at the following intervals after the treatment system is fitted to the ship:
 - for a declared ship, at least annually for the first two years and afterwards, at least every two years
 - for a ship other than a declared ship, at least once in the first five years and afterwards, at least every two years
 - the assessment must show that the levels of sewage quality characteristics remaining in the sewage after it has been treated in the treatment system are not more than the levels for the relevant grade of treated sewage for the treatment system
- (iii) keep the system documentation and system service manual on board and readily available for inspection at all reasonable times
- (iv) keep written service records for the treatment system and ensure they are kept on board and readily available for inspection at all reasonable times.

7.0 Garbage

It is an offence to discharge garbage (either deliberately or negligently) into South Australia coastal waters. Under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* severe penalties apply.

Items of garbage generally found on board ships include:

- food waste
- paper products
- rags
- glass
- metal

- fishing gear
- deck sweepings
- all plastics.

Operators can prevent garbage entering the water by:

- ensuring that nothing is thrown overboard
- having secure garbage bins/bags to store garbage on board until you return to shore
- retrieving garbage if it does enter the water.

Note: If shore facilities are not adequate for the disposal of your garbage, let the marina operator or port authority know.

7.1 Other requirements

There are several specific garbage requirements that operators must adhere to, including:

- all ships that are at least 12 metres in length overall must display a placard about garbage disposal that notifies the ship's crew and passengers of the prohibitions and requirements for the disposal of garbage

New international regulations requiring vessels and fixed or floating platforms to carry a garbage management plan came into effect on 1 January 2013. These requirements are part of MARPOL, which is in force in 151 countries and is applied in Australia by Commonwealth and state/territory legislation.

- if you are the shipowner/operator of a commercial or recreational vessel that is over 400 tonnes gross weight, or the vessel is certified to carry 15 or more passengers, or operate a fixed or floating platform, you are now required to carry on board a garbage management plan in accordance with the regulation.
- A garbage management plan must—
 - (a) provide written procedures for the collection, storage, processing and disposing of garbage, including procedures for the use of the garbage disposal equipment on board; and
 - (b) designate a person to be responsible for ensuring the plan is followed; and
 - (c) be in accordance with the guidelines developed by the IMO.

- If a garbage record book, in the form specified in the Appendix to Annex V of the 1978 Protocol, is not carried at all times on a ship to which this regulation applies, the master and the owner of the ship are each guilty of an offence.

8.0 Pollution prevention documentation

Ships operating in South Australia waters are required to carry documentation in relation to various aspects of pollution prevention. Failure to carry the required documentation is an offence. Penalties apply for non-compliance. The documents mentioned in this guide include:

- Shipboard Oil Pollution Emergency Plan (SOPEP)
- Oil Record Book
- Shipboard Sewage Management Plan
- Sewage Disposal Record Book
- Sewage Treatment System Documentation, System Service Manual and Service Records
- Placard about garbage disposal requirements
- Shipboard waste management plan (garbage).
- Pollution prevention for ships, required documents
- Pollution prevention documents, other than MARPOL documents, required for ships in South Australia waters.

9.0 Response Plan to Oil Spills

This plan has been prepared in accordance with the agreed arrangements of Australia's *National Plan for Maritime Environmental Emergencies* (National Plan) and the requirements for South Australia. The Marine Operations Group of Transport SA is responsible for the management of the National Plan in South Australia and for ensuring that State and Regional Plans are maintained to deal with oil spills wherever they occur in State waters.

Any pollution from a ship or notice of oil on any State waters can be reported to the nearest port operator, or:

P E N I N S U L A | P O R T S

*The Adelaide Outer Harbour signal station Telephone (+61) 8 82483505 or
Marine Operations Group, Transport SA, Telephone (+61) 8 83475025*

Port Spencer ANNEX 1 – FIRST STRIKE RESPONSE PLAN (below) deals with first-strike response to oil spills from ships and other marine sources within the port limits of Port Spencer, South Australia. See chart below for details of the port area.

The port limits *exclude* Lipson Island and Marine Operations (SA) is responsible for oil spill response in this area.



ANNEX 1 - FIRST STRIKE RESPONSE PLAN

(MARINE INCIDENTS)

PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	

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Response Container Content

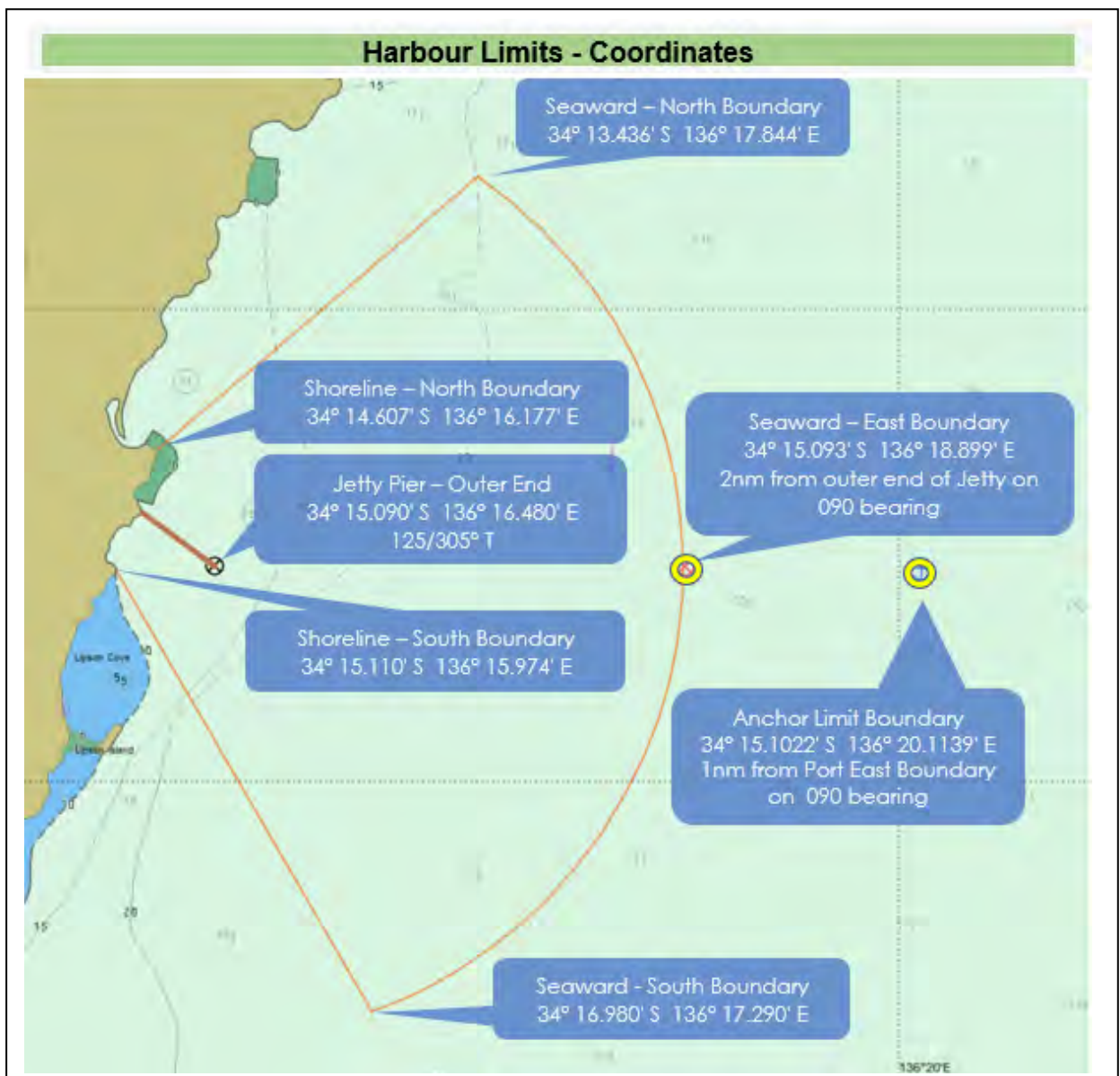
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ANNEX 1 FIRST STRIKE RESPONSE PLAN – OIL Pollutants

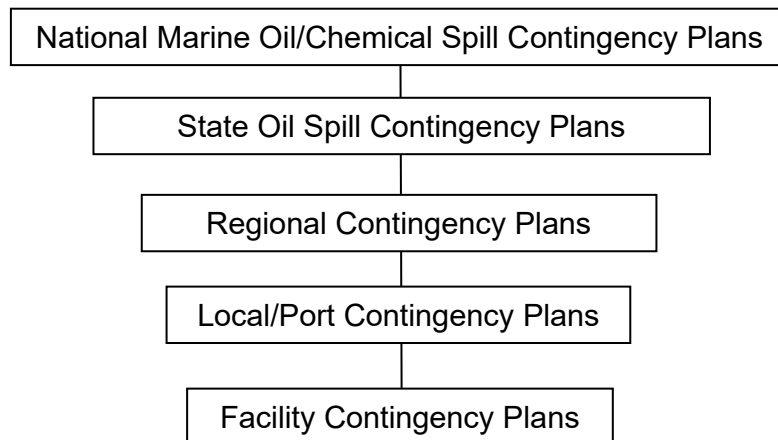
1.1 Objective

This First Strike Response Plan has been developed for the Port of Port Spencer to provide a response system proportional to the Oil Spill Risks identified within Port Limits from ships and other marine sources.

NOTE: Peninsula Port Authority – Port Spencer should be alerted to any incident involving marine pollution by oil to ensure immediate response on their behalf as well as appropriate support relating to the first strike plan.



1.2 National Plan – Hierarchy



1.3 Roles and Responsibilities

The roles and responsibilities for first strike response to oil spills within the port limits of Port Spencer are defined as follows:

- Maritime Safety South Australia (DPTI) is both Statutory and Combat Agency for ship sourced oil spills that impact South Australia Coastal waters and is the pre-designated Incident controller for all incidents within the scope of this plan.
- The port operator, PENINSULA PORTS is responsible for ensuring that an adequate first-strike oil spill response capability is maintained within the port limits of Port Spencer.
- Local councils generally assume responsibility for clean-up of oil impacted shorelines outside of National Parks. Depending upon the geographical location of stranded oil the District of Tumby Bay may be requested to undertake shoreline clean-ups operations following an oil spill within the port.
- The South Australian Marine Spill Contingency Action Plan (SAMSCAP) is managed by DPTI.
- The Marine Operations Group of Transport SA is responsible for clean-up of oil from beaches within National Parks.

Details of the roles and responsibilities may be found in *Appendix 1* to the Inter-Governmental Agreement on the National Plan.

The DPTI is the nominated SA Control Agency for oil spills in SA State marine and inland waters and will assume overall direction of emergency management activities in an emergency. Authority for control carries with it the responsibility for tasking and coordinating other organisations in accordance with the needs of the situation. The *Emergency Management Act 2004* (SA) identifies the SA Police as the coordinating agency for all emergencies.

The State Coordinator is the person for the time being holding or acting in the position of Commissioner of Police, therefore, the arrangements in SA will be;

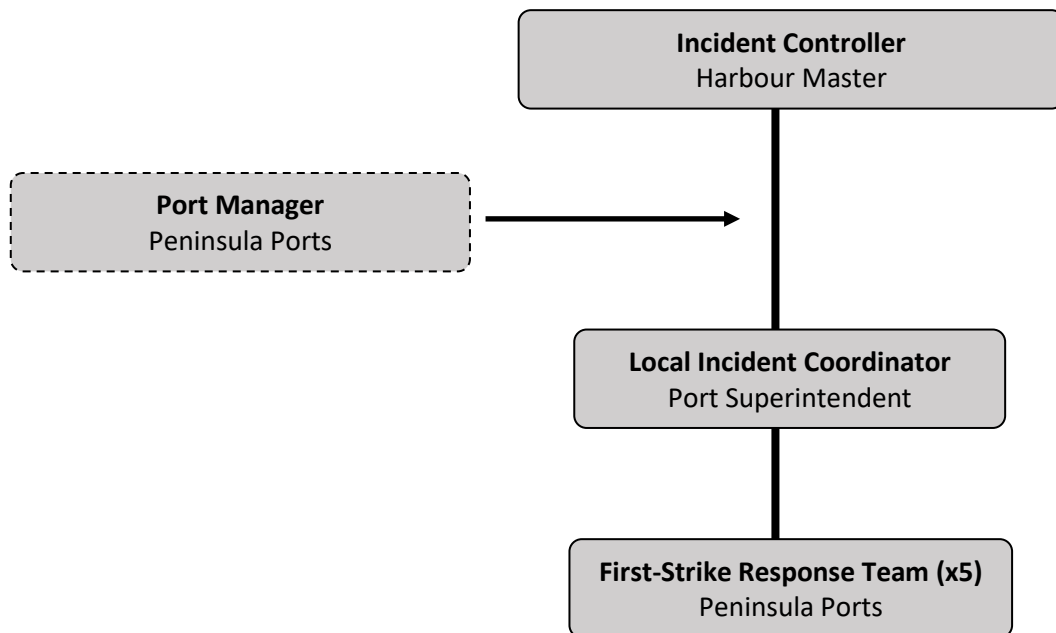
- SA Police will become the Coordinating Agency for any spill incident;
- DPTI will become the Control Agency for a spill within 3nm;
- DPTI provides the SMPC;
- DPTI will plan & execute the State arrangements for the incident within 3nm;
- DPTI will plan & execute the State shoreline arrangements for the incident within 3nm;
- DPTI will integrate the Port Spencer resources within its own command structure;
- DPTI will integrate the Port Spencer technical expertise within its own command structure

PENINSULA PORTS acknowledge that the responsibility for clean-up of a spill associated with its activities remains with PENINSULA PORTS and in the event of State or Commonwealth assistance all reasonable costs incurred will be recoverable.

The South Australia Marine Spill Contingency Action plan (SAMSCAP) is used as the basis for management of all oil spills outside port limits. This will also include an oil spill within the port limits if assessed as in excess of 10 tonnes, or otherwise agreed with the Port Spencer Incident Controller.

Port Spencer scope focuses on Level 1 marine oil spills (up to 10 tonnes) that occur.

1.4 Response Team Structure (trained personnel pursuant to



1.5 Constraints

The *Marine Parks Act 2007* (SA) and the *Marine Parks (Zoning) Regulations 2012* (SA) prohibit entering or engaging in any activity in a restricted access zone and prohibit certain activities in marine park zones (Lipson Island).

The regulations do, however, allow for a number of exemptions from prohibitions and restrictions, including for persons acting in the course of emergency. The definition of emergency provided in the regulations includes an event that causes or threatens to cause harm to the environment, so a permit may not be required. If Peninsula Ports is directed by the State to undertake spill response activities in a marine park zone, Peninsula Ports will only undertake these activities once permit requirements are confirmed.

1.6 Scope

This plan describes the specific actions to be taken in the event of a spill from any of the identified high-risk incident locations identified within the port limits.

The Basic components of this first strike plan are as follows:

- Predictions of oil trajectory, impact areas & weathering processes (predetermined);
- Response protection priorities (predetermined);
- Response strategies e.g. contain & recover with booms and skimmers (predetermined);
- OH&S involved in the operation, including hazards & control measures;
- Waste Management;
- Personnel - number of responders needed;
- Equipment – the type of equipment and the ancillaries and logistics required;
- The expected realistic timing for the operation; and
- Clear communications for the response operation.

1.7 Overview of response systems in Port Spencer

The four key response strategies considered most effective for the perceived risks at Port Spencer are,

- Stop the spill at its source
- Monitor and evaluate (Helicopter)
- Protection of key resources using containment boom (Jetty, Port shoreline)
- Containment and Recovery (on water collection and skimmer systems as soon as practicable)
- Shoreline clean-up (outer port beaches – Rogers beach, Lipson Cove beach)

The strategies were considered as most appropriate considering the brevity of available time to commence a **response facility's proximity** to immediate assistance and sensitive environmental areas close by.

These above selected strategies were also deemed appropriate in consideration of the constant changing profile of the Port waterways

during the construction of new facilities.

1.8 Environmental Protection Priorities

No FSRP can guarantee complete protection of the marine environment from an oil spill. The FSRP provides a realistic response system designed to protect the key resources identified as being under threat from a marine oil spill event within Port Limits.

1.9 Threat assessment

The most likely type of pollution incidents to occur within the port are small operational discharges from the tugs and multi-purpose vessel. However, there is also a chance of larger operational discharges of fuel oil or waste oil from the visiting bulk carriers at the berth and/or significant spills of heavy fuel oil resulting from contact incidents within the port.

1.10 Possible Spill Scenarios

The types of incidents most likely to occur within the port are small spills of petrol, diesel fuel or bilge oil from operational vessels operating in the port.

Spills of up to:

- 300 tonnes of heavy fuel oil and other oil products from Bulk Carriers involved in serious striking or grounding incidents within the port;¹
- 10 tonnes of bunker fuel or bilge oil during ships' internal transfer operations;²
- 50 litres of diesel fuel or bilge oil from operational vessels could also occur in the port.

Large spills of fuel oil and other oil products and from road tankers or other land-based sources are also possible.

¹ See for example Pacific Adventurer bunker spill in 2009: <https://www.amsa.gov.au/marine-environment/incidents-and-exercises/response-pacific-adventurer-incident-strategic-issues>

² See for example Global Peace Bunker spill in Gladstone in 2006: <https://www.amsa.gov.au/marine-environment/incidents-and-exercises/global-peace-oil-spill-report-incident-analysis-team>

1.11 Response and Handover Arrangements

Early first-strike response action should include an assessment of the time and resources required to effectively manage each incident. Where a response is likely to be prolonged or exceed the port's first-strike response capacity, Port Spencer should request assistance from Maritime Safety South Australia. When determining the need for assistance or hand-over of the response Port Spencer should consider the number and availability of local trained response personnel, their ability to work safely without the need for excessive work hours, and the capacity of the ports' first-strike response equipment. Requests for assistance should be made as soon as possible and preferably in the first or subsequent SITREPs.

Level one spills might require dispersant spraying, although approval will be sought from the State Marine Pollution Controller (SMPC). Only Prescribed officers under SAMSCAP and the National Plan may authorise the use of Dispersants.

In the first instance following a spill, Peninsula Ports Response Team and Vessels (including tugs as appropriate) may be utilised for:

- Deployment of boom
- Containment of any surface oil
- Monitoring and reporting of oil type, quantity and extent of surface coverage
- Initial clean-up response; and
- If instructed by SMPC, application of dispersants.

If approved, the surface application of dispersants may be an effective response tool on hydrocarbons, as long as they can be applied to fresh oil and during the dispersant "window of opportunity".

1.12 Peninsula Ports Incident Control Centre

Port Spencer VTS will, in the first instance for a tier 1 oil spill, act as the Incident Control Centre and communications hub for Peninsula Ports. If required, and subject to guidance from the SMPC, an Incident Control Centre may be upgraded or transferred to another location for an ongoing or higher-level Tier 2/3 response.

1.13 Initial Assessment

All Oil spills reported to the VTS should be assessed immediately and the appropriate response plan activated. The initial assessment should determine if:

- Is it safe to respond? (MSDS)
- Can we stop the spill at its source?
- Has the discharge stopped?
- Where is it going? (Ebb or Flood Tide)
- When will it get there?
- Which prepositioned system should be deployed first? (flood tide)
- What receptors will be impacted outside the harbour? (ebb tide)
- Is it safe to employ those response strategies?

1.14 Lipson Island Fauna Conservation Reserve

Lipson Island Fauna Conservation Reserve is a Category III Natural Monument or Feature (based on the International Union for the Conservation of Nature or 'IUCN' categorisation). The Primary objective of the Lipson Island Fauna Conservation Reserve is to protect the outstanding natural features and associated biodiversity and habitats in and near to Lipson Island. IUCN Category III is related to the conservation of the natural feature itself, in this case, Lipson Island and its immediate vicinity.

The Lipson Island Fauna Conservation reserve, established in 1967, is centred on Latitude 35.2638 S Longitude 136.2658 E, is 8 ha in area, and is primarily a marine reserve.

Any spill response must give proper attention to the protection of the Lipson Island Fauna Conservation Reserve and its natural environment.

Diagram needed for oil spill planning and training purposes:

1.15 Response considerations and options

Location	Monitor	Contain & recover	Protect Resources	Shoreline Clean-up	Apply Dispersant
Jetty	Yes	If practicable	If practicable	If practicable	If authorised
Lipson Island Fauna Conservation Reserve	Yes	If practicable	YES	YES	NO
Shoreline	Yes	If practicable	If practicable	If practicable	If authorised

1.16 Response Level Determination

Response Level Indication	Level3	Level2	Level1
Spill Details			
Release Volume	> 300m ³	10m ³ – 300m ³	< 10m ³
Continuous release	Yes	No	No
Hydrocarbon has high persistent component	Yes	Yes	No
Resolution likely to take	> 2 weeks	48hrs to 2 weeks	< 48hrs
Spill Impact			
Actual or potential threat to, or	Yes	No	No
Adverse impact on public or	Yes	Possible	No
Oil will reach the shoreline	Yes	No	No
Media coverage likely	International	National	Local
Likely Resources Required			
International resources required, International agencies and government involved	Yes	Possibly	No
Regional resources required; multiple agencies involved	Yes	Yes	No
Peninsula Ports resources on hand will be sufficient	No	No	Yes

1.17 Oil Spill Response Mechanism Overview

1.17.1 Appropriate Equipment

PPA-PS has oil spill response equipment which:

- Is capable of containing and recovering oil rapidly in accordance with the expected response time available;
- Able to contain and recover a 120-tonne spill of Heavy Fuel Oil within 2 hours of deployment
- Is able to store and transfer up to 150 tonnes of Heavy Fuel Oil recovered to two 50t storage bladders as well as two 10t towable storage bladders
- Has a dedicated first response vessels (M P V) used for towing booms into position and skimming
- Equipment for a team of 20 shoreline responders.

1.17.2 Training

The Port Spencer Port Authority has in place a targeted training regime which provides a training pathway for responders to develop their skills in mounting a first strike response with the available equipment.

1.17.2.1 Training Regime & Exercises

Table 1 is the training regime developed to prepare sufficient personnel for the required response operations as shown in the First Strike Plans.

TABLE 1 TRAINING REGIME			
TRAINING OR QUALIFICATION	NUMBER REQUIRED	PURPOSE OF TRAINING	REVALIDATION FOR TRAINED PERSONNEL
Restricted Coxswain	2	Meet legal obligations and ensure safety	As required by National regulations
Introduction to oil spills	all	Provide all site-based personnel with an understanding of oil spill response operations	2 basic courses every year
Shoreline assessment and clean-up	2	To lead an assessment team and commence clean-up operations	2 years
Aerial observers course	2	To gain skills required to make an assessment of spill location and extent	2 years
Equipment Operator	6	Capable responders to deploy on-shore and off-shore equipment in accordance with the First Strike Plans.	1 year
Oil Spill Team leader	2	Able to plan a response operation and manage offshore operations	Ongoing training provided up to 3 sessions per year

TABLE 2 TRAINING EXERCISES			
EXERCISE TYPE	PERSONNEL TO ATTEND	TESTING RESPONSE OPERATIONS	FREQUENCY
Desktop and planning	PPA- PH	Planning and cooperative	Annual
PPA-PS	Restricted Coxswains, Operators and Team Leaders	Continuous improvement of deployment operations	Annual

1.17.3 Responsibilities / Actions

Standard Work Instructions (SWI) have been formalized for all likely deployments of the leased oil spill response equipment by PPA-PS. This gives responders a prompt sheet to reference at any time rather than waiting for plans and instructions to be given. These are located at the site of the equipment as well the intranet and in the VTS office.

1.18 Floating Oil

The risk assessment, local experience and trajectory modelling all show that spilled oil will only be adrift for a few hours within the port before it enters the shoreline and beaches.

It is likely that oil emanating from all the high-risk incidents listed, could impact receptors in less than 1 hour.

First Strike response for floating oil:

Contact VTS immediately and request an on-water response operation to recover floating oil. Deploy MPV to commence skimming of floating oil, utilise MPV to tow booms into position from the Response Container.

1.19 Oiled Shorelines

The sandy shorelines provide an opportunity to recover oil which travels with the currents running parallel with the shorelines.

First Strike response for risk to or already oiled shorelines:

PPA-PS will deploy their stock of shore sealing booms and GP booms to establish several collection points on the identified beaches and to protect Lipson Island. The collection points identified also require oil recovery and storage equipment and access for servicing the equipment.

1.20 Oiled Wildlife (Shoreline Clean-up)

Only trained personnel in wildlife capture and cleaning should attempt to collect oiled wildlife.

At this stage the prompt notification of a spill and identified impact areas should be transmitted ASAP to DAW personnel to respond appropriately to the identified risks.

The highest risks to wildlife have been identified in the risk assessment as:

- Sea Birds

The OWRP will specify the estimated numbers of oiled birds, and the capture, transport, cleaning and rehabilitation of the animals.

1.21 Stopping the spill at the source

It may be possible to place a boom on the hull of the ship to capture leaking oil. This should only be attempted in close consultation with the Harbour Master and the ships Master and Chief Engineer. This should be done only after the appropriate equipment has been deployed to protect the jetty, beaches and environmental sensitive areas.

It is always a good idea to place a boom around the damaged area of a ship even if the leak has stopped in case of a secondary release; however, time does not permit this to be done prior to other protection

systems in the case of Port Spencer. As with all response systems, this should be exercised and tested.

1.22 Response Plans

The following response plans specify the potential of a spill to a particular location, along with response tactics and resource options.

1.22.1 Containment in Port Limits

Purpose: The purpose of the primary containment procedures is to reduce the likelihood of oil impacting the Port Limits.

The MPV is located at the Jetty able the capture and recovery of oil entering the Jetty area.

Response Tactics: Direct oil into the skimmer catchment area using the on-board booms, blower and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: The resources required for this operation are in the Response Container

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the Jetty.

1.22.2 Containment at Lipson Island

Purpose: To reduce the opportunity for oil to enter Lipson Island and reduce the impact.

Response Tactics: Direct the oil using the on-board booms (tugs) and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: Resources required are on board the MPV and Tugs

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the spill site.

1.23 EQUIPMENT LIST

Response Container Content

RESOURCES FOR CONTAINMENT	
RESOURCES	QTY
General Purpose Boom - Flex	300m
Land Sea Boom Kit (boom, pump & blower)	600m
Weir Skimmer Kit (skimmer & spate pump)	1
Flexi-Dam recovered oil storage container - 25 tons approx. - each	2
Anchor Kit	1
Sorbent Boom	120m
Sorbent Pads	500
Sorbent Mops	120
Bag of rags	1
Box of ear plugs	1
Sunscreen	1
Gloves	5
Hand cleaner	1
Tool bag	1
Inflatable life jackets	5
Box of spares	1
First aid kit	1
Shade tent	1

end of document

Appendix A: Bunker Transfer Checklist

Bunker transfer checklist			
Name of ship		Berth	
Start date/time		Finish date/time	
Product		Quantity	
Checklist			Yes/ No
1	Is the ship securely moored?		
2	Is there safe access between ships or ship/shore?		
3	Is the ship ready to move under its own power?		
4	Is there an effective and dedicated bunker watch in attendance on board?		
5	Means of communication between ship and supplier: o handheld radios o staff at manifolds o other		
6	Has emergency shut down procedure been agreed?		
7	Has the bunker tank and pipe system to be used on the ship been identified, tank ullage taken and volume to be received confirmed with		
8	Has information on firefighting & emergency procedures been exchanged?		
9	Is oil response equipment on hand and ready for use, with sufficient absorbent material available to deal with any accidental spill?		
10	Are all scuppers and other deck openings securely plugged or sealed?		
11	Is there an empty, plugged save-all or drip tray under the manifold connection?		
12	Are unused bunker connections closed, flanged and secured?		
13	Are bunker hoses: Of sufficient length to allow for ship-movement o in test o in good condition o properly rigged		

PENINSULA PORTS

14	Are all connections o bolted o fitted with secure camlocks o both	
15	Are hoses spanning the water continuous with no connections?	
16	Are "No Smoking/No Naked Flame" regulations being observed, including signage?	
17	Are sufficient personnel on board & ashore to deal with an emergency?	

Emergency contacts in event of spill

VTS VHF Ch: 16 Tel: TBA

The items in this checklist have been verified and the entries made are correct to the best of our knowledge.

Ship

Name & Rank:

Signature:

Barge/shore operations

Name & rank:

Signature:

10 JANUARY 2020



EMERGENCY RESPONSE PLAN

(MARINE INCIDENTS)

PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	
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A. ACRONYMS

AIIMS	Australasian Inter-services Incident Management System AMSA
AMSA	Australian Maritime Safety Authority
ATSB	Australian Transport Safety Bureau
AUS	Australia
Avgas	Aviation gasoline
CCU	Casualty Coordination Unit
CEO	Chief Executive Officer
CST	Centistokes
DEW	Department Environment and Water
DFES	Department of Fire and Emergency Services DOT Department of Transport
DPAW	Department of Parks and Wildlife
DPTI	Department of Planning, Transport and Infrastructure South Australia
EPCB	Environment Protection and Biodiversity Conservation Act 1999 FLIR Forward Looking Infra-Red
FSRP	First Strike Response Plan
G10	Automotive diesel fuel
GMMS	General Manager Marine Safety
HFO	Heavy Fuel Oil
HMA	Hazard Management Agency
IC	Incident Controller
IFO	Intermediate Fuel Oil
IMT	Incident Management Team
IPIECA	International Petroleum Industry Environmental Conservation Association
ITOPF	International Tanker Owners Pollution Federation Limited Jet A1

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	Aviation turbine fuel
JHA	Job Hazard Analysis
MARPOL	International Convention for Prevention of Pollution from Ships
MGO	Marine Grade Oil
MOP	Marine Oil Pollution
MPCP	Marine Pollution Contingency Plan MSDSMaterial Safety Data Sheet
MTE	Marine Transport Emergencies NATO F76 Naval distillate
NEBA	Net Environmental Benefit Analysis
NRT	National Response Team
OPRC	International convention on Oil Pollution Preparedness, Response and Co-operation 1990
OSCA	Oil Spill Control Agent
OSIRT	Oil Spill Incident Response Team
OSRA	Oil Spill Response Atlas
OSTM	Oil Spill Trajectory Modelling
OWRP	Oiled Wildlife Response Plan
OWR	Oiled Wildlife Response
P& I	Protection and Indemnity
PPA	Peninsula Ports Authority
PPA-PS	Peninsula Ports Authority Port of Port Spencer
POLREP	Pollution Report
RCC	Rescue Coordination Centre
SA	South Australia
SAR	Synthetic Aperture RADAR
SITREP	Situation Report
SLAR	Side Looking Aerial RADAR SMPC State Marine Pollution Coordinator SMS

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	Safety Management System
SRT	State Response Team
SWI	Standard Work Instruction
ToTB	Town of Tumby Bay
ULP	Unleaded Petrol
VTs	Vessel Traffic Service
VTSC	Vessel Traffic Service Centre
VTsO	Vessel traffic Services Officer

1.0 INTRODUCTION

The Emergency Response Plan relate to incidents that affect the operational capability of the port. This document has been developed in accordance with the guidance in:

- National Plan for Maritime Environmental Emergencies (National Plan)¹
- AMSA: Technical guidelines for preparing contingency plans for Marine and Coastal Facilities²
- SAMSCAP: South Australian Marine Spill Contingency Action Plan³
- SA Oiled Wildlife Response Plan⁴

1.1 Governance

1.1.1 National Governance

The National Plan is a cooperative arrangement between the Commonwealth, States, the Northern Territory and industry and is administered by AMSA.

The organisation of day to day (preparedness) management of the National Plan is set out in the National Plan.

Each state has prepared its own State Plan which sets out each State's/Northern Territory's arrangements (in SA this is SAMSCAP).

1.1.2 SA State Governance

The *State Emergency Management Plan*⁵ is written pursuant to the *State Emergency Management Act - 2004*⁶.

This Plan outlines responsibilities, authorities and the mechanisms to prevent, or if they occur, to manage and recover from major

¹ <https://www.amsa.gov.au/marine-environment/national-plan-maritime-environmental-emergencies>

² <https://www.amsa.gov.au/sites/default/files/2015-04-np-gui012-contingency-planning.pdf>

³ https://www.environment.sa.gov.au/files%2Fsharedassets%2Fpublic%2Fplants_and_animals%2Fanimal_welfare%2Fsa-marine-spill-cont-action-plan.pdf&usg=AOvVaw0Fzva7RKq5uQfku1MnZgpP

⁴ <https://www.environment.sa.gov.au/topics/plants-and-animals/animal-welfare/oiled-wildlife-response-plan>

⁵ <https://www.dpc.sa.gov.au/responsibilities/security-and-emergency-management/state-emergency-management-plan>

⁶ <https://www.legislation.sa.gov.au/LZ/C/A/EMERGENCY%20MANAGEMENT%20ACT%202004.aspx>

incidents and disasters within South Australia.

1.1.3 South Australian State Marine Pollution Management Committee

The South Australian Marine Pollution Management Committee oversees the management of pollution response preparedness and consists of representatives from State, Local Government and non-government agencies and industry members.

The South Australian Marine Pollution Management Committee is a sub-committee of the State Response Advisory Group (SRAG).

1.2 Scope

This plan applies to operational emergencies that occur within or that may affect Port Spencer and adjacent controlled waters up to a 2nm radius from the end of the jetty within Port limits.

The operational emergencies covered by this plan are categorised as follows;

- General Marine incidents
- Marine pollution emergencies (Marine Pollution Contingency Plan)
- Landside operations incidents
- Aircraft incidents

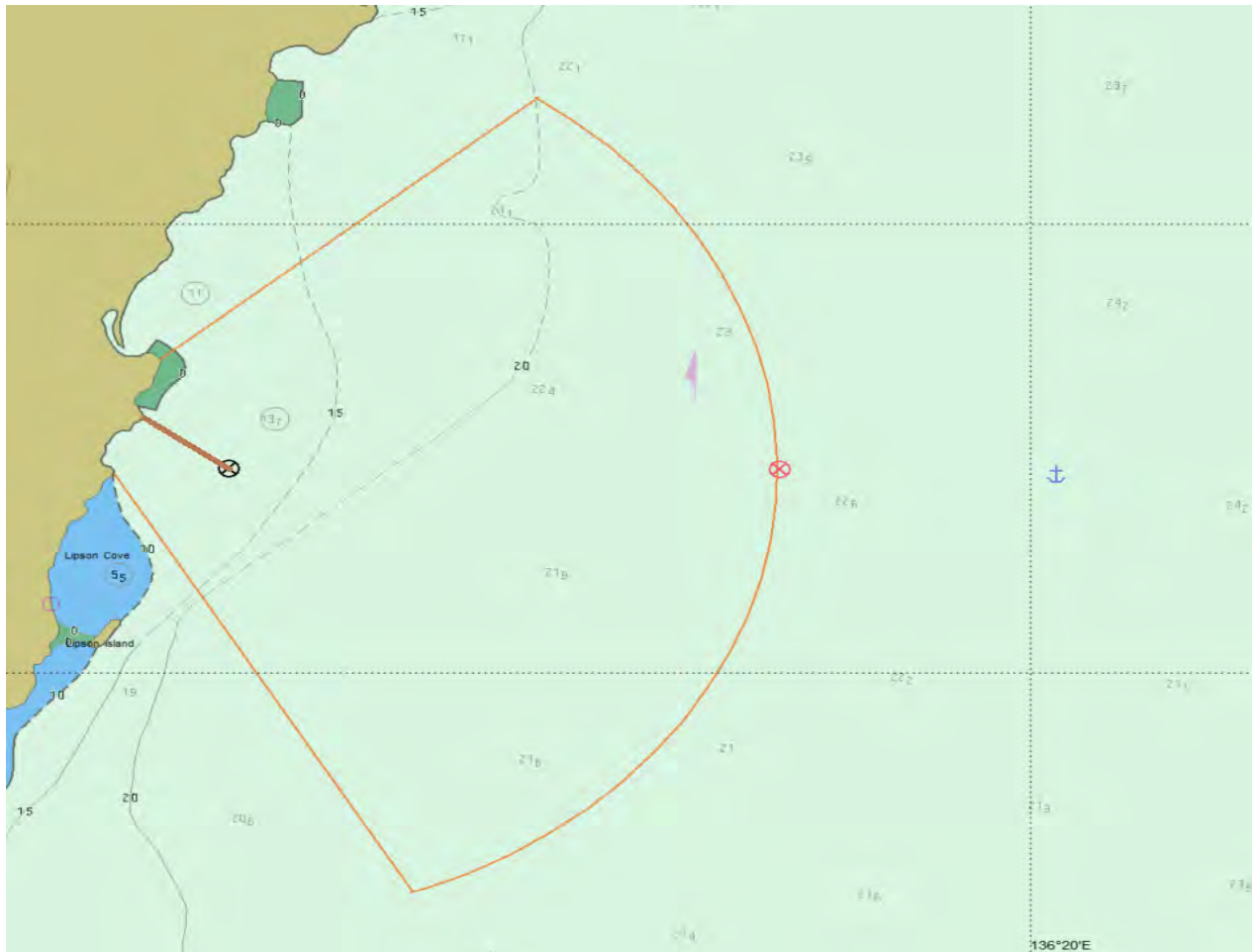


Figure 1 Port Spencer VTS Area and Maritime Zones

Port Spencer Harbour Description

Commencing at a point being the intersection of the median high-water mark with a straight line connecting a point defined by Latitude 34.2435400 degrees south and Longitude 136.2696767 degrees east with a point defined by Latitude 34.2239333 degrees south and Longitude 136.2974000 degrees east. Thence in a north easterly direction to the second point defined.

Thence following an arc with a radius of 2 nautical miles (3704.1 metres) from the end of the jetty at 34.2515000 degrees south and longitude 136.2746667 degrees east in a generally south easterly, southerly and south westerly to a point defined by latitude 34.2830000 degrees south and longitude 139.2881667-degree east.

Thence in a straight line on a bearing of 330 degrees true to the intersection with the median high-water mark.

Thence generally northerly along the median high-water mark to the point of commencement.

1.3 Aim and Objectives

The Emergency Response Plan aims to provide guidance to Peninsula Ports staff, port stakeholders, port users and hazard management agencies on the response to operational emergencies within and in the vicinity of Port Spencer, to ensure the least potential impact on port operations.

The Emergency Response Plan aims to;

- To enable Peninsula Ports Authority (PPA) Port of Port Spencer (PPA-PS) to protect, or where this is not possible, minimise the impact on the marine environment from any marine pollution incident within the port and its associated waters, through the initiation of a rapid, effective and appropriate incident response.
- To ensure that PPA-PS responds according to the priorities and procedures outlined within this document.
- To provide an effective system for reporting, assessing and responding to an oil pollution incident or a potential incident.
- To ensure the organisation of resources of all agencies involved in the incident response are in a high state of preparedness.
- To enlist the co-operation and support of all relevant agencies within the region.
- To protect the corporate, economic and environmental interests of PPA-PS.
- To ensure a seamless integration between PPA – PS, South Australian (SA) and national response efforts.

1.4 Legislation

This plan meets international, national and state obligation under the following conventions, acts, regulations and integrates with the following plans:

TABLE 1 CONVENTIONS, ACTS AND PLANS

Convention	Requirements
1990 International Convention on Oil Pollution Preparedness, Response and Cooperation (the OPRC Convention).	Provision for contingency plans for ships, offshore platforms, coastal terminals and ports, and for the development of national response plans.
1973/78 International Convention on the Prevention of Pollution from Ships (MARPOL)	Established to prevent pollution of the marine environment from ships for operational and accidental causes
1969 International Convention Relating to the Intervention on the High Seas in Cases of Oil Pollution Casualties (INTERVENTION)	Affirms the rights of coastal states to take such measures as may be necessary to prevent, mitigate or eliminate danger to its coastline or related interests following a marine casualty
1989 International Convention on Salvage (SALVAGE)	International framework for salvage. Expanded on the no cure no pay principle to provide enhanced salvage award for preventing or minimising damage to the environments
International Convention on Civil Liability for Oil Pollution Damage (CLC)	Relates to ships carrying oil as cargo. Ensures that adequate compensation is available for persons who suffer from oil pollution and places the liability on the owner of the ship.

International Convention on the Establishment of an International Fund for Compensation for Oil Pollution Damage (FUND)	<p>Establishes an international fund, subscribed to by the cargo interests, which would provide for the dual purposes of:</p> <ol style="list-style-type: none"> 1. Relieving the shipowner of the additional financial burden imposed on them by the CLC; and 2. Provide compensation to the extent that the protection afforded by CLC is inadequate
International Convention on Civil Liability for Bunker Oil Pollution Damage 2001	Provides for the recovery of pollution costs and payment of compensation from owners/ operators of all vessels using oil as bunker fuel and references the liability arrangements in the Convention on Limitation of Liability for Maritime Claims, 1976 and the 1996 Protocol.
Acts	
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999) as amended	Provides for protection of the environment and biodiversity in accordance with international conventions of which Australia is a signatory. This document meets Condition 5 of EPBC 2012/6590 approval conditions.
<i>Protection of the Sea (Prevention of Pollution by Ships) Act, 1983 as amended and Marine Orders Parts 91 and 93</i>	<p>Implements the International Convention for Prevention of Pollution from Ships (MARPOL). S11A requires vessels to have a Shipboard Oil Pollution Emergency Plan (SOPEP).</p> <p>Prohibits the discharge of oil or oily mixtures within coastal waters and sets penalties.</p> <p>Requires the reporting of all oil pollution incidents S11 [1] and sets penalties for failure to comply.</p> <p>A number of Marine Orders issued and administered by Australian Maritime Safety Authority (AMSA) under this Act.</p>
<i>Protection of the Sea (Civil Liability for Bunker Oil Pollution Damage) Act 2008</i>	Enacts the BUNKER convention into national law.
<i>Protection of the Sea (Civil Liability) Act 1981</i>	Enacts CLC into national law.

Protection of the Sea (Oil Pollution Compensation Fund) Act 1993	Enacts the FUND convention into national law.
Plans	
National Plan for Marine Pollution Emergencies	Arrangement for Marine Pollution Emergencies.
South Australian Marine Spill Contingency Action Plan	
South Australian Oiled Wildlife Response Plan	

1.5 Alignment with Hazard Management Plans

For the majority of incidents, the relevant Hazard Management Agency (HMA) will respond to the incident and manage the hazard specific component in conjunction with PPS-PS. PPA-PS will manage the impact on port operations and business continuity.

For Marine Transport Emergencies (MTE) the Harbour Master will assume the role of Incident Controller on behalf of the South Australian Department of Planning, Transport and Infrastructure (DPTI).

This plan integrates with the following local PPA policies, plans and procedures:

Reference to internal QA/ISO document required

- **Crisis Management Plan**
- **Business Continuity Manual**

- Incident Management Plan
- Emergency Response Procedures – Facility

1.6 Supporting Documents

Supporting documents may include but are not limited to, the following emergency response checklists (ERC):

- ERC – Bomb or Terrorism Threat
- ERC – Breakaway from Berth - Not under Command (NUC)
- ERC – Dangerous Goods (including ammonium nitrate) Emergency
- ERC - Evacuation of VTSC
- ERC – Person Overboard (from Vessel or Wharf)
- ERC - Marine Pollution Response (oil and chemical)
- ERC – Medical Evacuation (from Vessel or Wharf)
- ERC – Mooring Line Failure
- ERC – Recreational/Small Commercial Vessel Emergency In/Around Port Waters
- ERC – Security Breach (waterside)
- ERC – Shipping Channel Emergency
- ERC – Vessel Allision with Ship Loader
- ERC – Vessel Collision / Allision
- ERC – Vessel Fire / Explosion When at Berth
- ERC – Vessel Fire / Explosion When Not at Berth
- ERC – Vessel Grounding

1.7 Response Priorities

Operational emergency response by PPA-PS has the following priorities;

- Safety of life
- Minimising the impact on the environment
- Minimising the damage to port infrastructure
- Minimising the impact on port operations
- Ensuring the continuation of adjacent operations
- Recovery

1.8 Reporting Incidents

All incidents shall be reported to Port Spencer Vessel Traffic Services (PS VTS) on VHF channel 12.

The Duty Vessel Traffic Services Officer (VTSO) shall record the details of the incident on the relevant PPA emergency response procedure form detailing the relevant information.

1.9 Port Spencer Pilots (PSP)

Port Spencer Pilots will take action in accordance with the Pilot Contract expectations, Harbour Masters Direction and PPA-PS Safety Management System.

For a berthing channel emergency, the Duty Pilot (or replacement) will be present along with the Harbour Master or delegate (at VTS Centre) to aid in resolving / managing the emergency.

1.10 Stakeholders Actions

The Harbour Master or delegate will determine the resources required to respond to the incident.

Service providers will be contacted by Port Spencer VTS at the direction of the Harbour Master or his delegate for assistance if required.

All stakeholders or port users not involved in the emergency are to remain well clear of the incident location and not interfere with or hamper the response efforts.

1.11 Fire Fighting Resources

There is limited firefighting capability and resources available in the immediate Port Spencer area. Department of Fire and Emergency Services (DFES) has one volunteer fire brigade in Port Spencer and one in the town of Tumby Bay. These units will respond to landside emergencies and boundary cool from the deck of a vessel but will not be deployed internally on a vessel, to fight a fire.

Volunteers trained for shipboard operations could be employed to rescue casualties from a vessel. The volunteers are limited to provide boundary cooling, where possible. Additionally, appropriately trained DFES

volunteers will be deployed to tugs with firefighting capabilities to assist with the direction of the fire monitors.

Where additional assistance is required for landside firefighting, a formal request is to be made to DFES for assistance from other organisations with firefighting capabilities.

Note: There are strict assessment criteria to be considered before using firefighting foams (AFFF) within the Port Spencer operating environment. The approval of the Harbour Master must be sought prior to using firefighting foam within the Port's operating environment.

1.12 Smoke and Atmosphere Monitoring

In the event of a fire, the Town of Tumby Bay can provide atmospheric monitoring teams to ensure the safety of the public in surrounding areas.

Atmospheric monitoring is to be requested through DFES.

1.13 Recovery of Cost Incurred

All costs incurred in response to marine incidents, such as pilots, tugs, lines boats or crew transfer vessels shall be invoiced to the vessel's agent.

2.0 STATE ROLES AND RESPONSIBILITIES

The State Emergency Management Plan (SEMP) outlines the following roles and responsibilities:

2.1 Hazard Leader

A Hazard Leader is responsible for ensuring that all aspects of the hazard (prevention, planning, response and recovery) are addressed.

The Hazard Leader for hazardous materials in South Australia is SafeWork SA.

2.2 Coordinating Agency

The Coordinating agency is the South Australia Police (SAPOL).

They ensure that the Control Agency effectively responds to and manages an emergency incident and supporting agencies provide an appropriate level of support.

2.3 Control Agency

A Control Agency has responsibility to take control of the response to an emergency. The State Emergency Management Plan (SEMP) outlines who the Control Agency is for specific emergencies.

The Department of Planning, Transport and Infrastructure (DPTI) has been nominated as the Control Agency for Marine Spills in State Waters.

The Country Fire Service (CFS) and Metropolitan Fire Service (MFS) are the Control Agency for marine spills in inland waters.

3.0 INCIDENT MANAGEMENT – Port Spencer | Peninsula Ports Authority

3.1 Key Personnel

The key personnel that make up the Port Emergency Team are as follows:

- Harbour Master, Port Spencer, as Incident Controller.
- Deputy Harbour Master, Port Spencer as Second Incident Controller.
- Peninsula Port Manager, Port Control Supervisor.
- Response Team Leader 1, Scene of Incident (SOI) Commander #1

3.2 Incident Controller

The Incident Controller (IC) for all operational emergencies within or affecting Port Spencer is the Harbour Master or the delegate.

The Harbour Master may have various authorisations and delegations under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* and *Harbours and Navigation Act 1993* and should be trained in Incident Control and Incident Management Team.

3.3 Port Manager

The Manager of a Port is responsible for ensuring that the Port has a marine spill response plan, trained first responders and first response equipment.

These Managers are delegated under the *Protection of Marine Waters Act (Prevention of Pollution from Ships) Act 1987*.

3.4 Incident Control System

PPA - Port Spencer has adopted the Australasian Inter Service Incident Management System (AIIMS)⁷ for incident management as per the PPA-PS Incident Management Plan. AIIMS has been adopted to ensure interoperability with all response agencies and to provide a known structure that can be adapted to suit the response requirements.

The Incident Controller (IC) will assess the required response effort and adjust the size and scale of the response to meet the specific incident requirement. That is, the IC will determine number of responders required

⁷ <https://training.fema.gov/hiedu/docs/cem/comparative%20em%20-%20session%2021%20-%20handout%2021-1%20aiims%20manual.pdf>

and the functional areas that are stood up to form the Incident Management Team.

3.5 Incident Level Classifications

Under the AIIIMS Incident management system the following incident classifications are used;

- Level 1 – are generally able to be resolved through the application of local or initial resources only.
- Level 2 - are more complex in size, duration, resource management and risk and may require deployment of jurisdiction resources beyond the initial response
- Level 3 – are generally characterised by a degree of complexity that requires the Incident Controller to delegate all incident management functions to focus on strategic leadership and response coordination and may be supported by national and international resources.

In determining the level of the response, the following shall be considered;

- The nature of the emergency
- The location of the emergency and the ability of responders or emergency services to access the site if required
- The requirement for resources beyond the PPA-PS inventory
- The likely duration of the response effort
- The requirement for specialist skills

3.6 Incident Management Team Structure

The functional areas for the PPA-PS Incident Management Team include;

- Incident Controller
- Planning
- Operations
- Logistics
- Finance
- Casualty Coordination

An Investigation into the incident may be conducted by the;

- SA Police (SAPOL),
- Australian Transport Safety Bureau (ATSB),
- Australian Maritime Safety Authority (AMSA),
- DOT Marine Safety Investigation Unit (MSIU),
- Work Safe SA or Department of Mines and Petroleum.

Where the above organisations investigate, they will perform the role of the investigation function. The IMT is to provide support and assistance as required including ensuring appropriate records and evidence is maintained. PPA-PS may also investigate any incident that occurs with PPA operational areas in accordance with internal safety investigation policy.

Media and Public relations will be handled by the PPA Communications team. The communications team is contactable on;

Mobile: XXXXXXXXX

Email: XXXXXXXXXXXXXXXXXX

3.7 Salvage and Casualty Coordination

In the event of a maritime casualty, careful management and oversight of the salvage effort is required to ensure the response is effective and does not result in further risk to the marine environment or the operations of the port. The vessel owners will usually engage a salvor to render the casualty to a safe state and deliver the vessel to a specified location.

For level 1 incidents a casualty coordination unit may be established within the IMT.

For level 2 and level 3 incidents, a separate *casualty coordination* IMT will normally be raised. This will work closely with the salvor and commonwealth agencies, including MERCOM, to ensure the effectiveness of the salvage effort and the protection of the marine environment.

3.8 Role of the Casualty Coordination Unit

The role of the Casualty Coordination Unit (CCU) will depend on the nature of the incident.

For level 1 incidents the CCU will reside in the IMT where it will be responsible for coordinating the salvage effort from the **port's** perspective.

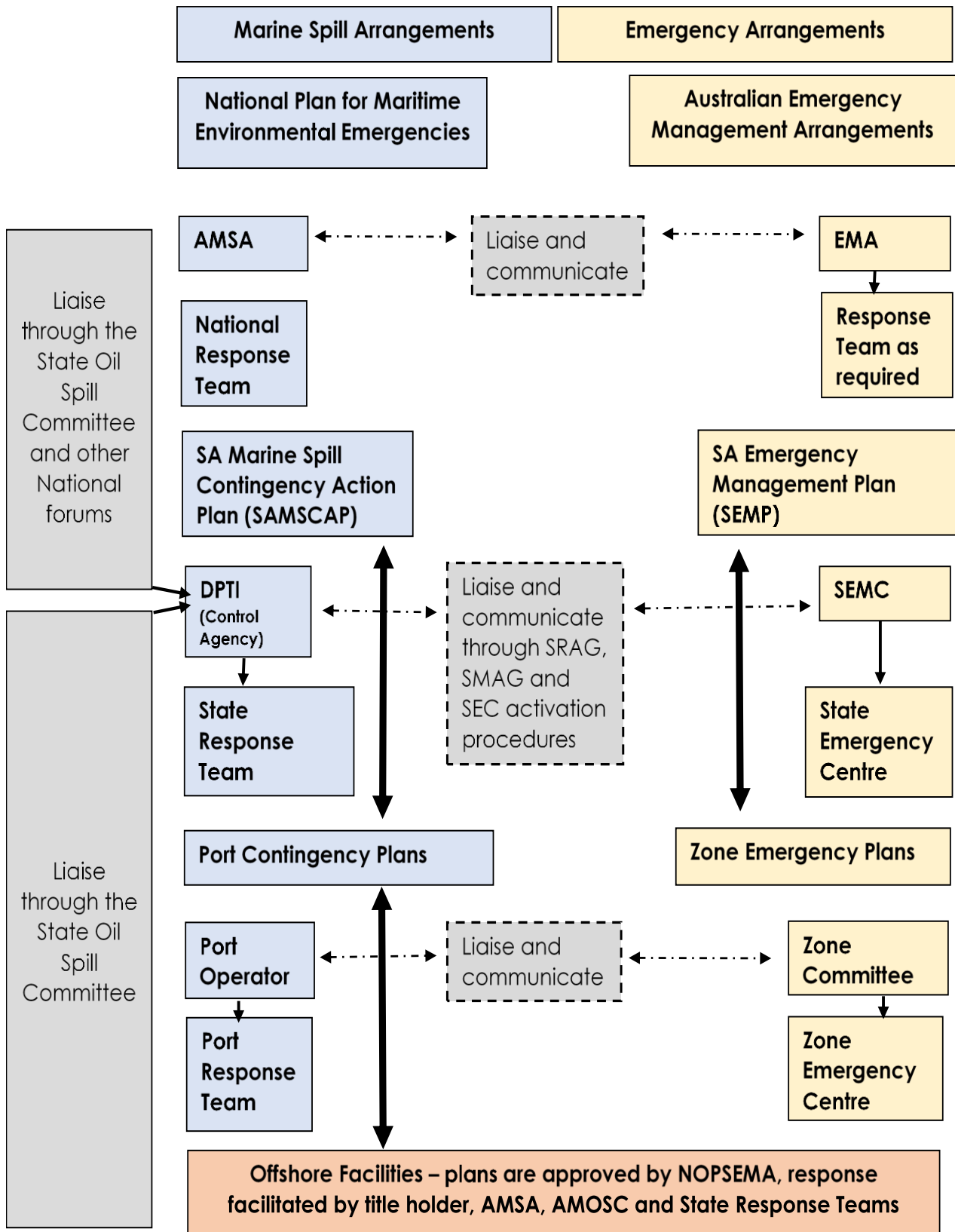
The CCU will also liaise with other individuals/agencies including but not limited to ship master, salvor, DPTI, AMSA, port service (pilots, tugs etc).

The CCU is to ensure that the salvage plan

- Is adequate and properly resourced
- Minimises the potential impact on the environment
- Does not have the potential to create further risk to port infrastructure or operations
- Takes into account forecasted and prevailing weather conditions and any other factors that may impact on the recovery operation.

3.9 Integration of Marine Spill & Emergency Response

PENINSULA | PORTS



3.10 IMT Locations

3.10.1 Incident Control Centre (ICC)

The designated ICC for Port Spencer is the Board Room located in the Port Administration Building having sufficient:

- Wi-fi or broadband access to the internet
- Sufficient number of computers, telephone and power outlets
- Enough desks, chairs and other office equipment

Table 3 outlines the functional areas breakout rooms;

TABLE 1 – IMT LOCATIONS		
FUNCTIONAL AREA	BREAKOUT ROOM	COMMENTS
Planning	Board Room	
Operations	Landside Operations Managers Office or Deputy Harbour Masters Office	Depending who performs the role. Additional desk space is available in marine
Finance	Finance Office area	
Logistics	Safety Managers or Maintenance Managers Office	Depending who performs the role. Additional desk space is available in marine
Media	CEO's Office	

3.11 Inter-agency and External Liaison

Where the IMT is liaising with another agency (such as DFES or ToTB) consideration should be given to include a representative of that agency within the IMT, as a liaison and advisor. This will facilitate better communication and will allow for a more in-depth assessment of the response requirements and ensure a more coordinated and efficient response.

A representative of the vessels *Protection and Indemnity Club* (P&I Club) may be invited to liaise with the IMT as an advisor to ensure that there is open communication and involvement for the P&I Club.

3.12 Safety during an Incident

The safety of personnel is the highest priority when responding to an event. All response activities must be undertaken safely, in compliance with PPA-PS policies and standard operating procedures, with consideration for the risks outlined below.

All personnel must comply with:

- PPA Occupational Safety and Health Policy
- PPA Fitness for Duty – Drug and Alcohol Policy
- PPA Fitness for Duty Policy – Fatigue Management Policy
- PPA Hazard Management Procedure
- PPA PPE Procedure
- PPA Incident Management Policy

Where a **person's** life is at immediate risk or requires immediate first aid, the responders are to assess the hazards and only when safe to do so provide assistance to the casualty.

Where the safety of life is not threatened, responders are required to complete a Job Hazard Analysis as per the Hazard Management Procedure.

3.13 Preservation of the Scene

The requirements in the PPA Incident Management Procedure to preserve the scene are to be complied with at all times.

4.0 ACTIVATION OF PLAN

4.1 Principles of Emergency Response

- Prevention:
Maintenance and testing of all detection and protection equipment on a regular basis
Inspection of all plant and storage facilities on a regular basis
Regular emergency response drills to ensure site and team readiness
- Containment:
Switch off any operating equipment
Isolate electrical supplies at the main switchboard
Take any operating equipment (e.g. forklifts) outside the warehouse
Close storm water shut off valves
Co-ordinate with the Incident Controller
- Rescue:
Trained personnel only
Approved and trained rescue crews only to respond
- First Aid:
First aid is to be given only by trained first aid officers

4.2 Alarm Initiation

Any person discovering an emergency or a situation, which is likely to give rise to an emergency, shall:

- Consider if they can control the situation alone
- Control it (only if safe to do so)
- Alarm - raise the alarm by contacting the Incident Controller who shall decide on the level of alert and details of the emergency.
- Rescue - assist or alert persons in immediate danger.

If in doubt, the alarm shall be activated first and then the doubt will be clarified.

4.3 Notification of Incident

4.3.1 Emergency Service

In the event of an incident, the following procedure is to be instigated:

1. Raise vocal alarm and make sure it is acted upon and/or phone 0-000.
2. If the alarm did not activate a call to emergency services automatically, 0-000 (or 112 from mobile phones) must be called if the Fire Brigade, Police or an Ambulance are required.
3. Advice to the Operator:
 - Location of the emergency Location of the emergency (street number and name, suburb, The nearest intersection);
 - Type of emergency (e.g. fire, explosion);
 - How many people are involved (e.g. Is there people in the building?);
 - Casualties
 - Assistance required
 - Hazards
 - Contact details (Name, number)

FOR ALL EMERGENCIES

AMBULANCE FIRE POLICE

DIAL 000

FROM A MOBILE TELEPHONE DIAL 112

5.0 GENERAL MARINE INCIDENTS

5.1 General Guidance for Marine Operational Emergencies

As indicated below, Port Spencer has numerous emergency response procedures to account for any possible marine emergencies that may occur at the port. As the list is comprehensive, PPA regularly exercises these procedures to ensure a timely, appropriate and decisive response is achieved to any marine emergency that may occur.

For all marine operational emergencies Port Spencer VTS will gain the necessary information (who, what, when, where, why, how and actions taken) from the vessel or stakeholder reporting the incident.

The Port Spencer VTS will operate in accordance with the relevant emergency response checklist reporting to the Harbour Master or his delegate as necessary to respond to the emergency.

The following will be considered by the Incident Controller;

- Safety of life
- Control over the vessel is maintained
- The vessel has sufficient resources to be assisted to a safe location.
- Minimise the risk to the marine environment
- Minimise the impact on shipping and port operations

A careful assessment of the impact the incident has on shipping will be made by the Harbour Master or delegate. The Incident Controller in conjunction with the Harbour Master will assess the impact, and where the safety of personnel is at risk the operation will be restricted or suspended shipping movements until it is safe to recommence. The impact will be carefully managed with a view to safely facilitate all operations.

5.2 Place of Refuge

A vessel in distress or requiring assistance may request a Place of Refuge so that it can carry out repairs or regain stability. A Place of Refuge could be closer to shore in more sheltered or calmer waters or could be a request to come into a port or suitable berth.

5.2.1 State Arrangements

For vessels within State waters, the approval of a request for a Place of Refuge is the responsibility of DPTI. The approval will be undertaken in consultation with AMSA and relevant port authorities/facility operators.

DPTI has adopted the *National Maritime Place of Refuge Risk Assessment Guidelines*⁸.

5.2.2 National Arrangements

AMSA has appointed a Maritime Emergency Response Commander (MERCOT) to act during a shipping casualty in Commonwealth waters.

The Commander is responsible for the management of emergency intervention issues in response to maritime casualty incidents where there is an actual or potential risk of significant pollution.

5.3 Jetty Integrity

The integrity of the jetty is paramount to the continued operation of the port and the stakeholders who rely upon the port. The Harbour Master or delegate, Duty Pilot, Marine Pilots and VTSSOs are to be mindful of the risk each incident presents to the jetty and the continued operation on the port. This risk is to be carefully managed, with the aim being for the jetty to remain clear, or where this is not possible, minimising the extent and duration of the obstruction or blockage.

Where there is doubt as to the continued safe operation of a vessel including the vessel's propulsion, main engine, power generation or steering gear, the Marine Pilot or Master shall not commit the vessel to the jetty.

5.4 Port Emergency

In the context of operational emergencies, a port emergency is defined as an event that poses significant risk to the safe or continued operation of the port by affecting the;

- Safety of personnel within the port area
- Port assets, or
- Port infrastructure.

⁸ <https://www.amsa.gov.au/marine-environment/national-plan-maritime-environmental-emergencies/np-gui-018-national-plan>

Note: A port emergency shall be declared if a steering gear failure or main engine slowdown or main engine failure is encountered by a vessel in the inner harbour or berthing pocket at the jetty.

A port emergency can be declared by the following;

- A Marine Pilot, piloting a ship
- The Harbour Master or delegate

A port emergency requires the co-ordination and careful allocation of port resources such as marine pilots, tugs, helicopters, pilot launches and lines boats. The Harbour Master or delegate will assess the situation, allocate resources as required and monitor the effectiveness of the response.

For all marine incidents where the complexity of the incident warrants, a second pilot will be transferred to the vessel to assist with communication and on scene management of the incident. Where appropriate, the first pilot may be evacuated and relieved from duty.

Where tugs are used to assist a vessel (including alongside and at the anchorage) a pilot will be transferred to the vessel to ensure the safe control of the tugs.

5.5 Inside Port / Harbour Limits

Where the passage of an outbound vessel located within the inner harbour area poses a risk to the integrity of the shipping channel, consideration will be given to return the vessel to the berth until the defect or deficiency is rectified.

The Harbour Master shall determine the most prudent course of action, in consultation with Duty Pilot and the Marine Pilot on the vessel.

5.6 Outer Port / Harbour

Once a vessel is between the 2nm radius from the end of jetty and the berthing box, it is committed to departing/arriving. Every effort should be made to continue the transit with compulsory tug assistance.

Where a tidally restricted vessel is in difficulty within the Port Limits, PS VTS shall continuously monitor the risk of grounding within the channel using all available information. Where the vessel cannot clear the Port within the tidal window, the Harbour Master will assess which escape route or method

is most suitable.

If a vessel is in difficulty, a careful assessment of the impact on subsequent movements shall be made. Based on the VTS and pilot assessment, including consideration of the vessel in difficulties progress and speed made good, subsequent vessels sailing may be delayed or diverted.

5.7 Movement and Control of Shipping

During a port emergency, the Harbour Master or delegate shall assess the situation and determine if there is a requirement to suspend shipping. Where Shipping is suspended, no vessel shall be moved within the VTS Area (including the anchorage) without the express permission of the Harbour Master or delegate. This requirement will be coordinated by the PS VTS through the normal traffic management processes.

5.8 Port Emergency VHF Working Channel

PS VTS shall allocate a Port Emergency frequency to be used as a working channel for the emergency (normally the PS working channel). This shall be a VHF channel that is not currently in use and free from interference. Only those stakeholders directly involved in the emergency response shall monitor or use the frequency.

All normal port reporting shall be made on the port working channel VHF *Channel 12*.

NOTE: All port users are to be aware that during a port emergency PS VTS will be focusing on the emergency. Routine communication will be prioritised. Stakeholders may be asked to wait or to contact the VTS at a later stage.

As soon as practicable after the formal declaration of a port emergency, the duty VTSO shall make a Sécurité broadcast to all stations on VHF Ch12 advising of a port emergency.

5.9 Ship Stability

Where there is concern that a vessel's stability cannot be maintained within safe limits, it shall be immediately reported to the Harbour Master. The Harbour Master and the Master shall assess the situation and take all necessary steps to ensure the safety of the vessel.

5.10 Dangerous Goods

Where dangerous goods (DG) are present on board, the Master and crew shall assess the potential for the DG to be affected by the emergency and advise the VTS accordingly. The Harbour Master will assess the situation and determine if DFES assistance is required.

5.11 Bulk Carrier in Port

On the receipt of an alarm that stems from an incident within two miles which may impact the port, all loading or discharging will cease and, where applicable, hatches will be closed and the vessel readied for sea.

The Vessel's fire control plan and stability documents must be obtained as a matter of priority.

5.12 Fire on a Vessel Alongside

The Harbour Master will assess the situation and allocate appropriate resources to assist the Master and crew in the response. Firefighting support vessels will be provided to assist the vessel where necessary. The primary use will be used for boundary cooling but can assist with fighting a fire on the deck. Where possible a DFES volunteer firefighter will be placed on the tug to direct the fire monitors.

For fires on vessels at PPA berths, the firefighting trailers will be used to aid from ashore. A careful assessment of the cargo and the type of fire shall be made and where appropriate, approved firefighting foam may be used.

If the fire on board the vessel results in loss of power or the mooring arrangements rendered inoperable, tugs will be used to hold the vessel alongside.

Once the fire is extinguished, the damage and condition of the vessel will be assessed and a plan to remove the vessel to a safe location will be implemented.

5.13 Fire on the Vessel Underway

Where a vessel is under way and suffers a fire, the pilot or master is to advise Port Spencer VTS. The Harbour Master in conjunction with the Pilot or master will assess the situation. Considerations will include;

- The severity of the fire and the location on-board
- The ability of the ship's crew to respond effectively to the fire
- The location of the vessel and its ability to reach safe water
- Assets required to assist and their availability

Firefighting support vessels will be sent to assist the vessel as above. The Harbour Master and duty pilot will assess the situation and determine the most suitable option including;

- Continue the passage to open water
- Anchor
- Berth

5.14 Fire on a Vessel in the Anchorage

Where a vessel suffers a fire in the anchorage the vessel shall remain at anchor unless approved to weigh anchor and get underway by the Harbour Master.

Firefighting support vessels will be used to assist the vessel with the firefighting response.

5.15 Vessel Grounding

Where a vessel grounds a careful assessment of the damage condition of the vessel will be made. The Harbour Master and Duty Pilot will assess the height of tide at the time of grounding and subsequent tides to determine if the vessel is likely to be re-floated. Where there is sufficient tidal height and the condition of the vessel allows, the vessel will be re-floated as soon as possible and shifted to an anchorage until an assessment of the vessel's damage condition can be made.

Where the vessel cannot be re-floated, or the damage condition is such that the vessel cannot be safely re-floated and moved to open water, the Harbour Master will assess the situation and determine what services are required. This may include tugs to hold the vessel in place and work boats to transfer personnel and equipment to the vessel.

If a vessel grounds in the berth pocket, the vessel's steering gear and propeller condition will be carefully assessed. If safe to do so, the vessel will be shifted to the anchorage so an assessment of the vessel's condition can

be made.

5.16 Vessel Collision

Where a collision occurs between two vessels, tug assistance will be provided if required. Both vessels will, if safe to do so, be allocated an anchorage whilst the damage condition is assessed.

For serious collision a careful assessment of the damage condition of both vessels will be required. Where vessels are locked together a salvage plan will be required.

5.17 Disabled Vessel in the Channel / Departure

Where a vessel is disabled within Port limits, such as for a main engine failure or blackout, the VTS will mobilise additional tugs to assist the vessel. The Harbour Master and the Duty Pilot will assess the options for the vessel and determine the best course of action based on Under Keel Clearance, the speed of advance and the conditions. In general, the vessel will be taken to open water where possible; if this is not possible the vessel will be towed to the most suitable area possible.

Careful assessment of the subsequent tides will be undertaken to determine the time the vessel can safely remain in the channel escape.

5.18 Pilot Injured or Incapacitated

Where the pilot is injured or incapacitated a second pilot will be immediately transferred to the vessel. In the interim the duty VTSO shall aid the masters and tugs relating to course over the ground and speed made good. Where the passage cannot be safely continued the tugs are to arrest the momentum of the ship and hold it in the centre of the port with the assistance from the VTSO until another pilot can be transferred to the vessel.

5.19 Mooring line failure

Mooring lines parting is a significant risk in Port Spencer. There is potential for significant interaction between the Vessel and the Jetty of mooring lines part due to wave action or berthing manoeuvres. All mooring failures shall be reported to the VTS. To ensure the vessel remains securely moored, a Pilot will be transferred to the vessel and tug assistance provided until the line/s can be rerun or the vessel taken to the anchorage. Where

necessary a lines boat will be used.

5.20 Vessel Dragging Anchor

All vessels are responsible for monitoring their position and safety whilst at anchor. Where the vessel observes the anchor is not holding, the Master is to assess the weather conditions and the draughts of the vessel. Where safe the vessel is to pay out more cable or request permission to get underway to re-anchor. This is to be reported to the VTS immediately and the vessel shall keep the VTS apprised of its actions and intentions.

If the vessel is immobilised (note this requires Harbour Master approval) or requires assistance to anchor a pilot and tugs will be allocated to assist the vessel.

5.21 Person Overboard (POB)

In the event of a MOB where the vessel cannot recover the person, or the person fell from the jetty or structure the VTS will direct suitable vessels in the vicinity to recover the person. Where there are no suitable vessels, the Pilot boat or recovery capable vessel will be used to recover the man.

5.22 Casualty Evacuation

There are limited local resources for evacuating a casualty from the ship. Where a casualty is unconscious or cannot sit upright without assistance, the evacuation shall be coordinated by the Rescue Coordination Centre (RCC) Australia.

If a casualty is transferred by boat, the Jetty Multi-Purpose Vessel landing will be used to transfer the casualty ashore.

5.23 Medical Evacuation and Sick or Injured Seafarer Transfer from a Ship

Where a casualty is conscious and can sit upright without assistance the Multi-Purpose Vessel may be used. A Paramedic or trained PPA-PS responder shall accompany the sick or injured seafarer. The vessel is to ensure that any wounds are cleaned and dressed, and a vomit bag is provided for the casualty.

The vessels Agent is responsible for arranging the attendance of the Paramedic and where the transfer cannot be incorporated into the scheduled pilot transfers, the cost will be invoiced to the agent.

5.24 Small Vessel Incidents

Where there is a small vessel incident such as collision, grounding or a small vessel becomes disabled, the VTS will request the assistance of nearby vessels to assist the vessel. The vessel will be towed to a safe place.

Any casualties will be dealt with as above and search and rescue will be as below.

5.25 Search and Rescue

For search and rescue incidents, the SA Police will be notified for state waters and (RCC) Australian will be notified for commonwealth waters. The VTS will request the assistance of small vessels in the area to respond to the incident. During the day consideration will be given to using the Pilot transfer helicopter/multi-purpose vessel to locate the vessel or casualties and direct small vessels to assist with recovery.

Where the situation is more complex, additional SAR assets will be allocated to the search by the SAR Coordinator.

Depending on location, SAPOL or RCC Australia will manage the incident.

5.26 Vessel Underway Collision with Ship Loader

For all piloted shipping movements, all personnel are required to be clear of the ship loader boom. Where there is a collision between a vessel underway and a ship loader (such as during maintenance) the VTS will utilise small craft in the vicinity to check for people in the water.

If required, additional towage will be provided to assist with the control of the vessel that collided with the ship loader. A careful assessment of the damage condition will be made and a plan for the vessel will be developed by the Harbour Master and where appropriate the Duty Marine Pilot.

5.27 Ship Loader Contact with Vessel during Loading

The immediate priority is to determine if there are any casualties. Once any casualties have been treated and removed from the scene, a thorough damage assessment of the ship and the ship loader will be undertaken. Where the damage is superficial and does not affect the safe operation of the ship loader or the safe loading of the vessel, loading may

be resumed.

Where serious damage is present, an engineering assessment of the ship loader will be required, and an appropriately qualified engineer will be required to verify that the loader is in a safe condition to load.

5.28 VTS Evacuation

Where an incident requires the evacuation of the VTS, the duty VTSO will make a Sécurité broadcast on VHF Channel 12, both the duty VTSO and duty Shipping Scheduler will divert the land lines to the relevant mobile phones and evacuate the VTS.

The Securite Broadcast will be as follows:

“SECURITE, SECURITE, SECURITE. ALL STATIONS ALL STATIONS, ALL STATIONS THIS IS PORT SPENCER VTS (x3). THE VTS IS BEING EVACUATED. VTS SERVICE IS TEMPORARILY SUSPENDED UNTIL FURTHER NOTICE.”

Once the VTSO's are in a safe location they will recommence providing VTS at a level of service commensurate with resources and facilities available. The level of service being provided will be communicated to all Port Users and Stakeholders.

6.0 MARINE OIL POLLUTION INCIDENT

6.1 Integration with Other Plans

6.1.1 National Plan for Maritime Environmental Emergencies

This plan provides for the coordination of assistance from other national and international organisations, the provision of specialised response equipment and financial assistance where the polluter cannot be identified.

6.1.2 South Australian State Emergency Management Plan

The State Emergency Management Plan (SEMP) outlines responsibilities, authorities and procedures to prevent, manage, and recover from, emergencies and disasters within South Australia.

A marine spill is considered an emergency under the SEMP. Depending on the size of the spill, both this plan (SAMSCAP) and the SEMP can be activated in order to facilitate cooperation with, and gain access to assistance from, other South Australian Government agencies.

Operational procedures and administrative arrangements linking the functional government authorities responsible for implementation of emergency responses are detailed in the State Emergency Management Plan.

6.1.3 SA Wildlife Response Plan for Oil Spills

The South Australian Response Plan for Oiled Wildlife has been developed and is administered by the Department of Environment, Water and Natural Resources (DEW). In the event of an impact of an oil or hazardous and noxious substances spill in State waters.

DEW officers will be mobilised to manage this component of the response.

6.1.4 Environmental & Scientific Advice for Oil Spills

Appropriate Environmental and Scientific advice is essential to make informed and effective decisions regarding the establishment of response objectives and the selection of the most appropriate response strategy and tactics. This advice should be incorporated at all levels of the response.

Such advice and assistance is provided through the Environmental and Scientific Coordinator(s)(ESC). In South Australia the ESC function is located

within the Environment Protection Authority (EPA). In the event of an impact of an oil or hazardous and noxious substances spill in State waters, the ESC(s) will be mobilised to coordinate the environmental & scientific advice as required by the Incident Controller.

6.1.5 Port and Facility Contingency Plans

The procedures and support mechanisms under SAMSCAP may be initiated to provide additional assistance not available locally when a marine pollution incident exceeds the capacity of the port or facility operator to effectively contain and/or clean up the spill.

6.1.6 ANNEX 1 – First Strike Response Plan

The First Strike Response Plan has been developed for the Port of Port Spencer to provide an immediate response system proportional to the Oil Spill Risks identified within Port Limits from ships and other marine sources.

See attached.

6.2 Risk Assessment

6.2.1 Possible causes of marine pollution emergencies:

- Collision between vessels
- Allision with a navigation aid or wharf
- Vessel grounding
- Illegal discharge from a vessel or ashore
- Incident during bunkering or cargo transfer operations

6.2.2 Indicative Volumes

TABLE 2 INDICATIVE VOLUMES						
SOURCE	INCIDENT	LOCATION	OIL TYPE	POTENTIAL VOLUME ¹		
Bulk Grain Carrier	Grounding	Anchorage	Heavy Fuel Oil/	<60,000 Dwt	2,200t HFO	300t MGO
	(Total Loss)	Channel or Harbour	MGO	60,000-90,000 Dwt	4,500t HFO	380t MGO
				90,000 – 160,000 DWT	4,500t HFO	400t MGO
				160,000DWT and above	Up to 7000t HFO	Up to 1000t MGO
	Grounding (Bottom Tank)	Harbour/Wharf or Channel	Heavy Fuel Oil	Up to 400t		
	Collision with wharf or another vessel		HFO or Diesel	Up to 150t		

6.3 Classification of Oils

Oils are generally classified by the American Petroleum Institute gravity scale into groups. Table 3 outlines the grouping of oils based on specific gravity. Oils within each group will generally have similar viscosity, spreading rates and pour points. Oils within each group will have a similar fate in the marine environment. Table 4 outlines the general fate of the oil in the marine environment.

TABLE 3 OIL GROUPS AND PROPERTIES					
GROUP	SPECIFIC GRAVITY	API GRAVITY	VISCOSITY (CST AT 15°C)	% BOILING < 200°C	% BOILING > 370°C
I	< 0.8	>45	0.5 – 2/0	50 - 100	0
II	0.8 – 0.85	35 – 45	4 – solid	10 – 48	0 – 40
III	0.85 – 0.95	17.5 – 35	8 – solid	14 – 34	28 – 60
IV	0.95 – 1.0	< 17.5	1500 - solid	3 - 34	33 - 92

TABLE 4 FATE OF OILS IN THE MARINE ENVIRONMENT				
WEATHERING PROCESS	GROUP I	GROUP II	GROUP III	GROUP IV
Spreading	Rapid	Rapid	Rapid	None
Evaporation	High	Moderate	Moderate	None
Emulsification	Little or no tendency	Low to Moderate	Moderate to High	High
Physical dispersion	Rapid	Moderate to Rapid	Moderate to Slow	Slow
Dissolution	Little	Low	Little	Little or none
Photo – oxidation	Not significant	Not significant	Not significant	Not significant
Sedimentation	Very low probability	Very low probability	Low Probability	Low probability unless in contact with sediment

6.4 Reporting of Marine Pollution Incidents

6.4.1 General

All marine pollution incidents shall be reported as soon as practicable to the Port Spencer Vessel Traffic Services Centre (VTSC) on VHF Channel 12.

Reports of marine pollution events may come from industry, vessel operators or members of the public and may be made to:

- Ports Signal Station at Port Adelaide ((08) 8248 3505 (24/7 number) or call on radio channel 12 – monitored 24/7);

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- EPA Pollution hotline (08) 8204 2004 or 1800 623 445 (non-metropolitan callers);
- The AMSA Rescue Coordination Centre (1800 641 792 – 24 hours).
- SA Police on 000, local police station or Police Communications Call Centre on 131 444

However, the observer chooses to report the spill, all reports should then be forwarded to the Signal Station on (08) 8248 3505.

Where the originator of the spill is known they may initiate a response but must report the spill to the signal station within 2 hours of the spill becoming known.

Where the spill is beyond the capability of the originator or first tier response agency to manage, this should be reported to the Signal Station who will pass the information to the Duty Officer who will refer the report to the State Marine Pollution Controller who may:

- Activate SAMSCAP and appoint an Incident Controller
- Notify AMSA
- Call an extraordinary meeting of the State Marine Spill Committee
- Ask the State Coordinator or the Deputy Commissioner for the State Emergency Centre to be opened.

EMERGENCY CONTACT LIST

Federal Agencies

AMSA	02 6230 6811
DoE	1800 110 395

South Australia

SMPC	08 8248 3505
DSD	08 8463 6666
DPTI	0418 806 054
PIRSA	1800 065 522
DEWNR	0417 801 094
Flinders Ports	08 8447 0611

6.4.2 Oiled Wildlife

If the SAMSCAP is activated for a marine oil pollution incident and a wildlife response is required, the relevant regional Oiled Wildlife Response Plan will be activated to provide on ground information specific to the region such as wildlife values, siting of oiled wildlife response facilities, equipment locations and local resources.

If small numbers of oiled animals are found and they can be treated using local resources (veterinarians, wildlife carers or DEW staff), no additional resources may be required and hence the oiled wildlife response may not need to be activated.

The level of escalation of the oiled wildlife response will be determined by the Incident Management Team.

If a DEW officer receives a report of an oil spill, a potential threat to wildlife or oiled wildlife, the officer should obtain all relevant information from the reporter including:

- location;
- access;
- number;
- species; and
- condition of oiled wildlife.

Communicate this information to the State Duty Officer as soon as possible. This information will then be provided to the Oil Spill Response Incident Controller via the 24-hour reporting hotline: (08) 8248 3505.

The State Duty Officer will contact the DEW Oiled Wildlife Advisor to advise the Control Agency on the management of the oiled wildlife response.

The incident management team will make decisions on levels of response, and therefore resources (equipment & personnel) required with input and advice from the Oiled Wildlife Advisor(s).

All decisions must be approved by the Incident Controller.

The Alinytjara Wilurara and Eyre Peninsula Regional Oiled Wildlife Response

Plan details the regional actions.

6.5 Investigation and Confirmation

Where possible during daylight, the Duty VTSO shall gain confirmation of the extent of the incident from nearby vessels or the **pilot transfer helicopter/Multi-purpose Vessel**.

[use of drones with cameras recommended for situational awareness – inexpensive, cameras inbuilt, can be flown regularly, great range]

This will confirm the report and will assist with the determination of the scale of the incident and provide more detail relating to, the extent and direction of travel of a potential oil slick or sheen.

6.6 Oil Spill Incident Response Team (OSIRT) Activation

The IC will, where appropriate, activate the ANNEX 1 - First Strike Response Plan (FSRP) – *attached*.

The Duty VTSO will commence callout procedure for the first responders in accordance with Emergency Response Checklist.

The duty VTSO is to advise the first member contacted to call at the security gate house and collect the oil spill equipment keys.

Upon notification of a marine pollution incident, OSIRT members shall proceed to the Administration Building for deployment into the field as per OSIRT Callout and Mobilisation Procedure.

Note: The keys to the Administration Building and the Oil Spill Equipment key are held at the Security Gate house and can be signed out by any member of OSIRT.

6.7 Scale of the Response

Based on the initial report and subsequent confirmation the IC shall determine the required response. This determination is to include the level of the response and an initial assessment of the requirement for state or national assistance.

Where state or national assistance is required the IC is to contact the duty

officer at the Adelaide Signal Station on (08) 8248 3505 and request state and/ or national assistance as appropriate. The request is to be backed up with an email when convenient.

State and national assistance can be requested at any point in the response.

There will be a lag between the request and arrival of resources on site. Assistance should be sought early from the state or national response team to minimise the delay of mobilising essential resources.

6.8 Protection Priorities

Note: The protection priorities listed below are based on an internal assessment. These will need to be reassessed for each marine pollution event.

They are a guide to assist the initial response efforts and to expedite initial planning.

Primary environmental sensitivities outside of the inner harbour are;

- Lipson Island

Lipson Island is located approximately 1.5 km south of the jetty and is in the State Lipson Cove Conservation Park.

Lipson Island is a nesting site for the little penguin (*Eudyptula minor*) and other burrow-nesting seabirds (a listed marine species under the EPBC Act). Other breeding colonies on Lipson Island include the black-faced cormorant (*Phalacrocorax fuscescens*), silver gull (*Larus novaehollandiae*) and crested tern (*Sterna bergii*), which are listed as marine species under the EPBC Act. The rock pigeon (*Columba livia*) and the common starling (*Sturnus vulgaris*) are the only introduced species of fauna on Lipson Island. No significant flora is present on the island. No introduced or conservation listed marine flora or fauna species are found in the intertidal survey.

- Lipson Cove

Lipson Cove is approximately 1.5 km to the south of the Port with Lipson Cove Beach and a small informal camping ground at the site.

- Rogers Beach

The coastline to the north of the Port consists of a small bay with a sandy private beach, known as Rogers Beach. This is currently accessible by a dirt track through private land.

6.8.1 Protection Priorities within the Port area

The Port will be used for export only and maritime import of fuel or chemicals is not planned as part of the operations.

The following are considered the highest protection priorities within the Port area;

- Jetty
- Inner Harbour
- Inner Harbour berths and shipping channel (economic)
- Shipping Channel (economic)

Social sensitivities for social amenity and recreational fishing include;

- Rogers Beach
- Lipson Cove

6.8.2 Economic significance of the Port

The Port is critical to the continued success of the South Australian and National economies and the continued prosperity of the Spencer Gulf Region. The Port may also serve as a multi-use export gate for grain, and potentially for other mining companies in the Eyre Peninsula region.

Vital operational areas within the Port include the following:

- Shipping Channel
- Inner Harbour and berth pocket

6.9 Activation Triggers

The recommendation for determining the level of the spill and response is based on how much oil or noxious substance is spilt and what resources are required to combat the spill.

Table 5 Possible "triggers" for determining Response Level			
Indicative spill size	Level One (0-10 tonnes)	Level Two (10-1,000 tonnes)	Level Three (greater than 1,000 tonnes)
Potential for economic or environmental harm	Low (not significant)	Moderate (Local or Short-term significance)	High (regional or long-term significance)
Indicative Resources Mobilised			
Local			
Regional			
State			
National			
National			
International			

6.10 Response Priorities

The response priorities are as follows;

- Human health and Safety
- Habitat and cultural resources
- Rare / endangered flora and fauna
- Commercial resources
- Recreational and amenity areas

Note: The primary response priority is the protection of human health and safety.

The overriding principle for marine pollution response is that the response efforts will have a net environmental benefit. That is the efforts to recover the oil will have less environmental impact than allowing the oil to weather naturally in the environment.

6.11 Immediate Response Options

Initial response actions are to be taken in accordance with the First Strike Response Plan. The FSRP has been developed for the most likely scenarios and utilises the prepositioned oil spill equipment to ensure the most effective response to minimise the impact on the protection priorities.

Where the incident falls outside the guidance in the FSRP a brief guidance on the effectiveness of strategies and tactics is given below.

6.11.1 Strategies and Tactics Evaluation

Due to the differing environments the Port has been separated into two (2) segments, the Outer Harbour and the Inner Harbour.

The Outer Harbour is defined as the area outside the Port Limit and the Inner Harbour is defined as the designated Port Limits area.

The strategies and tactics evaluation below are done in the order most likely to be successful. Each strategy has a brief summary of the approach and a synopsis of likely success.

A. *Protection, Containment and Recovery / Marine Response*

Protection, containment and recovery, involves the physical capture of oil on the water through the deployment of booms and the recovery of oil using skimmers. This will involve the use of vessels to contain the oil and transport waste, booms either towed by vessels or anchored in place to capture oil and skimmers to remove oil from the water's surface.

This is the preferred method but is dependent on several factors such as;

- Swell
- Wind
- Current

An assessment of the effectiveness of containment and recovery needs to be undertaken and careful monitoring and tending of booms is required.

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Booms are susceptible to several failures including;

- Entrainment – where oil breaks away from the bottom of the boom due to wave and current turbulence
- Drainage – where oil capture in the boom escapes under the boom due to the presence of too much oil
- Splash over – where captured oil in the boom passes over the boom due to swell and chop
- Submergence – where the boom is pulled below the water surface because the towing speed is too high
- Planing failure – where the boom is forced parallel to the water surface and is blown over due to high winds

In the Port Limits, the approach of protecting, containing and recovering of spilt oil is likely to be the most successful response option. Based on the credible spill scenarios and the proximity of the protection priorities, equipment has been prepositioned to mitigate the risk of oil reaching the shoreline.

B. Shore Line Response

Note: To ensure the best outcome in the event of a shoreline impact, it is vital that a beach pre-assessment and pre-clean is undertaken. This will allow for detailed planning of the shoreline response and minimise the amount of waste collected.

Shoreline response involves several different components including;

- Shoreline protection (deployment of boom or barriers to capture or deflect oil)
- Shoreline cleaning and remediation

Shoreline protection involves the deployment of booms or erecting of barriers to protect sensitive areas. Shoreline cleaning and remediation involves the manual or mechanical cleaning, washing methods or shoreline cleaners. Shoreline clean-up is resource intense and requires careful planning and execution.

Note: the use of heavy machinery to clean shorelines is not recommended. Heavy machinery removes more sand than manual cleaning and can push oil into the substrate of the beach which will result in remobilisation of oil for an extended period.

Shoreline clean-up is a viable option within and immediately adjacent to Port Limits. Careful monitoring of the oil's potential impact will be required due to the environmental sensitivities such as Lipson Island and the presence of rocky shoreline with fringing reefs. Deflection booming should be considered for any potential impacts on Lipson Island.

6.11.2 Natural Recovery

Natural recovery involves allowing the oil to degrade naturally over time. This is the preferred option where the oil does not pose a risk to sensitive natural or socioeconomic resources or where the net environmental impact of removing the oil is greater than allowing the oil to degrade naturally.

However, natural recovery may not be a viable option for port infrastructure or environmentally sensitive areas such as Lipson Island.

within and immediately adjacent to Port Limits, depending on the time of year and the prevailing weather conditions, this is unlikely to be a viable response option due to the proximity of natural and socioeconomic resources. Trajectory modelling combined with aerial observation will be required to ensure that the oil is tracking away from environmentally sensitive areas (Lipson Island, Lipson Cove & Rogers Beach) and the slick is weathering as predicted.

6.11.3 Oil Spill Control Agents (OSCA)

OSCA or dispersants are chemical agents that are used to treat the oil. The OSCA breaks down oil slicks into smaller droplets by interrupting the surface tension and disperses the oil through the water column. This approach is viable in certain cases and is dependent on;

- Type of oil
- The depth of water
- The environmental sensitivities that will be affected by the oil in the water or impacted if the oil is not treated
- The prevailing and forecast weather

OSCA's are generally not considered suitable for oils with a viscosity greater

than 5000 centistokes (CST). The primary risks in Port Spencer are HFO, IFO and refined light petroleum products due to accidental spillage from the attending vessel.

OSCA's are not a viable response option for HFO or light petroleum products such as MGO, ULP and other distillates. IFO has a narrow window of 4 to 8 hours for treatment before emulsification renders the oil untreatable. Dispersant application requires significant logistical support and requires mobilisation of aircraft or vessels, the OSCA and a system for application.

Dispersants must not be used in South Australian State Waters without the authorization of the State Marine Pollution Controller (SMPC). The SMPC must not authorise the use of dispersant without first consulting with the Environmental Scientific Coordinators (ESC) from the Environmental Protection Authority (EPA).

Prior to using an OSCA, a Net Environmental Benefit Analysis (NEBA) must be conducted. The NEBA is to consider the net environmental impact of using OSCA's versus the oil not being treated and weathering naturally. That is, will the oil do less damage to the environment on the surface with potential impacts to sensitivities or will the oil do more damage to the environment if dispersed into the water column.

All OSCA used must be on the [National Plan OSCA Register](#).

Further guidance on seeking approval for use of OSCA's refer to the [ASMA OSCA Guideline Two Protocol For Obtaining Approval for the Application of Oil Spill Control Agents to Oil at Sea or on Shorelines](#).

Where OSCA's are used, aerial observation during application is required to determine the effectiveness of the OSCA.

A water depth of 10 meters or less is considered too shallow for OSCA's to effectively disperse the oil.

OSCA may be a viable option in the Outer Harbour for an IFO under certain circumstances such as a continuous release or periodic release.

6.11.4 In-situ Burning

In-situ burning involves capturing the oil in specialised fire-resistant oil spill equipment and burning the oil with the assistance of an OSCA.

This is not a recognised response strategy in Australia. Any agents used to promote ignition must be on the National Plan OSCA Register.

Due to the hazard posed by toxic fumes burning, and the requirement for specialist fire retardant boom, in-situ burning is not considered a viable response option in the Port Spencer area.

6.12 Cost recovery

All cost associated with the response must be tracked.

This is vitally important for the recovery of costs from the polluter.

The finance functional area is responsible for the tracking of costs associated with the response effort. All responders are responsible for recording and advising finance of any cost associated with the response, this would include maintaining records of labour registration and responder time sheets.

For an ongoing response effort, a P & I Club representative should be consulted in the authorisation of expenditure to ensure minimal delays in cost recovery and that all costs can be recovered. The P & I Club will only cover reasonable costs incurred in an efficient and effective response.

Any costs considered 'unreasonable' or outside of established response measures may be challenged and not be recoverable.

6.13 Response Planning Support Tools

Once first strike response plan actions have been completed, situational awareness has been gained and the trajectory of the oil has been predicted, an assessment of the resources at risk needs to be made.

6.14 Ongoing Response - Fatigue

Where the size and complexity of the incident requires a response effort with duration greater than a week, careful consideration to fatigue management and business continuity will be required. Once the initial first strike response has been conducted, careful considerations of the use and allocation of personnel should be made. Where the response will continue for more than a week the IMT should be divided into two (2) with the

intention being for the first IMT group working for 5 to 7 days before handing over to the second IMT group. Any work routine shall comply with PPA Fitness for Duty Policy – *Fatigue Management Policy*.

For PPA to maintain control of the response effort and to ensure that PPA's corporate objectives and business continuity is maintained a PPA staff member should be used for the role of IC and each functional head.

For an ongoing and prolonged response, State Response Team (SRT) and National Response Team (NRT) resources should be mobilised. The SRT and NRT can provide both field team leaders and IMT resources.

For prolonged responses, the appointment of a Deputy IC should also be considered. The Deputy IC will be able to assist the IC by ensuring the smooth and efficient running of the IMT and ensuring all time-based outcomes are achieved whilst the IC coordinates external engagement.

6.15 Mobilising Personnel

For a large scale and ongoing response, all labour mobilised needs to be carefully tracked. Each person participating in the response needs to register using a *Labour Registration Form* and be provided with an induction outlining;

- Administrative requirements
- PPA Safety and Incident reporting requirements
- Outline of the response plan and actions
- PPA point of contact
- Accommodation and meal arrangements

6.16 Waste

Marine pollution incidents have the potential to generate large volumes of waste. Oil in the water increases its volume by between 3 to 5 times. Oil stranding ashore can increase in volume by between 10 and 50 times depending on the type of shoreline and the presence of debris.

The key principle for waste management is waste minimisation. If a shoreline will be impacted the following should occur;

- Shoreline pre-assessment

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- Shoreline pre-clean

This will reduce the amount of waste, facilitate planning for shoreline clean-up and assist with cost recovery.

Waste management plans need to be established as part of the logistics function of the IMT.

7.0 SURVEILLANCE AND MONITORING

7.1 Initial Assessment

The initial assessment of the incident will be based on limited and in some cases uncollaborated information. This needs verification to allow a proper assessment of the size and scale of the incident to be determined.

7.2 Situational Awareness

The IC and IMT needs to quickly gain situational awareness to determine;

- The scale of the incident
- The risk to environmental sensitivities
- The potential for a shoreline impact
- The need for resources

This can be gained quickly by vessel or aerial observation, such as by use of UAVs. Where possible, a trained aerial observer is to attend the flight. If this is not possible then photographs of the spill will provide additional information.

Once situational awareness is initially gained it needs to be maintained through regular observation.

Visual observation will be extremely limited at night except possibly within close proximity of the jetty, or the use of *Forward Looking Infra-Red (FLIR)* camera on fresh oil.

7.2.1 Aerial Observation

Aerial observation is powerful tool in oil spill response. Aerial observation allows for the situation to be quickly and relatively accurately assessed. It also allows for confirmation of trajectory modelling and continued assessment of the effectiveness of response efforts.

For initial assessments a photo or sketch of the extent of the oil will be acceptable from the pilot. But for more detailed analysis a trained aerial observer is required and should be put on the helicopter as soon as practicable.

A contracted pilot transfer helicopter/UAVs should be utilised as soon as

practicable to gain situational awareness. For larger spills, the systematic use of aerial observation will be key to the success of the response. A program with regular overflight and observation should be scheduled.

Aerial observations should be scheduled as follows;

- An early morning flight to gain situational awareness from the night before and confirm trajectory modelling
- An afternoon flight to update the IMT prior to afternoon briefs
- Flights as required to maintain situational awareness, such as for change of weather conditions or early on for large amounts of mobile oil

Due to the proximity of the helipad to the likely impacted area, rotary wing aircraft will be highly effective for aerial observation. For very large spills with large amounts of mobile oil, the use of fixed wing aircraft should be considered. For local situational awareness, the use of UAVs is recommended.

Assistance from AMSA can be requested for use of the search and rescue assets. These will take time to mobilise to site. To request the assets the IC should contact the Adelaide Signal Station on (08) 8248 3505 with the request.

All aerial observation should, where possible, be conducted in accordance with the guidelines of the [Bonn Agreement Aerial Operations Handbook](#).

When assessing oil on the water, the Bonn Oil Appearance code shall be used. The following 5 codes shall be used for assessing oil on the water.

TABLE 6 BONN OIL APPEARANCE CODE			
CODE	DESCRIPTION OR APPEARANCE	LAYER THICKNESS INTERVAL (µM)	LITRES PER KM ²
1	Sheen (silvery/grey)	0.04 to 0.30	40 to 300
2	Rainbow	0.30 to 5.0	300 to 5000
3	Metallic	5.0 to 50	5000 to 50,000
4	Discontinuous true oil colour	50 to 200	50,000 to 200,000
5	Continuous true oil colour	More than 200	More than 200,000

When making the assessment of oil in the water guidance shall be taken from the [Bonn Agreement Oil Appearance Code Atlas](#).

7.2.2 Vessel Observation

Vessel observation can assist with developing or maintaining situational awareness.

However, vessels are more limited in their ability to visually observe the oil.

Vessels due to the height of eye of the observer and the lower relative speed are less capable in terms of visual and photographic observation. Vessels can provide a quick initial assessment of incidents when operating in close proximity to the source.

8.0 SAFETY AND HAZARD MANAGEMENT

The protection of people from harm is the highest response priority. All response activities must be undertaken safely, in compliance with PPA standard operating procedures, and with consideration for the risks outlined below.

All personnel must comply with:

- PPA Occupational Safety and Health Policy
- PPA Fitness for Duty – Drug and Alcohol Policy
- PPA Fitness for Duty Policy – Fatigue Management Policy
- PPA Hazard Management Procedure
- PPA PPE Procedure
- PPA Incident Management Policy

8.1 Hazard Management

Oil Spill response actions have inherent risks/ hazards associated with them due to the toxicity and nature of the oil, the use of machinery, the weather, and presence of wildlife.

The PPA Hazard Management Procedure requires that the hazards associated with each task are identified and documented, and that controls are implemented to reduce the risk to as low as reasonably practicable.

Each team member is required to review the relevant SWI. Responders must also complete an individual Take 5 risk assessment to record any hazards and controls not reflected in the SWI. For any task where an SWI has not been developed, a Job Hazard Analysis (JHA) is to be developed by the team. Where the circumstances change during the response, a new Take 5 shall be conducted, and the JHA shall be reviewed in accordance with the *Hazard Management Procedure*. During any marine pollution response, all PPE controls stated in the risk assessment shall be worn by response personnel.

Crude oil and petroleum products are complex chemical mixtures,

containing polycyclic aromatic hydrocarbon solvents (such as benzene) and or hydrogen sulphide. Careful analysis of the oil shall be undertaken to determine the risk to responders, with consideration for how responders may become exposed to hazardous products, such as through:

- Effects of vapours
- Inhalation
- Skin Contact and ingestion

Additional risks may exist in the following circumstances:

- During the initial weathering stages, when oil can be particularly toxic as the light ends evaporate
- Under wharves and jetties, where the atmosphere may allow toxic gasses to build up or oxygen to be displaced

Other risks specific to each product are outlined in the relevant Material Safety Data Sheet (MSDS).

Responders should refer to the product MSDS to establish appropriate controls.

OSCA, degreasers, and detergents used to clean equipment also present different hazards. Refer to the relevant product MSDS for appropriate handling precautions.

Other hazards typically associated with oil spill response include:

- Toxicity of the oil or OSCA
- Uneven or slippery surfaces (potential for slips and falls)
- Wildlife and plant life (potential for physical injury, inappropriate handling causing harm)
- Machinery and equipment (potential for vehicle collisions, burns, crush injuries, being struck by mobile equipment)
- Working over or near water (potential for drowning)
- Hazardous substances (potential for ingestion or dermal reaction)
- Heavy, awkward or slippery equipment (potential for manual handling injuries)
- Extreme weather conditions inherent in the Spencer Gulf Region (potential for hypothermia, heat exhaustion, heat stroke or sun

burn)

Personnel should be mindful that gloves and other PPE become extremely slippery when oiled, increasing the time required to complete simple tasks. Shade is to be erected close to the work site, and water made available for all responders.

In case of emergency, personnel shall contact the VTS on XXXXXXXX or VHF Channel 12, in accordance with the PPA Port of Port Spencer Emergency Response Procedures.

All hazards and other incidents including injuries, property damage, and near misses must be reported to the relevant team leader immediately and addressed in accordance with the PPA Incident Management Procedure.

9.0 ENDING THE RESPONSE PHASE

The response phase ends when the State Marine Pollution Controller, in consultation with the Incident Controller and other advisors, determines that the spill has been collected and/or cleaned with respect to the Net Environmental Benefit (NEB).

It may not be possible to clean every beach, rock, cliff face, or area that has been affected by a spill due to inaccessibility, high energy coastline, or sensitivity of the area. Pursuing further cleaning of the area may affect the bathymetry of the area, plant life or otherwise be of little benefit in pursuing.

9.1 Triggers for ending response phase

The Incident Controller and SMPC should consider ending the response phase when one or more of these elements are noted:

- The source of the spill has been identified and contained e.g. no more substance is being leaked into the water
- Most (if not all) of the existing substance in the water has been collected
- Most (if not all) of the existing substance on the shoreline has been collected
- There is little or no re-oiling of the water or shoreline observed
- There is no environmental benefit in continuing a response
- The affected area is inaccessible, environmentally sensitive (e.g. it would do more damage to clean the area than to let the oil/noxious substance weather naturally) or otherwise unsuitable for response activities
- Supporting agencies, environmental advisors and/or the marine spill committee recommends the response phase ends.

10.0 EQUIPMENT AND CAPABILITY MAINTENANCE

PPA has a strong commitment to maintaining a high level of response preparedness. In order to ensure that PPA meets its obligations for preparedness and marine pollution emergency response PPA-PS has a multi-faceted approach to preparedness that encompasses;

- Planning
- Equipment
- Training
- Annual exercise
- Continuous improvement

10.1 Oil Spill Response Committee

The Oil Spill Response Committee is to ensure that PPA-PS is meeting its obligations for marine pollution response preparedness and planning. The committee is to comprise of members of relevant business sections of PPA based in Port Spencer. The committee is chaired by the Port Spencer Deputy Harbour Master.

The objectives of the oil spill committee include:

- To ensure that PPA-PS maintains a high level of preparedness for marine pollution incidents based on the risk of an incident and the potential impact of sensitive resources. Through ensuring;
- Equipment is appropriate and meets contractual requirements
- That staff are trained and able to safely and effectively participate in a response
- That the Marine Pollution Contingency plan is up to date and in line with industry best practice

The Oil Spill Response Committee is to meet quarterly. The minutes of the meetings are to be distributed to relevant PPA Port Spencer staff.

10.2 Equipment

Port Spencer has enough response equipment to deal with a Tier 1 oil spill.

This equipment is stored and maintained in a condition to ensure that it is ready for immediate deployment following the initial assessment of the spill report.

Peninsula Ports is required to ensure that regular serviceability checks are conducted on each piece of equipment and that employees are adequately trained in its operation, deployment, recovery and rehabilitation.

Peninsula Ports conduct annual response exercises that is part of this program where the equipment is fully deployed.

Where the equipment is damaged it is to be reported as soon as practicable as follows;

- During a response – to the team leader and then to the Operations functional area
- Outside of a response to the Deputy Harbour Master and raised as equipment damage via PPA incident reporting system

A dispersant stockpile is located at Calvin Grove Airfield, Virginia and north of Adelaide. The South Australian component of the National Plan stockpile is in Walkley Heights and managed by DPTI.

10.3 Training – Oil Spill Response

In order to meet PPA-PS preparedness, the Executive has approved the following training for Port Spencer based staff;

- Senior Operations Managers
 - AllMS Level 2
 - Media training
- Designated Incident Controllers
 - AMSA National Plan Incident Control Course
 - Media training
- Designated Functional Heads
 - National Plan training for nominated functional area

- National Plan IMT Course
- IMT Staff either
 - AMSA National Plan IMT
 - Level 1 Incident Management Course
- OSIRT
 - Attend OSIRT training 4 times a year
 - DOT Oiled Shoreline Course
 - DOT Basic Operators Course
- All Staff
 - For staff located in the regions - Oil Spill familiarisation training at least twice per year (combination of classroom and on water training)
 - For staff located in Perth - Oil spill familiarisation training at least once per year
- Operations Staff
 - National Plan Online Introduction to Marine Pollution

Training will be conducted in line with the PPA mandatory training matrix established for Port Spencer oil pollution response requirements.

10.4 OSIRT

OSIRT is primarily comprised of PPA operations and maintenance staff, which in the event of a marine pollution response will carry out the first strike deployments.

OSIRT training is to ensure that OSIRT members can safely and effectively operate the leased oil spill equipment and have the required knowledge to make informed decision in the field and provide advice to the IMT.

During the training OSIRT members who are identified as competent and who are accepting of further training, will be provided training to perform the role of team leader of oil spill response.

11.0 LANDSIDE EMERGENCIES

11.1 General Guidance for Landside Operational Emergencies

For all Landside operational emergencies, PS VTSO upon receiving the report will gain the necessary information from the person reporting the incident and contact the Harbour Master, the Landside Operations Manager and the relevant Landside Operations Superintendent. The duty VTSO will act in accordance with the direction of the Harbour Master and the relevant ERC.

During a landside emergency the following general steps are considered by the Incident Controller;

- Casualties are reported and Emergency Services notified
- Emergency Services Access to the site is facilitated
- The extent of the incident is assessed and the impact on adjacent operations and the safety of the vessel alongside is considered.
- Casualties are treated and removed to safety
- The area is made safe
- Assessment of infrastructure and the feasibility of commencing normal operations is considered.
- Recovery to normal operations

A careful assessment of the impact of the incident on adjacent operations is required. The Incident Controller in conjunction with the Landside Operations Manager/ Site Operations Superintendent will assess the impact and where the safety of personnel is at risk the operation will be restricted or suspended until it is safe to recommence. The impact will be carefully managed with a view to safely facilitate all operations.

Where a ship is alongside the berth and an incident occurs on the berth or in an adjacent landside area, the Incident Controller will assess the risk the incident poses to the safety of the vessel and its crew. Where necessary the vessel will be removed from the berth and sent to anchorage until it is safe for the vessel to return and cargo operations resumed.

11.2 Fall from Height (Including Gangway, Ship loader or Cargo)

Where a person falls from height, the severity of the person's injuries will be assessed, and appropriate medical aid will be provided. The contracted maritime security guards will contact Emergency Services, provide access to the site by facilitating the relevant security gate and provide first aid where appropriate. The contracted security operator will restrict unnecessary access to the site and have a security officer and vehicle on standby to escort emergency services to the site.

All cargo operations in the immediate area will cease until the casualty has received medical assistance and is removed from the location.

Once the scene has been released, operations will resume.

11.3 Ship Loader High Voltage Electrical Incident

Once the report of the failure has been received, the Landside Operations Coordinator will contact the relevant maintenance superintendent and arrange for suitable personnel to attend the ship loader to assess the damage, cordon off the area and make repairs.

11.4 Landside Fire

Once the report has been received by PH VTS, Emergency Services will be notified and their access to the site will be facilitated by the relevant security gate. The contracted security operator will restrict unnecessary access to the site and have a security officer and vehicle on standby to escort emergency services to the site.

Where relevant the adjacent buildings and areas will be evacuated and operations in the vicinity will be assessed to determine if they can safely continue. If a vessel is alongside the wharf and the fire presents a danger to the vessel or the vessels crew the Harbour Master will remove the vessel from the berth until it is safe for the vessel to return.

For all significant fires where the generated smoke could impact DFES will be requested to conduct smoke monitoring. Where additional firefighting resources are required, a request will be made to DFES for additional resources.

Once the fire has been extinguished, an assessment of the damage will be

made, and a recovery plan will be produced and communicated to all relevant Port users.

11.5 Bulk Hydrocarbon Spill Landside

The guidance in this part relates to major landside bulk hydrocarbon spills. For all minor hydrocarbon spills refer to Hydrocarbon Spill Response and Spill Kit Maintenance. Potential major spill sources include road tanker vehicle accident or transfer pipe. If a report of a major landside bulk hydrocarbon spill within PPA controlled land is received, the following actions will be taken;

- Ensure ESC's are activated on the vessel and at the terminal (during cargo operations)
- Evacuate the area of the site at risk
- Isolate where possible all potential sources of ignition
- Facilitate Emergency Service access to the site
- Block all drains

Where appropriate, consideration will be given to implementing temporary bunding arrangements to contain the bulk hydrocarbon products.

11.6 Dangerous Goods or Noxious and Hazardous Substance Spills

If a report of a spill of dangerous goods or hazardous and noxious substance spill which present a risk to human health or a risk to the environment within PPA controlled port area is received, the following actions will be taken;

- Stop cargo operations
- Evacuate the area of the site at risk
- Isolate where possible all potential sources of ignition
- Facilitate Emergency Service access to the site
- Block all drains

Where appropriate, consideration will be given to implementing temporary bunding arrangements to contain the dangerous goods or hazardous and noxious substance for DFES to manage.

11.7 Grain Dust

11.7.1 The Dangers of Grain Dust

One category of combustible dust is grain dust. Grain dust can be found in grain handling and grain storing facilities. An example of grain dust is dust from wheat, oats, barley etc. Grain dust is highly combustible, and much like other combustible dusts, certain conditions must be met for an explosion to occur.

There must be oxygen present, fuel (the combustible dust), an ignition source (heat or a spark) and a restrictive area.

Whether or not grain dust can cause an explosion depends on its concentration or MEC (minimum explosive concentration). The MEC of a dust particle depends on the type of grain the particle came from. It is important for dust levels to be maintained below the MEC in order to avoid any explosions.

If the grains undergo grinding before storage the resulting particle size may fall below 500 µmm, in which case they can mix with air to create an explosive atmosphere. Even if most of the particles are larger, finer dusts may well be present and therefore may still constitute a danger. The presence of combustible dusts always involves explosion risk if an ignition source is present.

Grain dust explosions occur in a series of combustion reactions. If an explosion occurs, it is very likely that the energy and fuel released by the first explosion will cause another explosion to occur. One of the best ways to reduce the chance of a combustible dust explosion is to prevent dust accumulation and decrease the number of potential ignition sources in the environment.

11.7.2 Methods of protection for dusts

Originally, there was no division between protection methods for gases and dusts, and the same methods of protection for gases were also used for dusts.

Today, with the evolution of regulations and standards, equipment is available designed specifically for dust explosion risk environments. Equipment for gases is designed on the principle that it is impossible to prevent their penetration inside the enclosure, while ingress prevention is a common feature of equipment for dust explosion-risk environments.

11.7.3 Methods of protection

The two basic principles of protection are segregation and prevention.

To select the right method of protection there are no fixed rules.

Manufacturers build equipment to suit every situation. The parameters of choice concern: the respect of rules for the choice of material depending on the type of zone, where the equipment will be installed, the facility of installation, and, especially, the ease of maintenance. Equipment should be chosen not only based on the initial cost but considering the total cost for the entire period of its useful life. A piece of equipment that requires less maintenance will usually be preferable.

Explosion protection will be adequate for most electrical equipment applications used near a silo.

Pressurisation has high conduction costs (the maintenance of internal overpressure provides a continuous use of energy for the pumping of air or inert gas), while the encapsulation is applied only to equipment that, once its life cycle is over, must be replaced.

With regard to intrinsic safety, the power involved is so low that the use is appropriate for process instrumentation and control.

11.8 Blockage of Port Access Roads

The port access road could be blocked for several reasons such as;

- Vehicle accident
- Road structural failure

Where the port access road becomes blocked, the priority will be to determine if there are casualties and to facilitate emergency services access to the scene.

Where possible, an alternate access to the port will be provided and communicated to port users.

An assessment of damage to the road and infrastructure will be conducted and a recovery plan developed and communicated to

relevant port users.

11.9 Heavy Vehicle Collision

This includes heavy vehicle collision with light vehicles, other heavy vehicles and infrastructure. Once the incident has been reported, the priority is to determine if there are casualties. Emergency Services will be notified and their access to the site will be facilitated by the relevant security gate. The contracted security operator will restrict unnecessary access to the site and have a security officer and vehicle on standby to escort emergency services to the site.

The landside operations team will assess the situation and determine if cargo operations need to stop.

Once any casualties have been treated and removed from the scene an assessment of the damage will be made and a recovery plan will be developed.

11.10 Cargo Handling Incident

Where there is an incident involving cargo such as a cargo shift, suspended load falling or a collision between a suspended load and infrastructure, the priority will be to determine if there are any casualties. Emergency Services will be notified and their access to the site will be facilitated by the relevant security gate. The contracted security operator will restrict unnecessary access to the site and have a security officer and vehicle on standby to escort emergency services to the site.

Where the cargo shift occurred on a vessel, assessment of the damage condition and stability condition will be made. AMSA will be notified of the incident and any required assistance will be provided to the investigation.

Once casualties have been treated and removed from the scene an assessment of the damage will be made and a recovery plan will be developed.

12.0 AIRCRAFT EMERGENCIES

This section applies to aircraft emergencies relating to the contracted pilot transfer helicopters. For all aircraft operational emergencies, PS VTS upon receiving the report will gain the necessary information from the vessel or person reporting the incident and contact the Harbour Master. PS VTS will act in accordance with the direction of the Harbour Master and relevant ERC. The HMA for air crash is South Australia Police.

During an aircraft emergency the following general steps are considered by the Incident Controller;

- Casualties are reported and Emergency Services notified
- Emergency Services Access to the site is facilitated as appropriate
- Ensure search and rescue operations commence if appropriate
- The extent of the incident is assessed and the impact on adjacent operations and the safety of the vessel alongside is considered.
- Casualties are treated and removed to safety
- Use pilot vessels for pilot transfers
- The area is made safe
- Assessment of infrastructure and the feasibility of commencing normal operations is considered.
- Recovery to normal operations

12.1 Helicopter Crash at the Helipad

Where the aircraft crashed on take-off or landing, the Duty VTSO will contact emergency services and the main security gate. Emergency Services will be notified and their access to the site will be facilitated by the relevant security gate. The contracted security operator will restrict unnecessary access to the site and have a security officer and vehicle on standby to escort emergency services to the site.

PS VTS where directed by the Harbour Master will advise PPA and the contracted pilot vessels and facilitate all transfers by launch.

The Harbour Master and the senior base pilot will assess the situation and provide any technical information required to emergency services.

Once any casualties have been dealt with, the Harbour Master and the senior base pilot will determine the recovery plan.

12.2 Helicopter Crash at Sea

Where the aircraft crashes at sea, PS VTS will direct suitable vessels in the area to assist the helicopter. Additionally, PS VTS will advise RCC Australia and assist as required with the search and rescue effort.

The Harbour Master and the senior helicopter pilot will assess the situation and devise a recovery plan.

PS VTS will advise the Duty Marine Pilot and the contracted pilot vessel operator. Transfers where necessary will be conducted by pilot launch.

12.3 Helicopter Crash on Vessel

Where the helicopter crashes on the vessel, PS VTS will notify the Harbour Master and duty pilot. Emergency services and RCC Australia will be notified and assistance provided to the response. If required, a second pilot will be transferred to the vessel where safe to do so.

The vessel will be returned to anchor until assistance has been provided to the casualties and an assessment of the damage condition can be made.

13.0 EXERCISES & TRAINING

13.1 Exercises

Regular exercises will be conducted with VTS, HMA's, port stakeholders and port users where appropriate. These exercises will be practical where possible. For incidents that cannot be safely replicated, desktop exercises will be held.

14.0 PROCESS OWNER & DOCUMENT CONTROL

The General Manager Operations owns this ERP. It is under his/her authority that the plan is distributed and executed.

To maximise its usefulness, the General Manager Operations encourages controlled copyholders and all other interested parties to suggest potential improvements. This ERP shall be controlled in accordance with Peninsula Ports Quality Management System.

The General Manager Operations has overall responsibility for this procedure.

15.0 REVIEW & REVISION

Areas of ineffectiveness or inefficiency will be noted, and the ERP modified to reflect the required actions. The modifications will be tested during subsequent drills.

In addition to review and revision arising from real emergency situations and training exercises, the ERP shall be subjected to a periodical review.

This review shall be carried out annually to ensure that the Plan is up-to-date, effective and in line with changing community standards

16.0 ANNEX 1 FIRST STRIKE RESPONSE PLAN – OIL Pollutants

16.1 Objective

This First Strike Response Plan has been developed for the Port of Port Spencer to provide a response system proportional to the Oil Spill Risks identified within Port Limits.

NOTE: West Coast Response should be alerted to any incident involving marine pollution by oil to ensure immediate response on their behalf as well as appropriate support relating to the first strike plan.

16.2 Scope

This plan describes the specific actions to be taken in the event of a spill from any of the identified high-risk incident locations identified within the port limits.

The Basic components of this first strike plan are as follows:

- Predictions of oil trajectory, impact areas & weathering processes (predetermined);
- Response protection priorities (predetermined);
- Response strategies e.g. contain & recover with booms and skimmers (predetermined);
- OH&S involved in the operation, including hazards & control measures;
- Waste Management;
- Personnel - number of responders needed;
- Equipment – the type of equipment and the ancillaries and logistics required;
- The expected realistic timing for the operation; and
- Clear communications for the response operation.

16.3 Overview of response systems in Port Spencer

The four key response strategies considered most effective for the perceived risks at Port Spencer are,

- Stop the spill at its source
- Monitor and evaluate (Helicopter)
- Protection of key resources using containment boom (mangrove and salt marsh)
- Containment and Recovery (on water collection and skimmer systems, use of Responder 4 as soon as practicable)
- Shoreline clean-up (outer harbour beaches)

The strategies were considered as most appropriate considering the brevity of available time to commence a response facility's proximity to immediate assistance and sensitive environmental areas close by.

These above selected strategies were also deemed appropriate in consideration of the constant changing profile of the Port waterways during the construction of new facilities.

16.4 Environmental Protection Priorities

No FSRP can guarantee complete protection of the marine environment from an oil spill. The FSRP provides a realistic response system designed to protect the key resources identified as being under threat from a marine oil spill event within Port Limits.

16.5 Initial Assessment

All Oil spills reported, to the VTS should be assessed immediately and the appropriate response plan activated. The initial assessment should determine if:

- Is it safe to respond? (MSDS)
- Can we stop the spill at its source?
- Has the discharge stopped?
- Where is it going? (Ebb or Flood Tide)
- When will it get there?

- Which prepositioned system should be deployed first? (flood tide)
- What receptors will be impacted outside the harbour? (ebb tide)
- Is it safe to employ those response strategies?

16.6 Oil Spill Response Mechanism Overview

16.6.1 Appropriate Equipment

PPA-PS has leased oil spill response equipment which:

- Is capable of containing and recovering oil rapidly in accordance with the expected response time available;
- Able to contain and recover a 250-tonne spill of Heavy Fuel Oil within 2 hours of deployment
- Is able to store and transfer up to 500 tonnes of Heavy Fuel Oil recovered aboard purpose-built response barges, two 50t storage bladders as well as two 10t towable storage bladders
- Utilise the MPV and/or tugs as first response vessels for towing booms into position and skimming
- Equipment for a team of 20 shoreline responders.

16.6.2 Training

The Port Spencer Port Authority has in place a targeted training regime which provides a training pathway for responders to develop their skills in mounting a first strike response with the available equipment.

16.6.2.1 Training Regime & Exercises

Table 1 is the training regime developed to prepare sufficient personnel for the required response operations as shown in the First Strike Plans.

TABLE 1 TRAINING REGIME			
TRAINING OR QUALIFICATION	NUMBER REQUIRED TO MAINTAIN CAPABILITY	PURPOSE OF TRAINING	REVALIDATION FOR TRAINED PERSONNEL
Restricted Coxswain	2	Meet legal obligations and ensure safety	As required by National regulations
Introduction to oil spills	all available personnel	Provide all site-based personnel with an understanding of oil spill response operations	2 basic courses every year
Shoreline assessment and clean-up	2	To lead an assessment team and commence clean-up	2 years
Aerial observers course	2	To gain skills required to make an assessment of spill location and extent	2 years
Equipment Operator	6	Capable responders to deploy on-shore and off-shore equipment in accordance with the First Strike Plans.	1 year
Oil Spill Team leader	2	Able to plan a response operation and manage offshore operations	Ongoing training provided up to 3 sessions per year

TABLE 2 TRAINING EXERCISES			
EXERCISE TYPE	PERSONNEL TO ATTEND	TESTING RESPONSE OPERATIONS	FREQUENCY
Desktop and planning	PPA- PH	Planning and cooperative	Annual
PPA-PS	Restricted Coxswains, Operators and Team Leaders	Continuous improvement of deployment operations	Annual

16.6.3 Responsibilities / Actions

Standard Work Instructions have been formalized for all likely deployments of the leased oil spill response equipment. This gives responders a prompt sheet to reference at any time rather than waiting for plans and instructions to be given. These are located at the site of the equipment as well the intranet.

16.7 Floating Oil

The risk assessment, local experience and trajectory modelling all show that spilled oil will only be adrift for a few hours within the port before it enters the mangrove wetlands or strands on the spoil bank and eastern beaches.

It is likely that oil emanating from all the high-risk incidents listed, could impact receptors in less than 1 hour.

First Strike response for floating oil:

Contact VTS immediately and request an on-water response operation to recover floating oil. Deploy the MPV to commence skimming of floating oil, utilise the MPV and/or Tugs to tow booms into position from the Response Container.

16.8 Oiled Shorelines

The sandy shorelines provide an opportunity to recover oil which travels with the currents running parallel with the shorelines.

First Strike response for risk to or already oiled shorelines:

PPA-PS will deploy their stock of shore sealing booms and GP booms to establish several collection points on the identified beaches and to protect Lipson Island. The collection points identified also require oil recovery and storage equipment and access for servicing the equipment.

16.9 Oiled Wildlife (Shoreline Clean-up)

Only trained personnel in wildlife capture and cleaning should attempt to collect oiled wildlife.

At this stage the prompt notification of a spill and identified impact areas should be transmitted ASAP to DAW personnel to respond appropriately to the identified risks.

The highest risks to wildlife have been identified in the risk assessment as:

- Sea Birds

The OWRP will specify the estimated numbers of oiled birds, and the capture, transport, cleaning and rehabilitation of the animals.

16.10 Stopping the spill at the source

It may be possible to place a boom on the hull of the ship to capture leaking oil. This should only be attempted in close consultation with the Harbour Master and the ships Master and Chief Engineer. This should be done only after the appropriate equipment has been deployed to protect the jetty, beaches and environmental sensitive areas.

It is always a good idea to place a boom around the damaged area of a ship even if the leak has stopped in case of a secondary release; however, time does not permit this to be done prior to other protection systems in the case of Port Spencer. As with all response systems, this should be exercised and tested.

16.11 Response Plans

The following response plans specify the potential of a spill to a particular location, along with response tactics and resource options.

16.11.1 Containment in Port Limits

Purpose: The purpose of the primary containment procedures is to reduce the likelihood of oil impacting the Port Limits.

The MPV is located at the Jetty able to capture and recovery of oil entering the Jetty area.

Response Tactics: Direct oil into the skimmer using the blower and booms collect oil using the Foilex TDS200 Skimmer

Resources: The resources required for this operation are located in the Response container.

Timing: It is expected that this deployment operation should take approximately 25 minutes.

16.11.2 Containment at Lipson Island

Purpose: To reduce the opportunity for oil to enter Lipson Island and reduce the impact.

Response Tactics: Direct oil into the skimmer with the blower and using the booms.

Resources: Resources required are in the Response Container.

Timing: It is expected that this deployment operation should take approximately 25 minutes.

end of document



ANNEX 1 - FIRST STRIKE RESPONSE PLAN

(MARINE INCIDENTS)
PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	

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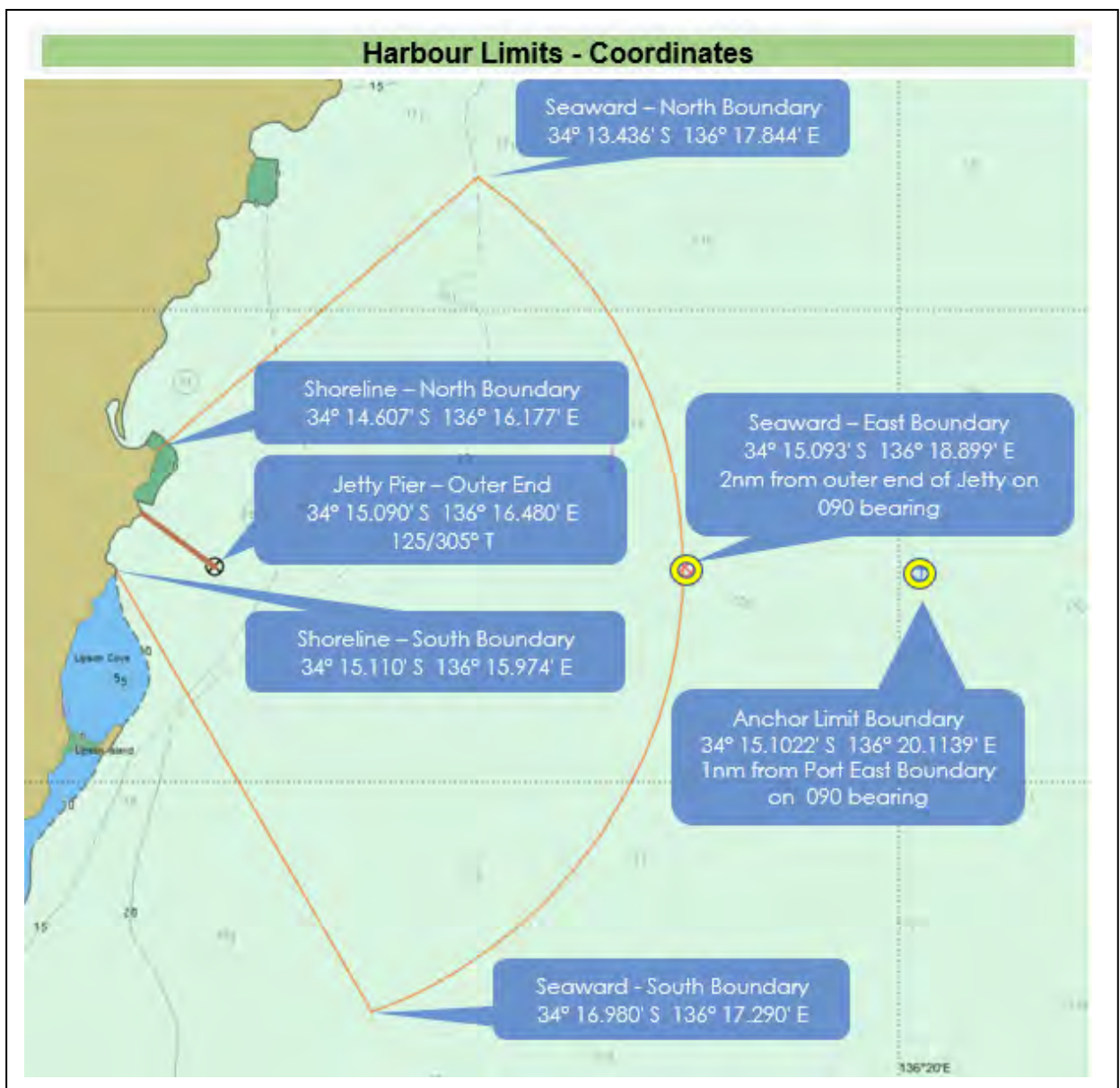
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ANNEX 1 FIRST STRIKE RESPONSE PLAN – OIL Pollutants

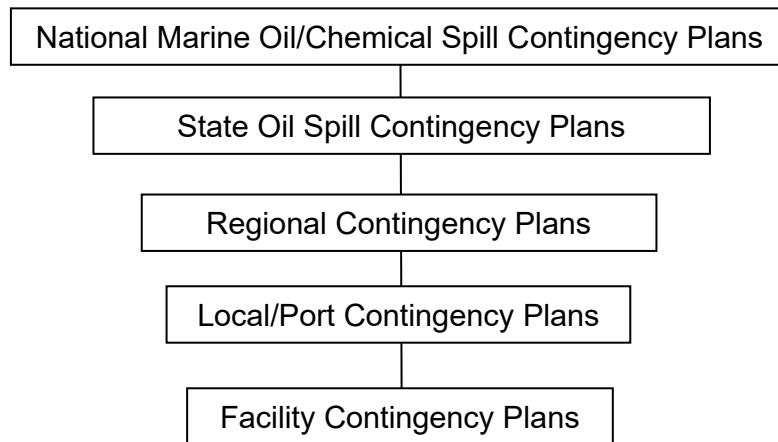
16.12 Objective

This First Strike Response Plan has been developed for the Port of Port Spencer to provide a response system proportional to the Oil Spill Risks identified within Port Limits from ships and other marine sources.

NOTE: Peninsula Port Authority – Port Spencer should be alerted to any incident involving marine pollution by oil to ensure immediate response on their behalf as well as appropriate support relating to the first strike plan.



16.13 National Plan – Hierarchy



16.14 Roles and Responsibilities

The roles and responsibilities for first strike response to oil spills within the port limits of Port Spencer are defined as follows:

- Maritime Safety South Australia (DPTI) is both Statutory and Combat Agency for ship sourced oil spills that impact South Australia Coastal waters and is the pre-designated Incident controller for all incidents within the scope of this plan.
- The port operator, PENINSULA PORTS is responsible for ensuring that an adequate first-strike oil spill response capability is maintained within the port limits of Port Spencer.
- Local councils generally assume responsibility for clean-up of oil impacted shorelines outside of National Parks. Depending upon the geographical location of stranded oil the District of Tumby Bay may be requested to undertake shoreline clean-ups operations following an oil spill within the port.
- The South Australian Marine Spill Contingency Action Plan (SAMSCAP) is

managed by DPTI.

- The Marine Operations Group of Transport SA is responsible for clean-up of oil from beaches within National Parks.

Details of the roles and responsibilities may be found in Appendix 1 to the Inter-Governmental Agreement on the National Plan.

The DPTI is the nominated SA Control Agency for oil spills in SA State marine and inland waters and will assume overall direction of emergency management activities in an emergency. Authority for control carries with it the responsibility for tasking and coordinating other organisations in accordance with the needs of the situation. The *Emergency Management Act 2004 (SA)* identifies the SA Police as the coordinating agency for all emergencies.

The State Coordinator is the person for the time being holding or acting in the position of Commissioner of Police, therefore, the arrangements in SA will be;

- SA Police will become the Coordinating Agency for any spill incident;
- DPTI will become the Control Agency for a spill within 3nm;
- DPTI provides the SMPC;
- DPTI will plan & execute the State arrangements for the incident within 3nm;
- DPTI will plan & execute the State shoreline arrangements for the incident within 3nm;
- DPTI will integrate the Port Spencer resources within its own command structure;
- DPTI will integrate the Port Spencer technical expertise within its own command structure

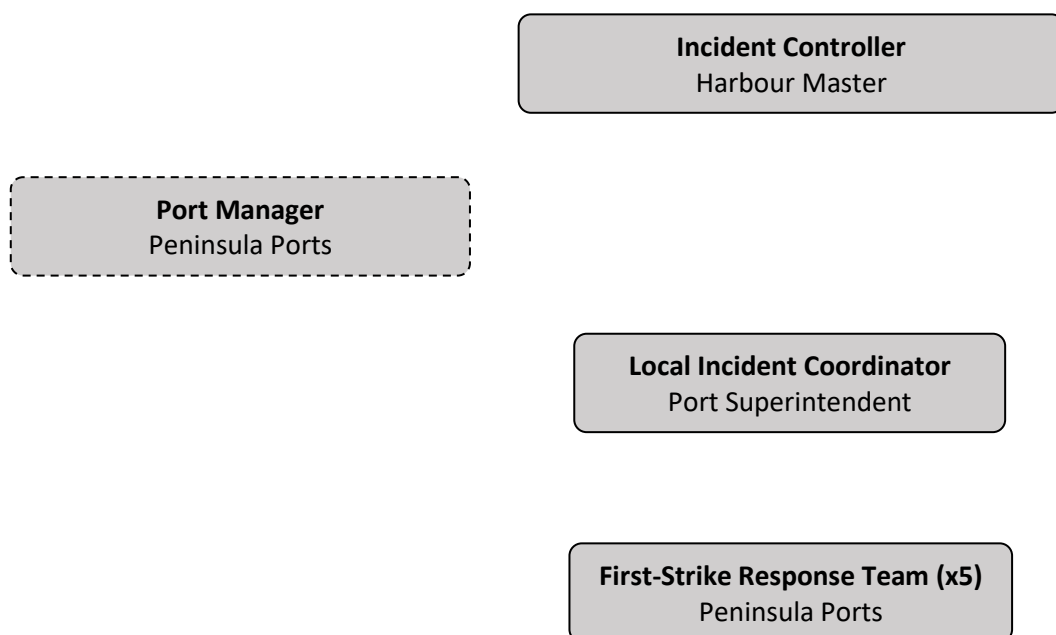
PENINSULA | PORTS

PENINSULA PORTS acknowledge that the responsibility for clean-up of a spill associated with its activities remains with PENINSULA PORTS and in the event of State or Commonwealth assistance all reasonable costs incurred will be recoverable.

The South Australia Marine Spill Contingency Action plan (SAMSCAP) is used as the basis for management of all oil spills outside port limits. This will also include an oil spill within the port limits if assessed as in excess of 10 tonnes, or otherwise agreed with the Port Spencer Incident Controller.

Port Spencer scope focuses on Level 1 marine oil spills (up to 10 tonnes) that occur.

16.15 Response Team Structure (trained personnel pursuant to



16.16 Constraints

The *Marine Parks Act 2007 (SA)* and the *Marine Parks (Zoning) Regulations 2012 (SA)* prohibit entering or engaging in any activity in a restricted access zone and prohibit certain activities in marine park zones (Lipson Island).

The regulations do, however, allow for a number of exemptions from prohibitions and restrictions, including for persons acting in the course of emergency. The definition of emergency provided in the regulations includes an event that causes or threatens to cause harm to the environment, so a

permit may not be required. If Peninsula Ports is directed by the State to undertake spill response activities in a marine park zone, Peninsula Ports will only undertake these activities once permit requirements are confirmed.

16.17 Scope

This plan describes the specific actions to be taken in the event of a spill from any of the identified high-risk incident locations identified within the port limits.

The Basic components of this first strike plan are as follows:

- Predictions of oil trajectory, impact areas & weathering processes (predetermined);
- Response protection priorities (predetermined);
- Response strategies e.g. contain & recover with booms and skimmers (predetermined);
- OH&S involved in the operation, including hazards & control measures;
- Waste Management;
- Personnel - number of responders needed;
- Equipment – the type of equipment and the ancillaries and logistics required;
- The expected realistic timing for the operation; and
- Clear communications for the response operation.

16.18 Overview of response systems in Port Spencer

The four key response strategies considered most effective for the perceived risks at Port Spencer are,

- Stop the spill at its source
- Monitor and evaluate (Helicopter)
- Protection of key resources using containment boom (Jetty, Port shoreline)
- Containment and Recovery (on water collection and skimmer)

systems as soon as practicable)

- Shoreline clean-up (outer port beaches – Rogers beach, Lipson Cove beach)

The strategies were considered as most appropriate considering the brevity of available time to commence a response facility's proximity to immediate assistance and sensitive environmental areas close by.

These above selected strategies were also deemed appropriate in consideration of the constant changing profile of the Port waterways during the construction of new facilities.

16.19 Environmental Protection Priorities

No FSRP can guarantee complete protection of the marine environment from an oil spill. The FSRP provides a realistic response system designed to protect the key resources identified as being under threat from a marine oil spill event within Port Limits.

16.20 Threat assessment

The most likely type of pollution incidents to occur within the port are small operational discharges from the tugs and multi-purpose vessel. However, there is also a chance of larger operational discharges of fuel oil or waste oil from the visiting bulk carriers at the berth and/or significant spills of heavy fuel oil resulting from contact incidents within the port.

16.21 Possible Spill Scenarios

The types of incidents most likely to occur within the port are small spills of petrol, diesel fuel or bilge oil from operational vessels operating in the port.

Spills of up to:

- 300 tonnes of heavy fuel oil and other oil products from Bulk Carriers involved in serious striking or grounding incidents within the port;⁹
- 10 tonnes of bunker fuel or bilge oil during ships' internal transfer operations;¹⁰

⁹ See for example Pacific Adventurer bunker spill in 2009: <https://www.amsa.gov.au/marine-environment/incidents-and-exercises/response-pacific-adventurer-incident-strategic-issues>

¹⁰ See for example Global Peace Bunker spill in Gladstone in 2006: <https://www.amsa.gov.au/marine->

- 50 litres of diesel fuel or bilge oil from operational vessels could also occur in the port.

Large spills of fuel oil and other oil products and from road tankers or other land-based sources are also possible.

16.22 Response and Handover Arrangements

Early first-strike response action should include an assessment of the time and resources required to effectively manage each incident. Where a response is likely to be prolonged or exceed the port's first-strike response capacity, Port Spencer should request assistance from Maritime Safety South Australia. When determining the need for assistance or hand-over of the response Port Spencer should consider the number and availability of local trained response personnel, their ability to work safely without the need for excessive work hours, and the capacity of the ports' first-strike response equipment. Requests for assistance should be made as soon as possible and preferably in the first or subsequent SITREPs.

Level one spills might require dispersant spraying, although approval will be sought from the State Marine Pollution Controller (SMPC). Only Prescribed officers under SAMSCAP and the National Plan may authorise the use of Dispersants.

In the first instance following a spill, Peninsula Ports Response Team and Vessels (including tugs as appropriate) may be utilised for:

- Deployment of boom
- Containment of any surface oil
- Monitoring and reporting of oil type, quantity and extent of surface coverage
- Initial clean-up response; and
- If instructed by SMPC, application of dispersants.

If approved, the surface application of dispersants may be an effective response tool on hydrocarbons, as long as they can be applied to fresh oil and during the dispersant “window of opportunity”.

16.23 Peninsula Ports Incident Control Centre

Port Spencer VTS will, in the first instance for a tier 1 oil spill, act as the Incident Control Centre and communications hub for Peninsula Ports. If required, and subject to guidance from the SMPC, an Incident Control Centre may be upgraded or transferred to another location for an ongoing or higher-level Tier 2/3 response.

16.24 Initial Assessment

All Oil spills reported to the VTS should be assessed immediately and the appropriate response plan activated. The initial assessment should determine if:

- Is it safe to respond? (MSDS)
- Can we stop the spill at its source?
- Has the discharge stopped?
- Where is it going? (Ebb or Flood Tide)
- When will it get there?
- Which prepositioned system should be deployed first? (flood tide)
- What receptors will be impacted outside the harbour? (ebb tide)
- Is it safe to employ those response strategies?

16.25 Lipson Island Fauna Conservation Reserve

Lipson Island Fauna Conservation Reserve is a Category III Natural Monument or Feature (based on the International Union for the Conservation of Nature or ‘IUCN’ categorisation). The Primary objective of the Lipson Island Fauna Conservation Reserve is to protect the outstanding natural features and associated biodiversity and habitats in and near to Lipson Island. IUCN Category III is related to the conservation of the natural feature itself, in this case, Lipson Island and its immediate vicinity.

The Lipson Island Fauna Conservation reserve, established in 1967, is centred on Latitude 35.2638 S Longitude 136.2658 E, is 8 ha in area, and is primarily a

marine reserve.

Any spill response must give proper attention to the protection of the Lipson Island Fauna Conservation Reserve and its natural environment.

Diagram needed for oil spill planning and training purposes:

16.26 Response considerations and options

Location	Monitor	Contain & recover	Protect Resources	Shoreline Cleanup	Apply Dispersant
Jetty	Yes	If practicable	If practicable	If practicable	If authorised
Lipson Island Fauna Conservation Reserve	Yes	If practicable	YES	YES	NO
Shoreline	Yes	If practicable	If practicable	If practicable	If authorised

16.27 Response Level Determination

Response Level Indication	Level3	Level2	Level1
Spill Details			
Release Volume	> 300m ³	10m ³ - 300m ³	< 10m ³
Continuous release	Yes	No	No
Hydrocarbon has high persistent component	Yes	Yes	No
Resolution likely to take	> 2 weeks	48hrs to 2 weeks	< 48hrs
Spill Impact			
Actual or potential threat to, or	Yes	No	No
Adverse impact on public or	Yes	Possible	No
Oil will reach the shoreline	Yes	No	No
Media coverage likely	International	National	Local
Likely Resources Required			
International resources required, International agencies and government involved	Yes	Possibly	No
Regional resources required; multiple agencies involved	Yes	Yes	No
Peninsula Ports resources on hand will be sufficient	No	No	Yes

16.28 Oil Spill Response Mechanism Overview

16.28.1 Appropriate Equipment

PPA-PS has oil spill response equipment which:

- Is capable of containing and recovering oil rapidly in accordance with the expected response time available;
- Able to contain and recover a 120-tonne spill of Heavy Fuel Oil within 2 hours of deployment
- Is able to store and transfer up to 150 tonnes of Heavy Fuel Oil recovered to two 50t storage bladders as well as two 10t towable storage bladders
- Has a dedicated first response vessels (M P V) used for towing booms into position and skimming
- Equipment for a team of 20 shoreline responders.

16.28.2 Training

The Port Spencer Port Authority has in place a targeted training regime which provides a training pathway for responders to develop their skills in mounting a first strike response with the available equipment.

16.28.2.1 Training Regime & Exercises

Table 1 is the training regime developed to prepare sufficient personnel for the required response operations as shown in the First Strike Plans.

TABLE 1 TRAINING REGIME			
TRAINING OR QUALIFICATION	NUMBER REQUIRED	PURPOSE OF TRAINING	REVALIDATION FOR TRAINED PERSONNEL
Restricted Coxswain	2	Meet legal obligations and ensure safety	As required by National regulations
Introduction to oil spills	all	Provide all site-based personnel with an understanding of oil spill response operations	2 basic courses every year
Shoreline assessment and clean-up	2	To lead an assessment team and commence clean-up operations	2 years
Aerial observers course	2	To gain skills required to make an assessment of spill location and extent	2 years
Equipment Operator	6	Capable responders to deploy on-shore and off-shore equipment in accordance with the First Strike Plans.	1 year
Oil Spill Team leader	2	Able to plan a response operation and manage offshore operations	Ongoing training provided up to 3 sessions per year

TABLE 2 TRAINING EXERCISES			
EXERCISE TYPE	PERSONNEL TO ATTEND	TESTING RESPONSE OPERATIONS	FREQUENCY
Desktop and planning	PPA- PH	Planning and cooperative	Annual
PPA-PS	Restricted Coxswains, Operators and Team Leaders	Continuous improvement of deployment operations	Annual

16.28.3 Responsibilities / Actions

Standard Work Instructions (SWI) have been formalized for all likely deployments of the leased oil spill response equipment by PPA-PS. This gives responders a prompt sheet to reference at any time rather than waiting for plans and instructions to be given. These are located at the site of the equipment as well the intranet and in the VTS office.

16.29 Floating Oil

The risk assessment, local experience and trajectory modelling all show that spilled oil will only be adrift for a few hours within the port before it enters the shoreline and beaches.

It is likely that oil emanating from all the high-risk incidents listed, could impact receptors in less than 1 hour.

First Strike response for floating oil:

Contact VTS immediately and request an on-water response operation to recover floating oil. Deploy MPV to commence skimming of floating oil, utilise MPV to tow booms into position from the Response Container.

16.30 Oiled Shorelines

The sandy shorelines provide an opportunity to recover oil which travels

with the currents running parallel with the shorelines.

First Strike response for risk to or already oiled shorelines:

PPA-PS will deploy their stock of shore sealing booms and GP booms to establish several collection points on the identified beaches and to protect Lipson Island. The collection points identified also require oil recovery and storage equipment and access for servicing the equipment.

16.31 Oiled Wildlife (Shoreline Clean-up)

Only trained personnel in wildlife capture and cleaning should attempt to collect oiled wildlife.

At this stage the prompt notification of a spill and identified impact areas should be transmitted ASAP to DAW personnel to respond appropriately to the identified risks.

The highest risks to wildlife have been identified in the risk assessment as:

- Sea Birds

The OWRP will specify the estimated numbers of oiled birds, and the capture, transport, cleaning and rehabilitation of the animals.

16.32 Stopping the spill at the source

It may be possible to place a boom on the hull of the ship to capture leaking oil. This should only be attempted in close consultation with the Harbour Master and the ships Master and Chief Engineer. This should be done only after the appropriate equipment has been deployed to protect the jetty, beaches and environmental sensitive areas.

It is always a good idea to place a boom around the damaged area of a ship even if the leak has stopped in case of a secondary release; however, time does not permit this to be done prior to other protection systems in the case of Port Spencer. As with all response systems, this should be exercised and tested.

16.33 Response Plans

The following response plans specify the potential of a spill to a particular location, along with response tactics and resource options.

16.33.1 Containment in Port Limits

Purpose: The purpose of the primary containment procedures is to reduce the likelihood of oil impacting the Port Limits.

The MPV is located at the Jetty able the capture and recovery of oil entering the Jetty area.

Response Tactics: Direct oil into the skimmer catchment area using the on-board booms, blower and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: The resources required for this operation are in the Response Container

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the Jetty.

16.33.2 Containment at Lipson Island

Purpose: To reduce the opportunity for oil to enter Lipson Island and reduce the impact.

Response Tactics: Direct the oil using the on-board booms (tugs) and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: Resources required are on board the MPV and Tugs

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the spill site.

16.34 EQUIPMENT LIST

Response Container Content

RESOURCES FOR CONTAINMENT	
RESOURCES	QTY
General Purpose Boom - Flex	300m
Land Sea Boom Kit (boom, pump & blower)	600m
Weir Skimmer Kit (skimmer & spate pump)	1
Flexi-Dam recovered oil storage container - 25 tons approx. - each	2
Anchor Kit	1
Sorbent Boom	120m
Sorbent Pads	500
Sorbent Mops	120
Bag of rags	1
Box of ear plugs	1
Sunscreen	1
Gloves	5
Hand cleaner	1
Tool bag	1
Inflatable life jackets	5
Box of spares	1
First aid kit	1
Shade tent	1

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ATTACHMENT 5: SUPPLEMENTARY QUESTIONS AND ANSWERS FOLLOWING AGENCY REVIEW OF RESPONSE DOCUMENT DATED 23 MARCH 2020,**Emailed questions dated 8 May 2020 from Mr Lee Webb (DPTI):**

“...can you please provide a broad analysis of:

1. The cost of the proposed design (causeway + jetty) vs a jetty only structure.
2. The cost of the proposed design vs a shorter causeway (i.e. half the length) + longer jetty.

... costs should include both construction costs, maintenance costs (especially future sand management and any associated SEB) and SEB costs (for both the loss of seagrass and reef flora communities).

The comparison should also include any recouped costs from the potential sale of excess rock material....”

Responses:

Email response on Friday 8th May 2020:

“...the cost differential comparison in item 1 below has already been provided as requested in the discussions pre-lodgement (a total differential of \$10million taking account of the matters raised below, however we acknowledge that we did not provide a detailed breakdown of the \$10million in the categories you suggest below and we will do so now).

Item 2 is a new request for an additional option some 6 months after the PER was lodged.

There also does not appear to be any acknowledgement of the significant change of having no cape size vessels, significant reduction in number of piles or eliminating the export of iron ore.

During the pre-lodgement discussions we were also asked to consider the option of creating tunnels across the causeway. This was assessed and we shared the feedback from e-coast on the feasibility of that additional option (not feasible as the tunnels would silt up quickly due to low tidal velocities at the site).”

Email response with supplementary information on Monday 11th May 2020:

“As requested please find attached the requested additional information, including assessment of the half length causeway.” Refer to Attachment 5A for the document.

Emailed questions dated 15 May 2020 from Mr Lee Webb (DPTI):

“...further clarification is required on the nature of the core material and its suitability from a structural integrity perspective (i.e. will the core be rock only and would it need to be compacted) and mitigation measures to be employed (especially to address turbidity, given that silt curtains are only effective in shallow water).

I have requested that the EPA and DEW provide me with a final list of any further information they need by COB today, which I will then forward to you.”

Response:

Email to Mr Lee Webb date 15 May 2020:

“We have already been investigating some of these issues as part of preparing the Southern Right Whale Management Plan – final copy as agreed with DAWE for their submission for Commonwealth minister delegate approval is attached.

In particular we are currently investigating the measures used around oil rigs as per the link below that may be better in deeper water:

<https://canadianpond.ca/air-bubble-curtains-bubble-tubing/>

<https://www.reaman.co.nz/docs/bubble-tubing-fine-bubble-linear-diffuser.pdf>

This document includes the following text:

“Underwater Air Bubble Curtains for:

- Protecting fish and marine mammals from underwater blasting and pile driving noise.
- Protecting marine mammals from offshore oil platforms and wind power farm construction and continuous operation vibrations and noises (machinery and engine noise).
- Containing oil spills within a given area.
- Controlling movement of marine life, plants and debris. A bubble barrier can control the movement of marine life and floating debris and control the migration of jellyfish, fish, seagrass, debris, sediments etc.”

The final approved Southern Right Whale Management Plan was included in the email and is at Attachment 8.

Monday 18th May email from Mr Lee Webb (DPTI):

“Please find below the EPA’s request for further information in regard to the causeway design.”

Following are the numbered EPA questions and the answers provided via return email to DPTI on the same day (The Information Memorandum was also attached to the email – refer Attachment 6 for the IM):

“The EPA has reviewed the response and has further questions that have arisen from that review.

1. Confirmation of the overall project costs?

Ans: As notified to investors in the Information Memorandum for the project (attached) the overall project cost is summarised as:

CAPEX	\$M
Land	1.5
Wharf / Marine structures	63
Ship Loader	15
Silos	37
Site wide Civils/Bunkers	29
Bunker Storage Material Handling System	21
Electrical, controls and automation (excl silos)	2.5
Other supply, install & operational contracts	7
Ops costs (CAPEX)	8
Contingency	15
Total Capex	\$199m ex GST

2. The Net Present Value analysis assumes a 30-year period with no terminal value. A discount rate of 5% (pre-tax real debt based, not WACC) has been applied to assign a higher value to future benefits (savings). This means that the total cost impact is less than could otherwise be demonstrated if a WACC were used.

- i. The EPA seeks confirmation that “real debt based” means that analysis is based on the commercial lending rate that would apply to the project (which is in effect a measure of opportunity cost).

Ans: “Pre-tax real” refers to the use of discounted rather than nominal values and without including taxation implications, consistent with DTF NPV procedures for government corporations doing NPV comparisons. Reference to “debt based” refers to only considering the commercially available debt component of the cost of capital (5% in current market). WACC is the “Weighted Average Cost of Capital” which applies a weighted average to the relative returns of debt interest and return on equity. The information Memorandum for investors assumed a 50:50 debt equity ratio, so a WACC would reflect that 50% of the capital attracts the higher return that equity investors would require, meaning a WACC will be higher than a debt alone discount rate.

3. The response contends that should a longer jetty / wharf construction be mandated the duration of construction over water will be longer than the current schedule, which is already challenged due to the timing of approvals. Based on current timing constructing the full length jetty would delay the completion of the wharf structure and therefore the ability to export grain for the 2021 harvest, in effect delaying the project by a full year due to the annual grain season. Were this impact to be costed it would be well in excess of the impacts previously stated. The impact on the grain industry alone of delayed access to a more cost competitive export route that avoids double handling of grain on the road network would exceed the \$10million cost impact.

Hence the Present Value (PV) cost increase associated with full removal of the causeway is estimated at \$10-11million (worse if all the surplus rock cannot be sold).

Hence the PV cost increase associated with removal of half the causeway length is estimated at \$6-7million (worse if all the surplus rock cannot be sold).

It is further contended that it is not practicable to require the project to incur the additional \$6-\$11 million impact associated with removal of the causeway (full or part) from the proposed project variation, especially as it would almost certainly place project viability at risk due to the resulting delay by a full grain harvest season of the ability to export grain.

- i. The EPA requests that the consultants provide evidence to support the assertion that the impact on the grain industry of delaying the project by requiring a full length jetty would be greater than \$10 million.

Ans: The Project Analysis (section 4) in the Information Memorandum (IM attached) estimates freight advantage (direct savings to growers) alone would average around \$3.50 per tonne of grain. Even at only 500,000 tonnes per annum that equates to \$1.75million in direct freight savings, but in addition the pricing of services to growers in the IM indicates at least \$10per tonne lower charges compared to the existing provider, which would not only apply to at least 500,000 tonnes coming directly to Port Spencer but also to whole of Eyre Peninsula pricing reduction that is likely to come from the existing providers to underpin their market share. Hence every year of delayed competition to the (effectively monopoly) existing service provider delays more competitive pricing of at least \$10 per tonne. Even if that were only realised by half the growers on Eyre Peninsula the delayed benefits would exceed \$10million (total average grain export is 2.6million tonnes across whole of Eyre Peninsula).

- ii. The EPA requests that the consultants provide evidence to support the assertion that removal of the causeway (full or part) from the proposed project variation is not practicable as it would almost certainly place project viability at risk due to the resulting delay by a full grain harvest season of the ability to export grain.

Ans: Investors are relying on the ability to generate revenue from the 2021 harvest season in supporting the project. A significant delay in revenue could lead investors to withdraw from the project. The Information Memorandum to investors does not contemplate missing the 2021 harvest and leaves the ability of investors to reconsider their investment should such a material change

occur. “Evidence” is the Information Memorandum as per attached that does not contemplate anything but the 2021 harvest. Given that the amended PER was lodged on 8th November 2019 there was considered to be adequate time to complete the approvals processes, with the Information Memorandum suggesting a potential construction commencement at the end of March 2020.

4. The EPA understands that the proposed amendment would use a different design for the jetty section having wharf bents at 42 m spans with two piles per bent, as opposed to the approved development that has wharf bents at 16-18 m spans with two-three piles per bent. As a result the number of piles is reduced from 184 to 18.

The proposed amendment would also use a different piling technique with launched span pile installation rather than using a Jack up barge.

- i. The EPA seeks further information as to whether the amended design with larger spans between wharf bents and different piling technique could be used to construct a jetty for the entire length.

Ans: the cost increase advised to DPTI/EPA/DEW to construct a jetty full length uses the new methodology of launching with larger spans and fewer piles per bent. A 210m increase in Jetty length equates to 5 additional spans of 42m – and 10 additional piles.

- ii. The EPA seeks further information as to the cost differential of applying the amended design with larger wharf bent spans and different piling technique to construct a jetty for the entire length.

Ans: larger wharf bent spans and different piling techniques has already been assumed in costing the increased jetty length. The original Centrex construction methods were cost prohibitive compared with the selected construction method.

There are some other supplementary questions around the need for a sensitivity analysis on more frequent sand dredging, seagrass wrack removal and a larger SEB calculation, although these are likely to be small costs in comparison to potential costs (and savings) identified at 1-4 above.

Ans: Further sensitivity analysis regarding sand transfers is attached – the additional scenario of halving the frequency of both sand transfer and seagrass wrack removal is provided below and doesn't provide a materially significant change in the NPV outcome.

REMOVE FULL CAUSEWAY	PV	Nominal
Additional costs		
Jetty additional spans	\$14.51	\$ 16.00
Move rock to stockpile	\$1.36	\$ 1.50
Savings		
No causeway construction	-\$2.72	-\$ 3.00
Sell armour rock	-\$0.55	-\$ 0.75
Sell core rock	-\$0.92	-\$ 1.25
Sand Transfer (year 15 and 30)	-\$0.68	-\$ 2.00
Seagrass rack 5(not 10) year cycle	-\$0.55	-\$ 1.25
SEB Payment reduction	-\$0.14	-\$ 0.15
TOTAL ADDITIONAL COST	\$10.31	\$ 9.10
REMOVE HALF CAUSEWAY	PV	Nominal
Additional costs		
Jetty additional spans	\$8.62	\$ 9.50
Move rock to stockpile	\$0.82	\$ 0.90
Savings		
Half causeway construction	-\$1.18	-\$ 1.30
Sell armour rock	-\$0.36	-\$ 0.45
Sell core rock	-\$0.60	-\$ 0.75
Seagrass rack 10 (not 20) year cycle	-\$0.32	-\$ 0.75
SEB Payment reduction	-\$0.71	-\$ 0.75
TOTAL ADDITIONAL COST	\$6.25	\$ 6.40

ATTACHMENT 5A: DOCUMENT ATTACHED TO EMAIL RESPONSE DATED 11TH MAY 2020

PORT SPENCER

RESPONSE TO PUBLIC COMMENTS

SUPPLEMENTARY QUESTIONS FROM EPA/DEW/DPTI 8 May 2020

REGARDING CAUSEWAY / GROUYNE

1 BACKGROUND

The Port Spencer Deep Water Port proposal by Centrex Metals was approved by the Governor in December 2012, after being the subject of a Public Environmental Report (PER) under the Major Development process (pursuant to sections 46-48 of the Development Act 1993). The proposal was for the development of a multi-user bulk commodity port, with the primary focus on the export of iron ore and grain.

Peninsula Ports (a subsidiary company of Free Eyre) is now the owner of the subject land and the approved development proposal and is seeking to make a variation to the existing authorisation for a modified design of the marine and land-based infrastructure. The focus of the proposal is now the export of grain, with a capacity of 1 million tonnes/year.

In order for the Minister for Planning to make a decision on the variation request (as the delegate of the Governor), a relevant PER is required. Given the period of time that has elapsed since the original proposal was assessed and the changed focus of the proposal, the Minister has determined that an Amendment to the PER process is required to be undertaken (pursuant to section 47 of the Development Act 1993).

The delegate for the Minister advised via public notice that Peninsula Ports had prepared an Amendment to the PER for the Port Spencer Grain Export Facility, which by way of that notice, was released on public consultation from 16 January until 21 February 2020.

A response to the public and government submissions to the Amendment to the PER was prepared and submitted to DPTI on Monday 23 March 2020.

On Friday 8th May email correspondence from DPTI was received seeking additional information regarding the proposed causeway as follows:

“Following recent discussions between senior levels of DPTI, EPA and DEW, could you please provide a comparison of the approved design with the proposed design and an alternative option.

Thus, can you please provide a broad analysis of:

- 1. The cost of the proposed design (causeway + jetty) vs a jetty only structure.*
- 2. The cost of the proposed design vs a shorter causeway (i.e. half the length) + longer jetty.*

The 'ballpark' costs should include both construction costs, maintenance costs (especially future sand management and any associated SEB) and SEB costs (for both the loss of seagrass and reef flora communities).

The comparison should also include any recouped costs from the potential sale of excess rock material."

This supplementary document answers the points above. The "jetty only structure" still involves the use of incremental launching as the construction methodology, but involves a larger number of spans and piles to reach shore. The superstructure still requires crane rails to enable the installation of the travelling ship loader that is assembled on shore and was costed during the preparation of the Amended PER.

It is noted that prior to lodgement of the Amended PER on 8th November 2019 EPA had asked about the feasibility of placing culverts across the causeway to enable sand transfer to continue. This was assessed and the feedback from authors of the sediment modelling report on the feasibility of that additional option was that the tidal velocities were too small to enable the sand to be carried all the way through the culvert prior to settling. In effect the culverts will fill with sand and become blocked.

2 ASSESSMENT OF CAUSEWAY OPTIONS

2.1 BASIS OF ASSESSMENT

To provide the broad analysis requested there are a number of assumptions that were made in making the assessment in the Amended PER that the full length jetty would incur an additional \$10million in capital cost compared with the causeway option.

These assumptions are:

- Flat level area required for silo construction. This area has to be sufficient to not only house the permanent structures of the silos, administration and maintenance buildings, service roads, power generation and other facilities, but it also has to be flat enough for the temporary construction activities for the silos, jetty and wharf assembly yard, and ship loader assembly area;
- All pavement materials on site are to utilise the rock made available through the excavation during establishment of the silo, wharf and ship loader assembly areas;
- The trial crushing that was done in August 2019 confirmed that the crushed rock able to be produced using this site won rock has low plasticity, making it non-compliant with DPTI specifications for road pavements. As a result, a customised, first principles approach to pavement design is required for the site roads and bunker pavements to suit this rock.
- Department for Energy and Mining confirmed prior to lodgement of the Amended PER that:
 - o Using the site won rock on site for the project does not require a Mineral Extraction Licence as it is essentially a cut to fill activity within the project planning approvals, and
 - o any sale of rock or use of rock outside of the project approvals would require application for a Mineral Extraction Licence (which was not pursued by Peninsula Ports as it was not required for the planned work).
- The non-compliance of the crushed rock with DPTI road pavement specifications makes its direct selling without further treatment difficult. Likewise, the number of sources willing to purchase the larger armour rock will be limited. As Peninsula Ports is not intending to operate a quarry as an ongoing business (and thereby further expanding the volume of rock cut from the site) there are limited means for commercial sale. As a result, the revenue potential has been limited to possible “profit” that can be made by having an arrangement with a commercial quarry operator to manage the sale of the rock on behalf of Peninsula Ports. This would include the operator managing the Mineral Extraction Licence and blending the material with other quarry products to enable its use in a commercial context. A business case for this activity has not been prepared, however an optimistic estimate of residual revenue to Peninsula Ports was included in the option assessment. The “profit” for full length jetty is assessed as (over a 10-year period – 40,000t per annum):
 - o Core material - 338,000tonnes at \$3.70/t (selling at \$15/t if upgraded to DPTI PM2)
 - o Armour rock – 34,000tonnes at \$22/t (selling at \$50/t ex site if a market exists)
 - o Market risk (uncertainty of selling the rock) is allowed for within these “profits”.
 - o Initially the stockpile of rock would be approximately 500m x 50m x 15m high. This would entirely fill the “future bunkers” area on the east of the site. This would likely result in significant and adverse stakeholder response.

- Note that the approved project had an even larger volume of rock excavated to fill in the valley and hence required diversion of the existing creek, whereas the revised design largely preserves the natural alignment of the creek and preserves its location.
- The SEB payment calculation associated with the causeway construction was included in the Amended PER at approximately \$150k. A pro-rata saving is assumed for the ½ length option.
- A further SEB payment is assumed to be included in the estimate for sand transfer at year 30. Note that sand transfer could potentially as late as year 40 or 50 based on the modelling without the presence of cape size vessels, however monitoring is required to confirm trigger points. Accretion rates for cape size vessels in the Assessed project were higher than accretion rates due to the proposed variation.
- Removal of seagrass wrack every 10 years is assumed as a saving in the full-length causeway option. 20 years is assumed as the timing of seagrass wrack removal for the ½ length causeway option.
- The Net Present Value (NPV) analysis assumes a 30-year period with no terminal value. A discount rate of 5% (pre-tax real debt based, not WACC) has been applied to assign a higher value to future benefits (savings). This means that the total cost impact is less than could otherwise be demonstrated if a WACC were used.
- A saving of \$3million of not having to build the causeway is based on costing done during the design development (\$8 per tonne), however there is not a pro-rata relationship to the ½ length option due to mobilisation costs for things such as silt curtains and mobilising long reach excavators that still apply to the shorter causeway.
- A cost increase of \$1.5million (\$4 per tonne) is added for the creation of and movement of rock to an on-site stockpile rather than direct placement in the causeway. This again is not a direct pro-rata for the ½ length option due to establishment costs.
- Selling of the core rock and armour rock is assumed to occur at a consistent rate until all surplus rock is removed from site. For the full-length causeway being removed this is assumed to occur over 5 years, with 3 years being applied for the ½ causeway option.
- The additional spans were costed early in the design development at \$16million, with the reduced additional cost not being pro-rata for the ½ length option due to assignment of temporary works costs over a shorter structure.

It is also worth noting that the approved design had over 180 piles, whereas the revised design with the causeway only has 18 piles. This results in a far shorter duration of construction impacts.

2.1.1.1 TIME IMPACTS NOT COSTED

Should a longer jetty / wharf construction be mandated the duration of construction over water will be longer than the current schedule, which is already challenged due to the timing of approvals. Based on current timing constructing the full length jetty would delay the completion of the wharf structure and therefore the ability to export grain for the 2021 harvest, in effect delaying the project by a full year due to the annual grain season.

Were this impact to be costed it would be well in excess of the impacts previously stated. The impact on the grain industry alone of delayed access to a more cost competitive export route that avoids double handling of grain on the road network would exceed the \$10million cost impact.

2.2 SUMMARY OF ANALYSIS

Following is a summary of the Net Present Value (NPV) analysis for the two options requested. In each case the broad analysis is provided as a range to the nearest \$1M

REMOVE FULL CAUSEWAY	PV	Nominal
Additional costs		
Jetty additional spans	\$14.51	\$ 16.00
Move rock to stockpile	\$1.36	\$ 1.50
Savings		
No causeway construction	-\$2.72	-\$ 3.00
Sell armour rock	-\$0.55	-\$ 0.75
Sell core rock	-\$0.92	-\$ 1.25
Sand Transfer (year 30)	-\$0.22	-\$ 1.00
Seagrass rack 10 year cycle	-\$0.27	-\$ 0.75
SEB Payment reduction	-\$0.14	-\$ 0.15
TOTAL ADDITIONAL COST	\$11.05	\$ 10.60

Hence the Present Value (PV) cost increase associated with full removal of the causeway is estimated at \$10-11million (worse if all the surplus rock cannot be sold).

REMOVE HALF CAUSEWAY	PV	Nominal
Additional costs		
Jetty additional spans	\$8.62	\$ 9.50
Move rock to stockpile	\$0.82	\$ 0.90
Savings		
Half causeway construction	-\$1.18	-\$ 1.30
Sell armour rock	-\$0.36	-\$ 0.45
Sell core rock	-\$0.60	-\$ 0.75
Seagrass rack 20 year cycle	-\$0.08	-\$ 0.25
SEB Payment reduction	-\$0.71	-\$ 0.75
TOTAL ADDITIONAL COST	\$6.49	\$ 6.90

Hence the PV cost increase associated with removal of half the causeway length is estimated at \$6-7million (worse if all the surplus rock cannot be sold).

The detailed NPV spreadsheet is provided in the section below.

It is contended that it is not practicable to require the project to incur the additional \$6-\$11million impact associated with removal of the causeway (full or part) from the proposed project variation, especially as it would almost certainly place project viability at risk due to the resulting delay by a full grain harvest season of the ability to export grain.

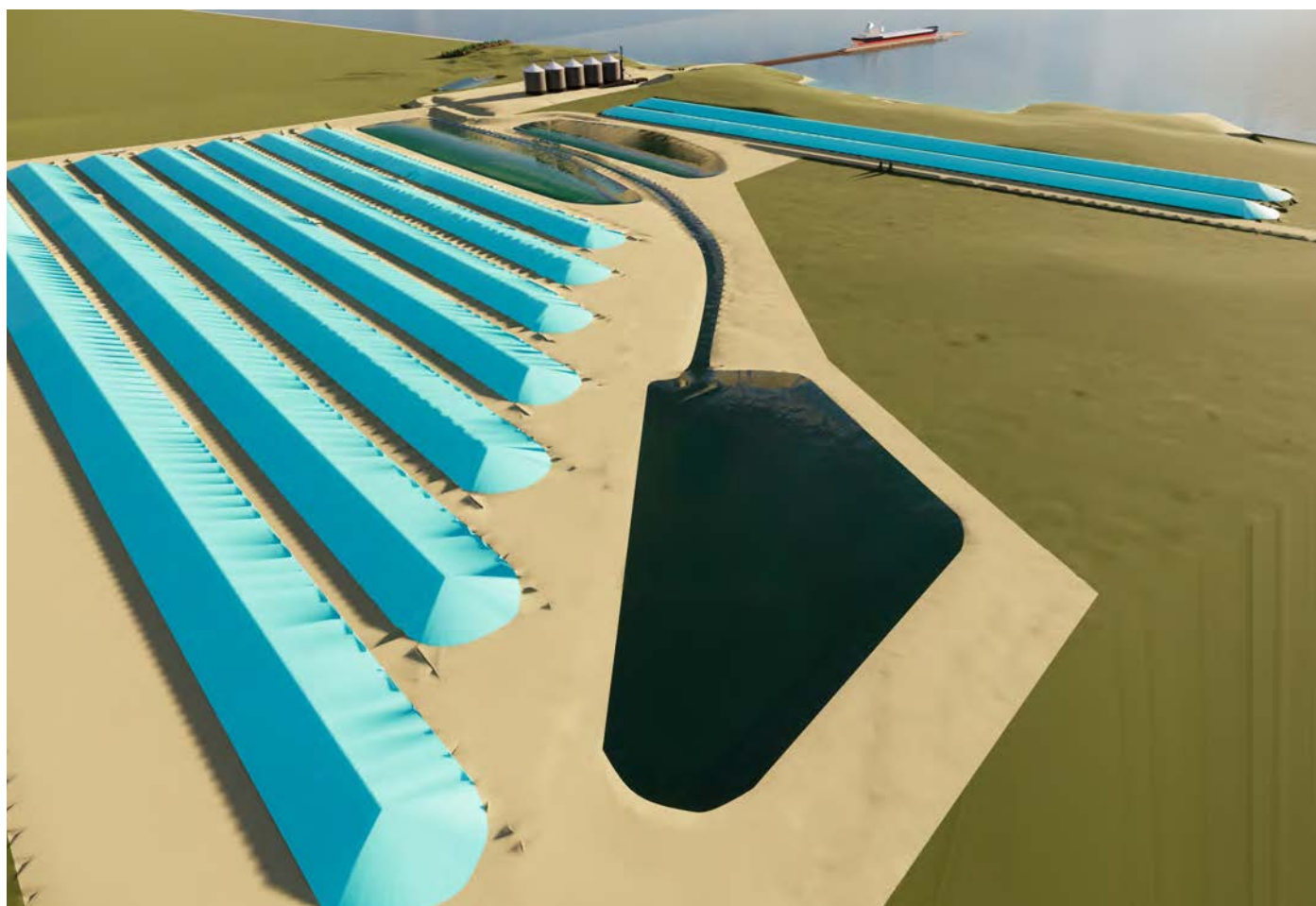
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REMOVE FULL CAUSEWAY	PV	Nominal
Additional costs		
Jetty additional spans	\$14.51	\$ 16.00
Move rock to stockpile	\$1.36	\$ 1.50
Savings		
No causeway construction	-\$2.72	-\$ 3.00
Sell armour rock	\$0.00	\$ 0.00
Sell core rock	\$0.00	\$ 0.00
Sand Transfer (year 30)	-\$0.22	-\$ 1.00
Seagrass rack 10 year cycle	-\$0.27	-\$ 0.75
SEB Payment reduction	-\$0.14	-\$ 0.15
TOTAL ADDITIONAL COST	\$12.52	\$ 12.60

REMOVE HALF CAUSEWAY	PV	Nominal
Additional costs		
Jetty additional spans	\$8.62	\$ 9.50
Move rock to stockpile	\$0.82	\$ 0.90
Savings		
Half causeway construction	-\$1.18	-\$ 1.30
Sell armour rock	\$0.00	\$ 0.00
Sell core rock	\$0.00	\$ 0.00
Seagrass rack 20 year cycle	-\$0.08	-\$ 0.25
SEB Payment reduction	-\$0.71	-\$ 0.75
TOTAL ADDITIONAL COST	\$7.46	\$ 8.10

ATTACHMENT 6: FREE EYRE INFORMATION MEMORANDUM FOR INVESTORS,

PENINSULA | PORTS



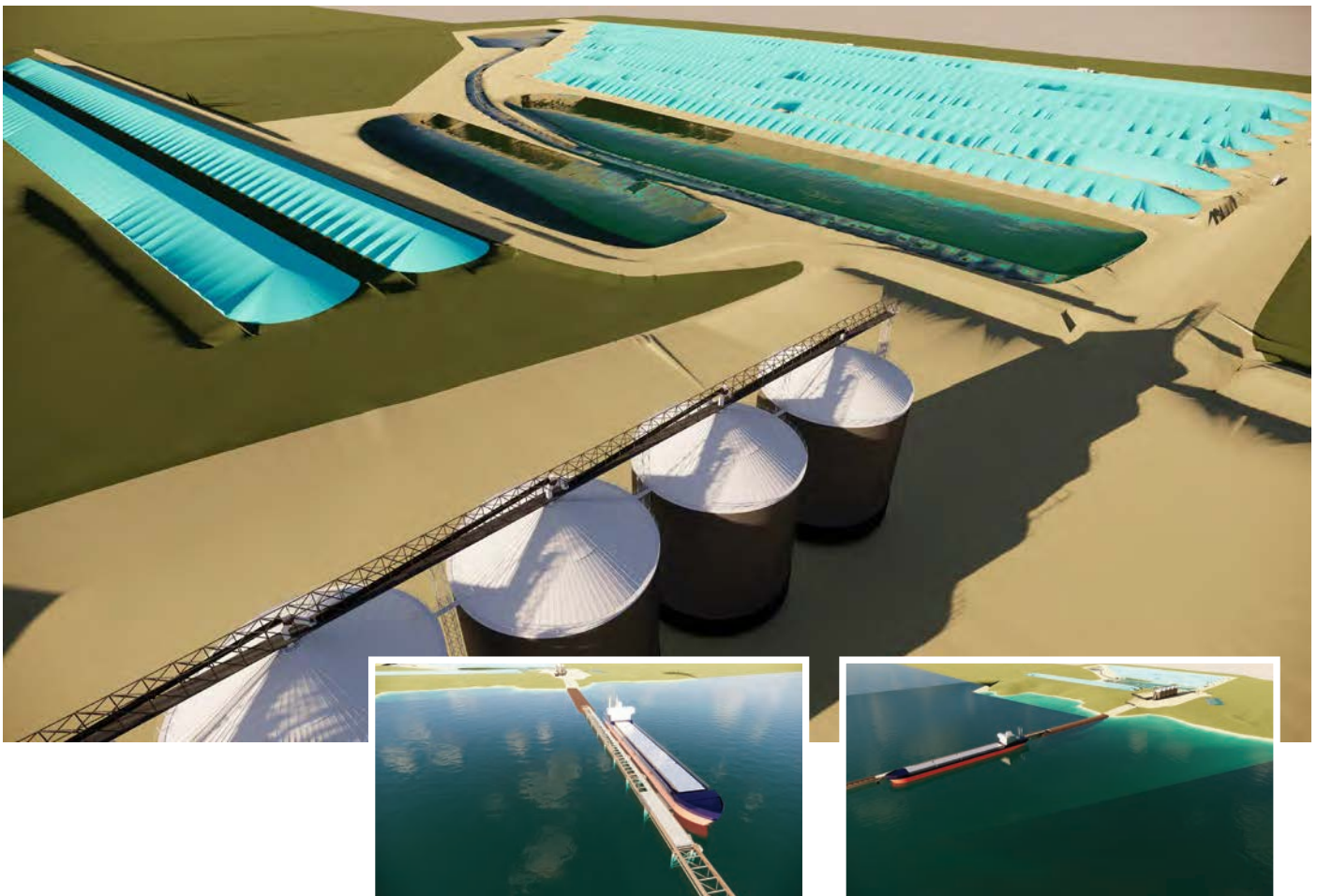
INFORMATION MEMORANDUM

November 2019

Compiled by FREE EYRE LIMITED

Issued by Free Eyre Limited ABN 18 124 308 041

“Port Spencer will provide a modern, cost-effective and competitive pathway for the export of grain from the heartland of Eyre Peninsula”



KEY FEATURES

KEY FEATURES OF PENINSULA PORTS AND THE PORT SPENCER PROJECT (“THE PROJECT”)

- Development cost of \$180m to \$220m.
- Projected Internal Rate of Return (IRR) of 12.3 % over an assumed 50 year life of the Project.
- Projected Return on Capital Employed (ROCE) averages 14.2% for the first 10 years.
- Free Eyre Ltd (FEL or “the Company”) is aiming to hold a strategic near 25% of the Project’s equity after securing equity and debt financing for construction and development.
- Enterprise value estimated on completion of build to be in the range of \$180 million to \$220 million. Enterprise value will be dependent upon profitability. Currently ports around Australia are valued at around 16 times earnings.
- Targeting up to 1 million tonnes grain throughput per annum (of an average regional production of 2.5 million tonnes) with a break-even throughput of 350,000 tonnes.
- Eyre Peninsula grain growers are expected to benefit through supply-chain savings, brought about by state-of-art receival and storage technology, and transport savings due to the strategic location of the new Port.
- Government approvals, attaching to the Centrex Metals Ltd land acquired by FEL subsidiary Peninsula Ports Pty Ltd (PPPL) in June 2019, are already in place for the development of an iron ore and grain port. The Project continues to benefit from holding Major Project Status with the South Australian government.
- Amendments to those existing planning and development approvals for the use of the land as a grain only port are well advanced. The Public Environmental Report (PER) was submitted to the State Government in early November 2019.
- Construction is targeted to commence in March 2020 and to be completed for wet testing in July 2021, so as to be open to receive grain for the harvest commencing in October / November 2021.
- FEL board members and management are experienced in the development of grain storage and major port infrastructure.
- FEL has a broad shareholder base with the majority of them active and progressive Eyre Peninsula farmers, many of whom are expected to support Port Spencer.
- Well credentialed advisers and constructors, experienced in major projects, have been engaged.

KEY FEATURES (cont)

REVENUE FEATURES

- The profitability of the Project is shown to be robust when tested against both receipt tonnage scenarios and storage fee revenue scenarios.

The following table demonstrates combined revenues received from the grower and exporter currently (estimated based on publicly available charges data), and at -\$10 and -\$20 / per ton (in the event of a pricing 'war' with competitors) :

Volume	400kt	800kt	1200kt
Revenue at \$53/T	\$21.2m	\$42.4m	\$63.6m
EBITDA	\$13.8m	\$32.6m	\$49.3m
Revenue at \$44.50 per tonne	\$17.8 m	\$35.6 m	\$53.4 m
EBITDA	\$10.7 m	\$24.9 m	\$39.1 m
Revenue at \$34.50 per tonne	\$13.8 m	\$27.6 m	\$41.4 m
EBITDA	\$6.7 m	\$16.9 m	\$27.1 m

Potential investors should consider projections and forward-looking statements in light of the assumptions, risks and disclaimers contained in this Information Memorandum (IM).

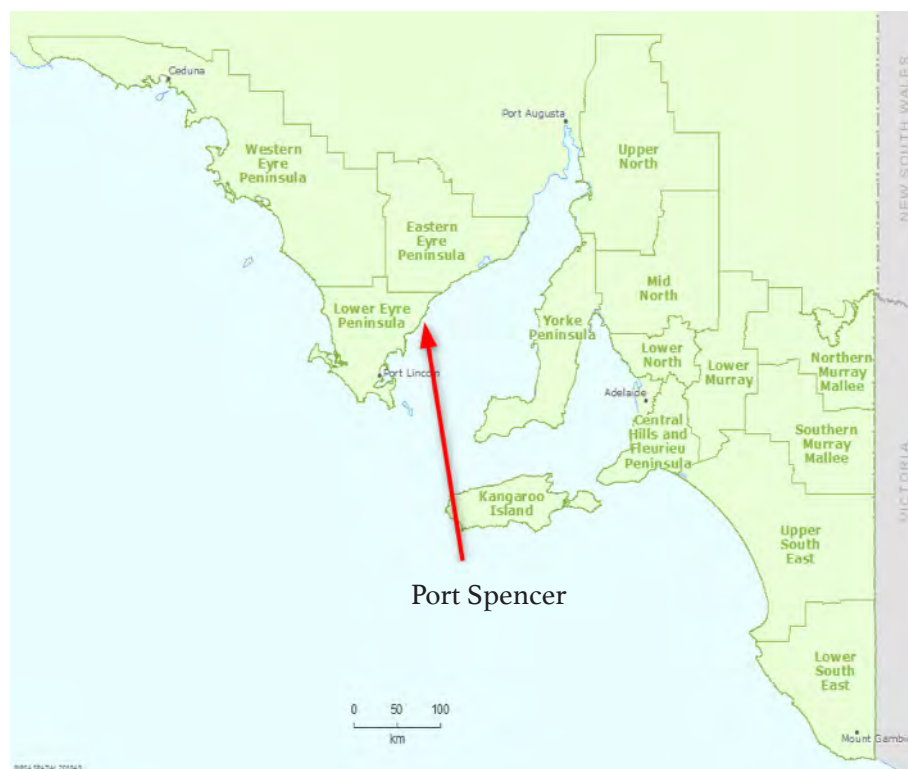


Initial test pits and rock crushing at Pt Spencer to confirm site material composition. Circa 300,000 metric tons of material will be required to be excavated and crashed from the site for the causeway, roadways and bunker pads.

KEY DATES FOR THIS INFORMATION MEMORANDUM*

Opening date for FEL Ordinary Share Applications	20 November 2019
Issue by FEL of up to \$2m of convertible notes	2 December 2019
FEL AGM	13 December 2019
Closing Date for FEL Ordinary Share applications	20 December 2019
Payment of first installment of FEL Ordinary Shares (\$1 per share)	By 20 December 2019
Issue of FEL Ordinary share Certificates	31 January 2020
Payment of a second installment (\$1) per subscribed FEL Ordinary share	Not earlier than 1 March 2020
Commencement of port construction	31 March 2020
Completion of additional equity and debt raising by PPPL	1 May 2020
Commissioning of port	1 July 2021
Expected first FEL Ordinary Share dividend	1 October 2022

*Dates are indicative only. FEL reserves the right to close the Offer early or to extend the closing date of the Offer (as the case may be) without prior notice. Intending investors are encouraged to submit their applications promptly. All other dates are forecasts.



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LETTER FROM THE CHAIRMAN



INVESTING THROUGH FREE EYRE LIMITED IN PENINSULA PORTS

This important Project will see the construction of a new deep-sea grain export facility at Sheep Hill on the Eyre Peninsula, to be known as Port Spencer. The Project has been enabled by the opportunistic acquisition by FEL subsidiary, Peninsula Ports Pty Ltd (PPPL), of the former Centrex Metals ore and grain port site, in June of this year.

The Project will be funded initially by seed capital provided by FEL to PPPL. The seed capital will be raised by subscriptions for Ordinary shares in FEL, the subject of this offer ("the Share Offer"), and \$2m of convertible notes issued by FEL under a separate private placement managed by Baker Young Stockbrokers.

FEL will oversee the Project, steer the raise by PPPL of the necessary equity and debt to enable the construction of Port Spencer, and ensure that the appropriate management and corporate governance structures are in place for PPPL to successfully operate Port Spencer for the benefit of PPPL's shareholders and the farmers of Eyre Peninsula.

FEL, ultimately, intends to hold close to 25% of the shares in PPPL after a major equity raise by PPPL from institutional investors in early 2020, at which point PPPL will cease to be a subsidiary of FEL.

It is important to note, that unlike other proposals, ours is a grain-only port and not reliant on minerals or other commodities to make it viable. Importantly, it is the only port alternative which allows and encourages grain growers and other individuals to invest in and have an influential say in the future of grain storage and handling on the Eyre Peninsula, and ultimately South Australia.

Port Spencer will provide a modern, cost effective and competitive pathway for the export of grain from the heartland of Eyre Peninsula. Our estimate is that road freight savings and competitive handling charges could mean about \$35 million in annual savings to the grain growers of Eyre Peninsula.

By using the latest technology both within grain handling and port design, the cost of operations will be world competitive. Investors in FEL Ordinary shares are well placed to participate in the margins created from a low operating cost and competitive storage and handling fees.

The Board, management and I have worked to produce a structure which allows participation of grain growers and others in the direction of this company, grain industry infrastructure, and returns from investing in the industry.

We encourage you to consider investing in the Eyre Peninsula's grain industry supply chain and as a result, in your own future.

A handwritten signature in dark ink, appearing to read "John Crosby".

John Crosby,
Chairman
FREE Eyre Limited

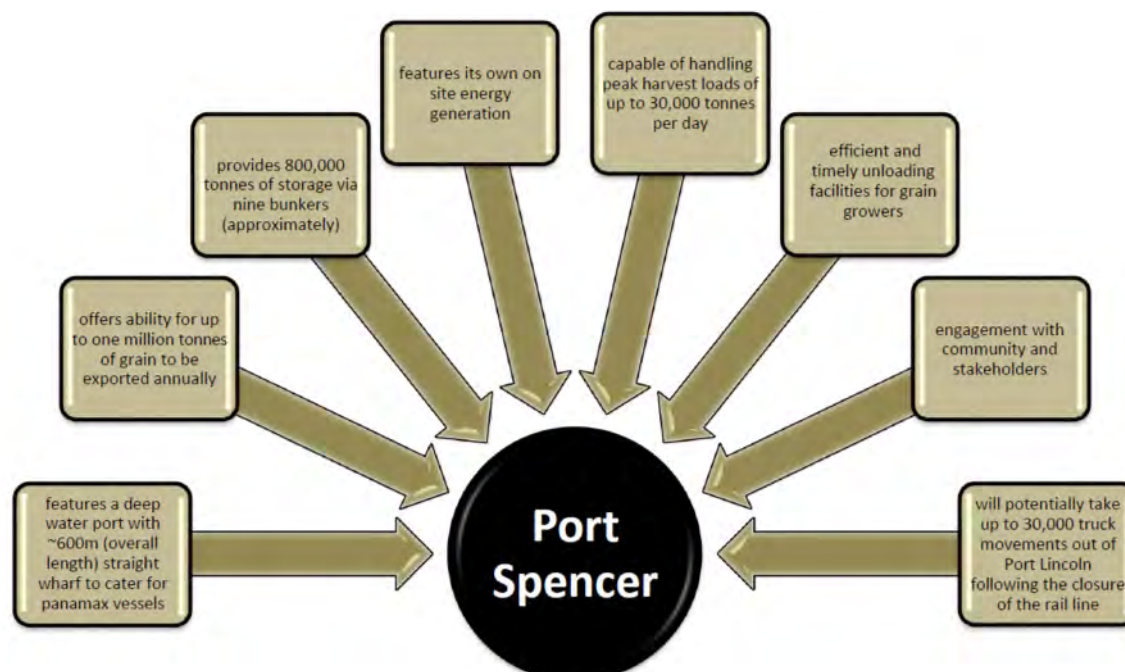
INVESTMENT SUMMARY

FEATURE	DESCRIPTION
Type of investment	<p>FEL is an unlisted public company. The Company is offering partly paid Ordinary shares to qualifying investors.</p> <p>FEL's principal current activity is facilitating the establishment of a deep-sea port at Port Spencer, Eyre Peninsula, South Australia, through its subsidiary entity Peninsula Ports Pty Ltd.</p> <p>Investment in the Company should be considered a long term investment.</p>
Ordinary Share terms	The new FEL Ordinary shares will have the same rights as existing Ordinary FEL shareholders in Those rights are set out in the FEL's Constitution (refer to www.freeeyre.com.au)
Issue Price	The issue price pursuant to this Information Memorandum is \$2.00 per FEL Ordinary share, payable in two instalments; \$1.00 payable upon subscription and a further \$1.00 payable upon a call made by the Company which will not be before 1 March 2020.
Number of shares offered	FEL is targeting an issue of between 4 – 8 million Ordinary shares to raise between \$8m and \$16m.
Use of funds	FEL will use the funds raised by the offer to acquire fully paid ordinary shares in the capital of PPPL. In turn FEL will ensure that PPPL uses this capital to complete its development approvals, feasibilities and costings for the Port Spencer project and to put itself in position to raise the necessary funding for construction of the deep sea port. If the FEL and PPPL fundraisings are successful it is envisaged that FEL will be diluted from 100% ownership of PPPL to around 25% of PPPL.
Target IRR	FEL is forecast to receive dividends from the Port Spencer project (through its shareholding in PPPL) based on a project IRR of 12.3% before tax.
Withdrawal rights and exit strategy	Under an unlisted company there is no secondary market or redemption facility for any shares in FEL at this time. It is contemplated that an "off-market" trading facility amongst shareholders will be offered to shareholders on an annual basis, following the commencement of business operations at Port Spencer.

INVESTMENT SUMMARY

FEATURE	DESCRIPTION
Risks	<p>An investment in FEL is subject to certain risks associated with companies generally, the specific circumstances of the Company and the Port Spencer project. The key risks include:</p> <p>Pre-construction:</p> <ul style="list-style-type: none"> • Construction of the facility is delayed due to unforeseen delays in receiving various regulatory approvals, licenses and leases • PPPL is unable to secure full construction funding for the project. <p>Post-construction:</p> <ul style="list-style-type: none"> • The company does not receive adequate patronage / tons of grain delivered from Eyre Peninsula grain producers so as to cover its operating costs. <p>Investors must have regard to these risks before investing in the Company.</p>

KEY PROJECT FEATURES



I. INTRODUCTION

FEL is seeking to raise a minimum of \$10 million and up to a maximum of \$18 million of equity in order to capitalise its subsidiary PPPL sufficiently to finalise the development stages of Peninsula Ports, Port Spencer facility. This will be done in preparation for a final investment round with institutional investors which will fund the construction phase. FEL will fund its seed capital by raising \$2m through a convertible note issue placed by Baker Young Stockbrokers, and raising between \$8m and \$16m pursuant to this offer of Ordinary shares in FEL.

The Port Spencer Project is projected to require an investment in the order of \$180m to \$220m. The funding plan can be summarised as follows:

INVESTMENT ROUND	ENTITY	DESCRIPTION
Round 1	FEL	\$2m via FEL convertible notes convertible into PPPL shares @\$2 per share targeted mainly at sophisticated clients of Baker Young Stockbrokers.
Round 2	FEL	\$8 to \$16m via FEL Ordinary shares issued @\$2 per share targeted mainly at sophisticated EP farmers and other interested sophisticated investors
Round 3	PPPL	\$82m to \$90m via shares in PPPL issued @\$3 per share targeted mainly at large institutional infrastructure investors
Round 4	PPPL	\$60m to \$100m of bank borrowings

In all, if the indicated FEL share issues is subscribed in full, and the other funding rounds are successful FEL will hold 10.5m shares from a maximum total of 41.5M shares in PPPL.

FEL is offering Ordinary shares, linked to the port investment, to sophisticated investors (Corporations Law: Section 708) at a planned 33% discount to the final investment round pricing. The newly issued Ordinary FEL shares will have all the same rights in respect of the returns from PPPL's port operations, as do existing Ordinary FEL shares

The new Ordinary FEL shares are priced at \$2.00 per share, with a \$1 instalment on application. The final \$1 payment will be called after 1 March 2020 as the funds are required.

It is the intention of FEL (subject to future market conditions) to hold the shares in PPPL as a consolidated investment stake, ensuring the ongoing engagement of Eyre Peninsula grain growers in benefits of ownership of Port Spencer going forward.

FEL see this investment in PPPL delivering long term benefits for its shareholders through high dividends and strong capital growth.

2. DETAILS OF THE OFFER

THE OFFER

The Offer is for Ordinary shares in the Company to qualifying investors at an issue price of \$2.00 per share payable in two instalments of \$1.00 per instalment.

The Ordinary shares are offered on a partly paid basis with \$1 to be paid upon a subscription being made under this offer and balance of \$1 to be paid when the Company issues a call, which will not be before 1st March 2020.

All applications must be made by signing and submitting the Application Form attached to this Information Memorandum. The FEL board can agree to accept further applications for shares at its discretion.

NUMBER OF ORDINARY SHARES ON OFFER

FEL is targeting the issue of between 4m and 8m Ordinary shares.

RIGHTS OF NEW ORDINARY FEL SHARES

The new FEL Ordinary shares will have the same rights as existing ordinary FEL shareholders in respect of dividends from income attributable to FEL's shareholding in PPPL. The rights of ordinary shares are set out in FEL's Constitution a copy of which can be found on www.freeeyre.com.au.

PARTLY PAID SHARES

All new Ordinary FEL partly paid shares are subject to the terms they are issued under and all applicable provisions of the Constitution. Holders of new Ordinary partly paid shares are liable to pay calls on the shares in accordance with the terms set out in section 2.1

Under the Company's Constitution, holders of partly paid shares will, subject to the terms of issue, be entitled to participate in dividends or other distributions of the Company in proportion to the amount the shares are paid. For example, if a holder has partly paid \$1 in each \$2 share, the shareholder would be entitled to receive 50% of any dividends being issued by the Company. Potential investors should note however that it is not expected that the Company will be in a position to pay any dividends on the partly paid shares at all until the Port Spencer project is complete and generating sufficient returns for Peninsula Ports to itself pay a dividend to its shareholders, including Free Eyre. Accordingly, potential investors should not expect any dividend return on their Ordinary shares until after the call has been made and the shares become fully paid.

CALLS

The Directors may provide a notice to holders of partly paid shares at any time requiring payment by the holder (a call) of any unpaid amounts within 14 days. The Directors will not make such a call until after 1 March 2020.

Interest may be incurred by the holder of a partly paid share on any amount unpaid after the due date.

A holder of a partly paid share may pay any unpaid amount on the share to the Company at any time in advance of a call being made. The Company has a right to hold all shares and all amounts distributable to a holder of a share until all unpaid calls or other amounts that may be due by the holder of a partly paid share have been paid (a lien).

2. DETAILS OF THE OFFER *(cont)*

FORFEITURE

If a call on a share is due and unpaid on the due date, then the share may, by resolution of the Directors, be forfeited. The Company is not obliged to provide notice of the forfeiture or to give effect to it. The Company may proceed with the sale of any forfeited shares subject to the Constitution.

PURPOSE AND USE OF FUNDS

The purpose of the offer is to enable FEL to subscribe for further shares in PPPL.

All funds raised from this offer (less the costs and expenses of the fund raising) will be used to subscribe for fully paid ordinary shares at \$2.00 per share in the capital of PPPL. In turn FEL will ensure that PPPL uses this capital to complete its development approvals, feasibilities and costings for the Port Spencer project and to put itself in position to raise the necessary funding for construction of the deep sea port.

OPENING AND CLOSING DATES

The Offer under this IM opens for applications on 18 November 2019 and will close on 20 December 2019.

All dates are subject to change and are indicative only. FEL has the right to vary these dates without prior notice, including the right to close the Offer early or to withdraw the Offer and to accept late applications.

Applicants are encouraged to apply as early as possible.

HOW TO APPLY

Applications for Ordinary FEL Shares may only be made by signing and returning the Application Form attached to this Information Memorandum

ISSUE OF SHARES

As soon as practicable after the Closing Date, FEL will determine the allocation of Ordinary Shares to Applicants. Investors will receive a confirmation letter within 5 days of the Closing Date confirming each Applicant's allocation of Ordinary FEL shares. FEL reserves the right to allocate shares in full, to issue a lesser number of shares than those for which an application has been made, to accept a late application or to decline an application.

The Offer Shares will be allotted in accordance with the allocations in the confirmation letters (subject to full remittance of the required first payment of the subscription money) and investors will receive a holding statement within five business days of allotment.

Where the number of Ordinary FEL shares allocated to an Applicant is less than the number applied for by an Applicant, surplus Application Monies will be returned to that Applicant.

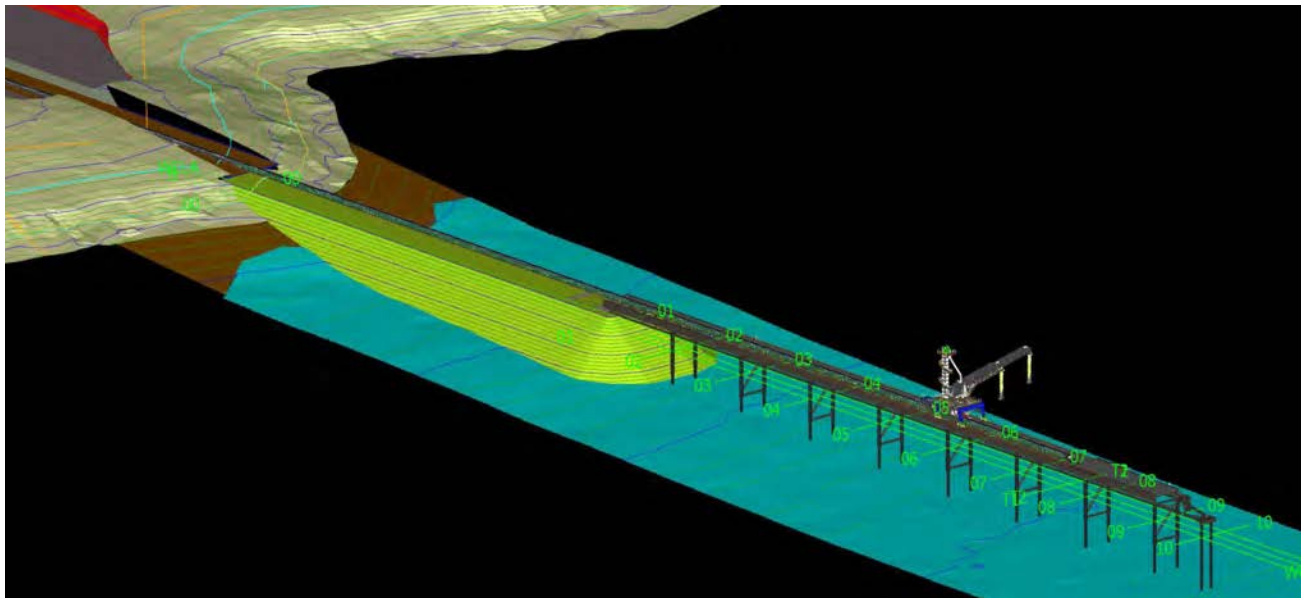
NO COOLING OFF PERIOD

There is no 'cooling off' period in relation to the issue of Offer Shares under this IM. Therefore, from the Closing Date for applications to invest, there will be no obligation on FEL to accept a request by an Applicant to withdraw their application.

3. PORT SPENCER PROJECT OUTLINE

The project is to build a new port facility at Sheep Hill, South Australia (Port Spencer) which is located approximately 70 kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. The site has a natural catchment of approximately 1.6 million tonnes located economically closer to, or equidistant to any other port.

The Port will comprise a deep-sea port and, initially, up to 800,000 tonnes of first-hand grain storage for a projected cost of \$180 million to \$220 million.



Engineers design of Port Spencer causeway, wharf and shiploader

BACKGROUND

Of the average 2.5 million tonnes of grain produced on Eyre Peninsula, approximately 1.6 million tonnes are naturally freight advantaged by up to \$10 per tonne (average \$3.50 per tonne) to Port Spencer as compared to Port Lincoln or the port at Thevenard. This represents the prime growing region on Eyre Peninsula with comparatively more stable and reliable yields and rainfall than some of the other areas in South Australia.

PORT DEVELOPMENT

Scoping and design of the jetty and wharf has been and continues to be a wharf system with a 550-metre-long causeway. The jetty is proposed, built via the launching method, with a travelling ship-loader, capable of loading Post Panamax-sized vessels requiring 14 metres of draft. The minimum berth depth would be 14.5 metres and range to 23 metres at the end of the jetty. Current advice is that no dredging will be required. The Port will be a conventional deep-water port with industry-accepted technology and methods to load Panamax and Post-Panamax sized vessels. Larger vessels such as Cape-size ships may be accommodated in the future but is not currently within the project scope.

The jetty will be positioned in a south-east direction to allow for tidal movements and swell impacts on berthing and mooring

3. PORT SPENCER PROJECT OUTLINE (cont)

The travelling ship-loader will be rated at a minimum 2,000 tonnes per hour of grain and be capable of loading a Panamax vessel within two days. This is consistent with industry standards and competitive with Port Lincoln and other Australian deep-water ports.

Tug and pilot operations will be sourced from the nearby ports of Port Lincoln and Whyalla. These services will be negotiated with the relevant companies when appropriate.

PORT STORAGE AND LOADING FACILITIES

The wharf will be serviced by 50,000 tonnes of silo storage capacity. This storage will be capable of being fumigated and will facilitate vessel loading via an integrated conveyor system. It will be filled via a conveyor loading system from the port bunkers, and by truck directly from farms and external storage sites.

The Port site will initially have a nominal 800,000 tonnes of bunker storage capacity in addition to the 50,000 tonnes of silos, and related intake and out-loading equipment. The bunkers will have an operational intake capacity of up to 30,000 tonnes per day. They will use approximately 50ha of land.

Design and construction are based on a core functional requirement that all trucks entering the site are unloaded within 1 hour, and that, once sampling is complete, the trucks are off site within 30 minutes after unloading.

GROWER SUPPORT

Since the formation of FEL, Eyre Peninsula growers have indicated strong support for the Company investigating and developing the opportunity for an alternative grain supply-chain vehicle. FEL shareholders currently produce about 75% of the grain grown on the Eyre Peninsula.

The proposed Port Spencer facility will provide a compelling point of difference with advantages allowing direct grower deliveries resulting in lower freight costs, and substantially reduced double handling.

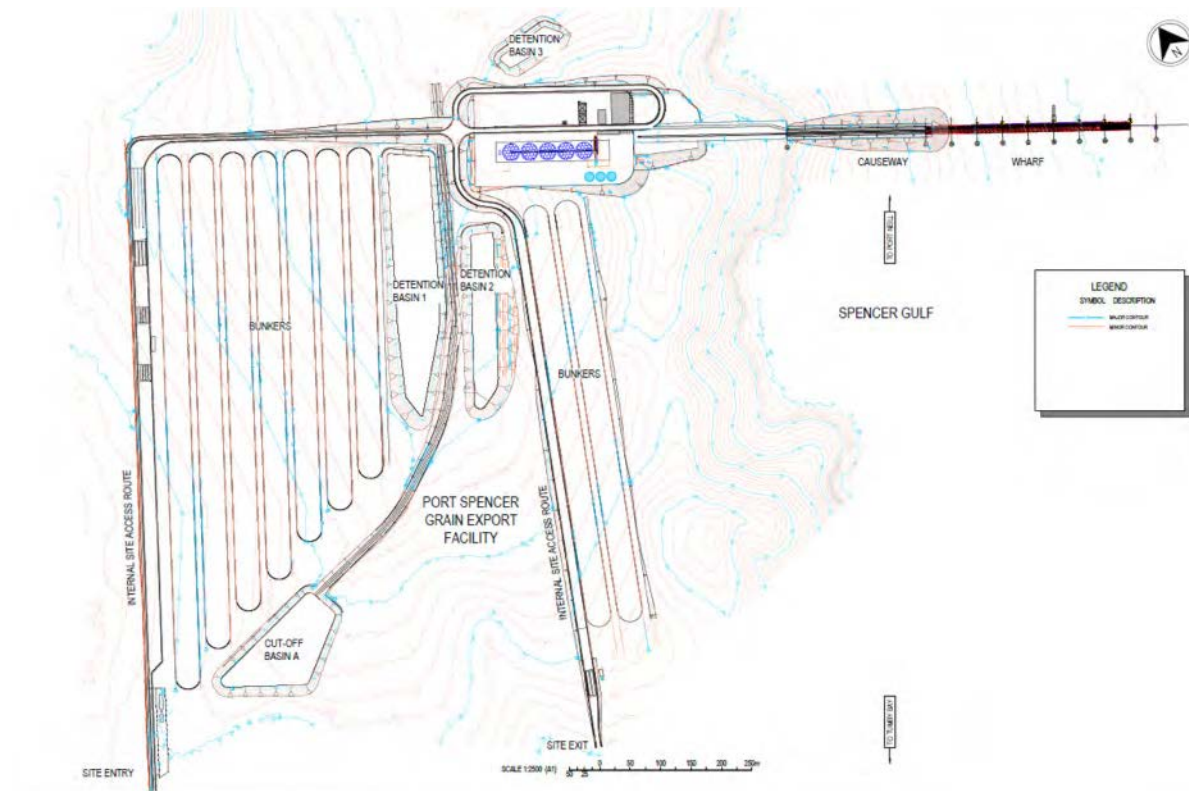
TRADER SUPPORT

Peninsula Ports believes it is likely that the proposed Port Spencer site will be equally and most likely more attractive to grain traders and exporters than Port Lincoln in terms of availability of shipping slots during harvest and peak shipping months, based on access, service levels, and competitive charging structures.

Peninsula Port's financial modelling assumes an average throughput of 800,000 tonnes, or circa 50% market share of the grain advantageously located closer to Port Spencer (versus other ports on the peninsula).

3. PORT SPENCER PROJECT OUTLINE (cont)

PORT SPENCER SITE



HISTORY OF PORT SPENCER

In 2011, Centrex Metals Limited ACN 096 298 752 (Centrex) proposed the Port Spencer site as a deep-sea port to facilitate iron ore exports from its proposed Eyre Iron Joint Venture project. Centrex proposed a development of up to \$325 million with a capacity of 20 million tonnes per annum.

The proposed Port is a naturally deep-water port with areas of 20 metres depth within 500 metres of the shoreline. Consultants have confirmed that dredging is not required. This depth can facilitate Panamax- and Post-Panamax sized vessels (Cape-size vessels may be accommodated for in the future but is not currently within the project).

FEL PARTNERED WITH CENTREX AT THE TIME TO INCLUDE GRAIN EXPORTS FROM THE PORT

Centrex has provided FEL and PPPL with uninhibited and free access to all past studies, plans and information (including geological, marine, and environmental information) for the Port. FEL estimates

3. PORT SPENCER PROJECT OUTLINE *(cont)*

that Centrex previously invested several million dollars over a number of years in direct and indirect cost to bring the Port to approved status. FEL wishes to leverage this as much as possible.

In 2011, the Centrex-proposed port received South Australian Government development approvals, subject to conditions, including that work was to start on the proposed port development by October 2016. However, no work commenced on it as the Eyre Iron Joint Venture project was abandoned following the decline in global iron ore prices. In the time since, a representative of the South Australian Government Department responsible for such development approvals, the Department of Planning Transport and Infrastructure (DPTI), has confirmed in a meeting held on 26 February 2019 that the original approvals are still valid and have been transferred with the title of the land to the Company.

As the Eyre Iron Joint Venture project was gazetted as a major project on 6 January 2011 (pursuant to Division 2, Major developments or projects, under section 46(1) of the Development Act 1993 (SA)), variations to the gazetted approval are now required. Such variations will relate to changing the proposed Port from an iron ore and grain facility to a pure grain facility. Work is underway on these variations.

Since this time, new and innovative design and construction practices have created the potential to significantly reduce the jetty and wharf construction costs to a level that enables Port Spencer to be economically viable with grain as the only commodity put through it.

On 3 June 2019 PPPL purchased the land for the proposed Port Spencer site, including 140 hectares of land suitable for commodity storage and handling with previous port approvals transferring with the land to the Company. The Company is currently well advanced with the Government of South Australia (Planning Department) to finalise the amendments to the existing approvals that will be required for final approval for the proposed Port to be secured.

To date PPPL's preliminary Project activities have been funded by support from FEL and a loan from DDH Graham Preferred Income Fund (refer Section 9)

4. PROJECT ANALYSIS

INVESTMENT CASE

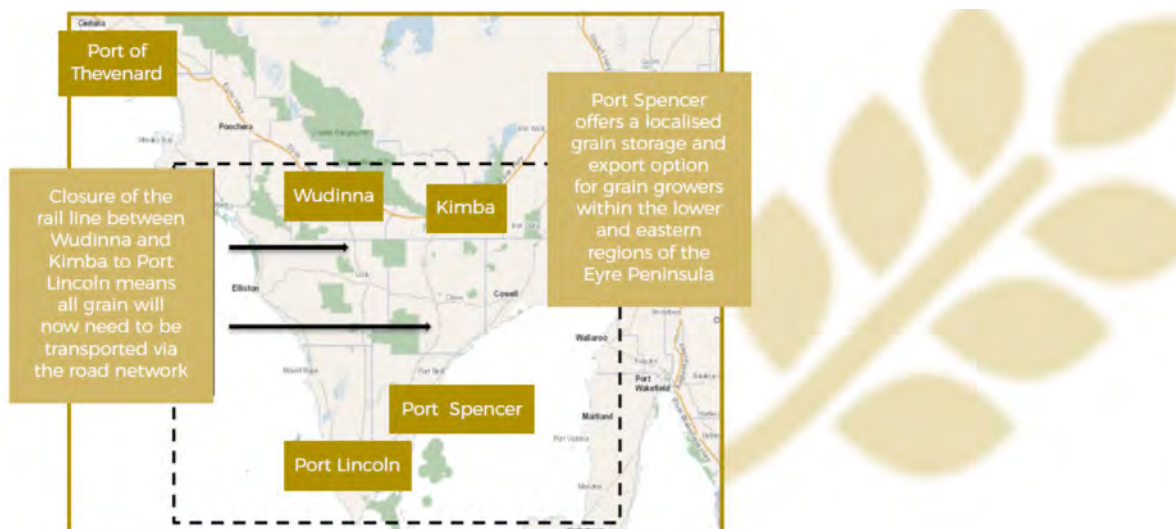
The Company believes that a new port at Port Spencer is commercially viable and attractive. This belief is based on the following:

- Significant freight advantage from proximity: on recent pricing comparisons, approximately 60% of grain produced in the Eyre Peninsula will benefit from freight advantage due to being closer to Port Spencer than to Port Lincoln or Thevenard. The Company estimates that this freight advantage on current pricing would average around \$3.50/tonne but up to \$12/ ton for grain growers at the upper end of the Peninsula's grain growing district, thereby reducing costs for grain growers and increasing grower returns by delivering to Port Spencer.
- Competitive port charges: Financial modelling by the Company shows that port charges can be competitive to those currently charged for shipping through Port Lincoln or Thevenard. Sensitivity analysis show that a 20% reduction in Port Spencer's port charges (subject to volumes) in order to meet competition, should still make the project profitable.
- Improved access to export traders: Opening up additional shipping slots in the peak shipping months (Dec-March) will allow all traders, but particularly medium to smaller grain traders, to have new access to shipping capacity that will in turn, bring greater competition from the global trade to bid for Eyre Peninsula grain.
- Port Spencer is also a significant grain transport solution for the Eyre Peninsula, following the closure of the region's rail network in 2019.

ANTICIPATED CAPITAL INVESTMENT

Capital investment for Port Spencer is estimated to be \$180 to \$220 million (including contingencies).

Preliminary scoping of the capital investment for the project is summarised as follows:



4. PROJECT ANALYSIS (cont)

CAPEX	\$M
Land	1.5
Wharf / Marine structures	63
Ship Loader	15
Silos	37
Site wide Civils/Bunkers	29
Bunker Storage Material Handling System	21
Electrical, controls and automation (excl silos)	2.5
Other supply, install & operational contracts	7
Ops costs (CAPEX)	8
Contingency	15
Total Capex	\$199m ex GST

These costs are preliminary, greenfield development estimates based on non-binding quotes and quantity-surveyor-estimates and include contingency allowances for risk. They are subject to further assessment, analysis and refinement as the project proposal progresses, including engineering, design and approvals. They do not include capitalised interest nor any contributions to external infrastructure upgrades that may be required for access to Port Spencer.

INVESTMENT HIGHLIGHTS

The Peninsula Ports Pty Ltd facility aims to:

- be the lowest cash cost operator in the region, enabling the port to be EBITDA positive on 350,000 tonnes of grain throughput with a 16% discount to current market prices.
- be one of two deep water port in the region enabling large Panamax vessels (80,000 tonnes of grain) to be loaded efficiently, cost effectively and not subject to weather.
- be the region's largest at-port storage facility with over 800,000 tonnes of at-port storage capacity.
- avoid the use of up-country storage to meet financial objectives.
- deliver high financial return as a pure grain port without the necessity for additional, potentially contaminating commodities.
- build in the flexibility to expand at-port storage to 1,500,000 tonnes (87% increase). This will enable Peninsula Ports to become Eyre Peninsula's largest grain export terminal.
- provide storage capacity to meet the region's annual yield improvements (approximating 3% per annum).
- realise grain road freight cost reduction to users of up to \$10 per tonne for approximately 1,600,000 tonnes of grain on Eyre Peninsula (200% of at-port storage capacity).

4. PROJECT ANALYSIS (cont)

EXAMPLE FORECAST FINANCIALS (SUBJECT TO CHANGE)

Note: these figures, estimates, and forecasts, are subject to the disclaimers in section 10 of this IM. Peninsula Ports considers the assumptions, estimates and forecasts presented in this document are reasonable, and the financial information provided is for general indication only and should not be relied upon to make investment decisions.

	Jun-22	Jun-23	Jun-24	Jun-25	Jun-26
VOLUMES - RECEIVALS & SHIPPING (kt)	600	800	850	850	850
KEY PERFORMANCE INDICATORS (\$/t)					
Revenue \$/tonne	45.49	47.33	48.54	49.78	51.04
Variable Operating Costs	(7.35)	(7.54)	(7.73)	(7.92)	(8.12)
Contribution Margin	38.14	39.79	40.81	41.86	42.93
Fixed Operating Costs / Overheads	(7.88)	(6.06)	(5.84)	(5.99)	(6.14)
EBITDA	30.26	33.73	34.97	35.87	36.79
Depreciation	(7.43)	(5.71)	(5.50)	(5.64)	(5.77)
EBIT \$/tonne	22.82	28.02	29.46	30.23	31.01
PROFIT AND LOSS (\$M)					
Revenue	27.3	37.9	41.3	42.3	43.4
Variable Operating Costs	(4.4)	(6.0)	(6.6)	(6.7)	(6.9)
Gross Margin	22.9	31.8	34.7	35.6	36.5
Fixed Operating Costs / Overheads	(4.7)	(4.8)	(5.0)	(5.1)	(5.2)
EBITDA	18.2	27.0	29.7	30.5	31.3
Depreciation	(4.5)	(4.6)	(4.7)	(4.8)	(4.9)
EBIT	13.7	22.4	25.0	25.7	26.4

4. PROJECT ANALYSIS (cont)

ASSUMPTIONS

The forecasts presented above are based on the following key assumptions and are subject to change (see earlier disclaimers). The assumptions include wheat volumes shipped from the proposed Port and port charges per tonne. These assumptions are summarised in the following two tables below.

	\$/T
Receival & Storage	\$21.20
Shipping	\$21.30
Discounts	\$-
SUB-TOTAL	\$42.50
Port	\$2.00
Blending	\$1.50
TOTAL	\$46.00

SENSITIVITY ANALYSIS

The profitability of the Project is shown to be robust when tested against both receival tonnage scenarios and storage and storage fee revenue scenarios. The following table demonstrates combined revenues received from the grower and exporter currently (estimated based on publicly available charges data), and at -\$10 and -\$20 / per ton (in the event of a pricing 'war' with competitors)

Volume	400kt	800kt	1200kt
Revenue at \$53/T	\$21.2m	\$42.4m	\$63.6m
EBITDA	\$13.8m	\$32.6m	\$49.3m
Revenue at \$44.50 per tonne	\$17.8 m	\$35.6 m	\$53.4 m
EBITDA	\$10.7 m	\$24.9 m	\$39.1 m
Revenue at \$34.50 per tonne	\$13.8 m	\$27.6 m	\$41.4 m
EBITDA	\$6.7 m	\$16.9 m	\$27.1 m

4. PROJECT ANALYSIS (cont)

PROJECT PARTNERS

FEL's philosophy has always been to seek and partner with specialist individuals and businesses who share our vision and operating philosophy. With Peninsula Ports, this philosophy has remained resolute and we are delighted to introduce our project partners:



Promanage is a South Australian based company and has successfully delivered small, medium and large scale multi-disciplinary projects across a range of industry sectors in both the public and private sector. Promanage offers a full range of construction, project and program management services spanning the entire project lifecycle. Promanage has well-established and long-working relationships with government, consultants and construction contractors.

Recent projects that Promanage have been involved in include the Sundrop Farms project, a pioneering arid climate agribusiness, using concentrated solar power to create the heat, electricity and desalinated water to power the high-tech greenhouse operations at Port Augusta and the Pirate Life Brewery development at Port Adelaide.



Jacobs, a S&P 500 listed company, is the world's largest supplier of design services and the top ranked marine and port facilities designer in the world*. Jacobs has been involved in Peninsula Ports proposed Port Spencer development from inception and is providing services across the range and breadth of the project. Jacobs is engaged in undertaking an amendment to the Public Environmental Report for the project, supported by functional design basis and project requirements services.



Pacific Maritime Lawyers Pty Ltd is a multi-disciplinary professional practice offering specialist maritime legal and consulting services.

Pacific Maritime has extensive experience in project and asset management, maritime incident investigation and support, maritime compliance, audits, risk assessments, commercial dispute resolution, negotiations, due diligence and business management.

4. PROJECT ANALYSIS (cont)



PML is providing the maritime expertise to Peninsula Ports, ensuring that the proposal satisfies shipping best practice and compliance with the myriad of nautical and port-related regulation.

Bardavcol are a South Australian based and owned Civil Engineering company who undertake a wide range of Civil Infrastructure projects with extensive experience in construction of bulk earthworks and pavements including those associated with a number of grain facilities throughout South Australia. Bardavcol will be providing to Peninsula Ports the following, via an “Early Contractor Involvement” (ECI) approach, to the project:

- Design review and management of detailed civil design in conjunction with ProManage
- Earthworks and pavement options review to ensure maximum utilisation of potential site won materials as pavement materials, minimising costs and tailoring the design to suit locally available materials.
- Undertake construction of the works, maximising the skills and economies of local trade participation (specifically crushing and plant hire) .



Allied is a major supplier of conveyors and silos to the Australian grain industry. Allied is designing and supplying the grain handling, grain assessment, quality control, fumigation systems and final silo storage up to the point of conveying to the Shiploader.



McConnell Dowell are leading international builders or waterside and other constructions. They built the Rio Tinto Modular wharf north of Weipa resulting in a cost effective solution for Rio. Their expertise is being used to design and construct a modern high capacity wharf capable of handling vessels up to 90,000 tonnes.



Piper Alderman is a multi-disciplinary Australian law firm, having been lead advisers to commercial interests across Australia for over 175 years. Pipers are arguably Australia's leading agribusiness legal firm, representing clients in many of the largest agribusiness transactions in rural and regional Australia.

5. THE ISSUER: FREE EYRE LIMITED

CORPORATE BACKGROUND

FREE Eyre Limited was incorporated as an unlisted public company in 2007. A Prospectus was launched to raise initial funds for the establishment of an office and management team based in Port Lincoln.

Two successive capital raising swelled the number of FREE Eyre shareholders to 472. The importance of this number is that well over half of the Eyre Peninsula's farming families are shareholders of the company, producing circa 75% of the Eyre Peninsula's grain, demonstrating the commitment and support provided to this truly unique business.

With 472 shareholders FREE Eyre is an Eyre Peninsula based rural investment vehicle that investigates and co-invests in the development of new businesses and value adding rural enterprises to bring about competition or value adding opportunities.

Ventures previously undertaken by FEL include the following agency and joint venture arrangements:

- EP Grain: a 50/50 grain marketing joint venture with Emerald Australia group
- EP Storage: construction and operation of the 100,000 ton up-country grain storage and handling facility at Rudall
- FE Energy: partnership with the Solar Shop that encouraged 70 farming families to take advantage of the generous, Government mandated feed-in tariffs through until 2027
- FE Grain: partnerships with PlumGrove, ProFarmer Australia, Clear Grain Exchange and most recently with Australia's leading independent grain advisory and pool management operator, Market Check.
- FE Fibre: partnership with the Michell Wool Group, Australia's largest wool processor and direct from farm wool buyer, aimed at challenging the traditional wool brokerage charges and supply chain
- Ag Guard: an innovative partnership with one of Australia's specialist crop insurance brokers, to challenge the premiums and services offer by incumbent crop insurance providers
- Telstra Store Whyalla: a long-standing partnership whereby FEL shareholders and their families received personalised, on farm service to increase their access to fixed and mobile technology and tailored communication packages for their individual situation and location.
- Maxiplus: an exclusive EP agency agreement to supply arguably the strongest and most durable South Australian made water tanks direct to EP farms. FEL and Maxiplus also collaborated to secure Regional Community Fund grants for firefighting tanks to over 140 farming families and community groups.
- Tin Roof Financial Services: a partnership with a specialist rural finance broker to bring about competition and alternative sources of finance to EP farming families.

Whilst FREE Eyre's mandate is to always consider ideas and suggestions about partnerships that will bring about competition and value adding opportunities to its shareholders and the Eyre Peninsula farming community, its clear and present focus is the development of the Peninsula Ports business and Port Spencer grain receipt and export facility.

5. THE ISSUER: FREE EYRE LIMITED (cont)

THE FREE EYRE LIMITED BOARD AND MANAGEMENT



CHAIRMAN OF BOARD OF DIRECTORS
JOHN CROSBY, Diploma in Agriculture (RDA)

Chair of the Agribusiness Advisory Board of Adelaide University, and Chair of Stoney Pinch Sands Pty Ltd; General Manager of own farming and investment business in SE South Australia; and Managing Director of C&F International (exporting Australian produce into Vietnam). Previously Chair of a number of wheat and meat industry bodies; senior roles with the NFF and Agribusiness Association of Australia; and Board member and General Manager of Elders.



CHIEF EXECUTIVE OFFICER
MARK RODDA, B Agricultural Business, Masters Innovations & Service Management, GAICD

CEO of FREE Eyre since 2009. Previously General Manager Elders Global wool operations. Recent consulting roles included Executive Officer of the AWI Wool Exchange Portal and ongoing agribusiness advisory roles to the University of Adelaide. Previous Directorships include Agribusiness Association of Australia, Australian Wool Handlers, Elders Primary Wool New Zealand, EP Grain, EP Storage, Elders Risk Management, Rodda Ag Co farming operations, Yorke Peninsula, South Australia



DIRECTOR
MATTHEW BAKER B ENG, MBA, GAICD

Currently Head of Corporate at Baker Young Stockbrokers. 25 years' experience in finance, corporate advisory and investor relations (Baker Young Stockbrokers and Patterson Securities). Additional experience as Business Advisor, Commonwealth Government Entrepreneurs and Commercialisation Program, start-up business, management, board and consulting roles



DIRECTOR
DAVID GIDDINGS B App Sc (Agriculture)

Farmer based at Wanilla / Wangarry on the lower Eyre Peninsula. Previous Chairman of the Wanilla Ag Bureau and Chairman of LEDA (Lower Eyre Ag Development)

5. THE ISSUER: FREE EYRE LIMITED (cont)



DIRECTOR
TREVOR GILMORE

Farmer based at Streaky Bay on the western Eyre Peninsula. Former Councillor of District Council of Streaky Bay, Member of Eyre Peninsula Water Resources Advisory Committee, Member of Streaky Bay Tourism Committee



DIRECTOR
KEVIN O'DRISCOLL

Former Chairman of Board of Directors, Ausbulk Ltd 1995 – 2004, Chairman of Ausbulk finance and Audit Committee, Nominations and Remuneration Committee and Listing Committee. Founder and Chairman of Semaphore Container Services, 2006 – II



COMPANY SECRETARY
ASHLEY ROFF FGIA, Master of Laws (LLM) (Hons 2)

Over 25 years of governance and legal experience in agriculture, including as legal counsel and company secretary of ABB Grain Ltd (now Glencore / Viterro), Ausbulk Ltd, Emerald Grain (a Sumitomo subsidiary) and Berri Ltd, and as current non-executive director of Port Lincoln based Angel Seafood Ltd (ASX: ASI).



DIRECTOR
GORDON TOLL FAusIMM

Honours degree in mining engineering from University of Queensland. Masters degree in business from Columbia University NY.

Corporate Career of 27 years with Consolidated Goldfields, BHP, Texasgulf, Atlantic Richfield & Rio Tinto - primary focus on iron ore, coal, copper and industrial minerals.

Followed by over 23 years as an entrepreneur exploring for major ore bodies and developing significant new port, materials handling, logistics and infrastructure projects including Savage River (Tasmania), Oyu Tolgoi (Mongolia), Ferrous Resources (Brazil), FerroAlloys Limited Vanadium (Kazakhstan), Lodestone Equities (South Australia)

5. THE ISSUER: FREE EYRE LIMITED (cont)

CAPITAL STRUCTURE

The capital structure of FEL following completion of the Offer and conversion of convertible notes is summarised below:

	Ordinary shares (low raise)	Ordinary Shares (high raise)
Shares on issue at date of IM	2.4m	2.4m
Shares issued pursuant to the Offer @ \$2 / share	4m	8m
Other shares which may be issued to support the Port Spencer project	0.125m	0.125m
TOTAL SHARES	6.525m	10.525m
Cash raised 2019/20	\$8m	\$16m

OPTIONS

Baker Young Stockbroking *	1m	1m
Cash raised 2023	\$2m	\$2m

**Options exercisable @ \$2.00 per PPPL share and exercisable on or before 30 June 2023*

PRO-FORMA BALANCE SHEET

The pro-forma unaudited consolidated balance sheet of FEL immediately after the completion of the allotment of the Offer Shares is contained in APPENDIX I.

Note that Free Eyre has been issued with 2.5 million shares in PPPL to recognise the significant discount on the purchase of the port site and attached approval work and the money spent by FEL to get the project to this stage. While the consolidated value of these shares is nil whilst PPPL remains a wholly owned subsidiary of FEL, once PPPL is deconsolidated upon the raising of institutional equity in 2020 this shareholding will be recognised as an investment in the accounts of FEL.

6. GRAINS INDUSTRY

SUPPLY CHAIN STRUCTURE

In essence, the export grain supply chain collates grain from domestic farmers and distributes it to overseas end users. The set of processes comprising the supply chain includes services such as storage, handling, freight and shipping.

From a grain grower's perspective, supply chain costs are a major cost item. Sometimes this can be the single largest cost item depending on several factors such as the distance from point of harvest to point of receipt, mode of transport and grain handling, and storage and loading charges.

A key consideration for understanding the export grain supply chain is the export window between December and May. This window comes about because of the harvest period in Australia, as well as coinciding with waning of supply from northern hemisphere competitors, and there are premiums and opportunities available in Asian markets. This relatively short window creates competition for labour, grain, rail, transport and port services and shipping slots. About 80% of grain produced in South Australia is exported.

The supply chain industry is highly concentrated. Three large bulk handlers are dominant players nationally – Cooperative Bulk Handling (CBH) in WA, Glencore/Viterra in South Australia and GrainCorp in eastern Australia. These bulk handling companies are highly integrated, and own/operate storage sites, rolling stock, ports, and exporting and marketing businesses. In South Australia, Viterra handles around 80% of the grain and exports up to 40% of grain produced in the State. A smaller but significant bulk handler is Cargill which operates in Australia as AWB Cargill, Cargill and AWB.

EYRE PENINSULA GRAIN PRODUCTION

The Department of Primary Industries and Regions South Australia (PIRSA) divides the Eyre Peninsula into three separate growing districts:

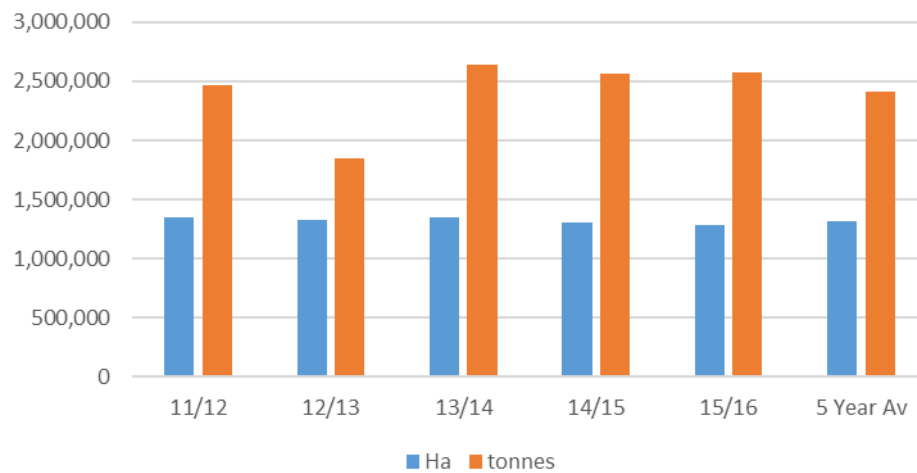
- Lower EP is the wetter and more reliable part of the peninsula. Yields can range in excess of 5T/Ha for wheat. The eastern side of this area is adjacent to the Port Spencer site.
- Western EP extends north from lower EP and on the western side of the peninsula. It tends to be more reliable than eastern EP but lower rainfall than the lower EP area.
- Eastern EP is the area north and east of lower EP and includes Kimba, Cleve and Cowell. This area is capable of very large grain production but does tend to suffer more in drier years.

EP by district area and yield				
	Western	Lower	Eastern	Total
Ha	480,500	139,400	392,100	1,011,900
Tonnes	719,100	429,100	682,500	1,830,700
T/Ha	1.50	3.08	1.74	1.81

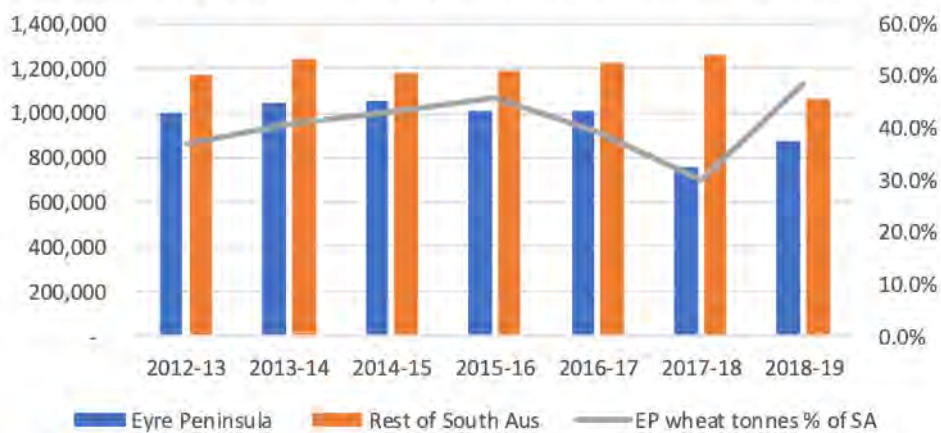
6. GRAINS INDUSTRY (cont)

On average, over the 5 years to 2018-19, approximately 72.5% of sown land area on the Eyre Peninsula is wheat.

EP Wheat Barley and Canola Production



Hectares sown to wheat in Eyre Peninsula & rest of South Australia & Eyre Peninsula % of SA harvest



6. GRAINS INDUSTRY (cont)

THE SOUTH AUSTRALIAN GRAIN INDUSTRY

GRAIN HANDLERS AND STORAGE

- Glencore Grain Australia (also a subsidiary of Viterra's global parent company) is the largest grain exporter in South Australia by market share. In 2017, Glencore's/ Viterra's storage was in excess of 11 million tonnes of wheat located across 90 operational grain receipt sites.
- During 2016-17, the Eyre Peninsula had a record-high wheat production at 2,527,000 tonnes. To cope with the record grain production, during the second half of 2016 a further 900,000 tonnes of bunker storage was built.

The Essential Services Commission of South Australia (ESCOMA) has stated that Viterra can be considered a "near-monopoly" supplier in providing supply-chain services (upcountry storage and handling, freight transport to port, and port services including export bulk loading facilities). This high market share results from the large amount of fixed infrastructure that it operates, and this is more predominant on the Eyre Peninsula than anywhere else in South Australia

OTHER FEATURES OF THE SA GRAIN SUPPLY CHAIN

The supply-chain has predominantly been built over the past 50 to 70 years by the grain grower cooperative South Australian Co-Operative Bulk Handling (SACBH) which was demutualised in 2000 and merged with ABB Grain (regional listed grain trader) in 2004. ABB Grain was purchased by Viterra Inc of Canada in 2009, which was then acquired in 2012 by Glencore of Switzerland, one of the world's largest commodity traders, in 2012.

The current wharf at Port Lincoln was built in 1975/76 and the bulk grain silos originally built in 1958. The infrastructure at Port Lincoln is showing signs of age and it is alleged that a number of the grain silos are no longer safe enough to use, within the facility.

Both Port Lincoln and Thevenard have experienced infrastructure issues in recent years. In June 2017, ship loading operations at Thevenard were suspended after a draft engineering report identified possible safety concerns regarding a section of the jetty infrastructure. In February 2019, Viterra announced that it would not renew its contract with the rail company providing grain movement on the Eyre Peninsula and all future grain movement would be done by road. South Australian Senator Alex Gallacher was reported as saying that this move to complete road transport would be "catastrophic" and could see an additional 30,000 B double trucks on the road. Locals also expressed concern at the bottlenecks this would cause on the roads and at the silos.

LUCKY BAY

T-Ports Pty Ltd (T-Ports) has commenced operating a bulk grain receipt and transshipping service at Lock and Lucky Bay, Eyre Peninsula. The T-Ports service offering contemplates utilising a shallow draft Trans-Shipment Vessel (TSV). The shallow draft vessel would trans-ship grain from the Lucky Bay harbour to deep water ocean-going vessels anchored in the Spencer Gulf. The TSV is expected to be commissioned in 2019, and the port silos and ship-loader completion expected in November/December 2019. Bulk grain export services are expected to be commercially provided from 1 January 2020.

6. GRAINS INDUSTRY (cont)

There are several other grain-handlers that operate in South Australia:

- Cargill (also trading as AWB Grainflow and AWB): grain receival and storage sites at Mallala, Pinnaroo, Crystal Brook and Maitland;
- Kl Pure Grain Pty Ltd: grain receival and storage at Kingscote;
- San Remo: durum wheat receival sites in Kulpara (Northern Yorke Peninsula) and Balaklava;
- ADM opened a new bunker and silo facility at Port Pirie for 2019/20 period.

It is estimated that there are another approximately 1 million tonnes of grain storage on farms used to manage the logistics of harvest buffering for cartage to silos.

INTERNATIONAL

South-East Asia, with a fast-growing population and wheat consumption rising is expected by the end of 2019 to be the largest wheat-importing region in the world for the first time.

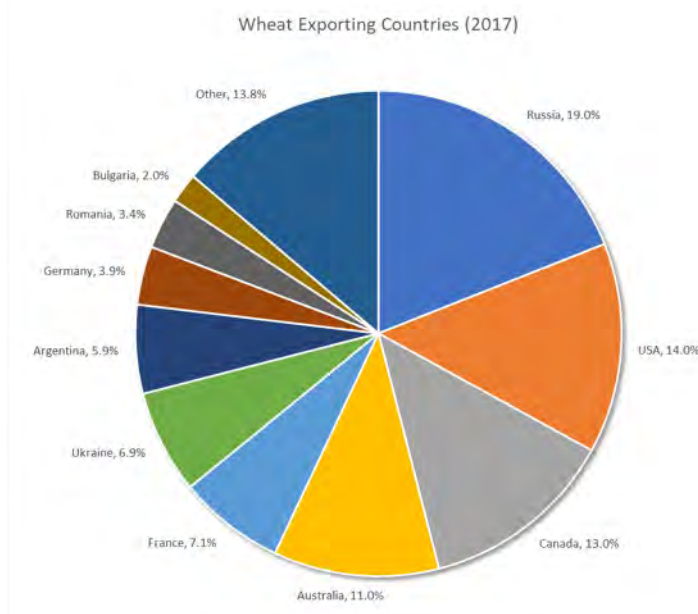
Wheat is farmed throughout the world. The leading wheat-producing countries between 1994 and 2017 were:

NO.	COUNTRY	WHEAT PRODUCTION (AVERAGE 1994-2017) (MILLION TONNES)
1.	China	111,082,875.00
2.	India	77,238,162.33
3.	United States	58,747,581.75
4.	Russia	47,771,413.17
5.	France	36,130,964.67
6.	Canada	26,305,512.50
7.	Germany	22,423,437.88
8.	Australia	21,585,223.83
9.	Pakistan	21,253,930.54
10.	Turkey	19,816,666.67

Food and feed demand in Indonesia has seen huge increases over the last 10 years, with its grain imports doubling, quickly becoming the second-largest importer of wheat in the world behind Egypt. The Philippines have seen similar growth to Indonesia, with import-growth accelerated by local typhoons destroying domestic crops of corn and rice. Wheat demand in these areas is also boosted by longer-term shifts in consumer preferences, as Asian countries are substituting more wheat into their diet in place of rice. CGIAR (formerly the Consultative Group for International Agricultural Research) has predicted that demand for wheat will rise 50% by 2050, with a world population of 9 billion or more and as many as 6.3 billion city-dwellers buying convenience foods.

In 2017, Australia was also the fourth-largest exporter of wheat in the world, behind Russia, the USA, and Canada.

6. GRAINS INDUSTRY (cont)



DISTRIBUTION AND EXPORTS FROM INCUMBENT OPERATORS

There are 6 main grain export terminals located across South Australia.

- Viterra's existing grain port facilities footprint
- Viterra's South Australian upcountry receival sites and port terminals have a total storage capacity of more than 10 million tonnes. Viterra operates six grain port terminals along the South Australian coast;

DEEP SEA PORTS

- Outer Harbour
- Port Lincoln (Eyre Peninsula)
- Port Giles (Yorke Peninsula)
- Port Adelaide Outer Harbour

SHALLOW PORTS

- Inner Harbour
- Thevenard (Eyre Peninsula)
- Port Adelaide
- Wallaroo (Yorke Peninsula)

Of importance to Peninsula Ports:

- Port Lincoln grain terminal is estimate to have approximately 396,000 tonnes silo capacity and exporting up to 2 million tonnes per annum;
- Thevenard grain terminal is estimated to have approximately 200,000 tonnes of silo capacity, exporting up to 400,000 tonnes per annum;

7. KEY RISKS

There are risks associated with any investment and there are various risks associated with an investment in the Company.

Prospective investors are cautioned that an investment in FEL is a speculative investment and involves a degree of risk.

The following highlights some of the risks that potential investors should consider prior to subscribing for shares in the Company. However, the following is not, and does not purport to be, a comprehensive statement of all relevant risks. Potential investors must seek their own professional advice in relation to the risks and must make their own assessment.

Each risk can result in extra time and costs, including in greater than proportionate manner. At worst, a risk may cause the project to not achieve completion.

EARLY DISPOSAL

No-one is under an obligation to buy-back or redeem shares in FEL of whatever class, and there is no ready market for those shares.

This investment is an illiquid investment for which there is unlikely to be an official secondary market. Investors who attempt to realise their investment at any time may be unable to do so or may only be able to do so at a significant loss.

It is envisaged, however, that once operational, Peninsula Ports will conduct an annual off-market trade period, whereby willing sellers and buyers of FEL shares will be provided with a mechanism to trade their shares.

OPERATING HISTORY & ESTABLISHMENT COSTS

The costs associated with development of the Port Spencer project, which has no operating history, are subject to a variety of factors outside of the control of the Company and Peninsula Ports which could significantly impact upon and increase those costs.

FURTHER FUNDRAISING

The funds to be raised pursuant to this Information Memorandum will form part of the overall funding requirements. For FEL to succeed it may require the need to raise further funds which would dilute any prospective investor's holding.

LACK OF DIVIDENDS

If the Port Spencer project does not succeed, or achieve the financial returns modelled (including because of weather events such as drought), then the ability for PPPL to pay dividends to its shareholders (including FEL) will be compromised and so in-turn will the ability of FEL to pay dividends to its shareholders.

COMPETITION

The grains industry is rapidly expanding on a global scale, and competitors and serious business challenges can emerge quickly. Aggressive marketing by the existing or emerging competitors (including the proponents of other port projects on the Eyre Peninsula, and the incumbent operator) could reduce the profitability of Peninsula Ports, and in-turn the Company's profitability, slow the growth of the Company and potentially harm the Company in the marketplace.

7. KEY RISKS (cont)

KEY PERSONNEL

The key personnel employed or engaged by FEL and by PPPL in relation to the project have a high degree of expertise and the Company and PPPL are reliant upon their continued service to maintain high performance in system administration, project development and management. The loss of key executives, staff or consultants or the inability to recruit staff and retain high calibre staff or consultants to manage the project could adversely affect the Company and/or the Project.

RISK MANAGEMENT

The directors of the Company have attempted to address all the associated risks as best as possible. However, there are other factors which are not specific to the Company which may impact on the Company, including:

- economic policies;
- interest rate changes;
- taxation policies;
- inflation rate changes;
- business confidence; and
- the state of the Australian economy and global economies.

CONSTRUCTION AND ENVIRONMENTAL PLANNING RISK

The key construction, environmental and planning risks are as follows:

- The construction costs are development estimates, are constantly being updated based on non-binding quotes and quantity surveyor estimates and are subject to latent risks. They include contingency allowances for risk as the final jetty and wharf designs are subject to completion of below-seabed geotechnical testing.
- The coastal land is subject to Native Title and will require an “Indigenous Land Use Agreement” or “ILUA” with the Barngarla people. The details of this agreement have been negotiated and are awaiting endorsement by a meeting of the Barngarla Determination Aboriginal Corporation (BDAC) due in October.
- The full approval process may take longer than expected resulting in a delayed start to construction. Approvals are subject to usual political risks (including policy changes). Approvals include but are not limited to: lodging a Public Environmental Report (PER), land use, geology and soils, surface water, groundwater, air quality, noise assessment, waste and materials, ecology, hydraulic modelling, Environment Protection and Biodiversity Conservation assessment, indigenous land use, visual amenity assessment, and socio-economic impacts.
- The jetty will be constructed offsite in China and shipped to site. To ensure the jetty meets Australian Standards a suitably qualified representative of the Project Manager will supervise and approve the individual stages of fabrication on site in China. The components may be damaged during transport.
- A delay in fabrication in China can have flow-on delays, e.g. it could result in a delay in jetty placement on site. In addition, the fabrication contract is likely to be in US Dollars or Chinese Yuan and will be subject to foreign exchange fluctuation risk.

7. KEY RISKS (cont)

- A contractor is unable to complete their requisite task due to unforeseen circumstances (e.g. force majeure, latent site issues, industrial relations activity) resulting in a delay to the fix or the appointment of another contractor for the brief.
- Unanticipated events such as market price changes, inclement weather, labour shortages, labour disputes, community opposition/action, environmental or social activists, and legal injunction or other formal dispute process could potentially delay the start of construction and project timeline.
- Approximately 7 kilometres of road needs to be upgraded to allow for safe and efficient forecast grain volumes to be delivered to site.

VOLUME RISK

The volumes to be exported through the Port will be determined by both the amount of grain produced in the catchment area and the cost of using the Port. The following table summarises potential revenue and EBITDA results at different volume levels and at “two port” cost levels.

VOLUME	400kt	800kt	1200kt
Revenue at \$53/T	\$21.2m	\$42.4m	\$63.6m
EBITDA	\$13.8m	\$32.6m	\$49.3m
Revenue at \$44.50 per tonne	\$17.8 m	\$35.6 m	\$53.4 m
EBITDA	\$10.7 m	\$24.9 m	\$39.1 m
Revenue at \$34.50 per tonne	\$13.8 m	\$27.6 m	\$41.4 m
EBITDA	\$6.7 m	\$16.9 m	\$27.1 m

EBITDA = earnings before interest, tax, depreciation and amortisation

ONGOING OPERATIONAL RISK

Operational risks include:

- securing throughput with traders including well-established global businesses such as Cargill, Archer Daniels Midland, and Glencore/Viterra);
- industrial action (whether landside or seaside);
- labour shortages;
- environmental/social activism;
- weather events such as drought (affecting grain production);
- competitive risk presented by new grain export facility development at Lucky Bay (utilising shallow draft trans-shipment vessels – see further information at section 7 (Grain Industry Background) of this IM);
- Lucky Bay could be taken over or improved to a level to provide better competition.

8. MATERIAL CONTRACTS

INTRODUCTION

Set out below is a brief summary of certain contracts to which the FEL group is a party and which the Directors of FEL have identified as material to the Company, and are of such a nature that an investor may wish to have details of particulars of them when making an assessment of whether to apply for the Share Offer.

1. BAKER YOUNG STOCKBROKERS MANDATE

FEL has engaged South Australia's premier stockbroking company, Baker Young Stockbroker (BYS) to assist with the capital raising program for this Information Memorandum as well as the next and final round of capital raising with institutional investors.

Key capital Raising Tranches:

ROUND 1 (Seed Round, \$2m Convertible Notes)

Support FEL to raise \$2m from non shareholders / BYS clients for the acquisition of 1m shares in PPPL at \$2

ROUND 2 (Final Design Phase, \$16m, total paid up value of Ordinary FEL shares)

- Support FEL to raise approximately \$8m (value of first instalment) and a further \$8m (for the second installment at call by the FEL Board). If fully subscribed, this will total the issuing of 8m new Ordinary FEL shares. It is expected that this capital will largely be raised from existing shareholders and EP farmers / agribusinesses.

ROUND 3 (Shortfall of Round 2)

Support FEL to place any shortfall of Round 2 through the placement of Ordinary FEL shares or the issuing of Convertible Notes (in the same structure as Round 1 terms)

FEE STRUCTURE

FEL and Baker Young Stockbrokers have agreed a Fee Structure for the accomplishment of the above targets:

- a) Round 1. A fee of 8% on the Convertible Notes
- b) Round 2. A fee of 4% on total paid up value of capital raised through the issuing of Ordinary FEL shares
- c) Round 3. A fee of 8% on the capital raised through Convertible Notes.

FEL will also issue 1 million options to BYS over Ordinary Shares in PPPL. These options will have a strike price of \$2.00 and exercise date of 30 June 2023.

8. MATERIAL CONTRACTS *(cont)*

2. LOAN AGREEMENT DDH GRAHAM PREFERRED INCOME FUND TO PPPL

In an effort to secure the Port Spencer land and approvals from Centrex Metals, PPPL entered into a Facility Agreement with Sargon CT Pty Ltd (as custodian for the DDH Preferred Income Fund (lender)) on 30 May 2019.

PPPL utilised these funds to purchase the Port Spencer property and engage project partners (as outlined earlier in this I.M) to undertake the Early Contractor Involvement (ECI) phase of planning and design.

The Facility Agreement (loan) of \$2,500,000 is for a term of 3 years and carries a lending rate of 15%, payable monthly.

The Loan is secured over the assets and undertakings of PPPL

9. DISCLAIMERS

Investment in the shares offered under the Information Memorandum is speculative and independent financial or other professional advice should be obtained.

Please read this document carefully before you make a decision to invest. An investment in the Company has specific risks which you should consider before making a decision to invest.

This information memorandum was prepared by Free Eyre Ltd ABN 18 124 308 041 and was issued on 18 November 2019.

This Information Memorandum relates to the opportunity to acquire partly paid Ordinary shares in FEL.

This Information Memorandum is provided by FEL solely to assist persons considering subscribing for Ordinary shares in the Company to assess the investment and associated risks.

Any person who receives this Information Memorandum (Recipient) should note that it is not a disclosure document (such as a prospectus) which has been or requires lodgement with the Australian Securities & Investments Commission (ASIC).

The information contained in this Information Memorandum is not intended to provide the basis of any credit or other evaluation in respect of the Company and should not be considered or relied on as a recommendation, advice, or a statement of opinion that is intended to influence a person in making a financial product or investment decision, including that any person should subscribe for, purchase or otherwise deal in any equity of the Company. This Information Memorandum does not consider your individual objectives, financial situation or needs, or those of any particular investor.

You should read this Information Memorandum carefully and consider the appropriateness of the information and the risk factors that could affect the performance of the investment having regard to your objectives, financial situation, needs and desires. Investment is subject to general investment risk, including loss of income or capital invested. You should not base your decision to invest solely on the information in this Information Memorandum and you should carefully read it in its entirety.

The Information Memorandum is not to be considered as investment, legal or tax advice. Before making an investment decision in relation to the Company, you should consider your own personal circumstances and consult your financial, legal, tax and other professional advisers about an investment in the Company.

The Company has not authorised any person to give any information or to make any representation in connection with the Share Offer which is not contained in this Information Memorandum. No information or representation which is not contained in this Information Memorandum may be relied upon as having been authorised by us in connection with the Share Offer. This Information Memorandum supersedes all previous representations and communications (including investor presentations or flyers) in respect of the Share Offer, FEL and PPPL.

As stated above, this Information Memorandum is not a prospectus, product disclosure statement or other disclosure document required under the Corporations Act 2001 (Cth) (Corporations Act) and it will not be lodged with ASIC. This Information Memorandum is not required to and may not contain the same level of detail which would be required in a product disclosure statement or a prospectus. Any invitation to purchase or subscribe to the securities will be an offer that does not require the provision of a product disclosure statement under Division 2 of Part 7.9 of the Corporations Act, nor disclosure for the purposes of section 708 of the Corporations Act. By retaining this Information Memorandum, you represent that you are not an investor to whom disclosure is required to be made under the Corporations Act.

9. DISCLAIMERS *(cont)*

The Share Offer is only available to qualifying investors. A qualifying investor is a person who qualifies for one of the exemptions under Part 6D.2 of the Corporations Act (e.g. as a “sophisticated investor”, made through a financial services licensee or as a “professional investor”). All investors who take up the offer under this IM will be required to execute an application form including an investor disclosure statement (see the Appendix) and maintain their status.

This Information Memorandum may contain forward-looking statements and prospective financial information relating to future matters and which are predictive in character. These may be affected by known and unknown risks, uncertainties and other important factors that could cause the actual results, performance or achievements of the Company to be materially different from those expressed or implied by such statements. Statements about the Company’s future operations, projections and forecasts are based on assumptions about future events and management actions which may not necessarily take place and are subject to uncertainties which may be outside the control of the Company.

The Company makes no guarantees, representations or warranties regarding whether projections or forecasts will be achieved or whether they represent the most likely outcomes.

This Information Memorandum and the Share Offer is only available to persons receiving this Information Memorandum within Australia to whom it is lawful to provide such information. This Information Memorandum does not constitute an offer in any jurisdiction in which, or to any person to whom, it would be unlawful to make the Share Offer or issue this Information Memorandum. If you receive this Information Memorandum in such circumstances you should seek advice on whether you are entitled to receive it or the Share Offer, and observe any applicable restrictions, limitations, prohibitions, or obligations. Unless otherwise stated, dollar amounts are expressed in Australian Dollars.

FEL, each of their agents, contractors, directors, officers and employees to the full extent permitted at law:

1. do not warrant or represent the origin, validity, accuracy, completeness or reliability of, or accept any responsibility for, errors or omissions in this Information Memorandum;
2. disclaim and exclude all liability for all claims of whatever nature that may arise in any way from or in connection with the provision of this Information Memorandum and any inaccuracy, incompleteness or currency of information within this IM, or any reliance by any person on it; and
3. do not, by this IM, provide any recommendation, service or advice.

By retaining this Information Memorandum, the Recipient acknowledges and agrees (for itself and its related bodies corporate and each of their management, officers, employees, agents, representatives and advisers) that:

- (a) this Information Memorandum and all of the information contained in it is confidential, and it will keep strictly confidential this Information Memorandum and its contents, and all other information made available to the Recipient in connection with this Information Memorandum or its contents;
- (b) neither this Information Memorandum nor its contents will be used, in whole or in part, by the Recipient or any of its officers, employees, servants, or agents for any purpose other than deciding whether to investigate further a possible acquisition of securities in the Company pursuant to the terms of this Information Memorandum;
- (c) this Information Memorandum will not be reproduced (nor its contents disclosed to a third party), either in whole or in part, without the prior written consent of the Company;

9. DISCLAIMERS *(cont)*

- (d) upon request, it will promptly return this Information Memorandum, together with any other material received in connection with it, to the company without retaining any copies; and
- (e) upon request, it gives in favour of the Company a separate confidentiality undertaking substantially on the terms set out in paragraphs (a) – (d) above.

UPDATING THE IM

Information contained in this IM is subject to change from time to time and may be updated by the Company. Any updated information (which is not materially adverse to investors) will be available from the FREE Eyre Limited website. Where updated information is materially adverse to investors, the Company will issue a supplementary IM.

APPENDIX I

Anticipated Pro-forma FREE Eyre Limited Balance Sheet, post capital raise associated with this Information Memorandum.

ASSETS	VALUE
Current FEL assets	\$0.237
Port Spencer land	\$1.5m
Work in progress	\$1.4m
Cash	\$10m
Equity on call	\$8m
Total assets	\$21.137m
LIABILITIES	
Convertible note	\$2m
DDH Graham loan	\$2.5m
Interest on convertible note	\$0.094m
Work committed but not yet complete	\$6m
TOTAL LIABILITIES	\$10.594m
NETT ASSETS	\$10.543m

ASSUMPTIONS

1. Balance sheet is as at completion of initial capital raise on 20th December 2019
2. Assumes that 8 million FREE Eyre shares are subscribed
3. Work committed relates to the detailed design progress work which is continuing through to March 2020.
4. Funding will carry through to receiving final approvals to construct the port
5. These figures do not take into account the capital raising costs as outlined on page 34.

APPENDIX 2

SHARE APPLICATION FORM INSTRUCTIONS APPLICATION TO SUBSCRIBE FOR PARTLY PAID ORDINARY SHARES IN FREE EYRE LIMITED (ACN 124 308 041) (Company)

The share application form is attached to this Appendix 2 (see Schedule2). Please return your completed form, accompanied by the signed Investor Disclosure Statement (see Schedule 1) and address all questions, to:

Free Eyre Limited
1/33 Hutt Street
Adelaide SA 5000
Attn : Mark Rodda
Tel: +61 8 8232 9266
Fax: +61 8 8232 2065
Email: mark@freeeyre.com.au

This Application Form accompanies the Information Memorandum dated November 2019 (IM). The IM contains important information about the offer of Ordinary shares in the Company. Applicants should read the IM in its entirety before applying for Ordinary Shares.

A person who gives another person access to the Application Form must at the same time and by the same means give the other person access to the IM.

Applicants should seek professional advice to assist them in forming their own opinion of the information in the IM and its relevance to their individual circumstances, investment objectives and needs.

No warranty or guarantee is, or can be, given in respect of the capital or future earnings of the Company.

The original Application Form should be sent to Free Eyre Limited (FEL).

Applications will not be processed until FEL is in receipt of the original Application Form and appropriate accompanying documentation.

APPENDIX 2 (cont)

INVESTOR INFORMATION FOR PARTICIPATION IN THE ISSUE OF PARTLY PAID ORDINARY SHARES IN FEL IMPORTANT

Participating Investors must:

1. Read and sign the Investor Disclosure Statement attached to this Appendix I (refer SCHEDULE 1).
2. If required, obtain the Certificate of a Qualified Accountant in the form attached to the Investor Disclosure Statement.
3. Complete and sign the Application Form attached to this Appendix I (refer SCHEDULE 2)
4. Send the signed Application Form, Investor Disclosure Statement, and, if required, the Certificate of a Qualified Accountant, to FEL. Please note that FEL is unable to accept your share application unless accompanied by the signed Investor Disclosure Statement and, if required, the Certificate of a Qualified Accountant.
5. Attach your cheque or transfer the subscription money to the bank account indicated on the Application Form (Schedule I). Please note that only the first instalment (\$1.00 per share) is required to be paid at this time in order to qualify for allotment. The second instalment (\$1.00 per share) will not fall due until a date to be advised by FEL but, in any case, not before March 1, 2020.

All sections must be completed in full, in CAPITAL LETTERS and signed by the subscriber(s) of the Partly Paid Ordinary Shares (Investor(s)) or the Investor's nominee(s).

The Company reserves the right to reject applications, including but not limited to applications that have not been correctly completed.

Note: All communications from the Company will be sent to the first named shareholder to the postal address, and/or electronic address, recorded in the register of members. If there are to be joint shareholders (which may not exceed two in number), all must be named in this form. Shares may not be held in the name of any person under the age of 18 years.

SUBJECT TO ALLOTMENT, A SHARE CERTIFICATE DETAILING A SHAREHOLDER'S HOLDINGS WILL BE SENT TO EACH SHAREHOLDER

SCHEDULE 1

INVESTOR DISCLOSURE STATEMENT TO FREE EYRE LIMITED (ACN 124 308 041) (Company) IMPORTANT NOTICE

This Investor Disclosure Statement is an important document and should be read in its entirety.

When you make an application for Partly Paid Ordinary Shares (“Ordinary Shares”) in the Company (by completing and executing this Application Form and delivering it to the Company), you (the applicant(s)) warrant and represent to the Company that:

1. you have received, read in its entirety and understood the Information Memorandum dated 18 November 2019 (IM);
2. in making your investment you have not relied on any information, representation, assurance or warranty supplied or made by or on behalf of the Company or any other party involved in the offer to issue, or issue of the Ordinary Shares and accordingly agree that neither the Company, or any other party involved in the offer to issue, or issue of the Ordinary Shares or their officers, agents or employees shall have any liability for any such information, representation, assurance or warranty;
3. in making your investment you have relied solely upon your own enquiries, independent advice and investigations as to the risks and prospects of your investment in the Company, including without limitation:
 - 3.1 the return of capital invested in the Company;
 - 3.2 the length of time that you will be required to remain as an investor in the Company;
 - 3.3 the financial viability of the proposed business of the Company and of Peninsula Ports Pty Ltd;
 - 3.4 future profitability of the proposed business of the Company and of Peninsula Ports Pty Ltd;
4. you agree to be bound by the terms of the IM, and the Company’s Constitution (published on www.freeeyre.com.au), as each may be amended, supplemented, replaced or reissued from time to time;
5. you understand that the offer to subscribe for Ordinary Shares is confidential and you will not disclose the existence or any part of the IM or this Application Form to any third party without the Company’s written consent;
6. you are not a minor or a bankrupt;
7. if you are a body corporate, you are a company incorporated duly organised validly existing and in good standing under the laws of the jurisdiction in which you were incorporated;
8. you are not a US citizen or resident of the US for tax purposes and nor are you acting for the account or benefit of a US citizen, or resident of the US, for tax purposes. For this sub-clause, a “US citizen or resident of the US for tax purposes” means: (i) anyone born in the United States who has not renounced their citizenship; or (ii) a United States citizen including persons with dual or multiple citizenships; or (iii) United States lawful permanent residents (e.g. green card holders);
9. monies deposited by you are not associated with crime, terrorism, money laundering or terrorism financing, nor will monies received from your account, or otherwise on your behalf, have any such association;

SCHEDULE 1 (cont)

10. you:

(1) irrevocably subscribe for at least AU\$500,000 for the Ordinary Shares (such subscriptions are deemed to be subscriptions by “sophisticated investor(s)” under section 708 of the Corporations Act);

OR

(2) the amount you irrevocably subscribe for this offer of Ordinary Shares, together with amounts previously subscribed for FEL Ordinary shares, adds up to at least AU\$500,000

OR

(3) if irrevocably subscribing for less than AU\$500,000 for the Ordinary Shares and clause 10.2 does not apply to you:

(A) acknowledge and represent that you are “sophisticated investor(s)” and/or “professional investor(s)” as defined in section 708 of the Corporations Act 2001 (Cth) (Corporations Act) and otherwise qualify as a “wholesale client” for the purposes of Chapter 7 of the Corporations Act; AND

(B) you attach a certificate from a qualified accountant dated within 24 months before the date of this Application Form certifying that you have net assets of at least AU\$2.5 million or gross income of AU\$250,000 per annum for each of the last two financial years;

OR

(4) the offer is made to a company or trust controlled by a person who meets the requirements of 10.3(a) or (b) and in determining the net assets and/or gross income of a person for the purposes of clauses 10(3) (B) and (4), the net assets and/or gross income of a company or trust controlled by the person may be included;

11. unless otherwise disclosed in this Application Form (for example, if investing as trustee of a trust), you are purchasing the Ordinary Shares solely for your own benefit for investment and no other person has or will have a direct or indirect beneficial interest in any Ordinary Shares;

12. If you are a trustee of a trust:

12.1 you have the power under the trust deed and law to:

(a) execute and deliver this Application Form and acquire and hold Ordinary Shares; and

(b) give the warranties and representation and perform your obligations under this Application Form;

12.2 all action required by the trust deed and law to authorise:

(a) the execution and delivery of this Application Form; and

(b) the performance of your obligations under this Application Form, has been taken.

13. you are not acquiring the Ordinary Shares for the purpose of resale and acknowledge that a resale within the first 12 months of issue may require a disclosure document in accordance with section 707(5) of the Corporations Act;

SCHEDULE 1 (cont)

14. you will not sell or transfer any Ordinary Shares including any beneficial interest without complying with the share transfer registration requirements determined by the directors of the Company. You understand, acknowledge and agree that: (i) certifications in respect of each of the matters addressed in this Application Form will be required as a condition to any subsequent sale or transfer; (ii) you will obtain such certifications, modified in such manner as may be acceptable to the Company, within ten days of receiving a written request from the Company; and (iii) you will execute (and/or procure execution) and deliver such documents as the Company may deem reasonably necessary to comply with any and all laws and ordinances to which the Company is or may be subject. You further acknowledge that the Company may decline to register the transfer if the above documents are not given;
 15. you acknowledge that the Company reserves the right to reject any application in whole or in part in its sole direction;
 16. you:
 - (a) have the knowledge, expertise and experience in financial matters to evaluate the risks of investing in the Company and to make an informed decision with respect thereto;
 - (b) are aware of the risks inherent in investing in the Ordinary Shares; and
 - (c) can bear the risk of loss of your entire investment;
 17. the Company is instructed to accept and execute any instructions given by you in writing by facsimile or by email.
 18. you consent to details relating to your application and holdings being disclosed to: (i) the Company's affiliates and intermediaries and other service providers for use in investor servicing duties, including the processing of your application, completing the share register, carrying out of your instructions, dealing of other matters relating to your holding of the Ordinary Shares and maintenance of any marketing database for market and product research and for provision of information on other products or services to you by the Company or its affiliates; and (ii) any statutory, regulatory or governmental bodies enabling compliance with applicable laws and regulations. You further acknowledge that this information and data may be retained by the recipient after you cease to hold any Ordinary Shares;
 19. you irrevocably authorise the Company as your agent to do all things necessary to effect registration in your name of the Ordinary Shares subscribed for and authorise any director of the Company to execute and/or complete any document required for such purpose;
 20. you acknowledge that to the maximum extent permitted by law, the Company does not accept any liability or responsibility for any loss or damage suffered by you in relation to your investment in the Company;
 21. you consent to any notice or other document to be sent to you by the Company by electronic means including but not limited to electronic mail or posting such notice or other document on a website notified to you;
- you have read carefully and understand the contents of this Application Form and the IM and have consulted your legal, accounting, commercial, taxation and/or financial advisers with respect to your investment in the Company and its suitability for you.

FREE EYRE LIMITED
33 Hutt St
Adelaide SA 5000

Broker Reference – Stamp
Only

Broker / Advisor Code

Application Form for Shares – Sophisticated Investors Only

The Applicant (as detailed in the schedule below) hereby applies for the number of ordinary partly paid shares (as specified in the schedule below) in Free Eyre Limited ("FEL"; or the "Company") at an issue price of AUD\$2.00 per share payable as to \$1.00 per share immediately and \$1.00 per share to be called not before 1 March 2020.

A Number of Shares Applied For

I/we ("Applicant") apply for Shares at AUD\$2.00 per share.

B First Instalment Amount Payable for Shares (@ \$1.00 per share)

AUD\$ NOTE: 2nd instalment \$1.00 per share due not before 1/3/20

C Full Name Details of Applicant - Title, Given Name(s) and Surname or Company Name

Name of Joint Applicant 2 or Account Designation eg. <Super Fund A/C>

Name of Joint Applicant 3

D Full Postal Address of Applicant 1

Suburb/City/Town:	State:	Country:	Postcode:
-------------------	--------	----------	-----------

E Shareholder Reference Number (if existing shareholder)

SRN:

F Contact Details

Contact Name:	Mobile:	Email:
---------------	---------	--------

I Payment

1. By electronic funds transfer to the Company's bank account:

Account Name: Free Eyre Limited

Branch Number:

Account Number:

REFERENCE: Please include your shareholder reference number OR your electronic funds transfer (EFT) reference number

2. By cheque drawn in favour of FREE EYRE LTD.

Return of the signed Application Form with receipt of the subscription monies by funds transfer will constitute the Applicant's acceptance of the offer to subscribe for shares in the Company and the making of the warranties and representations contained in the Investor Disclosure Statement. **The Investor Disclosure Statement to FEL is an important document and should be read in its entirety.**

SIGNED

<input type="text"/>	<input type="text"/>	<input type="text"/>
Applicant 1 / Director /Trustee	Applicant 2 /Director/Secretary	Applicant 3

DATE:

Guide to and terms of the Application Form

The instructions set out below will assist Applicants in completing the Application Form correctly.

Please complete all relevant sections of the Application Form using BLOCK LETTERS. These instructions are cross-referenced to each section of the Application Form. Further particulars and the correct forms of registrable titles to use on the Application Form are contained in the table below.

- A Insert the number of Shares you wish to apply for.
- B Insert the relevant amount of subscription monies. To calculate your subscription monies, total the number of shares applied for multiplied by \$1.00 (first call) on the understanding that a 2nd call will be made on or after 1 March 2020.
- C Write the full name you wish to appear on the statement of shareholdings. This must be either your own name or the name of a Company. Up to three joint Applicants may register. You should refer to the table below for the correct forms of registrable title. Applicants using the wrong form of title may be rejected.
- D Please enter the Applicant's postal address for all correspondence. All communications to the Applicant from the Share Registry will be mailed to the Applicant at the Applicant's address as shown. For Joint Applicants, only one address can be entered.
- E If the Applicant(s) are an existing shareholder in FEL, please insert the Shareholder Reference Number (SRN).
- Please enter a telephone number, email address and contact name in case we need to contact you in relation to your Application.
- F Lodgement of Application
Return your completed Application Form to:

By Email: mark@freeeyre.com.au

By post: The CEO
Free Eyre Ltd
33 Hutt St
Adelaide SA 5000

The Applicant:

- declares that all details and statements made by the Applicant on this Application Form are complete and accurate.
- declares that the agreements, statements, declarations and acknowledgements contained in this Application Form are for the benefit of the Company;
- represents and warrants to the Company that the Applicant has full right and authority to sign and lodge this Application Form, to subscribe for the shares, and to perform the other obligations set out in this Application Form, and has taken all action and obtained all regulatory and other consents, approvals and authorisations necessary in that respect;
- acknowledges that it has made its own enquiries regarding the Company and its business affairs and that the Company makes no representations or warranties to the Applicant other than detailed below;
- applies for the number of Shares specified in the Application Form or such lesser number as may be allocated by the Directors; and
- authorises the Directors to complete or amend this Application Form where necessary to correct any errors or omissions.

Application Forms and payment of subscription monies must be received no later than 20 December 2019 (the "Closing Date"), which may be extended at the discretion of the Company. Allotment by the Company will be as soon as practicable after the Closing Date.

IMPORTANT

Certificate by Qualified Accountant

If you are required under clause 10 of the Investor Disclosure Statement (Schedule 1 APPENDIX 2 of the FEL Information Memorandum) to provide a Certificate by a Qualified Accountant (to demonstrate you are a sophisticated investor) please ask your accountant to use the template attached to this Application Form to create the necessary Certificate AND ATTACH the signed Certificate to the Application Form when returning it.

Correct form of Registrable Title

Note that only legal entities are allowed to hold shares and options. Applications must be in the name(s) of a natural person(s), companies or other legal entities. At least one full given name and the surname are required for each natural person. The name of the beneficiary or any other non-registrable title may be included by way of an account designation if completed exactly as described in the example of correct forms of registrable title below:

Type of investor	Correct form of Registrable Title	Incorrect form of Registrable Title
Individual Use names in full, no initials	Mr John Alfred Smith	JA Smith
Minor (a person under the age of 18) Use the name of a responsible adult, do not use the name of a minor.	John Alfred Smith <Peter Smith>	Peter Smith
Company Use Company title, not abbreviations	ABC Pty Ltd	ABC P/L ABC Co
Trusts Use trustee(s) personal name(s), do not use the name of the trust	Mrs Sue Smith <Sue Smith Family A/C>	Sue Smith Family Trust
Deceased Estates Use executor(s) personal name(s), do not use the name of the deceased	Ms Jane Smith <Est John Smith A/C>	Estate of late John Smith
Partnerships Use partners personal names, do not use the name of the partnership	Mr John Smith and Mr Michael Smith <John Smith and Son A/C>	John Smith and Son

Sample certificate that a qualified accountant could issue to certify that a person or entity is a 'sophisticated' or 'wholesale investor' under chapters 6D or 7 of the Corporations Act 2001 respectively. This sample prepared by the Australian Securities & Investments Commission in March 2006.

References: ASIC Class Order [CO 01/1256] and Policy Statement 154

SAMPLE ONLY

Certificate by a qualified accountant

Chapters [6D or 7] of the Corporations Act 2001

Has this certificate been issued under Chapter 6D or 7?

Is the correct chapter inserted for the type of product being offered?

[Name of person or entity]

.....

[Address of person or entity]

.....

.....

.....

I certify that the [person or entity] whose details are set out above:

- has net assets of at least \$2.5million; or
- has a gross income for each of the last 2 financial years of at least \$250,000.

Is this certificate from a 'qualified accountant'?

Has the accountant indicated that: they belong to a professional body; have the approved membership designation; and meets that body's professional education requirements as listed in ASIC Class Order [CO 01/1256]?

I belong to [name of my professional body]

My membership designation from this professional body is

I comply with this body's continuing professional education requirements.

Is certificate current?

Issuer to check if this date is less than 2 years before when the products are being offered

Signature of accountant.....

Date certificate issue

(The following information might be included in the accountant's letterhead instead of here)

[Name of accountant]

[Address of accountant]

ATTACHMENT 7: BARDAVCOL PMP (INCLUDING STANDARD WORK INSTRUCTIONS),



Project Number: T6258

PORT SPENCER GRAIN EXPORT FACILITY

PROJECT MANAGEMENT PLAN

Prepared by	Date:	Reviewed by	Date	Approved by	Date	Revision
Anthony Paradiso	09/04/2020	T O'Connell	24/4/20			A

PROJECT MANAGEMENT PLAN

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PROJECT MANAGEMENT PLAN

PART 1 PROJECT OVERVIEW

I.D	Project	Information
A	Location:	Site is located at; Lipson Cove Road Lipson, 5607 South Australia.
B	General Description:	Undertake civil works for the Port Spencer Grain Export Facility including excavation for the facility, pavement construction for the bunkers, drainage and road upgrades.
	Scope:	Construct Only
	Principal Components:	<ul style="list-style-type: none"> • Drill & Blast Rock • Bulk Earthworks • Crush Pavement Materials • Road Works • Marine Construction • Pavements • Stormwater Drainage
C	Probable Timeline	18 Months
D	Approximate Value	\$ TBC
E	Client	Peninsula Ports
F	Head Contract	FORM – National Capital Works : NCW4 Ed 1.1 REFERENCE – CONTRACT NUMBER – TBC

PROJECT MANAGEMENT PLAN

1.1 Definitions and Acronyms

Definitions:

Hazard: is the potential to cause harm to a person or to the natural environment.

Plant: covers all machinery, equipment and fixed appliances. It does not include road-registered vehicles, household consumer goods (e.g. kitchen refrigerators or microwave ovens), common hand-held tools (drills, sanders, angle grinders, etc.), portable items (mobile phones, hand-held instruments, etc.), and general office furniture and equipment (e.g. desktop computers, printers).

Procedure: documents which broadly describe methodologies to control processes or activities. This includes details of responsible entities, authority levels, action steps and the associated inputs and outputs.

Project: an individual or collaborative enterprise that is carefully planned and managed to achieve a particular aim. For the purposes of Bardavcol operations, the word 'project' and 'site' can be utilised interchangeably, with the term 'project' being the preferred term.

Risk: means a combination of the likely exposure, severity and frequency of harm arising from a hazard.

Risk assessment: is the process of evaluating the likely severity and frequency of harm arising from a hazard.

Risk control: is the process of implementing measures to reduce the risk associated with a hazard. The control process must follow the control hierarchy. It is important that control measures do not introduce new hazards, and that the ongoing effectiveness of the controls is monitored.

Work Instruction: a descriptive procedure of a work activity.

Acronyms:

IMS	Integrated Management System
WHS	Work Health & Safety
PMP	Project Management Plan
PM	Project Manager / Contractors Representative
PE	Project Engineer (QSEMR)
SM	Site Manager
SS	Site Supervisor
SSM	Site Safety Manager
QSE	Quality Safety Environment
P	Policy
IP	Integrated Procedure
JTC	Job Task Card

PROJECT MANAGEMENT PLAN**1.2 Project Specific References**

Title	Author	Date
TBA – IFC Design and Specification		

1.3 Statutory References

An assessment against applicable primary legislation, regulation, standards and codes of practice relevant to this project has been undertaken to determine the statutory requirements.

The relevant legislation, regulation, standards and codes of practice are listed in Appendix A 'Legal and Other Statutory Requirements Register'.

PROJECT MANAGEMENT PLAN

1.4 Site Groups and Contact Details

Promanage			
Name	Position	Phone	Email
Mark Wilson	General Manager – Project Delivery	0411 486 499	m.wilson@promanage.com.au
Dragan Zlatkovic	Engineering Manager	0403 308 306	d.zlatkovic@promanage.com.au
Nazanin Nikoo Jamal	Project Engineer		n.nikoojamal@promanage.com.au

Peninsula Ports / Free Eyre			
Name	Position	Phone	Email
Tomislav Bacic			bacic.tom@gmail.com
Rosanne Curtis			rosanne@freeeyre.com.au

WGA			
Name	Position	Phone	Email
Peter James	Project Director		pjames@wga.com.au
Kevin Westbrook	Senior Project Manager	0448 719 651	KWestbrook@wga.com.au

Bardavcol			
Name	Position	Phone	Email
Tim O'Connell	Pre-Construction Engineer (initial)	0457 421 114	toconnell@bardavcol.com.au
Ben Vreugdenburg	Project Manager		BVreugdenburg@bardavcol.com.au
Simon Thomson	Safety Supervisor (Corporate)	0439 501 773	sthomson@bardavcol.com.au
Site Manager	Cran Turner	0419 818 979	cturner@bardavcol.com.au
Project Engineer	Iain Quick	0408 664 439	IQuick@bardavcol.com.au
Site Engineer	Davor Arar		DArar@bardavcol.com.au
Corporate Support:			
Anthony Paradiso	Construction Manager	0407 513 150	aparadiso@bardavcol.com.au
Henning Klovekorn	General Manager - Risk	0439 280 666	hklovekorn@bardavcol.com.au
Daniel Kranixfeld	Operations Manager	0419 851 965	dkranixfeld@bardavcol.com.au

PROJECT MANAGEMENT PLAN

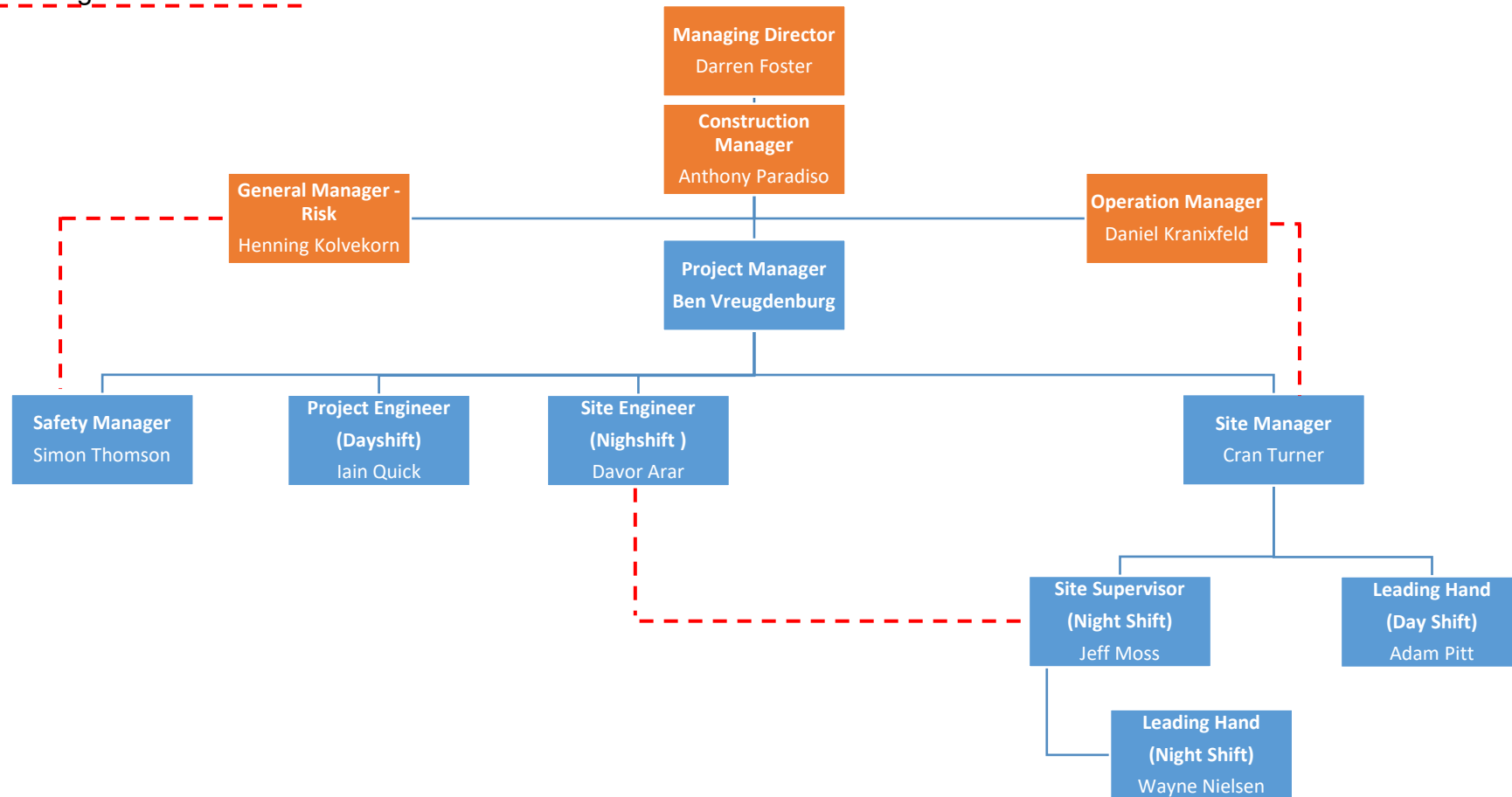
Phil Doyle	Commercial Manager	0417 844 004	Pdoyle@bardavcol.com.au
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Other Contacts:			
Organisation	Description	Phone	Email
SA EPA	General Enquiries / Incident Reporting	8204 2004	epainfo@epa.sa.gov.au
Safework SA	General Enquiries Incident Reporting	1300 365 255 1800 777 209	help.safework@sa.gov.au
Department of Environment, Water and Natural Resources	General Enquiries	8204 1910	Refer to DEWNR website
Office of the Technical Regulator (Electrical, Gas Utility Infrastructure)	General Contact Line	8266 5500	Refer to OTR website
Aboriginal Affairs and Reconciliation (Department of State Development)	General Enquiries	8226 8900	Refer to AAR website
Dial Before You Dig (DBYD)	General Service	1100	Sa-nt@1100.com.au
SA Power Networks	General Enquiries Faults / Emergencies	13 12 61 13 13 66	-
SA Water	Customer Service 24/7 Fault Report Line	1300 650 950 1300 883 121	

PROJECT MANAGEMENT PLAN

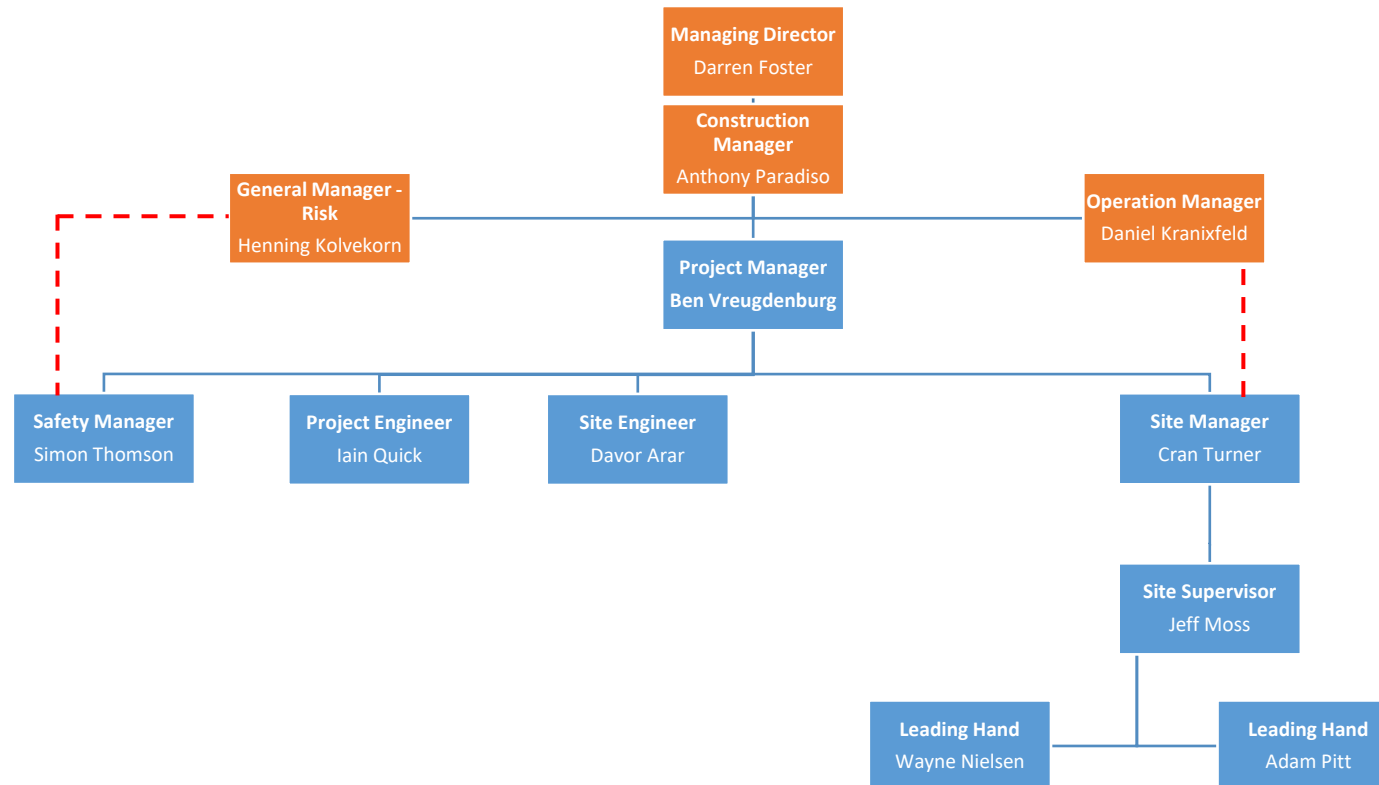
1.5 Site Organisational Chart

1.5.1 Site Organisational Chart – Double Shift



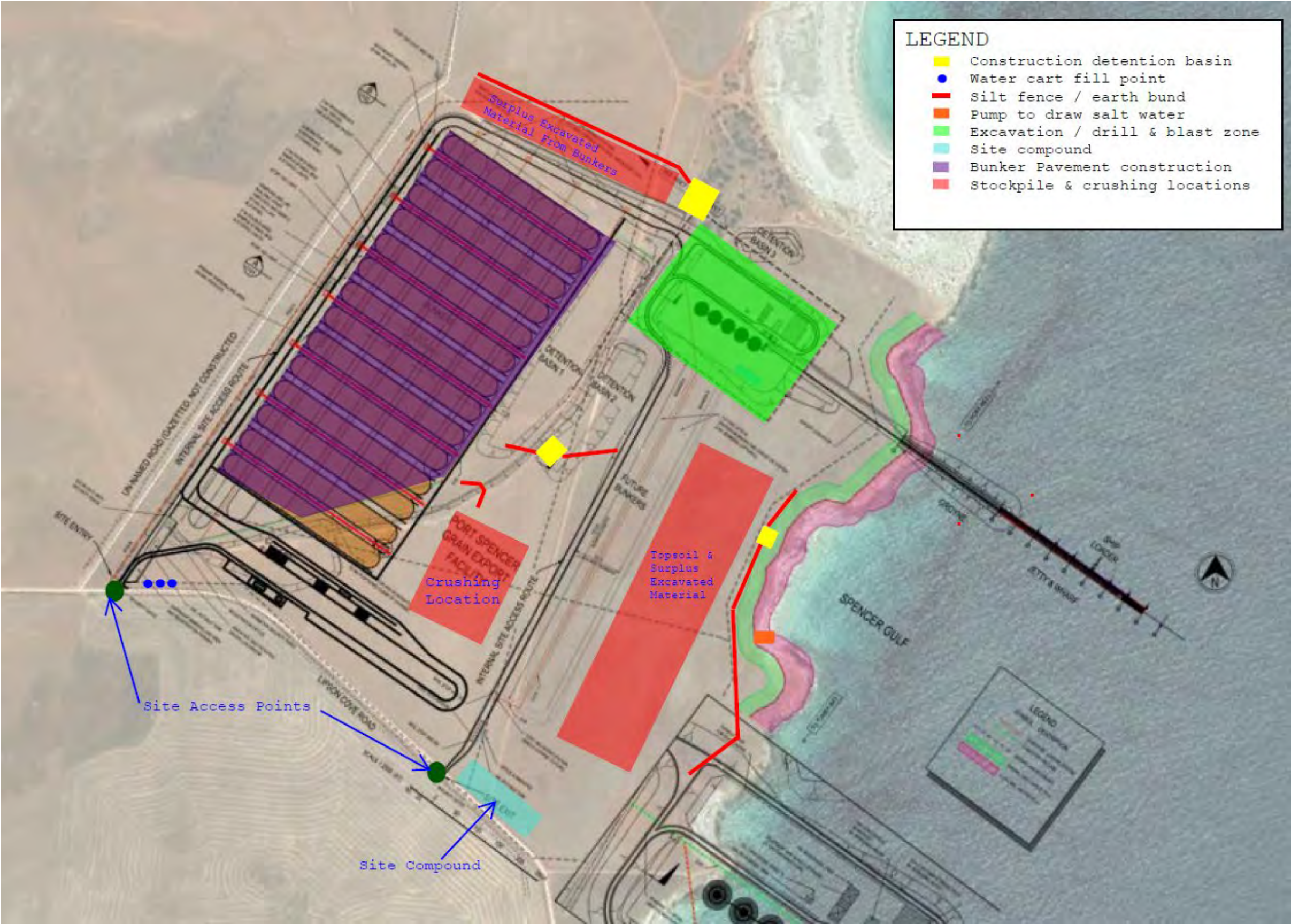
PROJECT MANAGEMENT PLAN

1.5.2 Site Organisational Chart – Single Shift



PROJECT MANAGEMENT PLAN

1.6 Site Layout Plan



PROJECT MANAGEMENT PLAN

1.7 Responsibility Statements

Responsibility statements, including safety and environmental responsibilities, of each relevant position are referenced within Appendix B. Responsibility statements for corporate support staff not listed are available on request.

Table 1.7.1 Responsibility Statements		Relevant to Project
RS	Construction Manager	✓
RS	Operations Manager	✓
RS	General Manager - Risk	✓
RS	Project Manager	✓
RS	Project Engineer	✓
RS	Site Engineer	✓
RS	Safety Manager	✓
RS	Site Manager	✓
RS	Site Supervisor	✓
RS	All Project Personnel	✓

1.8 Working Hours

Bardavcol will typically undertake site works within the hours outlined below. All work outside of these times, must be approved by the Bardavcol Project Manager and are subject to change depending on negotiations with the applicable subcontractors and program commitments.

Nominated working hours (24 hour time)			
Monday – Friday	0700	to	1800
Saturday	0700	to	1800
Main Cut Excavation / Groyne Construction (Night Shift)			
Sunday - Friday	1800	to	0700
Sundays, Public Holidays and Industry RDOs	Not Worked		

*Crushing activities may require extended shifts to meet programming requirements

PROJECT MANAGEMENT PLAN**1.9 Methodology for Key Activities****1.9.1 Blasting**

- Blasting works are to be carried out in accordance with AS 2187 Explosives – Storage Transport and Use
- Vibration Limits will be set within the Blast Management Plan (BMP) and will be guided by limits set out in Appendix J of AS 2187
- Refer to Appendix A for a sample Blast Management Plan used successfully on a previous Bardavcol project
- Blasting is required to generate excavations for the Jetty construction launch site and silos area, This site won rock will subsequently be used to produce several products for re use within the project :-
 - Groyne Materials – varying size to 6t
 - Pavement Source Rock – Varying size up to 600 mm max to enable crushing.
 - If required as general fill materials for bunker construction
- Drilling and Blasting are programmed to be carried out as dayshift operations.

1.9.2 Groyne construction

- Prior to construction a floating silt curtain will be placed around the groyne footprint. It is likely that this will be placed progressively and extended as the works proceeds to the final footprint.
- A combination of end tipper trucks and a dozer is to place and push the mined rock to be used for the Groyne core out into the footprint of the groyne to create a 'finger'
 - Core material is intended to be "Run of Mine" material loaded with a skeleton bucked to reduce fines content.



- Note that rocks are to be placed on the existing sea bed with no preliminary works deemed to be required
- A long reach excavator is to be used to trim the batters of the core to be 1:1.5
- As the groyne encroaches into the water and wave zone, a capping of 6 tonne rock is to be carted and placed using a combination of end tipper trucks and excavators

PROJECT MANAGEMENT PLAN

- As the depth of the groyne exceeds the wave impact zone depth at AHD -4.8m, a toe of 1-2 tonne rock is to be carted and placed using a combination of end tipper trucks and excavators prior to the placement of the 8 tonne rock
- It is proposed that the armour rock gets placed progressively to mitigate the risk of washout of the groyne core during a storm event
- Groyne construction is to be a dayshift operation
- No on ground personnel will be required on the groyne during construction
- A work boat will be in attendance at all times for silt curtain placement and management.

Refer to Appendix F for a diagrammatic representation of the above methodology.

During groyne works, aquatic sediment control in the form of floating silt curtains will be installed to minimise the impact of earthworks on the marine environment. Environmental controls specific to water quality will be managed through a Soil Erosion, Drainage and Water Quality Management Plan.

1.9.3 Crushing

- Crushing of blasted rock is required to produce pavement materials to be used in
 - Construction of bunkers
 - Backfill to Silo foundations
 - Internal roads and marshalling areas
 - Upgrade of Lipson Cove Road
 - Stormwater drainage materials
- Subject to crushing trials it is anticipated an “all in product” will be produced with a 2 stage (jaw crusher + secondary crusher) process. Producing approx. 7000-9000 tonne/week on a dayshift only basis.
- Subject to productivity targets short term night shift crushing may be required
- Due to the requirement to establish the Launch and Silo pads as soon as practically possible, the parent material for the crushing will be excavated from the blast site and stockpiled to the south of the site.
- Crushing and stockpiling will occur here (see attached Preliminary Layout Plan – Appendix B2), with crushed material incorporated into the works, being transported by off road trucks.

1.9.4 Earthworks and pavement construction

- Approximately 200,000m³ of cut/fill works are required for the bunkers, marshalling area internal roads and silo/shed pad
- All earthworks materials will be won from within the site, with the majority of the fill being generated from rock overburden and cut zones within the western bunkers.
- Off road dump trucks (ADT's) are anticipated to be the haulage units. Compaction will be carried out using standard compaction equipment (compactors and 12-15T vibrating rollers.)
- Following subgrade preparation and moisture conditioning, crushed rock will be spread to form the pavements. The pavement material will be hauled from the crushed material stockpile, condition and compacted. Compaction will be carried out using standard compaction equipment (12-15T vibrating rollers.)
- Both cut to fill (earthworks) and pavement works are anticipated to be dayshift operations

1.9.5 Bunker Walls

- Bunker walls are likely to be extruded concrete barriers (slip formed) with pre mixed concrete being hauled from Tumbay Bay and extruded or traditional steel “A Frames”
- Bunker Wall construction will be a dayshift operation

PROJECT MANAGEMENT PLAN



1.9.6 Asphalt Works

- Portions of the bunkers , internal roads will require placement of thin layers of asphalt to reduce in service dust scouring of pavement materials
- 30-40mm of AC7 Asphalt is anticipated to be incorporated into the works
- Asphalt will be sourced from Port Lincoln to negate the need for an onsite Asphalt Plant and the placement will be carried out during daylight hours

Construction Water

- Construction water is required for all of the above activities. Fresh potable water is not mandatory (technically) except for the production of concrete and pavements.
- Subject to designer approval salt water may be used to construct, earthworks and dust suppression. Salt water will be sourced by placing a pump adjacent the coast with a short intake pipe moored to the seafloor. This is anticipated to be a 30 lm length of 100 mm diameter poly pipe.
- Potable water will be brought to the site by extending the existing SA Water main along Lipson Cove Road (temporarily) for approx. 2 km and storing in a quickfill tank.

PROJECT MANAGEMENT PLAN

PART 2 MANAGEMENT SYSTEM

2.1 Management System Overview

The Bardavcol Integrated Management System (IMS) has been developed to meet and exceed the Australian regulatory framework and international management systems standards:

AS/NZS 4801:2001 - Occupational Health and Safety Management Systems

ISO 9001:2015 - Quality Management Systems

ISO 14001:2015 - Environmental Management Systems

OHSAS 18001:2007 - Occupational Health & Safety Management Systems

The corporate system is structured into four primary tiers:

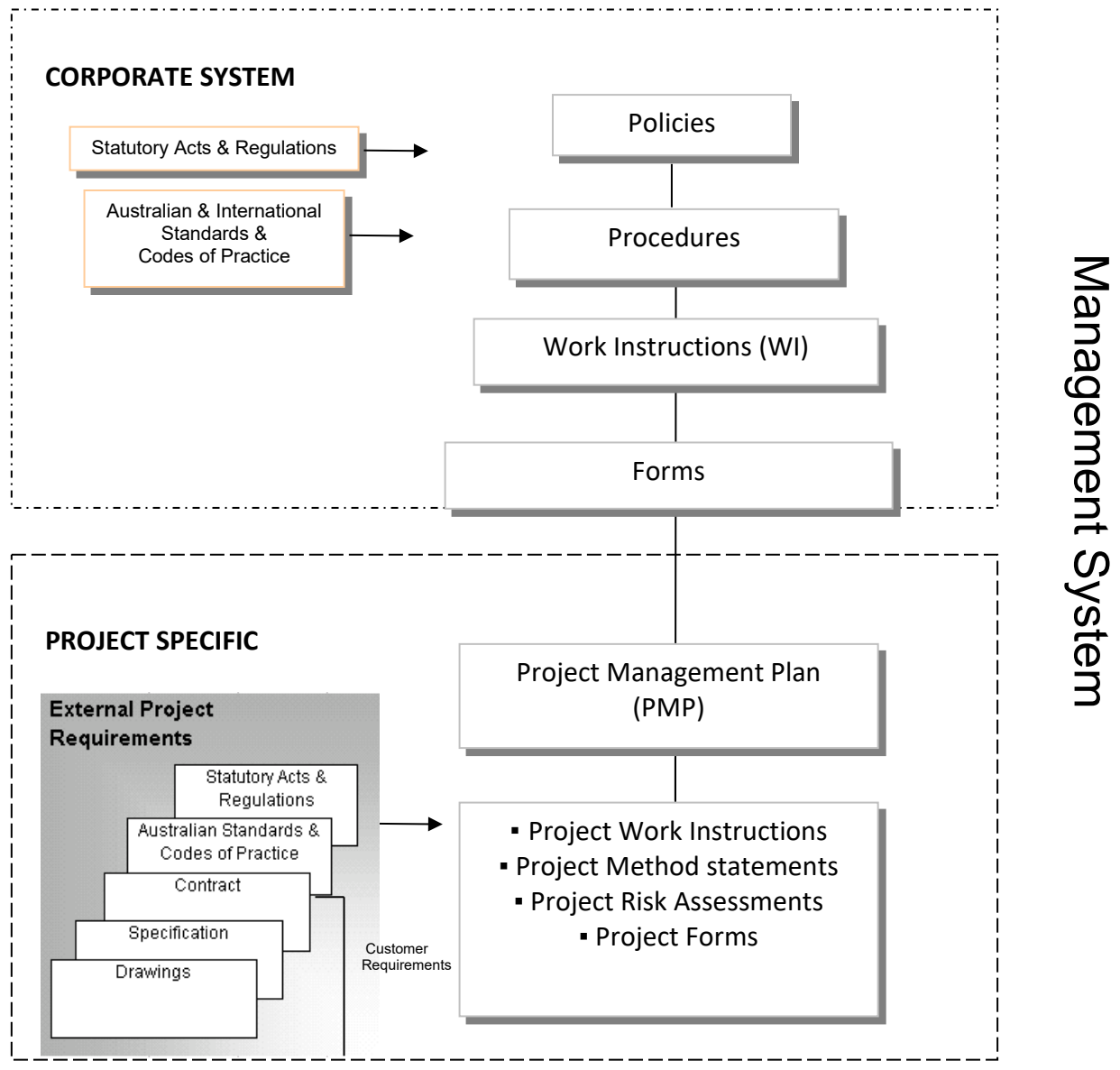
Policies	provide the guiding vision and commitment which transcend all levels of the management system
Procedures	provide broad information about how to perform activities and processes
Work Instruction	provide detail information about how to perform activities and processes
Forms	are utilized as a means to implement and record activities consistently.

Project specific documents, such as project management plans, project work instructions and project assessments are documents for specific projects outside of the direct scope of the corporate system.

For a complete overview of our management system, please refer to IP 00 Management Systems Overview.



PROJECT MANAGEMENT PLAN



2.2 Document Control and Distribution

The corporate management system is administered by the GMR. Corporate documents referenced in the Project Management Plan are available from the GMR on request. A document register is maintained by the GMR.

Revisions to the project management plan shall be made in accordance with system procedure *IP 11 'Document and Record Control Procedure'*. It shall be the responsibility of the project manager to ensure that revisions are made and controlled as per the above procedure and that all parties have received copies.

Revisions are distributed to all holders of controlled copies. It is the responsibility of the person receiving the revision to update the management plan assigned to them and to destroy obsolete copies of all amended pages.

PROJECT MANAGEMENT PLAN

A DCMP distribution register is maintained by the GMR or delegate in accordance with IP 11.

2.3 Corporate Management System: Principal QSE Procedures

The Bardavcol Integrated Management System (IMS) is being developed into a fully integrated system to meet and exceed the International Standards for Quality, Safety and Environmental Management. This integrated approach results in a user friendly, streamlined and efficient system which adds value throughout all levels of the business.

Ref.	Document	Correspondence to International Standard			
		AS/NZS 4801	ISO 9001	ISO 14001	OHSAS 18001
CP01 +	Corporate Policies	4.2	5.3	4.2	4.2
IP 01	Management Planning	4.3, 4.6	5.4, 5.5, 5.6	4.3, 4.6	4.3, 4.6
IP 02	Customer Requirements	4.3.1	5.2, 7.2	4.3.1, 4.3.2	4.3.1, 4.3.2
IP 03	Legal Requirements and Other Requirements	4.3.2	7.2.1, 7.3.2	4.3.1, 4.3.2	4.3.1, 4.3.2
IP 04	Procurement of Contracts	4.3.1, 4.3.2, 4.4.6	7.1, 7.2.1, 7.2.2, 7.3	4.3.2, 4.5.1	4.3.2, 4.5.1
IP 05	Product Quality Control and Traceability	4.5.1	7.6, 8.1-8.4	4.3.2, 4.5.1	4.3.2, 4.5.1
IP 06	Performance Management: Objectives & Targets	4.3.3	5.4.1	4.3.3	4.3.3
IP 07	Design Management	7.3, 4.5.4	7.3, 8.2.2	4.5.5	4.5.5
IP 08	Organisation, Resourcing and Responsibility	4.4.1	5.5.1, 5.5.2, 6.1-6.4	4.4.1	4.4.1
IP 09	Training and Competency	4.4.2	6.2.2	4.4.2	4.4.2
IP 10	Consultation, Communication and Reporting	4.4.3	5.5, 7.2.3	4.4.3	4.4.3
IP 11	Document Control and Records	4.4.4, 4.4.5, 4.5.3	4.2.3, 4.2.4	4.4.4, 4.4.5, 4.5.3	4.4.4, 4.4.5, 4.5.3.2
IP 12	Risk Management	4.4.6, 4.5.4	8.2.2	4.3.1, 4.5.5	4.3.1, 4.5.5
IP 13	Emergency Preparedness and Response	4.4.7	5.4, 8.3	4.4.7	4.4.7
IP 14	Monitoring, Measurement and Analysis	4.5.1	7.6, 8.1-8.4	4.5.1	4.5.1
IP 15	Incident Investigation, Corrective Action & Reporting	4.5.2	8.3, 8.5	4.5.2, 4.5.3	4.5.3.1, 4.5.3.2
IP 16	Management Systems Auditing	4.5.4	8.2.2	4.5.5	4.5.5
IP 17	Workers Compensation and Rehabilitation	4.3.2, 4.4.1.2, 4.5.4	8.2.2	4.3.2, 4.5.5	4.3.2, 4.5.5
IP 18	Contractor Management	4.3, 4.4, 4.5.4	6.2.2, 8.2.2	4.4.2, 4.4.6, 4.5.5	4.4.2, 4.4.6, 4.5.5

PROJECT MANAGEMENT PLAN

2.4 Project Auditing and Inspections

The following workplace inspection and IMS auditing schedule has been developed in conformity to the Bardavcol management system and the contractual requirements under the project. This section of the PMP covers quality, safety and environmental management auditing and workplace inspections.

Ref	Type		Reference	Scope	Frequency	Record	Responsible	
1	Corporate	Quality Audit	IP 16 Management Systems Auditing	Management system audit to the criteria of the integrated management manual.	As per Corporate QSE Plan	FO 122	GMR	
2		Safety Audit						
3		Environmental Audit						
4	Site	Quality Inspections		As per Inspection Test plans.				PE
5		Safety Inspection		Inspection of site environment including employee, public and subcontractor safety. Specific OHS focus and critical risk areas.	Fortnightly	FO 001	SSM, SM, PM	
6		Environmental Inspection						Inspection of project environment with focus on biodiversity and environmental impacts, sediment control, erosion, etc
7	Statutory / Contractual	Quality Audit /Inspection	As per contract			As directed.	Varied	Varied
		Environmental Audit / Inspection	As per requirements from EPA/SafeWorkSA			As directed.	Varied	Varied
8		Third Party Audit	Certification	The site may be subject to third party audits.		As directed.	Varied	Varied
9	Other	Third Party Audit	OFSC Scheme	The project may be subject to third party audits by the Office of the Federal Safety Commissioner.		Quarterly	OFSC	OFSC

PROJECT MANAGEMENT PLAN

PART 3 CONSTRUCTION QUALITY

3.1 Quality Management

Work quality will be controlled via inspection and test plans, hold / witness points and product traceability systems as described in the Corporate Integrated Procedure 'IP 05 Product Quality Control and Traceability'.

A register of mandatory hold and witness points will be developed and maintained by the Plant Manager. A quality control register will be developed and maintained by the Plant Manager and the works shall be divided into differing lots packages, as determined by the Plant Manager as per the scope of the works being conducted. These documents are available from the Plant Manager on request.

Quality work method statements will be prepared to manage quality of works according to the needs of the works being conducted. A list of the identified Project Specific Work Method Statements are listed in Table 3.1.

The issue status of each document shall be maintained on the Corporate Document Control Register. The following quality work method statements and work instructions will be prepared to manage construction quality.

The issue status of each document shall be maintained on the Corporate Document Control Register.

Table 3.1: Project Specific Work Method Statements

Work Method Statements	
T6258 WMS 01	Earthworks
T6258 WMS 02	Crushing
T6258 WMS 03	Pavement Construction
T6258 WMS 04	Groyne Construction
T6258 WMS 05	Drainage Construction
T6258 WMS 06	Asphalt Works

3.1 Quality Inspection and Test Plans

After a review of the quality aspects of the works, Inspection and Test Plans will be developed for the following construction activities:

Table 3.2: Project Specific Inspection and Test Plans

Inspection and Test Plans	
T6258 ITP 01	Earthworks
T6258 ITP 02	Crushing

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T6258 ITP 03	Pavement Construction
T6258 ITP 04	Groyne Construction
T6258 ITP 05	Drainage Construction
T6258 ITP 06	Asphalt Works

Inspection Test Plans are developed and maintained by the Project Engineer.

The Work Method Statements and Inspection Test Plans will be developed progressively prior to each relevant activity commencing.

3.2 Quality Management Registers

To ensure the correct documents are used through the duration of the project, the following Registers will be maintained:

Table 3.3: Quality Management Registers

Quality Management Registers
Project Document Control Register
Project Drawings Register
Lot Control Register, which include lot register, hold point register, etc

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PART 4 WORK HEALTH & SAFETY

4.1 Project Specific Risk Assessment and Control

A Work, Health and Safety Risk Management Assessment (FO 36 Integrated Risk Register) is maintained for the project and is included in Appendix C. Following an assessment of work health and safety risks, specific control methodologies have been prepared and are listed below:

Table 4.1: Applicable Corporate (Safe) Work Instructions

Safety Work Instructions	Project relevant	Safety Work Instructions	Project relevant
WI 00 Conducting a SWMS	✓	WI 01 Conducting a Job Hazard Analyses	✓
WI 02 Plant Safety - General	✓	WI 03 Plant - Skid Steer	✓
WI 04 Plant - Rubber Tyre Loader (FEL)	✓	WI 05 Plant - Front End Loader - Track	✗
WI 06 Plant - Dozer	✓	WI 07 Plant - Excavator	✓
WI 08 Plant - Quickhitch Operation	✓	WI 09 Plant - Compactor	✓
WI 10 Plant - Roller (Vibration)	✓	WI 11 Plant - Pneumatic Roller	✓
WI 12 Plant - Back Hoe	✗	WI 13 Plant - Grader	✓
WI 14 Plant - Road Trucks	✓	WI 15 Plant - Low Loader & Plant Trailer	✓
WI 16 Plant - Scraper	✓	WI 17 Plant - Forklift Operations	✗
WI 18 Plant - Off Road Articulated Trucks	✓	WI 19 Small Plant & Tool Safety - General	✓
WI 20 Tools - Electrical Power	✓	WI 21 Tools - RCDs	✓
WI 22 Tools - Small Portable Generators	✓	WI 23 Tools - Small Compaction Device Use	✓
WI 24 Tools - Quick Cut Saws	✓	WI 25 Tools - Angle Grinders	✓
WI 26 Tools - Oxy-Acetylene Operation	✓	WI 27 Tools - Chainsaws	✗
WI 28 Tools - Ladders	✓	WI 29 Operations of WHS Committee	✓
WI 30 Emergency Response	✓	WI 31 Hazardous Manual Task	✓
WI 32 Alcohol & Drugs	✓	WI 33 Personal Protective Equipment	✓
WI 34 Working Around Services	✓	WI 35 Site Security	✓
WI 36 Inclement Weather	✓	WI 37 Heat Stress	✓
WI 38 Communicable Diseases	✓	WI 39 Working in Traffic	✓
WI 40 Workplace Safety Inspections	✓	WI 41 Labour Hire Employees	✓
WI 42 Working at Heights	✓	WI 43 Storage & Handling of Haz.Chemicals	✓
WI 44 Mobile Phones & Pot. Exp. Atmosp.	✗	WI 45 Confined Space Procedure	✗
WI 46 Excavation and Trenching Work	✓	WI 47 Remote and Isolated Work	✓
WI 48 Welding	✓	WI 49 Use of Danger Tag	✓
WI 50 Incident Investigation	✓	WI 51 Asbestos Management	✗
WI 52 Health Monitoring	✓	WI 53 Hazardous Chemicals	✓
WI 61 Noise Emission Control	✓	WI 62 Atmospheric Emission	✓
WI 63 Vibration	✓	WI 64 Fire Control	✓
WI 65 Flora and Fauna Management	✓	WI 66 Erosion, Sediment and Runoff Control	✓
WI 67 Water Quality Measure Turbidity	✓	WI 68 Aboriginal & Cultural Heritage Protection	✓
WI 69 Infectious Plant and Disease Control	✓	WI 70 Site Access and Egress	✓

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WI 71 Operating within Rural Communities	✓	WI 72 Soil and Water Contamination Control	✓
WI 73 Solid and Liquid Waste Management	✓	WI 74 Storage & Handling of Hazardous Substances	✓
WI 75 Community Relations	✓	WI 76 Workplace Grievance Procedure	✓
WI 77 Loading and Unloading of Plant	✓	WI 78 Audit and Inspection Procedure	✓
WI 81 SWMS Procedure	✓	WI 82 Motor Vehicle	✓
WI 84 Lifting	✓	WI 85 Covid -19	✓

4.2 Safe Work Method Statements (SWMS)

SWMS will be prepared for high risk construction work and other activities/tasks identified in the risk register, or as required by Bardavcol's IMS. The SWMS must provide sufficient information for the workers performing the tasks to understand the work method, associated hazards and required controls. The SWMS to be implemented for this project are listed in Table 4.2.

Table 4.2: Project Specific SWMS

Safe Work Method Statements		Issue
SWMS 01	Site Establishment	0
SWMS 02	Clear & Grub	0
SWMS 03	Earthworks	0
SWMS 04	Drill & Blast	0
SWMS 05	Crushing	0
SWMS 06	Pavement Construction	0
SWMS 07	Working Near Water	0

A SWMS will be implemented for any high risk works not considered in the table above prior to the high risk work commencing.

Where there is other non-high risk work occurring that is not covered in the SWMS, a Job Task Card shall be completed prior to conducting the work identified.

Other hazards may be identified throughout the project. The SSM will conduct a quarterly review of Site Specific Hazards and will ensure a documented record of assessment and control methodologies is maintained.

All risks identified shall be recorded on the Integrated Risk Register.

The Safety Work Instructions, JTC's and Sub-Plans are attached to Appendix B.

4.3 Project Safety Management

Project WHS Targets

Table 4.3 lists the measurable WHS targets that have been identified for the project and shall be monitored and reviewed at regular intervals.

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Table 4.3: WH&S Measureable Targets

Item	Measurable Target
1	Zero Lost Time and Medical Treatment Injuries
2	Zero 'notifiable incidents' (SafeWorkSA).
3	100 % of workers on-site to be inducted.
4	Achieve 90% or above for internal WHS audit

Inductions

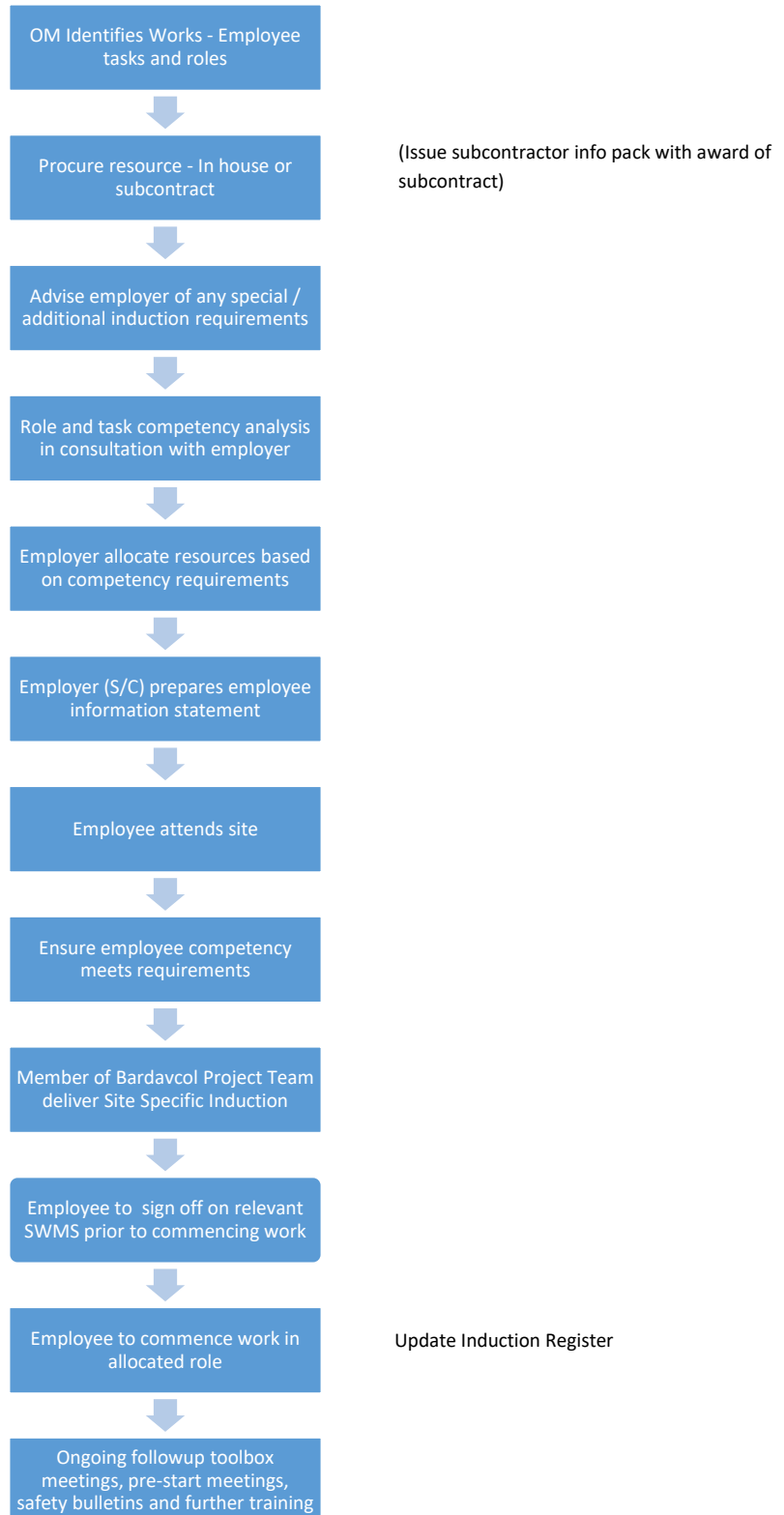
All persons who undertake work on the Bardavcol site shall, prior to first commencing work, complete a site specific induction conducted by Bardavcol. A copy of the Induction is included in Appendix D.

Bardavcol site inductions may be conducted by any of the Bardavcol project team. Persons inducted must sign the relevant induction register (Site or Visitor) and receive the induction information upon completing the induction.

The Bardavcol site induction will include the following subjects in accordance with *IP 09 Training and Competency*:-

- General site access requirements
- Safety rules and requirements
- Environmental rules and requirements
- Security issues
- Fatigue management program awareness
- Drug and alcohol program awareness
- Emergency response and contacts
- Dealing with the public and media inquiries about the project

Visitors who will be onsite less than 8hrs will undergo a visitor induction and be escorted by a member of the Bardavcol project team at all times whilst on site.

PROJECT MANAGEMENT PLAN**Induction Process**

PROJECT MANAGEMENT PLAN**Daily Pre-Start Meetings**

Daily pre-start briefings will be held prior to the start of each shift to communicate and consult with workers on the day's activities, coordination and interface issues and key hazards and controls. Records of pre-start meetings will be retained on file. All workers are required to sign on to the daily pre-start before entering their designated work zone, even if they arrive at site after the shift has commenced

Additionally, toolbox meetings shall occur:

- Upon commencement of a new activity on site
- At other times deemed necessary by the Project Manager or Site Manager
- A minimum of once every fortnight

Pre-Start meetings shall be minuted and copies stored in the digital project folder.

The Agenda shall include (but not limited to): Program, hazards, coordination, incident review, consultation, bulletins and current topics of interest.

Performance Reporting

In accordance with the Bardavcol Corporate Procedures IP06 Performance Management: Objectives and Targets and IP17 Management Review, the project will maintain records and provide reports on:

- (a) Number of lost time injuries
- (b) Working days lost due to injury
- (c) Current status of any injured personnel and damaged property
- (d) Implementation and outcome status of raised corrective actions and non-conformances.
- (e) All site audits.

These shall be recorded in the 'Monthly Report' tab of the Master Incident Register (M Drive).

4.4 Site Emergency Response Plan**Emergency Situations Management**

IP 13: Emergency Preparedness and Response shall be followed. This includes the establishment of an Emergency Control Organisation.

All potential emergency situations shall be identified, detailed, risk assessed, recorded and maintained in the Internal Risk Register (FO 36 – Appendix C).

A Trigger, Action, Response Plan (TARP - FO 101 – Appendix G) is to be developed and maintained by the Safety Supervisor in conjunction with the Project Manager and Site Manager. The TARP must be reviewed quarterly and after any notifiable incident. TARP's must be located at all suitable points at a project.

Emergency evacuation points shall be determined in accordance with FO 36, be signposted, referenced in the induction and indicated on emergency response maps.

Emergency drills shall be undertaken at least half yearly as determined by the Project Manager.

PROJECT MANAGEMENT PLAN

4.5 Emergency Equipment

The following table identifies the key emergency equipment required and responsibility for inspection and maintenance:

Table 4.4: Emergency Equipment

Type	Register location	Responsibility for testing	Responsibility for inspecting	Location
Fire Extinguishers	Bardavcol Site Office	Workshop Operations Supervisor	Workshop Operations Supervisor	Site buildings and Bardavcol site vehicles and plant
First Aid Kits	Bardavcol Site Office	Workshop Operations Supervisor	Workshop Operations Supervisor	First Aid room and Bardavcol site vehicles
Defibrillators	Bardavcol Site Office	Workshop Operations Supervisor	Workshop Operations Supervisor	First Aid room / location

4.6 Emergency Contact List

See Appendix E: FO 47 Emergency Response Poster

An emergency contact list shall be maintained by the Safety Manager and include details of:

- Emergency Control Organisation
- Medical center location
- First Aid and Fire Fighting equipment location
- Communication Plan
- Nearest Medical Center

PROJECT MANAGEMENT PLAN

PART 5 ENVIRONMENT

5.1 Project Specific Risk Assessment and Control

An Environmental Risk Management Assessment (FO 36 Integrated Risk Register) is maintained for the project and is included in Appendix C.

Following an assessment of environmental issues and risks, appropriate corporate work instructions have been selected for the project. Project Specific Environmental Instructions have also been prepared as part of specific risk areas as per the contractual requirements.

Applicable Corporate Work Instructions

Environmental Work Instructions	Relevant to Project
WI 61 Noise Emission Control	✓
WI 62 Atmospheric Emission	✓
WI 63 Vibration	✓
WI 64 Fire Control	✓
WI 65 Flora & Fauna Management	✓
WI 66 Erosion, Sediment & Runoff Control	✓
WI 67 Water Quality Measurement: Turbidity	✓
WI 68 Aboriginal & Cultural Heritage Protection	✓
WI 69 Infectious Disease & Weed Infestation Management	✓
WI 70 Site Access and Egress	✓
WI 71 Operating within Rural Communities	✓
WI 72 Soil & Groundwater Contamination Control	✗
WI 73 Solid and Liquid Waste Management	✓
WI 74 Storage and handling of hazardous substances	✓
WI 75 Community Relations	✓
WI 80 Dredging and Earthworks Management Plan	✓

5.2 Project Specific Environmental Management

Environmental Induction

All relevant employees and subcontractors engaged in the project will be taken through an appropriate environmental induction process. Employees and subcontractors engaged in physical site works must be trained in relevant environmental instructions and sub-plans. A record of this training shall be maintained by the Project Engineer. A copy of the Induction is included in Section 7.0.

PROJECT MANAGEMENT PLAN

Contractor Activity Zones

Activity zones shall be identified with the client prior to the commencement of works. No removal, disturbance or damage of vegetation is intended outside of the activity zones.

Fauna Protection

All environmental incidents will be reported using FO 005 Incident Report Form. Incidents resulting in significant environmental damage or impact will be investigated with appropriate corrective action measures put in place to remedy systemic shortcomings.

Significant environmental incidents, and any injury to or death to native wildlife, caused through or because of any construction activity, will be reported to the Superintendent.

Waste Management

Bardavcol aims to re-use and recycle as much waste as possible to reduce the quantity that is disposed to landfill.

The table below indicates the different waste types that are generated across the project and the preferred waste management outcome. An appropriate number and types of bins are provided in the office, workshop and yard with the aim to maximise recycling where practicable. Bins will be clearly marked and monitored for cross-contamination of wastes.

Materials will be salvaged and re-used where appropriate and safe to do so.

Hazardous waste will be transported and disposed of by EPA licensed companies and copies of Transport Certificates will be obtained to confirm the correct management of the waste. Any specific statutory requirements relating to the handling, transport and disposal of hazardous waste will be complied with.

Waste re-use, recycling and disposal performance can be tracked and monitored using the Waste Tracking Register at the discretion of the Project Manager.

Anticipated waste and management options are summarised in the table below.

Waste Type	Waste Generating Activities	Applicable Contractors	Waste Management Outcome			
			Re-use	Recycle	Recover	Disposal
Cardboard	Deliveries, packaging	Veolia		Bulk Bin		
Paper	Printing, packaging	Veolia		Bulk Bin		
Copier / Printer Toner	Site office	Planet Ark / Canon				
Oils, grease, oil filters and other hydrocarbons	Service & maintenance of plant	Envirogen				
Pallets	Deliveries, packaging	PalletCo				
Batteries	Plant / vehicle maintenance	Paramount Browns				

PROJECT MANAGEMENT PLAN

General waste	Site activites	Veolia (large bin)				
Excavated material	Excavation	Nil				

APPENDIX A

Legal and Other Statutory Requirements

PROJECT MANAGEMENT PLAN

Category	Aspect/Hazard/Issue	Legislation and Other Requirements	Jurisdiction	Type
Commercial	Infrastructure Project	Highway Act 1926	SA	Legislation
Environment	Air Quality	Environment Protection (Air Quality) Policy 2016	SA	Policy
Environment	Flora	Native Vegetation Act, 1991	SA	Legislation
Environment	Flora	Native Vegetation Regulations 2017	SA	Legislation
Environment	Flora/Fauna	National Parks and Wildlife Act, 1972	SA	Legislation
Environment	Flora/Fauna/Water	Natural Resources Management Act 2004	SA	Legislation
Environment	Flora/Fauna/Water	Wilderness Protection Act 1992	SA	Legislation
Environment	Flora/Fauna/Water	Wilderness Protection Regulations 2006	SA	Legislation
Environment	General	Environment Protection Act, 1993	SA	Legislation
Environment	General	Environment Protection and Biodiversity Conservation Act 1999	Commonwealth	Legislation
Environment	General	Environment Protection and Biodiversity Conservation Regulations 2000	Commonwealth	Legislation
Environment	General	Environment Protection Regulations 2009	SA	Legislation
Environment	General	Local Nuisance and Litter Control Act 2016	SA	Legislation
Environment	General	National Environment Protection Council (SA) Act 1995	SA	Legislation
Environment	Heritage	Aboriginal and Torres Strait Islander Heritage Protection Act 1984	Commonwealth	Legislation
Environment	Heritage	Aboriginal Heritage Act, 1998	SA	Legislation
Environment	Heritage	Heritage Places Act, 1993	SA	Legislation
Environment	Marine	Coast Protection Act 1972	SA	Legislation
Environment	Noise	Environment Protection (Noise) Policy, 2007	SA	Legislation
Environment	Noise	Guidelines for the use of the Environment Protection (Noise) Policy, 2007	SA	Legislation
Environment	Waste	Environment Protection (Movement of Controlled Waste) Policy 2014	SA	Legislation
Environment	Waste	Environment Protection (Waste to Resources) Policy, 2010	SA	Legislation
Environment	Waste	Guideline on Waste Containing Asbestos: Removal, Transport and Disposal (EPA414/09)	SA	Guide
Environment	Waste	Guideline on Waste Transport Certificate (EPA415/10)	SA	Guide
Environment	Waste	National Environment Protection (Movement of Controlled Waste between States and Territories) Measure	SA	Legislation
Environment	Water	Environment Protection (Water Quality) Policy, 2015	SA	Policy
Environment	Water	Guideline on Bunding and Spill Prevention (EPA 080/12)	SA	Guide
Environment	Water	Stormwater Pollution Prevention Code of Practice for the Building and Construction Industry	SA	Code

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Category	Aspect/Hazard/Issue	Legislation and Other Requirements	Jurisdiction	Type
Environment	Water	Water Resources Act 1997	SA	Legislation
IR	Discrimination	Age Discrimination Act 2004	Commonwealth	Legislation
IR	Discrimination	Australian Human Rights Commission Act 1986	Commonwealth	Legislation
IR	Discrimination	Disability Discrimination Act 1992	Commonwealth	Legislation
IR	Discrimination	Equal Opportunity Act (SA) 1984	SA	Legislation
IR	Discrimination	Racial Discrimination Act 1975	Commonwealth	Legislation
IR	Discrimination	Racial Vilification Act (SA) 1996	SA	Legislation
IR	Discrimination	Sex Discrimination Act 1984	Commonwealth	Legislation
IR	Discrimination	Workplace Gender Equality Act 2012	Commonwealth	Legislation
Safety	Asbestos	How to Manage and Control Asbestos in the Workplace	SA	Code
Safety	Asbestos	How to Safely Remove Asbestos	SA	Code
Safety	Communication and Consultation	Work Health and Safety Consultation, Cooperation and Coordination	SA	Code
Safety	Confined Spaces	Confined Spaces	SA	Code
Safety	Demolition	Demolition Work	SA	Code
Safety	Design	Safe Design of Structures	Commonwealth	Code
Safety	Electrical	Managing Electrical Risks in the Workplace	SA	Code
Safety	Emergency and Incident Response	First Aid in the Workplace	SA	Code
Safety	Excavation	Excavation Work	SA	Code
Safety	Falls/Working at Heights	Managing the Risks of Falls in the Workplace	SA	Code
Safety	Fire	Fire and Emergency Services Act (SA) 2005	SA	Legislation
Safety	Fire	Fire and Emergency Services Regulations (SA) 2005	SA	Legislation
Safety	General	Construction Work	Commonwealth	Code
Safety	General	How to Manage Health and Safety Risks	SA	Code
Safety	General	Managing the Work Environment and Facilities	SA	Code

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Category	Aspect/Hazard/Issue	Legislation and Other Requirements	Jurisdiction	Type
Safety	General	Work Health and Safety Act 2012	SA	Legislation
Safety	General	Work Health and Safety Regulations 2012	SA	Legislation
Safety	Hazardous Chemicals	Australian Code for the Transportation of Dangerous Goods by Road and Rail (ADG Code)	Commonwealth	Code
Safety	Hazardous Chemicals	Dangerous Substances (Dangerous Goods Transport) Regulations 2008	SA	Legislation
Safety	Hazardous Chemicals	Dangerous Substances (General) Regulations 2009	SA	Legislation
Safety	Hazardous Chemicals	Dangerous Substances Act 1979	SA	Legislation
Safety	Hazardous Chemicals	Labelling of Workplace Hazardous Chemicals	SA	Code
Safety	Hazardous Chemicals	Managing the Risks of Hazardous Chemicals in the Workplace	SA	Code
Safety	Hot Works	Welding Processes	SA	Code
Safety	Manual Handling	Hazardous Manual Tasks	SA	Code
Safety	Noise	Managing Noise and Preventing Hearing Loss at Work	SA	Code
Safety	Plant/Equipment	Managing the Risks of Plant in the Workplace	Commonwealth	Code
Safety	Plant/Equipment	Verification of Competency - Mobile Plant	OFSC	Fact Sheet
Safety	Rail	Rail Safety National Law (SA) (Drug and Alcohol Testing) Regulations 2012	SA	Legislation
Safety	Rail	Rail Safety National Law (SA) (Transitional Arrangements) Regulations 2012	SA	Legislation
Safety	Rail	Rail Safety National Law (SA) Act 2012	SA	Legislation
Safety	Rail	Rail Safety National Law National Regulations 2012	Commonwealth	Legislation
Safety	Return to Work	Return to Work Act 2014	SA	Legislation
Safety	Return to Work	Return to Work Regulations 2015	SA	Legislation
Safety	SWMS	Safe Work Method Statements and the Scheme	OFSC	Fact Sheet
Safety	Transport	Heavy Vehicle National Law (SA) Act 2013	SA	Legislation

APPENDIX B

Project Roles and Responsibilities

PROJECT MANAGEMENT PLAN

Project Manager

- Responsible and accountable for the overall project performance
- Development, implementation and ongoing review and maintenance of the Project Management Plan (PMP), Risk Register and related project plans
- Commit to and lead a positive safety culture and challenges all 'at-risk behaviour'
- Implement and manage Bardavcol's commercial processes and contractual requirements
- Ensure that project quality and commercial controls are established and maintained
- Monitor project performance against Bardavcol and project specific objectives and targets
- Prepare and submit project reports, as per the PMP, contract and Bardavcol's IMS
- Correct all unsafe acts and conditions and ensures issues are actioned within agreed timeframes
- Commit to and participate in safety conversations with personnel at all levels
- Actively encourages safe behaviour through immediate feedback to personnel involved
- Ensure all incidents and near misses are reported, investigated, corrective actions implemented and lessons learned shared
- Ensure all staff are competent to perform their required duties
- Ensure all work associated with the project is performed in a safe manner and complies with relevant legislation and IMS, project and contractual requirements
- Active involvement in rehabilitation and return to work processes
- Participate in project audits and inspections, as per the PMP
- Ensure there is sufficient and appropriate emergency response equipment on site and emergency response drills are performed as per the PMP
- Ensure communication and consultation occurs with all workers on key project items, including changes to hazards, risks, controls, site rules and other requirements
- Monitor the performance of the project team members to ensure behaviours reflect the expected culture and work is performed to the required standard

Site Manager, Site Supervisor and Engineers

- Promote a positive safety culture and provide leadership to other workers on site
- Conduct activities, as per the Project Management Plan, Project Risk Register, SWMS and other project plans
- Challenge 'at-risk behaviour' and actively encourage safe behaviour
- Ensure that all tasks are correctly risk assessed and that appropriate controls are implemented and that this process is documented (eg. SWMS, Job Task Cards, Permits)
- Prepare, facilitate, review and implement SWMS, Job Task Cards and other risk assessments, as required
- Perform project inspections and observations, as per the PMP and ensure that positive observations are communicated to workers and action items are closed out as soon as reasonably practicable
- Review project activities, evaluate the effectiveness of quality, safety and environmental controls
- Constructively participate in internal and external audits, as required
- Regularly inspect plant and equipment to ensure that they are in suitable condition and that the required documentation and inspections are in place
- Ensure the correct use and maintenance of Personnel Protective Equipment (PPE) requirements
- Contribute to and/or lead daily Pre-Start meetings and Tool Box Talks

PROJECT MANAGEMENT PLAN

- Ensure workers are inducted and have the required qualifications, training and competencies to perform their required duties
- Contribute to and support rehabilitation and return to work processes, as required
- Ensure that all work under their control is performed safely and in accordance with the project quality, safety and environmental requirements and complies with the relevant legislation, IMS and contractual requirements
- Maintain work areas under their control in a clean and tidy condition at all times
- Regularly communicate and consult with workers under their control on quality, safety and environmental issues and requirements
- Ensure that risk assessments (eg. SWMS, Job Task Cards) and work methods are reviewed and updated, as per the PMP or following a change in scope, method, hazards, risks or controls
- Initiate the reporting and investigation of all incidents and near misses associated with activities under their control and implement corrective actions
- Maintain positive interaction with other project team members, subcontractors, workers and other project stakeholders
- Proactively manage interfaces with other work groups/subcontractors to coordinate activities and ensure that safety, quality and environmental performance is not compromised
- Receive feedback constructively and either correct or escalate items raised and provide immediate feedback where possible and appropriate
- Correct all unsafe acts and conditions and ensures issues are actioned within agreed timeframes
- Engage in safety conversations with site personnel at all levels
- Contribute to the identification of training needs and make personnel available for scheduled training

Quality, Safety and Environmental Management Representative (QSEMR)

- Develop and maintain a quality management system for the project
- Assist other project personnel with completion of quality documentation
- Collate and package quality documentation into lot packages
- Prepare lot packages for submission to the Client
- Assist in the development and implementation of quality, safety and environmental plans
- Conduct activities as per the Project Management Plan, Project Risk Register, SWMS and other project plans
- Review and update the relevant parts of PMP and Project Risk Register
- Conduct and report inspections, as per the PMP
- Conduct internal audits, as required
- Assist external audits, as required
- Assist the HSE Manager with the continuous improvement of the IMS, as required

Project Safety Manager

- Promote a positive safety culture and provide leadership to other workers on site
- Communicate and consult with the Project Team members, subcontractors, workers and other stakeholders with regard to project safety hazards, risks and controls
- Coach and mentor workers on safety expectations and performance
- Challenge “at risk” behaviour and encourage safe behaviour
- Initiate safety conversations regularly at all levels
- Liaise with external WHS agencies (as required)

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- Collate and prepare project safety records and reports, including SWMS reviews, SWMS/Hazardous Chemical/Plant and other registers, inspections/observations, incident reports, communication and consultation records, risk reviews, permits
- Ensure incidents are reported to the HSE Manager and notifiable incidents to SafeWork SA and the OTR (as required)
- Review relevant drawings, specifications, programmes and schedules
- Review and update the relevant parts of PMP and Project Risk Register
- Identify and request WHS resources to achieve objectives
- Assist with work method planning, including design reviews and with a specific focus on high risk work
- Prepare subcontractor safety packs (or equivalent) and communicate and consult with subcontractors on safety expectations prior to their commencement
- Assist the HSE Manager with the continuous improvement of the IMS, as required
- Stop any unsafe works
- Convene and record toolbox meetings
- Provide input to and be involved with daily prestart briefings
- Assist with the preparation, review and implementation of SWMS, Job Task Cards and other risk assessments
- Conduct and assist incident investigations
- Develop and assist with the implementation of corrective actions from observations, inspections, audits and incident investigations (as appropriate)
- Provide specialist safety advice and assistance to workers (including Bardavcol and subcontractors)
- Assist with the preparation and delivery of inductions and ensure records of induction and training/competency are maintained and stored securely
- Assist in the review of required competencies and training gap analysis and recommend and assist in procuring and delivering project specific training
- Assist in development, implementation and evaluation of emergency response plans, procedures and drills
- Review emergency equipment requirements and provide recommendations to the Project Manager
- Provide first aid, as required and assist with Bardavcol's return to work processes as required
- Assist with the monitoring of fitness for work requirements, including any alcohol and other drugs testing
- Monitor all project activities to identify and report uncontrolled risks, non-conformances, and improvement opportunities
- Monitor and report on project safety performance, as per the PMP
- Conduct and report inspections, as per the PMP
- Conduct internal audits, as required
- Assist external audits, as required

All Project Personnel

- Ensure that they are inducted and have read and understood the project requirements relevant to their role and responsibilities (eg. SWMS, emergency requirements)
- Understand and actively participate in a positive safety culture and co-operate with project safety, quality and environmental requirements
- Engage in safety conversations with site personnel at all levels
- Has authority to stop unsafe acts

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- Positively participates in Pre-Start Briefings, Toolbox Talks and other communication and consultation forums
- Participate in risk assessments and development of SWMS, Job Task Cards, ITPs and other quality control processes applicable to their role and scope of work
- Work in a safe manner at all times and have regard to their own and the safety of others
- Be aware of other activities that they may affect or be affected by and proactively manage interfaces with other workers/activities
- Inspect plant and equipment before, during and after use, document the inspections (where required), tag out and report any damaged or faulty plant and equipment
- Ensure that plant and equipment is calibrated, maintained and serviced, as per the manufacturer's requirements
- Comply with the relevant project documentation, procedures, legislation, site policies and rules
- Keep their work area clean and tidy at all times
- Attend work fit for duty and not affected by alcohol or other drugs
- Identify opportunities and initiative to improve the project safety, quality and environmental performance
- Identify, control and make safe hazards where possible
- Correct all unsafe acts and conditions and ensures issues are actioned within agreed timeframes (applicable to their role and authority level)
- Report incidents, hazards or unsafe acts immediately

APPENDIX C

Project Risk Register

PROJECT MANAGEMENT PLAN

Project No.	T6258	Project Name:	Port Spencer Grain Export Facility	Location:	Lipson Cove Road, Lipson, 5607, South Australia	Date:	10/03/2020
Prepared by:	Anthony Paradiso			Reviewed by:	Tim O'Connell	Rev:	0
Description of Project or Scope of Works:	Undertake civil works for the Port Spencer Gain Export Facility including excavation for the facility, pavement construction for the bunkers, drainage and road upgrades.						

- Notes:**
1. This Risk Register is an overall risk assessment for the project scope of work under the responsibility of Bardavcol.
 2. The Risk Register is to be completed at the same time as the Project Management Plan. Hierarchy of control (order of preference: Elimination, Substitution, Isolation, Engineering, Administration, PPE) must be used to assess management controls.
 3. This register must be referred to in the review of SWMS, Plant Risk assessments etc.
 4. The project Risk Register is to be kept in the project file on site & communicated to workers as required ('Worker' includes individual workers of a subcontractor (including 'secondary' subcontractors), labour hire, all Bardavcol personnel and members of the public).
 5. The Risk Register is a living document and must be updated as the project scope, risk assessment or controls change.
 6. During the course of the project, some risks may reduce due to scope etc. When the risk has reduced, or is no longer applicable this may be noted on the register, but the details of the hazard must remain (ie. not deleted).
 7. 'Secondary' subcontractors are the responsibility of the Bardavcol engaged subcontractors; all control measures must be managed in accordance with Bardavcol's management systems (eg. this risk assessment) and instructions

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
001	Poor Communication - Increase risk of accidents or incidents	- Injury to workers - Fatigue to workers - Unfit for work	D	5	H 19	1. All workers to attend daily pre start meeting. 2. If workers are not present for prestart meeting, they must contact the Site Supervisor and report to the site office to read and sign prestart brief prior to commencing work. 3. All workers must complete the Bardavcol site specific induction before commencing work. 4. All workers whilst on site shall wear the mandatory PPE including, High visibility clothing, steel cap boots, long sleeve shirts, long pants, safety glasses, AS/NZS 1337.1, gloves for all manual handling tasks, hearing protection as required. 5. All workers to report "Fit For Work" 6. Fatigue to be managed, if you have or notice any concerns report to Supervisor immediately. 7. All visitors to sign in visitors register and must be escorted on site by an inducted worker	D	3	M 10	All Workers (Items 1 to 8)	
002	Drugs/Alcohol: - Use of drugs or alcohol by workers - Impaired judgement	- Impairment on physical condition resulting in: ➢ Injury to workers or public ➢ Damage to plant ➢ Property damage ➢ Adverse impact on quality of works	C	5	H 22	1. Participate in Bardavcol AOD testing, as scheduled 2. Education of workers on impacts of impairment through toolbox talks and/or pre-start briefings 3. Random testing to be performed if reasonable suspicion of workers affected by AOD 4. All AOD testing to be undertaken in accordance with Bardavcol procedures 5. Bardavcol AOD policy to be displayed in Bardavcol office / lunch room	E	5	M 16	All Workers (Items 1 to 3) Project Manager (Item 4 to 5)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
003	Fatigue: - Worker fatigue - Environmental factors (heat, cold, UV) - Impaired judgement	- Injuries to workers or public - Short- or long-term medical effects on workers - Adverse impact on quality of works - Program delays	A	5	E 25	1. Working hours 7am to 5pm Monday to Saturday 2. Rotation of personnel between tasks and hours of work (if required) 3. No more than 16 hours work in a 24 hour day 4. Minimum of 10 hour break between shifts 5. Supervisor approval and fatigue risk assessments must be completed if work is to extend from 14 hours and up to 16 hours	E	5	M 16	Project Manager (Item 1 to 4) Site Manager (Item 2 to 5) All Workers (Item 3 to 5)	
004	Noise	- Exposure to excessive noise causing hearing loss. - Disturbing local residents.	C	4	M 14	1. Noisy activities to be planned during day working hours Monday to Saturday 7:00AM to 7:00PM with less noisy activities to be undertaken at night 2. Hearing protection to be used where noise levels exceed national standards 3. Communicate work activities where excessive noise may impact other work groups. 4. Consider alternate shift arrangements of particularly noisy activities occurring adjacent on the ground workers 5. Communicate with residents for night works	E	3	7 L	Site Manager (Item 1,3,4) All Workers (Item 2) Project Manager or Project Engineer (Item 5)	
005	Vermin (Snakes and Spiders)	- Snake and spider bites.	D	3	M 10	1. Long pants and shirts to be worn and high side safety boots. 2. First aid facilities on site. 3. Emergency response procedures communicated and posted in offices and lunch rooms. 4. Where possible check areas prior to works. 5. Ensure gloves worn when shifting materials placed on the ground. 6. Bee hives / snake holes if found should be isolated, workers notified and removal experts engaged to deal with the issue 7. Emergency response to include spider / snake / bee stings 8. Obtain allergy information at inductions	E	3	L 7	All Workers (Item 1,4,5,6) Site Safety Manager (Item 2,3,7)	
006	Heat Stress / Working in Hot Conditions	- Heat stroke. - Heat exhaustion. - Heat stress. - Dehydration. - Fatigue. - Sun burn. - Eye damage.	B	5	E 24	1. Potable water to be available for all personnel on site. 2. Sun screen to be made available for all personnel on site. 3. Hard hat shade brims and tinted safety glasses to be made available. 4. Long sleeves and pants to be worn on site 5. Where possible work in shaded areas during extreme heat 6. Provide information to workers on heat stress, dehydration and working in hot conditions. 7. Shorter working days or cease works in extreme heat. 8. Allow workers to take regular breaks. 9. Supervisor to monitor workers. 10. Dehydration awareness posters in toilet blocks.	E	5	M 16	Site Manager (Item 1,2,3,5,6,7,8,9,11,12) All Workers (Item 4) Project Manager (Item 6,7,11) Project Engineer (Item 6,10) Site Safety Manager (Item 6,10)	

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Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
						11. Where appropriate implement an early start for physical works in hot weather 12. Worker rotation in hot weather					
007	Use of mobile plant: - Plant/plant interaction - Plant/worker interaction - Plant breakdown	- Collision plant on plant - Property damage - Crush injury - Being struck by - Program delays due to ineffective/damaged plant - Plant rollover	C	5	H 22	1. Compound setup to minimise plant / worker interaction 2. Exclusion zones to be implemented along with barriers and signage where required 3. Establish designated parking areas for light vehicles and inactive plant 4. Rotating/flashing beacons and reversing alarms for all heavy plant 5. PPE to be worn by all workers to ensure visibility to plant operators 6. Use UHF radio and clear communication for personnel working around plant (positive acknowledgment between plant operator and workers when entering the plant work area) 7. All hired plant to be inspected and stickered for use on site 8. Pre-start inspections for all plant prior to use that day/shift 9. Plant to be operated in accordance with manufacturer's and Bardavcol's WI 10. Seatbelts must be worn when using mobile plant, which includes light vehicles 11. Never talk or text on a hand held mobile phone when operating a vehicle or mobile plant 12. Spotters to be in place when detailed in the SWMS 13. Horns to be beeped once prior to engine start, twice prior to forward movement and three times prior to reversing. 14. Haul roads and access tracks to have edge protection or delineation. 15. Haul roads only to be used by inducted persons. 16. Appropriate licences sighted prior to operating. 17. Light vehicles that travel in areas of heavy plant must be fitted with flags 18. Competency to be verified for all plant operators 19. Stop logs or bunds to be installed in plant parking location in the compound 20. Park wheeled plant on level ground 21. Spotters to be used in congested areas close to infrastructure, plant or workers	E	5	M 16	Project Manager (Item 1) Site Manager (Item 1,2,3,14,15,18, 19,21,22,23,28) Site Safety Manager (Item 7,14,15, 16,18,22) All Workers (Item 4,5,6) Operators (Item 8,9,10,11,12,13,14, 15,17,20,21,22,23,24,25,26,27, 28)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
						22. Exclusion zones next to plant whilst tipping off loads. 23. Unload on firm, level ground 24. Lower tray bodies prior to moving away 25. Unload away from overhead services 26. Trucks must not be overloaded 27. Trucks not to operate on grades outside of the manufacturers limits 28. Services to be marked with hurdles					
008	Loading and Un-loading Plant - Plant and worker interaction - Plant rollover - Slippery surfaces - Manual handling - Working at height	- Collisions. - Sprains and strains. - Falls. - Crush injuries. - Roll over	B	5	E 24	1. Area flat and clear for all loading and un-loading 2. Minimum 10m exclusion zone to be established in potential fall zone. 3. Spotter to be used as required. 4. Communication to be established prior to commencing the task. 5. Competent and certified personnel to undertake the task 6. Correct manual handling techniques to be used for all lifting, pulling and pushing. 7. Overhead services including clearance distances to be identified prior to commencing the task. 8. Float ramps slippery surface to be assessed prior to proceeding. 9. Loading and unloading to only occur on firm, level ground	E	5	M 16	Site Manager (Item 1,3,7) Delivery Driver (Item 1,2,3,4,5,6,7,8,9)	
009	Water - Drowning	- Death - Disability	D	5	H 19	1. Life jackets to be worn by all workers when working in or on the water 2. Rescue plan to be detailed in SWMS 3. No isolated work. 2 or more workers when working in the water	E	5	M 16	Site Manager (Item 1 to 3) Project Manager (Item 2 & 3) All Workers (Item 1 & 3)	
010	Dust / Fumes	- Dust particles in eyes. - Health effects from inhalation of dust and fumes. - Impacts on visibility.	B	3	H 17	1. Monitor dust generated on site and ensure dust suppression controls are initiated when required 2. Appropriate dust masks to be worn for the activity being undertaken if dust generation cannot be reduced or eliminated 3. Safety glasses to be worn at all times 4. Excessive fumes to be monitored in congested and excavation work areas. 5. Watercart onsite for dust suppression at all times. 6. Stop works in excessively windy conditions that results in excessive dust 7. Ensure sufficient separation between the rock drilling and any workers on the ground	E	3	L 7	Site Manager (Item 1,4,5,6,7) Site Supervisor (Item 1,4,5,6,7) All Workers (Item 2,3) Project Manager (Item 6)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
011	Manual Handling <ul style="list-style-type: none"> - Heavy items/loads - Awkward positions - Repetitive tasks - Fit for task 	<ul style="list-style-type: none"> - Sprains & strains - Injury - MTI or LTI 	B	4	H 21	<ol style="list-style-type: none"> 1. Work in accordance with Hazardous Manual Tasks; 2. Where possible use mechanical aids for lifting; 3. If required use two person lift; 4. Ensure personnel are fit for the task; 5. Wear appropriate PPE for the task; and 6. Use correct manual handling techniques. 	D	4	M 15	All Workers (Items 1 to 6)	
012	Mobile Phone Use on Site <ul style="list-style-type: none"> - Distraction in the work place 	<ul style="list-style-type: none"> - Worker struck by plant / vehicle - Slip / trips / falls - Plant / vehicle accident - Plant / vehicle damage 	B	4	H 21	<ol style="list-style-type: none"> 1. Do not use mobile phone whilst performing work tasks; 2. Crew leaders may use mobile phone as part of approved work procedures if required to use a mobile phone; 3. If a phone call has to be made or taken whilst on site, workers shall step away from the work front, remain stationary while on the phone, keep head up to observe any vehicle or machine movements, when finished phone call return to the work front 4. Plant/vehicle operators are not to use mobile phones when operating/driving; and 5. Ensure that Machine or Plant is turned off and blade and boom are grounded, before answering call. Or call back when not stationed on plant. 	C	3	M 14	All Workers (Items 1 to 5)	
013	Unauthorised Access to Site <ul style="list-style-type: none"> - Public interactions - Plant / vehicle interactions - Theft / vandalism - Injury to public 	<ul style="list-style-type: none"> - Vehicle collision. - Collisions with other vehicles, mobile plant, equipment, fauna or pedestrians. - Injury to public - Theft, vandalism - Violence 	C	3	M 14	<ol style="list-style-type: none"> 1. Delineate hazards including after hours 2. Signage at all access points to delineate site 3. Signage to direct visitors to the office 4. All visitors to be escorted onsite 5. Gates to be locked outside of work hours 6. Compound areas to be monitored by CCTV and alarm system 7. Appropriate traffic controls to be in place on Lipson Cove Road 8. Excavations and drop offs to be bunted off or the like 9. Security fencing to be installed around the compound 10. Unauthorised personnel to be asked to leave site immediately 11. SP28 Security Management Plan to be in place 	E	3	L	Site Manager (items 1,2,3,5,7,8,9) All Workers (Items 4,10) Project Manager (Items 6,11)	
014	General Access to the Work Areas <ul style="list-style-type: none"> - Access to the excavation - Access to the Grain Bunkers - Access to the compound from the main gates 	<ul style="list-style-type: none"> - Vehicle collision. - Collisions with mobile plant, equipment, fauna or pedestrians. - Vehicle roll over - Being struck by - Property damage 	C	4	H 18	<ol style="list-style-type: none"> 1. Access roads to be regularly maintained. 2. Speed to be limited and sign posted 3. Bunds to be installed along steep drop offs 4. Signage to stop personnel going past the compound unintended. 5. Tracks to be inspected daily by the Site manager 6. All heavy vehicles on the access roads to communicate via. UHF 7. Notify plant operators when approaching by UHF, do not approach until there is positive confirmation 	D	4	M 15	Site Manager (Items 1,2,3,4,5,10,11,13) All workers (Items 6,7,8,9,12)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
						8. Workers on foot around plant to have UHF communications at all times (1 UHF per group is acceptable if they stay together) 9. Seat belts must be worn on site 10. Bunds or barriers to be installed at drop offs 11. Bunds to be at least 1/2 height of the wheel of the largest plant using the area 12. Stay at least 2m back from any drop offs 13. Watercart to be used to suppress dust					
015	Bushfire	<ul style="list-style-type: none"> - Smoke inhalation - Reduced visibility - Burns - Fatality - Equipment damage 	C	5	H 22	1. All spark producing activities to have a hot work permit in place. 2. CFS permits to be issued as required, but works being scheduled to a non total fire ban day should be considered 3. Workers to smoke in clearings or designated smoking areas. 4. Project emergency response plan to be communicated to all personnel 5. Monitor radio or CFS website for bushfire warnings in particular on total fire ban days 6. CFS website and radio to be monitored constantly during extreme and catastrophic fire danger days 7. Emergency Bushfire Action Response checklist to be implemented in an emergency	E	5	M 16	Project Engineer (Items 1,2,5,6,7) All Workers (Items 3) Project Manager (Items 4,5,6,7) Site Manager (Items 5,6)	
016	Slips / Trips / Falls Uneven / Slippery / Steep Ground / Rocky	<ul style="list-style-type: none"> - Sprains and strains. - Falls. - Lacerations 	B	3	H 17	1. Raised awareness during Site Induction. 2. Mandatory ankle support Safety boots. 3. Access tracks to be maintained and clear of debris and loose materials. 4. Daily prestart to detail site conditions. 5. Place rubble to compound areas 6. Stop works in excessively muddy / wet conditions 7. Adequate lighting to be provided in the site compound	D	3	M 10	Project Engineer (Items 1) Site Safety Manager (Item 1) Project Manager (Item 1,6) Site Manager (Item 1,3,4,5,6,7) All Workers (Item 2)	
017	Chemicals <ul style="list-style-type: none"> - Incorrect storage - Exposure - Incompatible chemicals 	<ul style="list-style-type: none"> - Chemical exposure. - Environmental impacts. - Fire/explosion. - Burns. 	B	4	H 21	1. All chemicals use on site to have SDS available and understood by everyone who uses the chemical in accordance with the SWMS. 2. PPE to be worn as per SDS. 3. Chemical Risk Assessment to be completed and made available prior to the chemical being used on site. 4. Chemicals to be handled and stored as per recommendations within SDS.	E	4	M 12	All Workers (Item 1,2,4) Project Engineer (Item 3) Site Manager (Item 3) Project Manager (Item 3)	
018	Blasting <ul style="list-style-type: none"> - Explosives - Fly Rock - Drill rig - Drop offs - Noise and dust - Uneven ground - Working in proximity to other activities - Misfire 	<ul style="list-style-type: none"> - Plant damage. - Crush, cut and graze injuries. - Explosion injuries. - Traffic Accident. - Public Injury. - Infrastructure damage - Being struck - Eye injury - Exposure to noise and dust 	D	5	H 19	1. Blast Management Plan (BMP) to be implemented and adhered to 2. Exclusion zones to be as per SWMS & BMP 3. Exclusion zone size to be developed in consultation with blasting contractor 4. Blast guards and clearance zones to be implemented 5. Blast guards to maintain the clearance zone until the all clear is provided by the shotfirer after the blast after it has been inspected	E	5	M 16	Project Manager (Item 1) Project Engineer (Item 1,6,9,10,17) Site Manager (Item 1,4,6,7,8,9,11,13) Blasting Subcontractor (Item 1,2,3,4,6,7,9) Blast Guards (Item 5) All Workers (Item 12,14)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
	- Electrical Storms	- Falls - Plant roller over				6. Blast signage to be erected at site compound prior to blasting to provide notification / warning. 7. Blast area to be delineated and have warning signage installed around it prior to commencing loading 8. Lipson Cove Rd to be closed during blasts (blocked by vehicle), clearing inspection to be undertaken prior to reopening the roadway 9. Blast permits to be in place prior to blasting 10. Local residents to be notified prior to blasts 11. All workers to be notified of planned blasts in the daily prestart meeting 12. All workers other than those specifically involved with the blasting or site clearance to leave site 30 minutes minimum prior to the blast. 13. Minimise tasks being undertaken downwind of the drill rig 14. No smoking in the blast area or within 10m of the blast truck 15. Works not to proceed during an electrical storm 16. Misfire procedure to be implemented 17. Vibration monitoring at nearest resident to ensure limits are not exceeded for human nuisance					
019	Crushing - Moving parts - Silica Dust - Working at heights - Noise - Housekeeping - Entanglement of machinery - Manual handling	- Silicosis - Crush injury - Being struck by injury - Hearing loss - Plant damage - Strains	C	5	H 22	1. Subcontractor to submit SWMS for the works for Bardavcol review 2. All guarding to be in place and working 3. Water cart to be on site to wet down stockpiles if required to manage dust 4. Excavated material to be tested for silica 5. Workers are not to work too close to the crushing works to avoid exposure to dust 6. Works to be reviewed on excessively windy days 7. Hearing protection to be worn when working on crushing activities for workers who are involved in crushing activities. Other workers to be removed from noise generating activity 8. Use correct manual handling techniques as per Bardavcol WI 9. Workers not to work at any height where you can fall from one level to another without fall protection 10. Plant to be "tagged out" if maintenance is required on mechanical parts 11. Layout plan for crushing area to be developed to ensure material storage is kept orderly	D	4	M 15	Crushing Subcontractor (Item 1,2,5,6,7,8,9,10,11) Site Manager (Item 3,5,6,7,11) Site Supervisor (Item 3,5,6,7,11) Project Manager (Item 4,11) Project Engineer (Item 4,11)	
020	Bulk Fuel Storage / Refuelling - Dangerous substances - Chemical exposure - Fire	- Burns. - Fire. - Explosion.	D	4	M 15	1. Develop Refuelling Management Plan. 2. Double bunded bulk fuel storage tank. 3. Regular monitoring of refuelling areas to ensure no leaks or spills	E	3	L 7	Project Manager (Item 1,2,4,8) Project Engineer (Item 1,2,3,4,8)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
	- Explosion	- Long term health problems. - Spills - Contamination				4. Refuelling Standard Operating Procedure. 5. Spill kits to be available 6. Workers to wear gloves when refuelling plant 7. Workers to report any spills or leaks immediately 8. Any contaminated soil to be cleaned up and disposed at a licenced waste facility				Site Manager (Item 3,5,8) Site Supervisor (Item 3,5,8) All Workers (Item 6,7)	
021	Lifting Operations - Underground & overhead services - Plant & vehicle interaction - Plant & worker interaction - Ground conditions - Tram loads - Plant reversing - Worker complacency - Weather conditions	- Collisions with plant and equipment. - Crush injuries. - Dropped loads. - Crane or plant tipping. - Fatality - Property damage - Workers being struck - Eye Injuries - Electrocutation	B	5	E 24	1. Exclusion zone to be implemented around lifting plant and lift zone except when a load is being trammed 2. Plant inductions to be completed prior to commencing on site 3. Plant pre-start checks to be completed daily 4. Competent and licensed workers to be used 5. Dogman/rigger to sling and control all lifts 6. Lifting gear to be regularly inspected (and tagged) including pre-use inspection 7. Crane/plant to be set up in appropriate position as approved 8. Crane/plant that use outriggers they must be set up appropriately 9. Services to be located and no outriggers to be placed on services without design consideration 10. Exclusion zones to overhead services as per asset owners requirements selection of plant to be considered to eliminate the potential to come into contact with the service 11. Exclusion zone to be implemented around lifting plant and lift zone except when a load is being trammed 12. Tag lines must be used for all lifts 13. Weight of load must be known or assessed prior to any lift 14. No lifting over the top of any person at any time, dogman/rigger and crane operator to make other workers aware of the lift 15. Lift study and plan to be developed for dual and complex lifts or as per WI 16. Assess slope and ground conditions suitable for access and egress 17. SWMS to be in place for lifting activities 18. Lifting works to cease in adverse weather conditions 19. Dogman/rigger and crane operator to use locked radio channel 20. One nominated dogman/rigger is to be in control of the load at all times 21. Loads to be secured in their final position prior to removing lifting gear 22. Lifting activities and changes to be discussed in daily prestart meetings	E	5	M 16	Crane Operator (Item 1,3,5,6,7,8,9, 10,11,12,13,14,16,17,19,20,21) Rigger (Item 1,3,5,6,7,8,9,10,11,12, 13,14,16,17,19,20,21) Site Manager (Item 1,2,4,7,10,11,16, 17,22) Site Supervisor (Item 1,2,4,7,10,11, 16,17,22) Site Safety Manager (Item 2,4,17,22) Project Engineer (Item 2,4,15) Project Manager (Item 15) All Workers (Item 18)	

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Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
022	Stockpile / Spoil Site - Steep slopes - Ground conditions - Traffic interface - Water	- Plant collisions. - Crush injuries. - Plant rollover. - Ground collapse. - Slips and trips	C	4	H 18	1. Bund (1/2 wheel height) to be maintained along the edge stockpiles that facilitate plant movements on them 2. Spoil site to be an exclusion zone for unauthorised personnel during operation. 3. Spoil site is delineated by signage and bunds from the compound and access track. 4. Exclusion zones next to plant whilst tipping off loads. 5. Loads to be tipped off on firm level ground. 6. Trucks unloading to be directed by the plant maintaining the stockpile site 7. Positive communication protocol between plant and vehicle 8. Use of the spoil site to cease in excessively wet conditions 9. Main access road speed limit to be 25kph in the vicinity of the spoil site 10. Trucks are not to operate overloaded 11. Layout plan to be implemented to communicate stockpile site at prestart	D	4	M 15	Site Manager (Item 1,3,8,11) All Workers (Item 2) Operators (Item 4,5,6,7,8,9,10) Project Engineer (Item 11)	
023	Electrical Work / Power Tools - Electrocution - Electric shock	- Fatality - Injury - Burns - Cuts / abrasions	B	5	E 24	1. Electrical works are to be undertaken by licensed electrical subcontractor 2. A SWMS to be provided by the electrical subcontractor for review prior to undertaking any works 3. Only an licensed electrician to disconnect and remove electrical cables 4. All appliances / leads etc. on site to be tested & tagged quarterly 5. Pre-use inspection of power tools including guarding 6. All cables treated as 'live' 7. Faulty/damaged equipment/appliances tagged out and reported to manager 8. Switchboard locked and only accessible by authorised personnel 9. Electrically powered tools must be used in conjunction with a Residual Current Device (RCD) 10. RCD to be tested prior to use daily 11. Power leads shall not be "piggy backed" 12. Refer Work Instruction for use of power tools 13. All electrical supply to be isolated prior to working on them by a licenced electrician	E	5	M 16	Project Manager (Item 1,2,3,4,8) Project Engineer (Item 1,2,3,4,8) Site Manager (Item 1,3,4,8) Site Safety Manager (Item 1,3,4,8) All Workers (Item 5,6,7,9,10,11,12) Electrician (Item 1,2,3,8,13)	
024	Covid 19	- Illness - Infecting other workers - Close work site - Fatality	A	5	E 25	1. Undertake risk assessment for the project 2. Workers to comply with Bardavcol Work Instruction 3. Posters & education material to be posted on notice board 4. Cleaning practices to be reviewed and increased cleaning regime implemented 5. Social distancing rules to be applied for gatherings and meetings.	C	3	M 14	Project Manager (Item 1,4) Project Engineer (Item 1,4) Site Manager (Item 1,4,7) Site Safety Supervisor (Item 1,3) All Workers (Item 2,5,6,8,9)	

PROJECT MANAGEMENT PLAN

Ref	Risk/Hazard	Consequences	Initial Risk/Rating			Management Controls	Revised Rating			Individual / Group responsible for management control(s)	Review date
			L	C	RS		L	C	RS		
						6. Workers to take ownership of their lunch / smoko space for hygiene and sanitisation. 7. Lunch / Smoko breaks to be staggered between work parties to avoid over-crowding and non-compliance with social distancing rules. 8. Pre-starts to be conducted in outside locations 9. Hands to be washed following visits to toilet, before eating and after touching frequently used surfaces 10. Workers to follow government protocols outside of work to minimise the risk of spreading to the work group					
025	Drainage - Soil Erosion, Water Quality	- Pollution of water	A	4	E 23	1. Development and implantation of detailed SEDMP 2. Establish cut off drains to divert water 3. Use of silt fences, silt socks, rock etc to trap sediment and slow flow of water. 4. Locate stockpiles away from water flow paths. 5. Regular inspections of erosion controls, stockpiles 6. Review of SEDMP as work progresses and site layout changes shape (i.e. change of grades through cut/fill earthworks). 7. Sediment controls to be in place along edge of water to minimise risk of adverse water quality impacts.	E	4	M 12		
026	Cultural Heritage	- Disturbance of cultural heritage item(s)	C	4	H 18	1. All personnel to be made aware of types of items they could potentially uncover during excavation through induction 2. Aboriginal Heritage Monitors to be in place for any excavation as specified 3. If any item of significance is discovered, works in the area to cease and Project Manager to be notified immediately. 4. Areas of significance to be identified via flagging and signage, and all personnel made aware through site induction. 5. Site inspections to ensure compliance with site specific requirements	E	4	M 12	Project Manager (Item 2) Project Engineer (Item 1,2,4,5) Site Safety Manager (Item 1,4) Site Manager (Item 2,4) All Workers (Item 3)	

PROJECT MANAGEMENT PLAN

STEP 1: IDENTIFY THE HAZARD

Hazard Identification
Definition
A hazard is anything (including any action, substance or process) in the work environment that has the potential to cause harm or damage (including injury or illness).
Hazards are identified through a number of key collaborative processes including risk assessments, SWMS, risk registers, inspections, etc.

Examples
<ul style="list-style-type: none">Manual handling of hand tools - knives, crowbars, etc.Lifting, pushing, pulling, bending, reaching, carrying or dragging objects;Working at height, near open edges, falls from height;Working on or near live services;Repetitive movements;Slippery/ unstable conditions or cluttered workplace;Bites from snakes, spiders;UV radiation / hot or cold weather;Noise or vibration;Windy / wet weather;Dusts, fumes, mists or vapours;Hot/ toxic/ caustic substances;Asbestos and other hazardous materials;Working on or near roadsides;Sharp edges;Poor lighting, visibility;Nearby workers or visitors;Unguarded equipment;Storage of chemicals;Fuelling of equipment, tools, vehicles and plant;Discharge of waste into stormwater or sewer;Operation of powered mechanical equipment near the public (noise).

STEP 2: ASSESS THE RISK
What is the likelihood of the hazard causing harm or damage and the potential consequences if nothing is done?

		Consequence				
Likelihood		Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost Certain	(A)	8	13	20	23	25
Likely	(B)	6	11	17	21	24
Possible	(C)	4	9	14	18	22
Unlikely	(D)	2	5	10	15	19
Rare	(E)	1	3	7	12	16

Note: The bold line illustrates risks that are deemed to be significant.

Likelihood (the chance of something happening)	
Rating	Description
Almost Certain	Almost inevitable outcome. The event is expected to occur in most circumstances. A similar outcome may have arisen several times in the same activity, operation, or location.
Likely	Not a certainty, but such an event is known to have occurred and represents a credible scenario. There is a good chance the event will occur.
Possible	Could happen, easy to imagine a feasible scenario where the situation could exist but it would be unusual for the event to occur. An event has probably occurred in the past.
Unlikely	Conceivable, occurrence would require multiple failures of systems and controls, but it would be possible for the event to occur.
Rare	Little chance of occurrence. Would require a combination of factors for the situation to result. The event is not known to have happened, but it is remotely possible in unforeseen circumstances.

Consequence (An outcome of an impact or event)			
Rating	Health and Safety	Property Damage	Environment
Catastrophic	Life threatening incident resulting in serious injury and/or disablement (including a fatality). LTI classification.	Critical equipment damage – unavailability of key assets for a significant period & significant impact on project productivity. Damage incurs costs >\$50,000.	Severe/long term pollution/damage to a large or critical aspect of the environment within and external to the site
Major	Serious injury, requiring hospitalisation, not life threatening. LTI classification.	Serious equipment damage – unavailability of key assets, major impact on project productivity. Damage incurs costs of \$5,000 - \$50,000	Serious pollution/damage to the environment within and external to the site
Moderate	Incident requires medical treatment by qualified practitioner. MTI classification.	Moderate equipment damage – unavailability of key assets, marginal impact on project productivity. Damage incurs costs of \$500 - \$5,000	Moderate pollution/damage to the environment within the site or to a small extent external to the site.
Minor	Injury requiring first aid treatment only. FAI classification.	Minor equipment damage – unavailability of assets, minor recoverable impact on project productivity. Damage incurs costs <\$500	Minor and localised pollution/damage to the environment, primarily confined within the site.
Insignificant	Injuries that do not require treatment.	Negligible damage to property which is difficult to see, minimal impact on project productivity that is immediately recoverable.	Negligible impact on environment, which is difficult to notice and does not require remedial action.

STEP 3: CONTROL THE RISK

Acceptability of Risk	
Rating	Action
23-25	Extreme: Do not proceed until further review of risk and inclusion of more effective controls, with priority to eliminate risk. Detailed action plan required, allocation of resources and monitoring. <i>Consult:</i> QSEM, CM, OM <i>Approval:</i> MD
17-22	High: Further action required, preferably by using multiple controls to mitigate and manage the risk. <i>Consult:</i> QSEM, CM, OM. <i>Approval:</i> CM, OM or PM
8-16	Medium: Take reasonable steps to mitigate risk. Manage using routine procedures. <i>Approval:</i> PM
1-7	Low: Action advisable if cost beneficial. <i>Approval:</i> PM

What control is required?
<ul style="list-style-type: none">The hierarchy of controls must be applied in descending order of effectiveness to assist in reducing risk “so far as is reasonably practicable”.<i>Administrative</i> and <i>PPE</i> controls should only be used when there are no other practical measures available, as an interim measure, or to supplement higher level controlsLegal and other requirements (eg. codes, standards) and contractual considerations must be taken into account for all Bardavcol activities including the control of risk.

Hierarchy of Control Measures (WHS Act 2012)	
Hierarchy	Description
Elimination	Most effective control measure, involves the removal of the risk (by removing the hazard or changing work processes).
If the risk cannot be eliminated, it must be minimised.	
Substitution	Replace the work method, plant or substance with another with a lower risk.
Isolation	Isolate the hazard from any person exposed to the hazard
Engineering	Change the physical characteristics of plant or workplace to remove or reduce the risk
Administrative	Use of policies, procedures, work instructions, signs, training etc. to reduce the risk
PPE	Equipment or clothing designed to provide protection.

APPENDIX D

Site Induction

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



The Inductee must read the *Site Induction – Site Specific Information* and complete all applicable parts of this induction confirmation form. Non-applicable parts are to be crossed out.

Workers must not be inducted or allowed to work on site if Bardavcol decides that they do not meet the site specific requirements, including fitness for work, qualifications and verification of competency.

Visitors must complete all highlighted sections of this form.

Visitors must be escorted onto site and escorted off.

This form must be signed by the Inductee, a Bardavcol representative and retained in a secure location, as part of the project file.

Site Details

Site Name:			
Location:		Induction Date:	

Part A – Inductee's Details

Select the appropriate box:	<input type="checkbox"/> Worker <input type="checkbox"/> Short-term worker (1-2 days only) <input type="checkbox"/> Visitor		
Surname:		First Name:	
Company:		Phone No:	
Trade (if applicable):		Position:	
Are you of Aboriginal or Torres Strait Islander descent? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I'd prefer not to say			
Is English your main language spoken at home. <input type="checkbox"/> Yes <input type="checkbox"/> No			
How well do you read and speak the English language. Very Well <input type="checkbox"/> Well <input type="checkbox"/> Not Very Well <input type="checkbox"/> Not At All <input type="checkbox"/>			
Do you have any medical conditions/allergies that may affect your ability to work safely on site. <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide details:			
Do you take any prescribed medication? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, provide details:			
Emergency Contact Details:			
Name:		Relationship:	Phone No.:

Part B – to be completed by workers only

Construction Industry Card (ie. White Card) No:		
A valid Construction Industry Card must be presented to work on site		
Duties to be performed on site:		
Details of Licences/Qualifications/Certificates of Competency applicable to the site and tasks to be performed Note: Copies will be retained with this induction record in the project file. Verification of competencies will be reviewed, as part of SWMS reviews, high risk work permits and job task reviews.		
Type	Licence / Reference No.	Expiry Date (if applicable)

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



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Part C - Induction Summary

Please ☒ the items as they are covered in the induction

<input type="checkbox"/> Amenities <input type="checkbox"/> Asbestos <input type="checkbox"/> Communication/Consultation <input type="checkbox"/> Emergency Response/First Aid <input type="checkbox"/> Excavation <input type="checkbox"/> Fitness to Work <input type="checkbox"/> Hazardous Chemicals <input type="checkbox"/> Housekeeping <input type="checkbox"/> Incidents, including near hits/miss and complaints <input type="checkbox"/> Site Access / Parking / Laydown/Storage <input type="checkbox"/> Manual Handling <input type="checkbox"/> Neighbours/General Public	<input type="checkbox"/> Noise <input type="checkbox"/> Plant and Equipment <input type="checkbox"/> PPE <input type="checkbox"/> Services – Underground / Overhead <input type="checkbox"/> Site Access / Parking / Laydown / Storage <input type="checkbox"/> Site Movement/Traffic Management <input type="checkbox"/> Stormwater drainage / Water quality <input type="checkbox"/> SWMS / Risk Assessment <input type="checkbox"/> Vegetation <input type="checkbox"/> Waste Management <input type="checkbox"/> Working Hours <input type="checkbox"/> Working around mobile plant.
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Part D- Induction Confirmation

This induction provides an overview of site safety, environmental and other requirements and is not intended to be task specific. For further risk management controls, please refer to the relevant Safe Work Method Statement, Job Task Card, ITP, Daily Pre-Start and applicable permit issued.			
Please <input checked="" type="checkbox"/> the applicable box below for Visitor / Worker			
<input type="checkbox"/> Visitor	I have read and understand the induction information provided and agree to abide by the requirements, as communicated. I will at all times be escorted on site by an inducted site representative.		
<input type="checkbox"/> Worker (long term)	I have read and understood the requirements of the site induction and I declare the information provided by me is correct. I agree to comply with all aspects of the site safety, environmental and quality requirements including Safe Work Method Statements, Job Task Cards and direction provided to me by the Supervisor and/or Bardavcol Project Team. I understand that failure to comply may result in my immediate removal from this site		
<input type="checkbox"/> Worker (short term / 1-2 days only)	I have read and understood the requirements of the site induction and I declare the information provided by me is correct. I agree to comply with all aspects of the site safety, environmental and quality requirements including Safe Work Method Statements, Job Task Cards and direction provided to me by the Supervisor and/or Bardavcol Project Team. I understand that failure to comply may result in my immediate removal from this site		
Inductee:	Name	Signature	Date
Project Representative:	Name	Signature	Date

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



This part of the induction provides workers with information on the project specific hazards/risks, controls and related requirements. Additional information on project specific hazards and controls will be communicated through Daily Pre-Starts and Toolbox Talks or a re-induction if required.

If any person has difficulty reading or requires an interpreter, they can request a one on one induction or additional assistance.

Confirmation of the induction and that the worker has read and understood the information below is recorded on the Site Induction Confirmation form.

Site Details

Site Name:	Port Spencer Grain Export Facility			
Location:	Lipson Cove Road, Lipson, 5607, South Australia			Date:
Key contacts:	Name	Position	Email	Contact Phone
	Anthony Paradiso	Project Manager	aparadiso@bardavcol.com.au	0457 421 114
	Cran Turner	Site Manager	cturner@bardavcol.com.au	0419 818 979
	Simon Thomson	Site Safety Manager	sthomson@bardavcol.com.au	0439 501 773
	TBC	Project Engineer		
	TBC	Site Engineer		
	TBC	Site Supervisor (Night Shift)		
	TBC	Leading Hand		

Emergency Contacts

Name	Role	Phone
Anthony Paradiso	First Aid Officer / Emergency Director	0457 421 114
Cran Turner	First Aid Officer / Emergency Coordinator	0419 818 979
Project Engineer	First Aid Officer / (Deputy Emergency Director)	
Site Engineer	First Aid Officer	
Site Supervisor (Night Shift)	First Aid Officer / (Deputy Emergency Coordinator)	
Leading Hand	First Aid Officer	

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



General

Amenities	<ul style="list-style-type: none"> Full amenities are located at the main compound
Communication and Consultation	<ul style="list-style-type: none"> Any employee can 'Stop their work' if works are unsafe. They must report the unsafe works as soon as it occurs All employees legally have a duty of care to other employees, if you see anything unsafe report it. Do not endanger yourself or others Pre start are held at 7:00am daily. Workers must attend the daily pre start and sign on. If not able to attend at time of pre-start briefing, you MUST see the Bardavcol Site Manager or other Management representative before commencing work on site to coordinate works Location of Emergency Numbers and Company Policies will be located in lunch room and site offices Location of WH&S Plan (PMP) and Safe Working Procedures in Bardavcol site offices All personnel and at least one representative from each subcontractor on site must attend Toolbox Meetings. These are held on site every fortnight
Emergency Response/First Aid	<ul style="list-style-type: none"> Call up on UHF Channel:XX "Emergency, Emergency, Emergency" State location and nature of the emergency - await response from Site Supervisor or Site Management - failing any response return to emergency assembly point, contact Emergency Services & site management Emergency Assembly Point Location: Bardavcol site compound First Aid Kit Location(s): Office & all Bardavcol Light Vehicles Fire Extinguisher(s): Office & all Bardavcol Light Vehicles & Plant
Fitness to Work	<ul style="list-style-type: none"> No alcohol or other drugs are permitted on this site. The use of prescribed medication must be disclosed to Bardavcol. Workers must adhere to any restrictions associated with the use of prescribed medication (e.g. use of plant and equipment) Workers must not be fatigued and have no undeclared injury or illness that would prevent them from undertaking their work safely. All non-work related injuries must be reported. Random testing will be undertaken during the project
Housekeeping	<ul style="list-style-type: none"> Housekeeping is the responsibility of all workers. Work area to be inspected daily for hazards prior to commencing works All areas must be left in a safe condition when on breaks, at the end of a shift and when works are completed. The site must be maintained in a tidy condition at all times and free from rubbish and other materials
Incidents, including near hits/miss and complaints	<ul style="list-style-type: none"> All incidents, including near hits/misses must be reported to Bardavcol, so that appropriate treatment can be provided for injuries/illness and action taken to minimise environmental harm or damage to property. It is important to report near hits/misses so that we can identify opportunities to prevent injuries/illness, environmental impacts and delays to production. Please report all complaints to Bardavcol so that they can be investigated and addressed appropriately. All environmental incidents to be reported to Bardavcol Project Engineer

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



PPE	<ul style="list-style-type: none"> Minimum PPE for this site and to be worn outside whilst conducting construction/maintenance work: <ul style="list-style-type: none"> hi-visibility vest/clothing safety boots – lace up/ankle height hard hat long sleeves, long pants safety glasses gloves – to be worn when performing manual tasks Additional PPE or variations to the above must be risk assessed and documented in a task specific SWMS
Site Access / Parking / Laydown / Storage	<ul style="list-style-type: none"> Refer to site plan Light vehicles and plant must only park in the designated areas Loading and unloading of plant and equipment must occur on stable ground and within an exclusion zone Operators must keep to the prepared tracks and designated work areas
SWMS	<ul style="list-style-type: none"> SWMS are required for high risk construction works. SWMS must be site specific and not generic. No activity or task that requires a SWMS can commence until the SWMS has been reviewed by Bardavcol.
Waste Management	<ul style="list-style-type: none"> Waste and recyclable materials must be contained and removed to prevent litter and other impacts Use bins provided around site for waste disposal and recycling.
Working Hours	<ul style="list-style-type: none"> Standard working hours are: <ul style="list-style-type: none"> Monday – Friday: 7:00am-6:00pm Saturday: 7:00am – 6:00pm Work outside of these hours must be approved by Bardavcol
Slips, Trips & Falls	<ul style="list-style-type: none"> Be aware of the ground surface you are walking/working on, Do not leave trailing cables or other obstacles for people to fall over. Keep work areas as flat as possible. Stepped changes in levels are an obvious tripping risk Footwear must be kept in good condition and worn properly.

Key Hazards / Risks / Controls

Asbestos	<ul style="list-style-type: none"> Asbestos containing materials are not expected to be present on site. If you suspect material contains asbestos, cease work immediately and notify the Bardavcol Project Manager or Supervisor. Work must not recommence in the area, until directed by Bardavcol
Excavation	<ul style="list-style-type: none"> All work to be carried out in accordance with an Excavation Permit and accepted Safe Work Method Statement(s). No topsoil or cleared & grubbed material is to leave site without approval from the Project Engineer. Materials are to be stockpiled at designated stockpile sites as directed. All excavations to have delineation and all delineation must be reinstated if workers leave the excavation site
Hazardous Chemicals	<ul style="list-style-type: none"> Hazardous chemicals must be risk assessed, detailed in the Safe Work Method Statement, recorded on a Hazardous Chemicals Register and copies of current Safety Data Sheets must be provided to Bardavcol Hazardous chemicals must be labelled, stored in approved containers, banded areas and in accordance with the SDS Workers must ensure that chemicals are used safely and that the required first aid, fire fighting, spill response, PPE, monitoring and any other controls are in place (refer to SDS for details). SDS register is available in Bardavcol site office
Noise	<ul style="list-style-type: none"> Tasks/activities that may affect other workers will be communicated during pre-start meetings

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



Manual Handling	<ul style="list-style-type: none"> Where possible use mechanical aids for lifting heavy items. Never attempt to move an object beyond your capacity. If in doubt, test the objects' weight before attempting to shift it: if it appears too heavy (i.e. not within your comfortable lifting capacity), awkward or bulky, obtain a mechanical lifting aid (i.e. machine, sack truck, trolley, hoist) and/or somebody to help. Avoid reaching out. Do not reach out to pick up any object. Do not over stretch or twist. Handle all objects as close to your body as possible. Do not perform jerky manoeuvring of objects i.e. a sudden exertion of force Communicate plan before team lifts & ensure clear path
Plant and Equipment	<ul style="list-style-type: none"> A Plant Risk Assessment and Plant Permit to Proceed must be completed prior to plant being used on site Vehicles travelling on or through the site to be equipped with operating flashing lights All plant to be clean upon arrival to site. A washdown bay is provided for use when leaving site A seatbelt must be worn at all times Daily pre-start inspections must be performed on plant prior to use. Plant must be properly maintained, operated in accordance the manufacturer's requirements or SOP. Faults/damage and repairs and maintenance must be reported to the Site Supervisor. Minimum training and competency requirements apply to all workers that operate plant and equipment. 9 inch grinders prohibited on Bardavcol Sites.
Services – underground/overhead	<ul style="list-style-type: none"> Care to be taken when working around services, check with the Site Manager for locations. Obtain DBYD information and Excavation Permit(s) prior to undertaking any excavation Prior to undertaking any work around services you must: <ul style="list-style-type: none"> ➢ Identify, Physically Locate and Protect all services. ➢ Ensure you are aware of the relevant rules for working in the vicinity. ➢ Ensure Dial Before You Dig plans are current
Site Movement/Traffic Management	<ul style="list-style-type: none"> Site speed limit is 25km/hr unless otherwise signposted Refer to site movement plan. Stick to designated access tracks within CAZ. Obey road rules when travelling between sites. All traffic management plans must be approved by Bardavcol management prior to implementation. Traffic Management must be installed and maintained by an accredited Work-Zone Traffic Management Officer. Traffic management to be coordinated with Site Manager
On Site Refuelling & Service	<ul style="list-style-type: none"> Personnel undertaking refuelling must sign onto the refuelling SOP. Notify management personnel of any leaks or spills identified Turn plant off when refuelling No smoking at any time in refuelling location No mobile electronic equipment to be operational during refuelling Long sleeved clothing, safety glasses and gloves to be worn whilst refuelling Sub-contractors must refuel and service plant at the Bardavcol site compound, unless approved otherwise by the Project Manager
Hot Works	<ul style="list-style-type: none"> All spark producing activities to have a hot work permit in place. CFS (Schedule 10) permits are required to undertake hot works on a total fire ban day Workers to smoke in clearings or designated smoking areas.
Crushing	<ul style="list-style-type: none"> Workers are not to work too close to the crushing works to avoid exposure to dust and noise Workers not to work at any height where you can fall from one level to another without fall protection

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



Blasting	<ul style="list-style-type: none"> • <i>Blast Management Plan (BMP) to be implemented and adhered to</i> • <i>All workers will be notified of planned blasts in the daily prestart meeting</i> • <i>All workers other than those specifically involved with the blasting or site clearance to leave site 30 minutes minimum prior to the blast.</i> • <i>No smoking in the blast area or within 10m of the blast truck</i>
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Environment

Vegetation	<ul style="list-style-type: none"> • <i>Clearance of vegetation, including trimming of branches must only occur as directed by Bardavcol and where possible avoided. Plant and vehicles must keep to designated transport routes and work areas.</i> • <i>To prevent spreading weeds, plant must travel on designated haul roads where provided. Avoid walking outside boundaries. Do not create your own tracks.</i> • <i>All works to remain inside the Contractor's Activity Zone (CAZ).</i> • <i>Familiarise yourself with the weed identification posters in the lunchroom to help identify any weeds on site</i> • <i>Trees marked with tape or flagged / barricaded off are to be protected, do not operate near them or park under them without approval from the Project Engineer</i>
Aboriginal & Cultural Heritage Protection	<ul style="list-style-type: none"> • <i>Discovery of any potential Aboriginal sites are to be treated as specified. If item of significance is discovered, works in the area to cease and Project Manager to be notified immediately.</i> • <i>Aboriginal Heritage Monitors to be in place for any excavation not in rock</i> • <i>Areas of significance to be identified via flagging and signage, and all personnel made aware through site induction.</i> • <i>Aboriginal Affairs (AARD) - 08 8266 8900 - Lev 13, 200 Victoria Sq. Adelaide SA 5000</i>
Stormwater Drainage / Water Quality	<ul style="list-style-type: none"> • <i>A spill kit is located within the Site Compound in the event of a spill</i> • <i>Spills, leaks must be cleaned up immediately and any contaminated soil/material contained and removed for off-site disposal at a licensed waste facility</i> • <i>Do not discharge any water from site without the approval of the Project Engineer</i> • <i>All contractors shall prevent solid waste, oils, chemicals, bitumen spray and waste water from any construction activity from leaving the site or entering existing waterways</i>
Erosion / Drag-out	<ul style="list-style-type: none"> • <i>Trucks and vehicles are to keep to designated transport routes and the work area to minimise ground disturbance, erosion and off-site impacts</i> • <i>Plant and equipment washdown is only permitted in the work area and away drainage lines</i> • <i>Do not remove any sediment control devices without prior approval from the Project Engineer</i> • <i>Sedimentation and drainage run-off to be controlled in accordance with SEDMP</i>
Neighbours/General Public	<ul style="list-style-type: none"> • <i>Be aware of the potential for members of the public to move through the area and politely advise them to leave the area if they approach</i>
Fauna	<ul style="list-style-type: none"> • <i>ALL Environmental Incidents MUST be reported to your supervisor IMMEDIATELY</i> • <i>If any animals are identified during construction contact the Project Engineer</i> • <i>Inspect excavations daily for trapped animals</i> • <i>All Workers should be aware of the snake bite procedure and emergency plan, as displayed in the lunch room</i> • <i>If you encounter a snake:</i> <ul style="list-style-type: none"> ➢ <i>Leave it alone</i> ➢ <i>Walk in the other direction</i> ➢ <i>Notify your Supervisor as soon as you can</i>

PROJECT MANAGEMENT PLAN

Site Induction and Site Specific Information



SITE SAFETY RULES

THESE MUST BE OBEYED AT ALL TIMES WHILST ON SITE

1. **DO NOT** STAND OR WALK DIRECTLY IN THE PATH OF MOVING PLANT OR VEHICLES.
2. **DO NOT** ENTER A DESIGNATED EXCLUSION ZONE WITHOUT USING POSITIVE COMMUNICATIONS.
3. **DO NOT** OPERATE OR DRIVE A VEHICLE OR PLANT WITHOUT AUTHORISATION AND THE CORRECT CLASS OF LICENCE.
4. **DO NOT** WORK FROM HEIGHT WITHOUT ADEQUATE FALL PROTECTION.
5. **DO NOT** USE A MOBILE PHONE WHILE WALKING ON SITE OR OPERATING PLANT OR VEHICLES.
6. **DO NOT** DRIVE ANY VEHICLE OR ARRIVE FOR WORK UNDER THE INFLUENCE OF ALCOHOL OR ILLICIT DRUGS.
7. **DO NOT** START WORK OR ENTER INTO A WORK ZONE UNTIL YOU HAVE READ AND SIGNED ONTO THE DAILY PRE-START, AND TASK CARD.
8. **DO NOT** USE ANY 240 VOLT ELECTRICAL APPLIANCE OR POWER TOOL UNLESS THE INSPECTION, TEST AND TAG IS IN DATE.
9. **DO NOT** CONDUCT ANY HIGH RISK WORK WITHOUT THE RELEVANT AUTHORISED WORK PERMIT.
10. **DO NOT** USE ANY LIFTING DEVICE OR EQUIPMENT UNLESS THE INSPECTION, TEST AND TAG IS IN DATE.
11. **DO NOT** LEAVE ANY WORK AREAS WITHOUT FIRST CONDUCTING A HOUSEKEEPING CHECK AND REMOVED ALL POTENTIAL TRIP HAZARDS.
12. **DO NOT** START ANY WORK ACTIVITY WITHOUT THE CORRECT PPE BEING WORN.

Non-Compliance with site rules may result in disciplinary action and / or removal from site

APPENDIX E

Policies

- Work Health & Safety Policy Statement
 - Quality Policy Statement
 - Environment Policy Statement

PROJECT MANAGEMENT PLAN**WORK HEALTH & SAFETY POLICY STATEMENT****BARDAVCOL**

It is the policy of Bardavcol Pty Ltd to ensure, so far as is reasonably practicable, that all employees, subcontractors, suppliers, visitors, clients and their agents, and the general public are, whilst at or adjacent a Bardavcol worksite, safe from injury and risks to health.

Further, Bardavcol will provide and maintain, so far as is reasonably practicable, a safe working environment and safe systems of work, in compliance with all relevant Acts, Regulations, Standards, Codes of Practice and customer requirements pertaining to Work Health, and Safety.

To achieve these objectives, Bardavcol will establish, implement and maintain appropriate policies, plans, procedures and measurable targets for the elimination of work-related injury and illness. Bardavcol will ensure plant, substances and structures are provided in a safe condition, and will provide appropriate information, instruction, training, supervision, management and facilities as are reasonably necessary. Bardavcol will integrate health and safety measures with all elements of its work, and will monitor working conditions at each workplace under its management and control to ensure compliance with the standards adopted. Bardavcol will consult with workers, health and safety representatives, health and safety committees on relevant issues, and will consult, cooperate with and co-ordinate activities with other persons who have a duty in relation to the same work health and safety matter.

Bardavcol requires that all employees, subcontractors, suppliers, visitors, clients and their agents comply with established policies, plans and procedures and take all reasonable steps to protect their own health and safety and to avoid adversely affecting the health and safety of any other person whilst at work. In particular, it is the duty of all personnel to use equipment provided for health and safety purposes, to identify and report any observed workplace hazards, and to obey all reasonable instructions in respect of health and safety.

Bardavcol is committed to a process of continuous improvement. Accordingly, Bardavcol will monitor, measure, evaluate and report its performance in the achievement of the stated objectives and targets.

This policy statement shall be displayed prominently at every Bardavcol worksite, and will be reviewed annually in consultation with Bardavcol's health and safety committee and Bardavcol's employees to ensure it remains relevant and appropriate to Bardavcol's activities.



Darren Foster
Managing Director

April 2014

Rev 3

CP01

PROJECT MANAGEMENT PLAN**QUALITY POLICY STATEMENT****BARDAVCOL**

Bardavcol Pty Ltd is an independent company based in South Australia, undertaking Civil Engineering construction work for a wide range of South Australian and Federal Government bodies, statutory authorities, local government and private developers.

The company recognises that its customers are entitled to expect that all materials and services will conform to their specified requirements and undertakes to manage and conduct its business in a manner that will meet this expectation.

This will be achieved through planning, implementation, monitoring, control and verification of all aspects of the work as defined in this manual and in the applicable contract.

To achieve this objective it is the policy of Bardavcol Pty Ltd to establish and maintain an effective and efficient quality management system which:

- Will produce objective evidence that the customer's specified requirements are met;
- Will ensure that all subcontractors, suppliers and employees of Bardavcol Pty Ltd whose performance may affect quality will be involved and will comply with this policy and all the requirements that are derived from this policy.
- Will ensure a commitment to continually improving the effectiveness of its Quality Management System by seeking customer feedback, and by evaluating its own performance against established corporate objectives and key performance indicators at all levels of the business.

The quality management system which Bardavcol Pty Ltd use is designed in accordance with the requirements of International Standard 9001:2008 "Quality Management Systems".

The company's Systems Procedure Manual, which describes the quality management systems, is conveyed to all staff and is available to Clients on request



Darren Foster
Managing Director

CP03

PROJECT MANAGEMENT PLAN

ENVIRONMENTAL POLICY STATEMENT

BARDAVCOL

It is the firm policy of Bardavcol Pty Ltd to proactively support the protection of the natural environment for the benefit of current and future generations.

Accordingly, Bardavcol will ensure, so far as is reasonably practicable, that the environmental impacts of all its activities, products and services are controlled to prevent pollution and to comply with all relevant Acts, Regulations, Standards, Codes of Practice and customer requirements pertaining to environmental management and protection.

To achieve these objectives, Bardavcol will establish, implement and maintain appropriate policies, targets, plans, procedures and systems of work relating to environmental management. Bardavcol will integrate environmental management measures with all elements of its work, and will monitor environmental conditions at each workplace under its management and control to ensure compliance with the standards adopted.

Bardavcol will further provide appropriate information, instruction, training, and supervision as reasonably necessary to achieve these objectives.

Bardavcol requires that all persons who work for or on behalf of the company, including all employees, subcontractors and suppliers, and those persons who visit Bardavcol workplaces, comply with established policies, plans and procedures and take all reasonable steps to protect the natural environment, prevent pollution and minimise adverse environmental impacts whilst at work.

Bardavcol is committed to a process of continuous improvement. Accordingly, Bardavcol will monitor, measure, evaluate and report its performance in the achievement of the stated environmental objectives and targets, and amend its practices as necessary. Bardavcol will review this policy and objectives annually to ensure continuing relevance and effectiveness.

This policy statement shall be communicated to all persons working for Bardavcol and shall be displayed prominently at every Bardavcol worksite.



Darren Foster
Managing Director

CP04

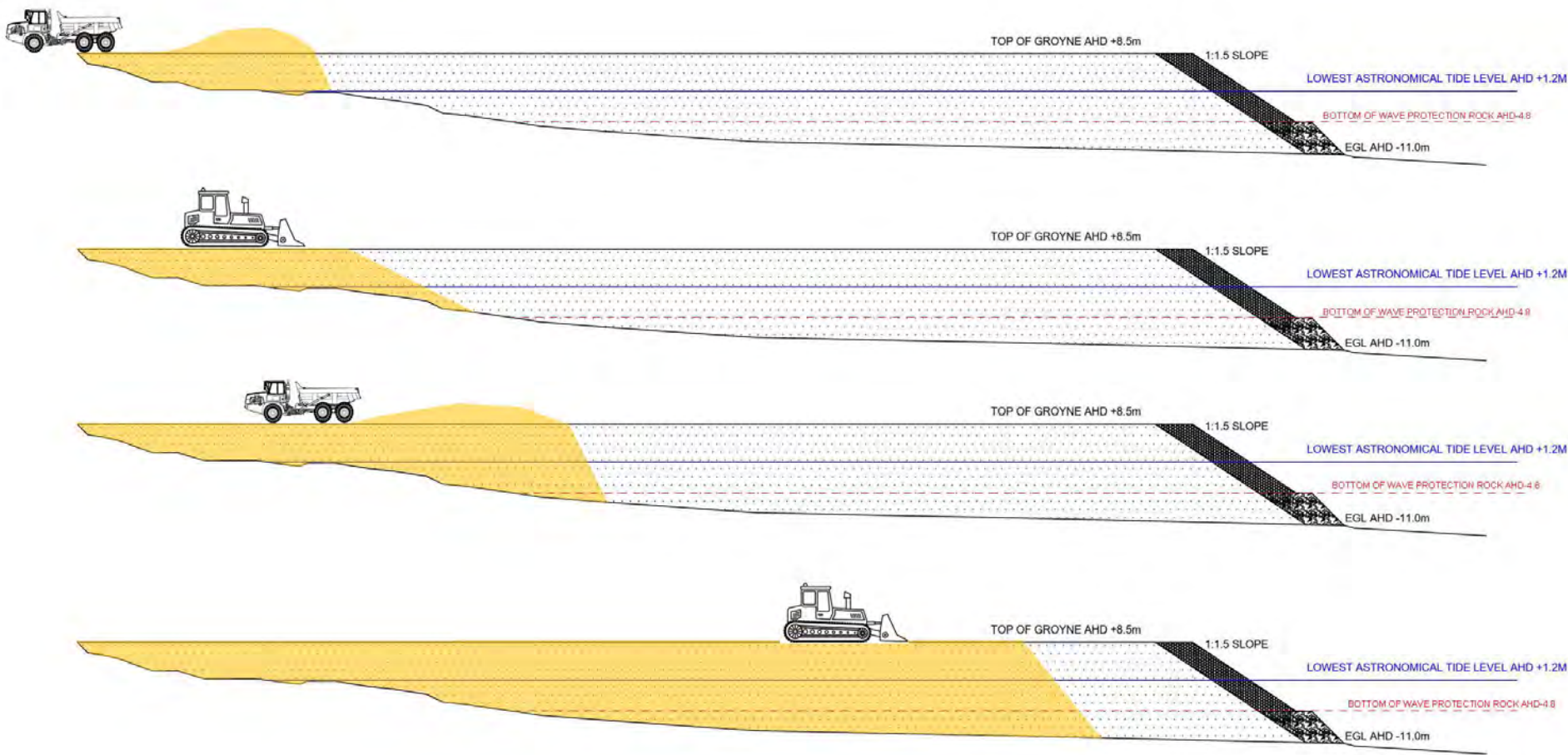
APPENDIX F

Methodology

- Groyne Construction Methodology (to be developed further on approval and final design)
 - Rock Processing

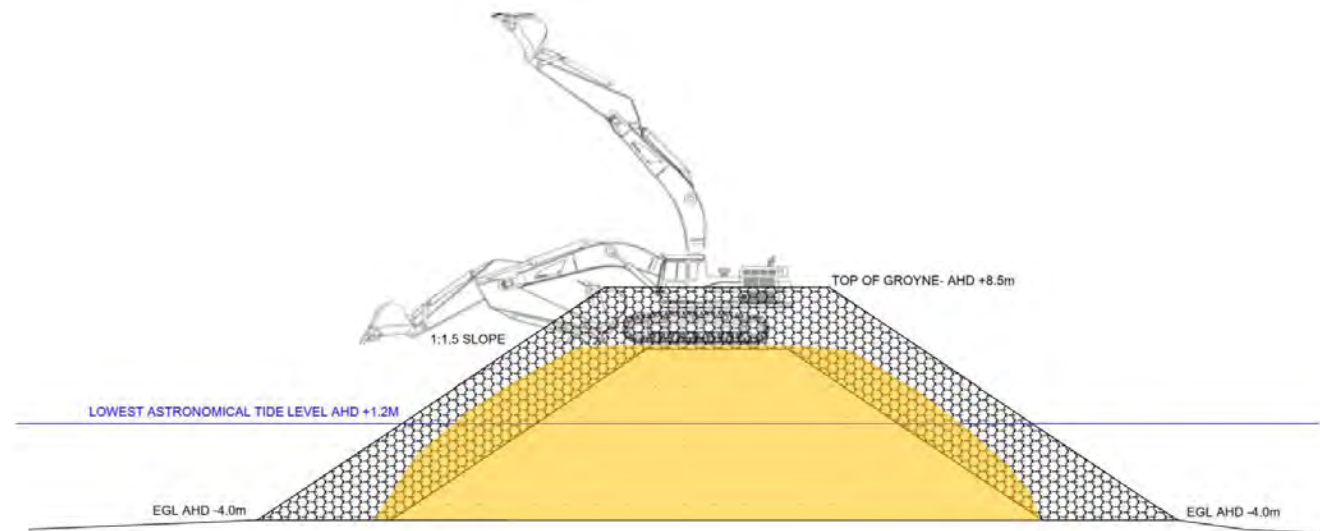
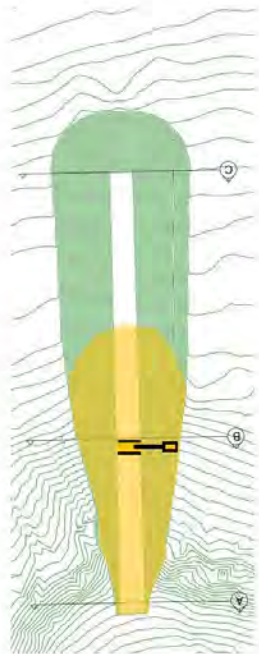
PROJECT MANAGEMENT PLAN

A combination of trucks and a dozer to create a platform out into the water over footprint of groyne



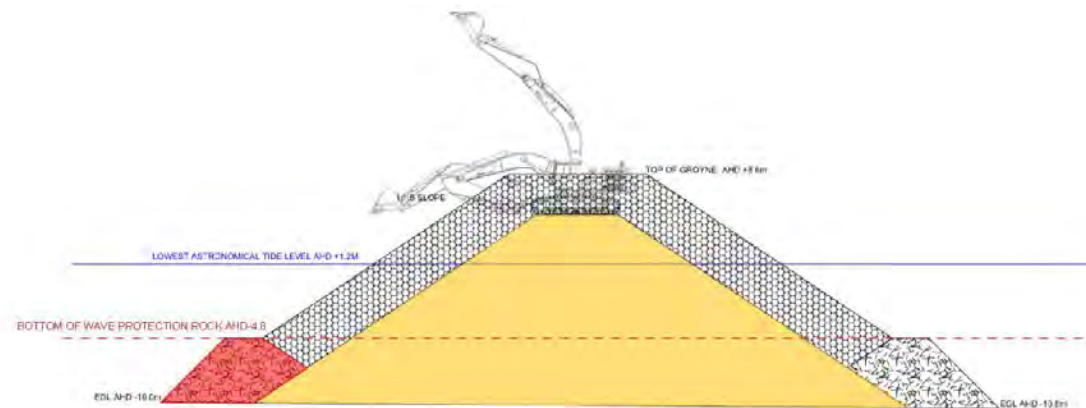
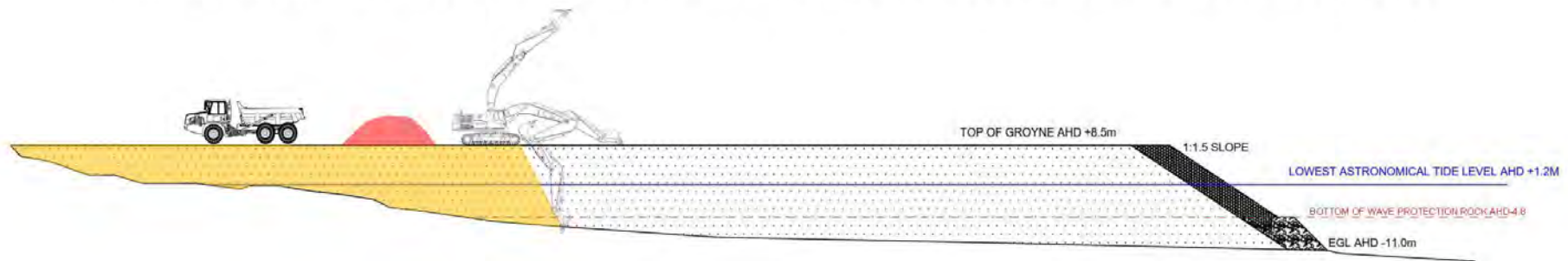
PROJECT MANAGEMENT PLAN

A long reach excavator is to trim the batters from the platform created by the trucks and dozer



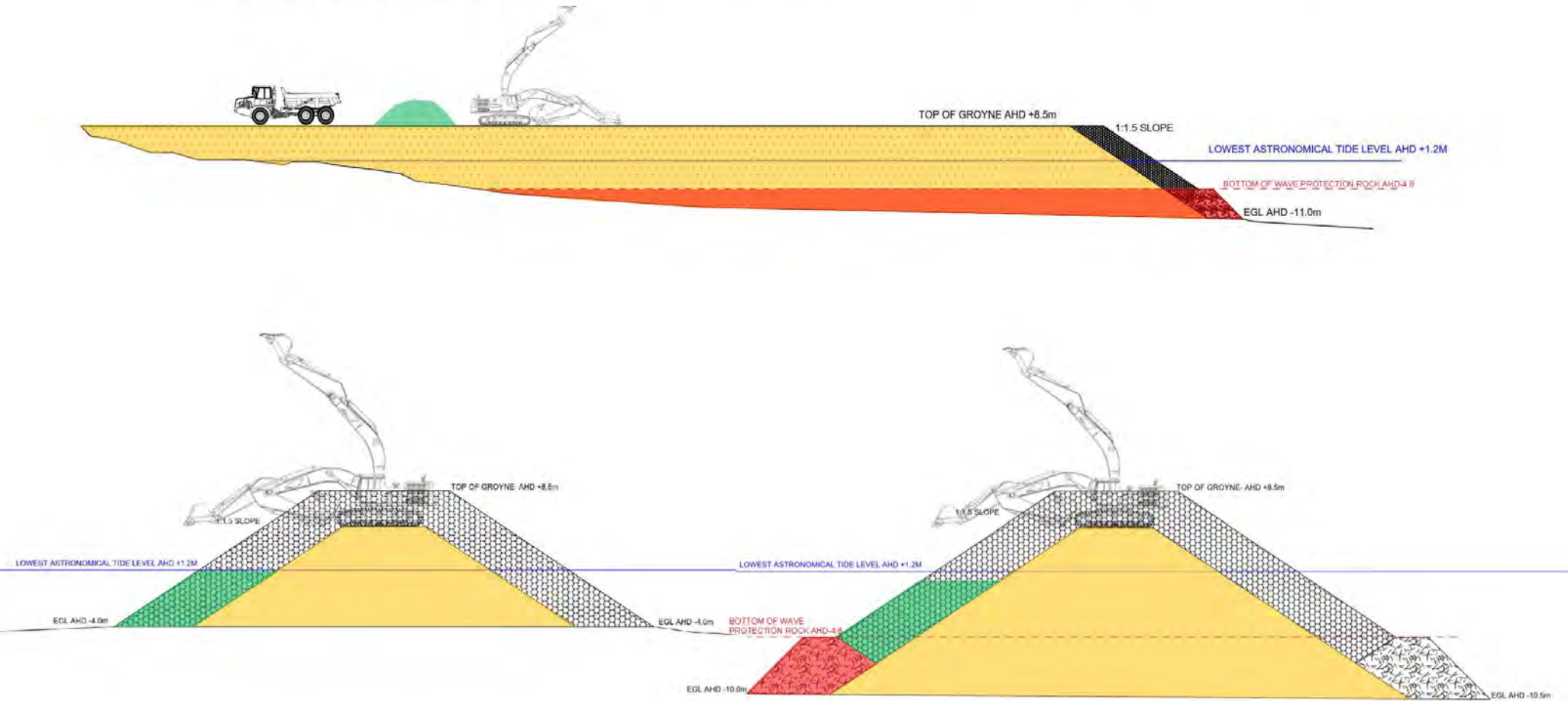
PROJECT MANAGEMENT PLAN

A truck is to end tip the 1-2 tonne armour rock onto the trimmed core and an excavator is to place the rock on/roll the rock down the Groyne batters to create a bench for the 8 tonne rock to sit on



PROJECT MANAGEMENT PLAN

A truck is to end tip the 8 tonne armour rock onto the trimmed core and an excavator is to place the rock on the Groyne batters



APPENDIX G

Trigger, Action, Response Plan

APPENDIX H

Soil Erosion & Drainage Management Plan (SEDMP)

(Landside Works)



APPENDIX I

Blast Management Plan



Project No. T6258

PORT SPENCER GRAIN EXPORT FACILITY

BLAST MANAGEMENT PLAN

Prepared by	Date:	Reviewed by	Date	Approved by	Date	Revision
Anthony Paradiso	09/04/2020	T O'Connell	20/4/20			A

BLAST MANAGEMENT PLAN

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BLAST MANAGEMENT PLAN

1. Project Location:

The blasting works are to be undertaken on the north side of Lipsin Cove Road, Lipson, SA, 5607 as shown in Figure 1. Access is via Lipsin Cove Road off Lincoln Highway.



Figure 1: Location of Drill & Blast Works

2. Scope:

This Blast Management Plan (BMP) applies to the works associated with drill and blast of approximately 275,000m³ of rock for the Port Spencer Grain Export Facility project.

3. Purpose:

To ensure compliance with the contract, specifications, relevant Australian Standards, Acts and Regulations.

4. Objectives:

To detail actions and procedures to be carried out during the Port Spencer Grain Export Facility in order to achieve the desired outcome with the minimum impact on the surrounding environment.

The desired outcomes are:

- Ensure that all obligations contained within the project documents and other legal and regulatory controls relevant to the drill and blast works are implemented,
- Ensure that policies, objectives and targets satisfy the requirements of approval authorities are established,
- Identify risks and hazards associated with the drill and blast works, including control and/or mitigation.
- Introduce blast as part of the overall task in a planned manner,
- Control the blast process from design to initiation, evaluation and misfire treatment,
- Assure the safety of the public, site personnel and surrounding properties,
- Identify site specific requirements,
- Define a processes to audit, inspect, review, update, record and monitor the performance and effectiveness of the Blast Management Plan, and
- Impacts from drill and blast works to be identified through monitoring and minimised where possible.

BLAST MANAGEMENT PLAN

5. Surrounding Infrastructure:

The closest infrastructure to the blast zone is a resident approximately 830m from the blast area. Marine monitoring is a requirement to ensure whale in the gulf are not impacted by blasting works

AS 2187.2 details that ground vibration and airblast produced by blasting falls into two categories: -

- those causing human discomfort; and
- those with the potential for causing damage to structures, architectural elements and services.

For human comfort Appendix J of AS2187.2 specifies: -

- A vibration limit of 5mm/s for 95% blasts per year with a 10 mm/s maximum
- An airblast limit of 115 dBL for 95% blasts per year with a 120 dBL maximum

It should be noted that the vibration levels at which people become annoyed are well below vibration levels at which damage occurs. Accordingly the limits provided for human comfort are less than the limits that would result in damage to the structure.

Monitoring (land and marine (whale)) will be undertaken during blasting to ensure the vibration at these locations is within the specified limits or that whales are not within 1500 m of the blast site when blasting. Further a complaints register will be maintained for the works to log any complaints from the drill and blast works. Refer to section 11 for further details on the monitoring.

6. Responsibilities:

a) Project Manager

- i) Development of the BMP,
- ii) Engage a suitably qualified sub-contractor to undertake the drill and blast works,
- iii) Management of drill and blast sub-contractor,
- iv) Determine work methods in consultation with the Site Manager and drill and blast sub-contractor,
- v) Review and approve the Safe Work Method Statement (SWMS) provided by the drill and blast sub-contractor,
- vi) Ensure all drill and blast works are undertaken in accordance with the BMP, and
- vii) Review and approve any amendments to the BMP.

b) Project Engineer

- i) Review and amend the BMP as required,
- ii) Monitor site works for conformance with the BMP,
- iii) Ensure that blast monitoring is undertaken in accordance with the BMP,
- iv) Provision of the Blast Reports to Promanage,
- v) Manage blast notification boards,
- vi) Provide training to the blast buards in conjunction with the drill & blast sub-contractor,
- vii) Issue of blast permit,
- viii) Notification to stakeholders prior to blasts,
- ix) Ensure all workers are inducted into the site and relevant SWMS,
- x) Liaise with Promanage and respond to any complaints received,
- xi) Ensure all Hold Points and Witness Points are complied with,
- xii) Develop a traffic management plan for the work,
- xiii) Ensure that blast design reports are provided to Promanage, and
- xiv) Maintain a calibration register for the monitors.

c) Site Manager

- i) Ensure all workers are inducted into the site and relevant SWMS,
- ii) Fill the role of blast controller,
- iii) Provide training to the blast sentries,
- iv) Manage the site clearance process prior to the blasts,

BLAST MANAGEMENT PLAN

- v) Ensure all workers on site are aware of the blast activities and exclusion zones in place,
- vi) Implement traffic management for the blast,
- vii) Provide safe access to site for the drill and blast sub-contractor, and
- viii) Co-ordinate works with the drill and blast sub-contractor.

d) Drill and Blast Subcontractor

- i) Provide SWMS for the works for approval by Bardavcol,
- ii) Provide risk assessment for the works,
- iii) Provide a detailed Blast Management Plan for the design of the blasts and the management of the physical blasting works,
- iv) Provide a blasting safety procedure,
- v) Provide onsite training for blast controller and blast guards,
- vi) Coordination of works with the Bardavcol management team,
- vii) Provision of blast designs that meet the project requirements,
- viii) Apply for blast permit,
- ix) Ensuring blasting works are carried out in accordance with the relevant Australian Standards,
- x) Provision of licensed explosive transport vehicles ,
- xi) Provide suitably licensed and experienced shot firers to manage the works, and
- xii) Provision of the Blast Report to Bardavcol.

7. Responsible Persons / Contacts

Name	Company	Position	Mobile	Email
Ben Vreugdenburg	Bardavcol	Project Manager	0488 104 464	BVreugdenburg@bardavcol.com.au
Ian Quick	Bardavcol	Project Engineer	0408 664 439	IQuick@bardavcol.com.au
Cranstone Turner	Bardavcol	Site Manager	0419 818 979	cturner@bardavcol.com.au
Mick Carroll	A&M Drilling and Blasting Services	Managing Director	0427 005 521	asiandrilling@gmail.com

8. Licences:

Copies of all relevant licences for the shotfirers to undertake the works on site are attached in Appendix D.

9. Blasting Methods

The current drill and blast methodology is provided in Appendix E.

9.1 Preliminary Blast Design

All blasts on the project will be designed to ensure that the required design criteria is achieved. The blast design will consider the following: -

- Fragmentation,
- Movement,
- Environmental considerations,
- Preservation of the stability of adjacent rock, and
- Minimization of back-break/over-break.

A document control process will be established to ensure that all persons involved in the blast operation have access to all necessary documentation, including the correct blast design for the task. Final blast designs will be provided to Promanage 24 hours prior to the blast.

All blast designs will be reviewed to ensure that the project outcomes are achieved and if not the blast design will be modified.

BLAST MANAGEMENT PLAN

9.2 Blast Monitoring

Bardavcol will undertake the blast monitoring in house using Texcel GTM blast monitors. Each monitor will require calibration every 12 months; these calibration certificates will be provided to Promange prior to use of the vibration monitors. Texcel will provide training in the use of the monitors to the Project Manager and Project Engineer.

The specified ground vibration limits are shown in the below table:

Description	PPV (mm/s)
Residential houses	5

Blast monitors will be implemented to monitor the blast and positioned in the following locations: -

- Nearest residential property approximately 830m north west of the blast site;
- 600m east of the blast site; and
- Lipson Cove Road 900m south west of the blast site.
- Marine Monitors to observe the presences of whales in the gulf within 1500 lm of the blast

The results of the monitoring will be provided to Promange after each blast as part of the Blast Report. Should the limits be exceeded a Blast Exceedance report will be provided to Promange. The blasts will also be filmed in high definition to monitor fly rock. Marine monitors will provide a written report of their activities for each blast.

9.3 Blast Warning Systems

Prior to the commencement of blasting works on site notification signs will be installed at the main compound entrance gate.

On the day prior to the blast the Project Manager or delegate will undertake the following notifications:

- Mark the time and date of the blast on the blast notification signs
- Provide blast details to the following:
 - Promange – Mark Wilson (m.wilson@promanage.com.au)
 - Call or email the landholders within the immediate vicinity
 - SAPOL – TBC (TBC)
 - Safework SA – Luke Brammy (luke.brammy@sa.gov.au) & Brett Pfeffer (brett.pfeffer@sa.gov.au)

On the day of each blast the Project Manager or delegate will adjust the site blasting signs to show that there will be a blast today. The site manager will notify the project personnel of the blast during the daily prestart including an outline of the no go zone during the loading of the shot and the site clearance procedure prior to blasting.

When the blast has been loaded the shotfirer will indicate to the Bardavcol Blast Controller that the site is to be cleared. The blast controller will then direct all workers on site to park their plant clear of the blast and proceed to the site offices. The Blast Controller will then request the blast sentries take up their positions as attached in Appendix K.

- Lipson Cove Road at the locations stopped to traffic
- Site compound location, and
- Private access road to the north east of the blast zone.
- Marine Monitors having undertaken their surveillance will be stationed at the site compound and report clearance or otherwise to the Blast Controller

Traffic Management will be set up in accordance with the attached plan in Appendix H on Lipson Cover Road to close the road at the locations documented in the traffic management plan. A detour cannot be implemented since Lipson Cove Road is a no through road, further the road will be subject to closure for a short period of time.

Once the sentries are in place the Blast Controller will confirm with each blast sentry and Marine monitor via UHF radio that their area is secure. A single Siren Runs will then be undertaken by the Site Manager as follows:

- Blast Zone to the site compound to clear the site;

BLAST MANAGEMENT PLAN

- Lipson Cove Road between the road closures; and
- Private access road to the east of the blast site to the beach to the north of the blast site.

On successful completion of the siren run the Blast Controller will check with each of the blast sentries that their areas are still secure and clear and he will then hand over the cleared site over to the shotfirer for blasting. The shotfirer will call “firing in 5 seconds” and give a countdown to the blast.

The blast shall be inspected by the shotfirer and if there are no misfires, shall advise the guards that it is “all clear”

All personnel whom will be a blast sentry shall have specific training undertaken by the Bardavcol blast controller to outline the importance of their roles, timing and communication protocols to be used. During this training each sentry will be provided with a copy of the blasting safety procedure. At completion of the training and prior to the first blast a dry run will be undertaken to ensure the clearance procedures are implemented correctly.

9.4 Blast Safety Management

Refer to A&M Drilling & Blasting Services Safe Work Method Statement in Appendix B.

9.5 Review and Development

After each blast the Blast Management Plan, blast design and monitoring results will be reviewed by the Bardavcol Project Engineer and drill and blast sub-contractor and changes implemented as required to insure the Blast Management Plan objectives and specified requirements are met.

10. Records

- Site Induction Records
- SWMS
- Plant Inspections
- Blast Designs
- Blast Reports
- Safety Inspections
- Complaints Register
- Prestart Meeting Records
- Blast Guard Safety Training Register
- Blast Permits

11. References

- AS 2187.0-1998 Explosives – Storage, Transport & Use – Terminology
- AS2187.2-2006 Explosives – Storage & Use – Use of Explosives
- AS1678 Emergency Procedure Guide – Transport
- South Australia Explosives Regulations 2001
- South Australia Explosives Act 1936
- The Australian Dangerous Goods Code Edition 7.4
- Australian Code for the Transport of Explosives by Road and Rail 3rd Edition

12. Schedules

- Appendix A - A&M Drilling & Blasting Services: Blast Management Plan
- Appendix B - A&M Drilling & Blasting Services: SWMS
- Appendix C - A&M Drilling & Blasting Services: Risk Assessment
- Appendix D - A&M Drilling & Blasting Services: Licences

BLAST MANAGEMENT PLAN

- Appendix E - A&M Drilling & Blasting Services: Drill & Blast Methodology
- Appendix F - A&M Drilling & Blasting Services: Blast Report Template
- Appendix G - A&M Drilling & Blasting Services: Blasting Standard Operating Procedures
- Appendix H Lipson Cove Road Traffic Management Plan
- Appendix I Vibration Monitor Calibration Certificates
- Appendix J Blast Permit
- Appendix K Blast Sentry Positions & Siren Run

Appendix A

A&M Drilling & Blasting Services

Blast Management Plan

BLAST MANAGEMENT PLAN



WORK DEPOT: LOT 100 REFINERY ROAD, LONSDALE S.A. 5160

HEAD OFFICE: 21 BURNHAM ROAD, KINGSTON PARK S.A. 5049

PHONE: (08) 8296 7411

FAX: (08) 8296 7422

MOBILE: 0427 005 521 EMAIL: amdrill@senet.com.au

www.amdrillingandblasting.com.au

Blasting Management Plan

Project Identification Bardavcol Pty Ltd

Prepared and Authorised by:

Mick Carroll

Director

A & M Drilling and Blasting Services

Dated 27/3/20

BLAST MANAGEMENT PLAN

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Part I: Security Arrangements / Warning details.....	6
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BLAST MANAGEMENT PLAN

Section 1: Blast Plan For Port Spencer Wheat Silo Project

Part A: Brief Blast Summary

Site where blast conducted	
Brief description of this type of blast	
Objectives for the blast	

Part B: Details of Key Appointments, Permits and Responsibilities

Details of blast plan author and category

Name and category	Michael Carroll		
Company name and address	A & M Drilling and Blasting Services 100 Refinery Road Lonsdale SA		
Position	Managing Director		
Contact details	Phone 0427005521	Fax:	Mobil:0427005521
Email	asiandrilling@gmail.com		

Details of site manager/principal employer giving approval to use explosives

Name	Mick Carroll		
Position	Director		
Company name and address	AM Drilling and Blasting Services Pty Ltd 100 refinery Road Lonsdale SA		
Contact details	Mick Carroll	Fax:	Mobile:0427005521
Email	asiandrilling@gmail.com admin@amdrill.com.au		

License Holders

Name	License Description	License Number	Expiry Date
Mick Carroll	SA Blaster licence	1189	31/03/21

Permits

BLAST MANAGEMENT PLAN

Name	Permit Description	Permit Number	Issuing Authority
Mick Carroll	Blasting licence	1189	Safe work SA

Part C: Site Specific Training

All personnel working on site must have the following training in addition to their standard work place training.

Training Requirement	Who
White Card Induction	All
Weather Event (Lightning)	All personnel must attend prestart meeting. This must be discussed that site will be evacuated and blast guard procedure enforced if a shot has commenced loading with explosives and a lightning event occurs. Blast Guards must remain in place until lightning has cleared.

All personnel involved with blasting will communicate using UHF channel to be confirmed.

A&M Drilling and Blasting Service will use the following procedures as part of their blast design, drilling, quality control, loading, stemming and firing of the blasts.

Document:

Document:

Document:

Document:

Part D: Blast Risk Management

Risk Assessment will be conducted by Drew Martin, Principal Drill and Blast Engineer, Blast It Global.

Document: "

Part E: Blast Design Procedure

All blast will be designed to ensure that the design criteria's that are required are achieved. The Risk Assessment documents the required engineering controls combined with standard best practice drill and blast design processes. Design control will include:

- Restrict Maximum Instantaneous Charge (MIC)
- Ensure that a minimum stemming length of
- Ensure that an mm blast hole or less is used
- Ensure that a minimum of 500 m exclusion zone is used for the Blast Exclusion Zone (BEZ);
- Non-electric initiation system, Electrical Hazards thunderstorm

The blast design parameters that will be used for the initial blast and proceeding blasts, if the post blast review concludes that these parameters meet the required blast results are documented in table 1.

Parameter	Dimension
-----------	-----------

BLAST MANAGEMENT PLAN

Bench Height (m)	
Hole Diameter (mm)	
Max Hole Depth (m)	
Sub drill (m)	
Stemming (m)	
Burden – Front Row (m)	
Burden (m)	
Spacing (m)	
Max Charge Weight (kg)	
Max Number of Holes Initiating in 8ms Interval (MIC)	
Distance to Nearest Structure (m)	

Table 1 Blast Design Parameters

A minimum of 150 blast holes per shot for a 10 metre holes will be loaded, stemmed, and fired on the same day.

The actual blast design parameters will be recorded on the A&M Drilling and Blasting Services Blast Report, documented in Appendix 1.

Part F: Initiation System

As per the Risk Assessment, the risk associated with premature initiation from stray currents and static current will be eliminated by using a non-electric initiation system. The Johnex or Orica brand of Exel Connectadets™ will be used. The initiation sequence will use a 400ms or 500 ms MS Down hole detonator delay. The surface connectors will use a combination of 17,25,42 millisecc connectors.

Technical Data Sheet and MSDS available at:

http://www.oricaminingservices.com/au/en/page/products_and_services/initiating_systems/initiating_systems

The shot will be initiated by using a non-electric lead in line to allow the Shotfirer to retreat to safe location. An approved shot shell stomper will be used to initiate.

A tie up plan will be complete prior to tying up of the blast. This tie up plan will form part of the post blast report.

Part G: Blast Reporting and Post Blast Reporting

The A&M Drilling and Blasting Services Blast Report is documented in Appendix 1. This report will be completed, post every blast. The report must be completed with 24 hours of firing the blast.

Part H: Sensitive Structures

As part of the Blasting Risk Assessment sensitive structures were identified and the required controls documented to ensure that minimal to no disturbance was caused to the surrounding community. Site infrastructure was also assessed for potential damage, with controls also established, which are the controls that are used in the blast design process.

Sensitive structures that were identified:

- Residential houses m complies with AS2187.2-2006 Appendix J Air blast Overpressure limits and Blast Vibration limits, 120 dbL and 0.5mm/s¹ correspondingly;
-
-
-
-
-

Details of the assessments and controls is documented in the risk assessment.

Document:

BLAST MANAGEMENT PLAN

Part I: Security Arrangements / Warning details

Describe security procedures for the site and the blast, including explosives	Initiation systems transported to site. Accessories in approved vehicle. Explosive vehicle escorted onto site by licensed Shotfirer. Blast area barricaded with signs No Entry Explosives. Authorised personnel only to enter. Explosives vehicle parked within barricaded area and locked when not attended.	
Detail communication system(s) between people involved or in the vicinity of the blast	Entry to the barricaded blast area will require personnel to communicate to the appointed Shotfirer and request permission to enter.	
Advanced warning	<input checked="" type="radio"/> YES <input type="radio"/> NO	
Audible warning	<input checked="" type="radio"/> YES <input type="radio"/> NO	
Sentries	<input checked="" type="radio"/> YES <input type="radio"/> NO	
Traffic management	<input checked="" type="radio"/> YES <input type="radio"/> NO	

Part J: Blast layout Plan

As part of the requirements for quality control and legislation the driller will be provided with a blast plan, which will include the following information:

- Hole No.
- Hole Diameter (mm)
- Hole Depth.
- Hole Angle.
- Burden (m)
- Spacing (m)
- Room to provide comments.
- Any additional information that may be required to drill the blast out accurately and safely.

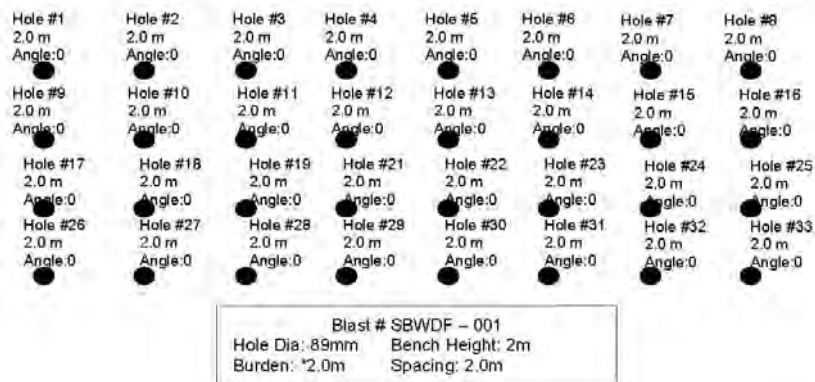


Figure 1 Example Pattern Layout Plan (Drillers Plan)

BLAST MANAGEMENT PLAN

Part K: Firing Times and Blast Clearance

The blasting time will be decided a minimum of 24 hours in advance of the blasting time. The shot firer and the Manager will authorise the firing times and communicate the firing times to neighbours of the facility, employees of the facility and the public for the initial blast.

All blast will be fired during the day at 5pm on that day this may change from time to time weather depending.

The expected blast time would be between. Blast notifications will be at the Bardavcol office and crib room.

The Blast Exclusion Zone (BEZ) will be a minimum of 500mts from the blast boundaries. The BEZ may be greater than the defined minimum distance. Appendix 2 displays the blast guard locations, which are greater than 500mts from the blast boundaries. The BEZ distance have been determined using an industry standard documented in the Blasting Risk Assessment.

Document: Bardavcol project Blasting Risk Assessment Rev1

The blast clearance will follow the procedure documented in the attached document:

Document: A&M Drilling & Blasting - Blast Guard Communications Procedure 27/3/20

Part L: Misfire Management

The misfire management will follow the produce outlined in the attached document.

Document: A & M Blast Procedure.pdf

Part M: Influence of Weather

If an electrical storm is approaching during loading, the site must be evacuated to the clearance distances outlined in Part K of this document and the blast guards established until the Shotfirer give the all clear for the weather event passing.

Appendix 1 Blast Report Template

[illegible]

Appendix 1 Blast Guard Locations to be discussed on site

Appendix B

A&M Drilling & Blasting Services

SWMS

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



1. Company Details							
Company Name:		A & M Drilling and Blasting Services Pty Ltd 100 Refinery road Lonsdale SA.					
Contact Name:		Mick Carroll – 0427 005 521					
2. Activity Details							
Activity/ Task:		Drill & Blast Activities for construction rock removal for the Port Spencer Project.				SWMS #	A&M 001
Location:		21 kilometres North of Tumby Bay SA					
3. SWMS Preparation							
SWMS prepared by:				Name:	Mick Carroll	Date:	27/3/20
				Version #	1		
Workers who have had input in the development of the SWMS:				Name:	Michael Craker		
Name:		Daryl Prunnell		Name:	Michael Carroll		
4. Minimum PPE Requirements							
PPE	Y/N	PPE	Y/N	PPE	Y/N	PPE	Y/N
Safety Boots (Steel Cap)	Y	Hi Vis Shirt,	Y	Safety Glasses	Y	Gloves	
Hard Hat	Y	Long Trousers	Y	Long Sleeves	Y	Dust Mask	
Sunscreen	Y						
5. Any Hazardous Substances?							
Product Name	SDS Attached	Quantity (kg/l)	Product Name	SDS Attached	Quantity (kg/l)		

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



Diesel					
--------	--	--	--	--	--

6. Plant & Equipment Needed		
Item:	Inspection/ Maintenance Requirements:	Licence/ Ticket required to operate?
Drill Rig – Atlas Copco ECM720 x 2	Pre-start checklist / as per maintenance schedule	VOC
Light Vehicles x4	Pre-start checklist / scheduled services	D/L
Hand Tools		

7. Qualifications & Licences							
Qualifications & Competency / Name:	Michael Carroll	Gerard Pike			Tuang Beekman		Michael Cracker
White Card:	860070	458521			458522		40239000415601
Driver's Licence:	955109 (29/1/2030)	3087020 (28/1/2022)			1129823 (29/11/2021)		3999113 (5/3/2023)
Shot Firer License: South Australia:	No 1189 Expire 31/03/21						
Dangerous Goods Security License:	SCER (000184)						DGC023212 (19/10/2020)
Explosive License:							

(Page 3 of 7)

Signed 22/1/20 (rev 1)

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



8. Emergency Planning		
Emergency Type:	Emergency Equipment Available:	Location of Equipment:
<input type="checkbox"/> Fire	Fire Extinguisher	On vehicles
<input type="checkbox"/> Injury	First Aid Kit (phone)	Passenger side of LV
<input type="checkbox"/> Other		

9. National Legislation, Codes of Practices & Australian Standards	
1. Work Health & Safety Act 2012	5. Drill & Blast Methodology.
2. Explosive Act 2003	6. Port Spencer Project A&M Drilling Procedure.
3. Work Health & Safety Regulation 2012	7. Blasting Communication Procedure.
4. Explosive Regulation 2013	

10. Safe Work Method Statement

STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (S)
1	Prestart on Plant	Unplanned movement Accidental Start-up	H	Refer Attached: Isolation and Tagging Procedure Pre-Start Check Procedure Competent licensed operators Ensure 3 points contact maintained	M	Supervisors Operators

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (S)
2	Access to Work Area	Traffic interface of operational plant and other vehicles Slip trips and falls Road conditions	H	All personnel to read and sign on to swms prior to commencement of work No unauthorised personnel in work area All personnel inducted to site General awareness Isolate around work area Drive to conditions, 40kmh on access roads and 10kmh past personnel on ground and 20 km in the compound area.	M	All Personnel
3	Unloading Drill Rig from Low Loader	Drill Rig sliding off Low Loader	H	Ensure unloading on firm level area Rubber belting or matting used to unsure tracks grip Only experienced and competent	M	All Personnel
		Personnel struck by plant & vehicles	H	No unauthorised personnel in work area Exclusion zone established around work area Spotters in place if required Reverse Beepers and Flashing lights fitted to all machines plant and vehicles	M	
4	Approach and Set Up at Drill Location	Vehicle roll over or damage	H	No work to be undertaken on excessive grades Ensure area is correctly prepared If working near open face, dirt bund to be 1.5 metres from the face Competent and trained operators	M	All Personnel

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Friday 27/3/20 (rev 1)

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (S)
4	Approach and Set Up at Drill Location	Personnel struck by drill rig	H	No unauthorised personnel in work area Exclusion zone established around work area with barricading and signage Spotters in place if required Reverse Beebers and Flashing lights fitted to all machines plant and vehicles	M	All Personnel
		Manual handling / Slip, trips and falls	M	Use of mechanical lifting equipment where possible Follow manual handling procedure General awareness Work site housekeeping Adequate PPE as per site requirements	L	
5	Tramming Drill Rig	Damage to Drill Mast	M	Ensure drill rig mast is laid down to the horizontal position onto the mast head Bracket prior. Competent and trained operators	L	All Personnel
5	Tramming Drill Rig	Personnel struck by drill rig	M	No unauthorised personnel in work area Exclusion zone established around work area with barricading and signage Spotters in place if required Reverse Beebers and Flashing lights fitted to all machines plant and vehicles	L	All Personnel

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (\$)
6	Adding Drill Rods to Carousel	Caught in drill string by rotating of drill shank	H	No loose clothing, shirts etc. to be tucked in Isolate forward or reverse rotation with hydraulic valve installed in circuit Sensor in operator seat disengages rotation when weight is lifted from seat	M	Operator
7	Drilling Activity	Drilling into buried services, power, gas: <ul style="list-style-type: none"> • Electrocution • Explosion • Asphyxiation from gas • Damage to underground services 	H	Obtain services diagram, locate drill rig away from underground services Undertake visual check of buried services	M	Supervisors Operators
7	Drilling Activity	Drill string entanglement Loose clothing, long hair and working too close to the mast	H	Properly fitting clothes, tie back long hair, stand clear of drill rig whilst in motion Only competent trained operators.	M	Supervisors Operators
		Slip trip falls from mud spilt on hard surface, greasy ground surface	M	Minimise mud splashing and keep area clean, wear nonslip steel cap safety boots.	L	

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Friday 27/3/20 (rev 1)

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (\$)
		Fumes from drill rig or cuttings blown in air: <ul style="list-style-type: none"> Dust inhalation Foreign particles in eyes 	M	Use appropriate dust mask & ventilation Use goggles where required	L	
		Fire exhaust or cigarettes igniting long grass	M	Fire extinguisher on hand during drilling. Shroud exhaust and other heat sources from long grass and/ or other fuel sources, no smoking adjacent to rig. Clean up fuel spills immediately.	L	
		Muscle strain lifting injuries	M	Manual Handling Procedure Share load or use lifting device.	L	
7	Drilling Activity	Incorrect hole depth Heat stress / Dehydration Snake / Insect bite	M	Check depth of each hole If not to depth run back down hole as necessary If too deep, backfill to the required depth At the end of drilling each hole ensure all documentation is completed.	L	Supervisors Operators

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[Revised 27/3/20 Day 1]

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (S)
		Heat stress / Dehydration Snake / Insect bite	M	Rest breaks if required Adequate water Sunscreen Insect Repellent Adequate PPE as per site requirements	L	
8	Transport of Explosives	Explosion Vehicle accident	H	Explosives collected from A&M drilling magazine and transported in accordance with AS2187.1.2006 SAA Explosives Code 1 : Storage and Land Transport vehicle equipped with correct signage and placards as per AS2187 Clause 4.4.5 Detonators conveyed in separate approved container Transportation vehicle to be parked in an exclusive area Vehicle to be locked or facing window	M	Supervisors Shot Firer
9	Priming, Charging and Stemming of Blast Holes	Interaction with personnel and vehicle	H	Around work area with appropriate barricading and signage - Yellow witches' hats must be placed at all the access points delineating the blast area - Blast Warning signs must be displayed along the blast area No unauthorised personnel in work area	M	Supervisors Shot Firer

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Friday 27/3/20 (rev: 1)

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (\$)
		Atmospheric Activity e.g. - Dust Storms - Thunderstorms	H	All personnel to withdraw to a safe location Risk assessment to be carried if wet weather has created additional hazards	M	
9	Priming, Charging and Stemming of Blast Holes	Obstruction in the blast hole	H	All hole to be dipped prior to charging to ensure there are no obstruction	M	Supervisors Shot Firer
		Reconciliation of Explosives and Blasting Accessories	M	Once blast has been tied in, the explosives and accessories used, and remaining items are reconciled against numbers taken from explosive store.	L	
		Heat stress / Dehydration Snake / Insect bite	M	Rest breaks if required Adequate water Sunscreen Insect Repellent Adequate PPE as per site requirements	L	

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Friday 27/3/20 (rev 1)

BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



STEP	SAFE WORK METHOD STATEMENT JOB STEPS	POTENTIAL HAZARD	INITIAL RISK SCORE	RISK CONTROL MEASURES	RESIDUAL RISK SCORE	RESPONSIBLE PERSON (S)
10	Pre- Blast and Blast Procedure	Unauthorised personnel and vehicles in area	H	<p>Blast guards to be positioned themselves at the designated points that are pre-determined by the shot firer and ensuring they are beyond the exclusion zone of 500 meters.</p> <p>On notification that area is clear, the shot firer to-do an inspection of the adjacent areas is made via each blast guard location 5 minutes before the shot being fired.</p> <p>When advice is received again from the blast guards that the area is secure the blast is then initiated.</p>	L	Supervisors Shot Firer Blast Guards
11	Post Blast Procedure	Injuries and damage due to misfires	H	<p>Shot Area inspection for misfires</p> <p>No unauthorised personnel or equipment to enter shot area</p> <p>Blast Guards in place until all clear is given</p> <p>If a misfire being detected, you are to refer to Blasting Procedure, Section 9.</p>	M	Supervisors Shot Firer Blast Guards
12	Clean Up	Waste materials	M	<p>Remove all waste material from site</p> <p>Workplace inspection to be conducted to ensure waste material removed</p>	L	All Personnel

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Friday, 17/09/2010 11:11

BLAST MANAGEMENT PLAN

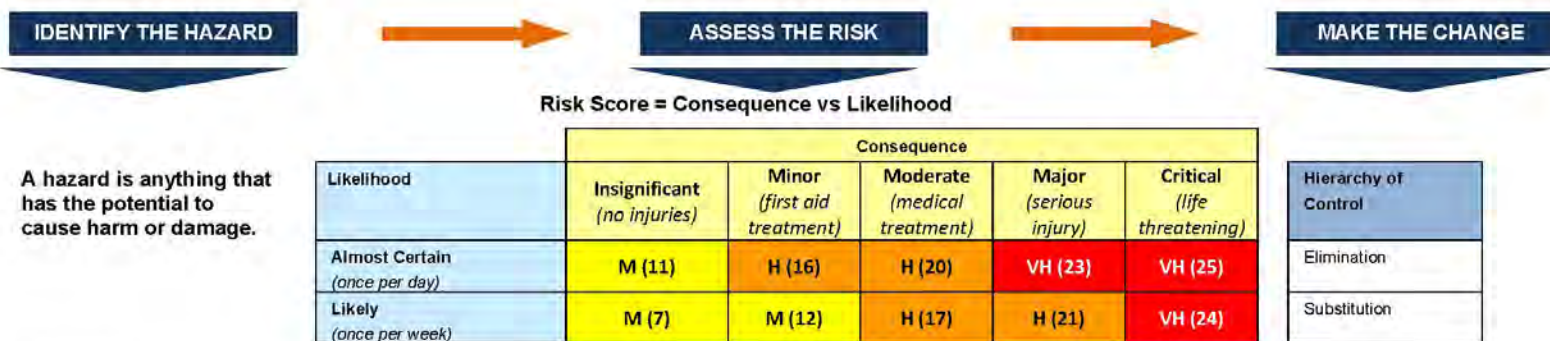
Safe Work Method Statement

A & M Drilling



11. SWMS Signoff		
Worker (name):	Signature:	Date:
I have read and understood the work steps and control measures in place		

12. Risk Assessment Matrix



BLAST MANAGEMENT PLAN

Safe Work Method Statement

A & M Drilling



Possible <i>(once per month)</i>	L (4)	M (8)	M (13)	H (18)	H (22)	Engineering
Unlikely <i>(once per year)</i>	L (2)	L (5)	M (9)	M (14)	H (19)	Administration
Rare <i>(may occur every ten years)</i>	L (1)	L (3)	L (6)	M (10)	H (15)	PPE

H18 - VH25	Unacceptable:	Immediate action required managing the risk.
M13 - H17	Issue:	Action required managing the risk.
L5 - M12	Monitor:	Action advisable if cost beneficial.
L1 - L4	Tolerable:	Manage using routine procedures.

When applying the Hierarchy of Control to reduce a risk, it is essential to recognise that 'administrative' measures do not mitigate 'consequence'. Good practice therefore requires implementation, where possible, of a higher rank control.

Appendix C


A&M Drilling & Blasting Services

Risk Assessment

Appendix D

A&M Drilling & Blasting Services Licences

BLAST MANAGEMENT PLAN


 Government of South Australia
 SafeWork SA

Explosives Carriage Licence

Client No: 25544 Printed Date: 29/07/2019 Michael John Carroll PO BOX 84 O'SULLIVAN BEACH SA 5166	Contact Details: CHEM Team ABN: 50 560 588 327 Address: Level 5 33 Richmond Road, KESWICK SA 5035 Phone: (08) 8226 4885 Email: CHEM.safework@sa.gov.au Website: safework.sa.gov.au
--	---

DETAILS

SCHEDULE S
 (Regulation 7.04 (3))
 South Australia
 Explosives Act 1936

75441

LICENCE TO CARRY EXPLOSIVES

A licence is hereby granted to :

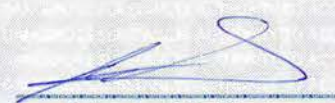
Michael John Carroll
 of **21 Burnham Road,**
KINGSTON PARK SA 5049
 to convey explosives by land in a quantity not exceeding 60kg Class 1, packaged non mixed loads
 Quantity 1: 60kg Class 1, packaged non mixed loads
 Quantity 2:
 Quantity 3:
 Total Qty: 60kg Class 1, packaged non mixed loads
 in the undermentioned vehicle owned by the said licensee, subject to the Act and Regulations.
 Make: HINO
 Type: TRUCK
 Registration No: UCM 299

This licence (unless previously revoked) shall expire on the thirty-first day of May 2020.

Dated: This first day of June 2019.

Special Conditions:



- 1) Night travel is granted pursuant to Regulation 7.11.
- 2) Maximum speed is 100km per hour, pursuant to Regulation 7.13(11).


 Delegate of the Director

This licence is to be kept in the vehicle.

Form: GL054

BLAST MANAGEMENT PLAN

Explosives Carriage Licence		 Government of South Australia SafeWork SA
Client No: 5211370 Printed Date: 25/07/2019	Contact Details: CHEM Team	
A & M Drilling & Blasting Services Pty Ltd T/A A & M Drilling and Blasting Services PO BOX 84 O'SULLIVAN BEACH SA 5166	ABN: 50 560 588 327 Address: Level 5 33 Richmond Road, KESWICK SA 5035 Phone: (08) 8226 4885 Email: CHEM.safework@sa.gov.au Website: safework.sa.gov.au	
DETAILS		
SCHEDULE S (Regulation 7.04 (3)) South Australia Explosives Act 1936		309871
LICENCE TO CARRY EXPLOSIVES		
A licence is hereby granted to : <div style="margin-left: 40px;"> A & M Drilling & Blasting Services Pty Ltd T/A A & M Drilling and Blasting Services of 21 Burnham Road, KINGSTON PARK SA 5049 to convey explosives by land in a quantity not exceeding 460kg Class 1, packaged non-mixed loads Quantity 1: 460kg Class 1, packaged non-mixed loads Quantity 2: Quantity 3: Total Qty: 460kg Class 1, packaged non-mixed loads in the undermentioned vehicle owned by the said licensee, subject to the Act and Regulations. Make: Nissan Type: Utility Registration No: WWI 743 This licence (unless previously revoked) shall expire on the thirty-first day of July 2020. Dated: This first day of August 2019. Special Conditions: 1) Night travel is granted pursuant to Regulation 7.11. 2) Maximum speed is 100km per hour, pursuant to Regulation 7.13(11). </div>		
 Delegate of the Director		Form: GL054
This licence is to be kept in the vehicle.		

BLAST MANAGEMENT PLAN

**EXPLOSIVES MIX AND USE AMMONIUM NITRATE MIXTURE**

Client No: 5211370 Printed Date: 25/07/2019

A & M Drilling & Blasting Services Pty Ltd
T/A A & M Drilling and Blasting Services
PO BOX 84
O'SULLIVAN BEACH SA 5166

Contact Details: CHEM Team

ABN: 50 560 588 327

Address: Level 5
33 Richmond Road,
KESWICK SA 5035

Phone: (08) 8226 4885

Email: CHEM.safework@sa.gov.au

Website: safework.sa.gov.au

DETAILS

SCHEDULE K
(Regulation 4.05(a))
South Australia
Explosives Act 1936

75551**LICENCE TO MIX AND USE AMMONIUM NITRATE MIXTURE**

This license is granted to

A & M Drilling & Blasting Services Pty Ltd

T/A A & M Drilling and Blasting Services

of **21 Burnham Road,**

KINGSTON PARK SA 5049

to mix and use an explosive consisting of ammonium nitrate (or a non-explosive mixture of ammonium nitrate with other substances as detailed in paragraph I hereunder) and carbonaceous or other materials as detailed in paragraph II hereunder, at the:

LICENSEE'S QUARRY AND ROADWORK SITES

Operated by the: LICENSEE

at: **VARIOUS LOCATIONS WITHIN SOUTH AUSTRALIA**

and shall remain in force until the thirty-first day of July 2020, unless previously revoked.

- I. The non-explosive mixture of ammonium nitrate with other substances shall be a mixture of ammonium nitrate with either (a) Kieselguhr; (b) calcium carbonate; or (c) such other substance as may be approved in writing by the Director.
- II. The carbonaceous or other materials to be mixed with ammonium nitrate (or non-explosive mixture of ammonium nitrate with other substances) shall be: DIESEL FUEL OIL

Special Conditions:

1) A CURRENT PERMIT TO PURCHASE EXPLOSIVES MUST BE HELD BY THE LICENSEE BEFORE ANY EXPLOSIVES CAN BE RECEIVED INTO CUSTODY, POSSESSION OR CONTROL.

2) FROM 25 JULY 2006, ASSOCIATED SECURITY SENSITIVE AMMONIUM NITRATE PERMITS AND/OR LICENSES MUST BE HELD.

This licence is granted subject to the condition that the licensee shall strictly comply with all relevant provisions of the Explosives Act, 1936, and the Regulations made thereunder.

Dated: first day of August 2019



Delegate of the Director

Form: GL082

BLAST MANAGEMENT PLAN



PERMIT TO PURCHASE EXPLOSIVES

Client No: 5211370

Printed Date: 08/04/2019

A & M Drilling & Blasting Services Pty Ltd
T/A A & M Drilling and Blasting Services
PO BOX 84
O'SULLIVAN BEACH SA 5166

Contact Details:

CHEM Team

ABN

50 560 588 327

Address:

Level 5
33 Richmond Road,
KESWICK SA 5035

Postal:

GPO BOX 465
ADELAIDE SA 5001

Phone:

(08) 8226 4885

Email:

CHEM.safework@sa.gov.au

Website:

safework.sa.gov.au

DETAILS

SCHEDULE E
(Regulation 14.07)
South Australia
Explosives Act 1936

697927

PERMIT TO PURCHASE EXPLOSIVES

Issued to : A & M Drilling & Blasting Services Pty Ltd
T/A A & M Drilling and Blasting Services
of 21 Burnham Road,
KINGSTON PARK SA 5049

and current for twelve months from the date of issue (unless previously cancelled)
for the purchase of: Blasting Explosives

Issued at: Keswick , this eighth day of April 2019.


Signature of the Permit Holder



* Inspector of Explosives
* ~~Inspector of Mines~~
* ~~Police Officer~~


* Strikeout whichever is not applicable

NOTE - On the expiration of this permit it is the responsibility of the holder to renew. Renewal notices are not sent out.

Delegate of the Director

Infonet Form: PE008

BLAST MANAGEMENT PLAN


Government
of South Australia
SafeWork SA

EXPLOSIVES MAGAZINE

Client No: 5211370 Printed Date: 25/07/2019	Contact Details: CHEM Team
A & M Drilling & Blasting Services Pty Ltd T/A A & M Drilling and Blasting Services PO BOX 84 O'SULLIVAN BEACH SA 5166	ABN: 50 560 588 327
	Address: Level 5 33 Richmond Road, KESWICK SA 5035
	Phone: (08) 8226 4885
	Email: CHEM.safework@sa.gov.au
	Website: safework.sa.gov.au

DETAILS

SCHEDULE S
(Regulation 11.04 (2))
South Australia
Explosives Act 1936

182674

LICENCE FOR MAGAZINE

A licence is hereby granted to :

A & M Drilling & Blasting Services Pty Ltd

of **21 Burnham Road,**
 KINGSTON PARK SA 5049

for a Magazine situated at Section 4416, Hundred of Kanmantoo

(Quantity to be stored not to exceed 750kg Blasting Explosives or premixed packaged commercial ANFO only) provided that the said magazine is maintained in accordance with the provisions of the Act and Regulations.

Quantity 1: 750kg Blasting Explosives or premixed packaged commercial ANFO only


Quantity 2:

Quantity 3:

Total Qty: 750kg Blasting Explosives or premixed packaged commercial ANFO only

This licence (unless previously revoked) shall expire on the thirty-first day of July 2020.

Special Conditions:
As per attached licence conditions.



Delegate of the Director

Form: GL056

BLAST MANAGEMENT PLAN

EXPLOSIVES MAGAZINE LICENCE CONDITIONS – ATTACHMENT A



These licence conditions form part of the following magazine licence to store explosives:

Licensee	A & M Drilling & Blasting Services Pty Ltd
Licence number	182674

TERMS AND THEIR EXPLANATION FORM PART OF THE CONDITIONS

Disqualification of explosives magazine by the approach of protected works where the protected works distances in place at the time of the issue of an *Explosives magazine* licence, are encroached upon by the establishment of any protected work, such as the building of houses or the making of roads, or the establishment of other works requiring protection, either inside or outside the *Explosives magazine* storage location, the *Licensee* must immediately cease the storage of explosives and return the licence to the *Explosives regulator* seeking an amended *Explosives magazine* licence or the revocation of the licence.

Where the *Licensee* of an *Explosives magazine* does not own the land on which the *Explosives magazine* is located, any site alterations by the land owner that compromise the *Explosives magazine* licence are accepted by the *Licensee* as a risk of storing explosives on that occupancy. The *Licensee* must immediately cease the storage of explosives and return the licence to the *Explosives regulator* seeking an amended *Explosives magazine* licence or the revocation of the licence.


Explosives regulator means the Director or delegated officer of the government agency assigned to the administration of the explosives legislation.

Licensee means the holder of a licence to store explosives in a magazine.

Mass of an explosive means, except where expressed otherwise in terms of net explosive quantity (NEQ), not only the mass of the explosive matter contained therein but the gross weight of the whole explosive; eg the mass of a firework includes the mass of the whole article, paper, clay, filling etc.

Protected works distances are the distances that must be maintained between magazines, and any protected works or protected places requiring protection. They include distances between magazines, process buildings and workshop buildings; and distances outside the *Explosives magazine* location to public places and open places of work in other occupancies, and distances to dwellings, public buildings, closed places of work in other occupancies and buildings or works used for storing flammable or explosive materials.

Last printed 25/07/2019 1:47:00 PM



Delegate of the Director

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Page 1 of 2

BLAST MANAGEMENT PLAN**EXPLOSIVES MAGAZINE LICENCE CONDITIONS – ATTACHMENT A****CONDITIONS**

Pursuant to Regulation 11.04 (6) of the *Explosives Regulations 2011*

1. The *Licensee* shall strictly comply with all relevant provisions of the South Australian *Explosives Act 1936* and pursuant regulations, and all lawful directions of the Director or his delegate.
2. All storage limits for explosives and the magazine locations shall comply with the details of the attached licence (No.182674) and the details supplied in the application for this licence.
3. The *Licensee* shall maintain records of all explosives received and dispatched from each magazine.
4. A current permit to purchase explosives must be held by the licensee before any explosives can be received into custody, possession or control for storage.
5. No alterations to occur to the magazine compound without prior notice and written approval from SafeWork SA.

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Delegate of the Director

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Appendix E

A&M Drilling & Blasting Services

Drill & Blast Methodology

BLAST MANAGEMENT PLAN

Drill and Blast Methodology
Compiled by Mick Carroll
AM Drilling and Blasting Services PTY LTD
Company Director.
Dated Sunday the 27/3/2020

Location Port Spencer Wheat Silo Project.

- (1) Drill pattern marked out by AM Drilling and Blast supervisor.
- (2) **Option 1 For a 10 Metre Bench**
Drill pattern to be used 3 metre spacing x 2.4 metre burden to a drill depth of 10 metres with 500 mm sub drill
Option 2 For a 6 Metre Bench
Drill pattern to be used 2.7 metre spacing x 2.3 metre burden x 6 metre to a drill depth of 6 metres plus 500mm sub drill.
- (3) Drill and Blast supervisor to provide the driller with the drilling plan, this will include location, drill depth hole size burden spacing number of holes total drill metres.
- (4) Shot firer to be in full control of loading operations, other staff to assist shot firer to sign on to the SWMS abide by the shot fires direction.
- (5) Shot firer to place bollards in red or flagging along the front of the face drop off.
- (6) Shot firer to measure each hole prior to priming the hole any blocked holes will have to be re-drilled.
- (7) Shotfirer to secure area within 8 metres of the holes that require re drilling using bollards witches' caps Orange/Red.
- (8) All holes on the drill pattern have been check for correct depth.
- (9) Shotfirer to collect explosives from the Magazine then transported in separate carrying licenced boxes then transported to the shot area in a licenced vehicle.
- (10) Shot firer to take detonators form the carrying box and to be placed by each hole. The H primers are taken from the carrying box then placed by each hole.
- (11) Shot firer and the labourers to assist placing cartridges down each hole under the shot firers control for the trial shot we have 150-gram primers.
- (12) Prior to stemming the holes each Nonel or electric det will have a rock wrapped around Each one to avoid being covered up or damaged while aggregate is being poured into Each hole.
- (13) After the shot has been loaded all excess Auto Stem to be taken of the shot and returned to the magazine.
- (14) Shot firer to place the connector dets on the ground by each hole using the required shot plan.

BLAST MANAGEMENT PLAN

- (15) Once the shot has been tied in the shot firer and the assistant walk the shot to make sure that all the connections are connected.
- (16) The shot area is secured with Bollards and signage, proceed to advise the site manager that the shot is tied in and ready to initiate.
- (17) Shot firer to advise the project manager that the shot will be ready to fire. Shot firer to advise blast guards 1,2,3,4,5 to meet in the compound or appropriate location to discuss the blast guard procedure each blast guard will have a copy of the procedure while blasting is carried out.
- (18) 30 minutes prior to blast time, blast guards move to the locations as directed by the shot firer.
- (19) 15 minutes to firing time shot firer to advise blast guards 1,2,3,4, and 5 to move into their dedicated location.
- (20) 10 minutes shot firer to advise all blast guards to move into position and block the access points in to the blast area.
- (21) Shot firer to sound siren while doing the siren run of the surrounding blast area with two-way radio to contact blast guard 1,2,3,4,5, ask that all access points be closed and are secure.
- (22) Upon confirmation that all blast guards are secure the shot firer will advise the Manager that the shot is ready to fire.
- (23) Shot firer has the siren running Manager confirms the shot to be fired shot firer to turn off the siren, restart siren for 10 seconds then fire the shot.
- (24) Shot has been fired, the shot firer will inspect the blast Checking for misfires of Connector dets or cut offs with the electric wires.
- (25) Shot firer to sound the siren for 1 minute that the blast site is safe and secure.
- (26) Shot firer to advise blast guards 1,2,3,4, and 5 that the blast site is all clear and safe, blast guards are to step down and reopen the roads and all access points. Shot firer to advise the site manager that the all clear is given.
- (27) Shot firer an assistant to clear blast site of Bollards safety cones. Blast signs clear notice boards in crib room and main offices.

Appendix F

A&M Drilling & Blasting Services

Blast Report Template

BLAST MANAGEMENT PLAN



DETAILS:			
Client:		Date:	
Location:		Stage:	
Shot-Firer:	Mick Carroll	Bench number:	
Licence #:	1189	Design RL:	
Weather:		Designer:	Mick Carroll
Rate Code:		Vibration Monitored:	

DRILL PATTERN:			
Blast Hole Diameter: 102mm	Hole Depth:	Minimum Hole Depth:	
Burden: metres		Spacing: metres	
Estimated BCM:		Actual BCM Volume:	
Number of Holes:		Number of Rows:	
Ave. Bench Height:		Sub-drill:	0.5
Ave. Powder Factor:		Blast Type:	
Pattern Type:		Blast Hole Inclination:	80 degrees
Nature of Blast Face:		Total Drilled Metres:	

EXPLOSIVES:			
Primer:	400-gram PPP	Primer Qty:	
Primer type:	150-gram H Primer Booster 32x 200mm	Primer Qty:	
Anfo :		Anfo Qty:	
Emulsion:	Super Dry 60 / 40 @ 1.15 density	Emulsion Qty:	
Detonator type:		In hole delays:	
Nonel 6 metre x 425m/s	Qty units		
Nonel 12 metre x 400m/s	Qty		
Nonel 18 metre x 400m/s	Qty units		
Connector Dets Surface:	Connector Dets:		Total Connectors.
6 metre 17m/s	Qty units		
6 metre 25m/s	Qty units		
6 metre 42m/s	Qty units		
	Qty		
Safety Fuse:	Metres: used	Initiation type:	Nonel

BLAST MANAGEMENT PLAN



Firing lead inline:	Metres: Not used Safety fuse 2 metres	Charge Configuration:	
---------------------	--	-----------------------	--

BLAST VIBRATION PREDICTION:				K Factor:	B Factor:	
Monitor:	PPV Limit:	Rows:	Distance (m):	Predicted PPV (mm/s):	Max Charge for PPV (kg)	MIC (kg)
Stemming material: Drill chippings.		10 -14 -20 mm aggregate			Ave. Stemming metres	metres

PROTECTIVE MEASURES REQUIRED: Clearance area of 500 metres while Blasting is in progress.						

PROPOSED BLAST DATE AND TIME:	
Date:	/11/19
Time:	

APPROVALS:	
A & M Drilling Representative:	
Name:	Mick Carroll
Signature:	
Date:	/11/19
Representative:	
Name:	
Signature:	
Date:	/11/19

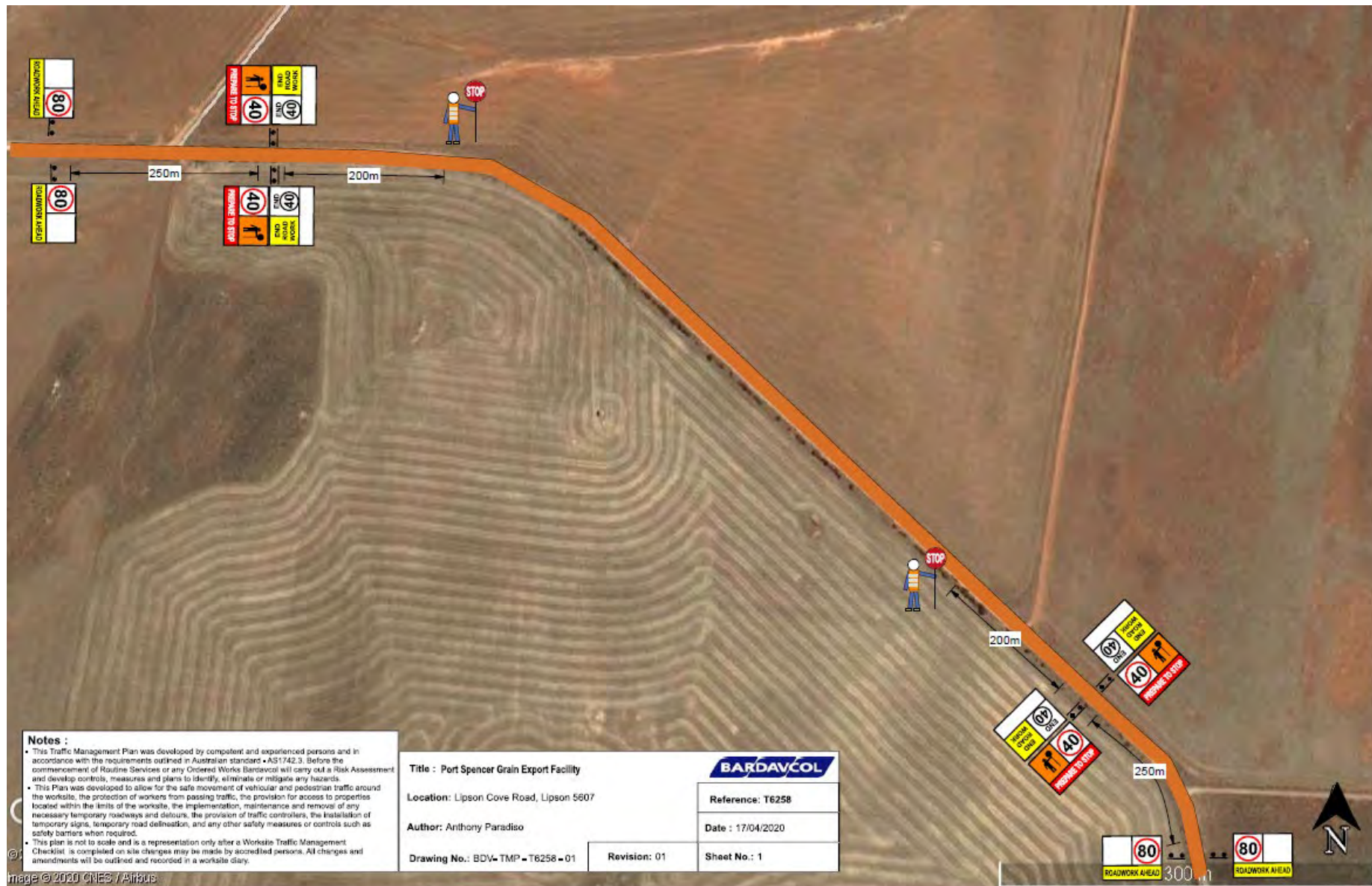
BLAST DESIGN

Appendix G
A&M Drilling & Blasting Services
Drilling Standard Operating Procedures

Appendix H

Lipson Cove Traffic Management Plan

BLAST MANAGEMENT PLAN



Appendix I

Vibration Monitor Calibration Certificates

Appendix J

Blast Permit

BLAST MANAGEMENT PLAN

REF NO.:	T6258
REVISION:	0
DATE:	17/04/2020

BLAST/SHOTFIRE PERMIT



To be completed by an Authorised Person only

1. Authorisation		Permit No:.....
Date Issued: / /		
Work Supervisor/Contractor:		
Period of Permit: Date: Time: to Date: Time:		
Location of Proposed Work:		
Proposed work:		
<p>The Permit Holder and work party members are authorised to work within the scope of the Blast Management Plan for the period stated on this permit.</p>		
Authorised/Issuer:		Signed:
Permit Holder:		Signed:
2. Pre-Blast Checklist (All must be ticked prior to issuing permit on morning of the blast)		
<input type="checkbox"/> All site personnel aware of the blast	<input type="checkbox"/> Safework SA, Police and Promanage notified	
<input type="checkbox"/> Weather fine for blasting e.g. Lightening	<input type="checkbox"/> Residents notified (or attempted notification made)	
<input type="checkbox"/> Blast boards with time up on day of blast	<input type="checkbox"/> Blast guards on site and Traffic Management booked	
<input type="checkbox"/> Other:		
3. Other Hazards/Precautions/Requirements		
.....		
4. Completion of Work (Holder)		
I certify that the work is complete/incomplete , and people may return to work in the area.		
For work that is incomplete please provide detail:		
.....		
Name (Print):		Signature:
Date: / /		Time:
5. Receiving back		
The shotfirer has given the all clear to resume work. <input type="checkbox"/> This permit is now cancelled. <input type="checkbox"/>		
Authorised Issuer Signature Time am/pm Date/...../.....		

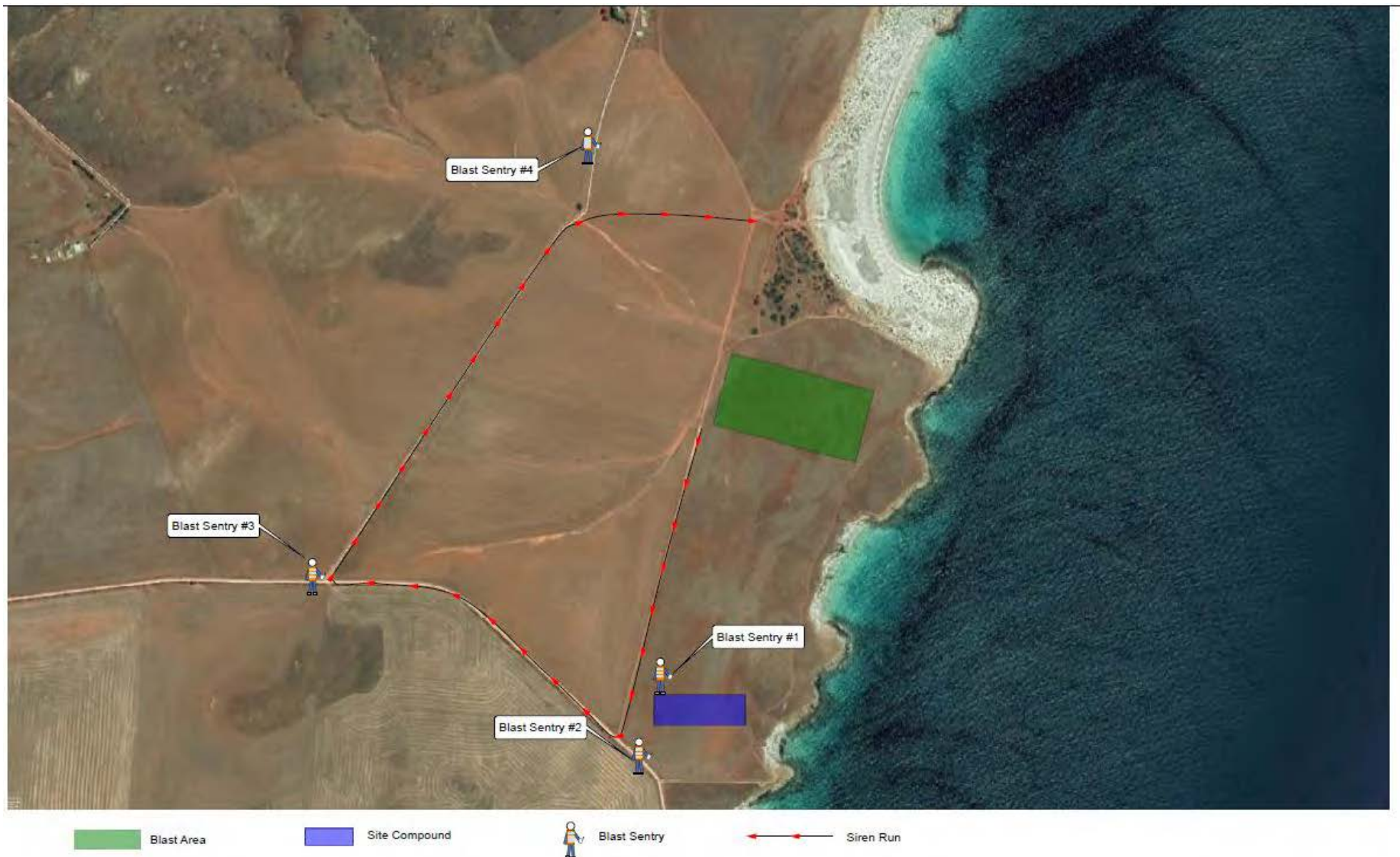
APPENDIX J

Marine Works Plan

Appendix K

Blast Sentry Positions & Siren Run

BLAST MANAGEMENT PLAN





Project No. T6258

PORT SPENCER GRAIN EXPORT FACILITY

SOIL EROSION & DRAINAGE MANAGEMENT PLAN (Landside)

Prepared by	Date:	Reviewed by	Date	Approved by	Date	Revision
Anthony Paradiso	20/04/2020	T O'Connell	24/4/20			A

SOIL EROSION AND DRAINAGE MANAGEMENT PLAN

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SOIL EROSION AND DRAINAGE MANAGEMENT PLAN

1. Scope:

This plan applies to all Bardavcol work on the Port Spencer Grain Export Facility project.

2. Purpose:

To ensure compliance with the Environmental Protection Act 1993.

3. Objectives:

- a) To minimise sediment laden runoff and pollution entering the Spencer Gulf either directly or indirectly.
- b) To minimise erosion caused by construction activities to the site and access roads.
- c) Effectively control surface runoff entering and leaving site.

4. Definitions

PM	Project Manager
PE	Project Engineer
SM	Site Manager
SS	Site Supervisor
SSM	Site Safety Manager

5. Responsibilities:

Task	Responsible
Development & revision of this plan.	PE
Approval of the plan.	PM
Identification of Soil Erosion and Drainage target areas	PM / SM
Implement Sediment and Erosion control measures	SM / SS
Undertake routine site inspections to monitor sediment control devices and erosion control measures	PE
Monitor weather conditions	PE / SM / SS

6. Site Description:

The Contractor's Activity Zone (CAZ) is detailed in Appendix B

A range of construction activities are to be undertaken as part of the Project, many involving the clearing of existing vegetative cover and exposure of open ground to potential erosion. The main body of the works is situated adjacent the Spencer Gulf with all stormwater run off currently entering the Spencer Gulf.

SOIL EROSION AND DRAINAGE MANAGEMENT PLAN

Some erosion is likely to occur because of the nature of all works, and as such, sediment and erosion management is considered very important to ensure sediment/pollution laden runoff does not enter the Spencer Gulf. Sketches in Appendix A detail the anticipated overland flow paths for the different work areas on the project.

7. Site Monitoring and Mitigation Measures:

- a) As described in the EPA Guidelines (Water Quality) 2010 is anticipated as certain rainfall events are expected to create in excess of 100 kilolitres of runoff over the site. Water quality monitoring regime will be implemented to determine turbidity, with sediment control devices installed to suit the works.
- b) The SEDMP will be updated prior to any changes to construction activities that may impact upon erosion and sedimentation. Plans will be updated and expanded upon as the construction landscape changes. Current plans detailed in Appendix B covers the following activities:
 - Excavation including drill and blast
 - Topsoil strip for bunkers
 - Earthworks for bunkers
 - Pavement construction for bunkers
 - Crushing works
 - Stockpile works
- c) The Project Engineer will provide notification to the Superintendent of any changes to this Sub Plan through submission of the revised plan.
- d) The SEDMP is developed and will be maintained in accordance with the Stormwater Pollution Prevention Code of Practice for Local, State and Federal Government, 1998.
- e) The Project Engineer will inspect all erosion and sediment control devices at the following intervals:
 - During and immediately after the first rain event ;
 - Once per week during dry weather;
 - Within the first hour of a storm event during work hours;
 - As soon as practicable following storm events outside of works hours and not later than the following day;
 - Twice during site working hours for periods of continuous rain; and
 - Prior to forecast rain events.
- f) The regular inspections will document all relevant information including:
 - The location and description of all sediment control structures and all in-stream devices.
 - The time and date on which sediment control structures and in-stream devices are inspected and record observations made as to their operating effectiveness.
 - The time and date on which the sediment control structures and in-stream devices are cleaned, repaired or altered and record all actions taken.
- g) Haul roads and access tracks will be crowned or have crossfall to minimise flows along the track surfaces.
- h) Sediment control devices will be used at drainage outlets to minimise water velocities reducing scouring.
- i) Catch drains and diversion drains will be constructed to minimise connectivity of flows to the Spencer Gulf
- j) Stockpile locations will be chosen in areas away from drainage lines and drip lines of trees where possible.
- k) Water from the plant washdown bay shall be retained in a detention basin, next to the washdown bay as this water will not enter any surrounding waterway refer to Appendix B.
- l) The sedimentation basin will be monitored and controlled through pumping out if required, where it will be operated as follows:

SOIL EROSION AND DRAINAGE MANAGEMENT PLAN**8. Site Inspections and Audits:**

As part of the Bardavcol management system water quality monitoring, site inspections and internal audits will be undertaken throughout the project. Inspection and testing of the SEDMP will be undertaken to record issues, ineffective control measures and potential improvements. In the forms outlined below any corrective actions from any observation, improvement notice, inspections or audits will be documented in the site corrective actions register.

- a) Onsite Observations
 - i) All staff to report environmental observations or issues as they occur to SM or PE.
- b) Daily Inspections
 - i) To be undertaken by the SM, SS or PE.
 - ii) Any issues to be documented recorded in site corrective actions register.
- c) Water Quality Monitoring
 - i) To be undertaken by the PE or delegate.
 - ii) Water quality monitoring to be undertaken at least once per fortnight throughout the project
 - iii) Water quality monitoring after every rainfall event and as soon as practicable if no site personnel are present.
- d) Environmental Site Inspections
 - i) To be undertaken by the PE or delegate.
 - ii) Undertaken at least weekly throughout the project.
- e) Environmental Management Systems Audit
 - i) To be undertaken by a qualified auditor (i.e. Bardavcol or third party subcontractor).
 - ii) Annually throughout the project.

9. Records:

- a) Sediment Control Device Plans
- b) Environmental Inspection

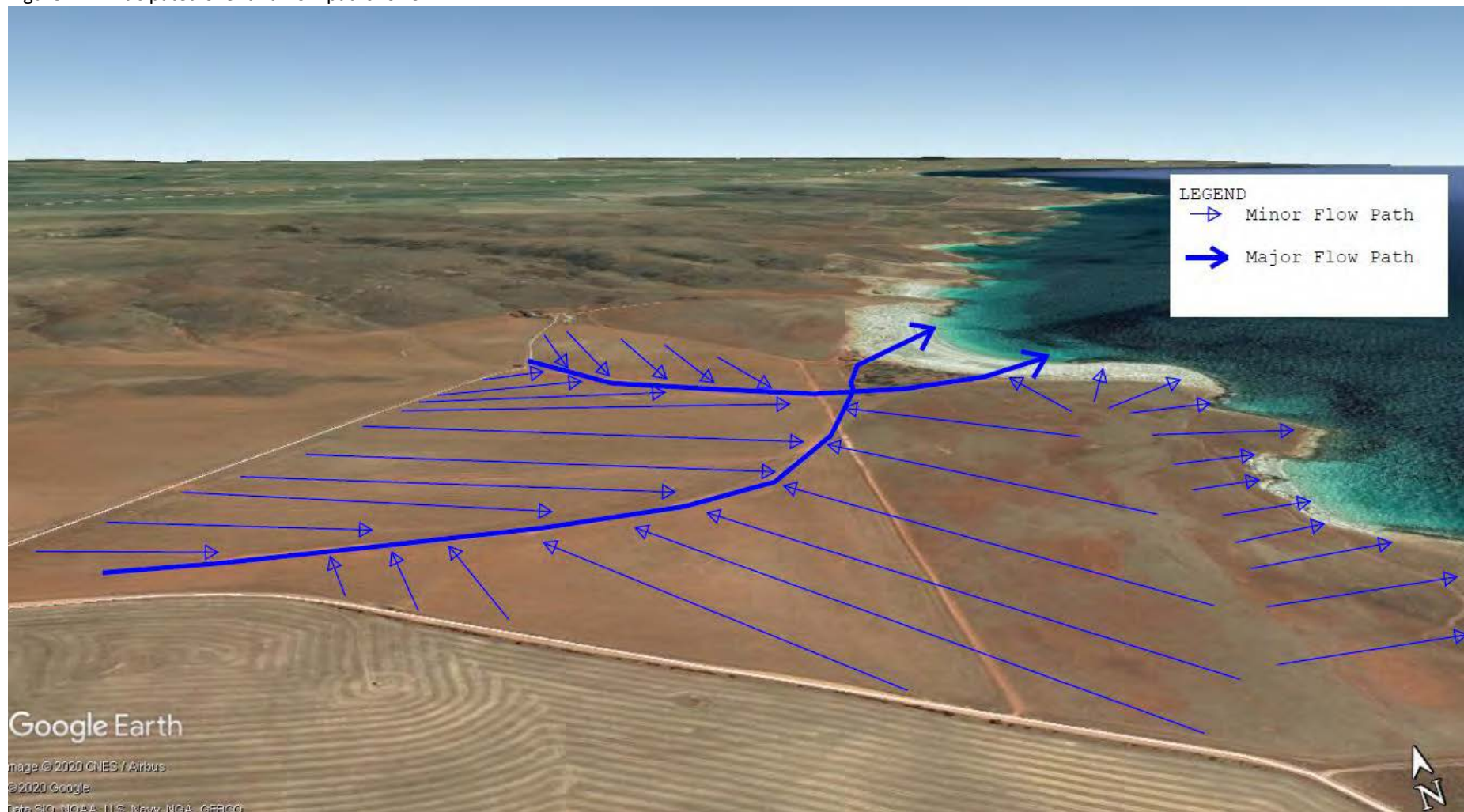
10. References:

- a) Stormwater Pollution Prevention Code of Practice for Local, State and Federal Government, 1998
- b) Environmental Protection Act 1993
- c) EPA Guideline (Water Quality) 2010

SOIL EROSION AND DRAINAGE MANAGEMENT PLAN

APPENDIX A: Expected Flow Path Sketches

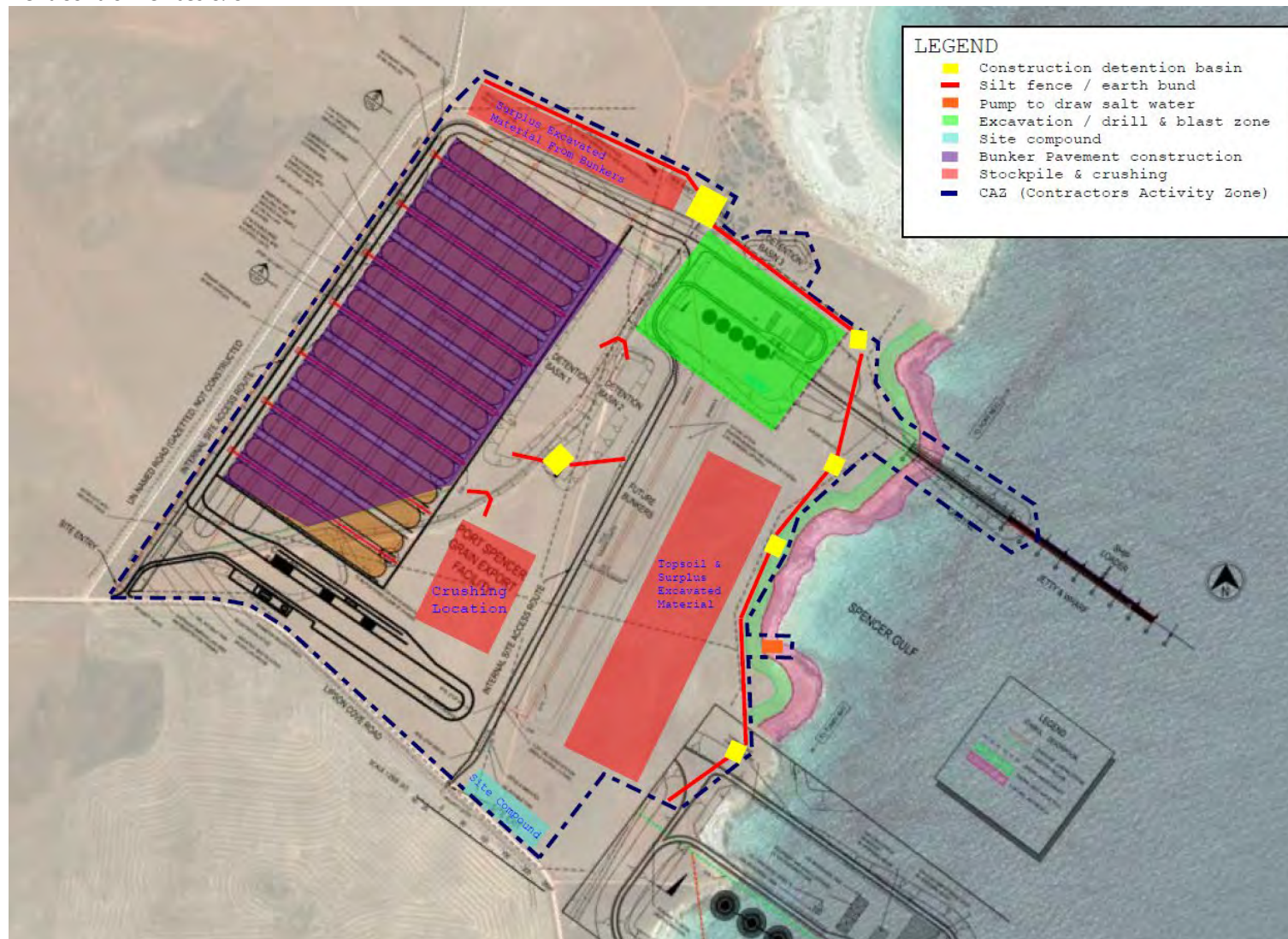
Figure A1: Anticipated overland flow paths for CAZ



SOIL EROSION AND DRAINAGE MANAGEMENT PLAN

APPENDIX B: Sediment Control Devices & CAZ

Figure B1: Sediment Control Devices & CAZ



CONDUCTING A SAFE WORK METHOD STATEMENT



WI 00: Revision 4

1 Purpose:

Provide a formalised framework and process for the risk assessment and control of hazards associated with work tasks.

2 Objective:

To provide a formalised framework for identifying and controlling hazards associated with a job.
To comply with regulatory standards and contractual requirements.

3 Target:

- Planning of work tasks
- Controls planned and implemented for hazards identified with a work task
- All personnel involved in the job task to be involved (consulted) with the final development of the Risk assessment.
- Minimise risks and control hazards associated with work to facilitate no incidents, accidents or injuries associated with work tasks.
- Personnel involved in conducting a risk assessment are trained and competent to do so.

4 Controls:**4.1 What is a Safe Work Method Statement (SWMS) / Risk Assessment?**

A Safe Work Method Statement is a detailed written plan of work that focuses on the safety precautions required to successfully complete a specific job. Note: the SWMS/Risk Assessment process can apply to any risk assessment undertaken eg. PMP risk assessments, plant hazard risk assessments, hazardous substance risk assessments, and purchasing risk assessments. Reference to the SWMS process includes the requirement to follow the same process for conducting other risk assessments (this extends to the training required).

A SWMS is an active discussion between work party members that breaks a job down into a sequence of steps, identifies the hazards at each step and then specifies the actions required to control those hazards. It is best done as a collaborative process, and to do effectively, it requires collaboration between the work group and supervision/management.

A SWMS should include references to Regulations, Permits to work, training requirements and for certain high risk activities, equipment inspection prior to use and rescue procedures/provisions (eg when personnel are Working at heights & entering Confined spaces).

A Safe Work Method Statement should be written for each identifiable job during a project. SWMSs/JSAs must also be drafted by sub contractors for work that they undertake when working for Bardavcol, refer to [FO 415 Bardavcol Special Conditions of Subcontract Regarding Safety](#). Subcontractor SWMSs must be assessed using [FO 026 SWMS-SWMS Assessment Form](#).

4.2 Project Management Planning – Initial Drafts of SWMSs

SWMSs will usually be considered and developed within Project Management Plans. SWMSs presented in PMPs are considered a first draft SWMS, as they will not contain all possible hazards and control measures due to having been developed prior to work commencing on a project (i.e. desktop development). These first draft SWMSs are to be used as a starting point for the final draft SWMS to be used on site. Prior to starting a job, the work group shall then use this first draft and finish the SWMS off in enough detail to identify and control the hazards associated with a job. Undertaking a SWMS/Risk Assessment is a 5 step process.

4.3 The 5 Steps of a SWMS / Risk Assessment process

1. **Document the activity:** Assemble those involved in the activity and then, using the SWMS worksheet ([FO013 Safe Work Method Statement Sheet](#)), write down the tasks that make up the activity, step by step. Where required, include any permits to work, installation, inspection and maintenance requirements, qualifications, training or competency or certifications required to complete the task.
2. **Identify the hazards:** Next to each task, identify what part of the task may: (1) cause injury to those doing the work or to anyone else nearby; (2) cause any environmental harm or damage

CONDUCTING A SAFE WORK METHOD STATEMENT



WI 00: Revision 4

3. **Document the control measures:** For each identified hazard, list the measures that need to be put in place to eliminate or minimise any likely risk of injury to those involved using the hierarchy of controls. Persons Conducting a SWMS should refer to Bardavcol Work Instructions to assist them in developing control measures.
4. **Identify who is responsible:** Document the name of the person responsible for implementing the control measure.
5. **Monitor and review:** Make sure the activity is supervised to ensure the documented process is being followed. The SWMS should be reviewed whenever a documented activity changes; when there is a change of personnel; or after an appropriate length of time. The site safety Inspection ([FO001 Site Safety Inspection Form](#)) requires control measures to be reviewed on SWMSs and JSAs that are in use at the time of the inspection to determine if control measures are effective or require improvement.

Should there be any concerns about conducting any part of the SWMS, the ESM should be consulted.

4.4 New Personnel On Site to Sign Off on SWMSs

Ensure that all personnel working on a job sign off on the SWMS, and also any new people that start on the job when it is already part way through are also inducted into the SWMS and have signed off on it.

5 Permits/Licences/training:

At least one person carrying out the risk assessment shall complete the in house SWMS module or an approved course as determined by the ESM.

6 Emergency Response & First Aid:

Emergency response and first aid requirements shall be considered in the SWMS and the emergency response management plan and first aid supplies updated according to the controls detailed in the risk assessment.

7 Program Inspection:

Fortnightly Site Safety and Environmental Inspections, Safety and Environmental Audits, Review of SWMS if work conditions change

8 References:

Work Health Safety Act, SA 2012

Work Health Safety Regulations, SA 2012

Codes of Practice under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Hazardous Manual Tasks

Managing the Risks of Falls at Workplaces

Labelling of Workplace Hazardous Chemicals

Preparation of Safety Data Sheets for Hazardous Chemicals

Confined Spaces

Managing Noise and Preventing Hearing Loss at Work

Managing the Work Environment and Facilities

Work Health and Safety Consultation Cooperation and Coordination

How to Safely Remove Asbestos

How to Manage and Control Asbestos in the Workplace

First Aid in the Workplace

Construction Work

Managing Risks of Plant in the Workplace

Managing Risks of Hazardous Chemicals in the Workplace

Managing electrical risks at the workplace

Demolition Work

Excavation Work

CONDUCTING A SAFE WORK METHOD STATEMENT



WI 00: Revision 4

Welding Processes

9 Tools/Forms:

[IP12 Risk Management](#)

[FO 013 Safe Work Method Statement Template](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

[FO 001 Site Safety Inspection Form](#)

CONDUCTING A JOB HAZARD ANALYSIS



WI 01: Revision 4

1 Purpose:

Provide a formalised framework and process for the risk assessment and control of hazards associated with work tasks.

2 Objective:

To provide a formalised framework for identifying and controlling hazards associated with a job.
To comply with regulatory standards and contractual requirements.

3 Target:

- Planning of work tasks
- Controls planned and implemented for hazards identified with a work task
- All personnel involved in the job task to be involved (consulted) with the final development of the Risk assessment.
- Minimise risks and control hazards associated with work to facilitate no incidents, accidents or injuries associated with work tasks.
- Personnel involved in conducting a risk assessment are trained and competent to do so.

4 Controls:**4.1 What is a Job Hazard Analysis (JHA) / Risk Assessment?**

A Job Hazard Analysis (also called a Job Safety Analysis [JSA]) is a detailed written plan of work that focuses on the safety precautions required to successfully complete a specific job. Note: the JHA/Risk Assessment process can apply to any risk assessment undertaken eg. PMP risk assessments, plant hazard risk assessments, hazardous substance risk assessments, and purchasing risk assessments. Reference to the JHA process includes the requirement to follow the same process for conducting other risk assessments (this extends to the training required).

A JHA is an active discussion between work party members that breaks a job down into a sequence of steps, identifies the hazards at each step and then specifies the actions required to control those hazards. It is best done as a collaborative process, and to do effectively, it requires collaboration between the work group and supervision/management.

A JHA should include references to Regulations, Permits to work, training requirements and for certain high risk activities, equipment inspection prior to use and rescue procedures/provisions (eg when personnel are Working at heights & entering Confined spaces).

A Job Hazard Analysis should be written for each identifiable job during a project. JHAs/JSAs must also be drafted by sub contractors for work that they undertake when working for Bardavcol, refer to [FO 415 Bardavcol Special Conditions of Subcontract Regarding Safety](#). Subcontractor JHAs must be assessed using [FO 026 JHA-SWMS Assessment Form](#).

4.2 Project Management Planning – Initial Drafts of JHAs

JHAs will usually be considered and developed within Project Management Plans. JHAs presented in PMPs are considered a first draft JHA, as they will not contain all possible hazards and control measures due to having been developed prior to work commencing on a project (i.e. desktop development). These first draft JHAs are to be used as a starting point for the final draft JHA to be used on site. Prior to starting a job, the work group can then use this first draft and finish the JHA off in enough detail to identify and control the hazards associated with a job. Undertaking a JHA/Risk Assessment is a 5 step process.

4.3 The 5 Steps of a JHA / Risk Assessment process

1. **Document the activity:** Assemble those involved in the activity and then, using the JHA worksheet ([FO013 Job Hazard Analysis Sheet](#)), write down the tasks that make up the activity, step by step. Where required, include any permits to work, installation, inspection and maintenance requirements, qualifications, training or competency or certifications required to complete the task.

CONDUCTING A JOB HAZARD ANALYSIS



WI 01: Revision 4

2. **Identify the hazards:** Next to each task, identify what part of the task may: (1) cause injury to those doing the work or to anyone else nearby; (2) cause any environmental harm or damage
3. **Document the control measures:** For each identified hazard, list the measures that need to be put in place to eliminate or minimise any likely risk of injury to those involved using the hierarchy of controls. Persons Conducting a JHA should refer to Bardavcol Work Instructions to assist them in developing control measures.
4. **Identify who is responsible:** Document the name of the person responsible for implementing the control measure.
5. **Monitor and review:** Make sure the activity is supervised to ensure the documented process is being followed. The JHA should be reviewed whenever a documented activity changes; when there is a change of personnel; or after an appropriate length of time. The site safety Inspection ([FO001 Site Safety Inspection Form](#)) requires control measures to be reviewed on JHAs and JSAs that are in use at the time of the inspection to determine if control measures are effective or require improvement.

Should there be any concerns about conducting any part of the JHA, the ESM should be consulted.

4.4 New Personnel On Site to Sign Off on JHAs

Ensure that all personnel working on a job sign off on the JHA, and also any new people that start on the job when it is already part way through are also inducted into the JHA and have signed off on it.

5 Permits/Licences/training:

At least one person carrying out the risk assessment shall complete the in house JHA module or an approved course as determined by the ESM.

6 Emergency Response & First Aid:

Emergency response and first aid requirements shall be considered in the JHA and the emergency response management plan and first aid supplies updated according to the controls detailed in the risk assessment.

7 Program Inspection:

Not Applicable

8 References:

Work, Health Safety & Welfare Act, SA 2012
Work, Health Safety & Welfare Regulations, SA 2012
COP under SA WHS Laws 2012:
How to Manage Work Health and Safety Risks
Hazardous Manual Tasks
Managing the Risks of Falls at Workplaces
Labelling of Workplace Hazardous Chemicals
Preparation of Safety Data Sheets for Hazardous Chemicals
Confined Spaces
Managing Noise and Preventing Hearing Loss at Work
Managing the Work Environment and Facilities
Work Health and Safety Consultation Cooperation and Coordination
How to Safely Remove Asbestos
How to Manage and Control Asbestos in the Workplace
First Aid in the Workplace
Construction Work
Managing Risks of Plant in the Workplace
Managing Risks of Hazardous Chemicals in the Workplace

CONDUCTING A JOB HAZARD ANALYSIS



WI 01: Revision 4

Managing electrical risks at the workplace
Demolition Work
Excavation Work
Welding Processes

9 Tools/Forms:

[IP12 Risk Management](#)

[FO 013 Job Hazard Analysis Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

[FO 001 Site Safety Inspection Form](#)

1. Purpose:

To minimize the risks associated with the deployment, management and operation of plant on Bardavcol sites.

2. Objective:

To comply with regulatory standards and contractual requirements.

3. Target:

- Environment in which plant operates is suitable and free of obstructions
- Operator(s) trained and use plant safely
- Plant not damaged, and fully operational
- No incidents, accidents or injuries associated with operation and control of plant & equipment.
- No damage to plant, equipment, buildings or infrastructure from operation and control of plant and equipment.

4. Controls:**4.1 Operation of Plant**

- a) Before attempting to drive or operate any company vehicle, employees and subcontractors must ensure that there are no obstructions before moving off and satisfy themselves that the vehicle is in a safe and roadworthy condition. Any faults or potential hazards must be reported to the Project Manager immediately.
- b) All site personnel are to maintain a safe working distance from all earthmoving plant at all times.
- c) Employees must:
 - not drive any company vehicle, crane, forklift or any other appliance for which they do not hold the driving license or hold a valid certificate of competency. Refer [FO 019 Equipment Requiring Licenses, Tickets Certificates of Competency to Operate](#).
 - not drive or operate plant, vehicles or equipment recklessly, or in a manner likely to cause danger to their fellow employees, other people or themselves. Employees must observe speed restrictions, traffic controls, road signs, parking restrictions and any other relevant regulations.
 - keep their vehicles in a clean and tidy condition ensuring that controls and safety devices are not obstructed or in any way rendered ineffective.
 - not carry unauthorized passengers or unauthorized loads.
 - not carry passengers unless there are seats and seat belts.
 - not use mobile phones while operating plant unless required by supervision.
 - not use headphones while operating plant.
 - not operate any vehicle, plant or equipment whilst intoxicated or under the influence of any drug. Any driver found in an intoxicated condition or under the influence of a drug may be suspended immediately. Refer [CP06 Alcohol & Drugs Policy](#); [SWI 06 – Alcohol & Drugs](#)
 - if employees leave their machine, any raised equipment (buckets, blades, etc) must be lowered to the ground.
 - not use any machinery, plant or equipment for which guards have been provided without those guards being in the authorized position and in full working order. Any faults or damage to guards must be reported to the Project Manager immediately.
 - not clean any machinery, plant or equipment whilst it is in motion.

- not leave any vehicle, plant or equipment running whilst unattended unless specifically required to do so.
- Employees under 18 years of age must not operate any dangerous machinery, plant or equipment unless they have been trained or are being retained under a course of supervision.
- not use any damaged or faulty tools, machinery, plant or equipment. Any damage or faults must be reported to the Site Supervisor / Project Manager immediately. Employees must not make temporary or running repairs unless approved by the Operations Supervisor.
- not make any electrical repairs or maintenance to any machinery, plant or equipment unless qualified and authorized to do so. Any electrical faults must be reported to the Operations Supervisor immediately.
- not attempt any repairs to any machinery, plant or equipment, unless qualified and authorized to do so.
- use machinery only for the purpose for which it was designed and must not attempt any alteration to machinery that is capable of making the machine a risk to health and safety.

d) Repair and Maintenance - all machinery shall be shut down or positive means taken to prevent its operation while repairs, adjustments, servicing and manual lubrication is being made. Any guard or safety device removed while making repairs shall be replaced before starting operations again.

Positive means shall include one of the following:

- (i) Lockout or isolation devices;
- (ii) Danger tags;
- (iii) Permit to work systems.

4.2 Plant Hazard Management

The Project Manager and/or Site Supervisor in consultation with the Site Safety Supervisor shall, when moving vehicles may create a risk to the well being of employees or the public, devise safe systems of work which may include extra signage, warning devices, detours, speed restrictions, high visibility clothing, traffic lights and spotters/flagmen. The induction process shall highlight any such risks that may occur from traffic movements.

It is the responsibility of the designated operator to ensure that his machine is in good condition and is safe to operate. He must adhere to the plant checklist issued by the Operations Supervisor and report to his Site Supervisor, Project Manager or the Operations Supervisor any fault, major or minor, with his machine as soon as possible.

Where there is no designated operator, as is the case with small rollers or some hire plant it is the responsibility of the Site Supervisor to ensure that plant is safe, serviceable and practical to use.

Where external plant is hired and operated by Bardavcol employees, such as water carts, it is the Site Supervisors responsibility to ensure that the plant is inspected prior to use for roadworthiness and is fit for purpose. No person shall operate any item of plant if it is not roadworthy, not fit for purpose or is unsafe.

The Bardavcol Operations Supervisor maintains a register/history file of all Bardavcol plant detailing the specific plant number, make or type of plant, current hours or kilometers, and when the next service (as prescribed by the manufacturer or supplier) is required. The Operations Supervisor notifies the Project Manager or Site Supervisor responsible for the plant at the time when the service is due and arranges a suitable time for the service to be undertaken.

The Bardavcol Site Supervisor (or when subcontractors plant is being used on site, the sub-contractors site representative) is responsible for ensuring that he is aware of the capabilities and also limitations of all items of plant under his control.

All sub-contractor (including plant hire) plant and equipment provided and used on-site must be properly maintained in good working order with any safety devices in place and operational. Subcontractors must confirm the maintenance and servicing performed on each item of their plant every month that they are on site. This may be done by providing copies of service and maintenance records or a written statement

outlining the service and maintenance that has been performed for each item of plant. Where plant is not serviced or maintained in accordance with the manufacturer's requirements, it must be removed from operation until the service and maintenance requirements have been updated. Records of subcontractor plant maintenance and service must be retained in the project files on site.

The Site Supervisor, Project Manager or Project Engineer shall carry out random visual checks of all subcontractor plant and equipment prior to release on site using [FO 028 Subcontractor Plant Compliance Checklist](#). Any equipment that appears to be faulty shall be removed from the construction area. Subcontractors are required to use daily checklists similar to Bardavcol's daily start up checklist whilst working on a Bardavcol project.

No plant operator shall modify or use an item of plant in a way that is not recommended by the manufacturer or is likely to cause equipment damage, failure or injury to themselves or other people.

NO PERSON SHALL USE OR OPERATE ANY ITEM OF PLANT THAT IS UNSAFE FOR USE, NOT ROADWORTHY OR NOT FIT FOR PURPOSE ON ANY BARDAVCOL SITE.

4.3 Common Hazards Involving Powered Mobile Plant

Powered mobile plant is extremely hazardous when it is operated in situations where:

- there are people or other vehicles sharing the same site or roadway. Pedestrians and bystanders are particularly vulnerable in zones where mobile plant and machinery is operated as the operator's vision may be restricted and plant, which is apparently idle, may move with little warning
- there is uncontrolled entry to the site during and after work
- the plant is poorly maintained. There have been recorded instances where plant has been operated even when it was known that safety critical components, such as brakes and steering, were defective
- people carrying out maintenance are also at risk from passing traffic, from equipment falling while raised, and from heavy components, such as buckets, not being properly supported
- the plant is operated in the vicinity of overhead or underground electrical equipment (risk of electrocution to the operator and others in the vicinity of the plant)
- the base on which the plant operates is unstable (i.e. subject to slippage, subsidence or collapse)
- people use the mobile plant in an application for which the plant has not been designed (such as pushing, pulling or towing)
- the load on the plant is unstable or unknown or exceeds the rated capacity of the plant
- hazardous atmospheres are present, particularly in spaces where a flammable or explosive vapour maybe present e.g. enclosed spaces, trenches
- any other work is carried out near the work area.

4.4 Assessing & Controlling Common Plant Movement & Operation Risks

The majority of mobile plant used by Bardavcol has been risk assessed using [FO 027 Plant Risk Assessment Form](#), and Safe Work Instructions in the SWI 02.02 et al series. Prior to use of plant on site a risk assessment needs to be conducted on the plant using [FO 027 Plant Risk Assessment Form](#). A Safe Work Instruction may then be drafted based on the risk assessment.

Assessing the degree of risk means assessing how likely it is that someone will be hurt (including how often people are exposed to the risk) as well as how severely it could hurt someone. Priority for implementation of measures to eliminate or control risks should ensure that matters of the greatest likelihood and severity are addressed first. The measures chosen will depend on the degree of the risk.

Vehicle movement procedures should be developed based on the risk assessment and should be updated each time the conditions on the site change in a way that may affect the health and safety of persons at the workplace. It should also include an assessment of the visibility of plant and traffic from all areas of the work site.

The 2 specific documents that are required to be developed for Bardavcol projects are:

- 1) Traffic Management Plan – written plan for traffic controls at road works.
- 2) Traffic Movement Plan – this relates to movement of plant and vehicles within a project site. The Traffic Movement Plan should include parking facilities, speed limits, out of bound areas and high risk areas

such as excavations and bridges. This plan is to be communicated to Bardavcol personnel and sub-contractors and client personnel where relevant.

The use of specific measures to eliminate or control identified risks should be done on the basis of the risk assessment. In particular, consider the following:

- isolating vehicles and plant used in or around the site and work area from persons on the site or work area. For example, vehicles or persons may be guided around or past the work area
- using fencing, barriers, barricades, temporary warning or control signs, or a combination of these to
- secure the area where moving plant is used
- planning the direction that plant moves, so the visibility of operators is not restricted
- using spotters/safety observers to control traffic movement,
- implementing safe working distances
- using audible reversing alarms and/or other technologies or other safe work practices,

Note: reversing alarms may cause confusion where multiple plant are using the same area; other systems of work may be required. Reversing alarms may also be inappropriate where work is to be carried out at night near residential areas,

- minimising the amount of moving plant working at one time. Where multiple plant is operated around the work site a competent person should be used to direct the plant:
 - operating in close proximity to each other
 - when reversing
 - where persons are on the ground
 - in other situations as indicated by the risk assessment
- implementing systems of control and notices at all entrances and exits where construction vehicles or plant enter or leave the work area by public roads, to protect and warn all persons approaching or in the vicinity,
- identifying designated delivery and turning areas. The movement of delivery vehicles on construction sites often presents a hazard, particularly when reversing, loading and unloading. Procedures should be implemented to warn all workers of the potential hazard. These procedures should include:
 - the requirement for truck drivers to report to a suitably signposted area on the site and/or
 - the requirement for a designated worker to act as an observer to ensure all persons are clear of the
 - reversing vehicle, and
 - a system of communication and warning to persons near the delivery point.

4.5 Controls for the Safe Operation of Plant

Systems of work must ensure that moving plant is operated safely. At a minimum, consideration should be given to the following:

- competence of persons working with plant – only persons who are competent, and where required hold the appropriate certificate of competency in accordance with the Regulation, must be permitted to operate plant or perform any installation or maintenance work on powered mobile plant. Refer to [FO 019 Equipment Requiring Licenses, Tickets Certificates of Competency to Operate](#). Copies of licenses or certificates to use plant of all Bardavcol and subcontractor personnel will be obtained and retained on project records.
- capability of operators – operators should never be permitted to operate plant while they are under the influence of alcohol or any substance or drug, including prescription and non-prescription drugs, which may adversely affect their ability to operate the plant in a safe manner
- vehicle movement procedures for positioning and re-positioning of plant – these procedures should include specific procedures when plant is operated near persons, near underground or above-ground services, moving plant onto a public road from site or reversing plant

- suitability and condition (state of maintenance and repair) of the plant to perform the intended task – this should also include the size and type of equipment required, ensuring its reach, capacity etc. are properly specified and that log books are available
- instruction and information about hazards – all persons who perform work using (or on) powered mobile plant must be adequately instructed in the hazards associated with the plant and carrying out the work on site and in the control measures for safe work. Safe operating procedures should be available covering the use and maintenance of powered mobile plant
- available information – ensure that all available manufacturer's information on the safe operation of the plant is provided, and that essential operating information is displayed, e.g. rated capacity, radius and basic operating instructions are displayed on cranes
- special requirements – any special requirements should be clearly identified and communicated, e.g. As the need for the plant to move when fully laden, the requirement for any accessories such as special slings, spreader beams, load stability plates or matting and counterweights
- site conditions – any limitations posed by the worksite (such as floor loadings or ground load limits) should be checked by an engineer prior to selecting the appropriate plant for the task. Spoil stockpiles should be regularly removed.
- appropriate staffing – the number of personnel required to perform the tasks safely.

4.6 Stability of Plant

To ensure that plant is stable on slopes or uneven ground surfaces consider the:

- plant is suitable for use on the slope or uneven ground
- tyre condition and pressure
- risk involved in raising the load when the crane or load shifting plant is articulated
- load is properly secured before moving
- loads are loaded in a controlled manner, not dropped
- operators are paying full attention during the load shift or whilst operating moving plant
- carrying or lifting equipment is not overloaded. The rated capacity of the machine must be checked before operation and observed
- no persons are in the vicinity during unloading or tipping.

ROPS:

- If plant is NOT fitted with a ROPS cabin, the following activities are not permitted:
 - Operate on a slope that places the plant at risk of overturning;
 - Work next to an edge where the plant is at risk of overturning due to collapse of the edge or travelling over the edge

FOPS:

- If plant is NOT fitted with FOPS, plant is not to work in situations where there is a risk of objects falling onto any part of the machine from height.

4.7 Controls for Pedestrians Near Moving Plant

When plant is operated in close vicinity of other plant or people, a competent person should be used as a spotter. The operator should observe the following procedures:

- where practicable plant should always move in a forward direction

- ensure no persons are at risk before reversing
- avoid hazards by facing and maintaining attention in the direction of travel
- spotter should always be in the sight of the plant operator
- clear communication systems should be in place.
- Pedestrians (especially public) should be isolated from mobile plant/vehicle movements. If necessary, barriers should be installed.

4.8 Safety Controls on Plant

Safety controls such as guards, warning devices, auto stops etc., are fitted to the plant for protection and must not be removed or made inoperative unless authorised personnel (competent persons) are carrying out repairs and adjustments. In such circumstances, the guards etc, must be reinstated and be fully operational prior to returning the plant to service.

Equipment to be fitted to all Bardavcol plant:

- Reversing beeper
- Rotating/flashing lights

Optional Equipment to be fitted to plant:

- UHF Radio
- Grab rails for access/egress – depends on assessment of plant at acquisition
- Relevant signage as required

Safety controls for plant are also applicable to subcontractor equipment. Refer to [FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety](#).

4.9 Plant Safe Working Distance

All machines have large blind spots around them particularly in the rear. Always approach machinery from the front where possible, never attempt to climb onto a moving machine and always alert operator of your presence prior to approaching. It is the plant operators responsibility to ensure that any person, including visitors, maintain a safe working distance from his plant while it is being operated. The plant operator must report any incidents where any person fails to maintain a safe working distance to the Site Safety Officer or Site Supervisor immediately after the incident has occurred. The Site Supervisor shall inform the Project Manager and complete an incident report using [FO 005 Incident Report Form](#) if the incident may require further action to take place.

Depending on the severity of the incident the Project Manager may consider the following:

- Retraining of the person or persons involved.
- Removal of the person or persons from the area in question.
- Removal of the person or persons from the site.

4.10 Lifting & Slings

A safe lift requires planning and must be carried out under the supervision of a competent/experienced person. No employee shall undertake any lifting / slinging operations unless they have received appropriate training and are aware of any Standard Operating Procedure or Safe Work Instruction that may apply to that particular lift.

Any lifting that may require a “**thought process**” must be carried out by a qualified and licensed dogman. Any lifting that does not require a “Thought process” must be undertaken under the control of a competent person – a Site Supervisor or Leading Hand.

If a competent person is required to carry out a slinging/lifting task they must ensure that:

- They are aware of the approximate mass/weight of the equipment or materials being lifted,
- The plant undertaking the lifting is suitable for the lift – is the lift within the safe operating limits of the plant and attachments,
- An appropriate lifting position on the plant is used,
- **If using a 'quick hitch', it is positively engaged and the safety pin bolted or locked in place,**
- The slings, chains and other attachments are in good condition (inspected prior to the lift) and have evidence of being recently tested and tagged. Never combine slings i.e.: nylon and chains. Shackles must be used where slings are attached to eye bolts or lifting lugs. All hooks must be supplied with devices to prevent load movement. Chains and slings must be used for their intended purpose – that is lifting and within their SWL.
- Chains and slings must not be used to tow items of plant as this may unknowingly place a load which could exceed the SWL and also cause unseen damage to the chain or sling,
- No person is permitted to work, stand or at any time be under the suspended load. Personnel are not allowed to 'ride' a load, sling or hooks.
- Hard hats and highly visibility vests are worn by all persons in the close vicinity of the lift,
- The area has been inspected to make sure that it is suitable for the operation and secured from unauthorised persons. No unauthorised persons are allowed in the lifting/slinging area,
- That if the plant has outriggers or stabilisers attached, that these are used when required and firmly located,
- Loads are not to be left suspended without an operator at the controls,
- Any lifting over fuel/chemical lines is risk assessed and controls put in place to minimise the risk, i.e. boards over the fuel lines, area cleared of personnel, physical barriers etc.

All sites must ensure that a regular inspection of chains and slings is carried out and any suspect slings or chains are not used, appropriately tagged "Not for Use" and returned to the Bardavcol Workshop. The Workshop staff are to be notified when the suspect slings or chains are returned.

Lift studies must be prepared by a competent person for the following:

- Lifting of persons in a workbox;
- Lifting within overhead power line exclusion zones;
- Where the load is 10 tonnes or more;
- Where the loss of the load would have a serious impact on production operations;
- Tilt-up panel lifting;
- Multiple crane lifts;
- A lift >75% of the crane's rated capacity; and
- Any other lift, as required by the Bardavcol Project Manager

SIGNALS TO AN OPERATOR MUST ONLY BE GIVEN BY ONE TRAINED / COMPETENT PERSON

4.11 Tip Over Axle / Convertible Tipping Trailers

The use of any Tip Over Axle / Convertible Tipping Trailer i.e.: those trailers that pivot on the rear axle only to discharge their loads is discouraged on all Bardavcol sites. If the Project Manager / Site Supervisor is unable to use any other type of trailer then a risk assessment must be undertaken which must include the development of a Job Safety Analysis prior to any use of these types of trailers.

4.12 Maintenance and Inspection of Mobile Plant

Following the purchase of plant, the manufacturer's operating manual and any applicable legislation must be reviewed to identify the specific inspection and maintenance requirements. The plant details, including the maintenance requirements must be entered into the plant register within Cheops, including:

- plant name/type
- manufacturer
- model number
- registration or serial number
- maintenance frequency (eg. month, hours, kilometres)
- when maintenance is next due
- the date when maintenance was last performed

The Operations Supervisor is responsible for ensuring that the plant register is maintained and that plant maintenance occurs at the specified intervals. The relevant plant operation data (eg. hours, kilometres) is submitted to the Operations Supervisor at nominated frequencies and entered into the Hours/Kilometres Register to enable maintenance to be scheduled.

Maintenance must be performed in accordance with the manufacturer's requirements and may be performed by the manufacturer's agent or a suitably qualified mechanic. Maintenance records are documented and provided to the Operations Supervisor for review and ensuring that any further work (ie. to rectify faults) is arranged. Maintenance records are to be retained in the workshop files.

Plant is inspected prior to the commencement of each shift by the plant operator and is documented on the Plant Daily Inspection Checklist. The checklists are submitted weekly to the Operations Supervisor for review and to action any identified issues. The checklist shall be retained in the workshop files.

Any faults or damage to plant identified during the inspection must be recorded on the checklist and reported to the Supervisor immediately. Where a fault or damage is identified that may prevent the safe operation of the plant or potentially put other workers and the public at risk, the plant must be locked out, tagged out and not be operated until it has been repaired or deemed safe to operate by the Operations Manager. The Operations Manager may engage internal and external resources (eg. competent persons) to assist with this process.

Details of faults or damage reported to the Operations Supervisor are recorded in a maintenance folder for each type of plant, with details of any repair or corrective action taken. Records of repair works are retained in the workshop files.

4.13 Inspection of slings, chains and lifting equipment

Slings, chains and lifting equipment (ie. shackles, hooks, chain blocks) shall be inspected prior to every use by a competent person and include an assessment of the full length of the sling or chain for any signs of damage and ensure that a WLL tag is fitted.

In addition, periodic inspections will be undertaken:

- Every 3 months
 - by a competent person to assess all surfaces along the full length of the sling or every individual chain link for any signs of damage

Slings or chains that contain any damage or fault must be removed from service (ie. tagged out) immediately.

- Every 12 months
 - by a recognized testing organization that is NATA accredited, in accordance with the applicable Australian Standards for the sling or chain

Periodic inspections may be conducted more frequently where the sling is used intensively and where conditions may cause damage (eg. corrosive environment). Periodic inspections must be documented and records provided to the Operations Supervisor as soon as practicable following the inspection to ensure that corrective actions are undertaken.

Inspections undertaken prior to use and periodically must be undertaken in well-lit locations, free from extremes of temperate. The inspection of chains and slings must assess the following (as applicable):

- external and excessive wear
- local abrasion
- cuts and contusions
- internal wear
- damage to protective coating or sleeve
- damage from high temperatures
- sunlight degradation
- chemical attack
- label damage
- deterioration of stitching
- damage of any eyes
- damage at the any terminal attachment
- damage to any end fittings

Specific requirements for the inspection of chains include:

- clean the chain thoroughly.
- lay the chain out on a clean surface or hang it up in a well lit area.
- every chain link should be individually inspected for any signs of wear, twisting, stretching, nicks, or gouging and any worn link measured to determine degree of wear using Vernier Calipers.
- master links and hooks should be inspected for any sign of wear at their load bearing points and for any signs of distortion, such as widening of hook throat opening.
- coupling links should be inspected for any signs of wear at their load bearing points, for excessive play of the load pin within the body halves and for impaired rotation of the body halves around the load pin.

Chain links or fittings having any defects should be clearly marked to indicate rejection and the chain sling should be withdrawn from service until properly repaired and retested prior to returning to service.

Chain slings that have damaged fittings may be repaired on-site by replacing the fittings (note: when reassembling coupling links it is recommended that a new pin and stud assembly be used), but must be proof tested after any modifications other than replacing safety latches that are not an integral part of a hook in accordance with AS3775.2.

The inspection must include any hooks and latches to be used with specific attention given to clearance between the hook and latch to ensure that it is within acceptable tolerances.

Slings and chains will be withdrawn from service immediately after the following:

- a dangerous condition of the sling or chain is suspected
- the label or tag is missing or illegible
- defective safety catches and self-locking hooks
- the cover or sewn sleeve has been damaged
- the stitching has been damaged
- a protective coating has been damaged
- an end fitting or coupling has been damaged (eg. distorted, cracked, fractured or excessively worn or corroded)
- whenever the sling has lost 10% or more of its minimum breaking strength
- any of the load-bearing fibres are damaged (eg. damage to a cover, surface chafe, cuts, fibres that are fused or glazed)
- any damage caused by chemicals (eg. local weakening, softness of the cover, flaking of surface fibres), including situations where a:
 - nylon sling has come into contact with an acid solution
 - polyester sling has come into contact with an alkaline solution
 - polypropylene sling has come into contact with an organic solvent (eg. wet paint, coal tar, paint stripping mixtures)

The Operations Supervisor is responsible for updating and maintaining the Bardavcol slings, chains and lifting equipment register. This register includes the following information

- reference number
- description (ie. type of sling, chain, equipment)
- serial number

- purchase date
- date of introduction to service
- inspection dates
- test date
- condition
- next inspection date

Project Managers must ensure that a project slings, chains and lifting equipment register is maintained for those items used on the project. The Register must include details of slings, chains and lifting equipment used by Bardavcol and subcontractors, including records of periodic inspection dates.

5 Permits/Licences:

- [FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)
- [FO 017 Excavation Work Permit](#)
- [FO 028 Subcontractor Plant Compliance Checklist](#)
- Permits and licenses will be determined by the nature of the work being carried out.
- Refer to Project Management Plan

6 Emergency Response:

- Cease operating plant, shut down plant.
- Apply Danger Tag or Out of Service Tag as appropriate and contact workshop personnel.
- Make area around plant safe.
- [FO 023 Emergency Response Plan](#)

7 Program Inspection:

- Plant specific inspection check lists as prescribed
- Preventative maintenance schedule as per manufacturer's requirements.
- Visual inspection prior to use.
- Any relevant pre-start checklists.

8 References:

- Work, Health & Safety Act, SA 2012
- Work, Health & Safety Regulations, SA 2012
- Code of Practice How to Manage Work Health and Safety Risks
- Code of Practice Managing Noise and Preventing Hearing Loss at Work
- Code of Practice Construction Work
- Code of Practice Managing Risks of Plant in the Workplace
- Code of Practice Excavation Work
- Code of Practice Demolition Work

9 Tools/Forms:

- [FO 001 Site Health & Safety Inspection Form](#)
- [FO 002 Site Induction Register](#)
- [FO 007 Site Induction Form](#)
- [FO 014 Risk Assessment Form](#)
- [FO 015 Risk Assessment Calculator](#)
- [FO 017 Excavation Work Permit](#)
- [FO 018 Hot Work Permit](#)
- [FO 019 Equipment Requiring Licenses, Tickets Certificates of Competency to Operate](#)
- [FO 020 Employee & Induction Checklist](#)
- [FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety](#)

- [FO 027 Plant Risk Assessment Form](#)
- [FO 028 Subcontractor Plant Compliance Checklist](#)
- [Project Management Plan Template](#)

1 Purpose:

To minimize health and safety risk posed by Skid Steer operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from skid steer operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Disengage safety locks – shut the cabin door
- Check hydraulic functions – by moving/operating bucket/attachment
- Be mindful of vehicle movement.

Operation:

- Use attachments for the purpose for which they are designed.
- Check with supervisor if uncertain of attachment use for task at hand.
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Loading Trucks

- Adhere to truck load limits

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet.
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – ie check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary

- Contact your supervisor

Getting the Machine On and Off the Trailer

- Park the trailer on firm flat terrain prior to loading or unloading trailer
- Ensure ramps are also on firm flat terrain prior to loading or unloading trailer
- If possible, have a spotter present
- Ensure visibility

Attachment Comes Loose or Falls Free

- Take extreme care when hitching and unhitching attachments
- Ensure locking pins are in place prior to use
- Ensure hydraulic connectors are correctly connected
- Locking pins can be either manual or hydraulic

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in
- Be aware of trenches and drop-offs in the work environment

Securing Machine & Attachments for Transport

- Use tie down points ONLY
- Check tie down equipment while doing the tying down to ensure it is in serviceable condition
- Use tie down chains for tying down only. NEVER use tie down chains for lifting or towing.
- If load binder appears damaged or worn, remove it from service and give it to your supervisor to send to the workshop
- Check trailer deck and machinery for loose or foreign equipment
- Do a final check of chains and straps to ensure they are tight prior to transport

Existing services – Above and Below Ground

- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower all raised equipment
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

Attachments

Bucket:

- Loading and unloading the bucket constantly changes the centre of gravity of the machine – keep this in mind.
- Emptying the bucket into trucks needs to be done from a relatively flat surface to reduce risk of tipping over.
- EVERYONE is to be kept CLEAR during operation of a 4 in 1 type bucket

Auger:

- ALWAYS watch the auger when it is being used
- No loose fitting garments to be worn by workers adjacent to auger – This includes high visibility vests

Broom:

- Ensure other workers maintain a safe distance from spinning parts

Mill Head/Profiler:

- Check cutting tips before use for damage and excessive wear
- Ensure other workers maintain a safe distance from spinning parts and other workers
- When changing cutting tips, raise Mill head and turn engine of machine OFF. Cutting tips may then be changed as per manufacturer's requirements.
- After turning off machine, do NOT leave the machine until the profiling head stops spinning.

When Leaving Plant:

- Lower attachments to ground
- Apply park brake/safety lock
- Turn off engine
- Wait for any rotating attachments to stop spinning
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Skid Steer Load Shifting Ticket

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Managing Noise and Preventing Hearing Loss at Work
- Construction Work
- Managing Risks of Plant in the Workplace
- Excavation Work
- Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

PLANT - FRONT END LOADER RUBBER TYRE (AND INTEGRATED TOOL CARRIER)



1 Purpose:

To minimize health and safety risk posed by Rubber Tyred Loader operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Rubber Tyred Loader operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions – by moving/operating bucket/attachment
- Be mindful of people and vehicles moving around you

Operation:

- Use attachments for the purpose for which they are designed.
- Check with supervisor if uncertain of attachment use for task at hand.
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Loading Trucks

- Adhere to truck load limits

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet.
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – ie check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

PLANT - FRONT END LOADER RUBBER TYRE (AND INTEGRATED TOOL CARRIER)



Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Attachment Comes Loose or Falls Free

- Take extreme care when hitching and unhitching attachments
- Ensure locking pins are in place prior to use
- Ensure hydraulic connectors are correctly connected
- Locking pins can be either manual or hydraulic

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in
- Be aware of trenches and drop-offs in the work environment

Existing services – Above and Below Ground

- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower all raised equipment
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine
- Pay attention and look at what you are doing
- Ensure cabin is kept clean and there are no loose objects that may obstruct the operator's access to machine controls

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

Attachments

Bucket:

- Loading and unloading the bucket constantly changes the centre of gravity of the machine – keep this in mind.
- Emptying the bucket into trucks needs to be done from a relatively flat surface to reduce risk of tipping over.
- EVERYONE is to be kept CLEAR during operation of a 4 in 1 type bucket

Broom:

- Ensure other workers maintain a safe distance from spinning parts and debris
- Work zone to be completely cleared by supervisor prior to operation

Pallet Forks:

PLANT - FRONT END LOADER RUBBER TYRE (AND INTEGRATED TOOL CARRIER)



- Do not exceed load rating of forks

Manual Handling Arm (Jib):

- Do not exceed load rating of MHA

When Leaving Plant:

- Lower attachments to ground
- Apply park brake/safety lock
- If machine is not turned off, ensure Hydraulic lock switch is activated
- If leaving the vicinity of the machine, turn off engine
- Wait for any rotating attachments to stop spinning
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Load Shifting Ticket for Loader

Appropriate class of license for weight range (e.g. IT28 MR Minimum)

Prior to being trained in SWI 30, you must have been trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Managing Noise and Preventing Hearing Loss at Work
- Construction Work
- Managing Risks of Plant in the Workplace
- Excavation Work
- Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Dozer operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Dozer operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tracks, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions – by moving/operating blade/ripper
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS be conscious of position of rippers, especially prior to moving
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet.
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in
- Be aware of trenches and drop-offs in the work environment

Existing services – Above and Below Ground

- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower blade & rippers if safe to do so
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine or tracks
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

When Leaving Plant:

- Lower blade & rippers to ground
- Apply park brake/safety lock
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Load Shifting Ticket for Dozer/Track Type Tractor

Appropriate class of license for weight range (e.g. D5 MR Minimum)

Prior to being trained in SWI 30, you must have been trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks
Managing Noise and Preventing Hearing Loss at Work
Construction Work
Managing Risks of Plant in the Workplace
Excavation Work
Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Excavator operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Excavator operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tracks, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions – by moving/operating boom, dipper, bucket
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Loading Trucks

- Adhere to truck load limits

Gradient

- Be mindful of gradient and direction of travel
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direction – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in
- Be aware of trenches and drop-offs in the work environment

ROPS:

- If your excavator is NOT fitted with a ROPS cabin, you are not permitted to undertake the following:

- Operate on a slope
- Work next to a ledge
- Do any face loading

Existing services – Above and Below Ground

- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower all hydraulic equipment
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine or tracks
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement rules.

Always

- When working in boggy conditions, work with tow hitch facing away from excavation so can be towed out if required
- Use quick hitch safety pin at all times
- Be aware of overhang when slewing
- Where possible, track in a forward direction

When Leaving Plant:

- Lower hydraulic equipment to ground
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Place security panels where fitted and when instructed
- Don't leave keys in ignition in unattended machine.

5 Permits/Licences:

Load Shifting Ticket for Excavator

Appropriate class of license for weight range

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
 How to Manage Work Health and Safety Risks
 Managing Noise and Preventing Hearing Loss at Work
 Construction Work
 Managing Risks of Plant in the Workplace
 Excavation Work
 Demolition Work

Tools/Forms:

[SWI 02.01 Plant Safety - General](#)
[SWI 09 Working Around Services](#)
[FO 001 Site Health & Safety Inspection Form](#)
[FO 005 Incident Report Form](#)
[FO 006 Workplace Injury and Illness Record](#)
[FO 007 Site Induction Register Form](#)
[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To ensure the safe use of quick hitches.

2 Objective:

To comply with regulatory standards and prevent misuse.

3 Target:

- No incidents, accidents or injuries related to quick hitch use
- No plant and equipment damage as a result of quick hitch misuse

4 What is a quick hitch

A quick-hitch is a device designed to facilitate the efficient connection and removal of attachments (such as buckets, grapples and rock breakers) to plant. It is often attached to the end of the dipper arm of an excavator, as a means of enabling different types and sizes of excavator bucket (for example) to be changed at will.

Quick-hitches are usually manufactured by independent companies, rather than the machine original equipment manufacturers.

The following types of quick hitches may be used:

Pin System Quick-hitch

The pin system quick-hitch takes advantage of the two pins that are used to attach a 'standard' type bucket to a machine's dipper arm.

Pins of this kind are fitted to all attachments used with the machine and the quick-hitch connects to the attachments by engaging with (and retaining) these two pins.

Depending on how a pin system quick-hitch is designed to mechanically operate in practice, it can be placed into one of three further classifications, which are:

Type of quick-hitch system	Typical method of engagement	Typical locking/security system
Manual	Manually retained e.g. by sprung latch operated with a lever	Manually inserted safety pin
Semi-automatic	Hydraulically operated retaining latch mechanism	Manually inserted safety pin
Fully-automatic	Hydraulically operated retaining latch mechanism	Hydraulically operated safety mechanism (may incorporate hydraulic and / or sprung safety system).

To make a connection a quick-hitch has to **engage** with an attachment and then **retain** it using some kind of a locking mechanism. A safety device, such as a safety pin or latch, must then be used to **secure** the retaining

mechanism, thus preventing it from inadvertently opening and causing the attachment to disconnect from the machine.

4 Risks associated with using quick hitches:

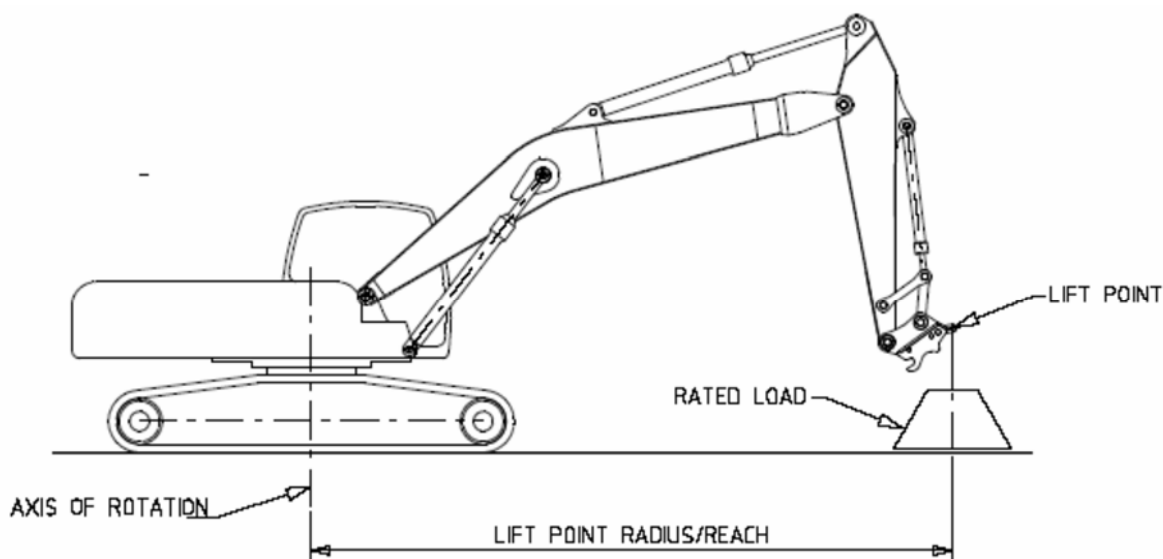
- The main risk arising from the use of a quick-hitch device is that the attachment, such as an excavating bucket, becomes disconnected from the quick-hitch and as a result works loose and falls from the machine.
- manual handling risks, when attempting to move an attachment;
- cuts, abrasions and other injury to hands, for example when conducting maintenance or changing attachments, particularly when attempting to insert a pin with a hammer;
- injury to eyes, in the same instances; and
- injury to feet, limbs and so forth, through attachments falling on personnel in the work area when being connected or disconnected.

5 Controls:

- a) It is the operator's responsibility to verify and ensure the safety pin is in place at all times when the machine is in use (whether attachment is fitted or not).
- b) Do not lift loads with attachments coupled to the quick hitch. If lifting from the quick hitch, only lift from the lifting eye provided. It is preferable to use the lifting eye on the dipper arm if provided.
- c) When using a machine fitted with a quick-hitch to assist lifting operations, only designated rated quick-hitch lifting eyes should be used for slinging or attaching a load.
- d) All attachments should be removed when lifting suspended loads on the quick hitch or dipper arm.

Safe Working Load

- 6 Safe working load (SWL) capacities should never be exceeded. Lifting equipment, including accessories, must be marked with the safe working load. The maximum capacity of the lifting gear must not exceed the SWL of the lowest rated component of the assembly.



Changing Attachments

There are several associated hazards which the worker may be exposed to when changing an attachment and which therefore require some guidance.

When an attachment is being disconnected, care should be taken as to where and how it is placed. It should be:

- positioned to facilitate later reattachment – to avoid the need for the attachment to be moved around manually, which is particularly important in the case of heavier attachments that pose a significant manual handling risk;
- located on level ground - machine attachments should never be disconnected on sloping ground or near to excavations, because they might roll down the slope or fall into the excavation;
- placed where plant has easy access to it; and
- ensure all hydraulic lines and cables are disconnected.

Attachment Selection

With some dedicated or manufacturer-specific quick-hitch equipment it may be possible to connect attachments that were not intended to be used with, or that are not suitable for, that particular dedicated quick-hitch system. For example, the use of a heavy breaker attachment might not be permitted by the quick-hitch manufacturer.

8

Operators must only use compatible quick-hitches and attachments or an unsafe connection may result.

Guidance for connecting Quick-hitches

Refer to manufacturer's quick hitch instructions.

9

10 Permits/Licences:

Appropriate load shifting licence for the machine operated

11 Emergency Response:

As per site Emergency Response Plan

12 Program Inspection:

Periodical preventative maintenance & inspection schedule.

13 References:

Work Health and Safety Act, SA 2012

Work Health and Safety Regulations, SA 2012

AS 4772: 2008 Earth-moving Machinery – Quick Hitches for Excavators and Backhoe Loaders.

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing Noise and Preventing Hearing Loss at Work

Construction Work

Managing Risks of Plant in the Workplace

Excavation Work

Demolition Work

9 Tools/Forms:

[FO 007 Site Induction Register Form](#)

[FO 013 SWMS](#)

[SWI-02.06 Plant - Excavator](#)

1 Purpose:

To minimize health and safety risk posed by Compactor operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Compactor operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions – by moving/operating blade
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other Plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in

- Be aware of trenches and drop-offs in the work environment

Existing services – Above and Below Ground

- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower blade if safe to do so
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement rules.

When Leaving Plant:

- Lower blade to ground
- Apply park brake/safety lock
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Load Shifting Ticket for Dozer/Track Type Tractor
Appropriate class of license for weight range (e.g. D5 MR Minimum)
Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
How to Manage Work Health and Safety Risks
Managing Noise and Preventing Hearing Loss at Work
Construction Work

Managing Risks of Plant in the Workplace
Excavation Work
Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Vibration Roller operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Vibration Roller operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other Plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Roll Over

- Always wear your seatbelt
- Be aware of the terrain you are working in

- Be aware of trenches and drop-offs in the work environment

Plant Failure

- Stop work immediately
- Secure plant
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement rules.

Operating Tip

- Exercise extreme caution when rolling edges

When Leaving Plant:

- Apply park brake/safety lock
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Appropriate class of license for weight range (e.g. MR Minimum)

Trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing Noise and Preventing Hearing Loss at Work

Construction Work

Managing Risks of Plant in the Workplace

Excavation Work

Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Pneumatic Roller operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Pneumatic Roller operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Use 3 points of contact, facing the machine, when climbing up to operator seat
- Seat & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Wear your seatbelt.

Visibility

- Ensure you have maximum visibility
- Be aware of blind spots.

Operating Close to Other Plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direction – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Roll Over

- Always wear your seatbelt
- Be aware of the terrain you are working in

- Be aware of drop-offs in the work environment

Plant Failure

- Stop work immediately
- Secure plant – apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement rules.

Tips For Use

- Bring machine to a complete stop before changing direction, i.e. forward/reverse

When Leaving Plant:

- Apply park brake
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Driver's License

Appropriate class of license for weight range (e.g. MR Minimum)

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Managing Noise and Preventing Hearing Loss at Work
- Construction Work
- Managing Risks of Plant in the Workplace
- Excavation Work
- Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Grader operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Grader operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions – by moving/operating blade/ripper
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS be conscious of position of blade and ripper, especially prior to moving
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)
- BE AWARE of potential travel speed of machine

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Give Way

- To larger vehicles
- Know the site's specific construction traffic movements
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet, slippery
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- Always ensure the vehicle that you are loading onto to or off from is on firm, flat ground

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower blade & rippers if safe to do so
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine or footholds
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

When Leaving Plant:

- Lower blade & rippers to ground
- Apply park brake/safety lock
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Appropriate class of license for weight range

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Managing Noise and Preventing Hearing Loss at Work
- Construction Work
- Managing Risks of Plant in the Workplace
- Excavation Work
- Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Road Truck operation (**Rigid, Articulated, Tippers, Tray Top, Water Carrier, Crane Trucks**).

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Road Truck operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect truck operation, safety equipment (e.g. reversing beeper, flashing light).

Start:

- Entering cabin using 3 points of contact, facing the truck
- Seat, mirror & belt adjustment
- Start truck
- Check gauges are within suitable operating limits & check warning lights
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS be conscious of position of tipper bodies, especially prior to moving
- NOBODY is to be adjacent to trucks during tipping or while hoist is raised
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular truck before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Loading Trucks

- Adhere to truck load limits

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet, slippery.
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in
- Be aware of trenches and drop-offs in the work environment

Existing Services – Above and Below Ground

- Be acutely aware of overhead power lines
- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the truck or steps
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

When Leaving Plant:

- Apply park brake/safety lock
- Turn off engine
- Lock/secure doors and bonnets
- Don't leave keys in unattended truck.

5 Permits/Licences:

Appropriate class of license for weight range

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure truck and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks
Managing Noise and Preventing Hearing Loss at Work
Construction Work
Managing Risks of Plant in the Workplace
Excavation Work
Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

PLANT - LOW LOADER & PLANT TRAILER



1 Purpose:

To minimize health and safety risk posed by using low loaders and plant trailers.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from low loader and plant trailer operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect trailer operation, tie down and other safety equipment (signs flags etc).

Operation:

- ALWAYS ensure NO personnel are within fall zone of plant or load

Familiarise Yourself With Trailer & Load

- Check Trailer anchor points and load tie down points.
- Ensure conforming weight distribution.
- Test the controls prior to loading plant.
- Ideally, use the most experienced operator present to load/unload machinery
- Ensure flat/stable surface during loading/unloading
- In addition to mandatory road rules, ensure familiarity with any site specific traffic rules and conditions
- Be aware of unfavourable environmental conditions of the loading surface – e.g. wet, muddy etc.
- Make sure persons loading plant are wearing seatbelts (where fitted).

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility during loading/offloading
- Be aware of blind spots.
- Be aware of any existing underground or overhead services during loading/unloading

Other Personnel

- Ensure no personnel adjacent loading/unloading.

Getting the Machine On and Off the Trailer

- Firm flat terrain
- Ramps on firm flat terrain
- If possible, have a spotter present
- Ensure visibility

Securing Machine & Attachments for Transport

- Use design intended tie down and anchor points ONLY.
- Check tie down equipment while doing the tying down to ensure it is in serviceable condition
- Use tie down chains for tying down only. NEVER use tie down chains for lifting or towing.
- If load binder appears damaged or worn, remove it from service and give it to your supervisor to send to the workshop
- Check trailer deck and machinery for loose or foreign equipment
- Do a final check of chains and straps to ensure they are tight prior to transport
- Re-check tie downs periodically during extended trips.

Existing services – Above and Below Ground

- Be aware of any existing overhead or underground services ie, power lines and service pits

Access/Egress

PLANT - LOW LOADER & PLANT TRAILER



- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine
- Pay attention and look at what you are doing.

Operating Plant When Loading/Unloading

- Maintain as low a centre of gravity as possible – buckets, rippers, blades etc as low as possible during loading/unloading
- Lower attachments
- Apply park brake/safety lock
- Turn off engine
- Wait for any rotating attachments to stop spinning
- Apply kill switch
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Appropriate Road License Class for Load Weights

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Phone manager.

7 Program Inspection:

Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Construction Work

Managing Risks of Plant in the Workplace

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Scraper operation.

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Scraper operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect machine operation, safety equipment.

Start:

- Entering cabin using 3 points of contact, facing the machine
- Seat, mirror & belt adjustment
- Start machine
- Check gauges are within suitable operating limits & check warning lights
- Check hydraulic functions – by moving/operating hydraulic controls
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS be conscious of elevation of bowl, especially prior to moving
- Make sure that NO-ONE is adjacent to machine during starting and operation – e.g. pivot pin during steering
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular plant before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Give Way

- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet, slippery.
- Make sure you wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.
- Ensure dust suppression measures are in place as part of work process

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direction – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Loading the Machine

- This will be done by sub-contractors

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in

Existing services – Above and Below Ground

- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant – i.e. lower blade & rippers if safe to do so
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the machine or foot holds
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

Tips for Use

- Maintain haul roads in good condition to minimise risk of rollover
- A combination of unstable or uneven terrain and steering in the wrong direction can easily result in rollover of scraper

When Leaving Plant:

- Close and lower bowl to ground
- Apply park brake/safety lock
- Turn off engine
- Apply kill switch at end of shift or when leaving machine
- Lock/secure doors and bonnets
- Don't leave keys in unattended machine.

5 Permits/Licences:

Appropriate class of license for weight range

Be trained in and signed off on [SWI 02.01 Plant Safety - General](#)

6 Emergency Response:

Secure machine and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
 How to Manage Work Health and Safety Risks
 Managing Noise and Preventing Hearing Loss at Work
 Construction Work
 Managing Risks of Plant in the Workplace
 Excavation Work
 Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)
[SWI 09 Working Around Services](#)
[FO 001 Site Health & Safety Inspection Form](#)
[FO 005 Incident Report Form](#)
[FO 006 Workplace Injury and Illness Record](#)
[FO 007 Site Induction Register Form](#)
[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

1 Purpose:

To minimize health and safety risk posed by Off-Road Articulated Road Truck operation (**Tippers, Water Carriers**).

2 Objective:

To comply with regulatory requirements.

3 Target:

- Minimise incidents, accidents or injuries from Off-Road Articulated Truck operations.

4 Controls:

Pre Start:

- Familiarise yourself with manufacturer's operation manual.
- Do a pre-start check as per the time-sheet.
- Checks to include greasing, fluid levels, tyres, damage/wear & tear that may effect truck operation, safety equipment (e.g. reversing beeper, flashing light).

Start:

- Entering cabin using 3 points of contact, facing the truck
- Seat, mirror & belt adjustment
- Number of passengers=number of seats
- Start truck
- Check gauges are within suitable operating limits & check warning lights
- Be mindful of people and vehicles moving around you

Operation:

- ALWAYS be conscious of position of tipper bodies, especially prior to moving
- NOBODY is to be adjacent to trucks during tipping or while hoist is raised
- ALWAYS ensure NO personnel are between your machine and any other fixed object – e.g. wall, other machine etc)

Familiarise Yourself With the Machine

- If you haven't used the particular truck before, spend some time in the cabin familiarising yourself with the controls and layout.
- Test the controls prior to use to get a feel for the machine.

Loading Trucks

- Adhere to truck load limits
- Awareness of load – i.e. sticky, wet, large lumps – especially when tipping.
- For water cart – load awareness of water movements – drive to conditions
- Ensure truck positioned safely to load and move off

Give Way

- To larger vehicles
- Laden vehicles have right of way
- Ensure familiarity with site specific traffic rules and conditions

Gradient

- Be mindful of gradient and direction of travel
- Be mindful of the job you are doing relative to the gradient.
- Be aware of the conditions of the gradient surface – e.g. wet, slippery.
- Use designated roadways where provided
- Wear your seatbelt.

Visibility

- Make sure windows and mirrors are kept clean to ensure maximum visibility
- Be aware of blind spots.

Operating Close to Other plant and Personnel

- Remain aware of environment at all times.
- Always check when changing direct – i.e. check behind prior to reversing.

Unauthorised Personnel in Work Area

- Stop the machine if necessary
- Contact your supervisor

Roll Over

- Always wear your seatbelt in the cabin
- Be aware of the terrain you are working in – especially uneven ground conditions and variable gradients
- Don't speed or turn too sharply
- Be aware of trenches and drop-offs in the work environment

Existing Services – Above and Below Ground

- Be acutely aware of overhead power lines
- Refer to [SWI 09 Working Around Services](#)
- Project manager or supervisor does dial before you dig.
- Use appropriate techniques when working around services. This will depend on the services, proximity and authority requirements
- If uncertain, check with your supervisor prior to commencing or continuing work.

Plant Failure

- Stop work immediately
- Secure plant
- Apply park brake
- Turn off engine
- Address any immediate environmental or safety hazards if it is safe to do so – e.g. use shovel to build dirt bunding if fuel is spilling to contain it.
- Contact your supervisor and/or get assistance

Access/Egress

- Ensure steps are clear and free of debris
- Clean steps off if necessary, prior to use
- Maintain 3 points of contact and face the machine when getting into and out of the cabin
- Use the steps and rails provided on the machine for access and egress
- DON'T jump off the truck or steps
- Pay attention and look at what you are doing

Site Specific Considerations

- Ensure you have been inducted onto the site and have been instructed in any relevant Job Hazard Analysis, Job Safety Analysis or Safe Work Method Statement
- Ensure you are familiar with the site specific plant movement and plant operation rules.

When Leaving Plant:

- Apply park brake/safety lock
- Turn off engine
- Lock/secure doors and bonnets
- Don't leave keys in unattended truck.

5 Permits/Licences:

HR License

6 Emergency Response:

Secure truck and turn off engine as per above.

7 Program Inspection:

Daily Pre Start Check.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing Noise and Preventing Hearing Loss at Work

Construction Work

Managing Risks of Plant in the Workplace

Excavation Work

Demolition Work

9 Tools/Forms:

[SWI 02.01 Plant Safety - General](#)

[SWI 09 Working Around Services](#)

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

SMALL PLANT & TOOL SAFETY - GENERAL



1 Purpose:

To minimize the risks associated with working with small plant and tools.
Provide general safety guidelines that apply to all small plant and equipment used at Bardavcol.

2 Objective:

To comply with regulatory standards and contractual requirements.
To minimise incidents, accidents and injuries associated with the use of small plant and tools used at Bardavcol.

3 Target:

- Minimise incidents, accidents or injuries associated with the operation or use of small plant & tools.
- No damage to small plant and tools, buildings or infrastructure from the operation of small plant and tools.

4 Controls:

4.1 Use of Small Plant & Tools

- a) Prior to operating or using small plant and tools, employees and subcontractors must ensure that plant or tools are in a safe and serviceable condition. Any faults or potential hazards must be reported to a Supervisor immediately.
- b) Employees must:
- not operate small plant and tools that they have not been trained in using.
 - not operate plant or use tools recklessly, or in a manner likely to cause danger to their fellow employees, other people or themselves.
 - keep their small plant and tools in a clean and tidy condition ensuring that controls and safety devices are not obstructed or in any way rendered ineffective.
 - Not operate any small plant or tools whilst intoxicated or under the influence of any drug. Any employee found in an intoxicated condition or under the influence of a drug may be suspended immediately. [Refer CP06 Alcohol & Drugs Policy; SWI 06 – Alcohol & Drugs](#)
 - If employees leave their small plant or tools, they must be turned off (if powered) and left in a safe place so as not to cause a hazard in the work place.
 - not use any plant or tools that have had safety guards removed or damaged. If this is discovered, the plant or tool is to be reported to a supervisor and taken out of service until it is made safe.
 - not clean any small plant or tool whilst it is in motion.
 - not leave any small plant or tool running whilst unattended unless specifically required to do so.
 - not use any damaged or faulty tools, small plant or equipment. Any damage or faults must be reported to the Site Supervisor / Project Manager immediately. Employees must not make temporary or running repairs unless approved by the Operations Supervisor.
 - not make any electrical repairs or maintenance to any small plant or tools unless qualified and authorized to do so. Any electrical faults must be reported to the Operations Supervisor immediately.
 - not attempt any repairs to any small plant or equipment, unless qualified and authorized to do so.
 - use small plant and tools only for the purpose for which it was designed.
- c) Repair and Maintenance - all machinery shall be shut down or positive means taken to prevent its operation while repairs, adjustments, servicing and manual lubrication is being made. Any guard or safety device removed while making repairs shall be replaced before starting operations again.

Positive means shall include one of the following:

- (i) Lockout or isolation devices;
- (ii) Danger tags;

- (iii) Permit to work systems.

4.2 Small Plant & Tool Hazard Management

Where possible, safe work instructions are to be used as the reference document for the safe use of small plant and tools used by Bardavcol personnel.

It is the responsibility of employees to ensure that small plant and tools are in good condition and are safe to operate/use.

Supervisors are responsible for ensuring any small plant and tools that arrive on site is serviceable and practical to use. The supervisor is also responsible for inspecting the small plant or tools prior to use. No person shall operate any item of plant if it is not serviceable, not fit for purpose or is unsafe.

All sub-contractor small plant and tools provided and used on-site must be properly maintained in good working order with any safety devices in place and operational. Subcontractor small plant and tools will be subject to random checks by Bardavcol personnel.

Small plant and tools are not to be modified in a manner not recommended by the manufacturer.

4.3 Common Hazards Involving Small Plant & Tools

Common Hazards involving small plant & tools:

- PPE required
- Correct use
- Elevated noise levels
- Power source hazard (electrical, air pressure, fuel etc.)
- Guarding in place
- Fuels storage
- Regular inspection
- Use without training or instruction

Small plant and tools can be hazardous when:

- It is poorly maintained.
- Used in an application for which it has not been designed.
- The capacity of the plant or tool is exceeded.
- Personnel are untrained or inexperienced in their use.

Refer to relevant small plant and tools Safe Work Instructions in the "Tools" safe work instruction series.

4.4 Electrical Hazards Involving Small Plant & Tools

All portable electrical equipment shall carry current test tags, including extension chords.

All electrical equipment shall be used with RCDs in accordance with [SWI 03.03 Tools – Residual Current Devices \(RCDs\)](#).

Voltage Reduction Devices (VRDs) shall be used with arc welders in the following conditions:

- Where the environment is above 32 degrees Celsius
- In confined spaces e.g. inside pressure vessel, processing tanks, storage tanks, conductive confined spaces.
- A person is in contact with conductive parts of a work piece, e.g. steel building structures
- In hot, wet, damp or humid environments.

5 Permits/Licences:

[FO 018 Hot Work Permit](#)

[FO 028 Subcontractor Plant Compliance Checklist](#)

6 Emergency Response:

Cease operating small plant or tool and shut it down.

Apply Danger Tag or Out of Service Tag as appropriate and notify Supervisor.

Make area around plant or tool is safe.

[FO 023 Emergency Response Plan](#)

7 Program Inspection:

Plant specific inspection check lists as prescribed

Preventative maintenance schedule as per manufacturer's requirements.

Visual inspection prior to use.

Any relevant pre-start checklists.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing Noise and Preventing Hearing Loss at Work

Construction Work

Excavation Work

Demolition Work

Hazardous Manual Tasks

Managing the Risks of Falls at Workplaces

Confined Spaces

Managing electrical risks at the workplace

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)
[FO 002 Site Induction Register](#)
[FO 007 Site Induction Form](#)
[FO 014 Risk Assessment Form](#)
[FO 015 Risk Assessment Calculator](#)
[FO 018 Hot Work Permit](#)
[FO 020 Employee & Induction Checklist](#)
[FO 027 Plant Risk Assessment Form](#)
[FO 028 Subcontractor Plant Compliance Checklist](#)
[Project Management Plan Template](#)

TOOLS - ELECTRICAL POWER TOOLS



1 Purpose:

To minimize health and safety risk posed by Electrical Power Tools.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries from electrical power tools.

4 Controls:

Electrical Power Tool Use Steps:

- a) Electrically powered tools must be used in conjunction with a RESIDUAL CURRENT DEVICE (RCD). These RCD's must be regularly tested. [Refer SWI 03.03 Residual Current Devices](#)
- b) Before any person uses an electrical powered tool a visual check must be undertaken to cover the following points:
 - ***Does the equipment have a current inspection tag- January – March =RED, April – June=GREEN, July – September=BLUE, October – December=YELLOW***
 - Are there any indications on the electrical lead to the machine of something having been dropped on it or having ran over it? If so the lead should be checked by an electrician before the equipment is operated.
 - Check that any guards are correctly fitted and secure, and in the case of moving guards such as those used on a saw, that these operate smoothly and correctly.
- c) Ensure the electrical power supply available is the same rating as that shown on the manufacturer's label.
- d) Make sure any power cable is correctly 'tagged' and that it is long enough to reach your work area without straining it.
- e) Make sure you use all necessary protective equipment (eye protection, earmuffs etc) while operating the tool, [Refer SWI 08 Personal Protective Equipment](#)
- f) Never drag an electrical power tool along or raise it from one level to another by pulling it by the electric supply cable.
- g) Where possible keep electrical leads off the floor, but if this is not possible, ensure they are kept off aisle ways or other means of access. Employees are not permitted to use extension leads in excess of 30 metres in length. As far as practicable all extension leads should be supported above the ground tagged and maintained in good condition.
- h) Where an electrical lead must cross an aisle way or roadway used by vehicles: these leads must be protected by a channel, formed by two boards, or some other suitable material.
- i) Never stand on a damp or wet surface when using electrical equipment. Keep the equipment clean and dry.
- j) Never use excessive force which causes the electric tool to slow down. This causes heating of the electrical part of the tool and can cause an insulation breakdown.

TOOLS - ELECTRICAL POWER TOOLS



- k) Portable electric tools should only be used for their designed purpose.
- l) Disconnect the electrical power source from the tool to change accessories or do any adjustments.
- m) Make sure all cutting accessories (drills, saw blades, etc) are correctly sharpened and that they are not blunt from previous use.
- n) Disconnect the tool from the power source when it is not in use.
- o) Make sure all electric power tools are stored in such a way that the chance of damage is minimised.
- p) While you are using an electrically powered tool; you feel any electric shock, even a very slight one, immediately stop the tool and disconnect it from the power source. Take the tool to your Supervisor and report the condition immediately. REPORT ALL DEFECTS IMMEDIATELY. [Refer IP 15 Incident Investigation, Corrective Action & Reporting](#)

5 Permits/Licences:

Hot Work Permit where applicable

6 Emergency Response:

Remove energy source from electrical power tools.

7 Program Inspection:

Electrical Testing & Tagging process for electrical equipment.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Managing Noise and Preventing Hearing Loss at Work
- Construction Work
- Excavation Work
- Demolition Work
- Hazardous Manual Tasks
- Managing the Risks of Falls at Workplaces
- Confined Spaces
- Managing electrical risks at the workplace

9 Tools/Forms”

[FO 001 Site Health & Safety Inspection Form](#)

[FO 005 Incident Report Form](#)

[FO 006 Workplace Injury and Illness Record](#)

[FO 007 Site Induction Register Form](#)

TOOLS - RESIDUAL CURRENT DEVICES (RCD's)



1 Purpose:

To minimize the health and safety risk from using electrical equipment, and regulate the use of RCDs within Bardavcol's operations.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries from using electrical equipment.

4 Controls:

Residual Current Devices are relay switches that measure current going through the active wire into a device, such as a power tool and leaving it through the neutral wire. When current becomes diverted by being earthed (i.e.: through an employee holding the tool) the RCD reacts to the electrical imbalance and cuts off the electrical supply. Use of RCD's should not be regarded as a substitute for basic electrical safety precautions.

- a) All moveable electrical equipment that has electricity supplied through a socket outlet must be connected to a non-portable (fixed) or portable RCD.
- b) Every portable RCD must be tested each time it is plugged into a socket. Fixed RCD's must be tested monthly. No RCD shall be used if it fails to operate correctly. The person using the RCD is responsible for the testing of the unit.
- c) Every portable RCD must be load tested every three months. Fixed RCD's must be load tested annually. No RCD shall be used if it fails these tests.
- d) Every portable RCD must have marked on it the following:
 - (i) 'Test before use. Do not use if test fails'.
 - (ii) The rated voltage of the RCD i.e. 230V or 220V to 240V.
- e) RCD's are not to be stored or used in adverse conditions or in a damaged state or immersed in water.
- f) All equipment must be unplugged from the electrical supply and the RCD before any inspection or repair of the equipment is attempted.
- g) Employees are not permitted to use extension leads in excess of 32 metres in length. As far as practicable all extension leads should be supported above the ground tagged and maintained in good condition.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Electrical Testing & Tagging process for electrical equipment.

RCD test incorporates push button test and operating time tests (in accordance with AS/NZS 3760) for portable and non-portable RCDs.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

TOOLS - RESIDUAL CURRENT DEVICES (RCD's)



How to Manage Work Health and Safety Risks
Construction Work
Excavation Work
Demolition Work
Hazardous Manual Tasks
Managing electrical risks at the workplace

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 020 Employee Induction Checklist](#)

[FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety](#)

TOOLS - SMALL PORTABLE GENERATORS



1 Purpose:

To minimize the health and safety risks associated with using small portable generators.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with small portable generator use.
- No damage to plant, equipment and infrastructure from small portable generator usage

4 Controls:

a) Engine Operation & Starting

1. Fill crankcase with oil.
 - Place your generator on level ground.
 - Remove Plug or Dipstick.
 - Fill crankcase slowly to point of overflowing or correct level on dipstick. Replace plug or dipstick securely.
 - An earth stake, where fitted, must always be used.
2. Pull engine over several times to ensure there has been no damage during transit.
3. Switch off electrical power outlets.
4. Turn fuel valve ON.
5. Close choke - It is normal to use the choke when starting the generator from cold.
6. DO NOT ADJUST THROTTLE SETTING.
7. Set the ON/OFF switch to the ON position.
8. RECOIL/ROPE START - Pull the starter handle until slight resistance is felt, then pull briskly. Allow rope to recoil slowly.
9. When engine starts, progressively OPEN THE CHOKE until engine runs smoothly.
10. Allow engine to warm up for about 1 to 2 minutes before applying high loadings to your generator.

b) Hints for Safe Operation and Best Performance

- Daily air cleaner servicing is recommended in dusty conditions.
- Do not operate petrol driven generator at less than 1/3 full load for long periods.
- Use correct sized flexible power cables. Do not use light domestic extension leads for high power loadings or over long distances. Damage to appliances and/or generator may result from excessive voltage drop in the cable.
- When starting and stopping your generator, turn off all connected appliances - especially induction motor driven appliances such as refrigerators, water pumps, air conditioners, workshop machinery and electronic appliances such as TV sets. Damage may occur to these appliances due to the high/low voltage output from the generator under starting and stopping situations.
- Stop engine before filling with petrol.
- Allow all spilt petrol to evaporate before re-starting.

TOOLS - SMALL PORTABLE GENERATORS



- Do not operate generator without sufficient ventilation. Poisonous carbon monoxide gases - colourless and odourless - are contained in exhaust gases.
- Do not operate your generator in a closed box. Both engine and generator require clean cooling air.
- Protect generator from water and rain.
- Never connect generator to any wall mounted power outlet by means of a cord and plug. All wiring work associated with the connection of the generator to an existing electrical installation must be carried out by a licensed electrical contractor.
- Always ensure that the generator has a Residual Current Device (RCD) fixed which is operating correctly. **An earth stake, where fitted, must always be used.**
- If the generator does not have a built in RCD, ensure portable RCDs are being used. Refer to [SWI 03.03 Tools – Residual Current Devices \(RCDs\)](#).

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Visual inspection prior to use
Preventative maintenance schedule

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
How to Manage Work Health and Safety Risks
Construction Work
Excavation Work
Demolition Work
Hazardous Manual Tasks
Managing electrical risks at the workplace

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)
[FO 007 Site Induction Register Form](#)
[FO 010 Standard Safety, Environmental Emergency Flowchart](#)
[FO 013 Job Hazard Analysis Sheet](#)
[FO 014 Risk Assessment Form](#)
[FO 015 Risk Assessment Calculator](#)

TOOLS – SMALL COMPACTION DEVICE USE (LEG RAMMER, DPU, VIBRATION PLATE)



1 Purpose:

To minimise health and safety risks associated with wacker use.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with wacker use.
- No damage to plant, equipment, buildings or infrastructure from wacker use.

4 Controls:

- a) Do not lift machine in and out of vehicles on your own as they are heavy. Get help.
- b) Once the machine is standing safely and on even ground, a visual inspection is to be carried out for oil leaks around bellows. If leaking, advise Site Supervisor.
- c) If no leaks, check fuel reserve and top up if necessary.
- d) Switch fuel tank tap to "on" position.
- e) Switch choke switch to "on" position and pull starting handle until machine starts. Switch choke off and allow machine to warm up for a couple of minutes.
 - Should machine not start, ask advice from Site Supervisor.
- f) Ensure that ear protection is worn whilst operating machine. Site Supervisor has protection and will supply on request.
- g) We are now ready to go. Ensure that you have good steady control of machine and open throttle to start machine working. NB. It is not necessary to open throttle fully. Machine should bounce at a steady, continuous, smooth operating speed.
- h) Once job completed, shut down throttle to bring machine back to idle. Press "stop" button to shut off engine.
- i) It is important at this stage to shut fuel tap to "off" position.
- j) Remember get assistance to move machine from work area.
- k) Occasionally machines get bogged down if working in wet and heavy conditions. If this occurs switch throttle to idle machine and get help to lift out. Remember **Work Safely**.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Visual inspection prior to use.

Scheduled preventative maintenance schedule.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing Noise and Preventing Hearing Loss at Work

Construction Work

Excavation Work

Demolition Work

**TOOLS – SMALL COMPACTION
DEVICE USE (LEG RAMMER,
DPU, VIBRATION PLATE)**



Hazardous Manual Tasks
Managing the Risks of Falls at Workplaces
Confined Spaces
Managing electrical risks at the workplace

**TOOLS – SMALL COMPACTION
DEVICE USE (LEG RAMMER,
DPU, VIBRATION PLATE)**



9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 010 Standard Safety, Environmental Emergency Flowchart](#)

[FO 013 Job Hazard Analysis Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

1 Purpose:

To minimize health and safety risk associated with Quick Cut Saw operation.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with Quick Cut Saw operation.
- No damage to plant, equipment, buildings or infrastructure from Quick Cut Saw operation.

4 Controls:

a) Only people who are correctly trained and capable are to operate these machines.

b) Ensure you have all necessary safety equipment prior to use.

- Safety Glasses and Face Shield (Double eyed protection at all times)
- Dust Mask
- Ear Muffs or Ear Plugs

If you require any or all of the above see your Site Supervisor.

c) Prior to starting machine ensure work area is clear.

d) Where fitted, decompression button needs to be pressed prior to starting machine.

e) Check that cutting blade is correctly fitted and secure.

f) Check that safety guard is fitted correctly and is secure.

g) Check fuel level in tank. Use 50:1 mix unless OEM recommends a different ratio.

h) To start engine, flick on/off switch to on position, apply choke and pull starter cord until engine fires.
Switch choke to off position. It at this time the engine has stopped, pull starter cord until engine starts.
Allow engine to warm prior to use. Should you be unable to start machine inform Site Supervisor.

i) To stop engine simply flick on/off switch to off position.

j) Each time machine is refuelled the OUTER filter is to be cleaned.

k) Under NO circumstance is the INNER element to be removed. If at any time you are unsure about the cleaning of these filters ask your Site Supervisor.

l) Appropriate discs are to be used for cutting either concrete or metal, both types are available on request.

m) Keep machines in a clean and safe state as you may not necessarily be the next operator.

n) Use correct blade for the job: wet or dry blade.

o) Check condition of blade.

p) When cutting metal, obtain Hot Work Permit and observe Fire Bans

5 Permits/Licences:

Hot Work Permit.

Compliance with Fire Bans.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Visual inspection prior to use.

Scheduled preventative maintenance.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks
Managing Noise and Preventing Hearing Loss at Work
Construction Work
Excavation Work
Demolition Work
Hazardous Manual Tasks
Managing the Risks of Falls at Workplaces
Confined Spaces
Managing electrical risks at the workplace

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 010 Standard Safety, Environmental Emergency Flowchart](#)

[FO 013 Job Hazard Analysis Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

1 Purpose:

To minimize health and safety risk associated with using angle grinders.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with angle grinder use.
- No damage to plant, equipment, buildings or infrastructure from angle grinder use.

4 Controls:

Definition: A grinding machine which is hand held and can easily be moved from one location to another.

- a) Check condition of blade prior to start-up.
- b) Use the correct blade for the job.
- c) Double eyed protection must be used when operating portable grinder. Safety glasses and a face shield must be worn at all times.
- d) Before starting electric disc grinders, visually check the stone for signs of damage or fracture. Ensure the guard is in the right position to protect you should the stone break, and ensure handle is fitted, and that there are no other persons in the area who could be hit if the stone fractured.
- e) When using a grinder make sure you do not shower sparks over other persons. Use screens or position yourself so the sparks fly into a safe area.
- f) It is considered prudent to wear hearing protection during all grinding operations.
- g) Select the correct type of wheel for the job. Never grind on the sides of a straight wheel, use a cup shaped or saucer shaped wheel. If it is a cutting process that is required, then a proper cutting-off wheel must be used.
- h) Make sure that the area in which you are going to use the machine, is clear of tripping or stumbling hazards; and that you have good footing and balance before starting the machine.
- i) Ensure that the work is secure and cannot move. The operator must use two hands on the machine and always used the handle at all times. Therefore cannot hold the job at the same time.
- j) Shut off the power when the tool is not being used for grinding.
- k) Do not put the machine down until the wheel has stopped revolving.
- l) Put the machine down gently, being careful not to bump the wheel, and ensure it is in an area where it will be safe from passing traffic or falling objects. Make sure the machine is left in a position where it cannot fall.
- m) Machines should not be lifted or dragged by their flexible cables. Cables should not be left in areas where they may become damaged or cause a tripping hazard.
- n) Never use excessive effort on the machine while grinding.

5 Permits/Licences:

Hot work permit.
Observe Fire Bans.

6 Emergency Response:

Remove power source.

7 Program Inspection:

Tagging and testing schedule.
Visual inspection prior to use.
Scheduled preventative maintenance.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
 How to Manage Work Health and Safety Risks
 Managing Noise and Preventing Hearing Loss at Work
 Construction Work
 Excavation Work
 Demolition Work
 Hazardous Manual Tasks
 Managing the Risks of Falls at Workplaces
 Confined Spaces
 Managing electrical risks at the workplace

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)
[FO 007 Site Induction Register Form](#)
[FO 010 Standard Safety, Environmental Emergency Flowchart](#)
[FO 013 Job Hazard Analysis Sheet](#)
[FO 014 Risk Assessment Form](#)
[FO 015 Risk Assessment Calculator](#)

TOOLS - OXY-ACETYLENE OPERATION



1 Purpose:

To minimize health and safety risk associated with Oxy-Acetylene Operation.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with oxy-acetylene operation.
- No damage to plant, equipment, buildings or infrastructure from oxy-acetylene operation.

4 Controls:

a) Work Area

Where practicable, protective screens must be used to provide protection from any harmful rays produced by any welding operation. All fumes generated by a welding process must have an effective and appropriate means of being removed as not to cause risk to a person's health. A safe means of access and egress must be maintained at all times and the work area clean, clear and free from hazards to allow people to move conveniently and safely about the work area and be able to leave the work area and be able to leave that work area in an emergency.

b) Safe Work Procedures

Cylinders- any employee who may use oxy-acetylene cylinders must:

- always keep cylinders, empty or full, away from sources of heat such as radiators or furnaces;
- keep oil and grease stored away from the cylinders or other highly combustible materials;
- screen cylinders that are standing in the open against direct sunlight;
- protect cylinder valves from bumps and falling objects;
- close cylinder valves when not in use, when empty, or when moving cylinders. Be sure the cylinder valve is tightly closed before removing regulators;
- never allow anyone to strike an arc or tap an electrode against any cylinder;
- never try to fill a cylinder or mix gases in a cylinder;
- never tamper with or alter cylinder markings or numbers;
- never use cylinders as supports or rollers;
- never drain gas from cylinders except through properly attached pressure regulators or equipment designed for the purpose;
- open all cylinder valves slowly;
- never open a cylinder valve more than 1½ turns; and
- never use oxygen in pneumatic tools, in oil pre-heating burners, to start engines, to blow out pipelines or to freshen the atmosphere in confined areas.

Blowpipes, Regulators and Tubing - Handling and Care

- do not use oil or grease on any blowpipe, regulator, threads or section of tubing. Do not handle equipment with an oil rag, only gloves or hands;
- never use a blowpipe as a hammer to knock slag from work;

TOOLS - OXY-ACETYLENE OPERATION



- inspect all connections and all seating surfaces before use;
- never hang a blowpipe or tubing on a regulator of cylinder valve;
- always crack cylinder valves before attaching regulators;
- never try to connect a regulator to a cylinder other than for which the regulator is meant;
- periodically the pressure gauges on regulators should be tested for accuracy. Ensure before using that regulators have both a cylinder pressure and a deliver pressure gauge in working order. Pressure build-up in excess of 35kpa is to be regarded as excessive and requires immediate attention. Also if the pressure gauge indicator fails to return to the stop when pressure is released the gauge needs to be checked;
- when long lengths are required all connections must be tight and also ensure tubing is protected from being stepped on, run over, kinked or tangled. Protect tubing from sparks, hot slag, hot objects, sharp edges or open flames;
- use only tubing designed specifically for oxygen or acetylene. Red tubing should always be used for acetylene and black tubing for oxygen;
- examine all tubing periodically for leaks, worn parts and loose connections.

Operation

Starting Up

- Ensure that your equipment, hands and gloves are clean and free from oil and grease. Place the oxygen and fuel gas cylinders in a clear position where oil is not likely to drip on them and where they are not likely to be knocked by moving or falling objects. Before connecting regulators to the cylinders crack the cylinder valve carefully to blow out any foreign matter which might harm seats or clog orifices. Inspect all glands, couplings and seats to ensure that they are not scored and that they are clean. Attach the oxygen and fuel gas regulators to their respective cylinders and screw up sufficiently to prevent leaks. In tightening connections use spanners designed for the particular nut.
- Make certain that the oxygen and fuel gas regulator adjusting knobs are released. Oxygen and fuel gas cylinder valves should always be opened very slowly, so that the high pressure gauge hand on the regulator moves up gradually. A rush of high-pressure gas may strain the gauge mechanism. Also in the case of oxygen it may cause seat ignition and in the case of acetylene may cause decomposition. Never stand in front of regulator pressure gauge faces when opening cylinder valves. Always stand to one side. Never open cylinder valves more than 1½ turns.
- After connecting welding or cutting apparatus to oxygen and fuel gas cylinders or when starting to re-use the apparatus after an interval of ½ hour or more, each gas should be allowed to flow through its respective tube separately for a few seconds so as to purge the tubes of any mixture of gases. This operation should not be performed in a confined space.

During Work Breaks

- All valves, whether blowpipe or cylinder, should be closed during lunch hour, or whenever the operator leaves the work for any appreciable time.

Closing Down

- Close the blowpipe fuel gas valve.
- Close the blowpipe oxygen valve.

The above is satisfactory for temporary halts. However, when closing down finally in addition to

TOOLS - OXY-ACETYLENE OPERATION



closing the blowpipe valves, the following procedure should be adopted:

- Close both cylinder valves.
- Open the blowpipe oxygen valve and allow the gas to drain out.
- When both gauges on the regulator have fallen to zero, close the blowpipe oxygen valve.
- Release the oxygen regulator adjustment knob.
- Repeat this procedure with the fuel gas valves and regulator.
- Special precaution before attaching any air-fuel gas equipment to an oxygen fuel gas welding blowpipe - disconnect the oxygen tubing from the blowpipe.
- Whenever the flow of either oxygen or fuel gas is stopped by some obstruction, immediately close the valves on both cylinders and leave them closed until the obstruction is removed.

Working on Tanks or Containers

- Do not weld or cut containers such as barrels, drums or tanks until there is no possible chance of fire or explosion. Do not depend on sight or smell to determine if a container is safe to weld or cut. A very small amount of residual gas or liquid can cause a serious explosion.

Working inside Boilers or Confined Spaces

- When cutting or welding inside boilers or other confined spaces gas cylinders should always be kept outside. Special care should be taken to make sure that tubing and equipment is in good conditions, securely attached at connections and that there are no leaks anywhere.
- An assistant who understands the equipment should be stationed outside to control the gas supply and generally assist the operator.
- The assistant should keep the welding operator under observation at all times and in the case of an emergency immediately close the cylinder valves and render any other assistance necessary.
- When not in use the blowpipe should be extinguished and immediately removed from the confined space.
- Oxygen should not be used for the purpose of clearing fumes in a confined space, such use has caused fatal accidents.

Note: No person shall undertake any work in a confined space unless he has received appropriate training in confirmed space activities.

c) Personal Protective Equipment

Goggles must be worn with the correct shade filter, ie. of a type intended for welding work. Suitable **gloves, aprons, shoes** and other protective clothing must also be worn. Watch for sparks in sleeves, cuffs and open pockets. A suitable **respirator** must be worn when working on lead, lead bearing materials, steel coated with lead paints, cadmium coated materials or any objects giving off toxic fumes.

5 Permits/Licences:

Hot work permit.

6 Emergency Response:

Not Applicable.

TOOLS - OXY-ACETYLENE OPERATION



7 Program Inspection:

Visual inspection prior to use.
Scheduled preventative maintenance.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
 How to Manage Work Health and Safety Risks
 Construction Work
 Excavation Work
 Demolition Work
 Hazardous Manual Tasks
 Managing the Risks of Falls at Workplaces
 Confined Spaces
 Managing electrical risks at the workplace

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)
[FO 007 Site Induction Register Form](#)
[FO 010 Standard Safety, Environmental Emergency Flowchart](#)
[FO 013 Job Hazard Analysis Sheet](#)
[FO 014 Risk Assessment Form](#)
[FO 015 Risk Assessment Calculator](#)
[FO 018 Hot Work Permit](#)
[FO 019 Equipment Requiring Licenses, Tickets, Certificates of Competency to Operate](#)
[FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety](#)

1 Purpose:

To provide guidance on portable ladders used within a Bardavcol workplace or by a Bardavcol employee.

2 Objective:

To comply with regulatory standards and to minimise the health and safety risks associated with ladder use.

3 Target:

No incidents, accidents or injuries associated with ladder use.

Hazards**4** In relation to the use of portable ladders, a safe system shall be implemented to control risks to health and safety arising from hazards and issues including:

- falls from heights;
- falling objects;
- overloading;
- incorrect ladder use / placement/ stability;
- very wet or windy conditions;
- proximity to traffic areas;
- in access ways or doorways;
- next to power lines.

5 Controls**a. General**

- Where reasonably practicable, plant, equipment and locations requiring access by workers, are to have a permanent fixed means of access (e.g. stairs, fixed ladder etc.).
- Extension or single ladders should only be used as a means of access to or egress from a work area. They should only be used as a working platform for light work of a short duration that can be carried out safely on the ladder.

b. Portable ladders (see Appendix 1 for components & terms relating to ladders):

- shall be selected, used and maintained in accordance with *AS 1892.5 Portable Ladders – Selection, Safe Use and Care*.
- shall be rated for the loads (person and equipment) on the ladder;
- shall be in good condition with all components functioning (inspected prior to use);
- shall have firm, stable, level footing and have enough room for personnel to comfortably step onto and off of.
- shall be clean of excess debris (i.e. grease, mud etc.);
- shall be kept close to the work with the user remaining near the centre line of the ladder (e.g. between the stiles);
- shall be accessed by only one person at any one time.
- shall be ascended or descended, with the person facing the ladder;
- if used within the arc of swinging doors / windows or in traffic areas shall have additional controls implemented (e.g. locked or chocked doors / windows, barricades, observer);
- used to support platforms shall be purpose-built trestle ladders;
- shall never be set up so it is supported by the rungs;
- when used against a tree or pole, personnel should use pole straps (fibre rope should not be used) or other fall arrest systems.
- Shall not be:
 - used to erect temporary trestles between step ladders
 - positioned on other workplace equipment and materials (e.g. plant, reo bars/mesh, loose materials, or to gain extra height on scaffolds or elevated work platforms);
 - used on or near live electrical equipment / hazards / powerlines or within an exclusion zone if they are metallic, wire reinforced or otherwise conductive.

Note: Refer to the OTR Electrical guidance document for further information regarding safe approach

distances and exclusion zones.

b. Three points of contact (i.e. two hands and one foot, or two feet and one hand) are to be maintained with the ladder or a stable structure at all times unless a control designed to support the person's body is being worn or used (e.g. fall arrestor, pole strap) that is securely connected to a static anchor point other than the ladder itself, or unless is specifically designed for use without 3 points of contact e.g. platform ladder.

c. Barriers, signage, etc., associated with the use of portable ladders where there is a risk of falling objects, shall be in accordance with SWI 21 Excavation & Trenching work, SWI 17 Working at heights and associated risk assessment.

d. *Single and Extension Ladders should:*

- be secured against displacement whilst in use (i.e. by tying off ladders at the top and / or bottom where practicable or by workers footing ladders)
- be placed at an angle as close as possible to 75° from the horizontal (4V:1H). Note: where a ladder is used at an angle less than 75°, the load rating may be affected.
- In the case of an extension ladder the overlap of any 2 adjacent sections should be not less than 3½ rungs.

e. Where the ladder is being used to gain access to or from a surface, the ladder is to extend at least 1m above the surface unless:

- the person is attached to a fall arrest harness that is securely connected to a static anchor point other than the ladder itself or other controls are implemented (e.g. an adequate hand hold is provided).

f. *Step and Trestle Ladders* - Double-sided step and trestle ladders are to be used in the fully-opened position and/or secured against movement.

g. Maximum ladder lengths:

	Single	Extension	Stepladders	Trestle
Metal ladders and reinforced plastic ladders	9m industrial	15m industrial	6.1m industrial	5m
Timber ladders	runged 9.2m	15.3m	5.5m industrial 5.5m platform	5.1m

h. Workers are not to stand higher than the tread or rung indicated on the ladder as the highest standing level, and are not to stand on:

- the top cap or the top tread of a self-supporting / step ladder (unless designed to do so);
- above the second top rung of a non-supporting ladder; nor
- the rear horizontal braces of a single-sided self-supporting / step ladder.

i. All tools and equipment are to be removed from all rungs and the top cap prior to moving the ladder.

6 Site Specific Management

a. Each site shall maintain a register of portable ladders held on that site. The register shall include purchase dates (where possible), identifier, size, description, manufacturer, inspection dates, pass/fail inspection details, location, status.

b. Inspections of portable ladders are to occur:

- when originally purchased, received and put into service;
- before each use (visual);
- every 6 months using FO036-Ladder Inspection Checklist; and
- Before re-use where a ladder has fallen or been struck.

Note: Particular attention is to be paid to internal corrosion, the rung / tread to stile connection and to deformed flanges. Under no circumstances must ladders be used with obvious defects such as loose or missing rungs, crack, splintered or warped steps. Damaged / unserviceable ladders are to removed from service, repaired or destroyed.

General

- c. Ladders should be stored in brackets or in racks and, where practicable, in sheltered locations.
- d. Ladders should not be left unattended in places accessible to the public.

7 Training

Personnel should be trained in: the correct use of the type of ladder intended to be used according to: the manufacturer's instructions; SWI 03.10; SWI 17; associated risk assessments; and how to conduct an inspection of a ladder (use FO 036 as a guide). A suitably qualified site supervisor may conduct this training.

8 Emergency Response:

In accordance with the Emergency Management Plan relevant to the workplace. Consideration should be given to retrieval of personnel in the event of a fall from a ladder or height. For example, personnel working in deep excavations (>1.5m) in remote locations may require the availability of a stretcher for personnel retrieval.

9 References

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Construction Work
- Excavation Work
- Demolition Work
- Hazardous Manual Tasks
- Managing the Risks of Falls at Workplaces
- Confined Spaces
- Managing electrical risks at the workplace

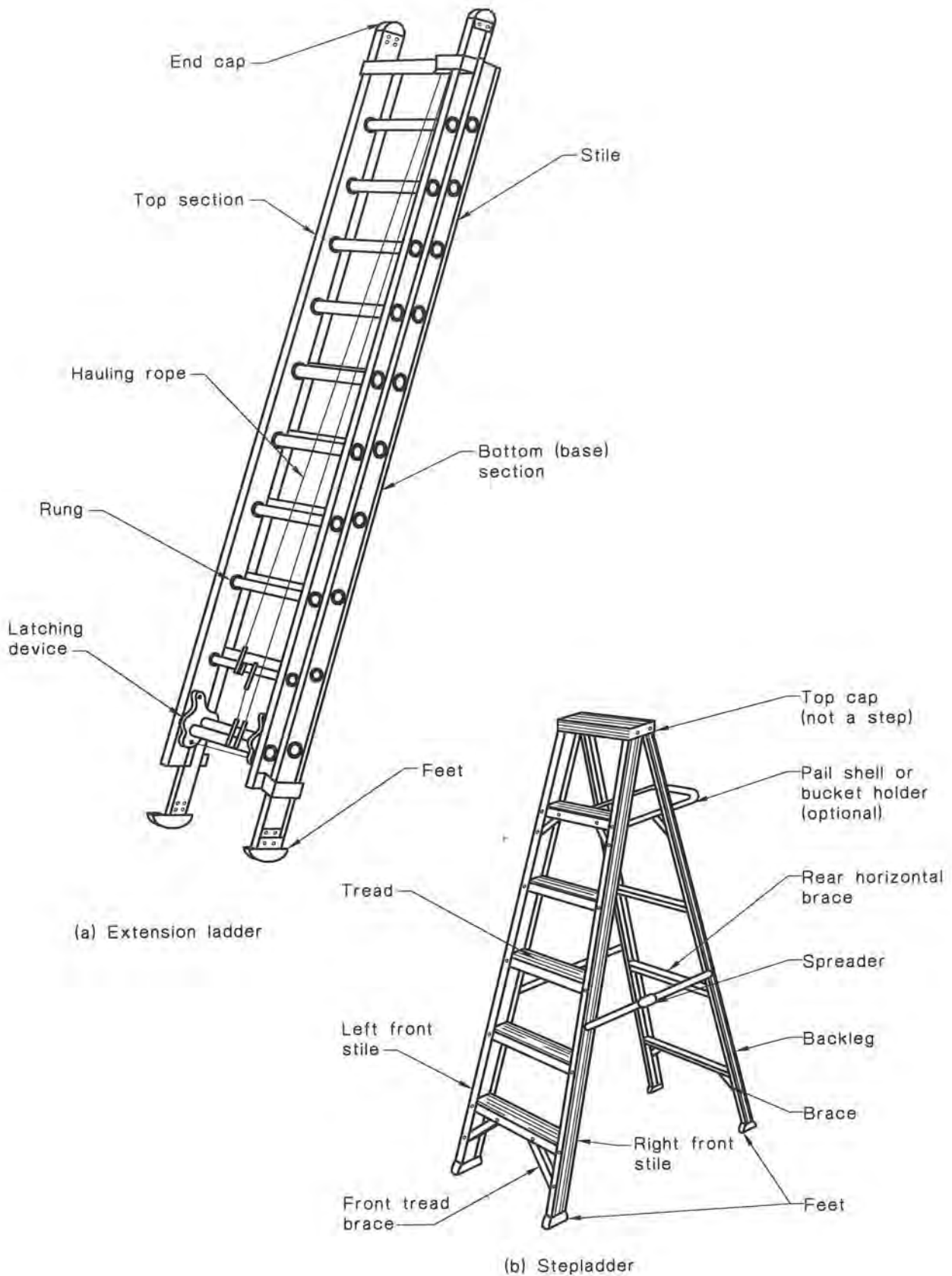
Ladder & Scaffold Standards:

- AS 1576.1 Scaffolding – General Requirements
- AS 1657 Fixed Platforms, walkways, stairways and ladders – Design, construction and installation.
- AS 1892.1 Portable Ladders – Metal
- AS 1892.2 Portable Ladders – Timber
- AS/NZ 1892:3 Portable Ladders – Reinforced plastic
- AS/NZS 1892.5 Portable Ladders – Selection, safe use and care
- AS/NZS 4576 Guidelines for Scaffolding

10 Tools/Forms:

- [FO 001 Site Safety Inspection Form](#)
- [FO 007 Site Induction Register Form](#)
- [FO 036 Ladder Inspection Checklist](#)
- [FO 013 Safe Work Method Statement Sheet](#)
- [FO 026 SWMS Assessment](#)

Appendix 1 - Components and terms relating to ladders (from AS/NZS1892.5)



OPERATIONS OF THE WHS COMMITTEE

1 Purpose:

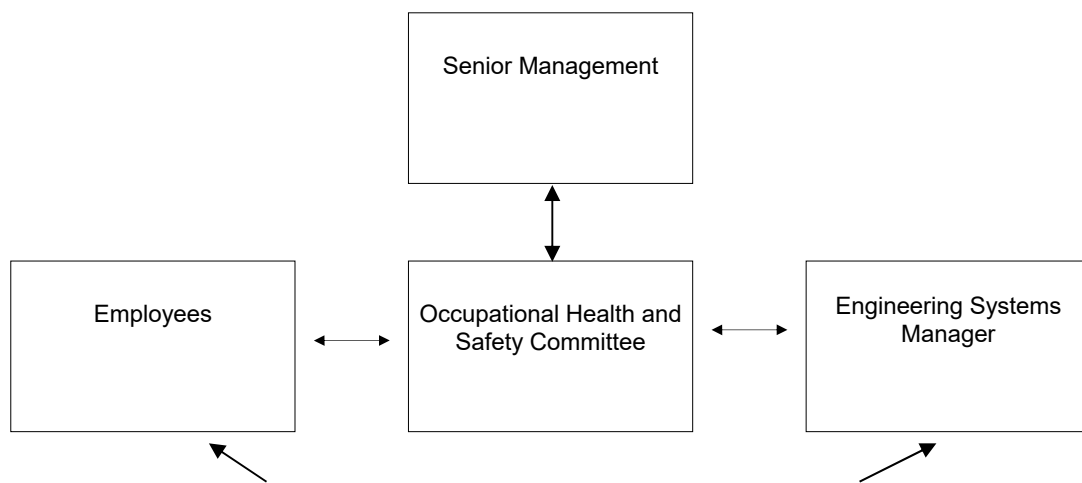
To provide a Committee structure as described in the Work, Health & Safety Act SA 2012 that endeavours to improve safety in the workplace.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Influence WHS in the workplace, including the reduction of incidents, accidents and injuries associated with the Bardavcol's operations.

4 Controls:**a) Bardavcol Work, Health & Safety Organisation Chart****b) Make up of Work, Health & Safety Committee**

A Work, Health & Safety committee shall be made up, proportionately where possible, of management, supervisory and field staff. When a committee position becomes vacant it shall, where possible, be filled by a person from the same area as the departing member (management, supervisory or field staff). The Engineering Systems Manager shall, when a position becomes vacant, issue a memo to the relevant area (management, supervisory or field staff) requesting nominations to fill the vacant position. When there is more than one nomination a ballot shall be held, the Engineering Systems Manager acting as returning officer for the ballot. A committee shall have a total of ten appointed members. This committee shall meet at least every three months.

c) Appointment of a Chairperson

The Work, Health & Safety Committee shall elect a member to chair meetings of the committee who shall keep minutes of all meetings and retain these minutes for a minimum period of three years. The chairperson and ESM shall communicate meeting items to the GM after the meeting.

d) Committee Members

The term of office of a member of the committee is three years. A member of the committee will be disqualified from acting or continuing to act as a member of the committee if:

He leaves the employment of Bardavcol Or,

He is absent, without leave from the committee for three or more consecutive meetings of the committee.

The disqualification of a person because of the above does not disqualify the person from again becoming a

OPERATIONS OF THE WHS COMMITTEE



committee member again.

Health and Safety Committee members shall be trained in the *WHS Committees Training (1day) course* or part completion of Level 1 Health and Safety Representative Level 1 (2 day course) as a minimum.

All WHS Committee and Health and Safety Representative training shall be provided by a Registered Training Organisations (RTO).

e) Functions of the Work, Health & Safety Committee

- Facilitate co-operation between the employer and employees by initiating, developing, carrying out and monitoring of measures concerning the health, safety and welfare of fellow employees.
- Assist in the resolution of Work, Health & Safety matters in the workplace.
- Devise possible methods of avoiding previous hazards encountered by employees in the workplace.
- Assist in formulating, reviewing and dissemination of practices, procedures and policies to employees on occupational health, safety and welfare issues arising in the workplace.
- Consult with the employer on any changes to the above-mentioned practices, procedures or policies and alert necessary information to employees.
- Ensure all minutes of the committee are distributed and displayed such that all employees can keep abreast of Work, Health & Safety matters.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Not Applicable.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA Work, Health & Safety Laws 2012:

How to Manage Work Health and Safety Risks

Work Health & Safety Consultation, Co-operation & Co-ordination

9 Tools/Forms:

WHS Committee Meeting Minutes

Monthly Management Systems Reports

1 Purpose:

Clearly state what to do in case of an emergency and the procedure to follow for evacuation.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Minimise potential harm related to emergency response situations at the Bardavcol office or workshop.
- Conduct at least 1 test emergency evacuation each year.

4 Controls:**a) Hazard Identification**

Employees, contractors and visitors at Bardavcol Head Office & Workshop may, at some time, be placed at risk by circumstances which create an emergency situation. These situations may include fire, criminal threat, natural or man-made and disasters.

b) Emergency Situations

In the event of an emergency, all personnel are to follow the "Emergency Procedure" as described in "C" below.

In the event of such an emergency, the Chief Warden shall then immediately notify the following, depending on the type and severity of incidents:

- Fire Department
- Ambulance
- Police
- Managing Director
- Business Development Director
- General Manager
- Operations Manager

c) Emergency Evacuation Procedure

Emergencies, which could require evacuation of the building, include fumes, smoke, fire, gas and explosion or security emergency (bomb threat, suspicious package). If no alarms have sounded, activate a "Break Glass Alarm" as soon as possible.

In an emergency, all personnel will obey the directions of the Wardens who will be identified by the wearing of yellow or orange vests.

Yellow = Warden

Orange = Chief Warden

Location of Equipment: Wardens will keep vests and two way radios in their offices.

Employees, Contractors & Visitors: Are to follow the Emergency Evacuation Procedure below. The procedure will be posted in the office and the workshop:

- 1** On hearing the **Alert Alarm** – *Stay Calm*.
- 2** Switch off all appliances and close doors and windows.
- 3** When you hear the **Evacuation Alarm**, leave the building and head to the *Assembly Area*.
- 4** Help others that need assistance when evacuating – if safe to do so.
- 5** Proceed to the *Assembly Area* as shown on the *Emergency Evacuation Map*.
- 6** Don't go back into the building until you've been told it's safe by one of the Fire Wardens.

d) Emergency Evacuation Procedure for Key Personnel**Chief Warden (Orange Vest)**

The Chief Warden will oversee any Emergency Evacuation that may occur. Tasks are as follows:

- (a) Ascertain the nature of the emergency and determine appropriate action;
- (b) Maintain communication with Warden(s) and delegate someone to notify the Managing Director, Business Development Director, General Manager and Operations Manager of current status;

- (c) Delegate someone to inform the appropriate authorities of current situation i.e. Police, Fire Brigade, Engineering staff etc.
- (d) Ensure that all Wardens are informed of situation;
- (e) Chief Warden will ensure that the progress of any actions is recorded in Incident Log;
- (f) If total evacuation is necessary all Area Wardens to ensure all personnel assemble in "Assembly Area";
- (J) Brief the emergency services personnel upon arrival on type, scope and location of the emergency and status of the evacuation and thereafter act on the senior officer's instructions.

Wardens (Yellow Vest)

On hearing an alarm or on becoming aware of the emergency the Wardens shall take the following actions:

- (a) Implement the emergency procedures for the area;
- (b) Check for any abnormal situation and assess problem;
- (c) Check to ensure doors are properly closed, and turn OFF air conditioners;
- (d) Decide on appropriate action. Remove persons adjacent to threat when advised as need arises;
- (e) Report situation to Chief Warden and keep informed of progress;
- (f) Sweep the buildings (including toilets);
- (g) Ensure evacuation complete;
- (h) Ensure orderly flow of personnel to Assembly Area;
- (i) Get the diary at the reception desk and take it to the Assembly area to do a head count;
- (j) The Wardens will be the last person to leave his/her area after notification of "All Areas Possible Checked" to Chief Warden.

e) Emergency Evacuation Drills

A drill will be held at least once a year, and a review of this procedure will be conducted by the Chief Warden and Wardens with the results of the review referred to the WHS Committee and management.

5 Permits/Licences:

Not Relevant

6 Emergency Response:

First Aid.

Emergency Evacuation Procedure

7 Program Inspection:

Evacuation drill.

Evaluation of the drill to ensure effectiveness.

Review of procedures.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing the Work Environment and Facilities

9 Tools/Forms:

[IP13 Emergency Preparedness and Response](#)

Emergency Evacuation Map

[FO 023 Emergency Response Plan](#)

1 Purpose:

To identify and manage risks to musculoskeletal disorders associated with hazardous manual tasks, in accordance with the WHS Act & Regulations 2012 and the Code Of Practice for Hazardous Manual Tasks (2011).

2 Objective:

- Eliminate or minimise, as far as reasonably practicable, injuries from manual tasks to persons on Bardavcol worksites.
- Comply with statutory and regulatory requirements.

3 Definition:

Hazardous Manual Task (HMT) means a task that requires a person to lift, lower, push, pull, carry or otherwise move, hold or restrain any person, animal or thing that involves one or more of the following:

- | | |
|-----------------------------|--|
| • Repetitive movement | Using the same parts of the body to repeat similar movements over a period of time. |
| • Repetitive force | Using force repeatedly over a period of time to move or support an object . |
| • Sustained force | Occurs when force is applied continuously over a period of time. |
| • High Force | Occurs in any task that a worker describes as physically demanding, a worker needs help to do because of the effort required and/or requires a stronger person or two people to do the task. |
| • Sudden force | Task where force is applied suddenly and with speed resulting in jerky or unexpected movements while handling an item or load. |
| • Sustained posture | Where a part of or the whole body is kept in the same position for a prolonged period. |
| • Awkward posture | Where any part of the body is in an uncomfortable or unnatural position; postures that are unbalanced or asymmetrical or that require extreme joint angles, bending, twisting or reaching. |
| • Whole body vibration | When vibration is transmitted through the whole body usually via a supporting surface, for example, a seat or floor in heavy vehicles or machinery. |
| • <i>Hand-arm Vibration</i> | When vibration is transferred through a vibrating tool, steering wheel or machinery controls. |

Musculoskeletal Disorder (MSD) means an injury to, or disease of, the musculoskeletal system, whether occurring suddenly or over time, but does not include an injury caused by crushing, entrapment or cutting resulting principally from the mechanical operation of plant.

4 Guidance Notes:

It covers more than lifting heavy weights and affects more than the back. Manual tasks may also involve bending, lowering, reaching or twisting. Injuries often occur due to wear and tear, accumulated from frequent periods of manual handling activity that stress the body, such as repetitive work or heavy lifting. The effects of these injuries often become more disabling as workers become older.

Musco-Skeletal Disorders include:

- sprains and strains of muscles, ligaments and tendons;
- injuries to muscles, ligaments, intervertebral discs and other structures in the back;

- injuries of soft tissues such as nerves, ligaments and tendons in the wrists, arms and shoulders.

Musculoskeletal disorders occur in two main ways:

- *gradual* wear and tear caused by frequent or prolonged periods of muscular effort associated with repeated or continuous use of the same body parts, including static positions;
- *sudden* damage caused by intense or strenuous activity, or unexpected movements such as when materials being handled move or change position suddenly.

5 Procedure (see flowchart):

- a) Identify hazardous manual task (see definition of Hazardous Manual Task)
- b) Assess the task & associated risk of MSD. Does the task involve any of aspects detailed in the definition of hazardous manual tasks? If yes, then proceed to implementing controls.
- c) Eliminate the risks or apply appropriate controls in accordance with the standard hierarchy of control
 - Engineering solution: The use of cranes, hoists, forklifts, winches, trolleys or other lifting equipment shall be considered first instead of manually manoeuvring heavy loads.
 - Task modification
 - Work-station layout modification
 - Undertaking manual handling with two or more persons
 - Training of personnel in manual handling techniques
 - Rotation of employees in task

When carrying out a risk assessment consider the following risk factors;

- Job demands;
 - Work organisation;
 - Workplace layout;
 - Working position and posture;
 - Repetition of work;
 - Range of movement necessary for tasks, including their frequency and duration;
 - Weight and dimension of loads
 - A load difficult or awkward to handle (eg. Shape, temperature, instability)
 - Individual lifting capacity - Age, fitness level and other factors related to the personnel required to do the task;
 - Working environment and conditions (heat, noise, cold, vibration, slippery surfaces, air quality, obstructions, weather – if working outdoors);
 - Required PPE e.g gloves;
 - Equipment and tool design
 - Workstation design
- d) Re-assess residual risk to ensure it is as low as reasonably practicable
 - e) Provide information, instruction & training to Workers involved
 - f) Implement controls
 - g) Review task and controls

6 Controls to assist individual technique with Hazardous Manual Handling tasks

- 1) Never attempt to move an object beyond your capacity. If in doubt, test the objects' weight before attempting to shift it: if it appears too heavy (i.e. not within your comfortable lifting capacity), awkward, bulky, obtain a mechanical lifting aid (i.e. machine, sack truck, trolley, hoist) and/or

somebody to help.

- 2) Different weights suit different people. Avoid moving heavy loads without help. You be the judge and ask for help, and when asked help your workmate. Plan and coordinate the task with the people involved with the move.
- 3) Ensure objects to be moved have sufficient space surrounding them to enable a safe move.
- 4) Avoid reaching out. Do not reach out to pick up any object. Do not over stretch or twist.
- 5) Handle all objects as close to your body as possible.
- 6) Do not perform jerky manoeuvring of objects i.e. a sudden exertion of force.

Performing the lift

- 1) Get a good footing and never try to move anything which you consider too heavy, bulky or awkward.
- 2) Place your feet about shoulder width apart in a comfortable, balanced position, close to the load being moved.
- 3) Bend the knees and grasp the load. Ensure load is balanced.
- 4) Keep back straight – not vertical but straight (the closer to vertical you are when lifting and carrying, the less risk of injury. Maintaining a straight back keeps your spine, back muscles and related organs in the correct alignment. Your back should not be arched or bent and your chin should be tucked in to lock your spine.
- 5) Take a firm hold on the load at designated lifting points with the palms of the hands NOT just the fingers. N.B. Use gloves to protect against any sharp protruding objects. Ensure fingers and toes are clear of item to be placed or when manoeuvring load.
- 6) Manoeuvre object smoothly and gradually by straightening the legs – ensure the strong thigh muscles do the work – not the lower back muscles.
- 7) Do not twist your body when manoeuvring objects. If you have to change direction, turn with both of your feet, not your body. Avoid twisting at your shoulders and/or hips.
- 8) When carrying an object, ensure it is close to your body and watch where you're going. Ensure you can see beyond the object you are carrying (this includes your footing).
- 9) Avoid lifting or holding above shoulder height and repetitive actions. Take breaks and/or rotate tasks.
- 10) Stack or store between waist and shoulder heights as much as possible.
- 11) When lowering the object, maintain a good grip and keep the back straight. Watch out that your fingers don't get caught and pinched by the load.
- 12) Avoid holding or working in a fixed position with the back bent.



Correct way to pick up and transport a load.

Remember, the move that is too heavy or awkward, is the move that injures you!

7 Hazard Notification

All Bardavcol and Sub contractor personnel have the responsibility to report to their direct manager if they believe the task could potentially lead to a MSD. Managers shall take the appropriate action in accordance with this SWI

8 Hazardous Manual Task Case Study - Shovelling

Using the right shovelling technique is one of the most important aspects for the safety of this task. Because the shovelling scenarios, operators and shovel tips are so varied, it is difficult to specify specific methods of shovelling that will suit all people in every situation. A more practical approach is to provide some general guidelines on techniques and then train people to apply these principles in practically orientated training for the work they are performing.

There are a lot of variations in the task, including:

- Shovel type (eg. trench or short shaft).
- Task (eg. trench work, cleaning around machinery)
- Operator (varying levels of fitness and training).
- Job demands (eg. occasional shovel work or very frequent).

Common Hazards Associated with Shovel Work

- Repetitive extended reach forwards - This increases the strain on the lower back.
- Highly repetitive shovelling - Increases accumulated fatigue on the job. Eg. if there is not rotation to different tasks during the shift.
- Overloading the shovel blade - This places excessive leverage and strain on the person. Particularly for longer shafted shovels.
- Poor Shovelling techniques - Eg. Throwing the material behind the operator. This causes excessive twisting and bending of the operator's spine.

Shovelling Checklist

The objective of this checklist is to provide a structure for the development of manual handling risk control options for shovelling-based tasks.

Step 1: Can the Shovelling Task Be Eliminated

Eg. Is there double handling of the material? Can a machine place/work the material without requiring manual shovelling?

Step 2: Can the Manual Shovelling Be Re-Engineered

If the material has to be moved. Can the process be mechanised? Use a front end loader or a Skid-steer.

Step 3: Select the Right Shovel for the Task

If manual shovelling has to be performed the correct type of shovel should be used to minimise the risk of injury. There are a range of different shovel designs available (eg. trench shovel, D handle, long handle, square mouth etc).

General Shovel Design Features

The following is a guide to evaluate the level of safety for a shovel's design.

This information may be used to evaluate the right shovel for the task and assess new shovels prior to purchase.

Flat Blade

Having the blade the same angle as the shaft reduces operator fatigue when digging or breaking up soil of ground height.

Angled Blade

Having the shaft and blade at a 40 – 45 degree angle is better for picking up material from the ground. This

is because when the blade is parallel to the ground the shaft is at 45 degrees which requires less bending for the operator to hold the shovel.

Blade Sharpness: The sharper the edge of the blade the less effort will be required by the user to push the blade through materials. Especially soil and finer grain sands.

Shaft Length: Longer shafted handles are better for working at ground height or down benches. The longer shaft means that the operator does not have to bend as much. Having a bend in the shaft also reduces forward bending even more.

Shaft Materials: Many aluminium shafted shovels are lighter and need less physical effort to use the shovel compared to heavier wooden or other metal shafted shovels.

Grip: A softer grip on the shaft of the handle will make it easier to hold, absorb some of the impact on the palm of the hand and reduce heat transmission on hot days.

Handle Shape: A “D” shaped end on the shaft of the handle is used for more power when lifting and turning the shovel.

5 Permits/Licences/Training:

All Bardavcol and subcontractor personnel who are required to perform a hazardous manual task, shall be properly trained/instructed in performing the task. The task shall be documented in a SWMS.

Bardavcol or the subcontractor shall, if hazardous manual handling has been identified:

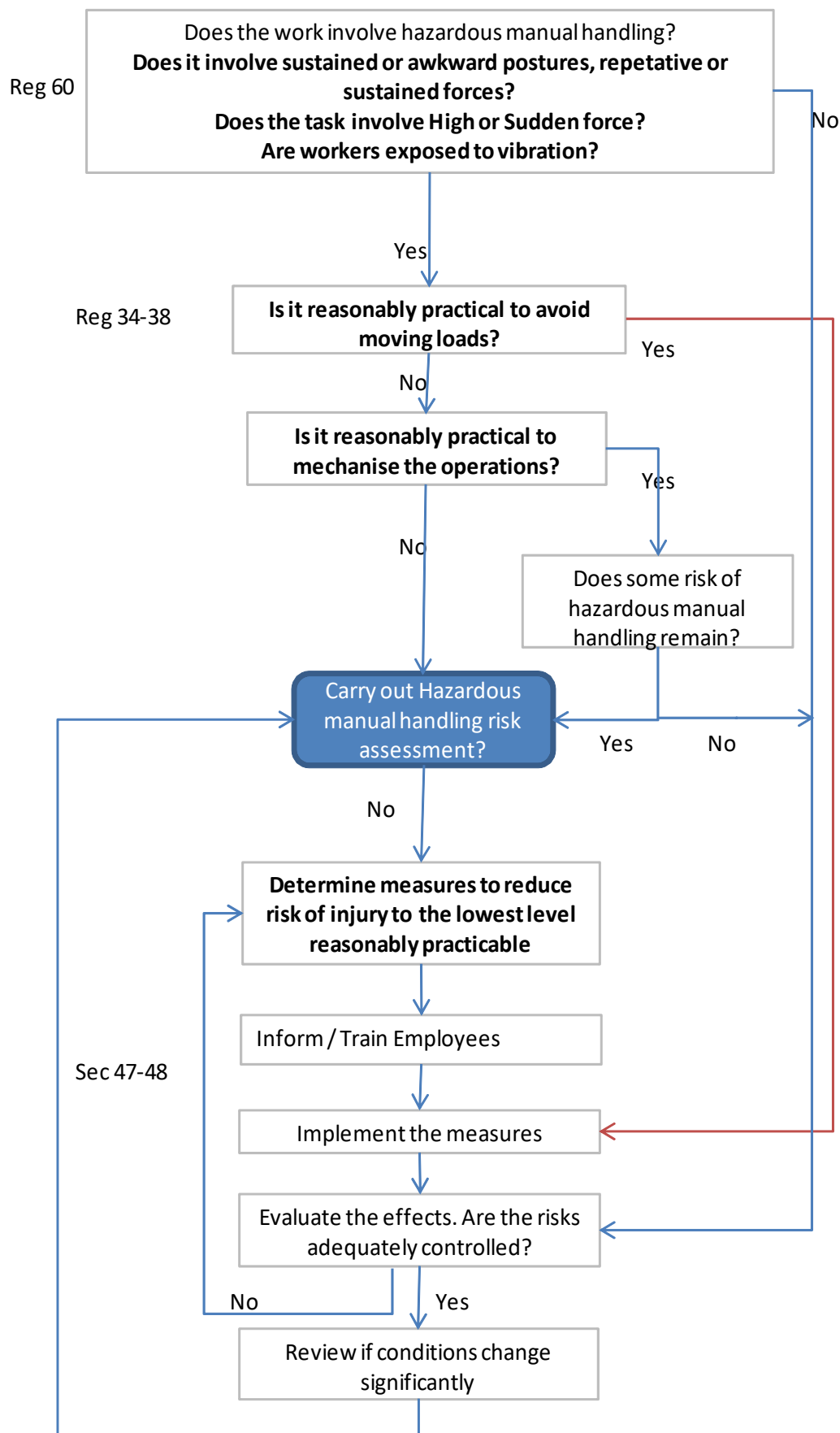
- redesign the manual handling task to eliminate or control the risk factors;
- ensure that all employees involved in manual handling receive appropriate training, including training in safe manual handling techniques.

In addition to the employees involved in manual handling, other target groups also requiring training include:

- supervisors and managers of employees involved in manual handling tasks;
- staff responsible for work organisation, job and task design.

Training Objectives :

- the prevention of musculoskeletal disorders by an approach based on risk identification and assessment, and primary control through job and task design;
- the recognition and promotion of understanding of the multi-faceted nature of hazardous manual handling activities; and
- the promotion and utilisation of safe manual handling techniques



6 Emergency Response:

As per site Emergency Response Plan

7 Program Inspection:

Safety inspections, SWMS review, Internal Audits.

8 References:

Work, Health and Safety Act SA 2012

Work, Health and Safety Regulations SA 2012

Code of Practice – Hazardous Manual Tasks Dec 2011

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

1 Purpose:

To control and minimise risks associated with the effects of consuming alcohol and drugs in the workplace. To outline Bardavcol's management of risks relating alcohol and other drugs in the workplace and its processes for testing and compliance with this procedure

2 Objective:

To ensure a safe working environment for all personnel.

To reduce harm associated with the effects of consuming alcohol and drugs.

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with the effects of consuming alcohol and drugs.
- No damage to plant, equipment, buildings or infrastructure from the effects of consuming alcohol and drugs.

4 Controls:**4.1 Responsibilities**

Bardavcol is responsible for:

- ensuring that this procedure is communicated to workers and other persons that attend its workplaces;
- implementing this procedure;
- coordinating alcohol or other drug testing, as described in this procedure;
- ensuring that test results are treated as private and confidential; and
- ensuring that support and counseling is provided, as appropriate.

Workers are responsible for:

- ensuring that they are fit for work and do not attend site or perform work while affected by alcohol or other drugs, including prescription medication;
- notifying management if they are concerned about their fitness to work, or the fitness of other workers; and
- participating in any alcohol or other drugs testing, as per this procedure, relevant contract or Project Management Plan.

4.2 Acceptable Limits

Bardavcol's acceptable limits for workers and other persons at its workplaces are as follows:

- Alcohol – a Blood Alcohol Concentration (BAC) of 0.00%
- Other Drugs – levels below the target concentrations for oral fluid testing specified in AS 4760: 2006 Procedures for Specimen Collection and the Detection and Quantization of Drugs in Oral Fluid

Possession

Workers and any other persons at a Bardavcol workplace must not have any alcohol or drugs in their possession or control with the exception of:

- drugs that have been prescribed by a medical practitioner and/or non-prescribed legal drugs for personal use in recommended doses;
- gifts that include alcohol, on the condition that they are not opened and are removed from the workplace at the end of that day or shift.

The unauthorised supply or possession of alcohol or drugs in the workplace is not permitted and may result in disciplinary action, including the immediate removal of the worker (or other person) from the workplace, pending the outcome of a formal investigation.

4.3 Medication

Workers must immediately disclose any prescription or non-prescription medication to their Manager or Supervisor. If a worker is concerned that the prescribed medication is affecting their ability to perform their work, they must notify their manager immediately and stop work.

All workers that are taking prescription medication must ensure that they advise their Doctor or Pharmacist of the requirements of their role, obtain information on any restrictions that may be applicable, take the medication as prescribed and observe any warnings or instructions on the packaging.

Bardavcol may seek information from their employee's Doctor or Pharmacist relating to prescribed and non-prescribed medications to ensure that the potential impacts and applicable work restrictions are understood.

Workers that disclose medication to their Manager or Supervisor and provide evidence in support of prescribed medication:

- will not be penalised for recording an Unconfirmed Positive test result (ie. from an initial test on site), provided the levels detected in a confirmatory test are consistent with the dosages prescribed; and
- may be offered alternative duties that do not involve high risk construction works during the period that elapses between the initial test and receipt of the laboratory confirmation test results (if the confirmation test result is positive, action will be taken in accordance with Section 7).

4.4 Social Events

Employees may attend business or social events on behalf of, or as a representative of Bardavcol at which alcohol is served. In these situations, consumption of alcohol is permitted to reasonable limits and on the basis that the employee does not become inebriated or drunk and/or behave inappropriately or unprofessionally.

Employees must ensure that they have a safe means of transport to and from the event and do not return to a Bardavcol workplace that same day if they have consumed alcohol.

Employees are not permitted to possess, consume or be affected by other drugs at work related social events.

4.5 Testing Process and Protocols

Bardavcol may undertake the following alcohol and other drugs testing in relation to its workplaces and other operations:

- random alcohol and other drugs testing;
- targeted alcohol and other drugs testing (refer to 'Definitions' for clarification);
- alcohol and other drugs testing following an incident or near hit/miss;
- alcohol and other drugs testing on reasonable suspicion;
- voluntary alcohol and other drugs testing;
- medical assessment, including pre-employment or pre-assignment.

Where required, Bardavcol will comply with a client or Principal Contractor's testing requirements and may undertake its own testing, in accordance with this procedure and in consultation with the client or Principal Contractor.

In each of the above testing scenarios, trained and authorised personnel will conduct alcohol and other drugs testing. This may include an external organisation or authorised Bardavcol employees that have been trained in this procedure and in the correct use of alcohol and other drug testing equipment (eg. breathalyzer, oral fluid [saliva] testing equipment).

BAC testing will be conducted using a breathalyzer that meets the Australian Standard. All testing will be conducted using calibrated equipment and testing methods. Calibration records for Bardavcol equipment will be maintained with the equipment. External testing organisations will maintain records of equipment calibration and provide copies upon request.

Specimens will be taken in accordance with Australian Standards and not used for any purpose other than alcohol and other drugs testing.

Testing must be conducted in a way that provides confidentiality and privacy for the participants, taking into account the location of the workplace and available amenities.

Workers and other persons required to be tested must not take anything by mouth (eg. food, liquids, gum, etc) for at least 10 minutes prior to alcohol and other drugs testing.

Bardavcol's requirements relating to alcohol and other drugs testing will be communicated through employment contracts, conditions of contract, workplace inductions and/or any other method considered appropriate.

Workers and other persons that are tested must complete and sign a declaration of medication use and consent form, prior to conduct of a test for drugs or alcohol. Refusal to complete and sign a declaration and consent form and/or refusal to submit to a test in accordance with this procedure will be treated as a Confirmed Positive test result.

A person who returns a Confirmed Positive test result shall be deemed not Fit for Work.

4.6 Alcohol

Blood Alcohol Concentration (BAC) test results above 0.00% will be classified as an unconfirmed positive result.

In the event of an unconfirmed positive BAC result a second confirmatory test will be conducted after 30 minutes. During this period no food or drink must be consumed by the worker or other person being tested and they must remain in the designated waiting area.

If the result of the second test is above the stated limits this will be classified and recorded as a Confirmed Positive Test and the applicable processes detailed in Section 7 will be followed.

4.7 Other Drugs

Drug testing performed at Bardavcol workplaces will involve the analysis of oral fluids (ie. saliva), in accordance with AS 4760: 2006 Procedures for Specimen Collection and the Detection and Quantization of Drugs in Oral Fluid. Workplace testing of urine will only be performed if it is a contractual, statutory or client requirement.

Testing will, as a minimum, include screening for:

- amphetamines
- methamphetamines
- opiates
- benzodiazepines
- cannabis (ie. THC)
- cocaine

Target concentrations for oral fluid testing will be those specified in AS 4760: 2006 Procedures for Specimen Collection and the Detection and Quantization of Drugs in Oral Fluid.

In the event of an Unconfirmed Positive Test result from the initial drug testing:

- a second oral saliva sample will be obtained, which will be split into an A and B sample and sent to a NATA accredited laboratory for confirmation testing; and
- the worker or other person will be immediately removed from the workplace and provided with options to be transported to their place of residence or nominated address.

(note: if the worker or other person declines options for alternative transport from site and decides to operate their own vehicle, they must be counseled against this in the presence of a witness and a record of the conversation documented. Details of their vehicle registration, make, model and colour must be obtained and documented with the record of conversation)

If the result of the laboratory confirmatory test is above the applicable target concentrations this will be classified and recorded as a Confirmed Positive test result and the applicable processes detailed in

Section 7 will be followed.

In the event that the laboratory confirms a Negative Test result, the worker will be allowed to return to the workplace and no record will be placed onto the worker's file.

4.8 Random Testing

Random alcohol and other drugs testing may occur at any of Bardavcol's workplaces at any time.

For Bardavcol workplaces that:

- involve 'high risk construction works'; and/or
- have a contract value greater than \$5 million,

random alcohol and other drugs testing will be undertaken, as a minimum, in accordance with the following frequency:

- less than 30 workers at the workplace – at least 10% of the workforce each month;
- 30 to 100 workers at the workplace – a minimum of 5 workers each month; and
- greater than 100 workers at the workplace – a minimum of 10 workers each month.

All workers, including visitors may be subject to random testing and it is mandatory for all person(s) selected to participate in the testing process. Failure to participate (if selected) will be treated as a Confirmed Positive result.

Random testing will be coordinated by the QSE Manager or their Delegate in liaison with the authorised Bardavcol employees and/or testing organisation. This will include attending site at the agreed time, informing the project team that testing is to be conducted and ensuring that workers and other personnel remain on site, until the testing has been completed.

The method of selecting workers for testing will be determined by the testing organisation or authorised Bardavcol employees, and will be random, fair and equitable and documented on the *Record of Alcohol and Other Drugs Testing*.

Workers and other persons selected for testing must:

- remain on site and/or in the designated area until they have undergone testing;
- attend the testing area at the time requested;
- provide a numbered photo identification to the testing organisation to confirm their identity (where numbered photo identification is unable to be provided, the worker or other persons Manager or Supervisor can confirm their identity in writing);
- sign the consent form provided and disclose any prescribed or other medication that they have taken; and
- follow instructions from the testing organisation to facilitate the testing process.

4.9 Incident related Testing

Workers involved in an incident may be tested for alcohol and other drugs, as part of the investigation

process. In determining if testing is required, consideration will be given to, but not limited to the following:

- factors that may have contributed to the incident;
- actual or potential consequences of the incident; and
- reasonable suspicion that those involved are affected by alcohol or other drugs.

Testing must be undertaken by an authorised Bardavcol employee or testing organisation as soon as practicable after the incident and participation is mandatory.

The worker(s) required to be tested must be advised of the testing to be performed and accompanied by a Bardavcol representative.

4.10 Reasonable Suspicion Testing

In the event that there is a reasonable suspicion that a worker's performance is affected by alcohol or other drugs it must be immediately reported to the Project Manager, Site Manager or Supervisor. The Project Manager, Site Manager or Supervisor must complete the Reasonable Suspicion Alcohol and Drugs Assessment. An alcohol or other drugs test must be approved by the Construction Manager, QSE Manager or General Manager.

4.11 Voluntary Testing

Bardavcol may provide equipment for workers and other persons that attend its workplaces to undertake voluntary alcohol testing prior to commencing work. The results of such testing will not be recorded or form part of a disciplinary process.

Voluntary testing for other drugs will be at the employees own cost and must be conducted off site and by an approved testing organisation.

Testing equipment must be stored and operated in accordance with the manufacturer's instructions. The set-up and management of voluntary testing equipment is to be documented in the Project Management Plan.

4.12 Medical Assessment

Bardavcol's pre-employment medical assessment requires the person to undertake alcohol and other drug testing. Testing must be performed by Bardavcol's nominated testing organisation and may involve the analysis of oral fluids (ie. saliva) or a urine sample.

Where a client or contract requires a Bardavcol worker to undertake a medical assessment that involves alcohol and other drug testing, Bardavcol will comply with the client's or contract requirements.

4.13 Breaches of Alcohol and other Drugs Limits

Breaches under this procedure include the following:

- interference, substitution or tampering with a specimen or testing device to alter a test result;

- refusal to participate in testing;
- failure to produce the required sample in the required timeframe;
- intentionally leaving the workplace to avoid testing, after the testing provider/authorised person has entered the workplace;
- refusal to sign the consent form provided by the testing provider/authorised person; and
- a confirmed positive test result for alcohol or for other drugs

Consequences and actions in response to breaches under this procedure are summarised in Table 1 (below).

Table 1: Disciplinary process for breaches of the Alcohol and Other Drugs Procedure:

	Consequences / Disciplinary Action
Bardavcol Employee - First Confirmed Positive Test Result or Breach	<p>Immediate stand down of the worker without pay until such time as a negative result can be produced</p> <p>Offered a referral to counseling and/or rehabilitation</p> <p>Worker not permitted to return to work until such time as a negative test result is produced. The worker must ensure that the test performed is equivalent to the original test method and that their identity has been confirmed by the testing organisation. Costs incurred in this process will be the responsibility of the worker</p> <p>Alcohol breach:</p> <ul style="list-style-type: none"> - a negative breathalyzer result is acceptable and this may be performed prior to commencing their next shift <p>Other drugs breach:</p> <ul style="list-style-type: none"> - a negative oral saliva test result will be required to be produced prior to returning to work, in accordance with the conditions outlined above <p>Written warning will be provided to the employee advising them that a second positive result within the next 6 months will result in dismissal</p> <p>Employee to be subject to targeted testing during the following 3 months</p>
Bardavcol Employee - Second Confirmed Positive Test Result or Breach (within 6 months since last Confirmed Positive Test Result or Breach)	<p>Immediate termination of the worker's employment and removal from the workplace</p>

Bardavcol Employee <ul style="list-style-type: none"> - Medical assessment <ul style="list-style-type: none"> a) pre-employment assessment b) client/contractual medical assessment 	a) Pre-employment medical assessment: A confirmed positive test result will prevent the person from being considered for employment at that time.
	b) Client or contract specific medical assessment: A confirmed positive test result will exclude the employee from that workplace and the disciplinary action detailed above will apply
Bardavcol Employee <ul style="list-style-type: none"> - Re-employment of a former employee terminated for 2 successive Confirmed Positive Test Results or Breaches of this Procedure 	Not permitted to be re-employed for any position for a minimum period of 12 months following termination Re-employment after this period subject to a new pre-employment medical producing a negative alcohol and other drugs test result
Other persons, including subcontractors, suppliers and visitors <ul style="list-style-type: none"> - Confirmed Positive Test Result 	Immediate removal from the workplace for a confirmed positive result for alcohol and an unconfirmed positive result for other drugs Return to the workplace permitted upon production of a negative confirmatory test result (confirmatory testing is at their own cost and the worker must ensure that the test performed is equivalent to the original test method and that their identity has been confirmed by the testing organisation) General Manager's discretion as to whether the person is permanently banned from all Bardavcol workplaces or whether the equivalent approach for a Bardavcol employee is applied. Decision communicated to Senior Management to monitor implementation of ban (if imposed)

4.14 Employee Support

Support services, including counseling, may be provided to workers that believe that they require assistance, or if they record an unconfirmed positive or confirmed positive test result. The support and services will be arranged by the QSE Manager, HR Manager or General Manager.

4. 15 Confidentiality

Information obtained through alcohol and other drug testing will be treated confidentially and access will be restricted, as per this procedure.

The results of testing (negative, unconfirmed positive and confirmed positive) must not be disclosed to unauthorised persons and without the written permission of the individual. Breaches of this process may result in disciplinary action.

4. 16 Complaints

Any complaints relating to alcohol and other drug testing should be reported to the General Manager.

4. 17 Training

Information on this procedure must be communicated to:

- existing employees, as part of specific Toolbox Talk or equivalent forum;

- new employees, as part of the new starter induction;
- workers at Bardavcol workplaces, as part of the site induction.

Specific training relating to alcohol and other drugs, including testing and the use of testing equipment will be provided, as required and recorded in the Corporate Training and Competency Database.

4. 18 Review

The General Manager is responsible for this review of this procedure, as per the review period set out in the Corporate Document Control Register.

Additional reviews may be undertaken following the recording of an unconfirmed positive or confirmed positive result, or in response to changes to legislation or client/contractual requirements.

An annual report is to be provided to Senior Management on the implementation and effectiveness of this procedure, including a summary of the testing performed and outcomes.

4. 19 Records

Records relating to alcohol and other drug testing will be maintained by the HR Manager and unconfirmed and confirmed positive test results and other breaches will be recorded on the individual's personnel file. Following a 6 month period of negative test results any formal disciplinary action issued during that period for confirmed positive test results will be disregarded in future disciplinary action.

Records relating to non-Bardavcol workers (ie. personnel not directly employed by Bardavcol) will be provided to their management.

If the confirmed positive test result relates to an incident, the testing records will only be referenced in the investigation report.

Records of testing, including types, locations and number of negative, unconfirmed and confirmed positive results will be maintained by the QSE Manager, with no reference to personal information. Records of testing will also be maintained by the testing organisation.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Not applicable.

8 References:

Bardavcol Alcohol and Drugs Policy Statement

Bardavcol employment contract (including relevant enterprise agreements)

Subcontract documentation

Employee and project site inductions

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing the Work Environment and Facilities

South Australian Road Traffic Act 1961, Division 5 – Drink Driving & Drug Driving

Alcohol and Other Drugs at the Workplace Guidance Note 2008 (Commission for Occupational Safety and Health)

AS 4760 *Procedures for specimen collection and the detection and quantitation of drugs in oral fluid*
Code for the Tendering and Performance of Building Work 2016 (ie. The Building Code)

Definitions

Blood Alcohol Concentration (BAC):	the concentration of alcohol in the bloodstream expressed as a percentage
Confirmed Positive test result:	the result of a second test that confirms the presence of alcohol or drugs above the zero tolerance levels specified in this procedure
Drug:	any substance, article, preparation or mixture (with the exception of alcohol) whether gaseous, liquid, solid or in any form which, when consumed or used by any person, deprives or alters the person either temporarily or permanently of any of their normal mental or physical faculties
Fit for Work:	a person's physical, mental and emotional state that enables them to perform assigned tasks safely, competently and in a manner that does not threaten or compromise the safety or health of themselves or others.
Negative test result:	a result that is below the the zero tolerance levels specified in this procedure
Targeted alcohol and other drugs testing:	testing that a worker is directed to undertake as part of a disciplinary process, such as following a first confirmed positive test result or breach
Unconfirmed positive test result:	an initial test result above the zero tolerance levels specified in this procedure, which prompts the requirement for a second or confirmatory test to be performed
Worker:	any person that carries out work in any capacity for Bardavcol, including a contractor, subcontractor, labor hire employee or visitor
Workplace:	a place where work is carried out and includes any place where a worker goes o is likely to be while at work

9 Forms:

[FO 005 - Incident Report Form](#)

[FO 008 – Standard Toolbox Meeting Form](#)

Relevant Human Resources Procedures and Forms.

Declaration of medication use and consent form

PERSONAL PROTECTIVE EQUIPMENT



1 Purpose:

To minimize the risk of injury to personnel who are exposed to hazards in the workplace by virtue of handling materials, tools or equipment or working amongst machinery and plant (such hazards being greater than normally encountered in domestic, public and office situations) when administrative, engineering, substitution and elimination control mechanisms are not practicable.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Minimise residual risk of injury to personnel following application of higher level controls from the hierarchy of controls.

4 Controls:

a) General

Personnel that are exposed to hazards in the workplace by virtue of handling materials, tools or equipment or working amongst machinery and plant shall wear the appropriate personal protective equipment.

b) Safety Footwear

All personnel shall wear safety footwear (to AS/NZS 2210.3:2009), of a type appropriate to the hazard:-

- Safety toe caps (steel or non-steel), non-elastic sided, with ankle support

NOTE: in workshops or where there is a risk of boot laces being entangled in rotating machinery, non lace-up boots including elastic sided, are permissible.

c) Safety Helmets

All personnel shall wear safety helmets (to AS/NZS1801:1997) where there is a foreseeable risk of head injury, including the following circumstances:-

- When working in excavations and cavities more than 1.5 metres deep including manholes, chambers and sewers.
- When working below overhead work (e.g. steel erection, roofing, scaffolding, etc).
- When working close to cranes, hoists and other lifting appliances, including pile driving plant.
- By everyone on site unless otherwise directed by Bardavcol personnel.

Helmets shall be replaced every 3 years from the dated stamped inside the helmet and if damaged due to severe impact or deterioration. Helmet parts shall not be modified or removed.

Helmets can be seriously damaged by substances such as petrol, paint, adhesives, aerosol sprays or cleaning agents, and shall be kept away from such substances.

d) Eye Protection

Approved eye protection such as safety glasses or goggles (to AS/NZS 1337.0:2010) must be worn by all persons engaged in, or working close to any activity which may cause eye injury when there is a foreseeable risk of flying particles. Examples of these activities are explosive power tools, abrasive blasting, power operated high speed cutting machines, drilling machines, welding operations, use of lasers, use of compressed air tools, use of high pressure water jets, use of chemicals, acids or other corrosive substances, breaking, cutting, drilling and carving of any substance with power or hand tools. Welding operations must be screened to protect personnel from eye injury. Eye protection must be worn in the welding bay area where eye injury could also be caused by the machines installed in that area.

PERSONAL PROTECTIVE EQUIPMENT



e) Ear Protection

Personnel shall wear approved ear protection (to AS/NZS 1336: 1997) when exposed to the risk of hearing loss, e.g. the operation of hammer drilling machines, explosive power tools, abrasive blasting, pneumatic breakers, high speed cutting machines or excessively noisy machinery.

f) High Visibility Clothing: Shirt, Vest, Jacket

- must be worn at all times while on a Bardavcol constructions site
- must be worn over other clothing and not be hidden by coats or other clothing.
- must be done up at all times.
- must be maintained clean, and in good repair.
- must be replaced when it begins to fade.
- **when work is carried out during hours of darkness, reflective road safety apparel shall be worn.**
- Must be the correct vest for the conditions i.e.: day, day/night

g) UV Protection

Exposure to the ultra-violet radiation while working outside is potentially harmful. The most hazardous time of the day for sunburn and skin damage is between the hours of 11.00 am and 3.00 pm during the summer months. UV damage can also be inflicted in cloudy conditions.

To avoid sunburn and exposure to ultra-violet radiation, an appropriate combination of the following PPE shall be worn/applied, taking ambient conditions and level of risk into account:

- long trousers
- long sleeve shirts
- safety glasses with UV protection
- 30+ broad spectrum sun-screen
- a brimmed hat
- a fabric brim for your safety helmet

h) General

The requirement for other safety personal protective equipment such as face masks must be considered by personnel when undertaking any risk assessment of operations on site, or when drafting a Safe Work Method Statement.

Personnel are responsible for advising their supervisor of any personal protective equipment requirement and also any defect in their safety apparel, to ensure this is provided.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Conduct inspections on PPE as per manufacturer's specifications

Conduct periodic safety audits and safety inspection (as per the Project Management Plan) to verify implementation of the work instruction.

PERSONAL PROTECTIVE EQUIPMENT



8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

AS/NZS 2210.3:2009 Occupational protective footwear – Specification for safety footwear

AS/NZS 4602:1999 High visibility safety garments

AS/NZS 1801:1997 Occupational protective helmets

AS/NZS 1337:2010.0 Personal eye protection – Eye and face protectors – Vocabulary

AS/NZS 1336:1997 Recommended practices for occupational eye protection

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement Sheet](#)

[FO 015 Risk Assessment Calculator](#)

[FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety](#)

WORKING AROUND SERVICES

**1 Purpose:**

To minimize risk to health, safety and assets associated with working around services.

2 Objective:

To comply with regulatory standards and utility service owner requirements.

3 Target:

- No incidents, accidents or injuries associated with working around services.
- No damage to any utility service assets, plant, equipment, buildings or infrastructure.

4 Controls:**a) The control philosophy for working around existing assets is:**

1. Identify
2. Locate physically
3. Mark
4. Protect
5. Communicate
6. Monitor

b) Actions to be taken when working around services:

1. Before starting any work at a site, request and obtain details of existing services (including chemical, fuel, and refrigerant lines). Inquire to "Dial Before You Dig", clients, and others as appropriate, noting that DBYD do not cover all service authorities, and plans may not be up to date.
2. Determine the requirements of all relevant service authorities in respect of services on the site, including (with examples shown in brackets relevant to work within SA)
 - a. Electrical (SAPN)
 - b. Communications (Telstra, AMCOM, NexGen, Optus, PipeNetworks, SabreNet)
 - c. Water / Fire water (SA Water)
 - d. Sewer (SA Water)
 - e. Gas (Envestra, APA, SEAGas)
 - f. Stormwater (DPTI, councils)
 - g. Private services (ARTC, airport, marine, etc)
3. Physically locate and mark all known services, in accordance with service authority requirements, using an accredited service locator if required. "Locate" means confirming the precise position of the service, by visual or other appropriate technique, and may include pot-holing (refer below) at sufficient frequency to be confident of the true position of the service.
4. Check for evidence of services not shown on the DBYD drawings. If any are suspected contact the service authorities for investigation prior to commencing work.
Do not rely only on the information provided by the Service Agency, whether regarding location, size, number or type of asset.
5. **Provide appropriate protection to all services, including any specific requirements of the relevant service authority (e.g. fencing, barriers, tiger-tails, isolation, safe watcher, etc)**
6. In particular, power lines must be tiger-tailed or de-energized when working within the limits prescribed by Australian Standard (or SAPN). Consideration should also be given to deploying tiger-tails or de-energizing power lines even when working outside the limits prescribed by Australian Standard (or SAPN) to further reduce the hazard.
7. Communicate the location of services and associated controls to personnel involved in work adjacent to the service (by documenting it in a SWMS, toolbox meetings, pre-start briefing, signs, excavation permit, etc) .
8. In determining risk assessment controls first preference should be to eliminate working adjacent live power/gas. Alternatively, services should be disconnected or isolated and made safe and a clearance certificate obtained from the relevant service provider and/or a qualified tradesperson. Exclusion zones for personnel and plant and isolating electrical/gas services should also be a high priority eg lock out/tag

WORKING AROUND SERVICES



out.

Refer to SWI01-Conducting a SWMS

9. The impact on existing services from demolition, tree & stump removal, excavation, piling, blasting and use of explosives, hot work, outrigger placement, mobile plant movements and temporary structure placement shall be assessed prior to commencing work.
10. Comply with all guidelines provided by service authorities for working around their assets. This may include having a representative on site during work, or use of an accredited operator.
11. An excavation permit system (FO.017) shall be used to document the process

c) Locating services:- pot-holing:

When the exact location cannot be confirmed beyond doubt by other means, exposure of the service by pot-holing shall be undertaken in accordance with the following procedure:-

1. Use the markings placed by the service locator
2. Refer to and comply with any procedures prescribed by the relevant service authorities
3. Excavate to locate the service by either:
 - i. Passive technique, such as pneumatic or hydraulic excavation ("Air-Ex"), or
 - ii. Hand dig, preferably with a plastic tipped spade or other suitable, safe tool (Under no circumstances use any mechanical device to excavate)
4. **No other method of pot-holing shall be used**, unless subject to formal risk assessment approved by Construction Manager or Operations Manager.
5. Following exposure the location and shall be measured and recorded by a surveyor. Photographic records may also be appropriate, particularly at intersecting services.

Whenever practicable, a permanent marker shall also be placed (eg. a capped length of conduit, visible at ground level) providing the marker does not increase the risk to the service.

5 Permits/Licences:

- 1 As prescribed by relevant service authority or asset owner
- 2 As prescribed by client or contract requirements (e.g. excavation permit, hot work permit)
- 3 Bardavcol excavation permit system (with Form FO 017).

6 Emergency Response:

Actions to be taken if services are contacted:

NB – emergency response (and routine) contact details for service authorities can be found on DB4YD information and / or website.

If an energised conduit / power lines is contacted and the energised conduit / power lines is resting on / touching any item of plant / machine the following actions must be taken:

1. Work shall cease **immediately in the vicinity and the Site Supervisor / Project Manager notified**
2. Operator to shut down machine, if safe to do so
3. Operator to remain on machine until fault is cleared
4. Operator must make no physical contact with any other person or object.
5. Contact SAPN **immediately** (& Office of the Technical Regulator (Electricity))
6. The machine shall be barricaded off and a responsible person nominated to stay near it
7. If it is necessary for the operator to leave the machine in the case of fire or other immediate danger the operator must:
 - jump clear of the machine making sure not to contact the machine and ground at the same time
 - Hop away from the machine with feet together for at least 5 meters

If an energised conduit / power line is contacted and the energised conduit / power lines is **not** resting on / touching any item of plant / machine the following actions must be taken:

1. Work shall cease **immediately in the immediate vicinity and the Site Supervisor / Project Manager notified**

WORKING AROUND SERVICES



2. Operator to shut down machine, if safe to do so
3. Contact SAPN **immediately** (& Office of the Technical Regulator (Electricity))
4. No work to occur in the immediate vicinity of **any** energised conduit / power line on the project site until SAPN have viewed the area.

In the case of contacting a gas main the following actions must be taken:

1. Work shall cease **immediately and the Site Supervisor / Project Manager notified**
2. All personnel must evacuate to a safe distance
3. Contact Envestra **immediately** (& Office of the Technical Regulator (Gas))
4. The area shall be barricaded off and a responsible person nominated to stay near it

In the case of contacting an optic fibre cable the following actions must be taken:

1. Work shall cease **immediately and the Site Supervisor / Project Manager notified**
2. To avoid injury due to laser signals in the cable, do not look at the broken end of the optic fibre or handle the cable within 1m of the damage
3. Asset owner to be notified immediately
4. The area shall be barricaded off and a responsible person nominated to stay near it

7 Program Inspection:

- Daily excavation inspections in accordance with WHS Regulations and SWI 21 – Excavation & Trenching Work
- Safety inspections in accordance with SWI 15 – Workplace Safety Inspections and FO 001 – Site Safety Inspection Form (not less than fortnightly)
- Audits in accordance with IP 16 – Management Systems Auditing
- Inspection on completion of excavation & backfill in accordance with FO 017 – Excavation Work Permit

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

- How to Manage Work Health and Safety Risks
- Managing electrical risks at the workplace

9 Tools/Forms:

SWI 17 Excavation & Trenching Work

FO 001 Site Health Safety Inspection Form

FO 007 Site Induction Register Form

FO 010 Standard Safety, Environmental Emergency Flowchart

FO 013 Safe Work Method Statement Sheet

FO 014 Risk Assessment Form

FO 015 Risk Assessment Calculator

FO 017 Excavation Work Permit

FO 019 Equipment Requiring Licenses, Tickets, Certificates of Competency to Operate

FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety

1 Purpose:

To minimise risks to workers and other persons from site hazards, to discourage vandalism and theft, and avoid damage to the works due to unauthorised access.

2 Objective:

To comply with regulatory standards and contractual requirements and prevent unauthorised entry.

3 Target:

- No incidents or injuries as a result of unauthorised entry.
- No loss or damage to plant, equipment, tools, materials, buildings or infrastructure.

4 Controls:**a) General**

Entry to construction sites by unauthorised people (especially youths) can result in serious injuries. Injuries can be sustained by plant, structures and excavations left in unsafe condition, falling objects, and slip, trip and fall hazards. WHS Regulations 2012 (SA) requires that a construction site must, so far as reasonably practicable, be secure from unauthorised access. In addition, there are commercial considerations, such as theft and vandalism

b) Risk Assessment

The “so far as reasonably practicable” test must have regard to the likelihood of unauthorised access and the risk that might arise from unauthorised access. A risk assessment shall be documented at time of project launch to identify hazards and determine appropriate control measures to be implemented to ensure the security of the site at all times.

c) Control Measures

The control measures implemented must be appropriate and effective. When selecting control measures, consider factors such as the nature of a particular hazard and ease of access by all persons (including pedestrians, children and unauthorised persons).

Control measures to be considered shall include:

- isolating the hazardous area by fencing, barricades, barriers, handrails or covers,
- backfilling excavations progressively
- hazard warning lights, signs, markers or flags
- observers/spotters (to provide protection for the public and employees)
- control of site entry, including the use of security personnel and perimeter fencing
- night lighting.

Control measures should be properly implemented and maintained until the work is completed or until there is no longer any risk to persons.

d) Leaving Mobile Plant Unattended

When leaving an item of plant unattended:-

- Park in a safe, secure place, on a level surface if possible
- (If no level area available, park across a slope, rather than up or down, where stable)
- neutralize the transmission where applicable and apply any safety locks
- lower all implements to ground, ensuring this does not create an additional hazard such as tripping
- turn off motor, and remove keys from plant to prevent use by unauthorised persons
- take measures to secure plant against unauthorised access.

e) Procedures for access to a Bardavcol work site:

- Access to a Bardavcol work site is not permitted unless authorised for a purpose;
- No person is allowed on a Bardavcol work site unless inducted or personally escorted by an inducted person;
- All visitors should first report to the Site Supervisor or site office and complete the visitor log and any other prescribed requirements prior to entering the site.
- Students visiting a Bardavcol work site require prior authorisation by General Manager, (after confirming insurance cover) and must be accompanied at all times on the site by a Bardavcol staff member;

f) Minimum company standards for site security [with responsibilities as designated]:

- Where the risk assessment identifies that site offices are vulnerable, a monitored electronic security system and appropriate night-time lighting shall be implemented. Any exemptions from this requirement must be authorized by the Operations Manager. Exemptions may be appropriate where the site is within a high security area, such as a Defence site, or in a highly visible area where vandalism would be unlikely. [Project Manager]
- Outside of working hours, all paper files and other sensitive project records shall be locked in a steel "Brownbuilt" type cabinet. All special equipment (eg measuring instruments) shall be similarly secured. On no account shall laptop computers be left onsite – they should be taken home by the user and stored in a safe place. Printers and photocopiers may be left within the general office area if impractical to do otherwise. [Project Manager]
- All small tools and equipment and high value density materials (eg bridge plaques) shall be stored within steel site containers, specially adapted for this purpose. Container doors shall be fitted with padlock security guards, and kept shut between access so that contents are not visible. At close of every shift, the container shall be secured by padlocks and a large item of plant (eg loader, grader, roller) or other suitable object (eg. concrete road barrier) placed immediately across the container doors to prevent unauthorized entry. [Responsibility – Project Supervisor]
- The site perimeter shall be fenced to prevent unauthorised and inadvertent entry in accordance with statutory requirements. As a minimum this will require 1.8m high temporary fence compliant with AS4687. In vandal-prone areas, consideration shall be given to temporary fence with one or more strands of barbed wire. Any reduction from this standard must first be authorized by the Construction Manager, after consideration of the "reasonably practicable" test. [Responsibilities: layout and procurement – Project Manager; deployment, daily inspection and maintenance –

Project Supervisor]

- Access points along the boundary shall be suitably controlled to prevent unauthorized access. Suitable methods might include a gate, a worker or security guard to control access, a remotely controlled boom-gate or barrier, or a length of bunting. [Selection – Project Manager; operation and maintenance – Project Supervisor]
- Appropriate signage (“Construction site keep out”; “Visitors report to site office”, etc) shall be installed at each entry to site, and at intervals of no more than 500m along the perimeter. Where appropriate, emergency contact phone numbers should be included. [Responsibility: Project Supervisor]
- On projects where Bardavcol is the Principal Contractor, a project sign shall be established, adjacent the site access point, and clearly visible from outside the worksite, showing;:
 - Company name (Bardavcol Pty Ltd) and contact numbers
 - After hours contact number
 - Builders license number (BLD 52873)
 - Any other information required by the applicable contract
- Regardless of the standard of perimeter fencing implemented, any hazards within the site shall be specifically protected (by eg steel plate, bunting, flagging, fencing) to a standard appropriate to the nature and severity of the hazard. This is also relevant to stores of large materials (eg reo, bridge beams), bulk materials (eg quarry product stockpiles), and dangerous materials (eg. fuels and lubricants) [Responsibility - Project Supervisor]

5 Permits/Licences:

Permits may be required by local authorities for perimeter fencing and hoarding, and for storage of some materials (eg. fuels).

Project Manager to check and obtain as required.

6 Emergency Response:

Emergency responses to potential incidents related to site security (eg. unauthorised access, vandalism, injuries, etc) are to be determined and documented in Project Management Plan or Emergency Response Plan, including relevant contact schedule / call-out roster [Project Manager]

7 Program Inspection:

Site Health & Safety Inspection

Inspection schedule as per site management risk assessment.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

Building Work Contractors Act, SA, 1995

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Construction Work

Managing the Work Environment and Facilities

AS4687 “Temporary fencing and hoardings”

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

[Project Management Plan Template](#)

1 Purpose:

To minimize health and safety risk associated with inclement weather.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with inclement weather.
- No damage to plant, equipment, buildings or infrastructure from inclement weather.

4 Controls:

- a) All employees must report to their immediate supervisor any adverse weather conditions (i.e. hot, cold, dusty, wet) that they feel may hinder their ability to carry out their duties safely. The Project Manager, Site Supervisor and/or Site Safety Supervisor shall monitor all weather conditions and take any appropriate action to ensure that employees are not working under any adverse weather conditions.
- b) At any time when sunburn may occur due to exposure to Ultra Violet radiation, a supply of sunscreen cream shall be made readily available from the Site Supervisor. Hats are available from the Operations Supervisor, All employees are encouraged to wear long sleeve shirts and long trousers for maximum protection.
- c) Heat Stress – Heat stress is a series of conditions in which the body is under stress from overheating. The human body has only very limited capacity to adjust to extremes of temperature and humidity. When these limits are exceeded, heat cramps, heat rash, heat exhaustion, heat syncope (fainting) and heat stroke can occur. Heat stroke is the most serious of these conditions and can be fatal. Refer also to [SWI 12 Heat Stress](#)

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Apply first aid.
Seek medical attention.

7 Program Inspection:

Site health and safety inspection.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
How to Manage Work Health and Safety Risks
Construction Work
Managing the Work Environment and Facilities

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)
[FO 007 Site Induction Register Form](#)
[FO 013 Safe Work Method Statement Sheet](#)
[FO 014 Risk Assessment Form](#)

1 Purpose:

To minimise health & safety impact caused by working in heat.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents or accidents relating to heat stress.
- Zero injury employees due to heat stress.

4 Controls:

- a) It is important to recognize the symptoms of dehydration and heat stress and to understand how dehydration, heat stress and heat exhaustion can occur when working in adverse climatic conditions particularly in conjunction with high humidity and direct exposure to the sun.

Indicators of this can be excessive fatigue, irritability, dizziness, blurred vision, weakness, clammy skin, vomiting, a flushed face, sunken eyes and also reduced amounts of urine production / dark yellow urine / difficulty in passing urine. Urine colour is usually the best indicator of dehydration in the early stages.

All employees must advise their Site Supervisor if they experience any of these symptoms, or observe any of these symptoms in their co-workers.

- b) The potential hazards of dehydration and heat stress shall be addressed in Job Hazard Assessments whenever adverse climatic conditions are anticipated. The following potential controls should be considered in the Job Hazard Assessment:-

Hazard Elimination:

- Can the task be rescheduled to a time when conditions are less adverse? e.g; tasks in direct sun to be scheduled before 11-00 am and after 3-00 pm (daylight saving time),

Hazard Isolation:

- Can the task be relocated to a shaded or protected area?
- In adverse weather conditions (heat in particular), **in consultation with employees**, the Bardavcol Supervisor may decide that it is appropriate to relocate workers to a more sheltered environment to await further instructions from the Project Manager,

Personal Protective Equipment:

- At all times (including cool and overcast days) recommend employees protect themselves by wearing wide brim hats, long sleeved shirts with collars, long trousers, sunglasses and by applying SPF30+ broad spectrum sunscreen.,
- The Bardavcol Supervisor shall have available and provide PPE for Bardavcol employees

Hydration

- The Bardavcol Supervisor shall ensure a supply of fresh drinking water is available on site and where practicable close to work areas to encourage regular re-hydration.

- c) The Bardavcol Supervisor shall ensure that regular breaks are scheduled to provide adequate opportunity for employees to re-hydrate to suit conditions.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Apply first aid.

7 Program Inspection:

Supervision to monitor temperatures and employees.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Construction Work

Managing the Work Environment and Facilities

Protection of Workers from the Ultraviolet 1991 Radiation in Sunlight [NOHSC: 3012(1991)].

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Assessment Calculator](#)

[FO 020 Employee Induction Checklist](#)

[FO 021 Bardavcol Special Conditions of Subcontract Regarding Safety](#)

1 Purpose:

To minimize health and safety impact caused by communicable diseases.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries in relation to communicable diseases

4 Controls:**a) Procedures for Personal and Workplace Hygiene**

A high standard of personal hygiene involving hand washing and hand care are important measures in infection control. Additionally, hygienic toilet and hand washing facilities are also essential to reduce the risk of transmission of communicable diseases.

- 1) Clearly identified hand washing facilities should be provided at each worksite.
- 2) When it is not possible for employees to wash their hands in running water alternative methods for hand washing should be available such as Alco wipes, environmental wipes or skin/baby wipes. (It is not appropriate for communal bowls of water to be provided for hand washing.)
- 3) Employees should wash and dry their hands:
 - before and after delivering first aid;
 - immediately after contact with blood or body substances;
 - immediately after removing gloves after delivering first aid;
 - at the end of every shift;
 - before and after eating, drinking or smoking; and
 - after going to the toilet.
- 4) Toilet and hand washing facilities must be maintained in a clean and hygienic state. All toilets and hand basins must be cleaned with disinfectant. All refuse must be removed from the worksite and disposed of.
- 5) Rubber gloves must be worn by all staff who clean toilets and hand washing facilities and when handling any refuse such as, paper towels or tissues.

Gloves which are split or punctured must be replaced immediately
- 6) The handling of syringes and needles must be in accordance with the "Procedures for Handling Syringes / Needles in the Workplace".

b) Procedures Handling Syringes / Needles in the Workplace

NEVER pick syringes up by hand.

To prevent employees from having direct contact with infectious substances through the handling of syringes / needles at work:

- Employees required to collect syringes / needles must use gloves of an approved standard and also tongs.
- Syringes / needles must be disposed of in "sharps" containers (rigid-wall puncture resistant containers) which must only be filled to 2/3 of the container, labeled correctly, capped tightly after each use and also stored in a secure location.
- Tongs which come into contact with syringes / needles must be rinsed thoroughly under running water.

Needles should not be recapped under any circumstances as this is the most common cause of needle

prick injury.

If an employee sustains a needle-stick injury at the workplace, the following shall apply:

- If soap and water are available then wash the injured area thoroughly.
- Report the injury immediately to the Supervisor.
- The Supervisor must immediately arrange for the injured person to obtain medical attention from a health clinic or medical practitioner.
- The Supervisor must ensure that the item causing the injury is retained and forwarded to the health clinic or medical practitioner.
- The Supervisor must complete an accident investigation report and report the accident to his Project Manager or the Engineering Systems Manager as soon as possible.
- Access to the area where the item causing the injury was found is to be restricted until a thorough supervised search is made for other foreign objects that could cause injury.

c) Delivery of First Aid

It is essential to treat all human blood, body fluids and tissues as potentially infectious.

- All people administering first aid, where there is a possibility of infection, must wear disposable gloves available from any Bardavcol First Aid Kit.
- If a person who is administering first aid is exposed to and becomes contaminated with blood or body substances they should undertake the following immediately:
 - If a wound, encourage bleeding;
 - Wash away the blood or body substance with soap and warm or cold water or use a mediprep swab.
 - If the eyes become contaminated, rinse while open with water or saline.
 - If blood gets into the mouth, spit it out then rinse with water and spit out repeatedly.

Following these actions, the Supervisor should be informed.

- Carefully mop up spilled blood and body substances with absorbent material such as paper, cloth rags or sawdust. Blood soaked material should be placed in a plastic bag and disposed of appropriately. Instruments (eg, scissors, splinter remover forceps) must be sterilised. The area where first aid was administered should be cleaned and disinfected.
- If resuscitation is needed, it should be started immediately. There is a low risk of transmission of HIV or Hepatitis B from performing mouth to mouth resuscitation if not using an approved resuscitation mask with a one-way valve or a resuscitation bag. Mouth to mouth resuscitation is a life saving procedure.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Apply First Aid.

Seek medical treatment for effected employees.

7 Program Inspection:

Scheduled WHS Inspections

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Construction Work
Managing the Work Environment and Facilities
First Aid in the Workplace

9 Tools/Forms:

[FO 005 – Incident Report Form](#)

[FO 006 – Workplace Injury and Illness Record](#)

[FO 007 – Site Induction Form and Register](#)

[FO 010 – Standard Safety, Environmental Emergency Flowchart](#)

[FO 014 – Risk Assessment Matrix](#)

[FO 015 – Risk Assessment Calculator](#)

1 Purpose:

To minimise health and safety risks associated with working in traffic.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with working in traffic.
- No damage to plant, equipment, buildings or infrastructure from working in traffic.

4 Controls:**a) Acronyms and Definitions:**

For the purposes of this SWI only:-

- (i) Traffic Controller: A person whose duty it is to control traffic at a Worksite [AS1742.3/1.4.18]
- (ii) TCO: Traffic Control Officer - a person qualified to design & install traffic controls
- (iii) TCP: Traffic Control Plan – a plan indicating the placement of traffic control devices
- (iv) TMP: Traffic Management Plan – a plan describing the approach to traffic control
- (v) Work Area: Has the meaning defined at AS1742.3 clause 1.4.22
- (vi) Work Site: Has the meaning defined at AS1742.3 clause 1.4.23
- (vii) WZTM: Work Zone Traffic Management

b) General

Where there is a risk that construction work may interact with pedestrian or vehicular traffic, the responsible Project Manager shall :-

- (i) appoint person(s) to manage traffic (the “Traffic Control Officer(s)”)
- (ii) arrange for preparation of a project TMP (which shall detail the approach to be taken to traffic management in accordance with AS1742.3 /2.2.2, including site pedestrian & vehicle movements)
- (iii) arrange for preparation of individual TCPs in accordance with the TMP [AS1742.3 /2.2.1]
- (iv) ensure all such plans comply with AS 1742:3 2003, the Contract, and any other relevant and applicable standards
- (v) arrange for review and approval of such plans in accordance with the Contract and the requirements of authorities with jurisdiction for public roads affected by the controls
- (vi) arrange for implementation, monitoring, and maintenance of traffic controls in accordance with those plans
- (vii) ensure records of plans and implementation are made and retained.
- (viii) ensure Traffic Control Officers and Traffic Controllers are appropriately trained and instructed
- (ix) ensure all workers are aware of the traffic controls insofar as it affects their activities

c) Project Start Up

- (i) Hazards associated with traffic and traffic controls shall be identified in the Project Risk Assessment.
- (ii) The TMP shall include a detailed risk assessment (in accordance with AS1742.3 clause 2.2.3), and address specific controls in accordance with Hierarchy of Control principles
- (iii) Project staging shall be addressed, including any temporarily trafficked areas, and staging plans developed for incorporation in the TMP.
- (iv) The Project Manager shall also prepare, implement and maintain a Site Traffic Movement Plan to control movement of pedestrians, vehicles and construction traffic into, within, and out of the Site

d) During Construction

- (i) A specific TCP shall be prepared for each **Work Site** and each **Work Area**, taking into account the layout of roads, traffic flow paths, and the circumstances pertaining to the **Work Area** and the work to be conducted within the **Work Area**.
- (ii) TCPs shall comply with AS 1742.3, the Contract, and any other relevant and applicable standards, and shall clearly indicate:-
 - Layout of roads and traffic lanes
 - Location and extent of the defined **Work Area**
 - Minimum clearance required from plant and workers to traffic (in particular, for cranes, excavators, EWPs and concrete boom pumps)
 - Direction of traffic flow in each lane
 - Pedestrian movements
 - Signs, bollards, cones and other traffic control devices (e.g. traffic lights)
 - Dimensions between signs and the limit of the **Work Area**
 - Orientation (i.e. :North")
 - The sequence of installing the controls and dismantling the controls
 - The requirement for **Traffic Controllers** (manual stop/slow control)
- (iii) TCPs shall be drafted by TCOs, preferably using appropriate software. However, a neat, hand-drawn sketch is better than no plan at all.
- (iv) TCPs which merely refer to a generic, typical traffic control layout by reference to a handbook are not acceptable, except in the most simple circumstances, and subject to specific approval of the Project Manager in each instance.
- (v) TCPs shall be reviewed and approved in accordance with the Contract and the requirements of authorities with jurisdiction for public roads affected by the TCPs prior to implementation.
- (vi) Traffic controls shall be implemented in accordance with the approved TCP prior to work commencing in the **Work Area** protected by the controls shown on the TCP
- (vii) During deployment of traffic controls in accordance with the TCP, the responsible TCO shall regularly inspect the traffic controls to ensure they continue to conform to the TCP, reinstate any controls that are vandalised, disturbed or displaced, and record information prescribed at Appendix A of AS 1743.3 using FO.035, including the time of each such inspection and any corrective actions.
- (viii) In the event that TCO duties are delegated to subcontractors, the subcontractor shall comply with all provisions of this SWI. The subcontractor may use their own forms for recording inspection and maintenance of traffic controls if their form captures all information detailed on FO.035, otherwise the subcontractor shall use FO.035
- (ix) TCPs relevant to the work to be conducted during that shift shall be available for inspection by workers at each daily prestart briefing.
- (x) Movement of construction plant across or within public traffic shall be appropriately controlled by accredited **Traffic Controllers** or traffic signals in accordance with AS1742.3 clause 2.3.3, or by "shadow" escort vehicles in accordance with AS1742.3 clauses 4.4.1, 4.4.3 or 4.6.

5 Permits/Licences:

- (i) TCOs shall be trained in WZTM applicable to the jurisdiction in which the work is performed.
In SA this is a DPTI WZTM ticket.
- (ii) To conduct WZTM in SA on DPTI roads, a permit from DPTI Traffic Management Centre is required.

6 Emergency Response:

In the event of failure of the traffic controls to regulate traffic as designed, work in the associated **Work Area** shall cease until safe traffic flow is restored.

In the event of an incident associated with a **Work Area** under the protection of a TCP, work shall cease until the incident is cleared, safe traffic flow restored, and it is safe to resume work.

In the event of any other emergency, response shall be in accordance with the Project Emergency Response Plan.

7 Program Inspection:

- (i) The TMP shall be reviewed at the same time and frequency as the Project Management Plan.
- (ii) Relevant TCPs shall be reviewed daily prior to deployment of controls, and whenever there is any incident involving traffic operating under the TCP.
- (iii) Traffic controls shall be inspected in accordance with this SWI & reported daily using FO.035

8 References:

- (i) Work, Health & Safety Act, SA 2012
- (ii) Work, Health & Safety Regulations, SA 2012
- (iii) COP under SA WHS Laws 2012:-
 - How to Manage Work Health and Safety Risks
 - Construction Work
 - Managing the Work Environment and Facilities
- (iv) South Australian Road Traffic Act, 1961, Section 20
("Duty to place speed limit signs in relation to work areas or work sights").
- (v) The Code of Technical Requirements for the Legal Use of Traffic Control Devices, 1999.
- (vi) AS1742.3 Manual of Uniform Traffic Control Devices

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection Form](#)
[FO 007 Site Induction Register Form](#)
[FO 010 Standard Safety, Environmental Emergency Flowchart](#)
[FO 013 Safe Work Method Statement Sheet](#)
[FO 014 Risk Assessment Form](#)
[FO 015 Risk Assessment Calculator](#)
FO.035 WZTM Inspection

WORKPLACE SAFETY INSPECTIONS



1 Purpose:

To reduce health and safety risks in the workplace via periodic workplace health and safety based inspections.

2 Objective:

Provide a positive lead indicator for influencing safety performance.
To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with Bardavcol work sites.
- No damage to plant, equipment, buildings or infrastructure in Bardavcol work sites.

4 Controls:

- a) Inspecting and maintaining a safe work environment is the responsibility of all Bardavcol employees, supervisory staff and subcontractors and should be done daily or more frequently if required.
- b) Weekly/ fortnightly Site Inspections shall be undertaken by the Project Manager, Site Supervisor and Engineer using [FO 001 Site Health and Safety Inspection Form](#). Weekly Site inspections should be undertaken if any of the following occur;
 - The site is constantly changing through the nature / complexity of the site,
 - A large number of Bardavcol personnel and subcontractors need to work in a restricted area,
 - Non-Standard Bardavcol Operations / Activities are being undertaken – scaffolding, rigging, slinging crane operator, large scale concrete/reinforcement placement etc,
 - Plant / personnel/Public Interfaces are occurring on a regular basis.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Daily, Weekly, Fortnightly, Monthly.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
 How to Manage Work Health and Safety Risks
 Construction Work
 Excavation Work
 Confined Spaces
 Managing the Work Environment and Facilities

9 Tools/Forms:

[FO 001 - Site Health & Safety Inspection Form](#)
Project Management Plan

1 Purpose:

To minimise health and safety risk associated with labour hire employees working on Bardavcol sites.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with labour hire employees working for Bardavcol.
- No damage to plant, equipment, buildings or infrastructure from labour hire employees working for Bardavcol.

4 Controls:

a) Information to be provided by Bardavcol to the Labour Hire Company is via the Labour Hire Subcontract, and Schedule 1 of the subcontract will include a description of duties including:

- The type of work the worker is required to carry out,
- Any plant, equipment or substances the worker may be required to operate or handle,
- Any licences and qualifications required by the worker,
- The skills, knowledge and experience required for the work involved,
- The site location, type of working environment, commencement date and probable duration of placement.
- Copies of relevant site specific occupational health and safety procedures.

The Site Supervisor is to complete and send Schedule 1 to the Operations Supervisor. The Operations Supervisor will raise the subcontract works order and issue to the Labour Hire Company.

b) Information to be provided by Bardavcol to the Labour Hire Employee before commencing work on site:

Induction training aimed at familiarising the labour hire worker with Bardavcol's operations, facilities, policies, procedures and the actual work site.

- On-the-Job training to ensure the labour hire worker is equipped and also competent to perform the work safely,
- Close supervision of the labour hire worker where the worker is inexperienced in any task he is required to carry out or the task is of a hazardous nature.

The Bardavcol Site Supervisor / Project Manager has the following responsibilities;

- To make a copy of any tickets / licenses required prior to starting on site,
- To ensure correct labour and induction records are kept on site.

If the Labour Hire Employee is transferred to another Bardavcol site the Site Supervisor on the receiving site becomes responsible to ensure all the above requirements are complied with including;

- That the new project requirements are no different to those at the initial engagement,
- Carry out a new induction of the Labour Hire employee on site project requirements,
- That the Labour Hire Employee is correctly ticketed / licenced for works to be carried out on the new site.

c) The Labour Hire Company has the following responsibilities:

- (i) Gather information about the job – the type of work the labour hire worker will be required to perform, the plant, equipment and materials to be used or handled, the type of working environment (physical, excessive temperatures, noisy environments, confined space) and also the location of the workplace,
- (ii) Obtain Bardavcol's agreement to provide a safe and healthy workplace for labour hire workers supplied by the labour hire company,
- (iii) Gather information about the skills and competencies required for the job and conduct a work site visit. The aim of the work site visit is to verify the information provided by Bardavcol, assess compliance with relevant regulatory requirements and also the risks to health and safety associated with the work, negotiate arrangements to improve risk controls, if any are found to be unsatisfactory,
- (iv) Monitor the health and safety of labour hire workers – involving regular visits to the work site to discuss the job and conditions with the labour hire worker. Inspect the workplace and observe the work practices and also discussing any problems regarding the health and safety of labour hire workers with Bardavcol and reaching agreement as to any actions that may be required to ensure the health and safety of the contract worker.

d) The risk assessment process applies to labour hire personnel includes (but is not limited to):

- (i) Schedule 1 of the subcontract agreement
- (ii) Site safety risk assessment (PMP)
- (iii) Site safety induction
- (iv) Safe Work Method Statement that the labour hire employee is inducted into
- (v) Relevant Safe Work Instructions
- (vi) Toolbox meeting attendance

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Not Applicable

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Construction Work

Managing the Work Environment and Facilities

9 Forms:

Labour Hire Subcontract

1 Purpose:

To minimise the WH&S risks associated with working at heights.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents or accidents related to working at heights on Bardavcol sites.

4 Controls:

4.1 RESPONSIBILITIES

Bardavcol, so far as is reasonably practicable, is responsible for ensuring:

- that this procedure is understood and applied by its staff;
- that appropriate resources are available to enable the identification of hazards, risk assessment, implementation and evaluation of controls; and
- that staff are provided with the tools, training and support required to effectively manage working at heights risks.

Project Managers are responsible for ensuring:

- the implementation of this procedure as appropriate to their project;
- a hazard and risk assessment is conducted to identify tasks involving working at heights;
- adequate controls are implemented to eliminate, or where this is not practicable, minimise risks relating to working at heights;
- working at heights hazards, risks and controls are communicated to workers on the project;
- the effectiveness of controls are evaluated and revised, as appropriate to manage the hazards and risks;
- appropriate resources are available to ensure the identification of hazards, risk assessment and implementation and evaluation of controls; and
- SWMS are prepared for tasks involving working at height equal to or greater than 2 metres or as deemed necessary to manage risks to safety, property damage and the environment.

Supervisors are responsible for ensuring:

- that working at heights hazards and risks are assessed;
- adequate controls are implemented to eliminate, or where this is not practicable, minimise risks relating to working at heights;
- workers are communicated and consulted with on working at heights hazards, risks and controls relevant to the project;
- the effectiveness of controls are evaluated and revised, as appropriate, to manage the hazards and risks;
- SWMS are prepared for tasks involving working at height equal to, or greater than 2 metres or as deemed necessary to manage risks to safety, property damage and the environment; and
- regular inspections of working at heights equipment (ie scaffolding, EWP, anchor points, ladders or trestles) are conducted.

Subcontractors are responsible for ensuring:

- that working at heights hazards and risks are assessed in relation to their scope of work and other activities that could impact on their work (ie. tasks performed another work area);
- adequate controls are implemented to eliminate, or where this is not practicable, minimise risks relating to working at heights;
- workers are communicated and consulted with on working at heights hazards, risks and controls relevant to the project;
- the effectiveness of controls are evaluated and revised, as appropriate, to manage the hazards and risks; and

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- SWMS are prepared for tasks involving working at height equal to, or greater than 2 metres or as deemed necessary to manage risks to safety, property damage and the environment;
- regular inspections of working at heights equipment (ie scaffolding, EWP, anchor points, ladders or trestles) are conducted.

Workers are responsible for ensuring:

- compliance with the requirements of this procedure and any implemented controls in relation to working at heights at the project; and
- the Project Team is notified of any hazards, at risk behaviour or improvements required to manage working at heights risks.

4.2 Hazard Identification

The identification of hazards relating to risk of persons and objects falling from height requires the consideration of a range of factors, including the project scope of work, location, existing structures and any structures to be built. The identification process should involve consultation with workers, subcontractors, client, premises owners and designers. In some situations, advice may be needed from technical specialists, such as structural engineers, to check the stability of structures or load bearing capacity.

Hazards relating to working at heights and the risk of falls can include work:

- on any structure or plant being constructed, installed, demolished or dismantled, inspected, tested, repaired or cleaned;
- on a fragile surface (eg. roof sheeting, skylights, damaged access structure);
- on a potentially unstable surface (eg. areas of potential ground collapse);
- using equipment to work at an elevated level (eg. use of EWPs, scaffold, ladders);
- on a sloping or slippery surface where it is difficult for people to maintain their balance (eg. wet/muddy access ladders, batters);
- near an unprotected open edge (eg. near an incomplete staircase); and
- near a hole, shaft or pit into which a worker could fall, or into which an object could fall and strike a worker (eg. trenches, pits)

Consideration should also be given to hazards relating to:

- surfaces;
 - the stability, fragility or brittleness,
 - the potential to slip, for example where surfaces are wet, polished or glazed,
 - the safe movement of workers where surfaces change,
 - the strength or capability to support loads, and
 - the slope of work surfaces, for example, where they exceed 7 degrees;
- levels (ie. where levels change and workers may be exposed to a fall from one level to another);
- structures (ie. the stability of temporary or permanent structures);
- the ground (ie. the evenness and stability of the ground for safe support of scaffolding or a work platform);
- the working area (ie. whether it is crowded or cluttered);
- entry and exit from the working area;
- edges (ie. protection for open edges of floors, working platforms, walkways, walls or roofs);
- holes, openings or excavations (that require guarding); and
- hand grip (ie. places where hand grip may be lost)

4.3 Risk Assessment

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Where there is a potential for persons or objects to fall, a risk assessment must be undertaken and documented before commencing the work. Overall project risks are to be documented in the Project Risk Register and task specific risks documented in SWMS. The risk assessment must be reviewed where there is a change in the scope of works or if the risk a fall increases. The risk assessment should consider:

- the hazards associated with the work to be performed;
- what could happen if a fall did occur and how likely it is to occur;
- the potential consequences (ie. severity of the risk);
- whether any existing control measures are effective;
- what additional measures or actions are required to control the risk;
- how urgently controls need to be implemented to effectively manage the risk.

When assessing the risks arising from each fall/heights hazard, consideration should be given to the following:

- the design and layout of elevated work areas, including the distance of a potential fall;
- the number and movement of all people at the project;
- the proximity of workers to unsafe areas where loads are placed on elevated working areas (eg. loading areas) and where work is to be carried out above people and there is a risk of falling objects;
- the adequacy of inspection and maintenance of plant and equipment (eg. scaffolding);
- the adequacy of lighting for clear vision;
- weather conditions, including the presence of rain, wind, extreme heat or cold can cause slippery or unstable conditions;
- the suitability of footwear and clothing for the conditions;
- the suitability and condition of ladders, including where and how they are being used;
- the adequacy of current knowledge and training to perform the task safely (eg. inexperienced workers may be unfamiliar with a task); and
- the adequacy of procedures for all potential emergency situations.

4.4 Controls

Control measures must be developed and implemented based on the outcome of the risk assessment and documented in the Project Risk Register, SWMS or other applicable document. Project wide controls must be communicated through the project induction and communication and consultation on task specific controls managed through the SWMS development, review and induction process.

A Working at Heights Permit must be issued prior to the commencement of any work that involves the following:

- use of a Boom type EWP, or scissor lift greater than 11m;
- use of a work-box;
- a worker wearing a harness (eg. industrial rope access, fall restraint/arrest systems);
- accessing to the roof of a building/structure; or
- any other situation, as defined in the Project Management Plan.

In general, controls must:

- be selected according to the hierarchy of controls (refer to Table 1 below);
- ensure, where practicable work is completed on the ground or on a solid construction;
- eliminate, where reasonably practicable, the risk of a fall;
- where it is not reasonably practicable to eliminate the risk of falls, apply the hierarchy of hazard controls to reduce the risk of falls to so far as is reasonably practicable and must:
 - provide a fall protection (e.g. edge protection, covers); if not practicable
 - provide a work positioning system; if not practicable
 - provide a fall arrest harness;
- where a fall arrest harness is used, emergency rescue procedures are in place should a fall occur, the

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workers must be trained and instructed in those procedures and the procedures must be regularly tested;

- allow the selection of work methods which prevent work off ladders;
- ensure all working at heights equipment complies with the requirements of the relevant Australian Standards and is fit for purpose (note: all equipment must be checked prior to every use by a person trained in the use of the equipment);
- include equipment inspections undertaken by a person that has the relevant training and experience in the use of the equipment at specified intervals, as required or determined by the project or the manufacturer's specifications;
- ensure all equipment is registered and tagged to indicate compliance with inspection requirements;
- prevent tools and equipment from falling from height (eg. tool lanyards, kick boards on scaffold, chin straps);
- restrict or prevent access to areas that falling objects may land in if dropped from upper levels through the establishment and use of exclusion zones barricades and signage;
- ensure all forms of fixed, portable and moveable work platforms and suspended work cages conform to legislative requirements and relevant Australian Standards;
- ensure all persons erecting or dismantling scaffolding or operating elevating work platforms or cages are trained, deemed competent and where necessary certified for the equipment they are using;
- ensure that where persons are erecting or dismantling scaffolding and the risk of fall is 1.8 metres or greater a fall arrest harness system is used or alternative control measure are implemented to prevent a fall;
- ensure all persons tasked to work at heights are medically fit for such work; and
- allow for adequate supervision to be provided for tasks involving work at heights, including no work at height to be undertaken alone.

Table 1: Working at Heights Hierarchy of Control

Level 1: Undertake the work on the ground or from a solid construction		
Wherever possible seek options other than working at height (eg. work on the ground or from a solid construction)		
Level 2: Undertake the work using a passive fall prevention device		
Undertake hazard and risk assessment to determine the method of work based on height and risk of fall:		
▪ Scaffolds	▪ Perimeter Screens	▪ Safety Mesh
▪ Step Platforms	▪ Perimeter Guard Railing	▪ Protection for trenching works
▪ Elevated Work Platforms	▪ Guard railing edges of roofs	
Work area to be stable and secure, fitted with perimeter edge protection (e.g., handrail) 900-1100mm in height and mid-rail (Refer to AS/NZS 1576 and AS/NZS 4576).		
Level 3: Undertake the work using a work positioning system:		
This includes travel restraint systems and industrial rope access systems.		
Install guard railing, reduce shelf heights, mesh fragile roofs where access to elevated workplaces is regular and establish safe access (e.g., establish fixed ladders and safety harnesses, and anchor points).		
Perimeter screening, fencing, coverings or nets, handrails or other physical barriers that are of adequate height or load bearing to prevent the fall of a worker from an edge or through an opening.		

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Level 4: Undertake the work using a fall injury minimisation system

Undertake the work using process control to reduce the likelihood of injury.

Use equipment and/or materials that are intended to prevent or reduce the severity of an injury to a worker if a fall does occur. It can include industrial safety nets, catch platforms and safety harness system. Fall injury minimisation systems should only be used if it is not reasonably practicable to use higher level control measures. Refer to Australian Standard *AS/NZS 1891 - Industrial Fall Arrest Systems and Devices*.

Level 5: Use work platforms or platform ladders

If it is not reasonably practical to use a higher order of control, the use of platform ladders is to be in accordance with the accepted SWMS. Work platforms, including trestles, are to be used with guard rails and climbing steps and worker to maintain 3 point contact when ascending or descending.

Fall Prevention Systems/Structure

If the work cannot be performed on the ground or a solid construction, fall prevention systems/structures must be used to prevent the fall of workers and objects. These systems/structures include temporary work platforms (eg. scaffold, EWPs, perimeter guard rails).

Guard Rails

Guard rails can be installed to provide effective fall prevention:

- at the edges of roofs;
- at the edges of mezzanine floors, walkways, stairways, ramps and landings;
- on top of plant and structures where access is required;
- around openings in floor and roof structures; and
- at the edges of shafts, pits and other excavations.

Guard rails must have a top rail 900mm to 1100 mm above the working surface and a mid rail and a toe board.

The guard rail system must be adequate for the potential loads and take into account the number and mass of persons working in the area and the momentum of a falling person(s).

Scaffolding

Scaffolding must be designed and installed appropriate to the activities to be performed and loads, including materials, equipment, tools and workers.

Scaffolding must:

- be erected, altered and dismantled by a licensed scaffolder;
- if any person or object could fall more than four metres:
 - be erected, altered and dismantled by or under the direct supervision of a licensed scaffolder;
 - be inspected by a licensed scaffolder before use, at least every 30 days, after any incident that could affect its stability (eg. storm) and after any repairs;
- conform to AS/NZS 4576 *Guidelines for scaffolding* and the AS/NZS 1576 *Scaffolding series*;
- be of the same type and not mixed components if it is a prefabricated scaffold, unless the mixing of components has been approved, in writing, by the manufacturer;
- have safe access to and egress from the scaffold;
- have edge protection (hand rails, mid-rails and toe boards) at every open edge of a work platform;
- be maintained to ensure that working platforms are kept clear of debris and obstructions;
- not be altered (eg. removal of guardrails, planks, toe boards, braces) by unauthorised persons (ie. alterations must only be performed by an appropriately licensed scaffolder);

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- not be left incomplete or unattended without adequate controls (eg. danger tags, warning signs, physical barriers) in place to prevent unauthorised access; and
- not be accessed if defective.

Workers that perform work on a scaffold must be advised of the following:

- the safe load limits applicable to the scaffold;
- not to make any unauthorised alterations to the scaffold (such as removing guard rails, planks, ties, toe boards and braces); and
- report any defects or issues relating to the scaffold.

Mobile scaffolds must only be used by workers that are trained and competent in their use and must ensure that the scaffold:

- remains level and perpendicular at all times;
- is kept well clear of powerlines, open floor edges and penetrations;
- is not accessed until the castors are locked to prevent movement;
- is never moved while anyone is on it; and
- is only accessed using internal ladders.

Elevated Work Platforms

Elevated Work Platforms (EWPs) include scissor lifts and boom lifts. The type of EWP to be used must be selected with regard to the tasks to be performed, related hazards and consideration of:

- ground conditions (ie. stability);
- weather conditions (if applicable);
- ventilation (particularly if the EWP is not battery powered);
- access and egress;
- interface with other workers and the public; and
- proximity to overhead services and structures.

Mandatory requirements for the use of EWPs are as follows:

- workers operating the platform must be trained and competent in the use of the specific equipment, the safe use of fall arrest equipment (if applicable) and emergency rescue procedures;
- work must be performed in accordance with a SWMS that has been reviewed and accepted by Bardavcol prior to commencement;
- the platforms are only used as working platforms and not as a means of entering and exiting a work area unless the conditions set out in AS 2550.10 *Cranes, hoists and winches - Safe use - Mobile elevating work platforms* are met
- unless designed for rough terrain, the platforms are used only on a solid level surface;
- the surface area is checked to make sure that there are no penetrations or obstructions that could cause uncontrolled movement or overturning of the platform;
- the manufacturer's or supplier's instructions are consulted for information on safe operation;
- persons working in travel towers, boom lifts or cherry pickers must wear a properly anchored safety harness;
- where a safety harness is worn it must be directly attached to the designated anchor point and the lanyard must be as short as possible;
- workers that operate boom-type elevating work platforms with a boom length of 11 metres or more must be licensed.

As EWPs are defined as plant, their use must also satisfy the applicable requirements of Bardavcol's Plant and Equipment Procedure.

Workboxes

Workboxes must only be used where it is not reasonably practicable to use an EWP or scaffold. They must

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comprise of a platform surrounded by an edge protection system that is designed in accordance with AS 1418.17 *Cranes (including hoists and winches) —Design and construction of workboxes*.

The use of a workbox must not proceed unless a task specific risk assessment and SWMS has been prepared and reviewed by Bardavcol.

Mandatory requirements for the use of workboxes are as follows:

- the workbox must not be suspended over persons;
the workbox must be designed for the task and the lifting equipment (eg. crane, forklift truck, hoist) to ensure that it is securely attached (*workboxes fitted to a forklift must be securely attached to the forklift carriage and engineer-designed and constructed in accordance with AS 2359 Powered Industrial Trucks*)
- records of the workbox and lifting attachments must be maintained and checked by a competent person before use;
- the workbox must be fitted with a suitable anchorage capable of withstanding the fall forces specified in AS/NZS 1891.4 *Industrial fall-arrest systems and devices—Selection, use and maintenance*;
- workers must be attached to the anchorage by a lanyard and harness unless the workbox is fully enclosed;
- workers must remain within the workbox while they are being lifted or suspended;
- workers must not enter or leave the workbox when it is suspended (except in an emergency);
- the crane, forklift truck or hoist is fitted with the means to safely lower the workbox in an emergency or a power supply failure;
- the crane is suitably stabilised at all times while the workbox is used;
the crane has 'drive up' and 'drive-down' controls on both the hoisting and luffing motions and those controls are used (*no declutching allowing free fall is to be used while a workbox is in use*)
- resources and equipment are provided to enable an effective means of communication between any person in the workbox and the operator
- the crane is fitted with a safety hook and moused (lashed) accordingly;
- no other device must be used to gain additional height (eg. ladder);
- safety gates must be self-locking and kept shut while in the elevated position;
- the operator remains at the controls of the crane, forklift truck or hoist at all times;

Industrial Rope Access Systems

The use of industrial rope access systems to access a workface should only be used where alternatives such as EWPs and scaffold cannot be used safely, or it is not reasonable and practicable.

The main purpose of using an industrial rope access system should be to gain access to a work area rather than to provide backup fall protection.

In the event that industrial rope access systems are to be used, the following minimum requirements apply:

- operators must be trained and competent in the techniques;
- operators must not work alone, in case they require assistance in an emergency;
- industrial rope access systems must only be installed in a location where it is possible to provide prompt assistance or rescue if required;
- all equipment must be checked regularly by a competent person and records of checks maintained;
- prior to use, all fixed anchorage points must be checked by a competent person before attaching the rope access lines;
- a backup system must be used to protect the operator;
- two independently anchored ropes must be used for each person;
- any person within three metres of an unguarded edge must be adequately secured;
- all operators must wear a full body harness;
- resources and appropriate equipment must be provided to ensure that supervisors can communicate

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with workers;

- appropriate personal protective equipment is used, subject to a task specific risk assessment (eg. helmets, gloves, hearing protection, goggles and masks); and
- barricades and signposts must be placed on all access areas below the working area and anchorage locations to exclude and alert the public and other workers.

A SWMS must be prepared and reviewed by Bardavcol prior to the work commencing that includes details of emergency rescue procedures and confirmation that workers involved have been consulted with in relation to the hazards, risks and controls.

Falling Objects

The work at height risk assessment must consider the risk of an object falling from the work area and potential consequences to workers, public, environment and property. This is particularly important for work that involves demolition, work over or adjacent to other construction and public areas (eg. site compound, footpath, road) and includes the storage and transport of objects (and loads) at height. Controls to prevent the fall of objects must be documented in the applicable SMWS and communicated to workers prior to commencing the work. Controls include:

- Securing loads within containers or using restraint equipment when stored and/or shifted;
- Stacking materials so that they cannot slide, fall or collapse;
- Not exceeding load limits of the equipment that is storing the objects;
- Moving objects using equipment that is suitable for the task and by trained and competent workers;
- Establishing exclusions zones;
- Minimising the storage of materials at height;
- Removing materials that are not required for the task;
- Installing physical barriers (eg. toe boards); and
- Using chutes when removing waste and other materials.

Fall Restraint/Arrest Systems

Fall restraint/arrest systems must be used where the work cannot be performed on the ground or a solid construction and it is not reasonably practicable to control the risk through the use of fall prevention systems/structures. In certain situations, restraint/arrest systems may be used in combination with fall prevention structure/systems to ensure that the fall risk is effectively controlled.

Individual Fall Arrest Systems

Individual fall arrest systems require the worker to wear a harness that is connected to an anchorage point and comprise other components depending on the situation and set-up of the system that is used. The performance of the arrest system relies on the worker wearing and using the equipment correctly, therefore only workers that have been trained and deemed competent are permitted to use individual fall arrest systems. As a minimum, workers that use an individual fall arrest system must have completed *Work Safely at Heights* (RIIWH204D).

The following requirements apply to the safe use of the individual arrest system:

- components of the arrest system (eg. harness, lanyards, reels) must be inspected prior to every use and immediately following an arrested fall and recorded on the Working at Heights Permit;
- inspections must be conducted in accordance with the manufacturer's requirements and applicable Australian Standards (eg. AS/NZS 1891)
- periodic inspections must be conducted in accordance with the manufacturer's requirements and applicable Australian Standards (eg. AS/NZS 1891) and recorded in the Bardavcol and Project Equipment Register that are maintained by the Operations Supervisor and Project Team, respectively (note: Subcontractors and other personnel must provide evidence of these inspections to Bardavcol)

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where they are operating for periods greater than 6 months);

- components that are worn or show signs of weakness must be withdrawn from use and replaced (the arrest system must not be used unless all required components are in place);
- anchorage points must:
 - comply with AS/NZS 1891.4;
 - not be used unless it has been tested and approved by a competent person;
 - be inspected before use to assess its condition (if there is any sign of damage/fault it must not be used);
 - be located so that a lanyard of the arrest system can be attached prior to the worker moving to a position where they could fall;
- the location of anchorage points and records of their inspection must be recorded in the Project Equipment Register;
- arrest system that involve the use of a lanyard must ensure that there is sufficient distance between the work surface and any surface below to enable the system to fully deploy (including shock absorbers). (note: the maximum distance a person can free fall before the fall-arrest system take effects is 2 metres);
- the following factors must be considered in the selection of the lanyards:
 - worker's height
 - location and height of the anchorage point;
 - any slack in the horizontal line;
 - any stretching of the lanyard or horizontal life line when extended by a fall;
 - the length of the energy absorber when extended by a fall
- lanyards must not be used in conjunction with inertia reels to prevent the risk of excessive free fall prior to being arrested;
- harnesses must comply with AS/NZS 1891 and be correctly fitted;
- inertia reels must be used in accordance with the manufacturer's specifications and not locked to allow it to support the worker while performing the task;
- only compatible components must be used and in accordance with AS/NZS 1891;
- work should be avoided in locations above the anchorage point to reduce the free fall distance and potential for the lanyard to be caught on obstructions

Catch Platforms

Catch platforms must:

- incorporate a fully planked out deck;
- be positioned so that the deck extends at least 2 metres beyond all unprotected edges of the work area, except where extended guard railing is fitted to the catch platform;
- always be used with an adequate form of edge protection

Falling Objects

Control measures to contain or catch falling objects must consider:

- the types of objects that could fall;
- the fall gradient;
- fall distance;
- the strength of any protective equipment or structures to withstand the impact forces of a falling object.

Where mobile plant is required to operate in areas where there is a risk of falling objects, FOPs must be installed.

Other controls to restrain/arrest objects that can be applied include:

- tool lanyards;
- erecting a covered pedestrian walkway; and/or

- erecting a catch platform with vertical sheeting or perimeter screening.

Ladders

Ladders can be used in the following situations:

- for access to, or egress from a work area; or
- to perform light work of short duration where it can be done safely and it is not reasonable and practicable to use a higher order control (eg. elevated work platform, scaffold).

Ladders must be:

- manufactured for industrial use;
- have a minimum load rating of 120kg;
- selected according the location, duration of the task, ground/surface and weather conditions;
- inspected prior to use to ensure that they are in good working condition and free of faults and damage;
- set-up on firm, stable and level ground;
- positioned at a safe distance from the supporting structure (if applicable);
- the correct size/height to enable safe use/access; and
- used in accordance with the manufacturer's requirements

Ladders for Access or Egress

Where fixed or extension ladders are used for access or egress:

- the ladder must be located on a firm, stable surface
- the ladder must be secured at the top or bottom, with a preference for both ends (where practicable);
- the step-on and step-off points must be free from obstructions;
- the ladder must extend at least one metre above the stepping-off point onto the working platform or access area; and
- fall protection must be provided at the stepping-off and/or stepping-on point.

Work performed from ladders

Where work is required to be performed from a ladder (ie. it has been demonstrated that it is not reasonable or practicable to use a higher order control), this must be done using a platform ladder. The use of an extension or 'A-frame' ladder to perform work is only permitted if it is demonstrated by a risk assessment that it is a safer alternative to a platform ladder (ie. work performed in congested areas). Step ladders are not permitted.

Other requirements

In general, activities not permitted when using ladders include:

- a) carrying of materials (unless within a tool belt or tether to the worker) or performing work unless three points of contact can be made (with the exception of work performed on the platform of platform ladders);
- b) use of metal or metal reinforced ladders when working on live electrical installations, or where there is a risk of electric shock;
- c) using a ladder to perform arc welding, oxy cutting, quick cut saws or work over other workers;
- d) using tools that require a high degree of leverage force which, if released, may cause the user to over-balance or fall from the ladder (eg. pinch bars);

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- e) multiple workers to be on the ladder at the same time;
- f) use of a ladder near a 'live' edge of an open floor, penetration or beside edge protection;
- g) reaching such that the worker's torso is outside of the ladder frame;
- h) facing away from the ladder when going up or down, or when working from it
- i) standing on a rung closer than 900 mm to the top of a single or extension ladder

Activities (f)-(i) may be permitted if:

- additional and appropriate fall protection equipment is used in conjunction with the ladder;
- SWMS for the task clearly document the controls that must be implemented;
- it can be demonstrated that the use of higher order controls are not reasonably practicable; and
- the Project Manager reviews and approves the SWMS.

Additional controls must be implemented when ladders are used:

- in plant/vehicle/pedestrian access areas, including roads, footpaths, doorways;
- on scaffolding or an elevated work platform to get extra height
- next to power lines unless the worker is trained and authorised and the appropriate ladder is being used
- in very wet or windy conditions
- next to traffic areas, unless the working area is barricaded.

4.5 Training and Competency

Bardavcol must ensure that workers and subcontractors involved with working at heights are adequately trained for the type of work being carried out. The level of training obtained must be demonstrated with a relevant certificate, ticket or licence and confirmed prior to the commencement of work. This may be done prior to, or as part of the project induction.

As a minimum, all workers required to work where there is a potential to fall must:

- complete the project induction;
- be trained and understand the Work at Heights Permit process;
- be trained and understand the applicable safe system of work (eg. safe work method statement, standard operating procedure, risk assessment); and
- be trained on the equipment to be used and emergency response and rescue procedures (note: this may form part of the SWMS induction)

For defined high risk work (ie erection of scaffolding, installation of anchor points, use of fall arrest systems), workers must possess competencies as defined in the relevant Australian Standard and WHS legislation. Common 'work at height' activities and minimum competencies are listed below.

Activity	Minimum Competency
Elevated Work Platform – scissor <11 metres	Operate Elevating Work Platform (RIIHAN301D) Familiarisation training (for the specific EWP used)
Elevated Work Platform – boom <11 metres	Operate Elevating Work Platform (RIIHAN301D) Familiarisation training (for the specific EWP used)
Elevated Work Platform – boom >11 metres	Class WP Licence (high risk licence) Familiarisation training (for the specific EWP used)
Scaffolding (erection, alteration)	Basic (Class SB), Intermediate (Class SI) or Advanced (Class SA) Scaffolding, according to the scaffolding work to be performed

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Wearing a harness (including use of a fall arrest system)	Work Safely at Heights (RIIWH204D)
Working from a workbox	Work safely at heights (RIIWH204D)

5 Permits/Licences:

Equipment licenses as appropriate
 Certificates of competency as appropriate
 Potentially for working at heights permit depending on location of site

6 Emergency Response:

Whenever there are risks from working at height, appropriate emergency procedures, facilities and equipment (including first aid) must be established and provided. Typical injuries from falls can include unconsciousness and occluded airway, impalement, serious head or abdominal injuries and fractures. In developing emergency procedures, the different types of emergency and rescue scenarios that might arise and the working at heights hazards and controls identified in the project risk register must be considered.

When establishing emergency procedures, the following must be taken into account:

- location of work area;
- access to work area;
- need for emergency services;
- response times of emergency services;
- communications;
- type and location of rescue equipment;
- training requirements and competence of workers and rescuers; and
- appropriate first aid.

Once established, emergency procedures must be tested to confirm their effectiveness, the suitability of rescue equipment and identify opportunities for improvement. The testing of emergency procedures must be documented and actions taken to implement corrective actions or improvements opportunities that are identified

Arrested Falls

If the work at heights to be performed involves the use of a fall arrest system additional emergency response requirements must be considered by the project team and included in the project emergency response plan, SWMS and referenced in the applicable Working at Heights Permit.

These additional requirements are necessary given the increased risk associated with arrested falls and the quick response that is required to avoid serious injury and fatality.

Workers must

- never work alone when using a harness as fall protection;
- use a harness that allows legs to be kept horizontal;
- have access to foothold straps or an alternative method of placing weight on their legs; and
- be trained on emergency response procedures, equipment that is to be used to perform the work and in response to an emergency and movements to be performed (where possible) in the event that they or a worker is suspended in a harness.

7 Program Inspection and registers:

As per manufacturer's requirements.
 Check any equipment log books and service tags.

8 References:

Work, Health & Safety Act, SA 2012
 Work, Health & Safety Regulations, SA 2012
 COP under SA WHS Laws 2012:
 How to Manage Work Health and Safety Risks
 Construction Work
 Managing the Work Environment and Facilities
 Managing the Risks of Falls at Workplaces
 AS/NZS 4576 Guidelines for Scaffolding
 AS/NZS 1576 Scaffolding series
 AS/NZS 1891 Industrial fall arrest systems and devices series

Defenitions

EWP	Elevated work platform which includes a boom lift and scissor lift
Fall	a fall by a person from one level to another.
Falling Object	an object falling on a person if the falling object is reasonably likely to injure the person.
Fall Prevention Device	any equipment designed to prevent a fall for temporary work at heights and once in place does not require any further adjustment by workers using the device
Licensed Scaffolder	a worker that holds a High Risk Work Licence for scaffolding work applicable to the type of scaffolding work performed (ie. Class SB (Basic), Class SI (Intermediate) or Class SA (Advanced) High Risk Work Licence)
Risk of a fall	a circumstance that exposes a worker while at work, or other person while at or in the vicinity of a workplace, to a risk of a fall that is reasonably likely to cause injury to the worker or other person. This includes circumstances in which the worker or other person is: <ul style="list-style-type: none"> • in or on plant or a structure that is at an elevated level; • in or on plant that is being used to gain access to an elevated level; • in the vicinity of an opening through which a person could fall; • in the vicinity of an edge over which a person could fall; • on or in the vicinity of a surface through which a person could fall; • on or near the vicinity of a slippery, sloping or unstable surface; or • in any other place from which a person could fall.
Temporary Work Platform	a working platform, other than a permanently installed fixed platform, used to provide a working area for the duration of the job that prevents workers from falling (eg. scaffold, EWP)
Working at heights	a term used to describe a scenario where people or objects are at risk of falling from, into or through one level to another.

9 Tools/Forms:

[FO 001 Site Health & Safety Inspection](#)
[FO 002 Site Induction Register Form](#)
[FO 007 Site Induction Form](#)
[FO 013 Safe Work Method Statement Sheet](#)
[FO 014 Risk Assessment Form](#)
[FO 019 Equipment Requiring Licences/ Tickets/ Certificates of Competency to operate](#)

[FO 026 SWMS Assessment Form](#)

1 Purpose:

To minimise health and safety risks associated with the storage, handling and use of hazardous substances.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with the storage, handling and use of chemical products and hazardous substances.
- No damage to plant, equipment, buildings or infrastructure from the storage, handling and use of chemical products and hazardous substances..

4 Controls:

a) SDS Folder and Hazardous Substances Register

Obtain SDS for all chemical products to be used on site during the course of the project. Review the SDS for each chemical product and identify whether the chemical is a "Hazardous Substance".

Enter all Hazardous Substances in a list at the front of the SDS folder. This will be the "Hazardous Substance Register" for the site.

Use [FO032 Hazardous Substance Risk Assessment](#) to do a risk assessment regarding use of the hazardous substance on site. Attach the risk assessment to the SDS and put it behind the Hazardous Substances register.

All other SDS are to be entered into another Register (table) behind the collation of Hazardous Substances. Then all SDS are to be collated behind the SDS Register.

The Hazardous substance risk assessment shall document the quantity of the hazardous substance and this should be factored into the risk assessment. The quantity of hazardous substances on hand should be regularly reviewed and documented.

Check all SDS to ensure they are less than 5 years old.

b) General

NEVER mix chemicals together unless it is part of a prescribed work practice/procedure.

A hazardous substance can be anything, whether solid, liquid or vapour that can be unhealthy to any person at work.

Hazardous substances in the workplace must be used and stored in accordance to the manufacturer or supplier's written instructions and also agreed safe work procedures. Check SDS for any other substances that may be incompatible for storage in the same location. If unsure consult the manufacturer. Hazardous substances that are stored together must be compatible and should not present an increased threat of explosion or release of dangerous fumes if inadvertently mixed together.

All containers must be labelled, in good condition and stored correctly.

c) Harmful Effects of Hazardous Substances

Hazardous substances are dangerous. How dangerous, depends on the type of substance, what it is made of, the speed and way it enters the body and the amount of substance that enters the body.

The effect a hazardous substance has on the body also depends on the person's age, sex, body weight and state of health.

Harm to health may occur suddenly, such as dizziness, nausea and itchy eyes and skin; or it may occur gradually over many years.

In some cases, chemicals can cause permanent disability because the body has become very sensitive. For example, using a certain chemical could cause an asthma attack in a person who may never have suffered from asthma before.

Hazardous substances should have the relevant HAZCHEM sign displayed where they are stored. The SDS should also be easily accessible.

Hazardous substances enter the body through:

- Skin contact and absorption.
- Breathing in fumes, vapours and dust.
- Contact with chemicals while eating and drinking.
- Accidental ingestion as when blowing to clear spray nozzles.

The project risk assessment shall determine the extent of use of hazardous substances onsite and consider first aid measures such as emergency showers and an eyewash station/eye module in the first aid kit. The aim is to minimise exposure to below Workplace Exposure Standard. If SDS does not state what level of exposure is acceptable, consult manufacturer.

Any spillage of hazardous should be handled according to EW113 Solid and liquid waste management.

d) Safe Use of Hazardous Substances

All employees who use hazardous substances must:

- comply with controls identified in the Hazardous Substance Risk Assessment;
- be trained in the use of all hazardous substances handled;
- make sure any required safety equipment works well;
- report any leaks or blockages to the Operations Supervisor;
- always wear the correct safety equipment provided by your employer;
- not eat, drink or smoke while working with a hazardous substance and do not keep food near the substance; and
- wash their hands, face and other exposed areas with soap and water before going to the toilet or eating and drinking.
- Read the label. All substances must be labeled, even if decanted.
- Important information is written on labels of hazardous substance containers.
- Do not inhale the contents; it could make them sick.
- Never store hazardous substances in empty food or drink containers. Store them in their original labeled containers (note: any fuel/chemical lines should also be labelled according to legislation, standards and codes).

The Site Safety Supervisor / Site Supervisor or for the Bardavcol office and workshop the Operations Supervisor shall compile a list of materials or substances not listed on Worksafe Australia's list of Designated Hazardous Substances that can be found on his site. He shall make sure that he / she is familiar with any immediate procedure required in the event the material or substance becomes a health hazard to personnel (*eg. Jasol Spray and Wipe all Purpose Cleaner - safety instructions found on back of container; "Avoid contact with eyes. If contact occurs, flush with water - Avoid inhalation - If*

swallowed seek medical advice".)

It is the responsibility of the Site Supervisor / Site Safety Supervisor or for the Bardavcol office and workshop the Operations Supervisor to ensure that all containers used for holding hazardous substances are appropriately labeled and stored correctly as per the SDS.

The Site Supervisor / Site Safety Supervisor or for the Bardavcol office and workshop the Operations Supervisor shall, at the site induction for personnel or when new products are introduced to the workplace, ensure that all hazardous substances, their locations, the locations of the material safety data sheets are highlighted to inductees / employees and are readily available.

e) Empty Drums, Containers and Other Receptacles that may have contained Hazardous Substances

Points to Remember:

- Store empty drums, containers and other receptacles in a well ventilated area away from work areas.
- Never cut the tops off drums, containers and other receptacles that have contained flammable liquids or gases. Vapours left in the drum may explode.
- Do not apply heat to drums, containers and other receptacles that have held chemicals. It may produce poisonous gas and cause serious harm to your health.
- Do not cut any drum, containers and other receptacles that are not labelled.
- Never weld or grind near any empty drums, containers and other receptacles - SPARKS FLY.
- Do not use drums, containers and other receptacles as welding or cutting platforms. Construct a proper trestle.
- Do not use drums, containers and other receptacles for storing heavy material, or for lifting material by hooking to a crane if the drum is not reinforced.
- Correctly label all drums, containers and other receptacles.
- Even after cleaning, small amounts of vapour left in drums, containers or other receptacles can explode.

f) Monitoring and Health Surveillance

Monitoring and health surveillance shall be carried out for employees who have been identified in the workplace assessment stage as having:

- (i) A significant risk to health from a substances,
- (ii) Exposure to a substance for which an identifiable disease or health effect may be related to the exposure or there is a reasonable likelihood that the disease or other effect on health may occur under the particular conditions of work,
- (iii) A reasonable likelihood of being exposed to a substance when valid biological monitoring might be exceeded,
- (iv) Health surveillance and monitoring shall be done in consultation and with the approval of the employee.

The Engineering Systems Manager shall arrange for any monitoring or health surveillance required.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Refer SDS Sheet – follow emergency procedures described.

7 Program Inspection:

Visual inspection prior to use.

Scheduled preventative maintenance.

8 References:

Work Health and Safety Act SA 2012

Work Health and Safety Regulations SA 2012

Labelling of Workplace Hazardous Chemicals SA COP 2012

Preparation of Safety Data Sheets for Hazardous Chemicals SA COP 2012

Managing Risks of Hazardous Chemicals in the Workplace SA COP 2012

9 Tools/Forms:

[FO 001 – Site Safety Inspection Form](#)

[FO 007 – Site Induction Form and Register](#)

[FO 011 - Site Hazardous Substance Register](#)

[FO 013 – Safe Work Method Statement Sheet](#)

[FO 032 – Hazardous Substance Risk Assessment](#)

1 Purpose:

To minimise the health and safety risks associated with excavation and trenching work. This Work Instruction applies to excavation work if an excavation formed by the work is (or will be) more than 1.5 m high when measured from the bottom of the excavation.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with excavation and trenching work.

4 Controls:**a) Before any Excavation Work**

Before any excavation work begins, an Excavation Permit must be completed and obtained by the work group. An Engineer responsible for the site must assess all site conditions and prepare and issue an Excavation Permit (FO 23 Excavation Permit), on the site conditions, safety precautions and any other areas of concern pertaining to the safety of personnel near or in the excavation.

In accordance with WHS Regulations 2012 Section 304, prior to all excavations taking place, current underground essential services information about the areas of, and adjacent to, the excavation must be obtained before directing or allowing the excavation work to commence. This information must be communicated to the workers carrying out the excavation work. This information must be held for 2 years, and be presented to the regulator when asked. This information shall be included in the Excavation Permit (FO 23 Excavation Permit).

A competent person must, at least once a day, carry out an inspection of the excavation to ensure that conditions at the site are safe and that the work is being performed in accordance with any engineers report (where applicable). A signed written record must be prepared of the inspection and kept on site until the completion of the excavation work. Use FO 24 Excavation Daily Inspection or FO 109 Daily Excavation Inspection (Weekly format) for the purpose of maintaining a record of daily inspections for excavations.

b) Working in Trenches

All trenches 1.5 metres or deeper are to be shored, battered or benched such that the depth of the vertical trench does not exceed 1.5 metres. In line with Regulation 306 shoring, benching or battering is not required when written advice has been received from a geotechnical engineer (as part of the FO23) confirming all side of the trench are safe from collapse (taking into account any conditions, other controls and timeliness recommended therein).

The above threshold may need to be reduced in circumstances where material type or work activity, raise the risk level. Where there is any doubt concerning the structural integrity of materials and a potential risk of trench collapse due to the nature of material (i.e. sand), appropriate engineering advice and implementation of safety controls are required to render work in the trench safe. This includes circumstances where work in a proposed trench, which may involve kneeling or lying, may

EXCAVATION & TRENCHING WORK

require lowering the safety threshold below 1.5m, requiring appropriate shoring, battering or benching which is in height intervals less than 1.5m, as recommended by a geotechnical engineer.

In line with the Office of the Federal Safety Commissioner, shoring systems must, be:

- designed by a qualified engineer;
- detailed on up-to-date drawings/plans;
- installed by competent persons and verified as correctly installed prior to use in accordance with the drawing/plan; and
- authorised and signed off by a qualified engineer where changes to the design or installed system are made.

All shoring must be installed and checked daily by a competent-experienced employee. When working in a shored trench do NOT go out of the shored area.

Plant, equipment and materials, including spoil, must NOT be placed or operated within 1.0 metre of the edge of excavations or trenches because this may result in a wall collapse.

Hard hats must be worn in all trenches and personnel should take note of any changes to soil condition, small slips or movement, stress cracks, increased water etc. and report these to their supervisor.

Personnel must also report any unusual smells or evidence of hidden services such as water/gas mains, electricity of glass fibre cables – do not dig around services unless authorised to do so by the supervisor.

Trenches are usually cramped work areas so it's important to use mechanical assistance or lifting equipment whenever possible, for example, when laying pipes, moving heavy or awkward equipment.

Any trenches or excavations must have appropriate warning signage erected and be barricaded off (Min 900mm height) to warn people of their location and to prevent accidental or unauthorised entry. Barriers that are not designed as edge protection must be set back a suitable distance from the edge of the excavation. Where excavations are left open and there is a risk of public access, 1800mm high fencing or hoarding should be erected.

In addition suitable signs, barricades flashing lights etc. must be installed where there is vehicular traffic of night work. Signage shall conform to legislation, standards and codes.

As part of the SWMS development for excavation and working in trenches, consideration must be given to emergency situations, and a suitable emergency evacuation plan developed.

EXCAVATION & TRENCHING WORK

c) SWMS Development for working in Excavations/Trenches

Any construction work involving an excavation that is carried out in or near a shaft or trench with an excavated depth of greater than 1.5 metres, or a tunnel, is considered to be 'high risk construction work' and a Safe Work Method Statement (SWMS) must be authorised before carrying out the work.

A SWMS is to be developed for digging and working in excavations and trenches. Along with identifying and controlling relevant hazards associated with each step of the job, an Emergency & Rescue Procedure needs to be developed as part of the SWMS process.

Hazards commonly associated with excavation work:

- The fall or dislodgement of earth & rock
- The instability of the excavation or any adjoining structure
- The inrush or seepage of water
- Exposure to airborne contaminants above the safety threshold value
- Unplanned contact with services (electricity, water, gas, communications) (Refer to WI 34 Working Around Services).
- The placement of excavated material
- Falls into excavations
- The movement and positioning of heavy plant and equipment affecting the excavation
- Ground vibration affecting the stability of the excavation
- Vehicle movement
- Excessive noise from the operation of machinery
- Manual handling injuries
- Changes to excavation conditions

When the nature of the hazard and possible emergencies have been assessed and identified, some of the control measures may include:

- Development and communications of a warning system
- Development and communication of safe and rapid evacuation procedures, including injured persons
- Having trained personnel to oversee evacuation and rescue procedures until emergency authorities arrive
- Appropriate medical treatment and evacuation of injured persons
- Shutting down work in and around excavation
- Provision of firefighting and rescue equipment at appropriate locations
- Signage and physical barriers are put in place to prevent plant from getting dangerously close to an excavation.
- Obtaining geo-technical assessment to determine impact of excavation on surrounding structures. A dilapidation report may also be carried out.
- Where a geo-technical assessment identifies a threat to surrounding structures, temporary props are installed according to the relevant standards and codes.
- Display of evacuation procedures in appropriate locations at work site.

5 Permits/Licences:

FO 23 Excavation Work Permit

6 Emergency Response:

Emergency response plan to be developed as part of the Trenching/Excavation SWMS

FO 37 Safe Work Method Statement Sheet

The emergency response shall include (but not be limited by) the following potential emergency scenarios:

- flooding and water ingress;
- contact with hazardous services including electrical and gas;
- stability and collapse of excavation;
- fall from height;
- confined space and retrieval; and
- mobile plant rollover.

7 Program Inspection:

FO 24 Daily Excavation Inspection

FO 109 Daily Excavation Inspection (Week Format)

Site Health & Safety Inspection.

Scheduled inspections as per the Project Management Plan.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

Excavation Work

Demolition Work

How to Manage Work Health and Safety Risks

Managing the Work Environment and Facilities

9 Forms:

FO 37 Safe Work Method Statement Sheet

FO 015 Risk Management Calculator

FO 23 Excavation Work Permit

FO 24 Daily Excavation Inspection

FO 109 Daily Excavation Inspection (Week Format)

1 Purpose:

To minimise health and safety risks associated with working in isolation or remotely.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with remote or isolated work locations.

4 Controls:**a) Remote and Isolated Work**

All employees that are working alone in an area that is remote in terms of being isolated from the assistance of others because of the time, location or nature of the work must have adequate and reliable communication system in place before commencing work. This can also include a program/schedule of contacts over time with another person using that communication system i.e. contact Supervisor or contacted by Supervisor or site security or co-worker at set time intervals (e.g. every half hour or hour).

An adequate and reliable system of communication could vary from regular telephone calls or scheduled visits through to two way radio. The Project Manager or Site Supervisor in charge of a project will confirm with the employee on a system of communication before commencing work.

These details of any contact schedule and type of communication will be defined by the Supervisor/Project manager, and set out in the Job hazard Analysis for the job in question.

b) Safe Work Method Statement (SWMS)

Any special hazards and risks associated with working in isolation must be identified and written in the SWMS for the job.

When working in isolation, there are some additional considerations detailed below that may need controls:

- Are there particular hazards at the isolated workplace, e.g. weather conditions, road conditions, insects/snakes, communication coverage?
- Handling of temporary access equipment for one person, e.g. handling ladders as part of the job.
- Can one person safely handle all plant, substances and other equipment involved in the work? For example lifting requirements where the object may be too large for one person.
- Is the person medically fit and suitable for the purpose of the job to be performed?
- What are the foreseeable emergencies that may impose additional burdens to performing the job in isolation? For example, plant failure, bush fire/fire, release of pressurized gas, fumes. **A brief Emergency Response Plan is to be included in the SWMS for the job.**
- Are there any special supervision needs. For example, young or inexperienced, inexperienced persons, reading plans?

- Are there suitable first aid facilities and training available for the person working in isolation to treat minor injuries?
- What system is in place to monitor the condition of the person working in isolation? For example are there regular 'reporting in' requirements?
- Is there a default emergency process to follow if specific signals have not been periodically received from the person working in isolation?
- How is the alarm signal activated in the case of an emergency?
- What safety supervision arrangements are required for visiting the person working in isolation?

c) Remote and Isolated Work

All employees that are working alone in an area that is remote in terms of being isolated from the assistance of others because of the time, location or nature of the work must have adequate and reliable communication system in place before commencing work. This can also include a program/schedule of contacts over time with another person using that communication system i.e. contact Supervisor or contacted by Supervisor or site security or co-worker ten in the SWMS for the job.

d) Control of Hazards for Working in Isolation

They key points for ensuring WH&S risks are controlled for employees and contractors working in isolation are:

- Suitable communications in place
- Monitoring and feedback from the person working in isolation
- A Safe Work Method Statement that addresses the identified hazards associated with the job, including communications and monitoring and feedback noted above.

e) Work That Cannot be Undertaken by One Person

- Where there is a requirement to enter a confined space.
- Live electrical work or working on high voltage.
- Working with hazardous substances.

5 Permits/Licences:

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

6 Emergency Response:

An Emergency Response Plan is to be included in the SWMS for the job.

7 Program Inspection:

Regular communication between employee and designated supervisor as per schedule in the SWMS.
Site Health & Safety Inspection

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
How to Manage Work Health and Safety Risks
Managing the Work Environment and Facilities

9 Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Management Calculator](#)

[FO 017 Excavation Work Permit](#)

[FO 019 Equipment Requiring Licenses/Tickets/Certificates of Competency](#)

[FO 020 Employee Induction Checklist](#)

1 Purpose:

To minimise health and safety risks associated with welding.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with welding work.

4 Controls:

(i) Work Area

Where practicable, protective screens must be used to provide protection from any harmful rays produced by any welding operation. All fumes generated by a welding process must have an effective and appropriate means of being removed as not to cause risk to a person's health. A safe means of access and egress must be maintained at all times and the work area clean, clear and free from hazards to allow people to move conveniently and safely about the work area and be able to leave the work area and be able to leave that work area in an emergency.

(ii) Safe Procedures

No employee shall use any welding or allied process to repair or attempt to repair a drum, tank or container in which any flammable solution gas or other substance is or has been manufactured, used, handled or stored unless the drum, tank or container has been rendered free of the gas, solution or substance that might produce flammable gas.

When dealing with empty drums or similar containers, employees must NOT:

- apply heat to drums that have held chemicals as it may produce poisonous gases harmful to a person's health;
- weld or grind near empty drums due to any sparks causing a possible fire hazard; or
- use drums as welding or cutting platforms.

(iii) Personal Protective Equipment

If there is a risk of injury to the employee from welding or allied processes, then the employee must use protective clothing and equipment appropriate to the risk. If the fumes caused by welding or allied processes cannot be removed, a suitable respiratory device must be used.

5 Permits/Licences:

[FO 018 - Hot Work Permit](#)

Fire Ban Requirements

Site specific safety & environmental requirements – check with site engineer

6 Emergency Response:

De-energise welder.

Make the area safe.

Follow site emergency procedure.

7 Program Inspection:

Site Health & Safety Inspection.

Scheduled inspections as per the Project Management Plan.

8 References:

Work, Health & Safety Act, SA 2012
Work, Health & Safety Regulations, SA 2012
COP under SA WHS Laws 2012:
 Welding Processes
 How to Manage Work Health and Safety Risks
 Managing the Work Environment and Facilities

9 Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Management Calculator](#)

[FO 018 Hot Work Permit](#)

[FO 019 Equipment Requiring Licenses / Tickets / Certificates of Competency to Operate](#)

[FO 020 Employee Induction Checklist](#)

1 Purpose:

To minimise health and safety risks associated with the uncontrolled release of energy i.e. unwanted/uncontrolled operation of plant or tools.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No incidents, accidents or injuries associated with the unwanted/uncontrolled operation of plant or tools.

4 Controls:**a) Use of “Danger” Tags**

The main “Danger” tag used at Bardavcol is the “Do not Operate Tag” pictured below. The tag is used on plant, tools and machinery to make sure it is not used. The main reasons for not using plant, tools and machinery are:

- Plant/tool/machine/gas/electricity is currently being installed, serviced, repaired or decommissioned, and starting the machine or doing work around the area (either directly or indirectly) could result in an injury to a worker
- Plant/tool/machine is not safe to operate due to mechanical failure
- Operation will cause damage to the plant/tool/machine
- There will be an uncontrolled release of energy – pressurised fluid, gas, fumes.

Front and back view of tag**Use of Lockouts:**

- Electrical sources of power that in the process of being commissioned or

decommissioned may provide risk to workers or others in the vicinity.

- To be used when performing electrical isolation on the project

5 Permits/Licences:

Not Applicable

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Site Health & Safety Inspection.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing the Work Environment and Facilities

Managing Risks of Plant in the Workplace

Construction Work

Demolition Work

Excavation Work

9 Forms:

[FO 001 Site Health & Safety Inspection Form](#)

[FO 007 Site Induction Register Form](#)

[FO 013 Safe Work Method Statement Sheet](#)

[FO 014 Risk Assessment Form](#)

[FO 015 Risk Management Calculator](#)

[FO 019 Equipment Requiring Licenses / Tickets / Certificates of Competency to Operate](#)

[FO 020 Employee Induction Checklist](#)

1 **Purpose:**

To provide a written work instruction that details how to conduct an incident/accident investigation and report effectively.

2 **Objective:**

To comply with regulatory standards and contractual requirements.

3 **Target:**

- Incident/Accident investigations to be conducted and reported effectively.

4 **Controls:**

4.1 Accidents & Incidents

Accident: An accident is an incident that has resulted in an injury. There are a number of types of accidents:

Minor Injury – an injury that did not require any treatment.

Moderate Injury – an injury that requires first aid treatment only

Medically Treated Injury – an injury that requires medical treatment from a health professional.

Note: being consulted by a health professional does not constitute medical treatment. An MTI is only recorded if medical treatment is provided as part of the initial or subsequent consultation.

Lost Time Injury – a Lost time Injury is an injury that has resulted in a worker being away from work for 24 hours (1 day).

Fatality (Single or multiple) – an injury that has resulted in the death of a person. Note: a fatality requires notification to SafeWork SA

Public Injury – an injury that has been incurred by a person external to Bardavcol, that has no commercial link to the operation

Incident: An incident is any unplanned event resulting in, or having the potential, for injury, ill health, damage or loss. There are a number of types of incidents.

Near Miss – an unplanned event that could have caused injury, illness or damage.

Property Damage / Break In – an event where property damage has resulted or where Bardavcol property has been broken into.

Environmental Incident – an unplanned event that has resulted in damage to the environment, including damage to flora or fauna, or contamination of the environment.

Refer to IP 15 for guidance regarding notifiable incidents or accidents (incidents or accidents that need to be reported to a regulatory body or other authority)

4.2 Incident/Accident Investigation

When accidents are investigated, the emphasis should be concentrated on finding the root cause of the accident rather than the investigation procedure itself so you can prevent it from happening again. The purpose is to find facts that can lead to actions, not to find fault. Always look for deeper causes. Do not simply record the steps of the event. The aim is to find out what system failure occurred that allowed the incident/accident to occur, and then determine corrective actions to prevent or reduce the likelihood or recurrence.

Reasons to investigate a workplace accident include:

- Find out the cause of accidents and to prevent similar accidents in the future

- Fulfil any legal requirements
- Identify weaknesses in safety systems and make improvements
- Determine compliance with applicable safety regulations
- As a matter of due diligence and professional conduct
- Create an accurate record for future reference, including potential litigation

Incidents that involve no injury or property damage should still be investigated to determine the hazards that should be corrected. The same principles apply to a quick inquiry of a minor incident and to the more formal investigation of a serious event.

The Incident/Accident Investigation process can be divided into 5 steps:

1. Gather Information
2. Identify Contributing Factors
3. Root Cause Analysis
4. Corrective Action
5. Review

STEP 1 – Gather Information

Gather information regarding the incident as per [FO 005 Incident Report Form](#). This will include date, time, location, person(s) involved, witnesses, interviews, photos, statements and any other information relevant to the incident or accident.

The driver of every vehicle involved in an accident must [[Australian Road Rules](#) reg 287(2)]:

- Stop at the scene of the accident
- Give their details including their name and address, the name and address of the vehicle's owner, and the vehicle's registration number (or any other information necessary to identify the vehicle) to any other driver involved, any person injured (or their representative) or the owner of any property that has been damaged.
- Report to police within 24hrs if a fair estimate of the cost of repairing damage to property (other than to your own vehicle or property) is \$3000 or more [see Road Traffic (Road Rules – Ancillary and Miscellaneous Provisions) Regulations (SA) reg 39, 40, 41 and 42]

Eyewitness Accounts

Although there may be occasions when you are unable to do so, every effort should be made to interview witnesses. In some situations witnesses may be your primary source of information because you may be called upon to investigate an accident without being able to examine the scene immediately after the event. Because witnesses may be under emotional stress or afraid to be completely open for fear of recrimination, interviewing witnesses can be a difficult task facing an investigator.

Witnesses should be kept apart and interviewed as soon as possible after the accident. If witnesses have an opportunity to discuss the event among themselves, individual perceptions may be lost in the normal process of accepting a consensus view where doubt exists about the facts.

Witnesses should be interviewed alone, rather than in a group. You may decide to interview a witness at the scene of the accident where it is easier to establish the positions of each person involved and to obtain a description of the events. On the other hand, it may be preferable to carry out interviews in a quiet office where there will be fewer distractions. The decision may depend in part on the nature of the accident and the mental state of the witnesses.

Interviewing

The purpose of the interview is to establish an understanding with the witness and to obtain his or her own words describing the event. The following do's and don'ts for interviewing will assist with getting information accurately:

DO:

- put the witness, who may be upset, at ease
- emphasize the real reason for the investigation, to determine what happened and why
- let the witness talk, listen
- confirm that you have the statement correct
- try to sense any underlying feelings of the witness
- make short notes or ask someone else on the team to take them during the interview
- ask if it is okay to record the interview, if you are doing so
- close on a positive note

DO NOT:

- intimidate the witness
- interrupt
- prompt
- ask leading questions
- show your own emotions
- jump to conclusions

Ask open-ended questions that cannot be answered by simply "yes" or "no". The actual questions you ask the witness will naturally vary with each accident, but there are some general questions that should be asked each time:

- Where were you at the time of the accident?
- What were you doing at the time?
- What did you see, hear?
- What were the environmental conditions (weather, light, noise, etc.) at the time?
- What was (were) the injured worker(s) doing at the time?
- In your opinion, what caused the accident?
- How might similar accidents be prevented in the future?

If you were not at the scene at the time, asking questions is a straightforward approach to establishing what happened. Obviously, care must be taken to assess the credibility of any statements made in the interviews. Answers to a first few questions will generally show how well the witness could actually observe what happened.

Background Information

An excellent information source is gathering relevant documents such as:

- Safe Work Method Statement or Job Safety Analysis for the job or process taking place
- Technical data sheets
- Inspection reports
- Relevant company policies, procedures or work instructions
- Maintenance reports
- Past incident/accident reports
- Past Audit reports

Any pertinent information should be studied to see what might have happened, and what changes might be recommended to prevent recurrence of similar accidents. The amount of background information will depend on the significance of the incident/accident.

Photos & Measurements

Where relevant take photos and measurements and include these with the report.

Attachments to the Incident/Accident Report:

Attach relevant information gathered during this stage to the incident/accident report and include references from the body of the report. This will ensure a good record of the incident/accident is retained on file.

STEP 2 – Identify Contributing Factors

Contributing factors are those conditions that lead to the incident or accident occurring. Contributing factors are the factors that explain how and why an incident or accident happened. Examples of contributing factors:

- Management Systems - Adequate supervision, appropriate training / instruction / induction
- Work Methods – SWMS in place; SWI, Workzone Traffic Management; use of PPE or safety equipment; warnings / signs / notifications
- Environment - Noise / vibrations; housekeeping; ground conditions
- Plant, Equipment and Materials - Any defects or malfunctions; appropriateness to task
- Workplace Layout – Access and egress; clearances; congestion; traffic management and traffic movement plan
- People - Experience / knowledge / skills, Attention to task, behavior, fatigue

STEP 3 – Root Cause Analysis

A root cause analysis is a systematic process that determines the events and conditions that are necessary to produce or contribute to an incident/accident. The analysis develops what happened and how it happened, and then focuses on finding the underlying causes for why an incident happened by reviewing the contributing factors and determining the root cause.

Contributing factors address how and why an incident happened. Contributing factors are events or conditions that collectively increase the likelihood of an incident/accident but that individually did not cause the incident/accident.

The identification of root causes answers the question of why an incident/accident happened. Root causes are the causal factors that if corrected, would prevent recurrence of the incident. Root causes can include system deficiencies, management failures, inadequate competencies, performance errors, omissions, non-adherence to procedures and inadequate organizational communication. The aim of a root cause analysis is to identify where the management system has failed rather than apportion blame to an individual

The 5 Whys

A useful method for looking deeper into contributing factors to identify the root cause is the 5 Whys approach.

- Start with the Contributing Factor
- Ask “WHY?” 5 times
- There may be branches
- Keep asking why until the Root Cause(s) for each contributing factor are identified.
- Always think in terms systems – i.e. procedures, processes, planning, hazard identification, training.

Employee sprained ankle when he stepped into a hole

Why? Because there was no protection over the hole

Why? Because it had been removed

Why? Because someone removed it before leaving for home and didn't put the protection back

Why? 1) Human error 2) Because the marker was removable

Why? Because more permanent protection was not placed over the hole to start with

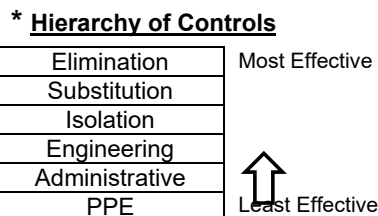
Once the root cause or causes have been identified, then corrective actions can be developed.

STEP 4 – Corrective Action

The most important final step is to come up with a set of well-considered corrective actions designed to prevent recurrences of similar incident/accidents. Corrective actions should:

- be specific
- be constructive
- get at root causes

Use the hierarchy of controls as the framework for identifying corrective actions, and aiming for improvements to the management system that will prevent incident/accidents from occurring in future.



Resist the temptation to make only general recommendations for corrective actions to save time and effort.

Don't make recommendations for corrective actions about disciplining a person or persons who may have been at fault. This would not only be counter to the real purpose of the investigation, but it would jeopardize the chances for a free flow of information in future incident/accident investigations. If human error was the root cause of the incident, ask how this could have been prevented by the system using the hierarchy of controls, e.g. training, procedure compliance, supervision

STEP 5 - Review

The effectiveness of control measures should be checked firstly by the QSEMR and the Project Manager, and then by the ESM and GM when sent in to be filed in the company Incident register. A further element of review is for the QSEMR and the Project manager to ensure that Corrective actions have been implemented and signed off on the report in a timely manner. The ESM or delegate will check incident reports have been signed off correctly during internal audits.

The final review of incident and accident reports is undertaken by the GM and ESM.

5 Permits/Licences:

Not Applicable

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Site Health & Safety Inspection, Internal (Safety, Quality, Environment) Systems & Compliance Audit.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA WHS Laws 2012:

How to Manage Work Health and Safety Risks

Managing the Work Environment and Facilities

Environment Protection Act, 1993

Part 9 – General Offences

83 Notification where serious or material environmental harm caused or threatened

83A Notification of site contamination of underground water

Electricity (General) Regulations 1997

Division 4 – Reporting and investigation of accidents

31 Reporting of accidents

31A Investigation of accidents

Gas Regulations 1997

Division 4 – Reporting of accidents

15 Reporting of accidents

Rail Safety Act 2007

Division 6 – Investigating and reporting by rail transport operators

74 Notification of certain occurrences

75 Investigation of notifiable occurrences

9.1 Procedure:

IP 15 - Incident Investigation, Corrective Action & Reporting

9.2 Forms:

[FO 005 Incident Report Form](#)

[FO 015 Risk Management Calculator](#)



Health Monitoring Procedure

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1. Purpose

This procedure outlines the requirements and processes for health monitoring that are undertaken for Bardavcol workers.

2. Scope

This procedure applies to projects and workers under Bardavcol's control

3. Definitions

Asbestos-related work	work involving asbestos (other than asbestos removal work) that is permitted under the WHS Regulations (r. 419)
Asbestos removal work	work involving the removal of asbestos or asbestos containing material
Hazardous chemical	A substance, mixture or article that satisfies the criteria for a hazard class in the Globally Harmonised System (GHS) (including a classification mentioned in schedule 6 of the Work Health and Safety Regulation 2012)
Health monitoring	monitoring a person to identify changes in the person's health status because of exposure to certain substances
Lead risk work	work carried out in a lead process (as defined in the WHS Regulations) that is likely to cause the blood lead level of a worker carrying out the work to exceed prescribed levels (refer to r.394 of WHS Regulations)
Worker	A worker is a person that carries out work and includes a Bardavcol employee, contractor or subcontractor, an employee of a contractor or subcontractor, an employee of a labour hire company that is working on or in relation to a Bardavcol project, an outworker, apprentice or trainee, a person on work experience, a volunteer.
Workplace	A place where work is carried out and includes any place where a worker goes, or is likely to be, while at work.

4. Responsibilities

Bardavcol, so far as is reasonably practicable, is responsible for ensuring:

- that this procedure is understood and applied by its workers;
- that appropriate resources are available to enable the identification and risk assessment of work that requires health monitoring; and
- implementation of any required health monitoring and controls.

The Project Manager must ensure that:

- project specific hazards and risks that may require health monitoring are identified and assessed;
- health monitoring programs are implemented where there is a significant risk of exposure in accordance with this procedure;
- affected workers and other relevant stakeholders are effectively consulted and communicated with in accordance with this procedure; and
- health monitoring records are kept confidential and in accordance with this procedure.

Workers are required to:

- participate in the health monitoring consultation processes; and
- comply with the requirements of the health monitoring program and the applicable work procedures and processes (eg. SWMS, inductions, etc)

QSE Manager is responsible for:

- coordinating health monitoring required for projects;
- liaising with the Project Manager and other internal stakeholders;
- liaising with the health monitoring provider to facilitate implementation;
- receiving and communicating health monitoring reports and related information;
- retaining health monitoring records

5. Procedure

Health monitoring involves the monitoring of a worker to identify changes in their health status due to exposure to certain substances. The monitoring processes involved can vary according to the type of substance and nature of the exposure and these are determined through consultation with a registered medical practitioner with experience in health monitoring.

While health monitoring primarily identifies the effects from workplace exposure to hazardous chemicals, it also provides useful information on the effectiveness of controls and whether additional or alternative controls are required. Information obtained from monitoring can also be used to communicate the effectiveness of controls and why specific controls are required to workers. This needs to be undertaken in a manner that prevents the unauthorized disclosure of personal monitoring results to workers.

Health monitoring does not include air monitoring or other measures to assess or control exposure

5.1. Requirement for health monitoring

Health monitoring is required, in accordance with WHS legislation when a worker is performing:

- lead risk work, as defined by the WHS Regulations
- asbestos removal or asbestos-related work and is at risk of exposure to asbestos when carrying out the work
- ongoing work that requires the use, handling, generation or storage of hazardous chemicals and there is a significant risk to the worker's health due to exposure to the chemical

The latter applies to hazardous chemicals listed in Schedule 14, Table 14.1 in the WHS Regulation and other hazardous chemicals where there is a:

- valid technique available to detect the effect on the worker's health; or
- valid way of determining exposure and it is uncertain on reasonable grounds whether exposure has resulted in the biological exposure standard being exceeded.

Where a worker is likely to be exposed to a hazardous chemical at a level that could adversely affect their health, the risk of exposure is considered significant when:

- the risks cannot be adequately controlled; or
- there is uncertainty about the risks (ie. there is insufficient information about the hazards or there is uncertainty about the degree of exposure)

Health monitoring is not required where the risk is significant but effectively controlled in accordance with known control measures (eg. controls listed in the SDS).

5.2. Assessing significant risk of exposure

Project specific risks relating to asbestos, lead and other hazardous chemicals must be assessed and documented in the Project Risk Register, Hazardous Chemical Risk Assessments and Safe Work Method Statements (where applicable).

In determining if workers will be significantly exposed, the assessment undertaken by the Project Manager or their nominated representative must consider the:

- hazards associated with the hazardous chemical;
- frequency, duration and extent (ie. dose) of exposure;
- the proposed use, application or interaction with the hazardous chemical;
- the likely workplace conditions; and
- worker medical conditions or health factors that may increase the risk of exposure.

In most instances, risk assessment will be based on information obtained from one, or a combination, of the following:

- product labels
- Safety Data Sheets
- other manufacturer's information
- Hazardous Materials Registers (or equivalent eg. Asbestos Register)
- past reports or test results (eg. site investigations) applicable to the location, materials, work methods etc
- monitoring or site assessments (if available)

Where the potential for significant exposure relates to hazardous chemicals that are generated at the workplace (eg. acid sulfate soils) and information is not available through the above sources, appropriately qualified and experienced personnel (eg. medical practitioner, consultants) may be consulted to assess the need for health monitoring.

5.3. *Managing health monitoring*

Where it has been identified that health monitoring is required, the Project Manager shall advise the QSE Manager (QSEM). The QSEM will assist the Project Manager to engage a registered medical practitioner with experience in health monitoring to develop a health monitoring program and provide them with the necessary information to facilitate this process. Information that may be provided includes:

- Project location;
- Personal details of workers that require health monitoring;
- Information on the hazardous chemicals (including lead and asbestos) that the workers are or will be exposed to and dates of past use or exposure (if known);
- The tasks to be performed and basis for health monitoring required;
- The SDS for the chemical; and
- Any other relevant information (eg. risk assessments, reports, exposure standards).

The program will be referenced in the PMP and include information on the workers (ie. positions, roles) that require monitoring, the type of monitoring to be undertaken and the frequency and timing of the monitoring.

The monitoring must be performed by, or under the supervision, of a registered medical practitioner with experience in health monitoring. It must commence prior to the work starting to ensure that the required baseline health data is obtained. The frequency of monitoring thereafter will be determined by the registered medical practitioner, including in response to a worker concern that they may have been exposed to the hazardous chemical.

In the event that the work has already commenced, health monitoring must be implemented as soon as is reasonably practicable. The registered medical practitioner that performs or supervises the health monitoring, will be provided with the information listed above, as well as details on when the work started and how long the worker(s) has been performing the work.

Should Bardavcol workers be required to perform 'lead risk work', asbestos removal or asbestos-related work the health monitoring program shall include the specific requirements detailed in the WHS Regulations.

Bardavcol will pay for all costs associated with the health monitoring for Bardavcol workers.

5.4. Consultation with workers

The Project Manager or their nominated representative must ensure that information on health monitoring requirements is provided to the relevant workers before they commence work. The consultation process must include information on:

- the type, frequency and timing of the monitoring, including test methods;
- the selection of the registered medical practitioner who will supervise or perform the monitoring;
- possible health effects from exposure (to extent that is known);
- the legal requirements for health monitoring (ie. WHS Regulations);
- any requirements to see a doctor or specialist;
- what symptoms of be aware of and how to report them;
- who pays for the health monitoring;
- if and how monitoring results may affect their work tasks, for example explaining circumstances where the worker may need to move to other tasks;
- record keeping requirements; and
- confidentiality of monitoring results and the disclosure obligations provided in the WHS Regulations.

Ongoing consultation with the workers at agreed intervals during the work period should be undertaken to ensure that any worker concerns can be addressed and to feedback is obtained on the monitoring process.

Counseling services will be made available to workers in response to feedback obtained through the consultation process.

5.5. Health Monitoring Reports

The EMS will ensure that health monitoring reports are obtained from the medical practitioner as soon as practicable after the completion of the monitoring program and at regular intervals for longer term or ongoing health monitoring programs.

On receipt of the report, the QSEM must review the report to ensure that it is addressed to Bardavcol and contains the following information:

- the name and date of birth of the worker;
- the date of the report;
- the name, registration number and signature of the registered medical practitioner;
- the date health monitoring was carried out;
- any test results that indicate whether or not the worker has been exposed to a hazardous chemical;
- for lead, any test results that indicate the worker has reached or exceeded the relevant blood lead level for that worker under regulation 415 of the WHS Regulations;
- any advice that test results indicate the worker may have contracted a disease, injury or illness as a result of carrying out the work that triggered the requirement for health monitoring;
- any recommendation that remedial measures be taken, including whether the worker can continue to carry out the type of work that triggered the requirement for health monitoring;
- whether medical counselling is required for the worker in relation to the work that triggered the requirement for health monitoring;
- the date of sampling if blood, urine or other samples are taken; and
- results of biological monitoring and other tests carried out (for inorganic lead, the report must also contain the details of the pathology service used to carry out tests).

The health monitoring report is likely to contain information only relating to the health monitoring program for the chemical(s) being used and not contain other confidential health information on workers, unless there is an obligation that Bardavcol should be informed of.

The report should not contain details of medical conditions disclosed to, or diagnosed by, the medical practitioner conducting the health monitoring if these have no relevance or bearing on the work being performed.

If the worker has a pre-existing medical condition which may exacerbate the health effects of chemicals and is not referred to in the report, this should be followed up with the medical practitioner to clarify what (if any) measures are required to effectively manage the situation (note: details of pre-existing medical conditions can only be included in the health monitoring report with the worker's written permission).

The report may also provide information on other factors (eg. lifestyle) that may exacerbate the effects of hazardous chemicals being used.

If any aspects of the report require clarification or information has not been provided (as detailed above), the medical practitioner shall be consulted with as soon as practicable to ensure that these are resolved promptly.

5.6. Communication of monitoring reports and further actions

Following their review of the medical practitioner's recommendations, the QSEM must provide a copy of the health monitoring report, as soon as practicable, to:

- the worker;
- the regulator if the report contains:
 - advice that the test results indicate the worker may have contracted a disease, injury or illness as a result of carrying out work with the chemical; or
 - a recommendation that remedial measures be taken including whether the worker can continue to carry out work with the hazardous chemical that triggered the requirement for health monitoring; or
 - for lead risk work, test results that indicate the worker has reached a blood lead level at or above the relevant removal level.

The QSEM must also consult with the Project Manager or their nominated representative on the findings of the health monitoring in the context of any recommendations or remedial actions detailed in the report and other implications for the management of the project.

Workers

In addition to providing the worker with a copy of the health monitoring report, the QSEM must consult with the worker in relation to:

- the recommendations contained in the report;
- any remedial measures that are required;
- arrangements for any further consultations with the medical practitioner;
- any concerns or issues raised by the worker.

The QSEM will undertake the above consultation process with the Project Manager or their nominated representative and will ensure that any further appointments with the medical practitioner, or as recommended in the monitoring report are arranged.

Bardavcol

If the report recommends that a worker should not, or must not be exposed to a hazardous chemical for a specified period of time, or should only work under conditions specified by the medical practitioner, the QSEM must ensure that the Project Manager is provided with this information. The Project Manager must ensure that:

- the relevant workers cease any work that involves the hazardous chemical immediately (where this is not possible, as soon as is reasonably practicable);
- they consult with the worker and the medical practitioner on the recommendations and alternative work arrangements;
- the recommended actions are implemented; and
- the worker does not return to the work until they are cleared to do so by the medical practitioner.

6. Review

The Project Manager must ensure that the work practices, procedures (including SWMS and other documented processes) and worker consultation processes are reviewed:

- at agreed intervals during the period that the work is being performed; and
- in response to recommendations contained in the health monitoring reports.

The purpose of these reviews is to:

- assess if the work is being performed according to the agreed method and controls;
- assess if there are hazards that had not been previously identified;
- evaluate the effectiveness of the controls; and
- identify any additional training or information to assist workers to perform the work safely and effectively.

Where the review process identifies deficiencies in work practices, procedures or consultation processes, corrective action must be taken to rectify the issues as soon as is reasonably practicable.

The Project Manager may request the QSEM to be involved in the above process.

7. Records

Health monitoring reports and other records for workers must be retained in the employee's health monitoring file that is kept separate from their personal file and treated as confidential.

Health monitoring records must not be disclosed to another person without the worker's written consent, except when the records are required to be provided under the WHS Regulations to:

- the regulator;
- another organization (ie. PCBU) that has a duty to provide health monitoring for the worker; and
- a person who must keep the record confidential under a duty of professional confidentiality.

The records obtained through health monitoring cannot be used for any other purpose.

Health monitoring records will be retained for:

- at least 30 years after the date of the record; and
- at least 40 years for asbestos health monitoring records.

The records must be retained for these periods even if the worker is no longer employed by Bardavcol.

The QSEM is responsible for the health monitoring files and ensuring that the records are maintained in accordance with the above details.

8. References and Related Documents

WHS Regulations 2012

Health Monitoring for Exposure to Hazardous Chemicals: A guide for persons conducting a business or undertaking



Hazardous Chemicals Procedure

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1 PURPOSE

The purpose of this procedure is to outline the requirements for the risk assessment, handling and storage of hazardous chemicals to prevent or minimise the risk of exposure and any resulting injury, illness, environmental impact or damage to property.

2 SCOPE

This procedure applies to Bardavcol's operations, including projects and workplaces under its control and persons and organisations that may be indirectly affected by Bardavcol's operations.

3 DEFINITIONS

ADG Code	Australian Code for the Transport of Dangerous Goods by Road and Rail
Bulk	Any quantity of a hazardous chemical that is: <ul style="list-style-type: none">a) in a container with a capacity exceeding 500L or net mass of more than 500kg; orb) if the hazardous chemical is solid, an undivided quantity exceeding 500kg
Dangerous Goods	Substances, mixtures or articles that, because of their physical, chemical (physicochemical) or acute toxicity properties, present an immediate hazard to people, property or the environment. Types of substances classified as dangerous goods include explosives, flammable liquids and gases, corrosives, chemically reactive or acutely (highly) toxic substances. Substances classified as dangerous goods are listed in the ADG Code and described in regulation 328(3) of the WHS Regulations
Exposure	The contact between a person and a chemical. The chemical may be in the form of gas, vapour, fume, liquid or solid.
Exposure Standard	Represents the airborne concentration of a particular substance or mixture that must not be exceeded. The exposure standard can be of three forms: <ul style="list-style-type: none">• 8-hour time-weighted average• Peak limitation• Short term exposure limit.
GHS	Refers to the Globally Harmonised System of Classification and Labelling of Chemicals
Hazard Category	A division of criteria within a hazard class in the GHS
Hazard Class	The nature of a physical, health or environmental hazard in the GHS
Hazardous Chemicals	Any substance, mixture or article that may cause adverse effects on people, property or the environment, as described in the Globally Harmonised System (GHS) and Work Health and Safety Regulations 2012
Hazard Pictogram	A graphical composition, including a symbol plus other graphical elements, that is assigned in the GHS to a hazard class or hazard category
Hazard Statement	A statement assigned in the GHS to a hazard class or hazard category describing the nature of the hazards of a hazardous chemical, including (if appropriate) the degree of hazard

Hazchem Code	As defined under the ADG code and also known as an Emergency Action Code
Manifest	A written summary of specific types of hazardous chemicals that are used, handled or stored at a Workplace. It is required where the quantities of those hazardous chemicals exceed prescribed threshold amounts (as per the WHS Regulations)
Placard	A sign or notice displayed or intended for display in a prominent place or next to a container or storage area for hazardous chemicals at a Workplace. The Placard contains information about the hazardous chemical stored in the container or storage area
Safety Data Sheet	A document that describes the identity, chemical and physical properties, health and environmental hazard information, uses, precautions for use, safe handling procedures and safe disposal procedures of a hazardous chemical.
Workplace	A place where work is carried out and includes: <ul style="list-style-type: none">• any place where a worker goes, or is likely to be, while at work;• a vehicle, vessel, aircraft or other mobile structure;• any waters and any installation on land, on the bed of any waters or floating on any waters.

4 RESPONSIBILITIES

Bardavcol, so far as is reasonably practicable, is responsible for ensuring:

- that this procedure is understood and applied by its staff;
- that appropriate resources are available to enable the identification and risk assessment of hazardous chemicals and implementation of appropriate controls;

The Project Manager must ensure that:

- a project emergency response plan is developed that includes specific requirements relating to hazardous chemicals used, stored or handled at the workplace;
- risks associated with purchasing, using, mixing, handling and storage of hazardous chemicals are identified, assessed, controlled and evaluated;
- workers who purchase, handle or store hazardous chemicals are provided with appropriate training, instruction and supervision;
- hazardous chemical registers are maintained and reviewed; and
- requirements of Safety Data Sheets (SDS), labelling, placarding etc are implemented and maintained

Workers are required to:

- participate in the development of hazardous chemical risk assessments and related safe work method statements; and
- comply with the requirements of SDSs, hazardous chemical risk assessments and project specific requirements relating to the use, storage and handling of hazardous substances

5 PROCEDURE

5.1 Hazardous Chemicals

A hazardous chemical is any substance, mixture or article that may cause adverse effects on people, property or the environment. The two types of general hazards associated with hazardous chemicals that may present an immediate or long term risk of injury or illness to people are:

Health hazards

- chemical properties that have the potential to cause adverse health effects
- exposure usually occurs through inhalation, skin contact or ingestion
- adverse effects can be acute (short term) and include headaches, nausea, vomiting or skin corrosion, or chronic (long term) and include asthma, dermatitis, nerve damage or cancer

Physicochemical hazards

- physical or chemical properties of the substance, mixture or article that pose risks to workers other than health risks, as they do not result from a biological interaction of chemical with the person
- they arise from inappropriate handling or use and can often result in injury to people and/or damage to property as a result of the intrinsic physical hazard (eg. flammable, corrosive, explosive, chemically reactive and oxidising chemicals)

Many chemicals have both health and physicochemical hazards.

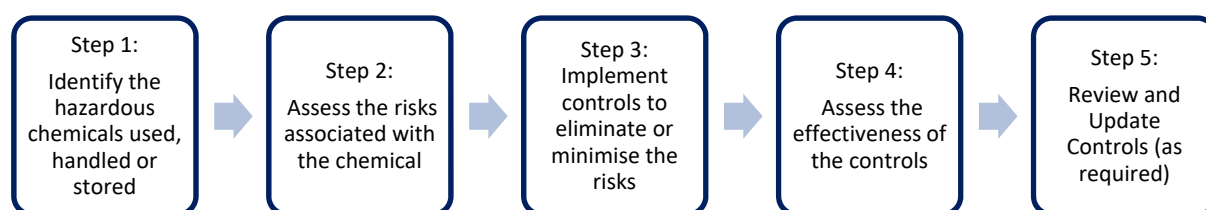
5.2 Managing Hazardous Chemicals

The process of managing hazardous chemicals is illustrated in Figure 1. A corporate register of hazardous chemicals is maintained, which contains information on chemicals that are commonly used on Bardavcol's projects.

Hazardous chemical risk assessments must be undertaken using the Hazardous Chemical Risk Assessment Form and provided to the Engineering Systems Manager to update the corporate register.

The nominated project representative must ensure that a project hazardous chemical register is updated and maintained for the duration of the project.

Figure 1: Hazardous Chemical Management Process



5.3 Identification of Hazardous Chemicals

Substances, mixtures or articles that are brought to a workplace for use, storage and/or handling must be assessed to determine if they contain hazardous chemicals. This includes items that are used in construction processes and to maintain project amenities and facilities.

The label of the substance and/or Safety Data Sheet must be reviewed and should provide sufficient information to assess the presence of hazardous chemicals. Where these are not available or are unclear, the supplier or manufacturer must be contacted to clarify the status of the substance, mixture or article.

Processes that generate hazardous chemicals (eg. welding) also need to be assessed to consider the risk to workers.

The identification process should be undertaken in consultation with workers to increase awareness of the risk of hazardous chemicals and to identify substances, mixtures or articles that may be less obvious to other workers.

The details of hazardous chemicals must be recorded in a Hazardous Chemical Register.

5.4 Risk Assessment

The purpose of the risk assessment is to identify the:

- workers, property and environment at risk of exposure;
- sources and processes that present the risk of exposure;
- control measures that are required, with reference to the hierarchy of controls; and
- first aid and emergency response measures;

A generic chemical risk assessment must be completed for all hazardous chemicals that are handled, stored, used or generated on Bardavcol projects and details recorded in a hazardous substances register.

This assessment must be documented using the Chemical Risk Assessment Form and consider:

- entry / exposure routes;
- physical form of the substance;
- toxicological hazards;
- any risks relating to incompatible materials;
- stability/reactivity hazards;
- special storage and handling requirements;
- emergency response requirements;
- ecological requirements; and
- any special transport and disposal requirements.

The hazardous chemical risk assessment must be incorporated into the development of Safe Work Method Statements (SWMS) and other task specific risk assessments, to ensure that hazards and risks specific to the task and project are considered, such as:

- situations where exposure may occur;
- extent and frequency of exposure;
- persons potentially exposed (eg. workers, visitors and public); and
- potential for interaction with other chemicals, plant and equipment.

Specific factors that must be assessed include, the:

- potential for fire and explosion (including dust)
- location of ignition sources (eg. flames, sparks, heat)
- potential for asphyxiation
- potential impacts of corrosive substances
- compressed gases, including air

An additional and more detailed risk assessment may be required when a significant risk to health has been identified or very high risk chemicals are proposed to be used. These chemicals include carcinogens, mutagens, reproductive toxicants or sensitisation agents.

5.5 Hazardous Chemical Registers

A hazardous chemical register must be developed, maintained and be easily accessible for each project. The register must include:

- a list of all hazardous chemicals handled, stored, used or generated at the workplace regardless of their sizes and quantities;
- the quantity of each hazardous chemical;
- the currency of the Safety Data Sheet; and
- who is responsible for each hazardous chemical.

The register and records of safety data sheets must be revised, as new hazardous chemicals are introduced to the project or Workplace and reviewed periodically to ensure that they are up to date.

The register and safety data sheets must be reviewed (as a minimum) when:

- there are changes to the quantities of chemicals held; and
- a hazardous chemical ceases to be used.

The information contained within the project hazardous chemical register is used by the project team to develop and implement the mandatory management controls detailed in the sections below.

A corporate hazardous chemical register must be maintained and accessible by project teams to allow information on hazardous chemicals commonly used across projects to be shared.

5.6 Hazardous Chemical Management Controls

Controls must be implemented to prevent exposure to hazardous chemicals and where this is not reasonably practicable, the controls must minimise the risk of exposure impact on workers, the environment and property.

Controls must be developed in accordance with the hierarchy of controls, with the first preference to eliminate the hazard. Guidance on the application of the hierarchy with respect to hazardous chemicals is provided below.

Controls	Description
Elimination	The most effective method of risk control and can be achieved by not using a hazardous chemical or eliminating exposure
Substitution	Replacement of a hazardous chemical with one that is less hazardous and presents lower risks
Isolation	Separating people from the chemicals or hazards by distance or barriers to prevent or minimise exposure
Engineering	Physical controls such as mechanical devices or processes that eliminate or minimise the generation of hazardous chemicals, suppresses or contains hazardous chemicals or limits the area of contamination in the event of a spill or leak
Administration	Systems or safe work practices (eg. SWMS) that help minimise exposure to hazardous chemicals and other potential hazards
PPE	Personal protective equipment such as chemical resistant gloves and glasses, face shield, overalls, footwear, respirators

A combination of controls may be required to effectively prevent or minimise the risk as low as reasonably practicable.

Communication and consultation is essential in the development of the controls and ensuring that workers understand the required controls for the use, storage and handling of hazardous chemicals. Tools to facilitate communication and consultation include the site induction, daily pre-start meetings, Toolbox meetings and the SWMS development and consultation process.

Controls must be maintained and evaluated to ensure that they are effective, in accordance with the SWMS, PMP and/or Risk Register. Triggers for review and revision (if required) include:

- the control measure is not effective in controlling the risk (this may be triggered by an incident);
- a new hazard or risk is identified;
- there is a proposed change in work method or location that the hazardous chemical will be used;
- there is a change to a Safety Data Sheet or Hazardous Chemical Register;
- requested through project consultation processes;
- if testing or assessment indicates that an exposure standard has, or may be exceeded.

5.7 Purchase, Handling and Storage

Prior to purchasing a hazardous chemical, an assessment must be undertaken to consider if alternatives are available that are less hazardous with respect to their use, handling and storage.

The least hazardous chemical should be purchased, taking into account factors such as availability, environmental impact, performance and cost.

Hazardous chemicals must be stored in accordance with the Safety Data Sheet, hazardous chemical risk assessment and the following:

- incompatible chemicals must be stored separately and in accordance with the segregation guide in Appendix 1;
- flammable and combustible chemicals must only be purchased and stored at the lowest practicable quantities;
- where there is a risk of fire or explosion, the chemical must be separated from potential sources of ignition;
- storage containers and systems used for hazardous chemicals must,
 - only be used for hazardous chemicals, and
 - be of appropriate size and type to contain any spills;
- storage and handling systems must only be used for their intended purpose and must be installed, operated, tested, maintained, repaired and decommissioned to prevent or minimise the risk to health and safety to workers and impacts to the environment and property;
- correct signage and placarding must be clearly displayed where hazardous chemicals are stored;
- storage and handling must not cause the hazardous chemical to become unstable, decompose or change to create a new hazard(s) or increase the associated risk
- containers and associated pipework or attachments for bulk storage of hazardous chemicals must:
 - have stable foundations and supports,
 - be secured to the foundation and supports to prevent any movement between the container and associated pipework and attachments, and
 - be in good condition and free of damage

5.8 Safety Data Sheets, Signage and Labelling

Safety Data Sheets

A Safety Data Sheet (SDS) must be obtained from the manufacturer, importer or supplier of the hazardous chemical before it is supplied, when it is supplied, or as soon as practicable after supply, but prior to use.

The person that purchases or is responsible for the use of the hazardous chemical is responsible for ensuring that a current SDS is obtained. This applies to Bardavcol workers, subcontractors and any other personnel that bring hazardous chemicals to the workplace.

A SDS remains current for a period of 5 years from the date of issue, unless it is modified by the manufacturer. Workers are not permitted to modify the contents of an SDS.

A current SDS must be kept as close as possible to the location that the hazardous chemical is stored or in use and must be easily accessible to workers involved in the use, storage, handling or disposal of the hazardous chemical. SDS' must also be readily accessible to emergency service personnel in the event of exposure. This includes personnel providing first aid treatment at the workplace.

Projects must ensure that SDS's are reviewed periodically to ensure that they are current and any expired documents are replaced.

Signage

Warning signs must be installed to ensure that workers and other personnel that attend the workplace are aware of the presence and location of hazardous chemicals. Signage must comply with AS 1319 *Safety Signs for the Occupational Environment* and be clearly visible to a person approaching the hazard, be located next to the hazard and warn of the hazards associated with the hazardous chemicals.

Signage must be reviewed periodically to ensure that it is current, in good condition and provide adequate warning to workers. This is particularly relevant where there are changes to the set-up of the workplace, including the location of storage facilities (ie. potential for reduced visibility of signs).

Labelling

Labels must be in accordance with the Globally Harmonized System of Classification and Labelling of Chemicals and the Work Health and Safety Regulations.

Where hazardous chemicals are decanted into smaller containers, these containers must be correctly and clearly labelled. The containers used, must also be appropriate for the hazardous chemical (ie. not cause risk to health and safety).

Unlabelled containers that are found must be stored separately and advice sought from the Environment Protection Authority on the correct disposal procedures.

5.9 Decanting, Mixing and Spraying

Decanting of hazardous chemicals into smaller or alternative containers should be avoided and minimised. Decanting must be undertaken in accordance with the SDS and with regard to the hazardous chemical risk assessment. New containers must be appropriate for the chemical that they will hold and must be correctly and clearly labelled.

Decanting of hazardous chemicals into food or drink containers is not permitted under any circumstances.

Hazardous chemicals found in unsuitable containers must be removed by the person responsible for the use, storage and/or handling of that chemical.

Decanting hazardous chemicals in explosive atmospheres or that have the potential to create explosive atmospheres must be undertaken with specific controls in place.

Mixing and spraying of hazardous chemicals must be undertaken in accordance with the SDS, hazardous chemical risk assessment and SWMS or other task specific risk assessment. This includes the implementation of controls, such as PPE, ventilation, isolation or monitoring, as required.

5.10 Manifest

A manifest is required where the quantities of hazardous chemicals used, handled or stored exceed the prescribed quantities, as detailed in Appendix 2. The primary purpose of the manifest is to provide emergency service organisations with information on the quantity, classification and location of hazardous chemicals at the workplace, including site plans and emergency contact details.

Projects that use, handle or store hazardous chemicals in quantities that require a manifest must:

- use the Bardavcol manifest template to record the required information;
- ensure that it is updated as soon as practicable after any change to the quantity or types of chemicals being used, stored, handled or generated at the workplace; and
- submit a copy of the Emergency Plan to the applicable Fire Service (eg. metropolitan, country)

5.11 Placards

5.11.1 General

Projects that involve the storage of hazardous chemicals in quantities above the thresholds listed in Appendix 2, must ensure that a placard is displayed and maintained at all times.

Placards must be:

- clearly legible by persons approaching the placard;
- separate from any other sign or writing that contradicts, qualifies or distracts attention from the placard; and
- kept clean, maintained in good condition and not covered or obscured.
- updated as soon as practicable when:
 - the type or quantity of hazardous chemical used, handled or stored at the workplace changes; and
 - the change requires the information displayed on the placard to be amended.

Where there are changes to the layout of a workplace, including the re-location of plant, equipment, materials and facilities (eg. storage containers), the location of placards must be reviewed to ensure that they are clearly visible and are appropriately located.

If the hazardous chemical is contained in a building, the placard must be:

- located as close as is reasonably practicable to the main entrance of the building; and
- located at the entrance to each room or walled section of the building in which the hazardous chemical is used, handled or stored.

If the hazardous chemical is contained in a container or outside storage area, the placard must be located next to the container or outside storage area.

5.11.2 Specific Requirements

Outer Warning Placards

Where a project involves the use, storage or handling of a hazardous chemical or group of hazardous chemicals in quantities that exceed the thresholds listed in Appendix 2, an outer warning placard must be displayed at each entrance to the workplace.

This placard is not required if the hazardous chemical or group of hazardous chemicals is used to re-fuel a vehicle and is either a flammable gas or liquid.

Bulk Storage

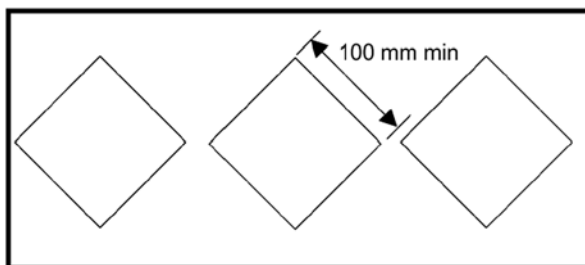
Projects that involve the bulk storage of the hazardous chemicals listed below must ensure that placards are displayed in accordance with Schedule 13 (clause 4 and 5) of the WHS Regulations:

- gases under pressure, including flammable gases and flammable aerosols;
- flammable liquids category 1, 2, 3;
- flammable solids category 1 or 2, self reactive substances B to F, self-heating substances category 1 or 2 or substances that, in contact with water, emit flammable gases;
- organic peroxides types B to F, oxidising solids and oxidising liquids category 1, 2 or 3;
- acute toxicity category 1, 2 or 3;
- skin corrosion category 1A, 1B or 1C and corrosive to metals category 1;
- unstable explosives, organic peroxides type A or self-reactive substances type A.

Storage of Packaged Hazardous Chemicals (excluding flammable liquids category 4)

Placards must:

- be in the form as shown below;
- be of sufficient size to accommodate the labels to be included on the placard;
- have a white or silver background;
- include each required class label in the form and colouring stated in the ADG Code for the hazardous chemical and with sides not less than 100mm



Flammable Liquids Category 4

Placards for the storage of flammable liquids category 4 (eg. diesel) in packages or bulk, must:

- have black letters on a white or silver background;
- comprise text in block letters that are at least 100mm in height; and
- be in the form as shown below.



5.12 Emergency Response

The project emergency response plan must include any specific requirements relating to the use, storage and handling of hazardous chemicals at the workplace. The plan may be prepared in consultation with emergency service organisations to ensure that the necessary controls and processes are in place. This is particularly relevant where manifest quantities are in use, storage or being handled (note: if a manifest is required, a copy of the Emergency Plan must be submitted to the relevant Fire Service).

Where it is foreseeable that there could be an impact beyond the workplace boundary, the plan should address these potential impacts and refer to the relevant stakeholders that may be affected or involved in the response process.

Emergency response equipment, including first aid materials that are listed in the SDS must be available and maintained at the workplace. This equipment must be reviewed periodically to ensure that they are in good condition, not expired, appropriately located and easily accessible.

Further information on emergency response processes are addressed in the Incident and Emergency Management Procedure.

6 REVIEW

The implementation and effectiveness of this procedure will be assessed through project inspections, internal audits and scheduled reviews. Additional review will be triggered by the report of hazards and incidents relating to the use, handling and storage of hazardous chemicals. Areas for improvement, including non-compliance that are identified will be actioned at a project and corporate level, as appropriate.

7 MAINTAIN RECORDS

Each project will maintain a filing system that adequately stores all records relating to the use, storage and handling of hazardous chemicals. This includes records of communication, consultation and review of the risk register and related processes (eg. hazardous chemical register, hazardous chemical risk assessments).

8 REFERENCES AND RELATED DOCUMENTS

Work Health and Safety Act 2012

Work Health and Safety Regulations 2012

Code of Practice: How to Manage Work Health and Safety Risks, December 2011

Chemical Risk Assessment Form (FO-2045)

Project Hazardous Chemical Register (FO-2047)

Master Hazardous Chemical Register (FO-2046)

Hazardous Chemicals Procedure



APPENDIX 1

Segregation Guide (AS 3833)

	Class	2.1	2.2	3	4.1	4.2	4.3	5.1	5.2	6	8
Compressed gases 2.1 Flammable	2.1		Compatible	KEEP APART	Segregate from	Segregate from	Segregate from	Segregate from	Segregate from	KEEP APART	KEEP APART
Compressed gases 2.2 Non-flammable/non-toxic	2.2		KEEP APART	Compatible	KEEP APART	Segregation may be necessary	Segregate from	Segregation may be necessary	Segregation may be necessary	Segregate from	KEEP APART
Flammable liquids (& combustible liquids)	3		Segregate from	KEEP APART	Compatible	KEEP APART	Segregate from	Segregate from	Segregate from	KEEP APART	KEEP APART
Flammable solids	4.1		Segregate from	Segregation may be necessary	KEEP APART	Compatible	KEEP APART	Segregate from	Segregate from	KEEP APART	Segregation may be necessary
Spontaneously combustible	4.2		Segregate from	Segregate from	Segregate from	KEEP APART	Compatible	KEEP APART	Segregate from	KEEP APART	KEEP APART
Dangerous when wet	4.3		Segregate from	Segregation may be necessary	Segregate from	Segregate from	KEEP APART	Compatible	KEEP APART	Segregate from	Segregation may be necessary
Oxidising agents	5.1		Segregate from	Segregation may be necessary	Segregate from	Segregate from	KEEP APART	*	Segregate from	KEEP APART	KEEP APART
Organic peroxides	5.2		Segregate from	Segregate from	Segregate from	Segregate from	Segregate from	Segregate from	Compatible	KEEP APART	KEEP APART
Toxic substances	6		KEEP APART	Segregation may be necessary	KEEP APART	KEEP APART	KEEP APART	Segregation may be necessary	KEEP APART	KEEP APART	Compatible
Corrosive substances	8		KEEP APART	KEEP APART	KEEP APART	Segregation may be necessary	KEEP APART	Segregation may be necessary	KEEP APART	KEEP APART	Segregation may be necessary

LEGEND:

	Dangerous goods of the same Class should be compatible; consult MSDS or suppliers about requirements for individual substances.
	Dangerous goods of the same Class could be incompatible or react dangerously. Consult the MSDS or suppliers about requirements for individual substances.
	Segregation of these Classes may be necessary. Consult the MSDS or supplier.
	Dangerous goods of these Classes should be kept apart by at least 3 m. Consult the MSDS or supplier.
	These combinations of dangerous goods should be segregated by at least 5 m and kept in separate compounds or building compartments.
	This requirement applies to organic peroxides, for which dedicated stores or storage cabinets are recommended. Adequate separation from other buildings and boundaries is required.

NOTES:

- 1 In all cases, the MSDS or supplier of the goods should be consulted.
- 2 The segregation of dangerous goods of Division 1.4S may be necessary. Consult the MSDS or the supplier of the goods.
- 3 Combustible liquids shall be segregated in the same manner as flammable liquids of Class 3.
- 4 Dangerous goods of Class 9 should be segregated in accordance with MSDS.
- 6 If the dangerous goods have a Subrisk of another class, then the segregation requirements for the Subrisk need to be determined and the more stringent segregation requirements applied.
- 7 Where smoke detectors are to be stored, their supplier should be consulted and any specific storage and handling recommendations followed.

APPENDIX 2

(extracted from the Code of Practice: Managing Risks of Hazardous Chemicals in the Workplace)

The table below shows placard and manifest quantities of hazardous chemicals, as specified in the WHS Regulations (Schedule 11). The final column of this table shows the link between the GHS classes and categories and the equivalent classes and categories of dangerous goods under the ADG Code.

Note: Where the WHS Regulations (Schedule 13) require a placard, the relevant dangerous goods class label (pictogram) must be displayed on the placard, rather than the corresponding GHS pictogram.

Column 1	Column 2	Column 3	Column 4	Column 5	ADG Code Classification
Item	Description of hazardous chemical		Placard quantity	Manifest quantity	
	Hazard Class	Hazard Category			
1	Flammable gases	Category 1	200L	5000L	2.1
2	Gases under pressure	with acute toxicity, categories 1, 2, 3 or 4 Note—Category 4 only up to LC ₅₀ of 5000 ppmV	50L	500L	2.3
3		with skin corrosion categories 1A, 1B or 1C	50L	500L	2.3
4		aerosols	5000L	10 000L	2.1 or 2.2
5		not specified elsewhere in this Table	1000L	10 000L	2.2
6	Flammable liquids	Category 1	50L	500L	3 (PG I)
7		Category 2	250L	2500L	3 (PG II)
8		Category 3	1000L	10 000L	3 (PG III)
9		Any mix of chemicals from Items 6 – 8 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000L	10 000L	
10		Category 4	10 000L	100 000L	Note 3
11	Self-reactive substances	Type A	5kg or 5L	50kg or 50L	GTDTBT – Note 4
12		Type B	50kg or 50L	500kg or 500L	4.1 (Type B)
13		Type C-F	250kg or 250L	2500kg or 2500L	4.1 (Type C-F)
14	Flammable solids	Category 1	250kg	2500kg	4.1 (PG II)
15		Category 2	1000kg	10 000kg	4.1 (PG III)
16		Any mix of chemicals from Items 12 - 15 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
17	Pyrophoric liquids and Pyrophoric solids	Category 1	50kg or 50L	500kg or 500L	4.2 (PG I)
18	Self heating substances	Category 1	250kg or 250L	2500kg or 2500L	4.2 (PG II)
19	and mixtures	Category 2	1000kg or 1000L	10 000kg or 10 000L	4.2 (PG III)
20		Any mix of chemicals from Items 17 - 19 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
21	Substances which in contact with water emit flammable gas	Category 1	50kg or 50L	500kg or 500L	4.3 (PG I)
22		Category 2	250kg or 250L	2500kg or 2500L	4.3 (PG II)
23		Category 3	1000kg or 1000L	10 000kg or 10 000L	4.3 (PG III)
24		Any mix of chemicals from Items 21 - 23 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
25	Oxidising liquids and	Category 1	50kg or 50L	500kg or 500L	5.1 (PG I)
26	Oxidising solids	Category 2	250kg or 250L	2500kg or 2500L	5.1 (PG II)

Column 1	Column 2	Column 3	Column 4	Column 5	ADG Code Classification
Item	Description of hazardous chemical		Placard quantity	Manifest quantity	
	Hazard Class	Hazard Category			
27		Category 3	1000kg or 1000L	10 000kg or 10 000L	5.1 (PG III)
28		Any mix of chemicals from Items 25 - 27 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
29	Organic peroxides	Type A	5kg or 5L	50kg or 50L	GTDTBT – Note 5
30		Type B	50kg or 50L	500kg or 500L	5.2 (Type B)
31		Type C - F	250kg or 250L	2500kg or 2500L	5.2 (Type C-F)
32		Any mix of chemicals from Items 30 and 31 where none of the items exceeds the quantities in columns 4 or 5 on their own	250kg or 250L	2500kg or 2500L	
33	Acute Toxicity	Category 1	50kg or 50L	500kg or 500L	6.1 (PG I) – Note 5
34		Category 2	250kg or 250L	2500kg or 2500L	6.1 (PG II)
35		Category 3	1000kg or 1000L	10 000kg or 10 000L	6.1 (PG III)
36		Any mix of chemicals from Items 33 - 35 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
37	Skin corrosion	Category 1A	50kg or 50L	500kg or 500L	8 (PG I)
38		Category 1B	250kg or 250L	2500kg or 2500L	8 (PG II)
39		Category 1C	1000kg or 1000L	10 000kg or 10 000L	8 (PG III)
40	Corrosive to metals	Category 1	1000kg or 1000L	10 000kg or 10 000L	8 (PG III)
41		Any mix of chemicals from Items 37 - 40 where none of the items exceeds the quantities in columns 4 or 5 on their own	1000kg or 1000L	10 000kg or 10 000L	
42	Unstable explosives		5kg or 5L	50kg or 50L	GTDTBT – Note 5
43		Any mix of chemicals from Items 11, 29 and 42 where none of the items exceeds the quantities in columns 4 or 5 on their own	5kg or 5L	50kg or 50L	

- For the purposes of this table, if a flammable liquid category 4 is used, handled or stored in the same spill compound as one or more flammable liquids of categories 1, 2 or 3, the total quantity of flammable liquids categories 1, 2 or 3 must be determined as if the flammable liquid category 4 had the same classification as the flammable liquid in the spill compound with the lowest flash point.
- Example: For placard and manifest purposes, a spill compound containing 1000L of flammable liquid category 1 and 1000L of flammable liquid category 4 is considered to contain 2000L of flammable liquid category 1.
- For the item 2 in the table, Gases under pressure with acute toxicity category 4 only applies up to a LC₅₀ of 5000 ppmV. This is equivalent to Division 2.3 dangerous goods under the ADG Code.
- Only flammable liquids with a flash point of up to 93°C are classified as hazardous chemicals under the WHS Regulations and the GHS. C1 combustible liquids with flashpoints between 93°C and 150°C are not classified as hazardous workplace chemicals.
- GTDTBT means goods too dangerous to be transported.
- Division 2.3 under the ADG Code includes gases and vapours classified as acutely toxic (categories 1, 2 and 3) and gases which are corrosive to skin (category 1).

1 Purpose & Scope:

Control and verify the design and construction to ensure specified requirements are met or exceeded. Design and construct may also apply to temporary works that enable the construction of permanent works.

2 Responsibilities:

Business Development Director

During the registration of interest phase of a D&C contract the Business Development Director shall formulate a detailed list of required design competencies. An assessment of strengths and weaknesses of design consultants, coupled with current workload & strategic market alignment will form part of the initial approach to engaging the design consultants or multiple consultants

Estimating Manager

Following the initial evaluation & recommendation by the Business Development Director the Estimating Manager will assess the scope of work and assign specific competencies of design elements to the targeted design consultants. This yields two outcomes. Firstly the Estimating Manager will be able to assess the potential consultant's level of relevant experience and understanding of the project & secondly the ability of the consultant to deliver client expectations while still focusing on value engineering practices to enhance profitability for Bardavcol. Once the design consultants have been vetted, by the Business Development Director and the Estimating Manager, a design team structure is developed. Dependent on project complexity a design team will be established. This may take the form of a lead consultant, responsible for prescribed activities plus the co-ordination of sub-design consultants, or a whole of project brief. Bardavcol may choose to act as the coordinator of the selected design consultants

Design Manager

A Design Manager will be nominated for each D&C Project. The Design Manager will liaise with the Estimating Manager to gain understanding of the design consultant / consultants, selection. The Design Manager will then develop a design brief for the consultant / consultants.

The design brief defines design responsibilities. The Design Manager will engage consultants for design and verification.

The Design Manager will coordinate the process by establishing a Design Plan and monitoring the design and verification processes against that plan.

Estimator

Contribute mainly through the planning and procurement stages of the design with advice on cost, timing and suitability issues.

Commercial Manager

Contribute primarily with the engagement of the Design consultants with advice on contractual and commercial issues. Design team accountability is an area that must be considered when engaging consultants.

3 Procedure Requirements:

3.1 General

On projects where Bardavcol has a design and construct responsibility the design and construction will be subject to control and verification procedures that will ensure that the design conforms to the user desired outcomes and also regulatory and legal requirements.

3.2 Feasibility proposal development for the project

The following actions are to be established by the Business Development Director / Estimating Manager (depending on project requirements) prior to any submission to a Client

- Establish full scope of work for the project.
- Prepare guidelines for the Feasibility Proposal.
- Establish extent of Preliminary Design to be undertaken at Tender stage
- Develop responsibility matrix assigning consultants to design competencies.
- Conduct workshops with Bardavcol Project Team / Consultants.
- Develop action plan to interrogate specification / contract documents.
- Formalise communication protocols
- Review feasibility design responses / alternatives

Once all items listed above have been considered a budget price shall be developed by the Business Development Director / Estimating Manager and submitted to the Managing Director for review.

3.3 Detailed Tender Submission to Client

The following (where applicable) shall be established prior to submission to the client of a detailed tender:

- Review and Update Scope of Work and Programme for Detailed Design, Tender Submission & Final Design and Construction.
- Review and Amend Terms and Conditions of Contract for Design Consultants including Completion of Annexures and Schedules including Insurance Requirements, Terms of Payment, Defects Liability Period and Special Conditions for Main Contracts and Subcontracts. This is to be provided to the tenderer, particularly designers prior to tender submission.
- Establish a firm cut off point for client initiated scope changes.
- Final Design Fixed Fee from Design Consultants.
- Fixed Price Quotations and Budget Prices from Suppliers and Subcontractors.
- In-house pricing of self-performed works

Once the above points have been addressed a Detailed Tender Submission giving Lump Sum Price / Schedule of Rates / Warranted Maximum Price confirming Items above including PC / Provisional Sums and Qualifications shall be submitted to the client

3.4 Award of Contract for Final Design and Construction

Works cannot proceed prior to receiving written confirmation of contract award.

Bardavcol shall submit to the client duplicate contract documents for execution under seal or vice versa – the contract may be provided by the client. In this case, contracts with designers and subcontractors need to reflect conditions of head contract, i.e. 'back to back'.

After the Project requirements have been identified and agreed with the client the Project Scope can be finalised. Design inputs are then reviewed, to address any inadequacy or ambiguity prior to preparing a Design Brief and engaging the design consultant(s).

3.5 Planning of Design and Construct

The following actions are essential to initiate a process that will deliver a controlled / predictable end product delivery within time & budget. If the beginning of the process is flawed it will project inadequacies to all elements of the project.

Therefore it is critical to establish the following.

- Design Control Group (Bardavcol, Consultants, Client Representatives)
- Designer's capabilities, post contract award.
- Assign Design Staff, Individuals
- Establish Document Control System
- Co-ordination of design input information
- Interfaces between design elements
- Co-ordination of design outputs
- Design Programming- (ODDC)
- Co-ordination of changes in design briefs, scoping issues, inputs and outputs
- Co-ordination of design issues during construction
- Design Validation or Commissioning
- A Design Plan will be produced detailing the processes, the methods employed and the criteria for acceptance for each of the verification, review and validation steps.
- OHS constructability design risk assessments and reviews are carried out, recorded and where practicable appropriately managed (including aspects pertaining to design change).
- Design Meetings will be held on a regular basis to ensure mutual agreement on design objectives.
- Agreed escalation plan to manage design issues that impact on timely delivery of design lots
- Agreed penalties for lack of adherence to agreed design management plan.

3.6 Selection of Consultants

Consultants to be engaged by Bardavcol for project design work shall be selected using the following criteria where applicable;

- Relevant experience and capabilities
- Availability- actual people available for project design period.
- Track record with Bardavcol
- Track record on projects of a similar nature
- Technical expertise
- Key personnel and management
- Proposed methodology
- Project appreciation
- Fee structure
- Resource Flexibility
- Ability to deliver on time
- Relevant insurances / public liability
- Compliance with conditions of contract and / or engagement
- Compliance with certification requirements

Approval by the Commercial Manager and Business Development Director is required at the bottom of the "Contract for services / terms of engagement" form prior to engagement of any consultants. Reference to be made to the Bardavcol commercial responsibility chart.

3.7 Design and Construct Inputs

The Design Control Group shall determine all design requirements of the project through consideration of:

- Function and performance requirements
- Statutory and regulatory requirements
- Industry practice and standards
- Learning's from past experience on similar projects
- Analysis of Key Stakeholders

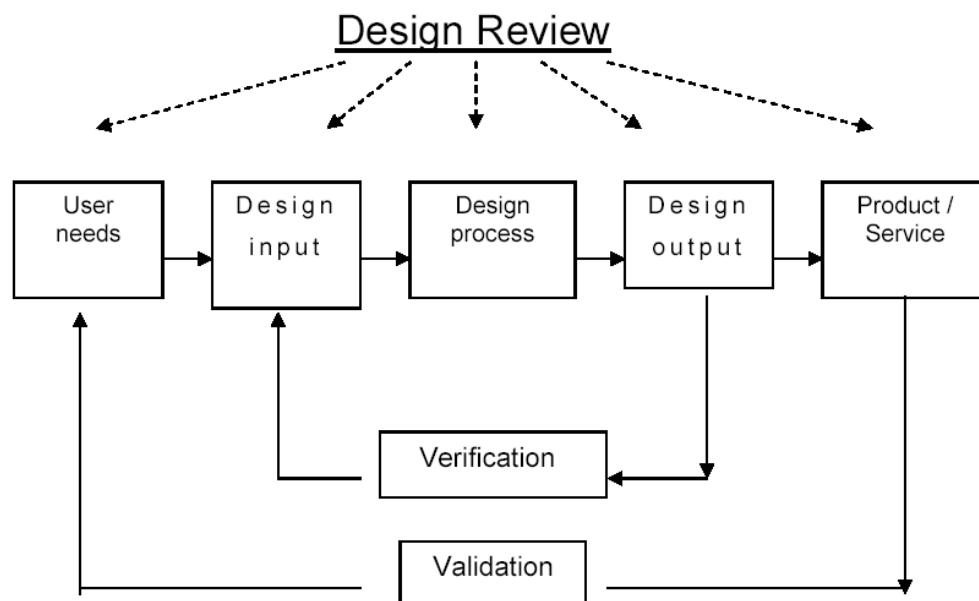
Records of the consideration of the design inputs are kept in minutes of Design Meeting and control is to be maintained over changes to inputs. All changes are to be recorded and cross-referenced with design outputs. The Duration of time/resource impact is then passed on to the Construction Manager who assesses construction impacts. Notification is then issued to the client. This can be in the form of an estimate (prior to activity) or actual. This provides historical impact of changes and enables justification / accountable evidence.

Control of inputs is imperative to maintain design and in turn project programme and shall be overseen by either the appointed Project Design Manager or the Project Manager.

3.8 Design and Construct Outputs

Design outputs, usually in the form of drawings, specifications or sketches, are provided initially to enable verification against the design inputs. Detail shall be contained in the Design Outputs describing characteristics such as:

- Acceptance criteria
- Constructability issues
- Information to assist in procurement
- Irrespective of input requirements, all designs shall conform to relevant regulations and standards and the elements imperative to safety.
- Design Output documentation status and distribution must be controlled.



3.9 Design and Development Review

One agenda item of the regular Design Meetings shall be a Review of each phase of the design and construct process and requires participation from all parties involved.

The review shall address where appropriate:

- Exploring possible alternatives or new concepts
- Co-ordinating design inputs
- OHS Risks and changes to the OHS plan and JHAs
- Value management
- Suitability of design outputs
- Obtaining input from end users
- Compatibility of outputs from different designers
- Constructability issues
- Cost of maintenance of end product
- Client acceptability.

3.10 Design and Development Verification

The Verification stage involves confirming for each design element, that design output meets the design input requirements.

This can be done by one of the following methods:

- Performing alternative calculations
- Comparison of design to reference design
- Notification of departures/modifications,
- Generation of request for modification to the Scope of Work, (SW) and or, the Technical Criteria(TC)
- Comparing the new design with a similar proven design
- Undertaking compliance testing
- Reviewing the design stage documents
- Verification may be done by Bardavcol or by an independent verifier such as another consultant with expertise in a similar field.

It will be good practice to return deficient design outputs back to the design consultant to amend, prior to issue to Verifier. This ensures that the designer's internal checking process is monitored and it also provides a smoother verification, as revisions are minimised. This process also improves designer accountability / quality.

3.11 Design and Development Validation

Validation of product design is checking (validating) that a product, which has been designed, actually meets the customer's needs.

Bardavcol shall clearly identify, document and agree with the client prior to contract award the requirements for any validation – criteria for assessment and Bardavcol's role in the design validation.

This is to ensure no unrealised expectations are held by any party about the extent of the validation – responsibilities for and any disagreement regarding rectification of any deficiencies identified in the project works.

Design validation may not normally be carried out by Bardavcol because of the difficulty associated with accurately replicating some design parameters in service (i.e.: earthquake loadings).

However some components of a design may be validated by prototype testing (eg: strength tests on trail mixes) or through particular performance characteristics which are a key part of a performance brief (e.g.: flow rate, output of tonnage).

3.12 Control of Design and Construct Changes

In controlling any design changes Bardavcol shall ensure;

- Identification of any change shall be recorded and tracked to ensure compatibility with the project - i.e.: impact on other design areas, procurement, scheduling and overall construction ,
- Review of the change by relevant parties,
- Approval of change before implementation,
- Any change to documentation is transmitted to all relevant parties involved in the development, design and construction of the project.

The procedure for proposing, approving and implementing design changes is as follows;

- All changes shall be fully documented
- All changes shall be approved by the Design Manager or by the same authority who approved the original design (or as otherwise designated in the design plan)
- Maintain a register of changes with reference to applicable documentation

4 References:

AS 3905.15 1998 Guidelines to Quality in Project Management
AS 4000 1997 General Conditions of Contract
AS 4121 1994 Code of Ethics and Procedures for the selection of Consultants
AS 4122 2000 General Conditions of Contract for Engagement of Consultants
AS 4901 1998 Subcontract Conditions
AS 4902 2000 General Conditions of Contract for Design and Construct
AS 4916 2002 Construction Management – General Conditions
ISO 9001 2008 Quality Management Systems – Requirements
ISO 9004 2000 Quality Management Systems – Guidelines for Performance Improvements

5 Tools/Forms/Documentation Generated:

Consultant's brief
Contract for services / terms of engagement form
Design plan
Design meeting minutes

1 Purpose & Scope:

Set out guidelines for assessing subcontractors and providing them with accurate purchasing information as project purchasing is a critical aspect of the total project in enabling the finished work to be of a specified or required standard.

This Procedure applies to all subcontractors and suppliers being considered for construction projects.

2 Responsibilities:

Commercial Manager

Updating acceptable sub-contractors list. Approve all major purchase and subcontract work orders in conjunction with the Construction Manager.

Estimator

Recommendation of sub-contractors considered within the tender.

Project Manager

Selection of subcontractors in consultation with the Construction Manager, Estimator and Contracts

Contracts Administration

Issuing purchasing documentation

3 Procedure Requirements:

3.1 Evaluation of Subcontractors

The Estimator shall initially select and obtain prices from a suitable range of subcontractors/suppliers to tender for a particular item of work.

After the Contract is awarded, the Project Manager in consultation with the Construction Manager (or his nominee), Estimator and Commercial Manager shall assess the complexity and technical requirements of the materials or services to be provided, then base the selection of the appropriate subcontractor/supplier on the following:

- Price and resources.
- The impact of the subcontractor's product or service on the quality of the final product.
- Previously demonstrated capability and performance with regard to technical requirements and production within a designated time based programme.
- Knowledge and acceptance of the conditions of subcontract.
- Any additional supervision Bardavcol may have to provide to ensure that the subcontractor/supplier can meet the specification requirements and the cost of providing this additional supervision

Details shall also be obtained by the Project Manager of any subcontractor's proposed subcontract work as part of the assessment.

3.2 Subcontractor's/Suppliers OHS, Quality Assurance & Environmental System

Generally on all Bardavcol projects, subcontractors and suppliers shall fall under the Bardavcol project management system unless the subcontractor or supplier has his own management system procedures that surpass that which is described in the Bardavcol Management System in which case their system shall prevail for their operations, pending an assessment by the Project Manager / Engineering Systems Manager. Prior to a subcontractor using his own system, process/product control documentation calibration registers, inspection and test plans, in-process checklists and other identification/traceability documentation including records shall be submitted to Bardavcol for approval and use during the project. This documentation will be made available to the client when requested.

All decisions concerning the system the subcontractor/suppliers adopts will take into account any specific customer requirements. The Project Manager shall determine which subcontractor will be required to perform their own quality assurance and which will be performed under Bardavcol's system.

Where a sub-contractor/supplier falls under the Bardavcol System relevant details of the quality management system may be forwarded to the sub-contractor by the Project Manager. Where a sub-contractor/supplier has an adequate system or third party accreditation, the Project Manager shall ensure the subcontractor/supplier is aware of any modifications to standard practice required for the project.

3.3 Preferred Subcontractors List

The Commercial Manager shall maintain records of acceptable subcontractors, whether deemed acceptable from company experience or assessment on the Common Data Base which is updated at regular intervals in conjunction with the Managing Director.

If any staff member having responsibilities under this procedure, consider that a sub-contractor has become unacceptable, those concerns shall be raised with their Manager for consideration by the Managing Director.

3.4 Purchasing Data

3.4.1 General

An order form shall be issued to all subcontractors/suppliers at the commencement of ordering or engaging their services.

The Project Manager is responsible for raising the order form. Where a service is to be provided by a subcontractor, a sub-contract work order shall be issued for that service, where a product is to be supplied, a purchase order shall be used for each product.

The order form must clearly describe the goods or services ordered.

The Commercial Manager and Construction Manager are responsible for approving all major material purchase orders and also subcontract work orders in accordance with the current Statement of Commercial Responsibility Levels.

The Project Manager shall, where appropriate, document the following information on the relevant order form:

- The subcontract conditions applicable.
- Scheduled programmed dates of work.
- Subcontract condition annexure.
- The type, quantity and method of identification of each material item or service ordered, including manufacturer recommendations to be supplied.
- The class, style, grade or other precise identification.
- The title and revision status of applicable sections of the specification, drawings, codes and standards and other relevant technical data.
- Subcontractor and environmental systems requirements;
- Verification, hold/witness points, requirements for NCRS, quality record keeping, identification and traceability, process control, subcontractor quality plan submission, calibration of equipment, auditing, design verification, presentation, packaging and transportation requirements.
- Any Occupational Health Safety & Welfare, Quality and Environmental requirements.
- The items, rates and lump sum prices applicable to the scope of work.
- Requirements for approval of personnel, procedures, processes, products, services, equipment and documentation.

The Project Manager is responsible for ensuring that all subcontract personnel, procedures, processes, products/services, equipment and documentation meet both the specification and also Bardavcol's requirements. The order form shall, where applicable, detail these requirements and will be formulated by the Project Manager.

3.4.2 Purchasing Plan

When required by the client a purchasing plan shall be developed and shall include the following;

- Types of product or service subcontracted
- Purchasing schedule which states the timing of procurement of the product or service to be subcontracted and include provision for the approval process
- Bardavcol's method of assessment of the subcontractors ability to meet the subcontract requirement including quality system requirements specified
- Bardavcol's plans for inspection and surveillance of the subcontractor to verify the operation of the quality system and product conformity requirements
- All specified inspection and testing shown in the subcontractors inspection and test
- The purchasing plan shall form part of any quality plan for the project.

3.5 Verification of Purchased Product

The Project Manager shall, if requested by the client, deemed necessary by himself or Bardavcol management, establish an audit or surveillance programme of the subcontractor's or supplier's work. All delivery dockets for supplied product, time sheets / dayworks dockets for subcontractors, Bardavcol Dayworks Dockets, and any other documentation required shall be verified by the Project Manager or Site Supervisor, attached to the relevant Daily Report Sheet and returned to Bardavcol's Head Office on a weekly basis signed by the Project Manager. The Project Manager shall be responsible for organising any Client verification required.

The client or his representative shall be afforded the right, during the life of a project, to verify any subcontracted product for the project at the subcontractor's premises. The Project Manager (or his nominee) shall facilitate this.

Any verification by the Client does not absolve Bardavcol of providing a complying product.

The Project Manager (or his nominee) shall satisfy himself that all specification requirements for the inspection and testing of any purchased product have been carried out prior to offering the product to the client for acceptance.

3.6 Completion of a Project

On completion of a project the Project Manager shall issue a letter to the Client requesting a certificate of practical completion (or similar) and stating the date when practical completion was achieved. The defects liability/maintenance period (if one is stated in the contractual documents) for the project will commence from the date of practical completion and expire on the date stated in the contract documents (usually six or twelve months).

During the Defects Liability/Maintenance Period when an issue requiring attention arises, it is the responsibility of the Project Manager to initiate action to address the issue.

Shortly before the expiration date for the defects liability/maintenance period the Project Manager shall inform the client of the impending date and request a list of any defects (if any) so that inspection and rectification of any defects can be attended.

Once all defects have been rectified the Project Manager or his Nominee will carry out a final inspection and inform the Construction Manager and General Manager that the project is complete.

Upon completion of a project, a Project Completion Report shall be completed within 8 weeks of the completion date, by the Project Manager. Within 4 weeks of the Project Completion Report being drafted, a Project Completion Meeting shall be held. The Project Completion Meeting will include all key Bardavcol personnel involved with the project including: Construction Manager, Project Manager, Estimator, General Manager, Engineering Systems Manager, Project Engineer(s), Project Supervisor(s) and invitees.

AS 3905.15 1998 Guidelines to Quality in Project Management
AS 4000 1997 General Conditions of Contract
AS 4901 1998 Subcontract Conditions
AS 4916 2002 Construction Management – General Conditions
ISO 9001 2008 Quality Management Systems – Requirements
ISO 9004 2000 Quality Management Systems – Guidelines for Performance Improvements

5 Tools/Forms/Documentation Generated:

Project Launch Record
Sub-Contract Work Order
Purchase Order
Daily Report Sheet
Project Completion Report
Project Completion Meeting Minutes

1 Purpose & Scope:

This procedure has been developed to highlight how the issue, approval and control of quality and environmental documents and also to cover aspects of record control.

This procedure applies to quality and environmental documents utilised within Bardavcol.

2 Responsibilities:

Commercial Manager

Approves and authorises new or changed documents relating to general contract administration.
Establishes and maintains procedures for filing, storage and disposition of records.

Project Manager

Issue, change and retaining of contractual documentation in consultation with the Construction Manager.
Maintaining records under his/her jurisdiction.

Quality Management Representative (when appointed to a project) /Site Supervisor

Completion of, issuing, change, control, removal and retaining of obsolete system documentation for his/her project.

3 Procedure Requirements:

3.1 General Documentation

The term 'general documentation' applies to the following documentation:

- Daily report sheets including all cross-referenced and associated instructions/materials/day-works dockets to be completed daily by the Site Supervisor or his nominee and forwarded to the Project Manager for sign-off. These signed daily report sheets are to be sent to the Bardavcol head office accounts department at the end of every week.
- Dayworks dockets (to be sent to the relevant Project Manager daily as part of the Daily Report Sheets).
- Plant hours and kilometres sheets (to be sent to the Operations Supervisor weekly).
- Plant operator safety checklists As part of the timesheets to be forwarded to the Workshop
- Toolbox meetings (to be sent to the Engineering Systems Manager).

It is the responsibility of the project supervision team under the guidance of the Project Manager to ensure that all general documentation is sent on time to the Bardavcol head office for processing.

3.2 Contract Documents

3.2.1 General

The term "contract documents" applies to the following documentation:

- Drawings, specification and any associated documents (e.g., cross section reports, geometric details, specified test methods etc.)
- General project related correspondence
- Contract review details
- Variations/instructions/memo's
- Progress claims/hourly invoices
- Material orders/requisitions/quotations
- Subcontractor/supplier orders/correspondence/quotations/instructions/variatioins
- Design documentation.

The Project Manager is responsible for maintaining and updating the above documents and may also maintain a register of the above documents.

The Project Manager (or his nominee) may maintain on site, for client and subcontractors, files on relevant

contract documents.

For large projects, or projects with a number of subcontractors (at the discretion of the Project Manager), a subcontractor scope of works sheet should be developed to ensure that all Bardavcol supervisory staff are fully informed of what any subcontractor's scope of works for the project is.

3.2.2 Distribution of and Amendments to Contract Documents

The Project Manager shall request from the Client, the appropriate number of "issued for Construction" documents.

The distribution of contract documents, when required, shall be as per the standard operating procedures, i.e. documents sent to Bardavcol personnel, usually by the Project Manager, shall be recorded by the Project Manager on their copy – usually initials at the top of the document.

Documents sent to clients, sub-contractors, suppliers or other external personnel shall be covered by a covering letter, document transmittal advice, facsimile transmission report or similar.

The Client may issue amendments to contract documents to Bardavcol's Project Manager and it is the responsibility of the Project Manager to ensure the amended documents *is* distributed to the relevant personnel.

The Client may formally notify Bardavcol of a minor amendment but not issue the revised document. It is then the responsibility of the Project Manager to ensure all relevant parties are advised.

Amendments to contract documents shall be distributed through the day to day administration at Head Office and on-site by the Project Manager or his nominee.

It is the responsibility both of the Project Manager to ensure that any invalid and/or obsolete documents are promptly removed from all areas of issue or use. The Project Manager shall maintain clearly marked obsolete documents retained for legal and/or knowledge presentation purposes.

3.2.3 Variation or Amendment to Contract documents

Contract documents may be amended by mutual agreement between Bardavcol and the Client. This may be initiated by the Client and the Project Manager as Bardavcol's representative. The Construction Manager and Project Manager shall liaise and communicate with the Client on notice of the variation and consequences of change.

Should the variation quotation sum be greater than the sum specified in the statement of commercial responsibility levels, item 3 then the Commercial Manager and / or the Managing Director, Business Development Director or Construction Manager shall review and approve the Project Managers recommendations.

3.3 Registers

Registers may be used to control the distribution of documentation and should contain the following information:

- Project name the register applies to
- Title of the document being recorded
- Date the document was received and/or sent
- Issue number or revision of the document (if applicable)
- Recipient or revision holder of the document
- Type or subject of document (if applicable)

All on-site correspondence, either incoming (site memos, site instructions, facsimiles, etc) or outgoing (Site instruction/confirmation forms, facsimiles etc) may be recorded on a correspondence register, depending on the size and nature of the project. This will ensure that any correspondence received or sent from site is documented, distributed correctly and also traceable.

When warranted for a project, a drawing register shall be compiled and maintained by the Project Manager when

there are any additions / amendments to project drawings.

3.4 Records to be Maintained

The Project Manager shall determine at the start of the project which records shall be maintained based on Bardavcol's systems procedures, specification / Client requirements and the project size.

On-site records shall be controlled by the Project Manager or his nominee while the project is in progress and shall include the following records:

- Contract review including all tender records.
- General correspondence.
- Variation instructions/correspondence.
- Progress claims/hourly invoices.
- Material orders/requisitions/quotations.
- Subcontractors/Suppliers orders/correspondence/quotations.
- Current and superseded contract documents such as specification, drawings.

3.5 Storage and Retention

At the completion of the project, the Project Manager shall ensure that a copy of all documentation including computerised data drawings and specifications are kept on file until the end of the Maintenance/Defects period.

Upon expiration of the Maintenance/Defects period the complete contract file is to be placed in archive storage, with Project Number, document descriptions and a destroy date (5 years later).

Any commissioning records and also operation and maintenance manuals relevant to the works shall be provided to the client no later than 28 days after the issue of the certificate of practical completion for the relevant work (or as stated in the contract document)

If required by the specification an index of quality records held by Bardavcol shall be provided to the client and if requested by the client Bardavcol will provide copies of quality records relating to the project

The Project Manager shall determine what computerised data will be filed and subsequently archived. This should not duplicate any hard copy information already on file. The Finance Manager will be given the computerised data in disk form and will be responsible for the archiving of this information onto tape backup in the same manner as outlined above.

A record of this information shall be kept in a register in the same format as that for the hardcopy archiving.

4 References:

- ISO 9001 2008 Quality Management Systems – Requirements
- ISO 9004 2000 Quality Management Systems – Guidelines for Performance Improvements AS 3905.15 1998
- Guidelines to Quality in Project Management
- AS 4916 2002 Construction Management – General Conditions

5 Tools/Forms/Documentation Generated:

- [FO 102 Calibration Register](#)
- [FO 105 Correspondence Register](#)
- [FO 106 Distribution register](#)
- [FO 107 Document Transmittal Advice register](#)
- [FO 108 Hold Point Clearance Register](#)
- [FO 113 Internal Distribution Register](#)
- [FO 114 Lot Register](#)
- [FO 115 Master Register](#)
- [FO 117 Non-Conformance Register](#)

All relevant registers and documentation soft-copies are maintained on the M drive under "PROJECTS" with each individual project listed by number.

All hard-copies of documents are maintained on site and then archived by project number.

1 Purpose & Scope:

Establish control within the process to prevent non-conformities rather than inspection of the finished product alone. Guidelines for any inspections and tests that may be needed are outlined and also the acceptability of any tests at appropriate stages of the process.

2 Responsibilities:**Project Manager**

Insuring Method Statements and in-process checklists, when requested by the Client or considered required by Bardavcol, are prepared, implemented and maintained. Rectifying deficiencies found on his project. Selection of appropriate subcontractors to carry out any inspection and testing. Selection of any inspection, measuring and test equipment for the project. Ensuring calibration procedures for all measuring and test equipment required for the project are maintained. Notify all subcontractors of what tests and/or standards may be required from them for the relevant project, usually at the time of placement of an order.

Site Supervisor/QMR

Complete in-process checklists when required, maintain selected equipment in his control in a satisfactory condition and notify the Project Manager when calibration of equipment under his control is required. Carry out checks of any subcontractor equipment used on the project.

Construction Manager/General Manager

Approving Method Statements and In-process checklists

3 Procedure Requirements:**3.1 General Procedural Requirements****3.1.1. General Processes**

General process activities, defined as those which have a significant affect on the finished product, shall be undertaken in accordance with the requirements of the project technical specification and associated documents, drawings and other instructions issued by the Client and forming part of the contract.

The Project Manager and Construction Manager/General Manager shall review the work to be performed under the contract and identify any significant processes which may require documented procedures such as method statements and in-process checklists specified in the contract and/or to effectively control the product. Development of any method statement or in-process checklist shall be overseen by the Construction Manager/General Manager and shall include references to standards, codes, regulations and the specification requirements, where applicable.

Review of method statements, inspection and test plans and in-process checklists is an ongoing requirement of the Project Manager with assistance from the Construction Manager/General Manager when requested and also through the auditing process.

3.1.2 Method Statements (when required for a specific project)

The Method Statement is a project specific document which details the conformance criteria so that the specification requirements are met.

3.1.3 Inspection and Test Plans, (when required for a specific project)

The Inspection and Test Plan may be used for significant processes requiring objective evidence that the Clients specification requirements have been met.

3.1.4 In-Process Checklist (when required for a specific project)

The In Process Checklist shall incorporate elements from the specification to establish conformance to specification requirements throughout the process

If required by the client or deemed necessary by the Project Manager or Construction Manager/General

Manager, the Project Manager shall ensure that an In-Process Checklist is prepared which include the following:

- Hold points and/or witness points to ensure the product is held until all verification activities required have been undertaken prior to proceeding to the next stage of the works.
- A check that materials have passed verification and are suitable for inclusion in the project.
- Any survey verification required.
- Compaction testing, or other external testing requirements.
- Environmental conditions, if any, prior to work proceeding.
- Critical product specification requirements and workmanship criteria.
- Parties responsible for carrying out inspections and tests.
- Comments column recording checks of the above.

3.2 Inspection & Test Status

3.2.1 General

The in-process inspection and test status of each component or lot shall be identified through the completion and acceptance of corroborating documentation, which will include either the in-process checklist form, hold point form or witness point form for the relevant component or lot.

This is to ensure that all specified (and also Bardavcol generated) inspection and test requirements are carried out and to safeguard against the possibility of non-conforming product being used, built on or covered over. The contract documentation will indicate hold points which require verification prior to works proceeding. The Project Manager and Construction Manager/General Manager will review the contract documentation and may add additional hold points to ensure that no area of concern is passed unless verification by the appropriate person is received.

3.2.2 Hold Points

A hold point is a point during the works that the Project Manager or Construction Manager/General Manager deem as being of significance and/or requires the Clients verification prior to works proceeding beyond that point and is an indicator of the status of the project.

Hold points shall be detailed on the in-process checklist or, if requested by the client on a Hold Point Clearance form. **No work shall proceed past a specified hold point unless the hold point has been released by the appropriate person.**

A Hold Point Clearance Register may be used to indicate the status of lots of work.

3.2.3 Witness Point

A witness point is a point during the works where the Client requires notification by Bardavcol that the point is reached. The Client will elect whether or not to witness this operation or stage of construction.

Hold points which have been consistently cleared without any problems and require inspection only shall be reclassified as witness points by Bardavcol, after obtaining approval from the Client.

3.3 Special Processes (when applicable to a project)

Special processes are those processes where:

- Processing deficiencies are revealed only through failure of the product in service.
- The results of the process cannot be measured in later inspections or tests without the destruction of the product.

Special processes shall be identified by the Project Manager as part of a review of the Clients specification requirements.

Where so identified, the Project Manager shall ensure that, when required, Method Statements and/or In-Process Checklists are prepared to cover any special processes.

The Project Manager shall pay particular attention to:

- Ensure that only qualified personnel, process procedures, documentation and equipment are applied to the work.
- Maintaining records of the qualified processes, equipment and personnel.
- Supplying objective evidence, if possible, that the special processes have met specified requirements.

3.4 Suitability of Equipment & Working Environment

The suitability and selection of plant and equipment to carry out tasks on a project shall be the responsibility of the Project manager (or his nominee). The timing of procurement of any plant shall be based on the construction programme, formulated and monitored by the Project Manager. Where subcontractor plant is to be used on a project the Project Manager shall satisfy himself that all plant has been properly maintained and in good working order with any safety devices in place and operational.

Assistance with ensuring that subcontractor plant is properly maintained and safe shall be given by the Construction Manager, Engineering Systems Manager and/or any appropriate regulatory body.

Any safety assessment of plant and equipment, either Bardavcol or subcontractor plant shall be as per Bardavcol's safety management system requirements.

Working environments shall be monitored by the Project Manager and/or Site Supervisor as to their suitability for achieving the specified quality outcomes. Any adjustments alterations or cessation of work practices due to non-favourable working environments shall be the responsibility of the Project Manager in consultation with the Construction Manager.

3.5 Control of Inspection, Measuring and Testing

3.5.1 Selection of Equipment

The Project Manager shall review the technical requirements of the project and:

- Select, where applicable, inspection, measuring and testing equipment to cover the inspections and tests Bardavcol will conduct.
- Delegate any specialist testing to appropriately qualified/certified subcontractors who shall select their own equipment.
- Ensure that the equipment is capable of the accuracy and precision necessary.

Due consideration shall be given to the measurement uncertainty of the test (tolerances) with respect to the measurement capability of the equipment (precision). For example, an automatic level reading to an accuracy of $\pm 10\text{mm}$ is unsuitable in a situation where the finished level tolerance is $\pm 5\text{mm}$.

It is the responsibility of all Bardavcol personnel who have survey equipment under their control to ensure that the equipment is properly calibrated periodically (or earlier if damage has occurred or is suspected to the equipment). The Operations Supervisor shall keep a copy of all calibration certificates. A master register is maintained of all holders of Bardavcol survey equipment by the Operations Supervisor.

3.5.2 Calibration of Bardavcol Equipment

The Project Manager shall, when required, arrange for:

- Established equipment to be calibrated prior to use on the project.
- New equipment to be calibrated prior to use on the project.
- Calibrated equipment to be recalibrated at the prescribed intervals.

All calibration of Bardavcol equipment shall be carried out by an approved external calibration service against recognised standards.

The calibration status of any Bardavcol equipment shall be shown by a suitable indicator attached to the equipment (e.g. a label indicating when next calibration due) or a calibration certificate kept with the equipment.

Any item which is damaged, suspect or found to be out of calibration shall be immediately removed from use and reported to the Project Manager and sent for recalibration.

The Project Manager shall analyse the calibration agency's findings and ascertain if any previous test results have

been affected.

3.5.3 Subcontractor Equipment

It is the subcontractor's responsibility to ensure that all inspection, measuring and testing equipment used on any Bardavcol project is capable of the accuracy and precision required, is correctly calibrated and is used and stored correctly. The Project Manager or his Nominee may request calibration certificates and also carry out checks of any subcontractors equipment to ensure that correct test equipment is used and any out of calibration equipment is not used. Subcontractor equipment shall clearly show by the use of a suitable indicator or record the calibration status of the equipment.

3.6 Subcontractor Survey Control

Where subcontractor survey teams are used on a project the method statements and the specification will detail activities required such as set out, measurement of works (when required) and also verification to satisfy both Bardavcol and the client that works are as per specification requirements. The in-process checklist may be used by Bardavcol to verify that any stage requirements have been met.

The establishment of survey control, set out of all main lines and levels and the issue of any verification certificates shall only be carried out by registered surveyors.

Other minor site survey activities may be carried out by a competent Site Supervisor or Leading Hand from marks established by a registered surveyor.

Should the need for the use of statistical techniques arise during a project or in response to Client requirements, the Project Manager shall review the work to be performed under the contract and identify those aspects of the work that may require statistical techniques to establish product conformance.

3.7 Statistical Techniques

3.7.1 General

For any aspect of the works identified as requiring statistical analysis to prove conformity with specification requirements the Project Manager (or his nominee) shall either use any statistical techniques highlighted by the client or if no statistical techniques are highlighted prepare a proposal which identifies the following;

- The nature of the particular statistical technique to be applied (graphical, historical, regression, etc).
- The scope and location of work applicable to the technique.
- The method for collection, analysis and reporting of results.
- The basis for acceptance or rejection of the product or lot according to the results of the analysis and, when applicable.

Where the technique is based upon samples drawn from a lot, batch or other bulk form of work, the proposal shall state a suitable random sampling method to ensure that the properties of all samples are unbiased and representative of the product as a whole.

3.7.2 Implementation of Statistical Techniques

The Project Manager shall either determine control limits or apply the specified control limits to the statistical technique and ensure the technique is incorporated in the applicable in-process checklist. The Project Manager (or his nominee) is responsible for ensuring personnel recording results are appropriately trained for analysing the recorded data and presenting the results on an established format. Any non-conforming lots shall be reworked and then re-sampled, retested and then resubmitted.

3.7.3 Compliance

Lot/Product compliance shall, when applicable, be used on the analysis of a predetermined number of samples randomly located within the lot parameters and in accordance with established guidelines (using acceptability characteristics and also mean and standard deviation).

4 References:

ISO 9001 2008 Quality Management Systems – Requirements
ISO 9004 2000 Quality Management Systems – Guidelines for Performance Improvements
AS 3905.15 1998 Guidelines to Quality in Project Management
AS 4000 1997 General Conditions of Contract
AS 4901 1998 Subcontract Conditions
AS 4916 2002 Construction Management – General Conditions

5 Tools/Forms/Documentation Generated:

[FO 102 Calibration Register](#)
[FO 103 Concrete Pour Summary](#)
[FO 104 Corrective & Preventative Action Request](#)
[FO 105 Correspondence Register](#)
[FO 106 Distribution Register](#)
[FO 107 Document Transmittal Advice Register](#)
[FO 108 Hold Point Clearance Register](#)
[FO 109 Hold Point Clearance](#)
[FO 110 In-Process Checklist](#)
[FO 111 Inspection & Test Plan](#)
[FO 112 Inspection Certificate](#)
[FO 113 Internal Distribution Register](#)
[FO 114 Lot Register](#)
[FO 115 Master Register](#)
[FO 116 Material Placement Summary](#)
[FO 117 Non-Conformance Register](#)
[FO 118 Non-Conformance Report](#)
[FO 119 Witness Point Notification](#)

CONTROL OF NON- CONFORMING PRODUCT & CONTINUOUS IMPROVEMENT



1 Purpose & Scope:

Maintain and implement procedures to ensure the reporting and discussion of non-conformance's or non-compliance that have, or could have, a potential to adversely affect the finished product and to ensure that any continuous improvement required is instigated as soon as possible. The reporting shall be such as to ensure that problems have been corrected and that methods are developed or modified to minimise the possibility of future non-compliance.

2 Responsibilities:

Project Manager

Identification, review and reporting to the Construction Manager of project related major non-conformance's. Initiating any corrective and preventative action as appropriate.

Construction Manager

Investigation and reporting of non-conformance's highlighted through cost control methods. Investigation of all major non-conformances. Initiating any corrective and preventative action as appropriate.

Engineering Systems Manager

Evaluation of non-conformance registers during auditing and ensuring any corrective and preventative action is carried out with regard to relevant requirements and standards.

3 Procedure Requirements:

3.1 Non Conformance Procedure

3.1.1 Identification and Notification of Non-Conformances

Non-conformance's and also perceived non-conformance's can be identified by any person associated with the Project - Bardavcol field personnel, subcontractors, clients and also through procedures such as cost control, auditing and also process control e.g.: in-process check-lists. When a period for non-conformance's reports to be submitted to the client is specified (usually 1 to 2 days) this shall be adhered to. For the case of a non-conformance which can be rectified by an extension of the process the client may not require notification. This will not preclude the Project Manager from reporting the non-conformance to the Construction Manager.

3.1.2 Client Corrective Actions and Complaints

All Client corrective actions issued by the Client shall be forwarded to the Construction Manager and Engineering Systems Manager as soon as possible for evaluation

3.1.3 Continuous Improvement

Continuous improvement is any action taken on an existing or perceived problem to prevent its recurrence. The reporting and promulgation of any actions taken shall be by raising a non-conformance continuous improvement report form

The Project Manager and also Engineering Systems Manager shall carry out regular reviews of non-conformances through a centralised non conformance register while a project is underway to identify any non-conformance's which either:

- Occur frequently and have a significant effect on the project.
- Obviously require a change in procedure to ensure against recurrence of a non-conformance.
- Result in serious delays or costs.

When such a non-conformance is identified, the Engineering Systems Manager, in consultation with the Project Manager and Construction Manager shall investigate the reason for the non-conformance to determine whether any corrective and/or preventative action is required.

CONTROL OF NON- CONFORMING PRODUCT & CONTINUOUS IMPROVEMENT



3.2 Documenting Non-Conformances

Non-conformance's may be documented using one or more of the following;

- A. Non-conformance / improvement report forms.
- B. In-process checklists.
- D. Site meeting minutes.
- E. Audit reports.
- F. Cost control reporting.
- G. Other means such as a defects list,

The type of documentation required will depend on the nature and severity of the problem and also client requirements.

A centralised non conformance register shall be maintained by each Project Manager or their delegate and reviewed by the ESM to identify any areas that require further action.

3.3 Review and Disposition

The Project Manager is responsible for reviewing any non-conformance's on his project and proposing the disposition.

Where required by the contract and when the disposition involves "accept as is" or "accept subject to repair/rework", the Project Manager shall notify the Client of the non-conformance and obtain the Clients agreement for the proposed disposition before proceeding.

Once authorisation is received, the Project Manager is responsible for initiating the disposition action.

Any non-conformance's highlighted through cost control methods shall be investigated by the Construction Manager and Project Manager to determine it's cause and extent. The Engineering Systems Manager, in consultation with the Construction Manager and Project Manager, shall analyse non-conformance improvement report registers, audit reports, Client observations/complaints, corrective actions and any other relevant information to detect and possibly eliminate potential causes of non-conformities. Any potential cause highlighted by a review of information shall be considered by the Construction Manager and Engineering Systems Manager (taking into consideration all aspects of the situation) who may either decide to:

- 1. Accept the situation or;
- 2. Initiate preventative action and also application of any controls to a specific project or to all Bardavcol projects

The Project Manager or Construction Manager (where appropriate) shall arrange for any proposed corrective or preventative action to be initiated without unreasonable delay and then verify the action has been effective in resolving the problem.

At the completion of a project the Project Manager shall carryout an assessment of non-conformances and report to the Construction Manager any products or work processes that may require further investigation/improvement to reduce the number of non-conformance associated with the product or work process. Within 3 months, the Engineering Systems Manager shall carry out a review of all continuous improvement actions to ensure that the appropriate changes have been implemented and are proving effective.

When the outcome of any action undertaken results in an improvement in a system procedure, the Engineering Systems Manager shall, after discussion with the Construction Manager and Project Managers, amend the system procedure to reflect the changes.

3.4 Re-testing / Re-inspection

Upon completion of any disposition required, the Project Manager or his nominee shall arrange for the item to be re-tested or re-inspected when requested by the client to establish the level of conformance with the technical requirements.

4 References:

CONTROL OF NON- CONFORMING PRODUCT & CONTINUOUS IMPROVEMENT



ISO 9001 2008 Quality Management Systems – Requirements
ISO 9004 2000 Quality Management Systems – Guidelines for Performance Improvements
AS 4000 1997 General Conditions of Contract
AS 4901 1998 Subcontract Conditions
AS 4902 2000 General Conditions of Contract for Design and Construct
AS 4916 2002 Construction Management – General Conditions

5 Tools/Forms/Documentation Generated:

Central Complaints Register

[FO 104 Corrective & Preventative Action Request](#)

[FO 108 Hold Point Clearance Register](#)

[FO 109 Hold Point Clearance](#)

[FO 110 In-Process Checklist](#)

[FO 111 Inspection & Test Plan](#)

[FO 112 Inspection Certificate](#)

[FO 114 Lot Register](#)

[FO 115 Master Register](#)

[FO 117 Non-Conformance Register](#)

[FO 118 Non-Conformance Report](#)

[FO 119 Witness Point Notification](#)

1 Purpose & Scope:

Monitors information relating to customer perception as to whether Bardavcol has met customer requirements.

2 Responsibilities:

All Bardavcol employees interfacing with customers. Any feedback from customers, good, bad or indifferent shall be reported to his / her manager.

3 Procedure Requirements:**3.1 Data Collection**

Data on customer feedback is gathered from the following sources.

- Tender process
- Post tender meeting minutes
- Project start-up meetings (TSA Partnering) / minutes
- Weekly or fortnightly Project Site meetings / minutes
- Partnering meetings / minutes
- Retrieval of Bank Guarantees on completion
- Defect notices
- Project handover / close out reports
- Customer Satisfaction Questionnaire
- Project Completion Report & meeting

3.2 Data Analysis

If there are any adverse trends that require preventive action the appropriate Manager will allocate responsibility to a staff member to undertake the appropriate corrective and preventive action. Also, the appropriate management meeting will determine the root cause of the non-conformities together with the remedial action and raise an NCR if appropriate.

The overall status of feedback from customers is considered in the appropriate management review meeting. The meeting will form an opinion on our customers' perception as to whether the company has met customer requirements.

4 References:

ISO 9001 2008 Quality Management Systems – Requirements

5 Tools/Forms/Documentation Generated:

Central Complaints Register
Customer Satisfaction Questionnaire
Project Completion Report
Project Completion Meeting Minutes
Tender process
Post tender meeting minutes
Project start-up meetings (TSA Partnering) / minutes
Weekly or fortnightly Project Site meetings / minutes
Partnering meetings / minutes
Retrieval of Bank Guarantees on completion
Defect notices
Project handover / close out reports

1 Purpose:

To minimize environmental impact caused by excessive noise emission.

2 Objective:

To comply with statutory and contractual requirements.

3 Target:

- i. Under the Environment Protection Act, 1993 Bardavcol has a “duty of care” not to pollute the environment through noisy activities. Although road, rail and public infrastructure construction work is excluded from the Environment Protection (Noise) Policy 2007, Bardavcol shall not undertake any activity that pollutes, or might pollute, the environment unless personnel undertakes all reasonable and practicable measures to prevent or minimise any resulting environmental harm.
- ii. Accordingly, Bardavcol’s target will be to comply with the provisions of the Environment Protection (Noise) Policy 2007, subject to any more stringent contractual requirement, or any concessions negotiated through a process based on DTEI Operational Instruction 21.7.
- iii. The EPNP provides that construction noise has an adverse affect on amenity if the
 - Source (site) noise level (continuous) > 45dB(A) and ambient noise (continuous)
 - Source (site) noise level (maximum) > 60dB(A) and ambient noise (maximum)
- iv. The EDNP provides that continuous noise with an adverse impact on amenity:
 - Must not occur on a Sunday or public holiday
 - Must not occur on any other day except between 7am and 7pm
- v. NB: noise from blast operations may be assumed as assessed by PIRSA under the Mining Act, 1971

4 Controls:

- a) Establish any relevant limits on noise, from:-
 - i. Contractual provisions
 - ii. Environment Protection (Noise) Policy, 2007
- b) Determine by reference to “[DTEI Operational Instruction 21.7 Infrastructure Work at Night](#), Appendix A” (see page 35), anticipated noise levels to be generated by the activity.
- c) If predicted or measured noise levels exceed the prescribed limits, develop a Noise Management Plan addressing the following matters:
 - i. Consultation measures
 - ii. Mitigation measures (refer to “d)” below)
 - iii. Approval
 - iv. Documentation
 - v. Monitoring (if required)
- d) The following mitigation measures shall be considered:-
 - i. Eliminate noise emission from source wherever possible by substitution or change of work practice
 - ii. Where practicable, use off-site or other alternative processes that eliminate or lessen resulting noise
 - iii. All plant and equipment to be regularly serviced and maintained in accordance with manufacturer’s specification.
 - iv. Plant to be fitted with appropriate noise suppression equipment.
 - v. When not in use, shut down, or throttle to a minimum, machines and plant.
 - vi. Plan and maintain traffic routes and access points to minimise noise impact.
 - vii. Plan to minimise vehicles reversing at night.
 - viii. Locate machinery compound areas and noisy machinery as far away from nearby properties as possible.
 - ix. Commence any particularly noisy part of work after 9:00a.m. if practicable
 - x. Operating equipment and handling materials so as to minimise impact noise

5 Permits/Licences:

Not applicable, however check contract requirements.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Conduct periodic environmental audits and inspections in accordance with the Project Management Plan Noise measurement where specified or prescribed under the Noise Management Plan.

8 References:

SA Environment Protection Act 1993

SA Environment Protection Regulations 2009

[Environment Protection \(Noise\) Policy 2007](#)

[EPA Guidelines for use of the Environment Protection \(Noise\) Policy 2007](#)

[EPA 425/09 Construction Noise](#)

AS 2436 Guide to Noise Control

[Environmental Code of Practice for Construction \(DTEI\)](#)

[DTEI Operational Instruction 21.7 Infrastructure Work at Night](#)

1 Purpose:

To minimize adverse environmental impact caused by atmospheric emissions.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Minimise emission of dust and gases from construction activities.
- Comply with Environmental Protection Authority emission standards for air quality.

4 Controls:

- a) Where reasonably practicable avoid activities which generate atmospheric emissions.
- b) Where reasonably practicable, substitute methods, plant & equipment which generate atmospheric emissions with suitable alternatives which generate lower emissions.
- c) Minimise airborne dust by:
 1. limiting the extent of disturbed areas & exposed soil at any time
 2. restoring disturbed areas as soon as reasonably practicable
 3. limit construction activities on windy days
 4. utilise dust suppression methods such as water carts, dust matting, seed grasses
 5. Stabilise long term stockpiles with grass, plastic or geo-fabrics
 6. cover loads when transporting dry material

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Cease activities causing non-conforming atmospheric emissions. Review root cause of non-conformance and implement corrective action measures.

7 Program Inspection:

Conduct periodic environmental audits and inspection (in accordance with the relevant Project Management Plan) to verify implementation of the work instruction.

Specific measurements are not required unless specifically directed in writing by the EPA (SA)

8 References:

Environment Protection Act 1993 *South Australia*

Environment Protection (Air Quality) Policy 2016 South Australia

Notes (for guidance only):-

- a) The Environment Protection (Air Quality) Policy 2016 South Australia prescribes [processes with the potential for air pollution, and including solid particles, specific chemicals and carbon monoxide. Generally only solid particles and carbon monoxide are likely to be relevant to the nature of our business.
- b) National Environmental Protection Measures (NEPMs) are broad framework setting instruments outlining agreed national objectives, and do not become law until enacted by NEPC in each jurisdiction. Currently NEPM in relation to air quality have not been enacted in SA.
- c) Other statutory criteria may apply, (e.g. for asbestos work) including under OH&S legislation.

WI 63.2

1 Purpose:

To minimize adverse environmental impact caused by vibration.

2 Objective:

To comply with regulatory standards and contractual requirements.

To ensure project initiated vibrations do not damage neighbouring infrastructure.

3 Target:

- No damage to neighbouring infrastructure.
- No exceedance of maximum allowable vibration level.

Note: Maximum permissible vibration levels shall be established based on a review of customer requirements and third party requirements, with reference to appropriate standards and guidelines.

4 Controls:

- Where reasonably practicable, eliminate or avoid activities which generate significant vibration in vicinity of adjacent structures by substitution or change of work practices, plant and equipment. Assess activities with potentially significant vibration generation located within close proximity of structures. As a general guide, 50m to 200m may be considered close proximity, depending on the nature of vibration source and sensitivity of the structure. The assessment shall consider potential effect's of activities and the applicable environmental conditions, ground types and integrity of affected structures. Seek advice from suitably qualified/experienced engineers where applicable.
- With the exception of blasting operation, in which case AS 2187.2 applies, there are no relevant Australian standards in respect of vibration. As a guideline Maximum acceptable vibration levels may be derived by reference to (DIN 4150 Part 3):-

DIN 4150-3 : 1999-02

Table 1: Guideline values for vibration velocity to be used when evaluating the effects of short-term vibration on structures

Line	Type of structure	Guideline values for velocity, v_r , in mm/s			
		Vibration at the foundation at a frequency of			Vibration at horizontal plane of highest floor at all frequencies
		1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz *)	
1	Buildings used for commercial purposes, industrial buildings, and buildings of similar design	20	20 to 40	40 to 50	40
2	Dwellings and buildings of similar design and/or occupancy	5	5 to 15	15 to 20	15
3	Structures that, because of their particular sensitivity to vibration, cannot be classified under lines 1 and 2 and are of great intrinsic value (e.g. listed buildings under preservation order)	3	3 to 8	8 to 10	8
*) At frequencies above 100 Hz, the values given in this column may be used as minimum values.					

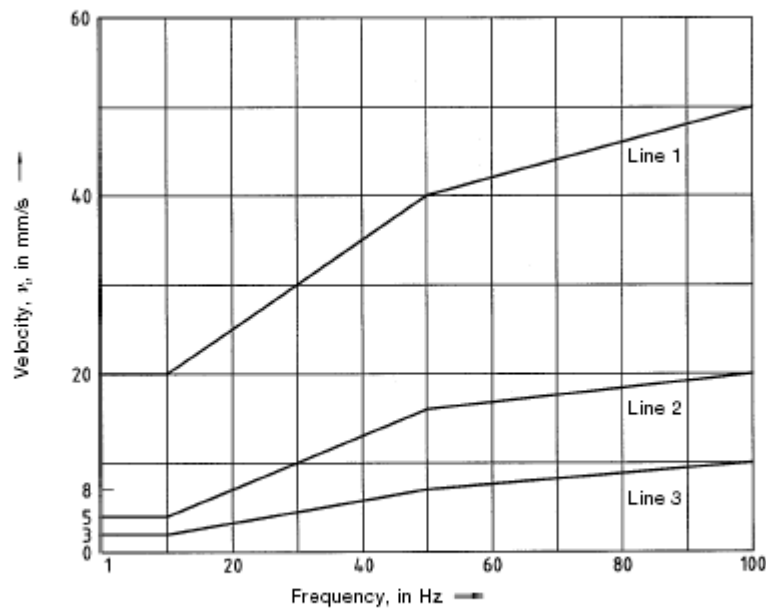


Figure 1: Curves for guideline values specified in table 1 for velocities measured at the foundation

c) Activities deemed medium to high risk shall be subject to:

- Review of consequences of activities and possible remedial actions (such as communication with relevant affected stakeholders).
- Undertaking a condition survey of structures at risk prior to commencing work.
- Approval to undertake the activities by the client's representative.
- Vibration monitoring and recording to relevant standard.

5 Permits/Licences:

Not applicable, but check customer requirements, and consult relevant authorities (e.g. gas).

6 Emergency Response:

Cease work generating excessive vibration, evaluate remedial opportunities and amend work practices or other actions as required.

7 Program Inspection:

- a) Where project activities are likely to generate vibration sufficient to damage neighbouring infrastructure, and/or where contracts prescribe it, consideration should be given to conducting and documenting surveys prior to, during and after completion of work.
- b) Conduct periodic environmental audits and inspections (as per the Project Management Plan) to verify implementation of the work instruction.
- c) Where maximum allowable vibration level are specified or established, consider measuring and documenting vibration levels at significant locations, either on a sample or continuous basis.

8 References:

BS 7385 (Part 2)
 ISO 4866
 DIN 4150 (Part 3)
 AS2187.2

1 Purpose:

To avoid unplanned fire caused by site activities.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No hot work in breach of statutory or contractual provisions
- No unplanned fires caused by site activities
- No damage to infrastructure or property
- No injury or death of fauna and flora

4 Controls:

- a) Eliminate or render safe all potential sources of sparks, flames or heat which may generate a fire. This includes but is not limited to:
 1. Use of grinding/cutting shields to ensure sparks do not interact with potential fire loads.
 2. Avoid driving vehicles and plant with hot parts (e.g. exhaust) over dry grasses.
 3. Use fire retardant materials in areas of increased fire risk
 4. Reduce potential fire loads by slashing and clearing risk areas where appropriate
 5. Identify and comply with relevant fire bans and restrictions.
- b) Appropriate and sufficient fire fighting equipment shall be provided where activities must be undertaken which have the potential to initiate a fire.
- c) Ensure an appropriate number of fire extinguishers are kept on site, appropriately signposted, located at the most appropriate locations, and kept accessible.
- d) Ensure fire fighting equipment is regularly inspected and maintained.
- e) Ensure early detection and communication of fires to local fire authorities. Provide fire awareness training to staff and contractors in increased fire risk areas.
- f) Ensure a 'first response' fire warden or fire support team is designated and trained to respond to small fires if safe to do so.
- g) Conduct fire drills on a regular basis and initiate continuous improvement.
- h) On Fire Ban Days, operating grinders, welders and cutters in open air requires:
 - Clearing the immediate area of flammable material by at least 4 metres.
 - A portable water spray bottle or hose connected to tap is at hand
 - The person using the tool is present at all times while the tool is in use
- i) Implement a Hot Work Permit system (client system where established, otherwise Bardavcol system).

5 Permits/Licences:

During Total Fire Ban days, Tools including: welding, mechanical cutting, gas appliances, angle grinding or other mechanical grinding tool, requires a Schedule 10 permit (from the Fire and Emergency Services Regulations 2005). This is obtained from the Local Council from their Fire Safety Officer.

6 Emergency Response:

Contact emergency services and report the location of the fire. Designate a person to meet the fire response crew to provide necessary direction and information. Evacuate personnel. Fight small fires if trained and safe to do so.

7 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Fire and Emergency Services Act 2005, South Australia
Fire and Emergency Services Regulations 2005, South Australia
[FO 018 Hot Work Permit](#)

WI 65: Revision 1

1 Purpose:

To minimise adverse impact on flora and fauna caused by activities.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No unplanned damage, removal, or death of fauna and flora
- No damage, removal or death of endangered or protected fauna and flora
- Protection of remnant vegetation and significant environmental areas
- Prevention, control and containment of environmental pollution

4 Controls:

- a) Identify endangered, threatened and protected species of flora and fauna relevant to project.
- b) Eliminate potential environmental risks by conducting a project specific environmental risk assessment prior to the commencement of construction activities and implementing control measures to protect fauna and flora.
- c) Delineate and protect (e.g. fence) areas identified as environmentally significant. Where physical protection is not possible, other measures such as relocation of fauna and flora may be feasible. Certain species, and their habitats, may be subject to certain protections, check with the Department for Environment and Natural Resources and Environment Protection Authority before attempting to remove or relocate flora and fauna.
- d) Inspect areas subject to clearing for fauna. Contact the client/superintendent, local Council environmental officer, Department of Environment and Natural Resources or EPA and seek to remove and relocate fauna using appropriately qualified personnel.
- e) Areas to be cleared shall be clearly marked prior to clearing commencement, and preferably reviewed with client representative to confirm correct identification.
- f) Machine operators and those involved in clearing activities to be instructed on the limits of clearing, specially protected or sensitive areas, and relevant environmental control measures.
- g) Obtain Superintendent/client and Regulatory authority to clear flora prior to clearing. The clearing of Native Vegetation is subject to a clearance approval by the Native Vegetation Council and requires submission of a detailed clearance request.
- h) The clearing/felling of large vegetation, such as trees, should be managed such that vegetation falls into the construction zone, not onto undisturbed or protected areas.
- i) Cleared vegetation to be chipped, mulched and reused where feasible.
- j) No parking under tree canopies (as this will damage roots).
- k) Plant and vehicles to remain on designated roads where possible.
- l) Utilise dye when spraying weed control chemicals to be able to identify chemical in the environment and reach of overspray. (Weed control chemicals not to be sprayed where overspray can negatively impact non-targeted species due to conditions).

5 Permits/Licences:

Native Vegetation Clearance by the Native Vegetation Council, Department of Water, Department for Environment & Natural Resources.

6 Emergency Response:

Where injured animals are found, contact the RSPCA or Fauna Rescue of South Australia for assistance. Where non-targeted vegetation has been inadvertently damaged, investigate remediation opportunities and notify the Native Vegetation Council.

7 Program Inspection:

Conduct periodic environmental audits and inspections (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

WI 65: Revision 1

Environment Protection Act 1993, Native Vegetation Act 1991 *South Australia*, Environment Protection Biodiversity Conservation Act 1999.

1 Purpose:

To minimize or eliminate soil erosion, sedimentation and pollution laden runoff caused by construction activities.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Minimise sediment laden runoff entering water bodies.
- Minimise scouring or erosion caused by uncontrolled runoff.
- Maintain all installed sedimentation control devices.
- Obtain regulatory licences prior to wastewater discharge where applicable.

4 Controls:

- a) Eliminate or minimise, activities which are likely to cause soil erosion, sedimentation or sediment laden runoff entering natural water systems.
- b) Divert natural runoff around construction areas prior to any site disturbance where possible.
- c) Prevent sediment laden runoff entering watercourses and adjoining areas by installing sediment control devices (SCD) such as hay bales or silt fences. Silt traps shall be constructed to the EPA stormwater pollution prevention code of practice. Stormwater drains to be protected by SCD such as silt socks or sand bags. SCD to be positioned at the toe of stockpiles where adverse runoff risks are identified.
- d) Maintain all installed SCD's. Repair or replace SCD's as required, remove accumulated silt and debris.
- e) Restrict vehicular movements over cleared areas.
- f) Material stockpiles to be kept clear of drainage lines.
- g) Work areas to be sealed prior to work completion each day where possible, this may include rolling and grading to ensure areas are free draining.
- h) Land under a 'soil conservation order' (Soil Conservation and Landcare Act) shall be managed according to the requirements of the order.
- i) Batter slopes to be protected with mulch, grasses or plants wherever possible.
- j) Water cleared areas exposed to high wind velocities (erosion) shall be watered or protected with wind shields such as vegetation buffers.
- k) Where site works have the potential to pollute the stormwater system/environment via runoff contamination (e.g. concrete mixing), these activities shall be appropriately contained.
- l) Vehicles, plant, trucks (e.g. concrete trucks) shall be washed down in appropriately controlled / contained zones.
- m) Concrete slurry, paints, solvents, oils and other wastes shall not be allowed to enter the stormwater system or otherwise pollute the environment and shall be handled and disposed in accordance with EW13 Solid and Liquid Waste Management.
- n) Erosion shall be controlled by the construction of catch drains, diversion drains to catch, intercept, slow and direct surface water runoff. Level spreaders, silt traps or sedimentation basins shall be constructed where required.
- o) Stabilisation and rehabilitation (e.g. revegetation) of disturbed areas shall occur where surfaces will remain unsealed.

5 Permits/Licences:

Earthworks and/or Drainage	EPA	Spoil exceeding 100 kilolitres shall not be dumped/pumped into water courses without permission from the Environment Protection Authority. An earthworks drainage licence is required where discharged water will have a concentration of suspended solids over 25 milligrams per litre.
Dredging	EPA	When disturbing bed of marine or inland waters.
Water Affecting Activity	DW*	Any activity impacting on inland waters.

6 Emergency Response:

Apply emergency controls where possible (e.g. stem runoff), review control methods and systems. Implement appropriate remediation and control actions.

7 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Environment Protection Act 1993 *South Australia*
Environment Protection Regulations 2009 *South Australia*
Stormwater Pollution Prevention Code of Practice 1999 *EPA*
Natural Resources Management Act (NRMA) 2004 *South Australia*

* Department of Water

1 Purpose:

To minimize adverse environmental impact to water bodies caused by excessive turbidity.

Note: Excessive water turbidity can significantly impact marine fauna and flora by interfering with photosynthesis and changing dissolved nutrient levels within the water body.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No irreparable damage to marine flora and fauna
- No death of marine flora and fauna

4 Controls:

- Eliminate, by design or change of work methods, the need to conduct activities in or around watercourses which have the potential to cause or increase water turbidity levels (e.g. dredging, piling etc).
- Where water turbidity measurements are required due to a risk of increased water turbidity the following turbidity standards shall apply:

Environment	Maximum allowable turbidity (NTU*)
Marine aquatic ecosystems	10 NTU
Upland and lowland river systems	50 NTU
Lakes, reservoirs & wetlands	100 NTU

- Reading to be taken in open water to remove potential for edge effects (localised runoff laden material increasing turbidity levels).
- Turbidity readings shall be taken using a calibrated electronic turbidity meter.
- Where vertical light attenuation readings are required, Secchi Depth Measurements shall be undertaken to AS3550.7 by appropriately trained employees or subcontractors.
- A written record of all measurements shall be taken, maintained and stored for the duration of the project or as contractually required.
- All equipment utilised for water quality monitoring shall be appropriately stored, maintained and calibrated.

5 Permits/Licences:

Earthworks / drainage licence (EPA), water affecting activities licence (DWLBC).

6 Emergency Response:

Cease activity / prevent turbidity migrating.

7 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Australian Water Quality Guidelines for Fresh and Marine Waters, ANZECC, 1992
Environment Protection Act 1993, *South Australia*
Environment Protection (Water Quality) Policy 2003
Natural Resource Management Act 2004
Australian and New Zealand Guidelines for Fresh and Marine Water Quality

*Nephelometric Turbidity Unit

EPA: Environment Protection Authority

DWLBC: Department of Water, Land and Biodiversity Conservation.

1 Purpose:

To protect areas and objects of cultural and indigenous heritage (sites of significance).

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Observe and report all discoveries of potential cultural and indigenous heritage.
- No damage to sites of significance or significant objects.

4 Controls:

- a) Ensure sites of significance have been identified where applicable by written confirmation from the Department of State Development, Aboriginal Affairs and Reconciliation (DSD-AAR).
- b) Where sites of significance have been identified in the project area, the area must be appropriately protected. No disturbance of sites of significance is permitted without permission from the DSD-AAR.
- c) If artefacts are located, inform the Supervisor, Project Manager, Engineering Systems Manager and Superintendent immediately (in sequential order).
- d) Upon discovery of a site, object or remains, a qualified archaeologist may be engaged and/or SAPOL to identify human remains and their origin.
- e) Cease work in the area where discoveries are made until approval is given to recommence.
- f) Construct and maintain flagging or fencing around areas where heritage discoveries have been made.
- g) Report the discovery of significant Aboriginal heritage objects to the Department of State Development, Aboriginal Affairs and Reconciliation (DSD-AAR) on 08 8226 8900.
- h) Engage Aboriginal monitors in identified sites of significance as determined by consultation with the client and AHB.
- i) Should non-aboriginal objects of cultural significance be found (e.g. early European settlement) they need only be reported if they were discovered in an area entered into the Local or State Heritage Register.

5 Permits/Licences:

Not Applicable

Note: Where destruction of a site of significance is required, authorisation pursuant to section 23 of the Aboriginal Heritage Act 1988 to damage, disturb or interfere with any Aboriginal sites, objects or remains in relation to the project may be required. This authorisation is granted by the Minister for Aboriginal Affairs and Reconciliation.

6 Emergency Response:

As above (items b, c,d,e,f)

7 Program Inspection:

Conduct periodic environmental audits and inspections (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Aboriginal Heritage Act SA1988

Heritage Places Act SA 1993

Aboriginal & Torres Strait Islander Heritage Protection Act 1984

Environment Protection & Biodiversity Conservation Act 1999

1 Purpose:

To minimise and control the spread of infectious plant diseases such as *Phytophthora cinnamomi* and *Mundulla Yellows* within government defined risk areas.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No infestation or cross-contamination between infectious matter and uninfected matter.
- No operationally caused spread of infection outside of identified infectious zones.

4 Controls:

- a) Infestation zones to be clearly identified within the operational area (either stipulated by contractual specifications or by contacting the Department of Environment and Heritage SA).
- b) Infestation zones to be fenced or otherwise appropriately delineated (e.g. pegged and marked with flagging), where a risk of cross-contamination exists.
- c) Employees and subcontractors working in infected zones to be educated on infectious plant disease controls (to be included in project induction as a minimum).
- d) Construction activities to be limited to non-infected zones wherever possible.
- e) Where work must be conducted within an infected zone, or between infected and uninfected zones, the following hygiene protocols must be observed:
 - All potentially infected vehicles/plant/equipment/clothing and footwear shall be free of soil and vegetative material when leaving an infected zone.
 - Vehicles/plant/equipment/footwear shall be thoroughly inspected and cleaned prior to leaving an infected zone. *Cleaning methodologies include:*
 - Use of a wash-down bay with a minimum fill depth of 300mm and a sodium hypochlorite to water disinfectant solution of 60mL/100L.
 - Wash-down water shall be directed into a detention basin, sump or evaporation pond.
 - Use of hand-held spray bottles treated with appropriate disinfectant (e.g. sodium hypochlorite 6mL/10L).
 - Tools such as brooms and brushes to assist in the removal of contaminants.
 - High pressure water cleaners within a bunded area.
 - The use of compressed air tools and brushes during dry conditions.

Exceptions to the above requirements may exist for specific circumstances such as :

 - where the infectious disease risk level of an area is low & may suit lower control measures;
 - in instances where topsoil and vegetative matter have been completely stripped;
 - Where plant/vehicles/equipment have remained on sealed roadways;
 - Where special contractual, legal or other appropriate dispensations have been made.
- f) Cleared infected material shall be disposed in a manner which will restrict its ability to propagate infection. Control measures include off-site disposal, mulching and dispersal of infected material in an approved infected area or burial of infected material or as otherwise directed by contractual arrangements.
- g) No infected material shall be allowed to leave the infected area without approval from the Superintendent/Client, the Environmental Protection Authority. The following infectious material transportation protocols must be implemented:
 - Covering or appropriately securing infected material during transport.
 - Providing awareness training to transportation crews.

▪ Establishing that the destination site of the infectious material is approved to receive infectious material.

- h) Where hygiene protocols are implemented, form 'FO 23 Infectious Plant Disease Control Inspection' must be completed at a minimum of 1 inspection per week or as defined by the Project Management Plan.

5 Occupational Health and Safety

- Disinfectant shall be stored and handled as per manufactures recommendations on the Material Safety Data Sheet (including use and provision of appropriate personal protective equipment).
- Compressed air and high pressure water cleaners shall not be utilised to decontaminate personnel.
- Training in the construction and maintenance of wash-down bays, decontamination methodologies and handling of disinfectants shall be provided to relevant personnel.

6 Permits/Licences:

Not Applicable.

7 Emergency Response:

Cease operations in the area of concern. Review and amend work systems where applicable. A 2m buffer zone must be established, signposted and marked where a previously uninfected area has been contaminated. Seek appropriate advice.

8 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

9 References:

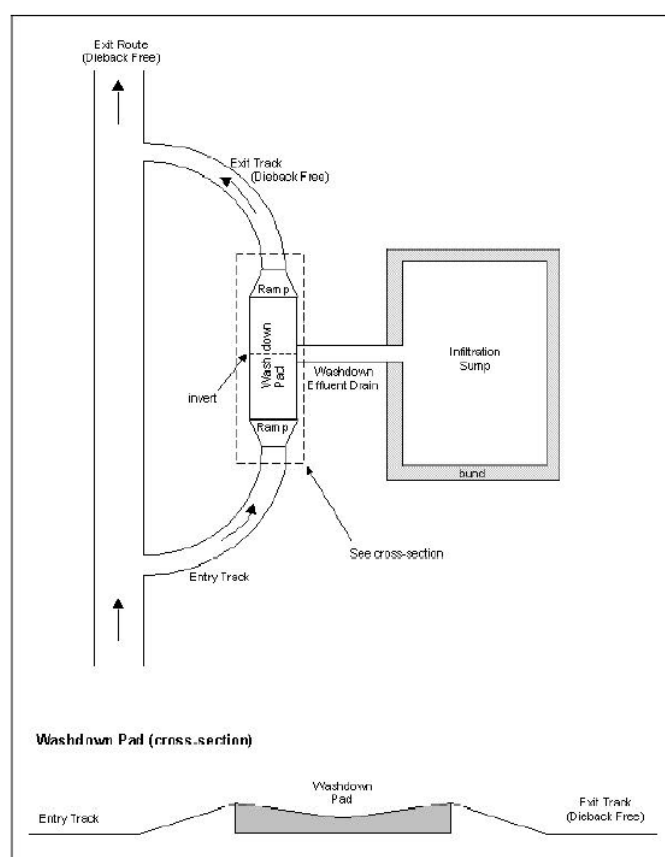
Environment Protection Act 1993 *South Australia*

Natural Resources Management Act 2004 *South Australia*

Phytophthora (Dieback) Control, Operational Instruction 21.3, Transport SA (2000).

Phytophthora Management Guidelines, Government of South Australia, Phytophthora Technical Group (2006)

Phytophthora (Dieback) Washdown Facility



Wash-down bay example:

Phytophthora (Dieback) Control,
Operational Instruction 21.3, Transport
SA (2000).

1 Purpose:

To minimize environmental impact caused by site access and egress.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No land contamination
- Minimise soil erosion, water ponding and flooding
- Minimise traffic congestion
- No injury to fauna and flora outside of the designated access/egress route.

4 Controls:

- a) All access and egress routes to be carefully planned ahead of project commencement to minimise the environmental impact. Utilise existing tracks or areas of pre-disturbed vegetation and avoid traffic congestions.
- b) Access and egress routes to be clearly signposted and delineated by flagging, fencing or other markers where practical.
- c) Monitor, and review effectiveness of site access and egress on regular intervals and amend/improve access/egress as required.
- d) Avoid construction of multiple tracks where possible.
- e) Monitor spread of site soil and mud from site and clean roads adversely affected by soil and mud deposits.
- f) Construct appropriate surface water runoff drainage to minimise flooding and erosion.
- g) Haul Roads Edge Protection:

Construction of Haul Roads Edge protection must be provided to prevent mobile plant and ancillary vehicles from being driven over an unprotected edge. All benches and roads which run alongside free edges where there is a drop, lagoon or other hazard which would put the driver, or others, at risk if the vehicle left the bench or road, shall have adequate edge protection provided.

On roads used by mobile plant the minimum recommended acceptable height of the edge protection should be the radius of the largest wheel / tyre, or as otherwise assessed via written analysis by a suitably qualified person under direction from the Project Manager. Additional protection may be needed in high risk areas such as sharp bends or steep haul roads.

The aim of the edge protection is to stop the largest, fully loaded vehicle crossing it when travelling at the maximum foreseeable speed.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Conduct periodic environmental audits to verify implementation of the work instruction.

8 References:

SA Environment Protection Act 1993
SA Work Health and Safety Act 2012

1 Purpose:

To minimize environmental impact on rural communities and landholders caused by construction activities.

2 Objective:

To maintain good standing and reputation with rural communities and landholders.

3 Target:

- No damage to infrastructure
- No loss of livestock
- No or minimal disruption to rural business

4 Controls:

- a) Eliminate or minimise the need to enter or impinge on rural landholdings by construction design and work planning.
- b) Ensure the following rural principles are implemented where no other direction is prescribed:
 - a) Leave rural gates (stock gates) as you find them. If they are open, leave them open. If gates are shut, ensure gates are shut on passing through.
 - b) Do not interfere with (feed or move) livestock or crops
 - c) Gain permission to enter rural property from landowner, if unsure of landownership don't enter land.
 - d) Utilise existing traffic paths (roads, corridors etc) wherever possible. Driving on mounds or other non-defined areas may increase soil erosion. Where there are no existing traffic paths, obtain approval before establishing any new traffic paths and ensure traffic remains in designated area.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Environment Protection Act 1993, South Australia

1 Purpose:

To minimise environmental impact caused by unplanned soil and/or water contamination (such contaminants as hydrocarbons, solvents, pesticides, heavy metals, oil etc).

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No spills or leaks of contaminants
- No destruction of flora
- No injury to fauna
- No cross-contamination

4 Controls:

- a) All potential contaminants to be appropriately stored and handled in accordance with regulatory standards.
- b) Plant and machinery to be regularly serviced and maintained to minimise potential of leaks into the natural environment.
- c) Appropriate preventative and contingency measures to be implemented when the potential exists for contaminated material to pollute the environment.

These may include:

- eliminating the risk by changing work practices or designs;
 - substituting a contaminant with a less harmful alternative product;
 - the provision of a spill response kit in close proximity to the area of greatest risk;
 - grading the land (slope adjusting) to divert potential spills away from significant areas (e.g. watercourses);
 - introducing more stringent plant and machinery inspections, or increasing inspection frequencies;
 - special contingency training of relevant employees to control potential spills or leaks.
- d) Monitor the natural environment for signs of contamination to enable early identification of pollution. Environmental monitoring may include visual inspection of watercourses, qualitative testing of surface waters and soils or groundwater testing via test bores.
 - e) Where contaminants are found in-situ within material such as soil, contaminants must be identified and stockpiled in a quarantine area to prevent cross contamination. Contaminated material must be removed and disposed (where necessary) as per legislative requirements.

5 Permits/Licences:

- Asbestos removal/transportation licence (where applicable)
- Waste transport certificate

6 Emergency Response:

Cease work in immediate area, contact the site supervisor and implement contingency plans (e.g. spill remediation). Contain the spill or area of cross contamination. Prevent contaminated run-off from entering storm water drain or watercourses.

7 Program Inspection:

Conduct periodic environmental audits and inspections (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Environment Protection Act 1993 *South Australia*

- Natural Resources Management Act 2004 *South Australia*
- SA Environmental Protection [Water Quality] Policy 2003

1 Purpose:

To minimize adverse environmental impact caused by the handling and disposal of waste materials from activities.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- No spills or uncontrolled discharge of waste
- No injury or death of fauna and flora

4 Controls:

- a) Eliminate or minimise waste materials by design or planning.
- b) Recycle materials wherever possible.
- c) Substitute stored, handled or transported waste with less harmful wastes wherever possible.
- d) Provide general, cardboard, metal and other relevant waste bins of sufficient size. Cover bins where they are subject to environmental conditions such as wind, water and vermin.
- e) Spillage response kits to be kept and maintained in areas where medium to high risk of waste spillage exists.
- f) Refuelling and maintenance activities to be planned to prevent discharge of wastes into a natural watercourse or storm water system. (I.e. bunded areas, or hardstand areas where slope gradient inhibits water flow into sensitive environments)
- g) Fuel and oil storage facilities to comply with AS1940 *The Storage and Handling of Flammable and Combustible Liquids*.
- h) Waste oil to be removed from site immediately or stored on site in a secure and bunded area and periodically removed from site to a licensed recycling facility.
- i) Disposal of waste shall be at suitably licensed waste / recycling / landfill sites. Toilet waste to be collected as required by a suitably licensed waste contractor.
- j) Concrete trucks and bitumen sprayers shall not be washed-out on site except in appropriate bunded or other approved waste catchment devices.
- k) No industrial, personal or commercial wastes shall be discharged into the natural watercourse system or storm water system, including solvents, detergents, chemicals, fertilisers and bitumen sprays.
- l) A trade waste discharge licence must be sought from SAWater prior to the discharge of any waste into the sewer system.

5 Permits/Licences:

Trade Waste Licence (SAWater), Waste Transport Certificate.

6 Emergency Response:

Spills to be rendered harmless and collected for treatment and/or disposal at an approved site.

7 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Environment Protection (Water Quality) Policy 2003
Environment Protection Act 1993 *South Australia*
Environmental Code of Practice for Construction (DTEI)
AS 1940

1 Purpose:

To minimise environmental impact and pollution caused by the storage and handling of hazardous substances.

2 Objective:

To comply with regulatory standards and contractual requirements.

3 Target:

- Responsible waste disposal.
- No waste spillage
- No pollution of environment.

4 Controls:

- a) Develop and maintain a hazardous substance register readily accessible to all employees via the company intranet system.
- b) Material Safety Data Sheets (MSDS) to be readily available and accessible for all hazardous substances used on site. Where particularly dangerous substances are used or stored, the MSDS must be displayed at the storage area.
- c) Hazchem signs to be displayed per the MSDS.
- d) The control, usage, transportation and storage of hazardous substances must be in accordance with manufacturer's instructions and relevant license requirements.
- e) Hazardous substances to be stored in a secure container, with appropriate bunding. The net capacity of a bund must be 120% of the net capacity of the largest tank.
- f) Incompatible hazardous substances must be segregated from each other. Provision must be made so that any spillage of one product can not flow and come into contact with another incompatible product. Reference the MSDS for compatibility status.
- g) All containers carrying hazardous substances to be clearly and correctly labelled with the relevant risk and safety phrases.
- h) Spill response kits to be ready and accessible at all times and monitored for replenishment of contents.
- i) The client is to be notified of spillage of hazardous substances where a potential of environmental harm/impact can occur.
- j) Store and maintain appropriate fire fighting equipment near the storage area.
- k) Relevant workers to be trained in the correct handling and storage of hazardous substances. Training to include spill response. Appropriate personal protective equipment to be utilized as per manufacturer's recommendations.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Cease work. In the event of fire, utilise fire suppression equipment if safe to do so and contact emergency services. In case of spillage, utilise spill response kits if safe to do so. Review problem/issue. Change work systems where required.

7 Program Inspection:

Conduct periodic environmental audits and inspection as per the Project Management Plan to verify implementation of the work instruction.

8 References:

Environment Protection Act 1993 *South Australia*
Dangerous Substances Act 1979 *South Australia*
Natural Resources Management Act 2004 *South Australia*
Labelling of Workplace Hazardous Chemicals SA COP 2012
Preparation of Safety Data Sheets for Hazardous Chemicals SA COP 2012
Managing Risks of Hazardous Chemicals in the Workplace SA COP 2012

1 Purpose:

To manage community expectations and minimise cause for adverse publicity.

2 Objective:

To keep all relevant community stakeholders appropriately informed of the project so that they are able to manage any impact on their activities without undue hardship or stress.

3 Target:

a) No justified complaints; no complaint not logged & investigated; no unresolved complaints

4 Controls:

b) Review contract for any specific responsibilities. Subject to compliance, proceed as follows:-

c) Identify relevant community stakeholders, such as:-

- local residents, local businesses, local schools, etc
- owners & operators of other assets in the vicinity (eg utilities & public transport providers)
- the relevant local council & emergency services

d) Establish a contact point for community stakeholders to address inquiries

- dedicated phone number (1300 number & after hours, if appropriate) and/or email address
- nominated project officer to initially intercept inquiries (project manager or delegate)

e) Induct project team:-

- Brief all staff on this procedure EWI-15
- During site induction brief all inductees on how to respond to public contact
- Ensure all project staff are empowered to intercept complaints & initiate response

f) If appropriate, conduct pre-construction meetings with key stakeholders & community representatives to ascertain any special requirements or constraints.

g) Develop appropriate display materials such as leaflets, letters/notices, brochures, stickers, posters for use in meetings & public information events.

h) Provide appropriate advance information to relevant, targeted stakeholders, such as:-

- advance notice of works (by e.g. letter drop, advertisement, VMS, website, email, etc)
- notification of contact number for inquiries & complaints (as above, or contact "card")
- in particular, notice of any pedestrian & traffic diversions, road closures, service interruptions & night-works

i) Manage complaints effectively:-

- i. Treat all complaint courteously, sensitively & responsibly
- ii. Log all complaints in a complaints register, & capture all relevant details
- iii. Ensure someone is tasked to investigate every complaint promptly & initiate any necessary corrective action within an appropriate timeframe
- iv. Provide the complainant with a prompt response & explanation of action (& log details)
- v. Provide regular feedback to the client

j) Provide appropriate feedback to members of the community in response to questions, concerns or complaints

k) Provide a mechanism for continuous improvement through discussion at site meetings, toolbox meetings & project staff meetings

5 Permits/Licences:

Generally not applicable, but review relevant contract specifications, legislation & regulations in respect of prescribed activities.

6 Emergency Response: Refer Emergency Response Plan for the respective project.

7 Program Inspection: Refer internal audit schedule for each project.

8 References:

ISO 9001, 2008

Environment Protection Act (SA) 1993 & associated regulations, policies & guidelines

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WORKPLACE GRIEVANCE



1. Purpose:

To provide an appropriate process for receiving, investigating and addressing complaints made by Bardavcol employees and other workers in relation to any workplace grievance concerning any act or omission by management or by other persons at the workplace, including discrimination, harassment, bullying, or any other employment-related behavior or decision.

2. Objective:

To resolve all legitimate complaints promptly, fairly and, where appropriate, discreetly and confidentially in accordance with established policies and statutory obligations.

3. Targets:

No legitimate complaint unresolved.

No consequential reprisals against complainant(s) or person(s) accused by complainant.

4. Process:

4.1. Employment Conditions and Related Matters

4.1.1. Employees covered by an Enterprise Agreement:

Complaints, grievances and disputes pertaining to employment conditions or other matters arising under an applicable enterprise agreement shall be administered in accordance with the dispute resolution provisions of the relevant enterprise agreement.

4.1.2. All other employees:

For all other employees, complaints, grievances and disputes pertaining to employment conditions or other related matters shall be resolved in accordance with the following process:

- a) Initially, the employee may discuss the matter with their immediate supervisor or manager
- b) If not satisfactorily settled within twenty four hours of provision of all relevant information, or in cases where the matter is of such a nature as to warrant the omission of the previous step, the employee may discuss the matter with the General Manager.
- c) If not satisfactorily settled within twenty four hours, the issue shall be resolved by the Managing Director.
- d) At any stage in this process, an employee who is a party to the complaint, grievance or dispute may appoint a representative to assist or act as an advocate in this process.

4.1.3. Workers who are not Bardavcol employees:

- a) Where the complaint concerns matters for which Bardavcol are responsible (eg. site amenities), they shall be dealt with generally in accordance with the procedure at 4.1.2.
- b) Where the complaint concerns other employment conditions or related matters, the responsible Bardavcol project manager shall ensure the matter is referred to the worker's employer and addressed in accordance with the terms of the contract between Bardavcol and the worker's employer.

4.2. Equal Opportunity, Discrimination and Harassment

4.2.1. General Principles:

- a) Complaints concerning allegations of discrimination and harassment shall be addressed strictly in accordance with the provisions of the relevant company policies.
- b) All complaints shall be investigated and resolved promptly, fairly and confidentially.
- c) Employees accused of workplace discrimination or harassment shall be treated in accordance with the principles of natural justice. This includes the right to know full details of allegations against

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them, a right of reply to those allegations, the presumption of innocence until evidence shows otherwise and the benefit of any reasonable doubt.

- d) Any complaints involving physical violence or other criminal activity shall be referred directly to the police or other appropriate authority.
- e) At all times during the process, Bardavcol shall monitor the work situation and ensure that neither the complainant nor the accused suffers further discrimination or harassment or vilification. This may involve separation of the employees concerned or suspension of employment pending the outcome of the investigation.

4.2.2. Grievance Officers

- a) Due to the potentially sensitive nature of complaints concerning discrimination and harassment, and potential impacts on both the complainant and the accused, Grievance Officers shall be appointed as an alternative point of initial contact for complaints.
- b) Unless otherwise notified, Grievance Officers shall be:-
 - The person holding the position of Office Manager, subject to this officer being female.
 - The person holding the position of Engineering Systems Manager
- c) A Grievance Officer's role is to receive complaints and take appropriate action as specifically detailed in 4.2.3 of this procedure in respect of their responsibilities.

4.2.3. Process:

- a) Initially, the complainant may speak to the person causing them the problem, or may discuss the matter with their immediate supervisor or manager, or, if appropriate, a Grievance Officer. With the complainant's approval, the supervisor or manager or Grievance Officer may speak to the person(s) involved in the matter, and attempt to resolve the matter.
- b) If the matter remains unresolved after these informal procedures, the complainant can make a formal complaint in writing to their supervisor, manager or Grievance Officer, detailing the nature of the grievance, the date and time of the initiating incident(s), the names of any witnesses, the date of making the complaint, and their signature.
- c) Once a formal complaint is received, the supervisor, manager or Grievance Officer, as the case may be, shall notify the Managing Director or General Manager, as appropriate according to their respective organizational responsibility, who will appoint a person to investigate the complaint.
- d) Details of the alleged complaint shall be investigated promptly and discreetly in an attempt to gather objective evidence related to the complaint. Complaints shall be resolved on the basis of objective evidence.
- e) Where appropriate, and only if the complainant consents, mediation may be conducted in an attempt to resolve the matter, according to the following principles:-
 - An appropriate mediator, not directly involved in the matters the subject of the complaint, shall conduct and control the mediation. This may be the Grievance Officer or a senior manager, as appropriate.
 - Participation by all parties shall be voluntary, and the mediation may be suspended or terminated at any stage if requested by a party or determined appropriate by the mediator.
 - Focus shall be on the behavior of concern and resolve to change the behavior, rather than a disciplinary response
- f) At any stage in this process, a complainant may appoint a representative to assist or act as their advocate in this process.
- g) In the case of informal complaints successfully resolved, the Managing Director or General Manager, as appropriate, shall determine whether a formal record should be held on file.
- h) Following the investigation of a formal (ie written) complaint the complainant shall be informed of the outcome, including any action to be taken by Bardavcol and the reasons for that response, and a record of the matter will be held on the personnel file of both parties to the complaint.

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- i) If the complainant is not satisfied with the way in which their grievance was handled, or is unhappy with the outcome, they may refer the matter to the Managing Director or General Manager, as appropriate, or to a relevant statutory authority.
- j) An employee against whom a complaint of discrimination or harassment is proven beyond reasonable doubt shall be subject to disciplinary action as appropriate, which may include a verbal warning, a written warning, loss of discretionary privileges, or termination of employment

4.2.4. Grievances involving personnel other than Bardavcol employees:

- a) Where a complaint is made against a Bardavcol employee by a person other than a Bardavcol employee, the complaint shall be investigated in accordance with the same process as applicable to complaints by a Bardavcol employee.
- b) Where a complaint is made by a person against a worker who is employed by a subcontractor engaged by Bardavcol, the responsible Bardavcol project manager shall ensure that the complaint is appropriately addressed in consultation with the respective subcontractor, and if not satisfactorily resolved, arrange removal of the worker from site.

5. Permits / Licenses: None applicable.

6. Competencies:

Grievance officers, mediators, Operations Manager, Construction Manager, General Manager and Managing Director shall each have a basic working knowledge of the relevant legislation as referenced.

7. Emergency Response:

At any stage during the handling and resolution of a complaint, grievance or dispute, should it become apparent that any party is threatened or harassed or at risk of harm by any of the other parties to the matter, the officer in charge of the matter at that stage shall temporarily suspend the process and take appropriate action, which might include separation of parties, escalation to more senior manager, and/or notification to police or other authorities.

8. Program Inspection & Review:

Annual review of complaints notified and complaints resolved.

Annual reporting to Equal Opportunity Commissioner For Women in the Workplace

9. References:

- 9.1. *Work Health & Safety Act (SA) 2012*
- 9.2. *Racial Discrimination Act 1975*
- 9.3. *Sex Discrimination Act 1984*
- 9.4. *Disability Discrimination Act 1992*
- 9.5. *Australian Human Rights Commission Act 1986*
- 9.6. *Age Discrimination Act 2004*
- 9.7. *Equal Opportunity for Women in the Workplace Act 1999*
- 9.8. *Equal Opportunity Act (SA) 1984*
- 9.9. *Racial Vilification Act (SA) 1996*

10. Tools / Forms:

FO.005 Incident Report Form

FO.206 Interview Record

Description: Loading and unloading mobile plant

Potential Hazards

- Roll or turn over of plant
- Overhead services (eg. electrical)
- On ground services
- Uneven, sloping ground
- Ground conditions (eg. mud)
- Ramp and trailer surface conditions (eg. moisture, frost)
- Ramp surface and plant interface (eg. metal on metal)
- Pedestrians
- Traffic (including road, rail)
- Manual handling (eg. lifting, pushing, pulling)
- Crush, pinch points (eg. lowering, raising ramps)
- Adjacent activities (eg. subcontractor interfaces)
- Weather (eg. rain, frost)

Minimum requirements

- Locate the truck and trailer on even and stable ground, engage the hand brake and install wheel chocks (where ground slopes)
- Ensure that there is a clearance of at least 3 metres between any part of the plant and electrical cables and related services (eg. distribution boards) during the loading/unloading process
- Flashing light and hazard lights engaged
- Spotter to be used during loading/unloading activities
- Agreed communication protocols with spotter (UHF, hand signals, verbal)
- Pre-inspection of ramps, truck and trailer to evaluate conditions (eg. moisture, debris)
- Confirm weight of plant and any attachments is within safe load limits of ramps, truck and trailer
- Pre-inspection of chains and restraint points to ensure that they are in good condition
- Ensure plant and any attachments are carefully, accurately and firmly secured
- PPE: Hi-vis vest/clothing, safety boots, hard hat, gloves, glasses, as a minimum (note: additional PPE may be required, according to site specific requirements)
- Establish exclusion zone around the loading and unloading area to demarcate the danger zone (note: this may involve the use of 't-tops', cones, bollards etc)

All plant that is driven onto, or off a truck and trailer using ramps, must be fitted with ROPs

Additional traffic management controls may be required, subject to the location of the loading/unloading area, separation distance from traffic routes and risk of injury.

A SWMS, Job Task Card or equivalent risk assessment must be completed prior to loading and unloading mobile plant that documents the task specific hazards and controls. Personnel involved in the loading and unloading activity must be consulted in this process and confirm that they understand the hazards and agreed controls (ie. "sign on" to the risk assessment).



Audit and Inspection Procedure

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1 PURPOSE

This procedure outlines the audit and inspection processes to:

- ensure conformance with:
 - Bardavcol's Integrated Management System (eg. policies, procedures);
 - ISO9001, AS/NZS 4801 and ISO 14001 standards;
 - Office of the Federal Safety Commissioner accreditation;
 - project specific requirements (eg. contract, project controls);
- ensure that corrective action is taken to remove or rectify any issue/s that may lead to harm to people, property or the environment;
- facilitate continuous improvement of the Integrated Management Systems and its operations (eg. projects); and
- facilitate communication and consultation processes across Bardavcol and with relevant stakeholders (eg. subcontractors).

2 SCOPE

This procedure applies to Bardavcol's operations, including projects and workplaces under its control.

3 DEFINITIONS

Auditor	A person who has the training and / or experience to perform audits.
Corrective Action	An action to eliminate the actual or potential cause of a non-conformance or non-compliance
Internal Audit	An audit performed by, or on behalf of, Bardavcol to assess compliance with the IMS, relevant standards and legislation (also referred to as a 'First Party Audit')
Non-conformance	A non-fulfilment of a process or product requirement (includes non-compliance)
Second Party Audit	An audit performed by a client or another organisation that Bardavcol provides services to. It includes audits that form part of a pre-qualification or similar process
Third Party Audit	An independent audit conducted by an accreditation body or organisation (eg. TQCSI, OFSC) against recognised standards or criteria (eg. Australian / International Standards, OFSC criteria).
Worker	A person that carries out work and includes a Bardavcol employee, contractor or subcontractor, an employee of a contractor or subcontractor, an employee of a labour hire company that is working on or in relation to a Bardavcol project, an outworker, apprentice or trainee, a person on work experience, a volunteer
Workplaces	A place where work is carried out and includes: <ul style="list-style-type: none">• any place where a worker goes, or is likely to be, while at work;• a vehicle, vessel, aircraft or other mobile structure;• any waters and any installation on land, on the bed of any waters or floating on any waters.

4 RESPONSIBILITIES

Bardavcol, so far as is reasonably practicable, is responsible for ensuring:

- that this procedure is understood and applied by its employees;
- that appropriate resources are available to ensure that internal audits and inspections are conducted in accordance with this procedure; and
- that employees are provided with the tools, training and support required to effectively perform internal audits, inspections, reviews and implement corrective actions.

Project Managers are responsible for ensuring:

- the implementation of this procedure as appropriate to their project and documented in the Project Management Plan;
- appropriate resources are available to enable inspections to be conducted in accordance with this procedure;
- corrective action plans are prepared in accordance with this procedure;
- corrective action is taken to address non-conformance and other issues identified through the inspection and audit process;
- evidence of close out of corrective actions is collected, filed and provided to the QSE Manager;
- findings from audits and inspections are communicated to workers on the project; and
- the inspection processes for the project are evaluated and revised, as appropriate to manage the hazards and risks.

Engineers and Supervisors are responsible for:

- conducting inspections in accordance with this procedure and the Project Management Plan;
- participating in internal, second and third party audits as required;
- ensuring corrective actions are implemented (as required) within the specified timeframes and that evidence of close out is collected and filed appropriately;
- assisting with the communication of findings from audits and inspections to workers on the project; and
- contributing to the evaluation and revision of the inspection processes for the project, as appropriate to manage the hazards and risks.

Subcontractors are responsible for:

- performing regular inspections of their own activities and processes to evaluate the effectiveness of their safe systems of work (eg. SWMS) and other controls;
- participating in Bardavcol's audit and inspection processes, as required;
- ensuring corrective action is taken to address non-conformance and other issues identified through the inspection and audit process, which relate to their activities and workers; and
- communicating and consulting with their workers on findings from the audit and inspection process applicable to their scope work.

Workers are responsible for ensuring:

- they participate in audits and inspections appropriate to their role and responsibilities; and
- they implement corrective actions, as required and within the specified timeframes.

Quality Safety Environment Manager is responsible for ensuring:

- the implementation of this procedure, as defined in the sections below.

5 PROCEDURE

Audits and inspections are required to facilitate continuous improvement and evaluate the effectiveness of:

- processes that identify and assess hazards/risks;
- controls that are implemented to eliminate or minimise risk; and
- the IMS and other processes that support Bardavcol's operations (eg. training and competency, communication and consultation).

They also enable the identification of positive performance, opportunities for improvement and corrective action required to eliminate or minimise risk, maintain compliance and conform to project specific requirements (eg. contract). This includes the effectiveness of communication and consultation processes and

This procedure outlines the audit and inspection processes applicable to workplaces under Bardavcol's control.

5.1 Audits

Audits are systematic and documented processes that objectively evaluate compliance against a defined set of criteria, based on the availability of relevant evidence (eg. records, test results, other information that is verifiable). Audit criteria are typically based on external standards (eg. ISO 9001, AS 4801, ISO 14001), legislation and other

statutory requirements (eg. Codes of Practice) and Bardavcol's Integrated Management System (IMS) and may vary according to the organisation that conducts the audit and the purpose of the audit.

The following sections outline the management of internal, second party and third party audits.

5.1.1 Internal Audits

5.1.1.1 Planning

The QSE Manager has overall responsibility for the planning and scheduling of internal audits for Bardavcol and the follow up process, which may include closing out of corrective actions. Planning will be done in consultation with other managers and include:

- scheduling internal audits to be conducted at appropriate times, based on the type, complexity, risk profile, client expectations and location of active projects;
- scheduling internal audits to be conducted at planned intervals to determine conformance with the IMS and consideration of previous audit findings, corrective actions and the importance of specific elements of the IMS;
- recording the scheduled audits in the Audit Schedule;
- defining the audit criteria, scope, frequency and method;
- selecting auditors based on their experience, knowledge and competence;
- reviewing audit outcomes and initiating corrective actions through the Bardavcol Corrective Action and Audit Register and reviewing relevant evidence, where required;
- following up on and verifying the adequacy of corrective actions implemented; and
- Identifying and acting on opportunities for improvements where possible.

5.1.1.2 Auditor Competency

Internal lead auditors must meet the following criteria:

- a) have a minimum of 5 years experience managing operational processes and resources required to implement third-party certified quality, safety and/or environmental management systems and be able to demonstrate that they have a sound knowledge of Bardavcol's Integrated Management Systems (eg. Project Manager, Construction Manager, Operations Manager); or
- b) have completed an auditor training course in the areas of quality, safety and/or environment and have a minimum of 3 years experience in roles involving the development and implementation of quality, safety and/or environmental management system

Other members of an internal audit team are not required to meet the above requirements, but should have sufficient knowledge and experience in the activities/processes that are to be audited. Auditors must be independent from the area which is being audited, unless it is not reasonably practicable for this to be achieved due to the timing and location of the audit.

5.1.1.3 Audit Programme

The QSE Manager is responsible for preparing an audit schedule for Bardavcol at the start of the calendar year for the following 12 month period. The audit schedule is based on the number, type and scope of active/anticipated projects, client/contract audit requirements, project location, project risk profile and project team requests.

Due to the difficulty in forecasting the number, type, commencement and duration of projects that will be won at the start of the calendar year, the audit schedule will be reviewed quarterly and updated to confirm the internal audits that will be held for the ensuing 3 month period (as a minimum). In general, a minimum of two internal audits will be conducted per quarter.

The audit schedule is maintained by the QSE Manager and includes details of proposed and completed audits.

5.1.1.4 *Audit Preparation*

When preparing for the internal audit, the auditor should:

- review the results from previous audits that were conducted on the project, element of the IMS, or element of the applicable standard and any existing open corrective actions;
- develop a high level audit plan against which to conduct the audit in consultation with the QSE Manager;
- notify and liaise with the relevant Project Manager to facilitate the necessary planning arrangements, including audit purpose, scope, frequency, resources and methods;
- conduct the audit using the Internal Audit form; and
- notify the QSE Manager of any internal audits so that they can update the audit schedule.

5.1.1.5 *Conducting Internal Audits*

In general, internal audits must be conducted in accordance with the following:

- an initial briefing is held with the audit participants prior to the audit commencing to discuss the purpose, scope, any changes since the previous audit (if applicable) and specific processes that may need to be addressed;
- the auditor will collect sufficient 'objective evidence' throughout the audit to determine the level of compliance against the applicable IMS requirements, legislation and standards;
- the method of collecting this evidence may include but is not limited to:
 - interviewing project team members and workers;
 - reviewing documentation and records (eg. completed forms, training records); and
 - observing tasks/activities.

The auditor must ensure that a final briefing is held with the Project Manager and/or the relevant project team members. The briefing may also extend to Senior Management and subcontractors (where appropriate). The purpose of the final briefing is to:

- review the audit findings and highlight areas of positive performance;
- clarify/resolve any findings that are unclear or disputed to avoid ambiguity;
- discuss possible corrective actions and target time frames for their implementation;
- discuss opportunities for improvement identified; and
- explain the process of issuing the audit form and any follow up that is required to address areas of non-compliance observed.

The audit form will be issued to the Project Manager and/or relevant project team members for review and action and will include:

- audit details (eg. project reference, date, auditor, other present);
- audit findings and classification (eg. compliant, non-compliant);
- details of the evidence collected or sighted; and
- suggested corrective actions.

The Project Manager must ensure that the Corrective Action Plan (if required) to address any non-conformances identified during the audit is completed within 7 days of its receipt and returned to the QSE Manager. The Corrective Action Plan must refer to non-conformance listed in the audit report and provide details of the proposed corrective action, person responsible for implementing the action and target implementation date.

5.1.2 **Second Party Audits**

The QSE Manager must be notified of any second party audits of a project or element of the IMS to be conducted by a client or other organisation and provided with a copy of the audit report that is issued.

The QSE Manager will update the Audit Schedule to include details of the second-party audit and ensure that audit findings are recorded in the Bardavcol Corrective Action and Audit Register.

A Corrective Action Plan will be prepared by the Project Manager (for project audits) or the QSE Manager (for IMS audits) to address any non-conformances identified during the audit. This plan must be completed within 7 days of receiving the audit report and a copy provided to the QSE Manager. The Corrective Action Plan must refer to non-

conformance listed in the audit report and provide details of the proposed corrective action, person responsible for implementing the action and target implementation date.

5.1.3 Third Party Audits

Third party audits are typically performed for the purpose of surveillance (ie. interim check on compliance) or re-certification/accreditation by an accredited or statutory organisation.

The QSE Manager is responsible for:

- liaising with the third party audit organisations and their auditors in relation to the scheduling, location and scope of the audit to be performed;
- liaising with the relevant project teams/workers/areas of Bardavcol that will be audited;
- attending the audits (including the entry and exit meetings) and providing support to relevant project teams/workers and areas;
- receiving the audit report;
- coordinating the preparation and submission of Corrective Action Plans and other documentation requested by the certification/accreditation organisation;
- updating the Bardavcol Corrective Action and Audit Register; and
- communicating the audit findings, as appropriate to the organisation.

Project Managers must ensure that project specific corrective actions are implemented within the agreed timeframes and that evidence of the 'close out' is collected and provided to the QSE Manager.

The QSE Manager must ensure that evidence of 'close out' of corrective actions is collected, filed and referenced in the Bardavcol Corrective Action and Audit Register in readiness for review at the next third-party audit.

5.2 Inspections

Inspections are primarily project/activity focused and involve the assessment of a task/process, behaviour, product, service or installation to determine its conformance or compliance with specified requirements, such as:

- Project specifications
- Australian or International Standards
- Bardavcol's IMS
- Project Management Plan and Risk Register
- SWMS, permits and other safe systems of work
- ITPs, IPCs and other quality control and assurance processes
- Project specific controls or requirements (eg. rules communicated through an induction)

The process should identify positive performance (eg. compliance, beyond compliance, innovation) and areas that require improvement or immediate action to ensure compliance or to eliminate or minimise risk.

The minimum types and frequency of inspections are listed in Table 1 and 2. Projects may require more frequent or additional inspections to be performed based on the complexity and risk profile of a project and/or other project specific requirements (eg. contract). The project specific inspection requirements must be detailed in the Project Management Plan.

Priority must be given to inspecting tasks/activities that are assessed as high risk or are defined by legislation as high risk work (eg. excavation, demolition, confined space, risk of falls). Where reasonably practicable, inspections should be undertaken in the early stages of work to ensure that the required controls are in place and are effective.

Additional and unplanned inspections should be carried out:

- if the scope or method of work has changed;
- if directed by senior management or the Quality Safety Environmental Manager (QSEM);
- as part of the incident investigation process, where an incident has occurred due to failure of a control; and/or
- as requested by a client or external authority.

The project induction must include information on the inspection processes that apply to the project and encourage workers to participate in the process. Inspection outcomes and feedback should be communicated to workers through Daily Pre-Start Meetings, Toolbox Talks, Bulletins and other forums, as required.

Table 1 – Minimum Inspection Requirements for Projects

Type	Description	Frequency (minimum)	By Whom
Safety Inspection	A checklist to ensure that project wide safety controls are implemented	Within 2 weeks of site establishment and monthly thereafter	Nominated Project Team Member(s)
Environmental Inspection	A checklist to ensure that project wide environmental controls are implemented	Within 2 weeks of site establishment and monthly thereafter	Nominated Project Team Member(s)
SWMS Task Observation	Ensures that tasks/activities are carried out in accordance with the relevant SWMS, Permits and agreed controls and facilitates open consultation with workers	1 per Month	Each Project Team Member
Hazard Observation	Records hazards and positive observations made at anytime or during scheduled site walks or visits.	1 per Month	Each Project Team Member

*Project Team Members includes Project Managers, Project Engineers and Supervisors

Table 2 – Minimum Inspection Requirements for Bardavcol's Dry Creek Facility and Senior Managers

Position	Inspection Type (recommended)	Inspection Frequency (minimum)
Operations Supervisor	Dry Creek Inspection Hazard Observation	1 per month
QSE Manager, Construction Manager, Operations Manager,	Safety or Environmental Inspection, SWMS Task Observation, Hazard Observation	1 per month
Managing Director	Safety or Environmental Inspection, SWMS Task Observation, Hazard Observation	1 every 6 months

Inspections should be undertaken by workers who have sufficient knowledge and experience of the relevant processes and activities. The inspection or review must be carried out within a reasonable time and, where reasonably practicable, in conjunction with the workers responsible for the work area or tasks/activities being inspected.

Positive behaviour, hazards/aspects, non-compliance or other issues identified during the inspection must be recorded on the relevant form and the responsible workers/organisations notified to ensure prompt attention and implementation of corrective actions. Where the task/activity observed presents a risk of harm to workers, property or the environment, the work must stop until the agreed corrective action has been successfully implemented. Corrective actions that cannot be implemented at the time are to be entered into the project corrective action register to ensure that they are tracked and "closed out" with the agreed timeframe.

Where the hazard/aspect, non-compliance or issue is:

- a result of negligent or reckless behaviour;
- a significant deviation from the IMS or legislative requirements; and/or
- a high potential incident (ie. dangerous occurrence, a serious near miss;

it must be reported as a 'hazard', 'near miss/hit' or 'incident' and may result in disciplinary action.

The worker performing the inspection must ensure that the inspection document remains "open" until such time that all of the actions required have been completed and their implementation confirmed.

5.3 Communication and Consultation

Communication and consultation with workers on findings, trends and other information relating to audits and inspections will occur through various forums and may include the Bardavcol Safety Committee, Bulletins, monthly performance reports, Daily Pre-Start Meetings, Toolbox Talks and presentations.

Where appropriate, the communication and consultation process will extend to subcontractors, clients and other project stakeholders to facilitate the sharing of information and continuous improvement.

6 REVIEW

The implementation of this procedure and effectiveness of the internal audit, inspection and related corrective action processes will be assessed through internal system audits and third-party audits. Areas for improvement, including non-compliance that is identified will be addressed at a project and organisation (eg. corporate) level, as appropriate.

7 RECORDS

Records of inspections, reviews, audits and related corrective actions (including evidence/confirmation of implementation) must be retained in the project file and archived in accordance with the Document and Record Control Procedure.

The QSE Manager must ensure that records of audits and related corrective actions (including evidence/confirmation of implementation) are retained in the Bardavcol Corrective Action and Audit Register and archived in accordance with the Document and Record Control Procedure.

8 REFERENCES AND RELATED DOCUMENTS

ISO 9001:2016 Quality Management Systems
ISO 45001:2018 Occupational Health and Safety Management Systems
ISO 14001:2016 Environmental Management Systems
Office of Federal Safety Commissioner Audit Criteria Guidelines
SWMS Task Observation (FO-2007)
Hazard Observation (FO-2006)
Safety Inspection (FO-2005)
Environmental Inspection (FO-2008)
Internal Audit Form
Audit Schedule
Audit Register

1 Purpose:

To minimize environmental impact on rural communities and landholders caused by construction activities.

2 Objective:

To maintain good standing and reputation with rural communities and landholders.

3 Target:

- No damage to infrastructure
- No loss of livestock
- No or minimal disruption to rural business

4 Controls:

- a) Eliminate or minimise the need to enter or impinge on rural landholdings by construction design and work planning.
- b) Ensure the following rural principles are implemented where no other direction is prescribed:
 - a) Leave rural gates (stock gates) as you find them. If they are open, leave them open. If gates are shut, ensure gates are shut on passing through.
 - b) Do not interfere with (feed or move) livestock or crops
 - c) Gain permission to enter rural property from landowner, if unsure of landownership don't enter land.
 - d) Utilise existing traffic paths (roads, corridors etc) wherever possible. Driving on mounds or other non-defined areas may increase soil erosion. Where there are no existing traffic paths, obtain approval before establishing any new traffic paths and ensure traffic remains in designated area.

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Not Applicable.

7 Program Inspection:

Conduct periodic environmental audits and inspection (as per the Project Management Plan) to verify implementation of the work instruction.

8 References:

Environment Protection Act 1993, South Australia



[Project No.] – [Project Name]

Dredging and Earthworks Drainage Management Plan

Rev	Prepared by			Reviewed by			Approved by		
	Name	Initials	Date	Name	Initials	Date	Name	Initials	Date

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1. Introduction

This plan provides information on the management of dredging and earthworks drainage to be performed, as part of the delivery of the [insert project name] project, in accordance with Bardavcol's EPA Licence (No. 22303) and with regard to the Project Management Plan and project specifications.

The plan provides details on the location and method of dredging and earthworks drainage, associated hazards and aspects, controls to prevent or minimise environmental impacts and monitoring measures to evaluate the effectiveness of the controls.

2. Project Summary

Client:	
Location:	
Scope of Works:	
Commencement Date (estimated):	
Duration (estimated):	
Project Manager:	
Supervisor:	

3. Dredging and Earthworks Drainage

3.1. Location

The site layout plan (Figure 1) indicates the location of

- the dredging zone;
- controls that will be installed to contain / minimise the impacts of the dredging / earthworks drainage activities; and
- water quality monitoring points.

[add additional figures if required to illustrate the more details of the location, depth and stages of the proposed dredging activities]

[add additional text if required to explain the purpose of the dredging, the existing conditions and environmental values and any other considerations such as neighbouring activities]

3.2. Methodology, including plant and equipment

It is anticipated that [XX] m³ of dredge spoil will be removed using the following methods:

- [Insert details of the method, plant and equipment relating to stages if applicable]
- [Insert details of the method, plant and equipment relating to site establishment ie. installation of controls, background monitoring]
- [Insert details of the dredge method, plant and equipment]
- [Insert details of the spoil and wastewater/runoff management on site]

- [reference the site layout plan and other drawings to indicate the location and design of spoil storage etc]
- [Insert details of the spoil removal, referencing any EPA licence requirements for transporters etc]

3.3. Notification to the EPA

The Project Manager will ensure that the EPA is notified in writing and at least 7 days prior to the commencement of dredging works of the site address, location of the dredging activities and proposed dredging dates.

3.4. Assessment of Affected Waters and Spoil

An assessment of the waters that will be affected by the dredging and substrate to be removed (ie. spoil) has been undertaken by [insert details]. Key findings applicable to the dredging activities are as follows:

- [insert details on water quality eg. pH, turbidity/suspended solids, salinity, temperature]
- [insert details on sediment sampling/visual assessment eg. pH, metals, nutrients, pesticides]
- [comment on the potential for acid sulfate soils]

Based on the above findings, the following environmental values apply to the management and monitoring of the spoil and supernatant:

- [insert the applicable limits eg. pH, turbidity, DO etc]
-

3.5. Controls

Controls will be implemented to eliminate or minimise (as per the hierarchy of controls) the impact of dredging and earthworks drainage activities, storage of spoil and management of runoff on the [insert the area that may be affected]. Controls with reference to key activity areas are listed below.

Dredging zone

- [insert details of controls to mitigate movement of sediment out of the dredge zone and the monitoring that will be performed]

Removal and Transfer of spoil

- [insert details of how activity will be performed and controls eg. spoil will loaded directly into trucks and transferred to the spoil storage area]

Spoil storage area

- [insert details of design/construction of storage area and how it will be managed]
- [insert details of water quality monitoring that will be performed eg. parameters, frequency]

Disposal of spoil

- Spoil classified as 'Waste Fill' will be transported to the [insert details of location and operator] for disposal
- Spoil classified as 'Intermediate Waste Soil' will be transported by trucks that hold an appropriate EPA Waste Transporter Licence to [insert details of location and operator] for disposal
- Spoil classified as 'Low Level Contaminated Waste' will be transported by trucks that hold an appropriate EPA Waste Transporter Licence to [insert details of location and operator], which is licensed to receive such waste.

In addition to the above, the Project Risk Register and Safe Work Method Statements (SWMS) for the tasks to be performed will include details of environmental controls for potential aspects such as dust, odour and noise.

Material storage and re-fuelling activities that are related to the dredging work will be located as far as reasonably practical from the water line. Liquids will be stored in bunded areas and a marine spill kit will be located nearby for easy access in the event of a spill.

3.6. Monitoring

Monitoring will involve the following activities:

- [for example - Daily inspection of the dredge zone, temporary spoil storage area, controls and downstream areas to assess water flows and the effectiveness of the controls];
- [for example - Daily inspections will be performed by the Supervisor or Project Engineer and recorded on the Environmental Inspection form];
- [for example - Monitoring of daily and weekly weather forecasts, including the likelihood and quantity of rain forecast, will be recorded on the Daily Pre-start form and communicated during the Daily Pre-start or a separate toolbox talk (if required)];
- [for example - Water quality monitoring will be performed at the locations shown on Figure 1 at least weekly and following each rain event (note: the first round of monitoring will be performed prior to any site works to set water quality reference levels, given the lack of known water quality data for the area)]
- [add additional details relating to the proposed monitoring]

Water quality monitoring will involve the assessment of pH, temperature, turbidity and dissolved oxygen. If the reference levels (refer to Table 1) are exceeded at the monitoring point downstream of the [insert details of the controls eg. silt curtain], dredging activities will cease and the work method and controls will be reviewed. The area between the dredge zone and [insert details of the controls eg. silt curtain] will be inspected to identify other potential causes for the exceedance in water quality values.

Work will not re-commence until the water quality downstream of the silt curtain has returned to or below the reference levels.

Table 1: Water quality monitoring parameters

Water Quality Parameters	Lower Range	Upper Range
Dissolved Oxygen		
pH	6.5	9
Temperature (°C)		
Turbidity (NTU)		

The EPA will be notified of any water quality exceedance and any changes to the work method and/or controls. This plan will also be updated and communicated to all workers on site, following such changes.

Dredging and earthworks drainage days will be recorded in the Dredging and Earthworks Drainage Register and will be submitted to the EPA in accordance with Bardavcol's licence.

4. Incident Response, Contingency Planning and Other Issues

[Insert details of potential emergency/high risk scenarios and how they will be managed to prevent/minimise environmental impacts]

All incidents will be reported to the Supervisor and an incident report completed. [Insert Client name] and the EPA will be notified of any incident that may result in pollution of water quality downstream of the dredge zone.

A refuelling area will be located away from the [insert water body name] which will reduce the consequence of any spills. A spill kit will be stored on site in the compound / refuelling area.

Information on the types, locations and use of spill response equipment will be communicated as part of the project induction. Specific training requirements will be identified and managed through the project training and competency processes.

SWMS and the relevant work permits must include details of any task specific spill mitigation and response equipment that is required.

The Project Management Plan and Risk Register provide further details on controls to mitigate potential impacts relating to noise, dust and odour, which include:

- [Restricting working hours to X:XX am to XX:XX pm];

- [Use of a water truck to suppress dust in the event that this becomes an issue];
- [Increased communication and consultation with neighbouring properties if odours are detected];
- [insert other controls, applicable to the project and scope of work]

5. Review

The Project Manager must ensure that this document is reviewed at least monthly, with more frequent reviews required in response to changes to the scope of work and project hazards/risk and controls. The review must evaluate the:

- Currency of the information within the DEDMP;
- Effectiveness of the dredging and earthworks drainage methods and controls;
- Changes to hazards, risks and statutory and contract/client requirements (if any);
- Adequacy of project roles and responsibilities; and
- Opportunities to improve project performance.

The outcome of the review process must be communicated to the relevant members of the project team and the QSEM.

6. Records

Records relating to the management of dredging and earthworks drainage activities will be maintained by the Project Manager in the project files, as per the Project Management Plan and Bardavcol's IMS. These records include:

- EPA notification of commencement of dredging and earthworks drainage activities
- Daily inspections, as detailed in this plan
- Water quality monitoring records
- Dredging and Earthworks Drainage Register

7. References and Related Documents

Bardavcol's EPA Licence no. 22303

Dredging and Earthworks Drainage Notification Form

Dredging and Earthworks Drainage Register

Water Quality Monitoring Record

Environmental Inspection Form



SWMS Procedure

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1. Purpose

To provide guidance and outline the requirements for the completion, review and evaluation of compliance of Safe Work Method Statements (SWMS).

2. Scope

This procedure applies to any person that performs construction work at sites under Bardavcol's control.

3. SWMS Definition

A SWMS is a document that sets out the high risk construction work activities to be carried out at a workplace (ie. project site), the hazards arising from these activities, assessment of risk and the measures to be put in place to control the risks. The controls must have regard to the hierarchy of controls.

One SWMS can be used for work that involves multiple high risk construction work activities, for example a work activity that requires the use of powered mobile plant, working at heights of more than 2 metres and working adjacent to a road used by traffic other than pedestrians.

4. Responsibilities

Bardavcol is responsible for ensuring that:

- a safe work method statement (SWMS) is prepared before any proposed high risk construction work commences;
- a copy of the agreed SWMS is provided to the principal contractor (if this is not Bardavcol) before the work commences;
- a SWMS is reviewed against Bardavcol's system requirements, project risk register and contractual requirements and revised where necessary prior to being accepted for use;
- the work is carried out in accordance with the SWMS;
- if the work is not carried out in accordance with the SWMS, the work:
 - is stopped immediately, or as soon as it is safe to do so; and
 - is resumed in accordance with the SWMS, or in accordance with a revised and acceptable SWMS;
- SWMS are made readily available for inspection; and
- a copy of the SWMS is retained for the entire construction period and archived following project completion.

The **Project Manager** is responsible for ensuring that:

- the requirements of this procedure are communicated to all persons responsible for developing and/or reviewing SWMS;
- workers are trained in the contents and work methods defined in the relevant SWMS;
- persons developing and/or reviewing SWMS apply the principles of the hierarchy of controls to control risk and hazards; and
- in the event of a notifiable injury, the SWMS is held on file for at least two years.

Any **person** who assigns work to others (ie. project team, subcontractor, service provider) must ensure that:

- those people who are to undertake the work are consulted during the development of the SWMS;
- the SWMS is developed in cooperation and coordination with other organisations to ensure shared hazards and associated risks are identified and appropriately controlled;
- the completed SWMS is reviewed and accepted using the SWMS Review Record, prior to work commencing;
- appropriate controls are applied for the identified site-specific hazards and sources of risk;
- high risk activities are formally assessed and nominated controls are agreed and accepted by the Project Manager or their nominated representative; and
- each SWMS has been communicated to and is understood and signed by, all workers participating in or associated with the task.

Workers are responsible for ensuring that they:

- participate in the preparation of SWMSs that relate to the work they are to undertake;

- sign the completed SWMS to demonstrate their participation in its development; and
- sign on existing SWMSs when entering a work area to demonstrate they have been instructed in the work to be undertaken and understand all hazards and controls for the task.

5. Procedure

5.1. Purpose of a SWMS

The primary purpose of a SWMS is to set out the work activities in a logical sequence, identify hazards and describes measures implemented to control the known risks.

Any activity, no matter how simple or complex can be broken down into a series of basic steps that will permit a systematic analysis of each part of the activity for hazards and potential impacts. The description of the process should not be so broad that it leaves out activities with the potential to cause incidents and prevents proper identification of the hazards nor is it necessary to go into fine detail of the tasks.

The aim of a SWMS is to:

- describe the activity or task to be undertaken;
- identify the resources, personnel, training and competencies associated with the task;
- identify plant, equipment and materials associated with the task;
- assess and select control measures (as appropriate) to eliminate or reduce, so far is reasonably practical, the risk; and
- systematically plan the activity so it can be completed efficiently and effectively.

5.2. Requirement to Develop a SWMS

A SWMS must be developed and implemented for a work activity that includes any the following high risk activities:

- involves a risk of a person falling more than 3 metres; or
- is carried out on a telecommunication tower; or
- involves demolition of an element of a structure that is load-bearing or otherwise related to the physical integrity of the structure; or
- involves, or is likely to involve, the disturbance of asbestos; or
- involves structural alterations or repairs that require temporary support to prevent collapse; or
- is carried out in or near a confined space; or
- is carried out in or near a shaft or trench with an excavated depth greater than 1.5 metres; or
- a tunnel; or
- involves the use of explosives; or
- is carried out on or near pressurised gas distribution mains or piping; or
- is carried out on or near chemical, fuel or refrigerant lines; or
- is carried out on or near energised electrical installations or services; or
- is carried out in an area that may have a contaminated or flammable atmosphere; or
- involves tilt-up or precast concrete; or
- is carried out on, in or adjacent to a road, railway, shipping lane or other traffic corridor that is in use by traffic other than pedestrians; or
- is carried out in an area at a workplace in which there is any movement of powered mobile plant; or
- is carried out in an area in which there are artificial extremes of temperature; or
- is carried out in or near water or other liquid that involves a risk of drowning; or
- diving work; or
- any other activity, as directed by the Project Manager or Bardavcol Senior Management.

In addition the appropriate SWMS must be reviewed, amended (where applicable) and communicated to all relevant workers when:

- new equipment or products are introduced to the site, for use with the relevant SWMS;
- a new work practice is incorporated into the work activity covered by the SWMS;
- when new employees are introduced to the work;
- where the work environment, within which the SWMS is being used, has changed, been reconfigured or relocated;

- jobs or tasks that are performed irregularly;
- unusual weather conditions exist;
- when safety, health or environmental concerns have been raised by an employee; and
- where a task can cause or contribute to environmental harm.

5.3. Preparation of a SWMS

Bardavcol must ensure that workers that will perform high risk construction work have prepared a SWMS before the proposed work commences.

In instances where there are different types of construction work occurring at the same time, in the same location or in close proximity to each other, the work must be coordinated and responsibility or shared risk clearly defined and communicated.

Bardavcol must ensure that work groups, consult, cooperate and coordinate activities with each other, as and where required.

Any person can prepare a SWMS, however it is common for supervisors and subcontractors undertaking the work (in consultation with workers who will be directly engaged in the construction work) to prepare the SWMS, as they understand the work being carried out and the workers undertaking the work. They can also ensure the SWMS is implemented, monitored and reviewed correctly.

Workers (and where applicable, their health and safety representatives) should be consulted in the preparation of the SWMS. If there are no workers engaged at the planning stage, consultation should occur with workers when the SWMS is first made available to workers for example, during induction training, or when it is reviewed such as during site specific training or a toolbox talk.

When preparing a SWMS the following must be taken into account:

- the circumstance or conditions at the site that may affect the way in which the construction work is performed;
- the Project Management Plan and Risk Register;
- any activity that is defined as high risk construction work;
- site-specific hazards and impacts relating to the construction work and risks to health, safety and the environment associated with those hazards or impacts;
- other work groups in the vicinity and how their work may affect or be affected by the proposed activity;
- competency and experience of those conducting the work; and
- any external factors that influence the work methods that be used and/or controls that can be implemented.

5.4. Content of a SWMS

As a minimum, the SWMS must:

- identify the work that is high risk construction work;
- set out a logical step by step process of the work to be performed;
- specify hazards relating to the work and the risks to health, safety and environment;
- describe the control measures to be implemented;
- describe how the control measures are to be implemented, monitored and reviewed;
- list the plant, equipment and tools that are to be used in the work;
- list any hazardous substances that are to be used on the site;
- list the qualifications, competencies of those who will undertake the work;
- list any training required to undertake the work; and
- include the following information:
 - the company responsible for the SWMS - name, address and ABN;
 - details of the person with overall responsibility for ensuring implementation, monitoring and compliance with the SWMS;
 - the name of the principal contractor,
 - the address where the construction work will be carried out,
 - the date the SWMS was prepared and the date it was provided to the principal contractor; and
 - the review date (if/when undertaken).

A sign-on sheet must be attached to the SWMS identifying those persons who have been instructed in the content of the SWMS, the date the instruction occurred and the signature of each worker acknowledging they participated and that they were given the opportunity to discuss the proposed measures.

The content of a SWMS should provide clear direction on the control measures to be implemented. There should be no statements that require a decision to be made by supervisors or workers. As an example, 'use appropriate PPE' does not detail the control measures. The control measures should be clearly specified (ie when using a jack hammer use anti-vibration gloves).

5.5. Maintaining the currency of a SWMS

A SWMS must be reviewed at least monthly, by the person with responsibility for the SWMS to make sure it remains effective. A SWMS must be reviewed (and revised if necessary) if the content is identified as not effectively managing the activity, hazards or risks involved. The review process should be carried out in consultation with workers who may be affected by the operation of the SWMS.

When a SWMS has been revised the person with responsibility for the SWMS must ensure:

- all persons involved with the construction work are advised that a revision has been made and how they can access the revised SWMS;
- the Project Manager or nominated person is advised of the change and provided with a copy of the revised SWMS (depending on the nature and extent of the change, a SWMS Review Record may need to be completed for the revised SWMS);
- all persons who will need to change a work procedure or system as a result of the review are advised of the changes in a way that will enable them to implement their duties consistently with the revised SWMS; and
- all workers that will be involved in the construction work are provided with the relevant information and instruction that will assist them to understand and implement the revised SWMS.

5.6. Submission and Acceptance of a SWMS

Each work crew and subcontractor is to submit a site specific SWMS before commencing work on site. The SWMS should be provided to the Project Manager or nominated person at least 3 days prior to the work crew or subcontractor commencing work to avoid or minimise delays if the SWMS does not meet the necessary requirements.

The Project Manager or nominated person must review each work crew and subcontractor SWMS using the 'SWMS Review Record', which lists the minimum acceptance criteria.

If the SWMS does not meet the necessary requirements, it will be returned to the person responsible to amend and rectify the identified issues. The revised SWMS must be re-submitted and reviewed prior to commencing work.

Work can only proceed following review and acceptance of the SWMS by the Project Manager or nominated person.

5.7. Monitoring Compliance to a SWMS

Bardavcol must ensure that all workers performing construction work have submitted a SWMS and are complying with the requirements of the SWMS.

Compliance monitoring will be undertaken through daily supervision by the project team and formal observation of individuals and work groups. Observations may be recorded on the *Hazard Observation or SWMS Task Observation Form*.

If the work is not performed in accordance with the SWMS, then the work must stop immediately or as soon as it is safe to do so. Work must not resume until the work can be performed in accordance with the SWMS. If this is not practical, the SWMS must be revised in consultation with the workers. Significant changes to the SWMS (ie. to the work method, controls), or where the risk analysis identifies an increased risk in performing the work, the amended SWMS must be re-submitted for review, prior to work proceeding.

6. Review

SWMS are to be reviewed monthly, or at intervals nominated in the Project Management Plan. The review should include consultation with workers that perform work under the SWMS to obtain practical feedback on how it can be improved.

7. Records

Copies of SWMS and SWMS Review Records must be retained in the project files for the duration of project and retained for archive upon project completion. Each project will establish and maintain an appropriate filing system that enables easy access to the SWMS and related documentation.

8. References and Related Documents

- Code of Practice: Construction Work
- Code of Practice: How to Manage Work Health and Safety Risks (SafeWork SA)
- Office of Federal Safety Commissioner Fact Sheet: Safe Work Method Statements
- Risk Management Procedure (PR 1012)
- SWMS Review Record (FO 2082)
- SWMS Task Observation (FO 2007)
- Hazard Observation (FO 2006)
- SWMS Template (FO 2081)

WI 82.2

1 Purpose:

To manage and regulate behaviours and responsibilities concerning motor vehicle use.

2 Objective:

To promote motor vehicle safety, reliability and sustainability.

3 Target:

- a) No justified complaints; no complaint not logged & investigated; no unresolved complaints
- b) No fatalities or injuries arising from the use of motor vehicles
- c) No legal breaches arising from the use of motor vehicles

4 Controls:

All persons in possession of, or who use, a vehicle supplied, provided or sponsored by Bardavcol (a "Bardavcol Vehicle") shall comply with the following requirements.

- 1. Bardavcol Vehicles shall always be driven in a safe and legal manner and in accordance with the Bardavcol Work Health & Safety Policy Statement and relevant procedures, rules and instructions.*
- 2. Bardavcol Vehicles shall not be driven by any person who has consumed alcohol or drugs which might impair their physical or mental capacity.*
- 3. If the Bardavcol Vehicle is involved in any accident that causes damage or injury, the driver shall obtain the other party's name(s), address(es) and insurance policy details (if other vehicles are involved) and all other relevant details, and report every accident to the Bardavcol Commercial Manager, and to the police as required. An incident report is required under IP 15. In the event an insurance claim is to be made against Bardavcol's comprehensive motor vehicle policy, the driver shall complete and sign a claim form. It is a condition of Bardavcol's insurance policy that the driver does not admit liability in the first instance.*
- 4. Where a driver of a Bardavcol Vehicle is involved in a motor vehicle accident whilst under the influence of alcohol or drugs, or the accident occurs as a result of the driver's negligence or recklessness, Bardavcol reserves the right to pursue the recovery of costs incurred as a result of the accident directly from the driver, or their employer. Where the driver is a Bardavcol employee, the employee will be subject to disciplinary action and possible termination of employment.*
- 5. Only authorised persons who hold a current, appropriate driving license shall drive a Bardavcol Vehicle. Bardavcol Vehicles shall not be used for personal or any other business use. Should a Bardavcol employee wish to use a Bardavcol Vehicle for personal or other business purposes, prior authorization must be obtained from the Bardavcol Operations Manager and any advised restrictions and limitations must be strictly complied with, unless the use of a Bardavcol Vehicle for personal or other business purposes is explicitly provided for elsewhere.*
- 6. Provision and/or use of a Bardavcol Vehicle does not form part of a Bardavcol employee's entitlements under a contract of employment unless explicitly detailed in the relevant letter of engagement, and then only to the extent specified.*
- 7. Drivers may be required to return Bardavcol Vehicles to the Dry Creek depot on the last working day before taking leave as arranged with the Operations Manager. Where required, Bardavcol will arrange transport home and the return of the Bardavcol Vehicle to the driver upon return from their leave.*
- 8. The driver shall ensure that the Bardavcol Vehicle is serviced in accordance with the vehicle's servicing requirements, maintained in a clean and tidy condition, is roadworthy at all times, has a fire extinguisher*

installed and is maintained fully operational.

9. *When not in use, the Bardavcol Vehicle shall be parked legally, in a safe position and off the road if possible. The vehicle must be locked and keys must be removed at all times when the vehicle is left unattended, and preferably garaged overnight.*
10. *Only the correct fuel shall be used in Bardavcol vehicles. Where reasonably practicable, refueling shall be from Bardavcol fuel bowzers (at Dry Creek or project sites). Where this is not reasonably practicable, commercial sources may be used where Bardavcol maintain a trading account.*
11. *Drivers in possession of a Fuel Card shall keep the card in a safe location and use the card only for fuel for the applicable vehicle. Fuel dockets shall be returned to the Bardavcol Accounts Department as soon as possible at the end of each month. When the Bardavcol Vehicle is transferred to another driver or is disposed of the Fuel Card shall be returned to the Bardavcol Operations Manager. Fuel is supplied by Bardavcol strictly for Bardavcol work purposes use only.*
12. *Drivers shall ensure that the Bardavcol Smoke-Free Policy Statement is complied with at all times.*
13. *Drivers are liable for all parking and traffic infringement penalties incurred relating to their use of a Bardavcol Vehicle.*
14. *Modification of any kind to Bardavcol vehicles without prior written authority from the plant manager, is prohibited. This includes the addition or removal of in-situ items including lights, stickers, horns, stereos and other items.*

5 Permits/Licences:

Valid driver's licence

6 Emergency Response:

If you are involved in a vehicle crash:

1. Stop at the scene of the crash. Failing to stop at the scene is against the law.
2. Assist: assist anyone who is injured.
 - Call 000 if there is danger or serious injury.
 - Call 131 444 if you require police assistance
3. Move your vehicle off the road if police are not attending (Call the plant manager for assistance).
4. Exchange information and Report to Police – See 4.3 and 4.4

Refer Emergency Response Plan for the respective project / site.

7 Program Inspection: Refer internal audit schedule for each project.

8 References:

Insurance Claim Form (See Commercial Manager)
IP 15.5 Incident Investigation, Corrective Action & Reporting

SAFETY COMMITTEE TERMS OF REFERENCE



1 Purpose:

The purpose of the Safety Committee is to facilitate consultation and collaboration between workers and management to improve health, safety and environmental performance across Bardavcol's operations.

2 Objectives (and functions):

- Influence WHS in the workplace, including the reduction of incidents, accidents and injuries associated with the Bardavcol's operations.
- Facilitate consultation and co-operation between workers and management.
- Assist in the identification of WHS hazards and risks
- Assist in the review and development of WHS policies, procedures, work instructions and forms.
- Comply with the provisions of the WHS Act SA 2012 (Including Division 2 and 4).
- Assist in the review of WHS audit results and plans.
- Management, oversight and administration over the role of WHS Representatives in line with the WHS Act SA 2012.
- Review and management of provisional improvement notices (PIN) in line with the WHS Act 2012.
- Consult with workers on WHS issues of significance (including new processes, risks etc.)

3 Targets:

- Abide by the WHS Act 2012 (Division 4).
- Meet quarterly or as prescribed under the WHS Act SA 2012.
- Review and resolve all PIN's within a reasonable timeframe or in absence thereof, escalate the issue to the regulator.
- Table for review, any significant amendment to the WHS management system, or new system developments which affects moderately or significantly, the WHS of workers.
- Take, review, approve and disseminate Committee Meetings within one month of meeting.

4 Controls:

a) Committee Membership

The Committee should comprise 5 - 10 persons and ideally include representatives from different functional areas within the operations (ie estimating, project management/engineering, the workshop, supervisors, administration). The composition and size of the Committee should be reviewed at least annually or following significant changes to staffing levels within the operations.

b) Appointment of a Chairperson

The Safety Committee shall elect a member to chair meetings of the committee who shall keep minutes of all meetings and retain these minutes for a minimum period of three years.

c) Committee Members

The term of office of a member of the committee is three years. A team member's position may be declared vacant if the person ceases to be an employee of Bardavcol, or are absent for three or more consecutive Committee meetings, without leave from the Committee. The vacancy does not prevent the person from becoming a Committee member again at a later date.

Health and Safety Committee members shall be trained in the *WHS Committees Training (1day) course* or part completion of Level 1 Health and Safety Representative Level 1 (2 day course) as a minimum.

All WHS Committee and Health and Safety Representative training shall be provided by a Registered Training Organisations (RTO).

SAFETY COMMITTEE TERMS OF REFERENCE



d) Appointment / election of Members

In the Case of a Committee established under Division 4 Section 75 (by request)

Committee membership may be determined by either:

- election (for worker representatives); or
- appointment (for management representatives)

If the Committee membership is based on an election, employees must nominate for membership and have another employee second their nomination.

The Safety Committee will appoint a Returning Officer for the election of members. When a Committee position becomes vacant, the Returning Officer will issue a memo to all staff requesting nominations to fill the vacant position(s). When the nominations exceed the number of vacant positions, a ballot will be conducted by the Returning Officer.

In the Case of a Committee established voluntarily

By a call of volunteers, consisting of a 50% ratio of worker representatives and management representatives, with worker representatives reflecting, wherever possible, the diversity of projects at any given time.

e) Meetings

Employees may submit to the Chairperson, or their representative on the Committee, any item they would like to be included on a meeting agenda.

Guests may be invited to meetings to provide advice as required by the Committee. Proposals regarding guests and topics should be provided to the Committee for discussion in advance.

Subcontractor representatives may be invited to attend Committee meetings, where deemed appropriate by the Chairperson and the Construction Manager, Operations Manager or General Manager - Risk.

Issues arising from Committee Meetings should be settled by consensus. Where consensus cannot be reached, the Committee should seek guidance from Senior Management to inform the discussion and facilitate agreement.

The Committee may make recommendations to senior management in relation to any matter on the agenda, or that is discussed in the meeting. The Committee may also request provision of information from senior management relevant to the operations of the Committee.

f) Quorum

For a Committee Meeting to be conducted, 50% of the Members and the Management Representative must be present.

Failure to meet the above minimum number will result in the meeting being postponed. The meeting should be re-scheduled at the next available time for members to attend

g) Code of Conduct

Meetings should be conducted in accordance with the principles below:

- Behaviour at every meeting will be based on respect for individuals.
- Each Member will be allowed to speak without interruption at the time indicated by the Chairperson.
- Time for discussion will be allowed after the speaker has outlined their issue.
- No person will be permitted to serve on the Committee if that person's behaviour is not in keeping

SAFETY COMMITTEE TERMS OF REFERENCE



- with Bardavcol's expectations.
- In situations where the behaviour of a member of the Committee is causing concern, the issue will be dealt with in consultation with the Managing Director.

h) Meeting Minutes

The Committee will agree on a person to take the minutes of the meeting.

The Committee Chairperson will arrange for the distribution of the minutes to:

- all Committee Members;
- Managing Director;
- Construction Manager;
- Operations Manager;
- General Manager - Risk;
- Project Safety Advisers or relevant WHS Representatives; and
- persons nominated to close out agreed actions.

The minutes will also be located on the intranet so that they can be accessed by Bardavcol staff.

Following each meeting, the Construction Manager, Operations Manager and General Manager - Risk will consult with the Managing Director on initiatives and recommendations made by the Committee that need to be referred to senior management.

Copies of the Meeting Minutes shall be posted on project notice boards by Safety Advisers (or relevant WHS Representatives).

5 Permits/Licences:

WHS Representative Training Course under the WHS Act SA 2012.

6 Emergency Response:

Dry Creek Emergency Response Plan, or if undertaken at another site, the site specific emergency response plan.

7 Program Inspection:

Not Applicable.

8 References:

Work, Health & Safety Act, SA 2012

Work, Health & Safety Regulations, SA 2012

COP under SA Work, Health & Safety Laws 2012:

How to Manage Work Health and Safety Risks

Work Health & Safety Consultation, Co-operation & Co-ordination

9 Tools/Forms:

WHS Committee Meeting Minutes (iAuditor)

WI 84.1

1 Purpose:

To manage, control and regulate behaviours, risks and responsibilities concerning lifting operations.

2 Definitions:

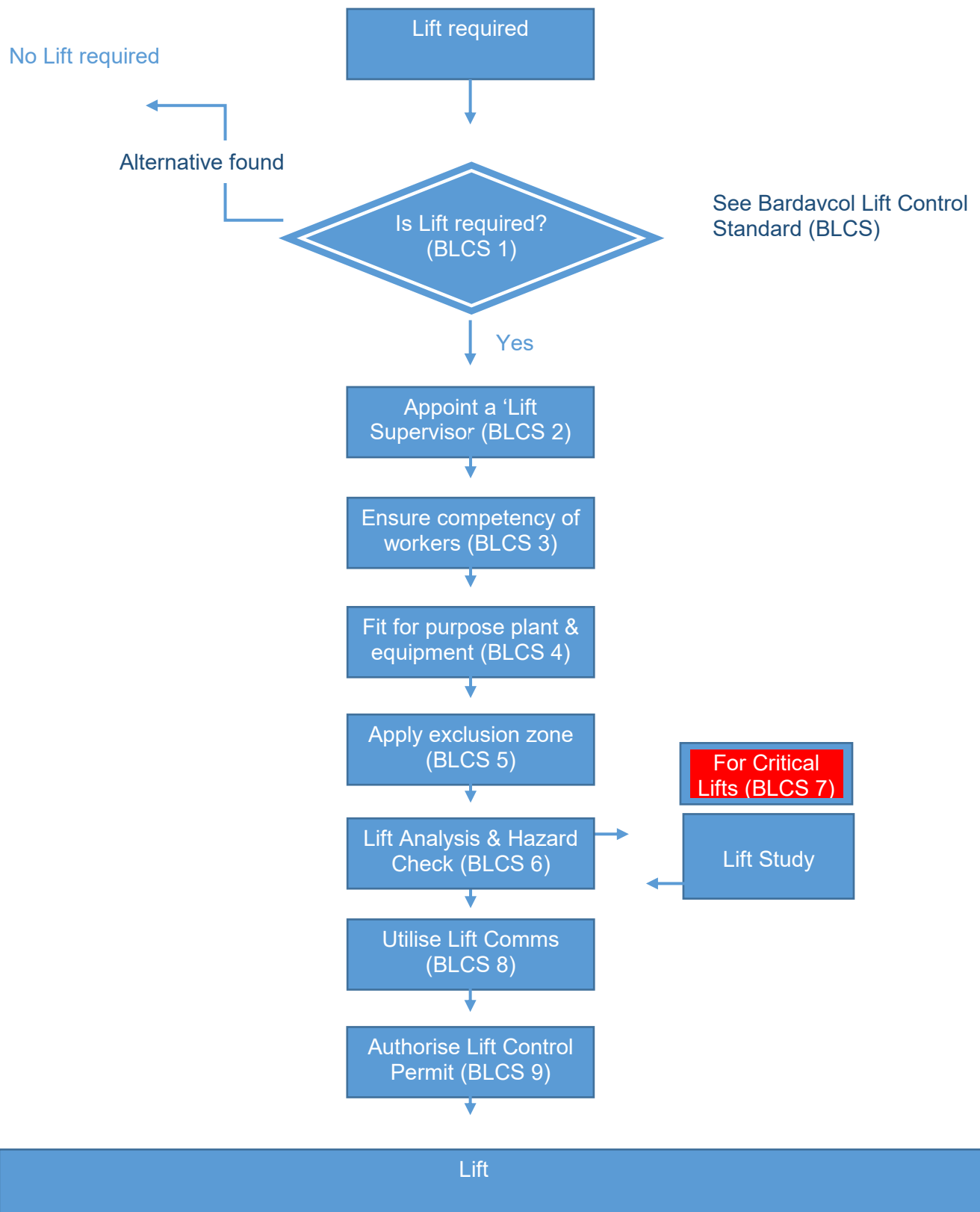
Critical Lift:	Any inherently complex or highly technical lift requiring specialist skills, experience or qualifications. The use of any tower crane. Any 'dual-lift' or 'multiple-machine-lift' scenario. Any lift over a water body (river, lake, sea), residential or commercial building. Any lift over a trafficked roadway. Any lift considered by the PM/LS/OM/CM to require an independent lift study.
Gross disproportion	As it relates to Section 4.10.1, when the cost of a crane is 3 times or more greater than the cost of earthmoving machinery. The benchmark taken from the UK HSE Executive "HSE principles for Cost Benefit Analysis (CBA) in support of ALARP decisions."
Lift Supervisor:	Competent, qualified and experienced person in charge of the lift.
Lift Control Verifier:	Independent technical verifier of the Lift Control Permit
PM:	Project Manager
PltM:	Plant Manager
OM:	Operations Manager
CM:	Construction Manager
Exclusions:	<i>The following are excluded from this Work Instruction:</i> <i>Manual handling, forklifts, lifts involving escalators or elevated work platforms,</i>

2 Objective:

To prevent and minimize the risk of injury, property damage and environmental impact from lifting operations.

3 Target:

- a) No Lifting failures.
- b) No fatalities or injuries arising from lifting.
- c) No legal breaches arising from lifting.
- d) All lifting equipment inspected as required under Australian law.
- e) No property damage

4 Controls:**4.0 Lift Process Overview**

4.1 Bardavcol Lift Control Standards (BLCS)

The following Lift Control Standards (LCS) must be observed for all lifts. These standards are non-negotiable and apply to all Bardavcol workers, contractors and subcontractors.

Responsibilities over each LCS is indicated in brackets.

All Bardavcol work places must have a copy of the BLCS for prominent display at their allocated Safety Board/s and/or induction room/s.

STANDARD	
1	The Hierarchy of Controls should be applied to the planning of lifts. This includes an assessment of alternatives to the use of mechanical lifting such that hazards can be eliminated or minimised (PM).
2	<i>An appropriately trained, qualified, experienced and competent worker shall be appointed to the role of 'Lift Supervisor' (LS) to coordinate, verify, implement and manage all aspects of the lift. All lifts shall be subject to a Lift Control Permit.</i>
3	Only trained, qualified and competent workers shall be involved in lifting operations (LS, PM).
4	<i>All mechanical aids, plant and equipment, including attachments and associated lifting infrastructure shall be in accordance with Australia Standards (or in their absence a recognised International Standard) and fit for purpose. (PM in conjunction with PltM) Documentation of the verification of compliance shall be maintained.</i>
5	<i>Exclusion zones shall be identified, marked (barricaded where of a moderate or higher risk level), and implemented for all lifts. No person shall stand under, or be in the 'drop path' of any suspended load.</i>
6	<i>All lifting calculations and safe lift operations shall be analysed, determined and controlled on a Lift Analysis and Hazard Check (part of the Lift Control Permit).</i>
7	<i>Any 'Critical Lift' must have an independent lift study prepared by a qualified/competent lifting specialist.</i>
8	<i>The LS, Rigger, Dogger and plant operator/s involved in a lift must be trained in the communication methods of Australia Standard AS2550.1</i>
9	<i>All lifts shall be subject to a 'Lift Control Permit' satisfactorily completed and authorised in accordance with WI 84.</i>

4.1 Hierarchy of Control Assessment

The BLCS (Standard 1) requires an assessment prior to a lift to ascertain if hazards relating to a lift can be eliminated or minimised through alternative means. This requires an analysis to consider:

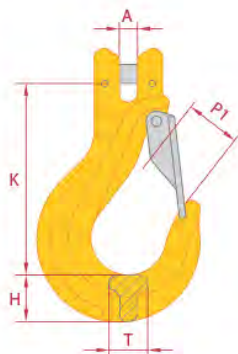
If the size, shape or weight of the object can be designed, delivered, handled or assembled in a way which eliminates, substitutes or reduces the risk, before making the decision to undertake a lift operation.

4.2 Bardavcol Lift Supervisor

The BLCS (Standard 2) requires the appointment of a Lift Supervisor (LS). The LS must:

1. Liaise with all workers involved with the lift, authorise and complete the Lift Control Permit.
2. Halt lift operations if alerted to unsafe conditions.
3. Warrant area preparations are completed before crane/lifting operations commence.
4. Confirm necessary traffic controls are in place.
5. Ensure workers understand their responsibilities and the associated hazards.
6. Allow crane operations near power lines or other energised infrastructure only when applicable requirements are met.
7. Implement precautions and hazard controls for critical lifts.
8. Ensure only appropriately trained and competent workers are used as per 4.3.
9. Be on site during all lift operations.
10. Be of appropriate skill, experience and competency to implement this work instruction (as determined by PM/OM/CM or appropriate delegate). Must have completed training in this work instruction by a Safety Supervisor within the last 24 months.

A Crane Driver, Dogman, Rigger or Supervisor can act as the 'Lifting Supervisor', providing they have the appropriate level of competency, training and are allocated as per 4.2.10.



**DO YOU KNOW THE 9
BARDAVCOL LIFT
CONTROL
STANDARDS?**

4.3 Use of trained and competent workers.

The BLCS (Standard 3) requires: “only trained, qualified and competent workers shall be involved in lifting”.

Activity	Circumstance	Training Required
Where plant is used	All lifting. I.e. Plant competency standards as per WI 2	Appropriate license or certificate of competency is required
Lifting	Where plant operators cannot see the load throughout the lift	Dogger (or Rigger) (High Risk Work License)
	Where plant operators can see the load throughout the lift but: <ul style="list-style-type: none"> - where there is a hazard pertaining to overhead, underground or other energised infrastructure (e.g. powerlines), - where there is plant movement or lifting in vicinity to hazards such as excavations, waterbodies, sensitive infrastructure, people etc. 	1 day ‘Spotter Training’ Course (e.g. Civil Train, CITB)
Slinging the Load	No judgement required because the: <ul style="list-style-type: none"> - selection of the slinging method is pre-determined by a competent person, and - lifting points are pre-determined by a competent person and marked on the load where appropriate - weight of the load—or load within a weight range—is pre-determined by a competent person e.g. may be marked on the load, and - selection of the lifting gear is pre-determined by a competent person. - The above is detailed in the Lift Control Permit. 	Dogger
	Judgement is required (i.e. application of slinging techniques for the purposes of lifting a load, including the selection of the method of lifting, nature of the load, its mass, its center of gravity etc)	Dogger
	Advanced judgement is required: <ul style="list-style-type: none"> - Erect steel & material hoists; - Install static lines and safety nets; - Erect mast climbing personnel platforms; - Install and maintain perimeter safety screens & shutters & crane loading bay platforms. 	Basic Rigger
	Advanced judgement is required: <ul style="list-style-type: none"> - Rig cranes, conveyors, dredges and excavators; - Erect precast concrete panels and tilt up panels; - Demolition work; - Dual crane lifts; - Erect material and man hoists. 	Intermediate Rigger
	Advanced judgement is required: <ul style="list-style-type: none"> - Rig: gin poles, shear legs, flying foxes, cable ways, guyed derricks and guyed structures. - Erect suspended scaffolds and fabricated hung scaffolds. 	Advanced Rigger

TRAINING GUIDE:

Load Slinging Course:

CPC CST2005A Carry out load slinging of off-site materials (1 day)

Dogman Licence Table:

CPC CLDG3001A Licence to perform dogging (5 day)

Rigger Licence Table:

CPC CLRG3001A Licence to perform rigging basic level (5 day)

CPC CLRG3002A Licence to perform rigging intermediate level (5 day)

CPC CLRG4001A Licence to perform advanced level (4 day)

Spotter:

RIIRTM203D - Work as a safety observer/spotter (1 Day)

Lifting Equipment / Crane Required Licences Table 4.3.1

Class	Competency Unit
Tower crane (CT)	CPCCLTC4001A
Self-erecting tower crane (CS)	CPCCLTC4002A
Portal boom crane (CP)	TLILIC3007
Bridge and gantry crane (CB)	TLILIC3003
Vehicle loading crane (CV)	TLILIC0012
Non-slewing mobile crane (CN)	TLILIC3006
Slewing mobile crane —with a capacity up to 20 tonnes (C2)	TLILIC3008
Slewing mobile crane —with a capacity up to 60 tonnes (C6)	TLILIC4009
Slewing mobile crane —with a capacity up to 100 tonnes (C1)	TLILIC4010
Slewing mobile crane —with a capacity over 100 tonnes (CO)	TLILIC4011

For up to date licence requirements for 'High Risk Work Licences' see SafeWorkSA website www.safeworksa.sa.gov.au

4.4 Fit for purpose plant and equipment

The BLCS (Standard 4) requires plant and equipment used in lifts to be fit for purpose. This requires the LS to ensure that each item of plant and equipment:

- Is suitable, safe and effective for the designated lift.
- Is designed for the lift.
- Includes the assessment of accessory, such as lifting gear, is appropriately inspected, marked and tagged.
- Has had a plant pre-start inspection completed and recorded (and any areas of deficiency addressed).
- Checked, visually inspected and tested (in accordance with relevant lifting standards)
- Is maintained under a system/certification (e.g. ISO45001) which ensures appropriate processes and records are in place to verify its safe design and safe condition.

4.5 No person shall stand or be in the 'drop path' of any suspended load.

The BLCS (Standard 5) requires that:

- No person shall stand under, or be in the 'drop path' of any suspended load.
- Exclusion zones shall be identified, marked (barricaded where of a moderate or higher risk level), and implemented for all lifts.
- For complex lift scenario's, the potential fall/drop path of objects (should the lift fail), including bounce, roll and deflection potentials, must be calculated and the fall/drop path must then form part of the exclusion zone.
- Exclusion zones shall at a minimum, be one and a half times the length of the load.
- Exclusion zones must always be greater than and inclusive of, the lift radius and potential drop zone.

4.6 Bardavcol Lift Analysis and Hazard Check (Part of the Lift Control Permit)

The BLCS (Standard 6) requires: As part of the Lift Control Permit, all lifting calculations and safe lift operations shall be analysed, determined and controlled. All lifting operations must also undergo a general safety inspection, to mitigate common and foreseeable lifting hazards.

All Lift Control Permits contain a 'Lift Analysis and Hazard Check' which include consideration of:

- *Lift calculation analysis*
- *overhead and underground services*
- *uneven/unsuitable/sloped ground conditions to support outriggers, tyres, tracks*
- *working near trenches and excavations*
- *risk of overturning*
- *crane and lifting equipment stability, indicating devices, safety devices*
- *sloping ground, including side slope and slope in direction of travel*
- *wind and other weather conditions (eg. lightning, thunderstorms)*
- *operating near the maximum rated capacity*
- *falling objects*
- *collision with other plant, structures or objects*
- *access routes for pick and carry operations or tramming*
- *other workers, public*

Note: The applicable SWMS or Job Task Card may be referenced in the Lift Analysis and Hazard Check.

4.7 Lift Studies

The BLCS (Standard 7): For Critical Lifts, the Lift Control Permit requires a Lift Study to determine appropriate plant, load calculations, crane selection, reach calculations, exclusion zones, designs, loadings and other aspects of lift safety. Lift studies are generally undertaken by specialist lifting experts with specific experience and qualifications. The PM shall, in consultation with the LS, procure an appropriate lift study where required.

Attributes to consider when choosing an Independent Lift Experts for Lift Studies:

Are they a member of the Crane Industry Council of Australia?

Do they offer NATA accredited facility offering in-house and on-site mechanical testing (ISO/IEC 17205) and visual inspections (ISO/IEC 17020) in compliance with ISO 17205 standards and repair services?

4.8 Bardaycol Lift Communication Protocols

The BLCS (Standard 8) requires that the LS, Rigger, Dogger and plant operator/s involved in a lift must be trained in the communication methods of Australia Standard AS2550.1

COMMUNICATION

4.8.1 General

Where communication is required between the operator and other personnel, a reliable and efficient method of communication shall be established.

4.8.2 Hand signals

Hand signals should be as shown in Figure 1.

4.8.3 Bell, buzzer and whistle signals

If used, bell, buzzer and whistle signals used should be as shown in Figure 1.

The bell or buzzer shall be located in a position where it can be readily heard by the crane operator while at the control position.











If two or more cranes are operating in close proximity, the tones of each bell, buzzer or whistle employed for the cranes shall be clearly distinguishable.

4.8.4 Radio communication

Where radio communication is used, the transmitting frequencies of the radio equipment shall be selected to prevent interference to or from other radio equipment being used in the vicinity of the crane.

WI 84.1

Figure 1 of AS2550.1

MOTION	HAND SIGNAL	WHISTLE, BELL OR BUZZER SIGNAL		MOTION	HAND SIGNAL	WHISTLE, BELL OR BUZZER SIGNAL
Hoisting raise		2 short ••		Hoisting lower		1 long —
Luffing boom up		3 short •••		Luffing boom down		4 short ••••
Slewing right		1 long, 2 short — ••		Slewing left		1 long, 1 short — •
Jib-trolley out: telescoping boom extend		1 long, 3 short — •••		Jib-trolley in: telescoping boom retract		1 long, 4 short — ••••
Travel and traverse		Not applicable		STOP		1 short •
CREEP SPEED: APPROPRIATE HAND SIGNAL FOR MOTION WITH HAND OPENING AND CLOSING						

4.9 Lift Control Permit Authority to Lift

The BLCS (Standard 9) requires the completion of the Lift Control Permit. This has a 'Lift Control Permit Authority to Lift' section which:

- Must be completed in full prior to any lift being undertaken.
- Must be signed by the independent verifier (author of the Lift Study) for any critical lift.
- Must be signed by the Lift Supervisor and any deputy. There is only one Lift Supervisor responsible for the Lift, hence a deputy only signs when 'acting' as the designated Lift Supervisor in circumstances where the primary Lift Supervisor is unable to be present.
- Must only be signed by the above, once all checks, inspections and verification documents have been attached.

The Lift Control Permit also ensures that all lifts undergo a process-based risk management approach to consider:

- *Approved Training*
- *Scope calculations*
- *Equipment Calculations*
- *Stakeholder management*
- *Environmental Conditions*
- *Equipment suitability and condition*

Lift Control permits are valid for a conditional time frame. The validity of the permit must not exceed 7 days (unless governed by Section 4.11 MTLTS), or when there has been a change in any aspect of the lift or lift conditions which could reasonably impact on the safety of the lift. The obligation to continually assess any variable conditions (such as weather, wind etc.) remains with the LS.

All Lift Control Permits must be issued by a Bardavcol Safety Supervisor, or in his/her absence, a Bardavcol Supervisor, Project Manager, Project Engineer or Construction Engineer to ensure that Bardavcol is aware of the lifting operation.

4.10 The use of Earthmoving Equipment / Plant for lifting

A person with management or control of plant must ensure, so far as is reasonably practicable, that any plant used to lift or transport a freely suspended load is specifically designed for that purpose (Sec 219 of WHS Regs). Unlike cranes, earthmoving equipment such as excavators, front-end loaders and backhoes are not designed for the primary purpose of lifting loads.

Earthmoving equipment should only be used to lift loads where it is not reasonably practicable to use a crane, where non-precision lifting is required and where such use, does not cause a greater risk to health and safety than if specifically designed plant were used. In that circumstance, *Earthmoving equipment shall only be used as a crane when:*

- *The plant is assessed and approved for lifting by the LS.*
- *The plant operator has successfully completed a VOC for that item of plant.*
- *All requirements under Appendix I of AS2550.1 have been complied with.*
- *Plant is in accordance with applicable safety and maintenance requirements.*

4.10.1 Assessability for 'reasonably practicable'

Bardavcol's position of when it is 'reasonable' to use earthmoving equipment is:

- A. *Where an additional safety factor of 20% has been calculated on top of the Safe Working Load, Rated Capacity or Working Load Limit (taking into account all attachments, reach etc, OR*
- B. *In circumstances when the requirement to lift has arisen either unexpectedly, as a result of an emergency event or other unforeseeable event AND earthmoving equipment is already available and accessible on site AND a crane is not readily accessible and available on site, OR*
- C. *In circumstances where, in addition to the above, the lift is one where non-precision lifting and placement is required, OR*
- D. *When a risk assessment is shown to indicate a 'low' risk for the lifting activity, following the consideration of all hazards, exposures, likelihoods and control measures, OR*
- E. *When the cost of a crane is grossly disproportionate to the risk and the use of earthmoving equipment for the lift is undertaken following Appendix I of AS2550.1 and this work instruction.*

APPENDIX I
USE OF EARTHMOVING EQUIPMENT AS A CRANE

(Normative)

Where earthmoving equipment is used as a crane, the following requirements apply:

- (a) The earthmoving equipment shall be travelled only with arm and boom retracted to minimum practicable radius.
- (b) Where the earthmoving equipment requires the use of stabilizers in order to achieve stability, the equipment shall be supported by such stabilizers.
- (c) No person shall be permitted under the boom or suspended load.
- (d) All persons operating the earth moving equipment, slinging or directing the load shall have the appropriate license, certificate or training, in accordance with the National Standard for Licensing Persons Performing High Risk Work (April 2006).
- (e) No person shall be lifted by earth moving equipment being used as a crane.
- (f) Where a quick hitch is used, loads shall only be suspended from a lift point on the quick hitch that complies with AS 1418.8, with the bucket and other attachments removed.
- (g) Lift points shall be arranged such that accidental unhooking of the load cannot occur.
- (h) Operational speed shall be reduced from high-speed mode.
- (i) Where the sling or tackle is wrapped over the back of the bucket, due care shall be taken to ensure that it does not come into contact with any sharp projection or sharp edge.
- (j) Loads shall not be suspended from bucket teeth or adaptors.
- (k) The rated capacity at each lifting point shall be prominently marked at the lifting point. This shall not be exceeded under any configuration, that is, the lifted load plus any attachments (bucket, etc.) shall not exceed the rated capacity.
- (l) Deductions from the rated capacity for larger than standard buckets or quick hitch devices shall be considered to determine the maximum allowable mass of the item that may be lifted.
- (m) Reference shall be made to the manufacturer's manual for correct operation.
- (n) Quick hitches shall be used only to support items of equipment specifically designed to fit, and specifically designed for the duty to be undertaken.
- (o) Quick hitches shall be maintained in proper working order at all times.
- (p) A crane service record (logbook) shall be used to record servicing, maintenance and repair work, and details of any malfunction that may occur with the machine.

4.11 Medium to Long Term Scenarios (MTLTS)

Certain sites/projects may undertake medium to long-term lift setups, such as sites with lifting equipment placed in-situ for extended periods (months or years). MTLTS setups require a Lift Control Permit, however, the permit can be issued to cover an extended timeframe as long as the permit is adequately maintained.

MTLTS require:

- A. The maintenance of worker training and competency (BLC3) at all times. Where multiple workers may be used throughout the period, the Lift Control Permit can 'refer' to an appropriate appendix listing the relevant workers and level of training and competency.
- B. Any new or change in Lift Supervisor (BLC3 2) requires the new LS to review and sign the Lift Control Permit, which for MTLTS can be undertaken by reference to an appendix listing the Permit Number and list of successive Lift Control and/or Lift Control Officers.
- C. BLC3 4, pertaining to 'fit for purpose' plant and equipment, to be maintained throughout the period, which can be undertaken by reference to an appendix indicating the sequential testing and maintenance regime undertaken on relevant plant and equipment for the period.
- D. BLC3 5 exclusion zones to be maintained at all times. To ensure the exclusions zones are adequate and maintained, the Lift Control Permit should, for MTLTS, reference an exclusion zone inspection schedule.
- E. Unique and documented lift studies for high risk lifts (referenced via sequential appendix) and independent verifiers.
- F. No Lift Analysis and Hazard Check to be completed for each individual lift, where a Lift Analysis and Hazard Check has been completed for the working day to cover all planned lifts and there is no change in conditions which could affect the lift risk.

The intent of MTLTS is to demonstrate full control over the lifting risks in line with the BLC3 under a single Lift Control Permit.

5 Permits/Licences:

See section 4.3

6 Emergency Response:

As per Project Management Plan Emergency Response Plan.

7 Program Inspection: Refer internal audit schedule for each project.**8 References:**

AS 2550 Cranes Hoists and Winches – General Requirements.
IP 15.5 Incident Investigation, Corrective Action & Reporting
FO 46 Lift Control Permit

1 Purpose:

To minimize and control the spread of COVID-19 in the workplace.

2 Objective:

To comply with regulatory standards.

3 Target:

- No or minimal spread of infectious disease.

4 Controls:

The following information has been compiled from the following Authorities: Safe Work Australia, Australian Government Department of Health, Department of Foreign Affairs and Trade (DFAT)

What is COVID-19?

The coronavirus disease (COVID-19) is caused by a recently identified strain of coronavirus in humans.

Coronaviruses form a large family of viruses that can cause the common cold and, in rare circumstances, more serious diseases like SARS (severe acute respiratory syndrome) and MERS (Middle East respiratory syndrome).

This new virus used to be known as the 'novel coronavirus (2019-nCov)' and first appeared in Wuhan city in Hubei Province, China. The World Health Organization (WHO) has declared the outbreak of COVID-19 as a Public Health Emergency of International Concern. While the majority of confirmed cases of COVID-19 have been reported from Mainland China, cases have been reported in many other countries and regions, including Iran, Italy and the Republic of Korea.

What are the symptoms of COVID-19?

Common symptoms of COVID-19 include:

- fever
- flu-like symptoms, such as coughing or sneezing
- difficulty breathing, which may develop into pneumonia
- sore throat
- fatigue

It can take up to 14 days for symptoms to show after a person has been infected.

Currently, it seems the elderly, people with a chronic disease (such as diabetes, chronic lung disease, kidney failure or people who are immunocompromised) may be at a higher risk of developing a serious case of COVID-19.

Legal Position and Duty of Care

The model Work Health and Safety (WHS) laws require a person conducting a business or undertaking (PCBU) to ensure, so far as is reasonably practicable, the health and safety of their workers and others at the workplace. This includes providing and maintaining a work environment that is without risk to health and safety.

To comply with the model WHS laws, PCBUs must identify hazards at the workplace and the associated risks, and do what is reasonably practicable to eliminate those risks, or where this is not reasonably practicable, to minimise those risks.

In line with recommendations from the authorities listed above, Bardavcol will:

- Closely monitor official Government sources for current information and advice.
- Review and disseminate information regarding infection control.
- Ensuring workers are aware of the isolation/quarantine periods in accordance with advice from the Australian Government Department of Health.
- Providing clear advice to workers about actions they should take if they become unwell or think they may have the symptoms of coronavirus, in accordance with advice from the Australian Government Department of Health and state or territory health department
- Eliminating or minimising international work travel, in line with the travel advice on the Australian Government's Smartraveller website

Workers also have a duty to take reasonable care for their own health and safety and to not adversely affect the health and safety of others. Workers should be reminded to always practice good hygiene and other measures to protect themselves and other against infection.

Hygiene standards and transmission avoidance.

All workers:

- Regularly wash your hands (or use hand sanitiser) after touching hard surfaces (particularly door handles, railings etc.) and before touching your face.
- Avoid where practical, close contact with persons who have travelled internationally, especially to countries on the DFAT watchlist, or those showing symptoms.
- Cover your mouth when coughing or sneezing, but do not use your hands to do so.
- See a health care professional if you start to feel unwell.
- Avoid unnecessary human contact such as shaking hands. Maintain 1.5m distance (general social distancing) from one another where possible. Maintain the indoor social distancing limit of one person for every four square metres.
- Stay away from persons coughing or sneezing.
- In conjunction with your line manager, plan work activities in a manner which reduces personal contact.

All sites:

- Non-essential group meetings to be avoided. Essential meetings to be carefully scrutinized for transmission risks. Controls to be applied as reasonably practicable, including cancellation where high risk, video conferencing, use of PPE (N95 or P2 masks), conducting meetings outside and maintaining a 1.5m distance.
- Risk assessments to be undertaken and controls implemented on a site by site basis for highly trafficked areas such as reception areas (e.g. consider cleaning of door handles, frequency of cleaning etc.).
- Consider staggered work start times for workers to allow for staggered lunch times to reduce contact.
- Non-essential shared use of motor vehicles to be avoided.
- Shared use of plant to be minimized.
- Include WI 85 training as part of all site inductions.
- Face-to-face meetings/contact (of any setting) within 1.5m (where the social distancing rule or other controls, could not be applied such as P2 masks) not to exceed 15 minutes.
- Sharing of a closed space (where the indoor social distancing limit of one person for every four square metres, or other controls, could not be applied) not to exceed 2 hours.

Self-Isolation (Self-Quarantine)

In some situations, you must isolate yourself, even if you have no symptoms. These situations are:

- If you are returning to Australia from any international country (refer to applicable government requirements).
- If you have been directed to do so by a government official (i.e. when contacted by Department of Health following attendance at an event where a known infected party was present).

Communication of Symptoms and Medical Clearance

If a worker starts experiencing symptoms that might indicate the presence of the virus, the worker cannot attend work and is required to obtain a medical clearance before returning to work.

Where a worker has contracted the virus, the employer should be immediately notified.

Managing Absences in the Workplace

Contact your line manager regarding leave arrangements applicable to your circumstance (i.e. returning from travel, when under self-isolation etc.).

Mental Health and Wellbeing

Some workers may experience mental health and wellbeing challenges as a result of the global pandemic. All sites are to ensure that workers are notified of support services including:

LIFELINE:

Phone: 13 11 14 (24 hours/7 days) Text: 0477 13 11 14 (6pm – midnight AEDT, 7 nights)

Chat online: <https://www.lifeline.org.au/crisis-chat> (7pm - midnight, 7 nights)

BEYOND BLUE: 13 11 14

MATES IN CONSTRUCTION: 1300 22 4636

International Travel General Consideration

If you are travelling outside of South Australia consider:

- Many insurances do not cover infectious disease outbreaks such as COVID-19.
- You may be delayed at airports as different quarantine restrictions exist in different countries.
- Check <https://www.smartraveller.gov.au/> for health warnings.
- Australia has 4 different international Travel Advice Levels with Level 4 being 'do not travel'

5 Permits/Licences:

Not Applicable.

6 Emergency Response:

Emergency Dial 000

Coronavirus Health Information Line 1800 020 080

7 Program Inspection:

As per Project Management Plan/QSE Plan.

8 References:

Safe Work Australia

Australian Government Department of Health (Federal)

SAHealth (State)

Department of Foreign Affairs and Trade (DFAT)

Business SA COVID-19 Employer Guide

**ATTACHMENT 8: SOUTHERN RIGHT WHALE MANAGEMENT PLAN AS APPROVED BY
MINISTER'S DELEGATE**



Australian Government

Department of Agriculture, Water and the Environment

Mr Greg Walters
CEO Peninsula Ports
Peninsula Ports Pty Ltd
Level 1, 33 Hutt Street
ADELAIDE SA 5000

Dear Mr Walters

**Port Spencer Stages 1 and 2, Eyre Peninsular, South Australia, EPBC
2012/6590: Southern Right Whale Management Plan**

Thank you for submitting the above management plan for approval in accordance with the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Officers of the Department have advised me on the plan and on the requirements of the EPBC Act conditions of approval for the above project. On this basis, and as a delegate of the Minister for the Environment, I have decided to approve the *Southern Right Whale Management Plan*, rev D, dated May 2020. The approved plan must now be implemented.

Condition 10 of the approval means that if Peninsula Ports wishes to implement the plan otherwise than in accordance with the approved plan, Peninsula Ports must submit a revised *Southern Right Whale Management Plan* for approval by the Minister.

Should you require any further information please contact Thomas Smith at Thomas.Smith@awe.gov.au or postapproval@awe.gov.au.

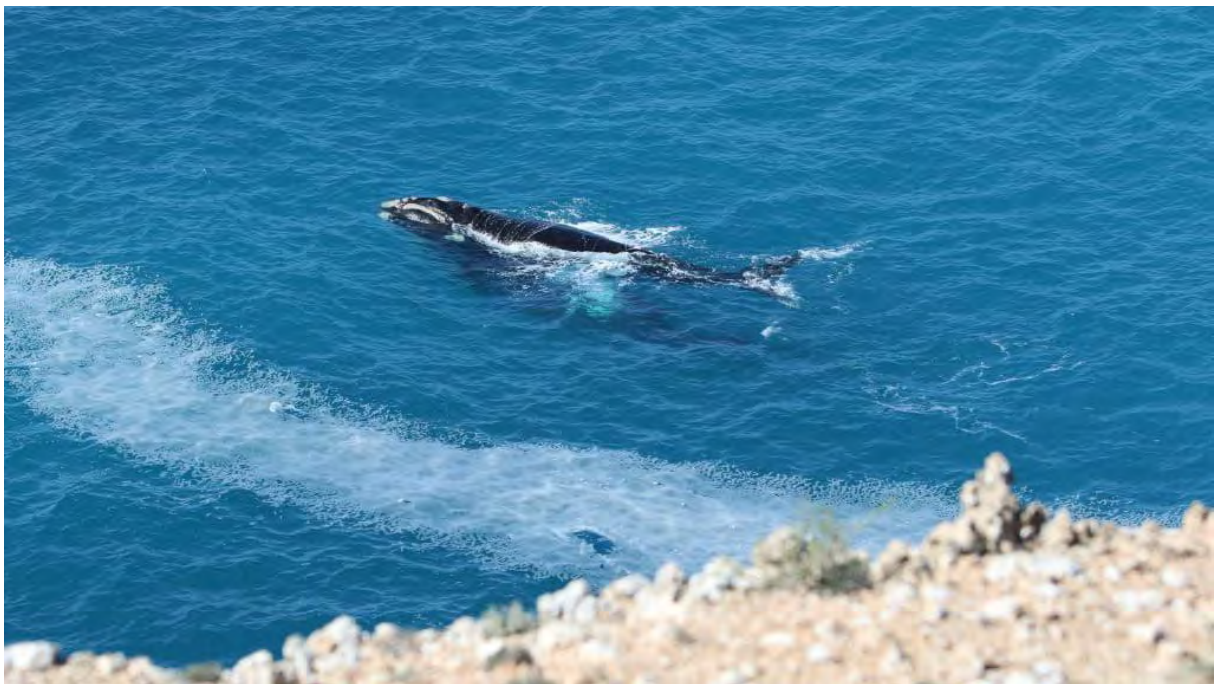
Yours sincerely

A handwritten signature in blue ink, appearing to read 'G. Manning'.

Greg Manning
Assistant Secretary
Assessments (WA, SA, NT), Post Approvals and Policy Branch

28 May 2020

Port Spencer Grain Export Facility Southern Right Whale Management Plan



A whale spotted just off the edge of the Head of the Bight. Picture: Andrew Brooks aboard Chinta Air plane.

Revision History

Rev	Prepared by	Date	Reviewed by	Date	Endorsed by	Date
Rev A Draft	Naz Nikoo	Nov 2019	Stephanie Mitchell	Dec 2019	Mark Wilson	Dec 2019
Rev B	Naz Nikoo	Jan 2020	Stephanie Mitchell	Dec 2019	Mark Wilson	Jan 2020
Rev C	Stephanie Mitchell / Naz Nikoo	March 2020	Mark Wilson	May 2020	Mark Wilson	May 2020
Rev D	Stephanie Mitchell / Naz Nikoo	March 2020	Mark Wilson	May 2020	Mark Wilson	May 2020

Distribution Register

Rev	Issued to	Organisation	Position	Format	Issue Date
Rev A Draft	Dr Alice Jones	Uni Adelaide - SGEDI	Research Associate	MS Word	12-12-2019
Rev B Draft	Dr Alice Jones	Uni Adelaide - SGEDI	Research Associate	MS Word	19-12-2019
Rev B Draft	Professor Bronwyn Gillanders and John Bastian	Uni Adelaide - SGEDI SGEDI	Deputy Dean Research Chair of SGEDI Board	MS Word	24-01-2020
Rev B	Panna Patel	Department of Environment and Energy	Post Approvals Assessments & Governance Branch	PDF	31-01-2020
Rev C	Thomas Smith	Department of Agriculture, Water and Environment	Assessment Officer, Post Approvals Branch	PDF and Word	12-05-2020
Rev D	Thomas Smith	Department of Agriculture, Water and Environment	Assessment Officer, Post Approvals Branch	PDF and Word	14-05-2020

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Abbreviations

Term / Acronym	Definition
ACCOBAMS	Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area
AIS	Automatic Identification Organisation
ALA	Atlas of Living Australia
AMSA	Australian Maritime Safety Authority
BC	Bulk Carrier
BLF	Bulk Load Facility
CASA	Civil Aviation Safety Authority
CEMP	Contractor's Environmental Management Plan
DEW	Department of Environment and Water
DAWE	Department of Agriculture, Water and Environment
DTHH	Down The Hole Hammer
EPBC	Environment Protection and Biodiversity Conservation
GPV	General Purpose Vessel
IMO	International Maritime Organisation
KIPT	Kangaroo Island Plantation Timber
MAROPs	Marine Operations Plan
MMO	Marine Mammal Observation
PER	Public Environmental Report
PMP	Project Management Plan
POB	Pilot On Board
PTS	Permanent Threshold Shift
RCD	Reverse Circulation Drill
RMS	Root Mean Square
SEL	Sound Exposure Level
SGEDI	Spencer Gulf Ecosystem and Development Initiative
SPL	Sound Pressure Level
SRWMP	Southern Right Whale Management Plan
tph	Tonne per hour
TTS	Temporary Threshold Shift
VTS	Vessel Traffic Services

1 INTRODUCTION

Peninsula Ports Pty Ltd (a subsidiary of Free Eyre) is establishing a Grain Export Facility as a new deep-water port with related grain storage and handling land infrastructure at Port Spencer, located 65km north of Port Lincoln on the Eyre Peninsula in South Australia.

Peninsula Ports Pty Ltd purchased land at Sheep Hill (Lipson, Eyre Peninsula) from Centrex Metals in May 2019 as well as all existing approvals for the project and a Major Project status from SA Government.

The development of Port Spencer will result in significant annual freight savings for grain growers in the region. Further to this, it is anticipated that the establishment of the port will introduce competition for current grain terminal operators providing further savings across the region. In order to realise these benefits, Peninsula Ports is planning for Port Spencer facility to be fully operational for grain receipt no later than October 2021, in time for the harvest and ready for loading of the first export ship.

1.1 PROJECT BACKGROUND

Centrex Metals Pty Ltd had been granted Environment Protection and Biodiversity Conservation (EPBC) approval 2012/6590 for the project with specified conditions (Refer to Section 4) for the construction and operation of a new deep water private multi-user port, Port Spencer, on the east coast of the Eyre Peninsula, South Australia in October 2013.

Centrex Metals Pty Limited made the decision to transition out of iron ore on the Eyre Peninsula, meaning the evaluated Project will not proceed in its original form. Peninsula Ports Pty Ltd is proposing to carry out the development of a new grain only export facility, which will not have the capacity to facilitate the export of iron ore.

A formal request to the Department of Environmental and Energy (now the Department of Agriculture, Water and the Environment) regarding the transfer of the existing EPBC Approval 2012/6590 from Centrex Metals Pty Ltd to Peninsula Ports Pty Ltd was lodged in September 2019. The previous EPBC Approval 2012/6590 for a multi-commodity port to a reduced scope for grain export only was transferred to Peninsula Ports Pty Ltd in November 2019 with conditions. Should the facility be upgraded to facilitate the export of iron ore, or other freight that will see an increase in the project size, further development in marine water, or an increase in shipping activity, an amended version of this plan will be submitted to the Commonwealth Department of Environment (currently DAWE) for approval. Any varied or additional action will not commence until such a revised plan is approved as per condition 10 of EPBC approval 2012/6590.

The Project site is located approximately 1.5km North of Lipson Cove Conservation Park (Figure 1). Traditional owners of the land are the Barngarla community, who have exclusive Native Title over the crown land along the coast.



Figure 1. Project Site Location.

1.2 PROJECT SCOPE

Port Spencer grain export facility will consist of following major elements:

1. 600m Jetty and wharf comprising of 228m long causeway, 84m jetty and 294m wharf and 18 piles driven from the steel structure to suit loading up to Panamax size vessels (Figure 2).
2. Approximately 900kT of bunker storage.
3. Grain delivery trucks automated weighing, sampling, in-loading hoppers, conveying, bunker stacking and reclaim systems.
4. Approximately 50kT in silo storage, with fumigation and ventilation systems, including 800tph rate of silo loading from bunkers or trucks.
5. Silo reclaim at 2,000tph with screening and bulk-weighing to export conveyor.
6. Export system, consisting of 2,000tph export conveyor and travelling ship loader with luffing, slewing and telescopic boom with chute.
7. Upgrades to local grain delivery trucks roads and network of internal site roads, for grain handling and facility maintenance.

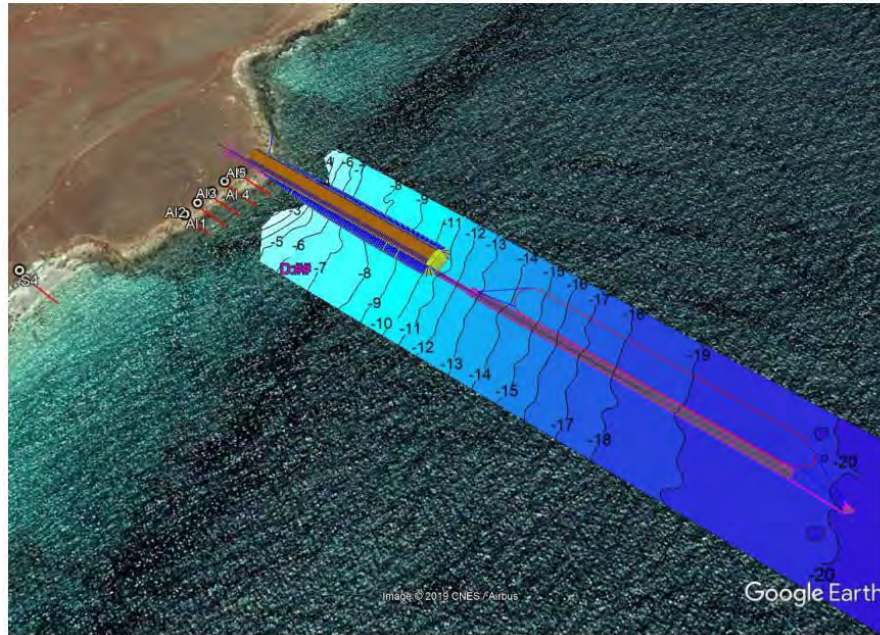


Figure 2. Proposed Port Spencer marine construction.

The main Project elements which may have an impact on southern right whale habitat use and behaviour include:

- a) The construction of the jetty and wharf comprising of a causeway and steel piles to suit Panamax size vessels, comprising of:
 - On-land drilling,
 - On-Land blasting,
 - Haul and place rocks for Groyne,
 - Impact piling,
 - Pile socket drilling,
 - Pile anchor grouting
 - Abrasive blasting and painting over water, and
 - Welding over water.
- b) The operations activities:
 - Entrance of vessels to the Gulf,
 - Movement up and down the Gulf,
 - Arrival under pilotage,
 - Berthing,
 - Loading Bulk Grain,
 - Unberthing and departure, and
 - Vessels departing from the Gulf.

Refer to Construction methodology (Appendix G) for details of the causeway and wharf construction methodology, as well as the operational management procedures. The details of standard procedures to be followed in the proposed Port is provided in Appendix E – Vessel Traffic Management Plan.

1.3 PROJECT MILESTONES

Table 1 represents the key milestones of the construction phase and operational activities at the Port Spencer Project based on the updated construction schedule (Appendix G);

Table 1. Project milestones.

Milestone	Commencement date
Construction activities	
Establish Site	May/June 2020
Land based drilling and blasting	May/June 2020
Site civil works and services:	
Bulk earthworks and hauling	May/June 2020
Silo pads	May/June 2020
Bunkers	July 2020
Silo structural works	August 2020
Haul and crush rocks for Groyne/causeway construction	July 2020
Groyne/causeway construction	July 2020
Piling commencement	TBC (Once SRWMP approved by DoEE)
Operational activities	
Arrival of bulk carrier at anchorage	As per shipping schedules – expected November 2021 at earliest
Transit to terminal and berthing	
Loading bulk grain	
Unberthing and departure from the terminal	

2 PURPOSE OF THIS PLAN

As per conditions 1,3, 4 and 6 of EPBC Approval 2012/6590, a management plan mapping all risks to the Southern Right Whale, monitoring plan and mitigation measures must be developed and implemented during the construction and operational activities of the Project. Hence, this document provides the proposed monitoring and management plan to protect southern right whales in Australian waters at the project location.

The main objectives of Southern Right Whale Management Plan (SRWMP) are as follows:

- To identify all anthropogenic risks to southern right whales arising from Port Spencer construction and operations activities.
- To ensure the appropriate control measures are in place to minimise the risk of injury to southern right whales arising from Port Spencer construction and operations activities.
- To ensure that EPBC Approval 2012/6590 specified conditions for monitoring, management and mitigation procedures to minimise the impacts of underwater noise are in place.
- To provide a monitoring plan for southern right whale habitat use and behaviour in the vicinity of the project, developed in consultation with SGEDI, and outline Peninsula Ports contribution to research on the southern right whales' utilisation of the Spencer Gulf.

2.1 STAKEHOLDER CONSULTATION

The SRWMP has been developed in consultation with DAWE and representatives of the Spencer Gulf Ecosystem and Development Initiative (SGEDI). Consultation with SGEDI has included the development of plans to monitor southern right whale habitat use and behaviour using appropriate survey techniques in the Southern Spencer Gulf, as required by EPBC Approval 2012/6590 condition 3b, and Peninsula Port's contribution to research on southern right whales through SGEDI, as per condition 3c. (Refer to Section 9 for further details).

This plan has also been peer reviewed by Dr Alice Jones from University of Adelaide. Dr Jones obtained her PhD in the spatial ecology of marine megafauna at the National Oceanography Centre in Southampton (UK) and has previously worked on SGEDI research projects.

2.2 INTERFACE WITH OTHER PLANS/REPORTS

This plan has been developed in conjunction with other management plans and report documents required under the Contract:

- Marine Operations Plan (MOP).
- Contractors Construction Environmental Management Plan (CEMP).
- Oil Spill Contingency Plan.
- Public Environmental Report (PER).
- Golder's Underwater Noise Modelling Report.
- Port Spencer Vessel Traffic Management Plan.

2.3 PLAN DISTRIBUTION

The controlled copy of this Plan will be maintained on the project document control database. A controlled copy of this Plan, as well as future updates, will be provided to Peninsula Ports Pty Ltd for approval by the Department of Agriculture, Water and Environment.

3 EPBC APPROVAL 2012/6590 CONDITIONS

Conditions as specified in the EPBC Approval 2012/6590 for the protection of Southern Right Whales during the construction and operation of Port Spencer are as follows:

Table 2. EPBC Approval 2012/6590 conditions.

Condition No.	Condition Description	Where addressed in SRWMP
Pile Driving		
1	<p>To protect Southern Right Whales, the person taking the action must develop measures to mitigate the impact of pile driving. Measures to be undertaken during marine piling activities must minimize the risk of physical impacts including temporary threshold shift to whales. These must include:</p> <p><i>Pre-start up visual observations</i></p> <ul style="list-style-type: none"> i. Visual observation for whales must be undertaken to the extent of the marine piling observation zone by a suitably trained crew member for at least 30 minutes before the commencement of marine piling. <p><i>Operating procedures</i></p> <ul style="list-style-type: none"> ii. Visual observations of the piling observation zone; iii. Exclusion zones must be implemented so as to ensure that whales, are not exposed to Sound Exposure Levels (SEL) of greater than or equal to 183 dB re 1µ Pa².s and must be no less than a 1250 metre horizontal radius for whales unless a lesser exclusion zone has been determined from noise monitoring of piling and approved by the Department and has a SEL equal to or below 183 dB re 1µ Pa².s. iv. If whales are sighted within the relevant exclusion zone, action to cease all piling within the relevant exclusion zone must be taken within two minutes of the sighting or as soon as possible if it is unsafe to cease piling within two minutes. If piling does not cease within two minutes the person taking the action must report the incident to the Minister in writing within one business day. v. Piling activities must not commence until whales are observed to move outside the exclusion zone or 30 minutes have passed since the last sighting; vi. Soft start procedures: Piling activities must be initiated at the soft start level and then build up to full operating impact force. The soft start procedures may only commence if no whales have been sighted in the exclusion zone during pre-start-up visual observations; vii. No marine piling operations shall occur between the hours of sunset and sunrise during the peak southern migration of mother and calf Southern right whale pods defined as April to November in any year; and 	Section 6.1

Condition No.	Condition Description	Where addressed in SRWMP
	<p>viii. Marine piling commenced prior to sunset or prior to a period of low visibility can continue between the hours of sunset and sunrise, unless marine pile driving is suspended for more than 15 minutes.</p> <p>Implementation of the measures must be monitored and the results sent to the department at the end of jetty construction activity.</p> <p>The measures must be implemented.</p>	
Blasting		
2.	<p>To protect Southern Right Whales, the person taking the action must develop measures to mitigate the impact of blasting, should blasting be required. These must include management measures to be undertaken for any blasting activities. These must include but not be limited to the following:</p> <p><i>Pre-start up visual observations</i></p> <p>i. Visual observation for whales must be undertaken to the extent of the marine blasting observation zone by a suitably trained crew member for at least 30 minutes before the commencement of blasting.</p> <p><i>Operating procedures</i></p> <p>i. Visual observations of the blasting observation zone;</p> <p>ii. Exclusion zones must be implemented so as to ensure that whales, are not exposed to Sound Exposure Levels (SEL) of greater than or equal to 183 dB re 1µ Pa².s and must be no less than a 1250 metre horizontal radius for whales unless a lesser exclusion zone has been determined from noise monitoring of piling and approved by the Department and has a SEL equal to or below 183 dB re 1µ Pa².s.</p> <p>iii. If whales are sighted within the relevant exclusion zone, action to cease all blasting within the relevant exclusion zone must be taken within two minutes of the sighting or as soon as possible if it is unsafe to cease blasting within two minutes. If blasting does not cease within two minutes the person taking the action must report the incident to the Minister in writing within one business day.</p> <p>iv. Piling activities must not commence until whales are observed to move outside the exclusion zone or 30 minutes have passed since the last sighting;</p> <p>v. Post blasting inspection procedures for injured whales including management of injured fauna;</p> <p>vi. Reporting within one business day to the Minster when injury to, or morality of, a whale occurs;</p> <p>vii. Contingency measures should blasting result in injury to or morality of fauna; and</p> <p>viii. Measures that prohibit night time blasting during the peak migration of Southern right whales, as determined in consultation with the South Australian Department of Environment, Water and Natural Resources or successor agency;</p>	NA / No marine blasting

Condition No.	Condition Description	Where addressed in SRWMP
	Implementation of the measures must be monitored and the results sent to department at the end of jetty construction activity. The measures must be implemented.	
Southern right whale		
3.	<p>To protect Southern Right Whale, the person taking the action must develop a Southern Right Whale management plan. The plan must include:</p> <ul style="list-style-type: none"> a. A description, including appropriate mapping of all threats to the Southern Right Whale arising from Port Spencer construction and operation activities; b. A plan to monitor Southern Right Whale habitat use and behaviour, using appropriate survey techniques for mapping of potential threats to the Southern Right Whale arising from Port Spencer construction and operation activities; c. Outline the contribution to research on the Southern Right Whale through Spencer Gulf Ecosystem and Development Initiative, including the specific research to be undertaken on species utilisation of the Spencer Gulf area, timing of the research and the products to be delivered; d. Mitigation measure to manage the impact of port operation and shipping, arising from Port Spencer construction and operation activities, including underwater noise caused by the port and vessels and the risk of vessel strike; e. Consideration and management of cumulative impacts arising from Port Spencer construction and operation activities; and f. Management of noise impact is to be included in the management plan and underwater noise must not exceed 183 dB re 1µ Pa².s. The proponent is to identify all sources of underwater noise that will be produced by proposal and develop measures to minimise these. 	<p>Section 5</p> <p>Section 7</p> <p>Section 9</p> <p>Sections 6</p> <p>Section 5.3</p> <p>Sections 5.2, 6.1 & 6.4</p>
4.	The Southern right whale management plan must be submitted for approval by the Minister at least three months prior to commencement of the action , unless otherwise approved by the Minister . Construction must not commence until the Southern right whale management plan has been approved. The approved Southern right whale management plan must be implemented.	Noted
5.	The person taking the action is to produce and implement an Oil Spill Contingency Plan. The Plan is to be approved by an appropriate authority and notice of the approval sent to the Department before construction commences. The plan must be implemented.	Appendix I
6.	The person taking the action is to participate in the Spencer Gulf Ecosystem and Development Initiative (SGEDI), in accordance with the SGEDI Business Plan to develop a comprehensive and informed decision system for development, including a plan to monitor Southern right whale habitat use and behaviour, using appropriate survey technique in southern Spencer Gulf during construction and operation of the port.	Section 6

Condition No.	Condition Description	Where addressed in SRWMP
Administrative		
7	Within 10 days after the commencement of the action , the person taking the action must advise the Department in writing of the actual date of commencement.	Noted
8	The person taking the action must maintain acute records substantiating all activities associated with or relevant to the actions of approval, including measures taken to implement the plans required by this approval, and make them available upon request to the Department . Such record may be subject to audit by the Department or an independent auditor in accordance with section 458 of the <i>Environment Protection and Biodiversity Conservation Act 1999</i> , or used to verify compliance with the conditions of approval. Summaries of audits will be posted on the Department's website. The Results of audits may also be published through the general media.	Noted
9.	Within three months of every 12 month anniversary of the commencement of the action , the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date publication and non-compliance with any of the conditions of this approval must be provided to the department at the same time as the compliance report is published.	Noted
10.	If the person taking the action wishes to carry out any activity otherwise than in accordance with the plans as specified in conditions 3 and 6, the person taking the action must submit the department for the Minister's written approval a revised version of that plan, the varied activity shall not commence until the Minister has approved the varied plan in writing. The Minister will not approve a varied plan unless the revised plan would result in equivalent or improved environmental outcome overtime. If the Minister approves the revised plan, that plan must be implemented in place of the plan originally approved.	Noted
11.	If the Minister believes that it is necessary or convenient for the better protection of listed threatened species and ecological communities to do so, the Minister may request that the person taking the action make specifies revisions to the plan specifies in the conditions and submit the revised plan for the Minister's written approval. The person taking the action must comply with any such request. The revised approved plan must be implemented. Unless the Minister has approved the revised plan, then the person taking the action must continue to implement the plan originally approved, as specified in the conditions.	Noted
12.	If, at any time after 5 years from the date of this approval, the person taking the action has not substantially commenced the action , then the person taking the action must not substantially commence the action without written agreement of the Minister .	Appendix C
13.	Unless otherwise agreed to in writing by the Minister , the person taking the action must publish all plans referred to in these conditions of approval on their website. Each plan must be published on the website within 1 month of being approved.	Noted

4 SOUTHERN RIGHT WHALES DESCRIPTION

According to the information provided in the 'Conservation Management Plan for the Southern Right Whale (2011-2021)'¹, southern right whales (*Eubalaena australis*) occur only in the southern hemisphere with a circumpolar distribution between latitudes of 16°S and 65°S. The Australian southern right whale population differs from other populations on mtDNA haplotype frequencies, although nuclear genes show little differentiation between Australian and New Zealand populations.

In Australian coastal waters, southern right whales occur along the southern coastline including Tasmania, generally as far north as Sydney (33°53'S, 151°13'E) on the east coast and Perth (31°55'S, 115°50'E) on the west coast. There are occasional occurrences further north, with the extremities of their range recorded as Hervey Bay (25°00'S, 152°50'E) and Exmouth (22°23'S, 114°07'E). In coastal areas, southern right whales generally occur within two kilometres offshore and tend to be distinctly clumped in aggregation areas.

Figure 3 represents the key sites and aggregation areas for Southern Right Whales in Australia (Conservation Management Plan for the Southern Right Whale 2011-2021).



Figure 3. Aggregation areas for southern right whales.

Southern right whales are found seasonally throughout the waters off southern Australia, with known nursery areas at the Head of the Bight and around Encounter Bay in South Australia. Southern right whales are also frequently sighted off the coast around the Fleurieu Peninsula and are transient in the Spencer Gulf region (Golder 2011) during their calving season (between May and November).

Southern right whales migrate seasonally between the summer feeding ground and winter breeding. The peak migration of mother and calf southern right whale pods is defined as being April to November.

¹ Department of Sustainability, Environment, Water, Population and Communities, 2012

4.1 SOUTHERN RIGHT WHALES SIGHTING DATA

A summary of the southern right whales' sightings data in the vicinity of the Port has been provided in Tables 3 and 4. Distance thresholds of 15-50 km from the Port location have been used as these are likely to be representative of southern right whale activity in the vicinity of the Project.

In summary, 60 sighting events of southern right whales were recorded within 50 km of the Port, with 21 of these in the period from 2010 – 2019. The last sighting within this zone was reported to the database in 2014. In the smaller buffer zones (15 and 30 km) around the port, the numbers of sightings reported to the database are lower.

Table 3. Summary of southern right whales' sightings from 1990-2019* at the Project location.

Distance threshold	Sightings total	Last sighting	Sightings 2010 - 2019	Sightings 2000-2009	Sightings 1990 - 1999	Sightings before 1990
15 km	17	2014	13	0	1	3
30 km	46	2014	19	7	12	8
50 km	60	2014	21	8	18	13

* Data from Atlas of Living Australia reported occurrence download at <https://biocache.ala.org.au/occurrences/search?q=qid:1576383739391> accessed on Sun Dec 15 15:23:21 AEDT 2019

In terms of seasonality, the earliest a whale has been recorded within 50 km of the Port is April and the latest is November, with the majority of sightings in July and August (this pattern holds for the smaller buffer zones too).

Table 4. Summary of the seasonality of southern right whales' sightings from 1990 – 2019* at the Project location.

Month	Sightings_15km	Sightings_30km	Sightings_50km
March	0	0	0
April	0	1	1
May	0	2	2
June	2	5	5
July	8	20	23
August	5	15	20
September	2	3	7
October	0	0	1
November	0	0	1
December	0	0	0

* Data from Atlas of Living Australia reported occurrence download at <https://biocache.ala.org.au/occurrences/search?q=qid:1576383739391> accessed on Sun Dec 15 15:23:21 AEDT 2019

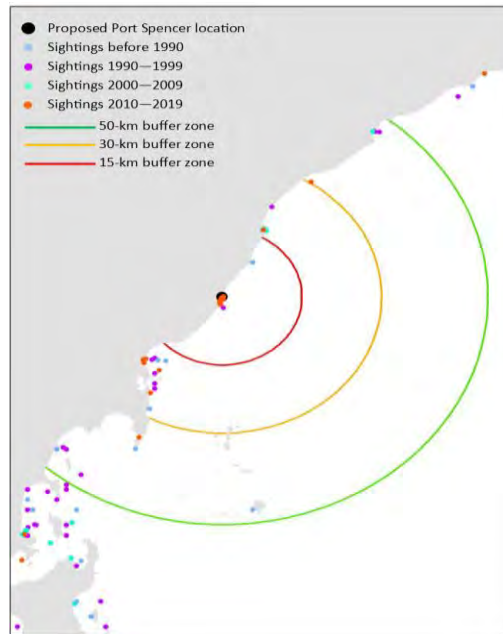


Figure 4. Sightings of southern right whales in the vicinity of the Port Spencer Project².

Given the low numbers of sightings within 50 km of the Port location, it is unlikely that the proposed Port construction is within the core migratory path of southern right whales or that it is close to an important aggregation site for the species.

Nevertheless, risk assessment and potential impacts (especially underwater noise impact and vessel strike) of the construction and operations activities on the southern right whales has been completed. Mitigation measures as well as the monitoring plans to manage the impacts of the underwater noise and the potential risk of vessel strike are presented in the following sections.

² Source: Atlas of Living Australia reported occurrence data download at <https://biocache.ala.org.au/occurrences/search?q=qid:1576383739391> accessed on Sun Dec 15 15:23:21 AEDT 2019.

5 THREATS TO THE SOUTHERN RIGHT WHALE

Threats to the southern right whale arising from Port Spencer construction and operation activities have been assessed and are outlined below.

5.1 RISK ASSESSMENT

The following steps have been undertaken to analyse the risks arising from the Port Spencer Project on southern right whales;

1. Identifying what activities are planned, when, how and where, determining the duration, time of the day, and time of the year (e.g. during whale season) of each activity as summarised in Table 5.
2. Selecting the appropriate consequence and likelihood descriptors from the definitions included in Table 1 & 2 in Appendix H.
3. Likelihood levels consider how probable it is for an impact on southern right whales from an activity associated with the Project to occur.
4. Determining the risk by identifying the matching risk row and consequence column of the risk matrix in Table 3 in Appendix H, with the risk level given by the matrix cell which the risk row and consequence column intersect at.
5. Including management and mitigation procedures, and additional management and mitigation measures if applicable.
6. Developing monitoring plans for each activity where a medium or high-risk score is determined (Section 6).

The overall level of risk to southern right whales arising from Port Spencer construction and operational activities (as outlined in Appendix G) has been determined using the framework described above and summarised in Table 6.

Table 5. Summary of construction and operational activities arising from Port Spencer which may impact Southern Right Whales.

What works are planned	When			How	Where (Marine / Land)	Significant impact (Injury)
	Duration (Days)	Day shift/ Night	Time of year			
Construction activities – March 2020 onwards						
On land drilling	125	Day / night shift	May/ June 2020	Small bore drilling – 89 mm diameter – similar to geotechnical investigation	Land	NO
On land blasting	Less than 20 days	Day shift	May/ June 2020	Controlled blasting	Land	Possible
Causeway construction	210	Day shift	June 2020	With dozer and excavator	Land and Marine	NO
Impact piling	36	Day	January – May 2021	With a hydraulic hammer	Marine	YES
Pile socket drilling	36	Day & night		With an RCD and DTHH	Marine	NO
Pile anchor grouting	4.5 (Total 108 hours)			With Grout pump	Marine	NO
Abrasive blasting and painting		Day & night	June 2020 – June 2021	With an abrasive medium i.e. industry standard inert garnet and an airless spray gun	Marine	NO

What works are planned	When			How	Where (Marine / Land)	Significant impact (Injury)
	Duration (Days)	Day shift/ Night	Time of year			
Welding over water		Day & night		With a welding machine	Offshore welding	NO
Operational activities – July 2021 onwards						
Entrance to the Gulf	Operational hours are a maximum of 17hrs per day on peak days during harvest- daylight hours wherever practicably possible, with night-time hours likely during peak (20-30 vessels per annum, approximately 60 nights per annum).	Day & night	All year	Normal vessel navigation	Marine	Possible
Movement up and down the Gulf		Day & night	All year	Normal vessel navigation	Marine	Possible
Arrival under pilotage		Day & night	All year	BC, GPV, tugs	Marine	No
Berthing		Day & night	All year	BC, GPV, tugs	Marine	No
Loading Bulk Grain		Day & night	All year	Ship loader	offshore	NO
Unberthing and departure		Day & night	All year	BC, GPV, tugs	Marine	No

Table 6. Potential risks and mitigation measures to southern right whales arising from construction and operations activities of the Port Spencer Project.

Phase	Activity/ Job	Risks (Potential)	Risks (Unwanted)	Mitigation Measures	Primary Risk Assessment		
					Likelihood	Consequence	Risk Score
Construction Phase of Port Spencer							
Wharf and Causeway construction	General activities including concrete cutting, breaking and lifting/ removing	Hydrocarbons released to the marine environment / spills and run offs	Chemical Pollution / Changes in water quality	(Refer to the Contractor's Environmental Management Plan (CEMP) for full details on hydrocarbon management procedures)	Unlikely	Minor	Low
	<ul style="list-style-type: none">Hazardous Substance Management and Spill Response Subplan in place.Spill kits and hydrocarbon booms in place.Trained response personnel on site.Regular maintenance inspection and monitoring during operation of machinery and vehicles, daily pre-start inspections and monitoring of vehicles and machinery to ensure defects are identified and remediedFloating silt curtain around the causeway footprint with work boat in place at all times for the management of silt curtain.						
	Equipment travelling on the wharf deck (excavator, mobile crane, dump trucks, light vehicles)	Noise generating activity and indirect disturbance (Turbidity)	Noise interface	(Refer to Sections 6.1, 6.2 and 6.4 of this plan for further details) <ul style="list-style-type: none">Pre-start equipment inspections, monitoring during piling, and regular maintenance to ensure any defects in equipment which may pose a risk are identified and remedied.	Almost Certain	Moderate	High

Phase	Activity/ Job	Risks (Potential)	Risks (Unwanted)	Mitigation Measures	Primary Risk Assessment		
					Likelihood	Consequence	Risk Score
				<ul style="list-style-type: none"> Underwater noise monitoring program to verify noise levels. Hours of operation restricted for certain activities. Pre-start visual observations from shore or jetty by qualified MMOs. Implementation of exclusion and safety zones at 1250 m and 500 m radius, respectively from each noise source (land-based blasting / pile driving). Soft start procedures. Restrictions on piling activity times during migration season (April to November each year). Noise mitigation technology (such as an Air Bubble Curtain or a Hydro Sound Damper) may be applied to pile driving activity to reduce pulse noise impacts 			
	Abrasive painting	Unplanned migration of pollutants	Chemical Pollution / Changes in water quality	<ul style="list-style-type: none"> Regular maintenance, inspections, and monitoring of equipment to ensure any defects are detected and remedied. 	Unlikely	Minor	Low
	Pile anchor and anulus grouting, Hot welding	Grout, shavings and broken welding disks release to water	Chemical Pollution / Changes in water quality	<ul style="list-style-type: none"> Welding mat will be used to prevent falling of objects into the water. 	Unlikely	Minor	Low
Operational Phase of Port Spencer							
Operational activities	Vessel movements, support vessel / tug operations	Hydrocarbons release to the marine environment	Chemical Pollution / Changes in water quality	(Refer to the Contractor's Environmental Management Plan (CEMP) for full details on hydrocarbon management procedures) <ul style="list-style-type: none"> Hazardous Substance Management and Spill Response Subplan in place. Spill kits and hydrocarbon booms in place. Trained response personnel on site. 	Unlikely	Minor	Low

Phase	Activity/ Job	Risks (Potential)	Risks (Unwanted)	Mitigation Measures	Primary Risk Assessment		
					Likelihood	Consequence	Risk Score
				<ul style="list-style-type: none"> Maintenance and pre-mobilisation inspections, and regular maintenance and monitoring of equipment to ensure any defects are detected and remedied. Vessel certification - Competent Master and crew. 			
	Vessel entrance to Gulf	Vessels cutting across the whale's migratory path	Disrupting the behaviour of southern right whales	(Refer to Section 6.3 of this plan for further details) <ul style="list-style-type: none"> Port related navigation aids for Australian Waters. Notify AMSA of the time of vessels entering the Gulf cutting across the migratory path. No monitoring by Peninsula Ports. 	Unlikely	Moderate	Medium
	Vessel movement up and down the Gulf	Vessels cutting across the Whales migratory path	Disturbing the behaviour of southern right whales	(Refer to Section 6.3 and Section 7 of this plan for further details) <ul style="list-style-type: none"> Port related navigation aids for Australian Waters. Notify AMSA of the time of vessels entering the Gulf cutting across the migratory path. Annual aerial surveying and monitoring for the presence of whales conducted from the Spencer Gulf mouth to the Port Spencer project, encompassing the Port Spencer shipping lane area, during the highest potential time for sightings of July and August. 	Unlikely	Minor	Low
	Arrival under pilotage	Collisions / disrupting the behaviour of southern right whales	Noise interface	(Refer to Section 6.4 of this plan for further details) <ul style="list-style-type: none"> Underwater noise monitoring program to verify noise levels 	Rare	Moderate	Low
			Vessel strike	(Refer to Section 6.3.1 of this plan for further details) <ul style="list-style-type: none"> Pilot and tug operators to look out for whales. If whales spotted, avoid impact if safe to do so. Speed limitations during southern right whale occupancy. 			

Phase	Activity/ Job	Risks (Potential)	Risks (Unwanted)	Mitigation Measures	Primary Risk Assessment		
					Likelihood	Consequence	Risk Score
				<ul style="list-style-type: none"> Manage zones in which Southern Right Whales are known to move to and from overwintering areas, and coastal movement areas. Training and awareness. Crew observations. Provide information to coastal shipping management to ensure it is aware of the potential for whale-ship collisions during the early winter and late spring migration seasons. Enlist the support of ships' captains in the identification of whales and logging and reporting of the location of whales to allow for photo-identification missions. 			
	Vessel movements, support vessel / tug operations	Indirect disturbance (turbidity)		(Refer to Section 6.3.2 of this plan for further details) <ul style="list-style-type: none"> Timing of vessel - enough time to allow the turbidity to dissipate. Vessels will not be under their own power within 1.5 km of the Jetty. 	Unlikely	Minor	Low
	Vessel movements, support vessel / tug operations	Entanglement	Mooring line- anchorage chain-tug lines	<ul style="list-style-type: none"> Vessels may be anchored 3nm from the end of the Jetty, an area which is not in a known migration path. 	Unlikely	Minor	Low

5.2 SOURCES OF UNDERWATER NOISE

Increases in underwater noise are expected to occur at the site as a result of the construction and operation of the Port. Sound sources can be categorised as pulsed (pile driving) or continuous (drilling). Sounds from moving sources (ships and vessels) are considered to be transient relative to the receivers.

The three main sources of project generated noise that potentially may have adverse effects on sensitive marine fauna in the Gulf Spencer are:

- Pile driving / Impact-piling (pulsed).
- Pile drilling (continuous).
- Vessel traffic and activity (transient).

Underwater noise modelling on the three main sources of project related noise was conducted by Golder in 2011 for the approved Port Spencer Stage 1 PER. In summary the modelled results showed:

- The cumulative sound exposure level (SEL) for impact pile driving activities could exceed the threshold for injury to marine mammals (180 dB re 1µPa) for distances from the source up to 431m.
- Predicted underwater noise from impact pile driving may exceed the behavioural threshold for marine mammals (160 dB re 1µPa- impulsive) for distances from the source up to 928 m.
- Predicted underwater noise from drilling may exceed the behavioural threshold for marine mammals (140 dB re 1µPa- continuous) for distances from the source up to 25m.
- Predicted vessel noise may exceed the behavioural threshold for marine mammals (140 dB re 1 µPa - continuous) for a distance up to 115 m from the source (vessel).

Potential underwater noise effects from land-based blasting activities were not included in the underwater noise modelling as the blasting is land based, not in the water. Table 7 below summarises the predicted noises from project activities and the distances (thresholds) from the noise sources where injury or changes in behaviour for cetaceans will occur.

Table 7. The predicted noise levels and threshold distances.

Phase	Activity	Predicted noise (dB)	Injury Threshold (dB)	Injury threshold (distance from noise source) (m)	Behavioural Threshold (dB)	Behaviour threshold (distance from noise source) (m)
Construction	Impact pile driving	205 Peak / 190 RMS ⁽¹⁾ at 10m	180	431	160	928
	Drilling	146 (RMS at 10m)	180	NA	140	25
Operations	Vessel traffic	175 (RMS at 1m)	180	NA	140	115

⁽¹⁾ RMS = Root Mean Square sound pressure levels (SPL).

Details on how noise impacts from project activities will be managed and minimised are presented in Section 6.

5.3 CUMULATIVE IMPACTS

This Project will not in itself increase the amount of grain grown in and exported from the Eyre Peninsula, or contribute to an overall increase in vessel movements that are exporting grain in the gulf, as an increase in vessel movements to and from Port Spencer will be balanced out by a reduction in vessel movements to and from other ports in the region that export grain.

In terms of the highest risk area to southern right whales - the entrance to the Gulf where the migration route that joins emerging and established large aggregation areas is located, this project should not see an increase in vessel movements in this area. It will however see an increase in the number of vessels moving north of Port Lincoln (i.e. 20-30 vessels per annum) on average every 18 days. Ship strike in this area is considered an unlikely and uncommon event as this area is generally outside the whale's migratory route between emerging and established large aggregation areas (Conservation Management Plan for the Southern Right Whale 2011-2021). For further information refer to section 6.3.1.

While whales in the region will be familiar with existing ship noise which will not increase in volume, the additional cumulative vessel movements north of Port Lincoln will mean that the background noise contribution from ships will be sustained for longer in that area.

Considering the above and given current knowledge of whale presence in the Spencer Gulf, the cumulative impact is considered to be negligible, the longer-term impacts of vessel's movements on whales is unclear and can only be assessed by improved data and the monitoring of the presence of southern right whales in the Spencer Gulf region and Port Spencer project area (Section 7).

6 MANAGEMENT AND MITIGATION OF RISKS

Risks to southern right whales arising from Port Spencer construction and operations activities as determined in Section 5 are

- Underwater noise generated from impact pile driving and drilling activities. (risk score = high)
- Noise from land-based blasting activities (risk score = low)
- Vessel strike (risk score = medium)

Management and mitigation measures for each of these risks are presented below:

6.1 IMPACT PILE DRIVING

6.1.1 NOISE MINIMISATION MEASURES

An assessment of potential noise minimisation measures has been made, with two identified as having a degree of demonstrated noise reduction.

Technologies that were considered include the following identified by ACCOBAMS³ (see also Figure 5):

Air Bubble Curtain:

A small air bubble curtain surrounds the noise source, consisting of a frame with holes placed around the noise source and supplied with air via a compressor. Noise reduction levels during several tests showed a reduction of between 4 – 14dB (SEL), and between 14 – 20dB (peak).

Hydro Sound Damper:

Technology consisting of fishing nets with small balloons fixed to it which are filled with gas and foam tuned to resonant frequencies. Noise reduction in tests showed a reduction of between 4-14 dB (SEL).

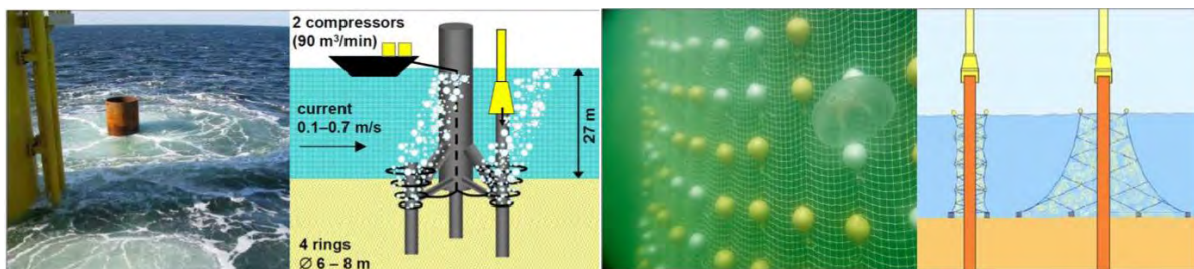


Figure 5. Noise mitigation technologies to reduce pulsive noise – Air Bubble Curtain (left), Hydro Sound Damper (right)

As the level of noise reduction in both of these measures is incapable of significantly reducing the effects of impact pile driving, neither of them removes the need for implementing avoidance of noise generation when whales are present in the vicinity of the piling activity.

³ Methodological Guide - Guidance on Underwater Noise Mitigation Measures, Seventh Meeting of the Parties to ACCOBAMS, 5-8 November 2019

As a result of the physical inability of impact piling noise to be significantly reduced and the inability of these additional measures to significantly protect whales from the noise generated, the approach to management will be avoidance of exposing the whales to noise through implementation of the safety and exclusion zones described in Section 6.1.2 below.

The mitigation measures presented above may be implemented as a response to noise being identified that is in excess of the injury threshold for marine mammals in the exclusion zone or as otherwise identified, Refer to Section 6.4.4 below further details on noise breach contingency measures.

6.1.2 MANAGEMENT AND MITIGATION ACTIONS

Based on the modelled noise impact results presented in Section 5.2 (Golder 2011), the cumulative SEL for impact pile driving activities could exceed the threshold for injury to marine mammals (180 dB re 1µPa) at a distance of 431m from the noise source.

In order to mitigate this risk an observation zone up to 2 km from each marine piling noise source will be observed at all times during piling activities by marine mammal observers (MMO) so as to detect any whales in the vicinity of the project. Within this 2 km observation zone a secondary zone – the exclusion zone will be in place 1,250 m from the marine piling noise source. If a whale enters this zone piling activity will be stopped. A third zone (the safety zone) will be 500m from the noise source, the zone in which injury to whales could occur.

Table 8 provides details on the daily management procedures for pile driving activities to mitigate the risk of injury to whales. A flow chart for the management of noise during impact pile driving is presented in Figure 7. Refer to Figure 6 for details on the observation, exclusion and safety zones to be observed from the noise source.

Table 8. Summary of management actions to minimise noise impacts during impact pile driving.

Management Action	Timing	Responsible
Daily Visual Observations		
1. Engage suitably trained and qualified Marine Mammal Observers (MMOs) for visual observation of southern right whales within the observation zone (Figure 6) – one land based, and one vessel / jetty based. One of the MMOs will be the Barngarla Land Management Officer.	Prior to construction commencing	Peninsular Ports
2. Visual observations by the MMO(s) will commence at least 30 minutes prior to the commencement of each marine piling shift.	30 mins prior to start of each shift	MMOs
3. If a whale enters / is in the observation zone in the first 30 minutes of observation piling cannot commence. Piling can only commence once the whale has been seen to leave the zone, or 30 minutes have passed since the last observation.	First 30 minutes of observations prior to commencement of piling	MMOs Project Manager
4. Continuous radio contact between the MMO(s) and the Piling Supervisor will be maintained during visual observations. MMOs will continually scan the observation and exclusion zones for the presence of the whales.	Continuous during piling	MMOs Piling Supervisor
5. Whilst piling is occurring - if a whale enters the exclusion zone, the MMO will immediately alert the Piling Supervisor and Site Manager (PM) that a	Immediate alert once whale sighted	MMO

Management Action	Timing	Responsible
whale is in the vicinity. All piling activities will cease no later than 2 minutes	Piling activity ceased within 2 minutes of alert	Piling Supervisor Project Manager
6. Piling activities must not recommence until the MMO observes that the whale has left the exclusion zone, or 30 minutes have passed since the last observation.	30 minutes since last observation	MMO to advise Project Manager when piling can recommence
Safety Zones		
7. MMO's will observe an area up to 2km from the noise source, which includes an exclusion zone and safety zone (Fig 6-2). The outer limit of the safety zone represents the distance from the noise source at which potential injury is possible based on noise modelling results (Appendix D).	Continuous during piling	MMOs
8. The observation zone, exclusion zone and safety zone will all be marked out using at least 5 floating buoys for each zone around the noise source (piling activity). Refer to Figure 6.	Prior to piling construction commencing	Project Manager
Piling Procedures		
9. A soft start procedure will be undertaken every time pile driving is resumed, even if no whales have been observed in the area., Power will be built up slowly over 20 minutes from a low energy start to give adequate time for marine mammals to leave the vicinity before exposure to the maximum sound pressure level.	At the start of each day of pile driving activity / each time pile driving resumes	Piling Supervisor
10. Piling will not be undertaken during poor visibility. If marine piling has commenced prior to sunset and / or a poor visibility period, it can be continued into the night-time if the piling had been continuous up to that point and not suspended for more than 15 minutes.	During poor visibility (darkness, or mist / fog)	MMOs to inform Project Manager
11. No marine piling will be undertaken during night-time - between the hours of sunset and sunrise - from 1st April to 30th November (the peak migration of mother and calf southern right whale pods) in any year - unless piling had already commenced prior to sunset (see point 10).	During construction	Site Manager

Resources

- Two trained Marine Mammal Observers (MMO's), with a third MMO available to work in rotating shifts will be engaged for visual monitoring of the mammal observation zone.
- One land-based MMO (20m above sea level) and one vessel-based or jetty construction site-based MMO will use binoculars and other appropriate equipment, which may include the use of drones, to provide warnings of approaching whales immediately.
- Traditional owners of the land are the Barngarla community, who have exclusive Native Title over the crown land along the coast. The Barngarla name for Lipson Cove is Boodloo and the southern right whale is a very important animal in Barngarla dreaming stories. Thus, the Barngarla Land Management Officer will be trained as one of the Marine Mammal Observers (MMO).

Staff training and awareness

- All site personnel will be inducted in the pile driving procedures prior to commencing work and any additional inductions or training required by the contract will be provided.

- All Project personnel's will be notified of the observation, exclusion and safety zones as well as the control measures to minimise the impact on whales during the daily pre-start briefings prior to the start of each shift.
- The qualified MMO(s) shall assist in training other members/personnel and providing advice.

Monitoring

- Underwater noise monitoring will be conducted by suitably qualified personnel during pile driving activities to verify that the noise signals being generated are consistent with the modelled predictions used to develop this plan, and to ensure underwater noise does not exceed 183 dB re 1 μ Pa².s. in the exclusion zone. Following assessment of monitoring results, safety and/or exclusion zone distances may be altered, subject to the approval of DAWE within the conditions of EPBC 2012/6590.
- MMO's will record data on any whale sightings made during the observations on a field sheet (Appendix A) and where possible, obtain a photograph of the sighting
- The data will be provided annually to Atlas of Living Australia.

Reporting

- If, for any reason, the piling activities have not been ceased within 2 minutes of sighting whales in the exclusion zone, an incident will be raised, and an internal incident investigation undertaken to determine the root cause to ensure no reoccurrence. The EMR will report the incident to the Minister, through the DAWE email notification process as advised by DAWE from time to time, within one business day, and a report detailing the incident findings will be forwarded to DAWE within 2 weeks.
- It is the responsibility of the MMO to monitor the implementation of all measures specified in Table 6 and to send the results of the monitoring to the DAWE at the end of the jetty construction activity.
- Any observations of whales will be reported to DAWE in the annual EPBC compliance report as per condition 9 of EPBC Approval 2012/6590, and also in the annual monitoring report submitted to DAWE and SGEDI as per Section 7.3.

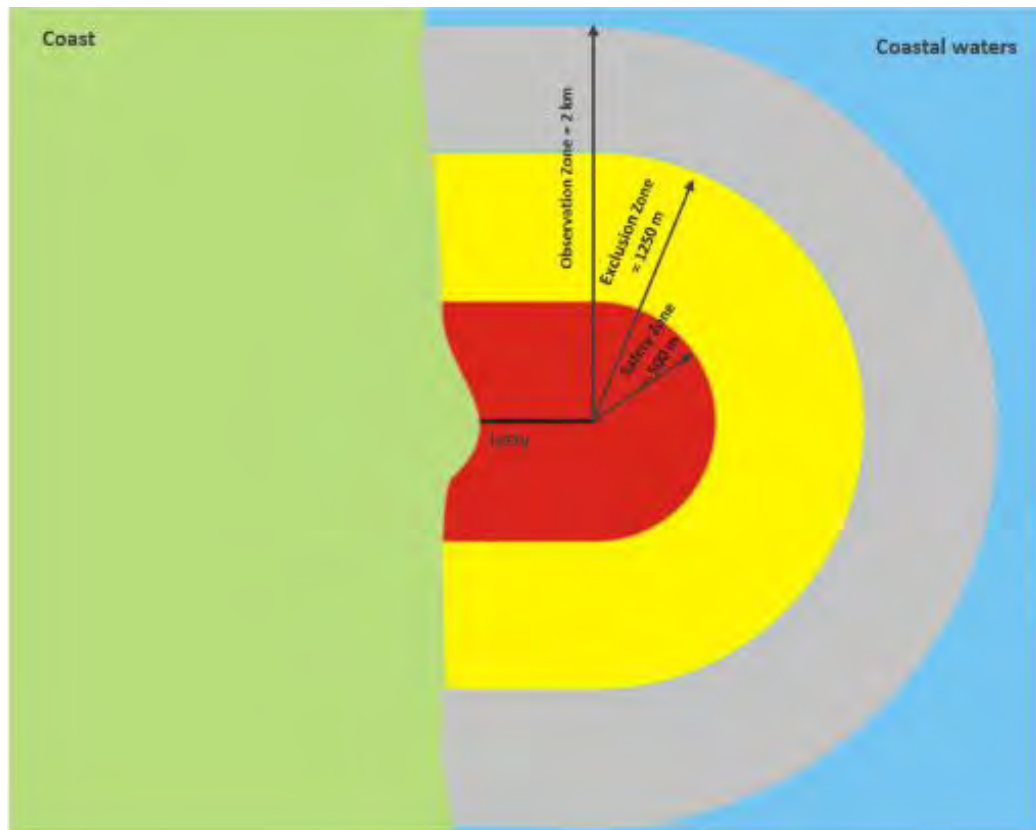
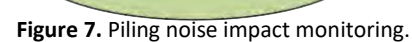


Figure 6. Diagram showing the Observation, Exclusion and Safety zones

Observation zone = Full extent of the MMO observation area from the noise source (2km) – if a whale is spotted in this zone in the 30 minutes prior to the start of the shift, piling (or blasting) cannot commence. Works can commence once the whale has been seen to move away from the exclusion zone, or 30 minutes has passed since the last sighting.

Exclusion Zone = 1,250m from the noise source - If a whale enters the exclusion zone whilst piling works are occurring the Piling Supervisor and Project Manager will be notified immediately and piling works must stop within 2 minutes. If a whale enters this zone during blasting a hold on blasting will occur. Works cannot recommence until the exclusion zone is clear.

Safety Zone = 0m – 500m from the noise source - The zone in which potential injury to marine mammals is possible based on noise modelling results.



6.2 LAND BASED BLASTING

The Port's location on a rocky headland means there may be a requirement for blasting to enable the building of a platform and creation of a cutting where the conveyor to the jetty will be located. Blasting work will be undertaken by personnel certified to design and execute blasting operations.

Blasting is programmed to be carried out during day shift only since the timing of blasting coincides with the migration season of southern right whales. It is unclear whether land-based blasting has any underwater noise impacts on southern right whales, however a safety zone, exclusion zone and observation zone 500m, 1,250m and 2km respectively from the land based noise source will be observed at sea by MMOs in the same way as for the pile driving activities in Section 6.1.2. so as to minimise the risk of injury to whales. Underwater noise monitoring will also be conducted at the time of blasting to verify underwater noise levels as a result of blasting activities (refer to Section 6.4 for further details). As the land-based blasting is along the same centreline as the piling activity and the closest shot is within approximately 50m of shore, the safety, exclusion and observations zones used for piling will also be used for all land-based blasting, representing a conservative approach.

The following management and monitoring procedures will be in place for each phase of blasting:

Table 9. Summary of management actions to minimise noise impacts during land-based blasting.

Management Action	Timing	Responsible
Pre-blast monitoring:		
1. Peninsula Ports will engage an MMO to undertake the observation task.	Prior to construction	Peninsular Ports
2. Visual observations of the Exclusion Zone for the southern right whale (as above) will be carried out by the MMO for 30 minutes prior to detonation using binoculars or other appropriate equipment, which may include the use of drones. Continual communicate via UHF radio with the Blast Guard will be maintained.	Commence 30 minutes prior to detonation	MMOs & Blast Guard
3. If a whale(s) is sighted blasting will not commence until the MMO notifies the Blast Guard that the whale(s) has moved outside the designated Exclusion Zone or 30 minutes has passed.	If a whale is spotted prior to commencement of blasting	MMOs & Blast Guard
During land-based blasting monitoring:		
4. Monitoring using visual observations for whales will be undertaken during daylight hours and in conditions where visibility is adequate to monitor the Exclusion Zone.	Continuously during blasting activities	MMOs
5. There will be no blasting conducted on land when there are poor visibility conditions (i.e. fog, mist, not enough light). The MMO will inform the Site Manager when blasting cannot occur.	Continuously during blasting activities	MMO & Project Manager
6. Go/No-Go Decision Process: the MMO will have the authority to recommend a hold on blasting until monitoring indicates that the Exclusion Zone is and will remain clear of detectable animals. The fire mission will be postponed if a whale is visually detected. The delay will continue until the whale(s) that caused the postponement are confirmed to have moved outside the Exclusion Zone, or until at least 30 minutes after the last sighting within the Exclusion Zone.	Continuously during blasting activities	Project Manager
Post-blast monitoring:		

7. Post-blast monitoring will commence immediately after each blast to determine whether there are any dead or injured whales. Vessel based and ground-based visual monitoring will be used.	Immediately following each blast	MMO(s)
8. If any whales are observed or detected in the Exclusion Zone during the post-blasting monitoring, the location, number, species, injuries (if present) and behaviour will be recorded in the daily monitoring sheet and reported). Dead or injured whales will be reported within 24 hours to DEW. An internal incident report will be raised, and an internal investigation conducted. A copy of the findings of the incident investigation will be provided to DEW and DAWE.	Reporting of dead or injured whales – within 24 hours of incident Incident report - within 2 weeks of incident	EMR Site Safety Officer

Resources

- Two trained Marine Mammal Observers (MMO's) will be engaged for visual monitoring of the mammal observation zone during land blasting activities.

Staff training and awareness

- All site personnel will be inducted in the land-based blasting procedures prior to commencing work and any additional inductions or training required by the contract will be provided.
- All Project personnel will be notified of the safety, exclusion and observation zones at 500m, 1,250m and 2km respectively from the noise source, as well as the control measures to minimise the impact on whales during the daily pre-start briefings prior to the start of each shift. For an abundance of caution Figure 6 will be adopted for the land-based blasting safety, exclusion and observation zones, even though the blasting is at least 50m inland from the shore (but along the same centreline as the piling).
- The qualified MMO(s) shall assist in training other members/personnel and providing advice.

Monitoring

- Underwater noise monitoring will be conducted by suitably qualified personnel during blasting activities to verify that the noise signals being generated do not exceed 183 dB re 1µ Pa².s. in the exclusion zone. Following assessment of monitoring results, safety and/or exclusion zone distances may be altered, subject to the approval of DAWE within the conditions of EPBC 2012/6590.
- MMO's will record data on any whale sightings made during the observations on a field sheet (Appendix A), including time and location of sighting, number of individuals, injuries if present, direction of travel and where possible, obtain a photograph of the sighting
- Data will be provided annually to Atlas of Living Australia.

Reporting

- Any observations of whales will be reported to DAWE in the annual EPBC compliance report as per condition 9 of EPBC Approval 2012/6590, and also in the annual monitoring report submitted to DAWE and SGEDI as per Section 7.3.
- Any sightings of dead or injured whales as a result of blasting will be reported within 24 hours to DEW. An incident investigation will be completed, and the incident report provided to DEW. The incident will also be reported in the annual EPBC report to DAWE. Refer also to Section 8 for details on the reporting of dead or injured whales.

6.3 MANAGEMENT OF VESSEL MOVEMENTS DURING OPERATIONS

According to the Conservation Management Plan for the southern right whale (2011-2021), it appears that southern right whales are the primary species involved in vessel collisions in the southern hemisphere although there are low numbers of recorded strikes in Australasian waters. Vessel collision is a greater risk for southern right whales when they are in the coastal zone due to the higher probability of encountering vessels. A considerable report has been undertaken by SGEDI regarding the interaction between whales and vessels at Spencer Gulf region (C Izzo and BM Gillanders. 2015). It is reported that the predicted risk of collision for southern right whales in southern Australia indicates relatively low risk of collision. For this project the area of highest potential for vessel strike is at the entrance to the Gulf, for which existing measures are in place as detailed in section 6.3.1.

There are three key areas for the proposed Project (as shown in Figures 8, 9 and 10) where potential risk of vessel strike exists due to ships moving across the likely migratory route between known aggregation sites around the Fleurieu Peninsula and the Great Australian Bight (Figure 3). Proposed monitoring plans at these areas are provided in the following sections:

6.3.1 AREA 1. ENTRANCE TO THE GULF AND AREA 2. MOVEMENT UP/DOWN THE GULF

Modelling was undertaken for the Kangaroo Island Plantation Timbers (KIPT) Smith Bay Wharf Environmental Impact Assessment in September 2018 to quantify the risk of regular shipping movements striking southern right whales during annual migration⁴. At the assumed KIPT shipping of every 14 days with a single ship moving from East to West and 260 whales crossing twice per year (520 crossings in total) within the shipping zone of approximately a 1000km by 200km domain, it is reported that the average number of whale-strikes is 0.00334 per year (1 every 300 years). It is stated as an upper bound probability assuming worst-case conditions and many variables discounted could serve to reduce this likelihood.

As the Port Spencer Project is in a similar operational area and will have a similar number of vessels to the KPTI Project, it is highly unlikely that the vessel movement at Area 1 and 2 (Figures 8 and 9) of the Port Spencer Project would cause a vessel collision with southern right whales. The Port Spencer Project should not see an increase in vessel movements at the entrance to the Gulf. It will however see an increase in the number of vessels moving north of Port Lincoln, i.e. 20-30 vessels per annum - on average a vessel every 18 days with an average loading rate of 2,000 tph, however this area is generally outside the migratory route. Thus, there will be little to no impact on current shipping operations within the Spencer Gulf, and vessels will continue to follow the current methodology of shipping in the Spencer Gulf by remaining under the general obligations of the Australian Maritime Safety Authority (AMSA).

Management measures to minimise potential whale-vessel strike at Areas 1 and 2 are summarised in Table 10 below. Refer also to Appendix E – Vessel Traffic Management Plan for further details on the standard Port Spencer Project vessel movement procedures.

⁴ Smith Bay Wharf Environmental Impact Statement Appendix 12 – Potential Effects of Vessels on the Southern Right Whale, https://www.sa.gov.au/data/assets/pdf_file/0004/507370/KIPT-EIS_Appendix_1_Marine-Ecological-Assessments.pdf

Table 10. Summary of management actions to minimise vessel strike at areas 1 and 2.

Management Action	Timing	Responsible
Vessels entering areas 1 and 2:		
1. Ships are required by the IMO to be fitted with an Automatic Identification System (AIS) for ship-to-ship and ship-to-shore communication (Australian Maritime Safety Authority 2008). The system uses high frequency radio to transmit and receive information at regular intervals including ship identification (IMO number, name, registration, etc.), position (latitude and longitude), course, speed and draught, effectively producing a path of their movements.	At all times	Vessel Master
2. The officer of the navigational watch for each vessel is responsible for maintaining a watch for whales and will notify the Vessel Master immediately if a whale is sighted.	Continuously during vessel movement in and out, and up and down the Spencer Gulf	Officer of the navigational watch Vessel Master
3. The Vessel Master must warn the Harbour Master (ship to shore communication) and other vessels in the vicinity (ship- to ship communication) in the event of any whale sightings.	Continuously during vessel movement in and out, and up and down the Spencer Gulf	Vessel Master Harbour Master
4. In the event of a whale sighting it is recommended to reduce vessel speeds to 10 knots or less to reduce the risk of ship strike.	In the event a whale is sighted	Vessel Master
5. In the event of a whale sighting, to minimise the risk of whale-vessel interaction, the vessel master should consider a modest route alteration.	In the event a whale is sighted	Vessel Master
6. These actions will continue for the life of the project.	Continuously during the construction and operations phases of the project	Vessel Master, Officer of the navigational watch, and Harbour Master


Figure 8. Vessel strike risk area 1 – Entrance into the Spencer Gulf



Figure 9. Vessel strike risk area 2 – Movement up and down the Spencer Gulf

6.3.2 AREA 3. ARRIVAL UNDER PILOTAGE

The arrival of vessels will occur at the commencement of the operation. Vessels will arrive at the anchorage point and take up a position as directed by Peninsular Ports (through Port Spencer VTS), approximately 3nm from the end of the Jetty, East. The number of vessels expected at the jetty during the early operational phase will be approximately 20-30 panamex vessels per year for grain (max frequency of two per fortnight). Potential for injury during berthing and unberthing is very low due to tugs controlling the vessel movements to a low speed.

A suitably experienced and qualified port management and operating company would be appointed to manage marine operations including harbour master duties, safety and security, environmental and emergency response. The Port Spencer operations would have a full suite of Operating, Safety and Emergency response plans and procedures for the land and marine environment to cover all potential incidents.

Management measures in place to minimise the potential vessel strike during the arrival of vessels under pilotage include:

Table 11. Summary of management actions to minimise vessel strike at area 3.

Management Action	Timing	Responsible
Vessels entering area 3:		
1. Vessels will have radio communications established with Port Spencer Vessel Traffic Services (VTS) at all times. Port Spencer VTS is the primary point of contact for Peninsular Ports and the Harbour Master. Pilotage procedures will ensure that Pilots use a slow approach speed to minimise both risk of vessel strike and minimise the potential need for maximum thrust use of propellers for manoeuvring (which would cause cavitation and therefore increased underwater noise)	At all times whilst vessel is under pilotage	Vessel Pilot Harbour Master
2. Tugs escort will be provided under the direction of a suitably qualified master to control the speed of vessel. Two 60 TBP tugs will escort a Panamax size vessel into safe berthing. This can be reduced to a single tug only under ideal weather conditions. The slower moving vessels will provide greater opportunity for both whales and vessels to avoid collision	At all times whilst vessel is under pilotage	Tug Master Vessel Pilot
3. The tugs will abide by instructions received from the Port Spencer VTS, including taking care to minimise the use of maximum power and therefore reduce the potential for cavitation (and noise).	At all times whilst vessel is under pilotage	Vessel Pilot Tug Master

Management Action	Timing	Responsible
4. If a whale(s) is spotted, it is the responsibility of tug operators and the vessel pilot to avoid strike if safe to do so	If a whale is spotted	Tug Operator Vessel Pilot
5. In order to minimise turbidity, noise from cavitation and disturbance to sediments, Port operational measures will be in place to ensure that vessels will not be under their own maximum propulsion within 1.5 km of the Jetty unless required for taking evasive action.	Continuously	Harbour Master

Note that it is not practicable for a port operator to impose measures on arriving vessels to reduce the inherent noise generation of bulk carrier vessels. Such measures can only be implemented during vessel construction or overhaul and are beyond the ability of individual port operators to enforce due to the global nature of shipping.

It is also important to note that the implementation of mitigation measures must not compromise navigational safety at sea.

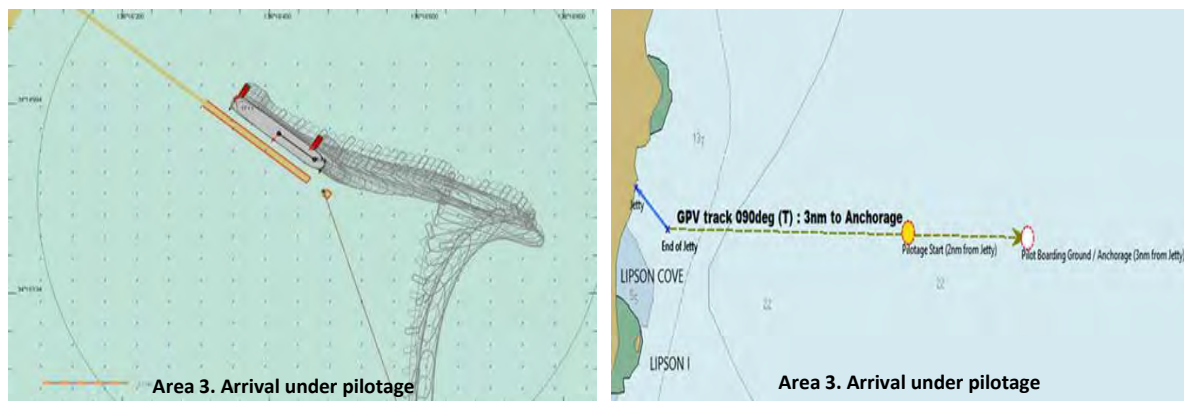


Figure 10. Vessel strike risk area 3 – Arrival into Port Spencer under pilotage.

6.4 UNDERWATER NOISE MONITORING

Based on noise modelling results provided by Golder (2011), noise generated during pile driving activities and vessel traffic at the Port Spencer Project is not anticipated to reach levels that would result in injury to marine mammals. In order to verify this an underwater noise monitoring program will be conducted during construction to ensure underwater noise does not exceed 183 dB re $1\mu\text{Pa}^2\cdot\text{s}$ outside the 500m safety zone and will continue into the operational phase to confirm that noise signals being generated by project activities do not exceed 183 dB re $1\mu\text{Pa}^2\cdot\text{s}$, at any time, as per EPBC 2012/6590 approval condition 3f.

6.4.1 PILE DRIVING ACTIVITIES DURING CONSTRUCTION

Underwater noise monitoring will be conducted continuously during pile driving activities by suitably qualified personnel, commencing as soon as pile driving activities commence. Underwater noise emitted during this time will include pile driving, pile drilling and the movement of vessels for the purposes of managing silt curtains and other equipment during pile driving. Noise monitoring will be conducted in three locations:

1. 50m-500m from the noise source
2. On the outer edge of the safety zone and no more than 500m from the noise source
3. On the outer edge of the exclusion zone and no more than 1,250m from the noise source

Monitoring results will be monitored in real time and results analysed daily to ensure breaches do not occur. Monitoring locations will alter slightly as pile driving activity moves further out to sea. Monitoring point 1 and 2 may be adjusted within their respective zones to gain adequate information to enable assessment of monitoring results, and request alteration of safety and/or exclusion zone distances, subject to the approval of DAWE within the conditions of EPBC 2012/6590. As piles are grouped in pairs any change to monitoring position will only occur following review of data for each pair of piles. Refer to Figure 11 below for indicative monitoring locations:

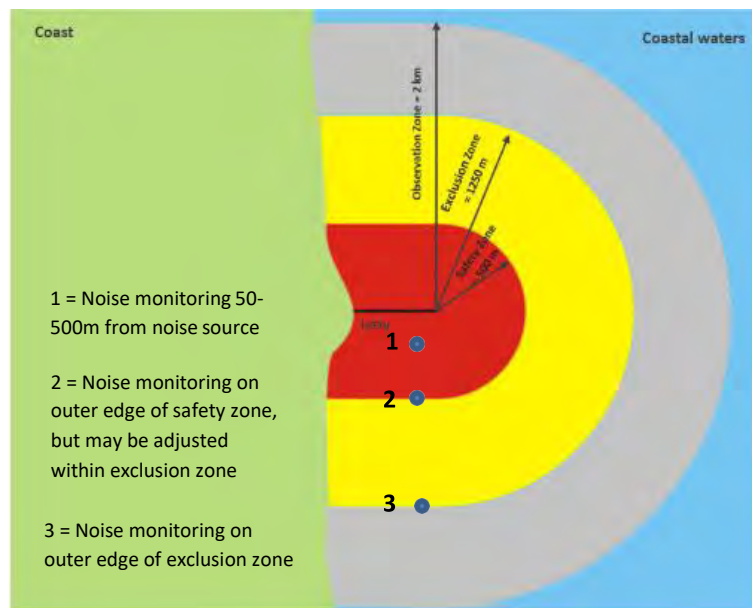


Figure 11. Indicative noise monitoring locations during pile driving activities.

Following the completion and review of monitoring results from the first five pile driving events, exclusion zone distances may be altered subject to the approval of DAWE within the conditions of EPBC 2012/6590. The noise monitoring program will subsequently be revised in accordance with these alterations if made.

6.4.2 LAND BASED BLASTING ACTIVITIES DURING CONSTRUCTION

Currently there is no evidence that noise from the land-based blasting to be conducted on site will have an effect on underwater noise. However, underwater noise monitoring will be conducted whilst land-based blasting is occurring to verify this. Noise monitoring will be conducted in the three locations as per 6.4.1, in the closest proximity as possible to the noise source on land. Monitoring will be conducted throughout the land-based blasting program.

Following the completion and review of monitoring results from the first three blast events, the exclusion zone distances may be altered subject to the approval of DAWE within the conditions of EPBC 2012/6590. The noise monitoring program will subsequently be revised in accordance with these alterations if made.

6.4.3 VESSEL MOVEMENTS DURING OPERATIONS

The zone around the Port Spencer jetty will be monitored during operations to determine underwater noise from vessels approaching and leaving the berth. Monitoring locations will be positioned at the same locations as the piling monitors (refer to Figure 11 above). These are located to be away from the vessel manoeuvring area to avoid the risk

of equipment being damaged. The nearest of these will initially be set 50m from the wharf to detect the maximum probable noise from vessel manoeuvring but may be adjusted following review of data from the first 6 vessel movements (3 vessels in and out of berth).

As per Section 6.3.2 vessels utilising Port Spencer will be brought to the jetty under pilotage from approximately 3nm, with the area that poses the greatest risk of cavitation and therefore maximum noise being the last 0.25nm due to the greatest potential for manoeuvring actions at higher engine power; monitoring in this area will capture the underwater noise generated by the higher propeller cavitation action as vessels and tugs approach and leave the wharf, actions which are likely to create the greatest potential for underwater noise from vessels associated with the project. In distances further away from this final 0.25nm manoeuvring zone vessels are typically in low power mode which generates less noise, and the wider area may also include vessels from other sources therefore making it difficult to distinguish between project related vessel noise and other vessel noise sources.

Monitoring will be conducted for one year commencing at the start of operations so as to provide data on one full operational season of the port. The monitoring program will be reviewed in consultation with DAWE at the completion of the first year of monitoring.

A summary of all underwater monitoring actions is presented in Table 12 below:

Table 12. Summary of the Port Spencer Underwater Noise Monitoring Program.

Project Activity	Timing	Responsible
Pile driving / drilling during construction		
1. Underwater noise monitoring locations set up prior to piling activities commencing in three locations – 50-500m, 500m and 1,250m from noise source	Prior to piling activities commencing	EMR
2. Monitoring results viewed in real time and analysed daily to ensure breaches do not occur	Continuously during piling activities	EMR
3. Monitoring locations altered as piling activities move further out to sea, and flexible following review of results	Prior to each new pile drive	EMR
Land based blasting during construction		
4. Underwater noise monitoring locations set up prior to land based blasting activities commencing – 50-500m, 500m and 1,250m from noise source, and flexible following review of results	Prior to blasting activities commencing	EMR
5. Monitoring results viewed in real time and analysed immediately following blast event to determine underwater acoustic effects	Immediately following blast event	EMR
Vessel movements during operations:		
6. Underwater noise monitoring locations set up prior to operations commencing in three locations – 50m, 500m and 1,250m from the end of the jetty, and flexible following review of results	Prior to operations commencing	EMR

6.4.4 CONTINGENCY MEASURES FOR UNDERWATER NOISE BREACHES

If underwater noise monitoring results indicate a breach (above 183 dB re 1 μ Pa².s) the activity creating the main source of noise at the time of the breach will cease immediately. The incident will be recorded in the internal incident reporting system, and the incident investigated to determine the root cause and ensure there's no reoccurrence.

In response, corrective actions may include the review of operational procedures and, if appropriate the application of additional noise mitigation technologies to reduce noise outputs such as those identified in Section 6.1.1 above. Activities will only resume once satisfactory controls have been put in place to address the issues which contributed towards the breach.

7 MONITORING PLAN – HABITAT USE AND BEHAVIOUR

Referring to condition 3b of the EPBC 2012/6590 approval, a plan to monitor southern right whale habitat use and behavior for the mapping of potential threats, from port construction and operation is required. An aerial surveying monitoring plan has been developed in consultation with SGEDI as below to map the presence of southern right whales in the Spencer Gulf and vicinity of the project. Data collected from the land-based monitoring for southern right whales as outlined in Sections 6.1 and 6.2 will also contribute to the data collected during the aerial surveys.

Monitoring will be conducted by suitably qualified personnel.

7.1 AIMS AND OBJECTIVES

The aims of the monitoring program are to:

- Monitor for the presence of whales in the vicinity of the Port Spencer project and the Spencer Gulf.
- Undertake species distribution modelling if/when sufficient survey data is collected
- Disseminate results of the program so as to contribute towards knowledge on the presence of southern right whales in the Spencer Gulf region.

The objectives of the monitoring program include the following:

- Conduct aerial grid survey monitoring from the mouth of the Spencer Gulf to the Project location over the peak migration period (July and August) using fixed wing aircraft.
- Document the location of sightings, direction of travel, number and type of individuals sighted, and photograph sightings.
- Report annually on the data collected to relevant government agencies and research groups.
- If sufficient data is collected, undertake species distribution modelling linking the presence of southern right whales to shipping routes in the Spencer Gulf.
- Map potential threats to the Southern Right Whale, arising from port operation and construction

7.2 METHODOLOGY

7.2.1 AERIAL SURVEYING

Background

Referring to Section 4, the peak migration of mother and calf southern right whale pods is defined as being April to November, and they are transient in the Spencer Gulf region during calving season between May and November (Golder 2011). The majority of whale sightings within 50km of the project location have been during July and August (Table 4). As noted in Section 4 above and in particular Figure 3 Spencer Gulf is not an aggregation area for Southern Right Whales. July and August are the months of historical highest sightings, so the aerial survey will concentrate on these months.

Survey Frequency

Up to a maximum of 6 days (minimum 3 days) of aerial surveys will be conducted in both July and August each year (maximum of 12 days per year in total – minimum 6 days) commencing in the first year of construction. Surveys will be conducted using a fixed wing aircraft flying in a grid pattern over the survey area to visually locate whales or whale pods in the vicinity of the project. Surveys will be undertaken in suitable weather conditions for spotting whales from the air and conducted in line with Civil Aviation Safety Authority rules and regulations.

Days will be selected based on an assessment of forecast weather conditions and providing maximum visibility for sighting activity. Consideration will also be given to actual land-based sightings, especially in the vicinity of the entrance to the gulf, to provide the maximum potential for meaningful data collection.

Survey Area

The extent of the survey area will be from the mouth of the Spencer Gulf moving up towards the Port Spencer project, covering the area encompassing the Port Spencer shipping lanes. During the survey the area will be tracked digitally in real time so as to determine which areas have been covered, and accurately record where sightings are being made. The survey area will be consistent each year.

A grid pattern will be established over the survey area such that the entire area can be observed within a three hour “on station” flying window. Priority will be given to completion of the observation grid within that window to maximise the potential of multiple sightings rather than following the first whale sighted for more detailed observation. Additional fuel load may be possible such that any sightings that do occur during the flight can be revisited for further observation. The ability to revisit sightings either during or following the completion of the grid will be subject to the pilot’s decision as to the safety of completing this additional tasking. It may be possible to land and re-fuel if multiple sightings were made and it is considered likely to be able to return to the likely whale location in time.

If, due to safety or weather-related disruptions, a flight is abandoned prior to completion of the grid survey an additional survey day will be added to provide maximum potential for consistent data collection. The minimum number of days has been set to provide a minimum coverage of data collection, however based on actual land-based sightings and favourable weather conditions increased data collection may be possible in some years, which would reflect the maximum number of days observation.

Where possible two consecutive days at a time will be clustered together to provide maximum potential for data collection, as whales observed on one day may still be in the search area the following day. Unfortunately, at the time of year of maximum whale activity there are a higher proportion of days unsuitable for aerial observation, which means a degree of opportunistic activity is unavoidable.

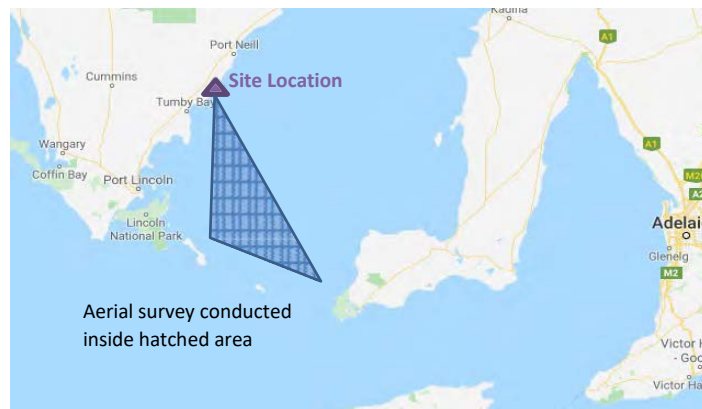


Figure 12. Area where aerial grid surveying will be conducted

7.2.2 DATA COLLECTION

In line with the monitoring of whale behaviour in the Great Australian Bight in 2015⁵, upon the encounter of a whale or whale pod the following data will be collected:

- GPS location of the sighting
- The direction of travel
- The number of individuals and composition of the sighting, e.g.:
 - Unaccompanied adult (adults sighted without a calf)
 - Adult and calf
- The time, date, and weather conditions
- Where possible, observations of behaviour using the behaviour codes

Data will be manually logged in field sheets (refer to example field sheet in Appendix A), and later transferred and stored in a digital database. The field sheets will also be used to log any sightings in the exclusion area that occur during the construction phase (Sections 6.1 and 6.2). The aircraft will remain on station with the whale for long enough for the data collection to be completed – this may require flying short racetrack patterns around the whale prior to resuming the grid pattern. Altitude limits for observation will be determined by the pilot based on safety as the highest priority.

7.2.3 PHOTOGRAPHS

Photographs of all southern right whale sightings will be taken from the aircraft during the aerial surveys from as low an altitude as can safely be achieved on the day.

⁵ Monitoring Southern Right Whale Abundance, distribution and population dynamics at the Great Australian Bight aggregation, Alice I MacKay and Simon D Goldsworthy, SARDI Publication number. F2014/000052-2, SARDI Research Report Series No. 835, March 2015

7.2.4 MAPPING OF SIGHTINGS

The GPS positions and directions of travel of all whale sightings will be mapped using ARC GIS, or a similar mapping program.

7.3 REPORTING

A report detailing the survey, any sightings, photographs, and a map indicating the locations of sightings will be provided to DEW, DAWE, SGEDI and published on Peninsula Ports website within 3 months of the survey completion, together with data collected by the MMO's during observations undertaken for pile driving and blasting activities (Section 6.1 and 6.2).

If and when sufficient sightings data has been collected, species distribution modelling will be undertaken by suitably qualified personnel taking into account shipping lanes in the region, and distributed to all relevant government agencies, SGEDI and research groups as well as published on the Peninsula Ports website.

7.4 ADAPTIVE MANAGEMENT OF THE MONITORING PROGRAM

A review of the monitoring program will be conducted every 5 years, the results of which will be provided to DAWE. If any amendments to the implementation of the monitoring program are required to better meet the programs objective a revised SRWMP will be submitted to the Department for approval in accordance with EPBC 2012/6590 approval condition 10.

If, through review, it is demonstrated that the monitoring program has adequately mapped potential threats to Southern Right Whales from port operations, the Minister's approval may be sought to cease the program, through the approval of a revised SRWMP.

7.5 BENEFITS OF THE MONITORING PROGRAM

The monitoring data that is currently available has significant limitations due to the land-based nature of the observations. Sightings are, to a degree, opportunistic in areas that are not documented as major aggregation areas for the whales. This monitoring program has the potential to fill in some significant gaps in data related to the movement and behavioural patterns of whales near the entrance to the gulf, which is an area of high shipping intensity.

This data may help the broader industry to make more informed decisions about the potential cumulative impact of shipping on Southern Right Whales.

8 REPORTING OF DEAD OR INJURED WHALES

In the unlikely event of sighting dead or injured whales, it is the responsibility of the EMR to report the incident to one of the following:

- Department of Environment and Water: [0427 556 676](tel:0427556676).
- 24-hour FISHWATCH hotline: [1800 065 522](tel:1800065522).
- Mammals staff at the South Australian Museum: [\(08\) 8203 7458](tel:0882037458) or [0412 708 012](tel:0412708012).
- Australian Maritime Safety Authority:
 - Complete the incident alert form 18 and submit online, or
 - Download form 18 and email the completed form to reports@amsa.gov.au, or
 - Phone: [1800 627 484](tel:1800627484).

Give the following information when reporting:

- Your contact details, and any other witness contact details.
- Location of incident with as much detail as possible.
- Time and date of the incident or when it was first noticed.
- Species or description of the animals, including size and number of animals involved.
- Weather conditions.
- Tide details.
- Accessibility by boat or vehicle.
- Any other relevant details.

The sighting of dead or injured whales will also be recorded internally in detail in the Peninsula Ports incident report system *and* reported in the annual EPBC report. If the injuries or death are potentially as a result of project activities (Section 6.1, 6.2 and 6.4.4) an incident investigation will be undertaken. A report including the findings of the incident investigation will be provided to DEW and DAWE within 2 weeks of the incident.

9 CONTRIBUTION TO SGEDI RESEARCH

Consultation was undertaken with the Chair of SGEDI, John Bastian, and the principal contact for SGEDI, Professor Bronwyn Gillanders over the period December 2019 through to April 2020. Table 13 summarises the meetings and consultation taken place with SGEDI members in order to develop the southern right whale management plan.

Following the consultation process, and review of the draft SRWMP plan that had also been peer reviewed by Dr Alice Jones of the University of Adelaide, SGEDI were able to confirm expectations regarding ongoing involvement of Peninsula Ports as follows:

- Peninsula Ports to become an active member of SGEDI.
- As an active member, to participate in meetings 3 times per annum with other SGEDI members for the purpose of sharing knowledge and collaborating on the objectives of SGEDI.
- Provision of the annual monitoring program reports to SGEDI (as per Section 7.3). The assessment in this plan that Port Spencer would not likely increase the number of vessels entering the gulf was

discussed with SGEDI and considered reasonable, as Port Spencer of itself would not increase the quantity of grain grown on the Eyre Peninsula.

SGEDI does not consider itself to have any formal approval role on any project, but rather it now represents a forum for collaboration amongst industry so that future approvals processes can be based on a shared agreement of current scientific research on matters that are common to all potential developments within the Spencer Gulf.

The current (April 2020) membership of SGEDI includes:

- BHP Billiton
- Santos
- Liberty OneSteel (formerly Arrium)
- Nyrstar
- Iron Road
- Flinders Ports
- Fisheries Research and Development Corporation
- SARDI
- Flinders University
- University of Adelaide

Table 13. Summary of consultation with SGEDI members.

Name	Position	Date	Details
Dr. Alice Jones	Uni Adelaide Research Associate – SGEDI member	12-12-2019	First Draft of SRWMP with appendices provided to Dr Alice Jones for Review.
		13-12-2019	Meeting with Dr. Alice Jones to provide consulting services to enable our compliance with the EPBC approval.
		17-12-2019	Requested a summary of sighting data around the Port Spencer location from Dr Alice Jones.
		19-12-2019	Whales sighting data provided by Dr Alice Jones.
		20-12-2019	Second draft of SRWMP provided to Dr Alice Jones for review.
		31-12-2019	Second draft of SRWMP has been peer reviewed by Dr Alice Jones.
Professor Bronwyn Gillanders and John Bastian	Uni Adelaide - Deputy Dean Research Chair of SGEDI Board	14-01-2020	Second draft of SRWMP provided to Professor Bronwyn Gillanders and John Bastian for review.
		24-01-2020	Meeting with Professor Bronwyn Gillanders and John Bastian to discuss Peninsula Port's contribution to research on southern right whales through SGEDI.

Name	Position	Date	Details
Professor Bronwyn Gillanders	Uni Adelaide - Deputy Dean Research	24-04-2020	Meeting with Professor Bronwyn Gillanders, Thomas (DAWE) and Vaughn Cox (DAWE) to discuss appropriate monitoring and research programs for the project in reference to the EPBC 2012/6590 approval conditions.
Thomas Smith	DAWE – Assessment Officer		
Vaughn Cox	DAWE - Manager		
Professor Bronwyn Gillanders	Uni Adelaide - Deputy Dean Research	27-04-2020	Meeting with Professor Bronwyn Gillanders to refine the proposed monitoring and research program

10 REFERENCES

- A Recovery Plan under the Environment Protection and Biodiversity Conservation Act 1999 2011-2021.
- Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act).
- International Regulations for the Prevention of Collision at Sea.
- DPTI Underwater Noise Guideline.
- Port Spencer Stage 1 PER Appendix K – Port Spencer Marine Baseline Quantitative Surveys, Golder Associates, February 2012
- Hay Point Coal Terminal Expansion Phase 3 - Dredging and Blasting Environmental Management Plan.
- Atlas of Living Australia <https://biocache.ala.org.au/occurrences/search?q=qid:1576383739391> accessed on Sun Dec 15 15:23:21 AEDT 2019.
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Appendix I	Oil Spill Contingency Plan
Appendix J	Contractors Construction Environmental Management Plan

Appendix A: Field Monitoring Sheet: Southern Right Whale Habitat Use and Behaviour

Whale Encounter Field Sheet:

Survey Location ID:		Composition of sighting:	
		FC (Female / calf)	
Date:		UA (unaccompanied adult)	
Observer:		Total number in group	
Encounter No:		Notes: Wind speed: Sea state: Other observations: (e.g. injuries, project activities occurring at the time)	
Encounter start time:	00: 00		
Start GPS location: Northing			
Easting			
Encounter end time:	00: 00		
End GPS location: Northing			
Easting			
Direction of travel			
Photos and behaviour:			
Photo IDs from and to:	(add in IDs of photos taken of this individual)		
Whale ID in group:	(add whale ID - i.e. calf 1, adult 1, UA 1)		
Behaviour noted:	(add in behaviour codes)		
Photos and behaviour:			
Photo IDs from and to:	(add in IDs of photos taken of this individual)		
Whale ID in group:	(add whale ID - i.e. calf 1, adult 1, UA 1)		
Behaviour noted:	(add in behaviour codes)		
Photos and behaviour:			
Photo IDs from and to:	(add in IDs of photos taken of this individual)		
Whale ID in group:	(add whale ID - i.e. calf 1, adult 1, UA 1)		
Behaviour noted:	(add in behaviour codes)		
Photos and behaviour:			
Photo IDs from and to:	(add in IDs of photos taken of this individual)		
Whale ID in group:	(add whale ID - i.e. calf 1, adult 1, UA 1)		
Behaviour noted:	(add in behaviour codes)		
Behaviour codes: Resting (R), Travelling (T), Social (SO). Breach (B), Evasive Dive (ED), Tail Slap (TS)			

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Appendix B - Marine Operations Plan

10 JANUARY 2020



MARINE OPERATIONS PLAN

(OPERATIONS MARINE & SHIPPING MANAGEMENT PLAN)

PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Anthony Stanton	John Kavanagh	
1.1	Ryan Norval	John Kavanagh	For Consultation and instructions Pacific Maritime Lawyers & Consultants

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1.0 Introduction

1.1. Purpose of this Plan

This Marine Operations plan (MAROPS Plan) describes the proposed maritime operations in Port Spencer (the Port) at a strategic level. The MAROPS Plan contains information for the guidance of all users of the Port, including ship's masters, owners, agents and other marine users operating in or near the Port.

The MAROPS Plan is to be read in conjunction with the following Peninsula Ports - Port Spencer (PP-PS) documents:

- Vessel Traffic Management Plan, which details the port procedures for marine operations;
- Aids to Navigation Plan, which details the establishment and maintenance of Aids to Navigation;
- Emergency Response Plan, which details the local, regional and national integration in response to an emergency;
- Ship Sourced Marine Pollution Management Plan, which details the possible impact from ship generated pollution;
- ANNEX 1 – First Strike Response Plan – Oil Pollutants, which details the assessment and actions at a local level oil spill.

The MAROPS plan also describes how Peninsula Ports (PP) complies with its legislative obligations but is not to be construed as legal advice.

This Plan and its requirements may be overridden by any specific instructions from the SA Department of Planning, Transport and Infrastructure (D-PTI), Peninsula Ports or the Harbour Master.

Nothing in the MAROPS Plan is intended to relieve any vessel, owner, operator, charterer, master, or person directing the movement of a vessel from the consequences of any failure to comply with any applicable law or regulation or of any neglect of precaution which may be required by the ordinary practice of seamanship, or by the special circumstances of the case.

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Information contained in this MAROPS Plan is based on information available as at the latest date in the document control sheet at the start of this Plan. Although every care has been taken to ensure that this information is correct, no warranty, expressed or implied, is given in regard to the accuracy of all printed contents. Peninsula Ports shall not be responsible for any loss or damage resulting from or caused by any inaccuracy.

1.2. Port Spencer

Port Spencer is a newly established grain export port, comprising of a single trestle and conveyor-fed loader. The trestle and port approaches are designed for Panamax and post Panamax bulk carriers.

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

Port Spencer is operated by Peninsula Ports, and the Port is gazetted pursuant to the *Harbours and Navigation Act 1993 (SA)*.

1.3. Contact Details

The Harbour Master

For operational maritime questions, marine incidents, pilotage, buoy moorings, navigation aids and towage requirements, please contact the Harbour Master's office.

The Harbour Master's office is located at: *(to be determined in future)*

Street address:

Phone:

Fax:

Email:

Port VTS

The Port Control Centre is situated at the Harbour Master's office. For ship traffic scheduling, pollution incidents and reporting defective navigation aids, please direct initial enquiries to the Port Control centre.

VHF Call sign is 'Port Spencer VTS' and the service is provided by Peninsula Ports during expected and scheduled operations, arrivals and departures.

The contact details are:

VHF Radio: VHF channels 12 and 16

Phone: *(to be determined in future)*

Fax:

Email:

In the event of a maritime emergency, Port Control (VTSO) will activate the appropriate response as detailed in the Port Spencer Emergency Response Plan.

Peninsula Ports

The operator of the Port is Peninsula Ports, and all questions relating to the port responsibilities, including security, services, and facilities are to be directed as follows:

Phone: *(to be determined in future)*

Fax:

Email:

1.4. Datum

All water depths refer to the 'lowest astronomical tide' height (LAT). All positions in this Plan are in WGS84, however, Australia uses the Geocentric Datum of Australia (GDA94) coordinate system. All directions are referenced to True North.

1.5. Scope

The port is operated in accordance with all laws in force in South Australia and any applicable Commonwealth or International laws. Further compliance information is summarised later in this MAROPS Plan. The relevant legislation referenced includes but is not limited to:

- *Navigation Act 1912 (Cth)* and supporting Marine Orders
- *Harbors and Navigation Act 1993 (SA)*
- *Environment Protection Act 1993 (SA)*
- *Maritime Services (Access) Act 2000 (SA)*
- *Customs Act 1901 (Cth)*
- *Quarantine Act 1908 (Cth)*
- *Occupational Health, Safety and Welfare Act 1986 (SA)*, including the Code of Practice for managing risks in Stevedoring
- *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*
- *South Australian Ports (Bulk Handling Facilities) Act 1996*
- *South Australian Ports (Disposal of Maritime Assets) Act 2000*
- *Recreational Access to Commercial Wharves Agreement*

2.0 Abbreviations and Definitions

ABS	American Bureau of Shipping
AMSA	Australian Maritime Safety Authority
APVMA	Australian Pesticides and Veterinary Medicines Authority
BC	Bulk Carrier
BLF	Bulk Load Facility
BLU Code	Code of Practice for the Safe Loading and Unloading of Bulk Carriers adopted by IMO Resolution A.862 (20) as in force from time to time.
BP	Bollard Pull
BV	Bureau Veritas
CTV	Crew Transfer Vessel
ECS	Electronic Chart System
GPV	A general-purpose high-speed vessel <12m suitable for the transfer of personnel and small volumes of stores.
IMO	International Maritime Organization
LM	Load Master
LOA	Length Overall
MT	Metric Tonnes
STCW95	Standards of safety training certification & watch keeping
NSCV	National Standard for Commercial Vessels
POB	Pilot on board
PP	Peninsula Ports
PP-PS	Peninsula Ports – Port Spencer
Terminal Operator	A person who has responsibility for operations conducted by the terminal or facility for the vessel.
Trimmed	for grain — see A 10.2 of the International Grain Code and trimming (loading cargo) in 1.12 of the BLU Code.
Port Spencer VTS	Port Spencer Vessel Traffic Services
VTSO	Port Spencer Vessel Traffic Services Operator
PEC	Pilot Exemption Certificate

3.0 Operational Plan for Development Phase

The following section outlines the key dates and operational activities comprising the Port Spencer development.

3.1 Key Dates and Phases *[TBC on confirmation of program schedule]*

Phase	Description	Intended Start Date
Mobilisation	<ul style="list-style-type: none"> Site establishment on land and commencement of bulk earthworks 	March 2020
Causeway Construction	<ul style="list-style-type: none"> Commence construction of causeway into the water 	June 2020
Wharf Construction	<ul style="list-style-type: none"> Commence piling for construction of wharf using incremental launch method (no barges) 	TBC Nov 2020
Installation of ship loader	<ul style="list-style-type: none"> Install ship loader onto wharf 	June 2021
Construction completion	<ul style="list-style-type: none"> Complete construction activities 	July 2021
Operational proving	<ul style="list-style-type: none"> End to end wet commissioning of infrastructure 	August 2021
Production	<ul style="list-style-type: none"> Receive grain into land-side bunkers 	October 2021
Shipping	<ul style="list-style-type: none"> Shipment of first grain from wharf 	November 2021 (TBC)

4.0 Port Operation Procedures

4.1 Overview of Operational Activities

The operational phase for Port Spencer Bulk Loading consists of four main activities:

- Arrival of bulk carrier at anchorage;
- Transit to terminal and berthing;
- Loading bulk grain;
- Unberthing and departure from the terminal.

The details of each activity are set out below.



Diagram 1 – Port Spencer Location

The Port Limit and Pilotage Area is set at a 2nm radius from the jetty head and terminates at the shore as shown in Diagrams 2 and 3 below.

The pilotage area is described as waters bounded by an imaginary semi-circle line drawn (see overleaf drawing):

- starting at 34° 14.607' S 136° 16.177' E on the Shoreline, a line drawn on bearing 050 (T) to a point at 34° 13.436' S 136° 17.844' E as a northerly border;

- *then*, a line extending in an arc from 34° 13.436' S 36° 17.844' E with a radius of 2 nautical miles centered on the end of the jetty at 34° 15.090' S 136° 16.480' E extending southwards to 34° 16.980' S 136° 17.290' E;
- *then* from the point at 34° 16.980' S 136° 17.290' E, draw a line on a bearing of 330 (T) to the point on the shoreline at 34° 15.110' S 136° 15.974' E as a southerly border.

Port Spencer Harbour Description – DGA94 Coordinates

Commencing at a point being the intersection of the median high-water mark with a straight line connecting a point defined by Latitude 34.2435400 degrees south and Longitude 136.2696767 degrees east with a point defined by Latitude 34.2239333 degrees south and Longitude 136.2974000 degrees east.

Thence in a north easterly direction to the second point defined.

Thence following an arc with a radius of 2 nautical miles (3704.1 metres) from the end of the jetty at 34.2515000 degrees south and longitude 136.2746667 degrees east in a generally south easterly, southerly and south westerly to a point defined by latitude 34.2830000 degrees south and longitude 139.2881667 degrees east.

Thence in a straight line on a bearing of 330 degrees true to the intersection with the median high-water mark.

Thence generally northerly along the median high-water mark to the point of commencement.

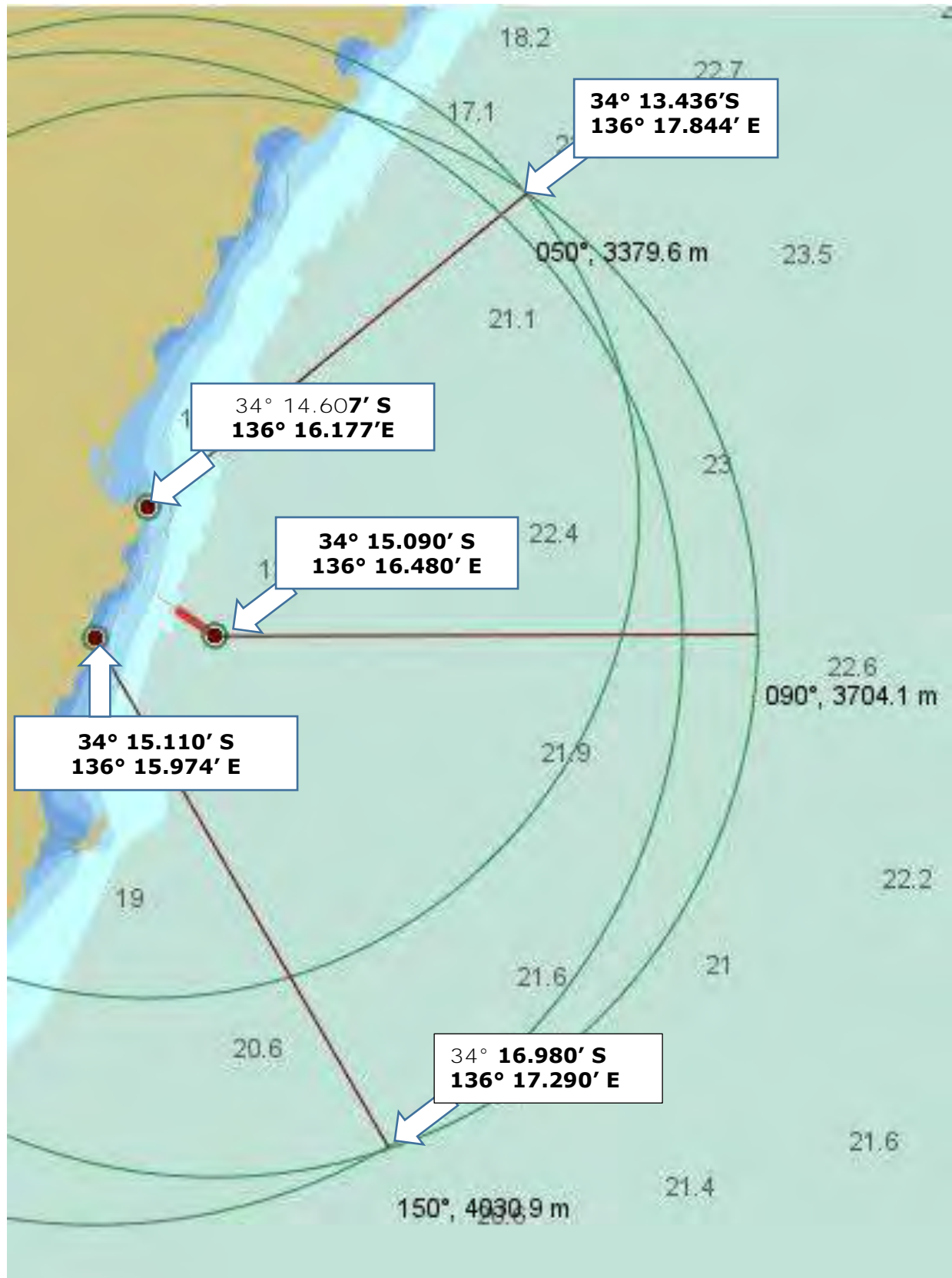


Diagram 2 – Proposed port limits

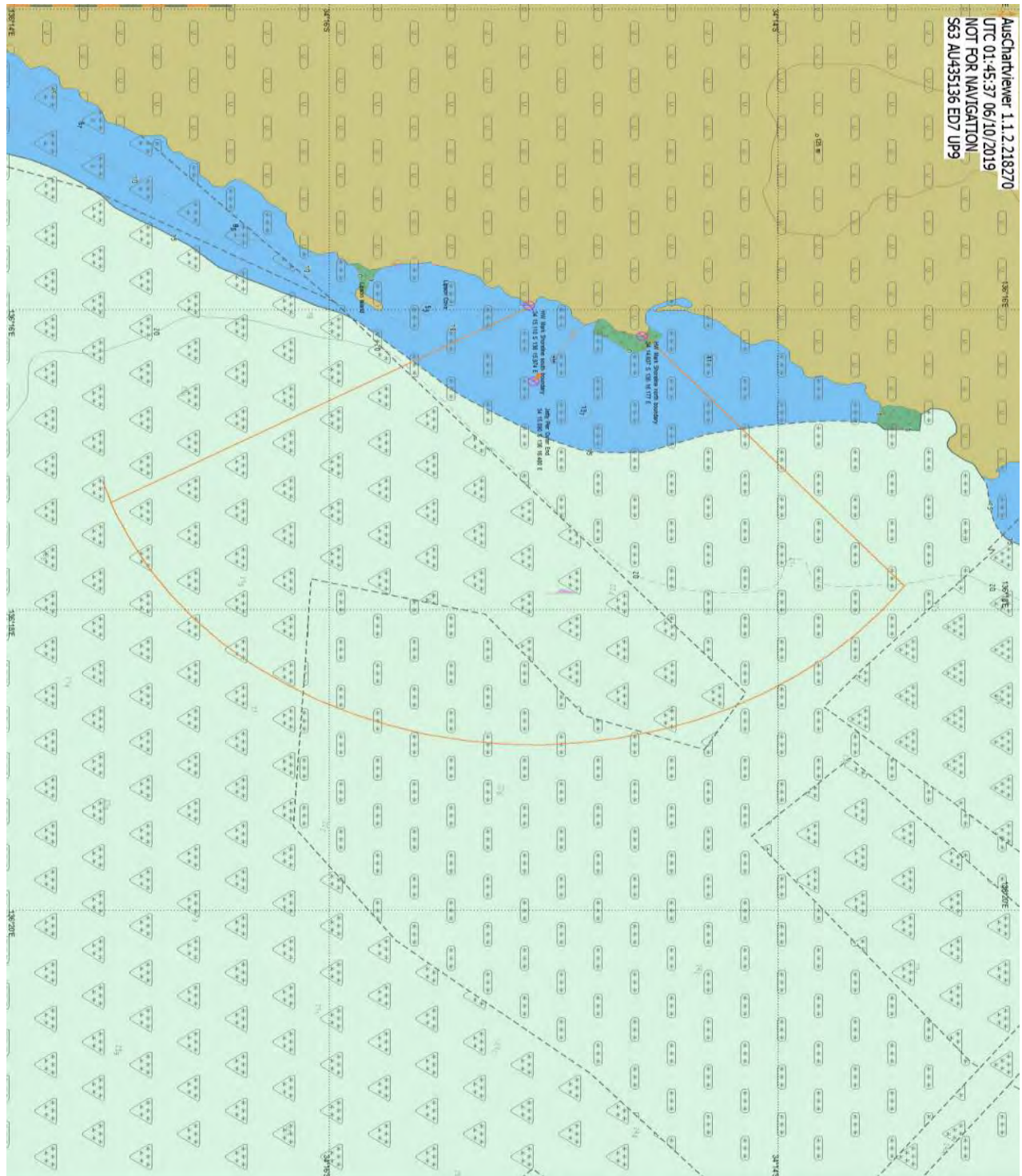


Diagram 3 – Proposed Port Spencer Port Limits – ENC AU45136

Notes: The Blue sounding line is set at a 15m sounding. True North is to the top of the Diagram. Category Zones of Confidence are indicated by the number of asterisks. Category C (three asterisks) or A2 (5 Asterisks) within the Diagram. The sounding confidence for Category C is $\pm 2\text{m} + 5\%$ of depth. Therefore, at 15 m sounding, the Zone of Confidence at Category C is $\pm 2.75\text{m}$. The sounding confidence for Category A2 is $\pm 1\text{m} + 2\%$ of depth.

4.1.1 Arrival check list

When	Who	What
96 hours before arrival	Master/owner	Customs notification
Not more than 96 hours or less than 12 hours before arrival	Master/owner	Quarantine notification
48 hours before arrival	Master/owner	Arrival Notification to Port Spencer Harbour Master
24 and 12 hours before arrival	Master	Arrival information update to Port Spencer VTS
2 hours before arrival	Master	VHF notification to Port Spencer VTS
2 hours before arrival	Peninsula Ports	All arrival preparations complete including pilotage and mooring arrangements

4.1.2 Departure Check List

When	Who	What
12 hours before departure	Master/owner	Confirm Departure information to Harbour Master
2 hours before Departure	Master/owner	Update Port Spencer VTS
2 hours before Departure	Peninsula Ports	All departure preparations complete, including pilotage and mooring arrangements
On completion of loading	Master/owner	Call Port Spencer VTS to inform that loading is complete and to confirm the departure drafts

4.1.3 Arrival of bulk carrier at anchorage

Port Spencer VTS

- Channel 16 Calling - Distress & Safety Channel 67 for Distress & Safety
- Channel 12 Vessels should monitor VHF at all times in Port Limits for information
- Ship/Shore/Ship Operations Transit advices/messages and information.
- Channel 6 or 8 Tug operations Primary channel - 6
- Channel 12 Port Spencer communications and Emergency Exercise/Response

All radio communications within the port will be conducted in standard marine navigation vocabulary as specified in the "Radio Telephone Ship Station Operators Handbook" (available from the Australian Communications Authority). Communication must be preceded by the identification of the channel the operator is using.

The first operational phase is the arrival of the bulk carrier and the handling of the bulk carrier.

The bulk carrier will arrive at anchorage and take up a position as directed by Peninsula Ports (through Port Spencer VTS), approximately 3nm from the end of the Jetty, East.

While at anchorage the ship will be inspected by grain surveyor/loadmaster and authorized officer, and any other contractors as necessary to obtain arrival clearance.

The anchorage is outside port limits, at location 34° 15.33' S / 136° 19.90' E, approximately 3 nm East of the jetty.

Once the jetty operations are ready for receiving the bulk carrier, a Port Spencer Marine Pilot will come aboard at the boarding ground (3nm from end of jetty, East) who will bring the ship to the loading jetty.

Tug escort will be provided by Port Lincoln tug contractor under the direction of a suitably qualified master and operating under the vessel's SMS.

Two 60 TBP tugs will be required to manage a Panamax size vessel into safe berthing.

Personnel will be transferred from BLF to ship and return by General Purpose Vessel (GPV). The GPV will be moored on the Southern side of the Jetty.

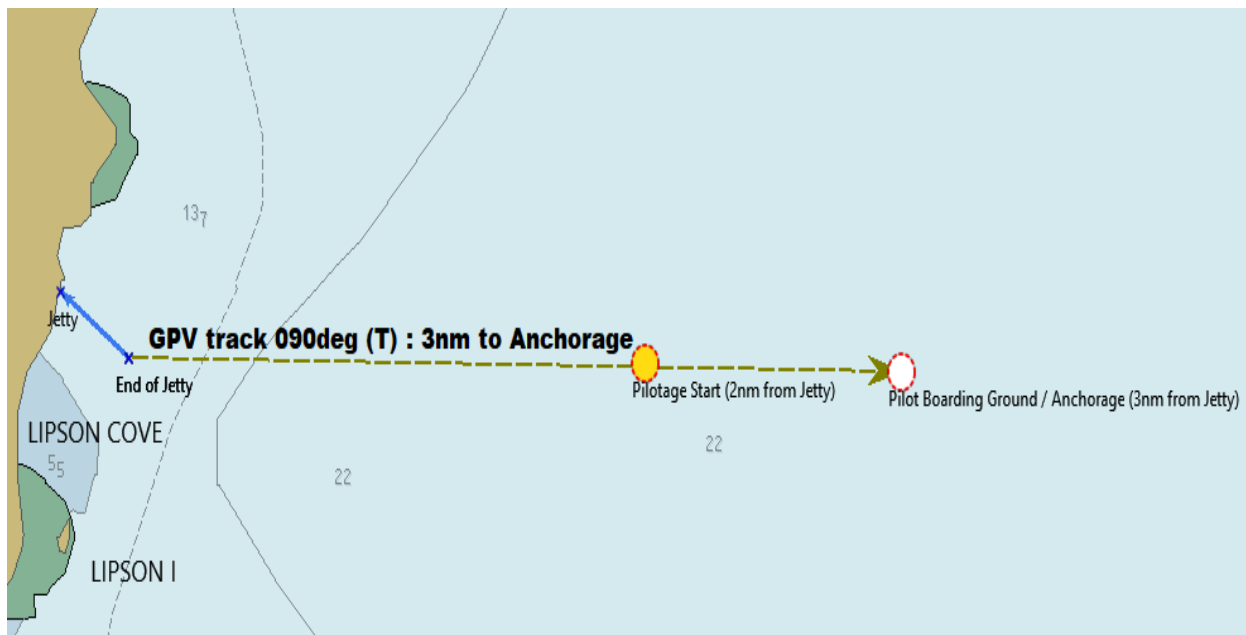


Diagram 4 – Relationship of Port Spencer anchorage and Pilot Boarding Ground to Jetty

Whenever an alternative/emergency anchorage is required, the BC vessel will seek guidance from the Harbour Master but noting that the responsibility for the safety of the Vessel at all times lies with the Master. Once conditions are favourable for berthing at Port Spencer, the BC vessel will steam to the designated “Pilot Boarding Ground / Anchorage” area.

4.1.4 Transit to terminal and berthing

Once cleared for arrival, the bulk carrier will be allocated a POB and berthing time by Port Spencer VTS.

A marine pilot will be transferred to the ship by GPV. The pilot will con the ship from port limits to the berth, until the last line is secured, in accordance with the legislative requirements for compulsory pilotage in port limits.

On boarding a vessel, the pilot will discuss a passage plan with the Master, review the ship's pilot card and exchange the normal pilot/master information. Once satisfied the pilot will then commence the pilotage passage (inward/outward).

Tugs, 60 TBP ASD (one or two, depending on size of ship and current/forecasted weather) will meet the bulk carrier on the inbound passage, assist the bulk carrier to berth on the Northern side with bow facing towards the Gulf, and stand by for emergency assistance within port limits.

BLF lines team (two teams of two each) will secure the ship from the shore side

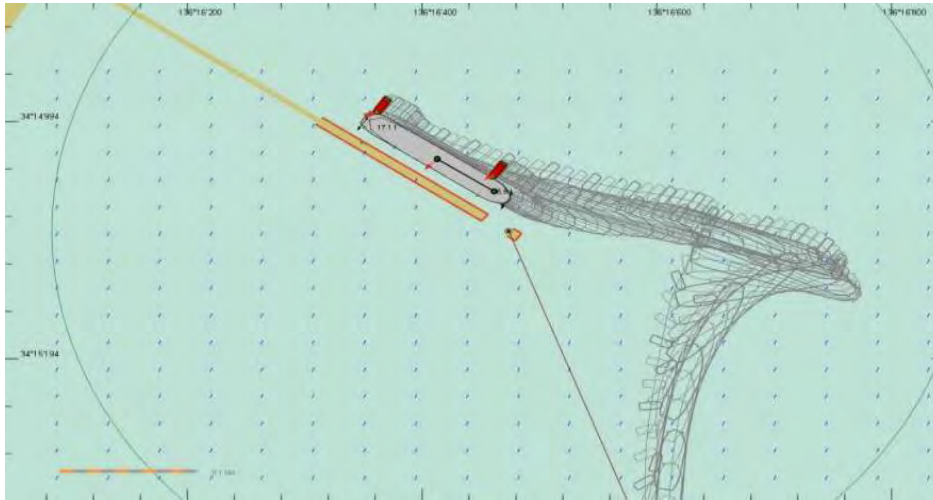


Diagram 5 – indicative SmartShip berthing manoeuvre for illustration purposes only – not to be used for navigation

4.1.5 Loading bulk grain.

Once all requirements of Maritime Orders are satisfied, master and terminal operator will agree to commence loading according to the load plan, under the supervision of the grain surveyor/load master.

Traveling ship loader with effective load rate of 2000MT/hr will see most ships loaded within 48 hrs from arrival.

The relevant Authorised officer (grain surveyor/loadmaster) will clear ship for departure with master and terminal operator agreement.

4.1.6 Precautions for berthing/unberthing

Jetty cranes and loaders will be positioned, boom up, amidships, or clear of the vessels bow/stern as determined by the Pilot.

Whilst a vessel is berthing no crane or loader movements will occur until the vessel is securely moored alongside.

When a vessel is departing no crane or loader movements will occur until the vessel is clear of the jetty.

Cranes and loaders will remain unmanned whilst a vessel is manoeuvring on, off or along the jetty.

4.1.7 Unberthing and departure from the terminal

Ship will be allocated a POB and departure time by Port Spencer VTS.

Lines teams and tug(s) will be in attendance to assist unberthing under pilot's direction.

Pilot will con ship from berth to port limits under escort of tugs.

On leaving port limits, tugs will return to BLF or deploy to assist incoming bulk carrier; and pilot will be either transferred to incoming bulk carrier or returned to BLF by GPV.

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4.2 Table of Key Processes, Equipment, Personnel, Regulation and Procedures

Serial	Process	Serial	Sub processes	Port Spencer Equipment	Port Spencer Personnel	Principal standard or regulation	Procedures
1	Arrival of ship at anchorage	1.1	Ship/shore exchange of information	Nil	VTSO Grain surveyor	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Port Procedures Manual	
		1.2	Drop anchor	Nil	Nil	Port Procedures ISM Code	
		1.3	Transfer grain surveyor to ship for hold inspection	GPV	GPV crew Grain surveyor VTSO	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 Marine Order 504	
2	Transit to terminal and berthing	2.1	Transfer pilot to ship	GPV	GPV crew Pilot VTSO	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 Marine Order 504 SOLAS Chapter V Regulation 23 Pilot Transfer Arrangements	

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		2.2	Tugs transit to anchorage to escort ship for inbound passage	Tugs	Tug crews	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012	
		2.3	Ship transits inbound under pilotage	Tugs	Tug crews	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 ISM Code	
		2.4	Ship secures to berth	Tugs Bollards	Tug crews Lines crews	Port Procedures Manual Marine Safety (Domestic Commercial Vessels) National Law Act 2012 Managing Risks in Stevedoring Code of Practice 2018 ISM Code	
3	Loading bulk grain	3.1	Pre-loading steps		Grain Surveyor Loadmaster	As below	
		3.2	Load bulk grain	Ship loader	Grain Surveyor Loadmaster	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Managing Risks in Stevedoring Code of Practice 2018	

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		3.3	Final trim and pours	Ship loader	Grain Surveyor Loadmaster	ISM Code Marine Order 33 Marine Order 34 BLU Code IMSBC Code Managing Risks in Stevedoring Code of Practice 2018 ISM Code	
		3.4	Post-loading steps		Grain Surveyor Loadmaster Terminal Operator	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Managing Risks in Stevedoring Code of Practice 2018	
4	Departure of ship	4.1	Exchange of departure information and documents	Nil	Grain Surveyor Loadmaster Terminal Operator VTSO	Marine Order 33 Marine Order 34 BLU Code IMSBC Code Port Procedures Manual	
		4.2	Unberthing	Tugs	Tug crew Pilot Lines crews	Port Procedures Manual Marine Order 21 Transport Operations (Marine Safety) Act 2016 Managing Risks in Stevedoring Code of Practice 2018 ISM Code	

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		11.3	Transit to port limits	Tugs	Tug crew Pilot	Port Procedures Manual Navigation Act 2012 Transport Operations (Marine Safety) Act 2016 ISM Code	
		11.4	Pilot and tugs depart	Tugs GPV	Tug crew GPV crew Pilot	Port Procedures Manual Navigation Act 2012 Transport Operations (Marine Safety) Act 2016 Marine Order 504	

4.3 Loading at BLF

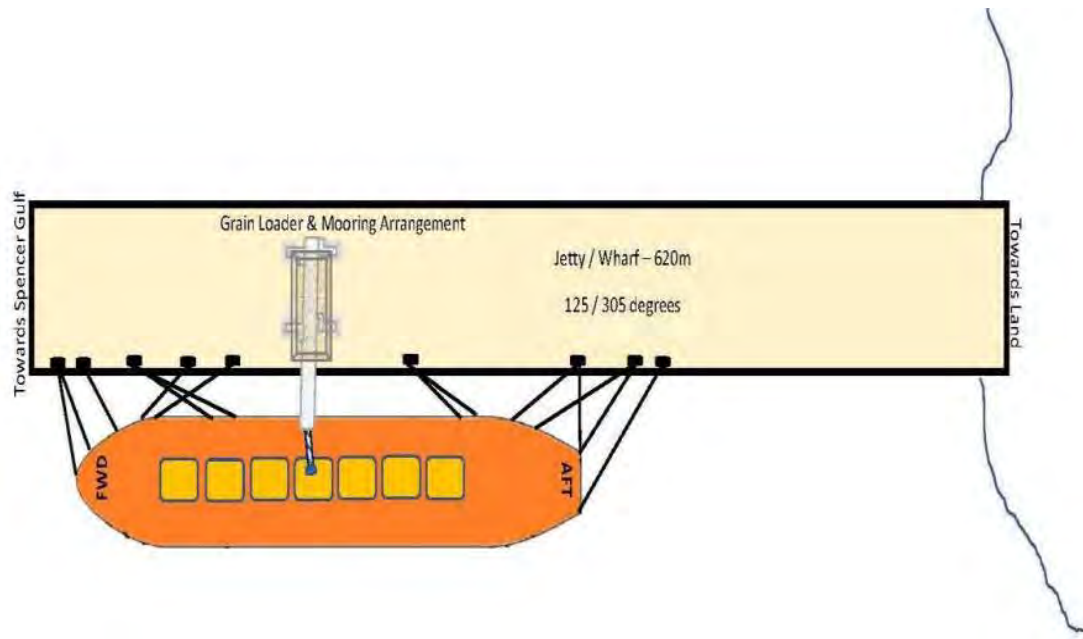


Diagram 6 – indicative berthing arrangement for illustration purposes only – not to be used for mooring

4.3.1 Securing to the BLF

The bulk carrier will moor securely at the loading position on the Northern side of the Jetty, bow out (east), alongside the Jetty before any loading activities commence.

Mooring shall be to the satisfaction of the master. The master shall ensure that mooring operations are carried out in a safe manner and the following items are correctly addressed:

- Suitable planning and supervision
- Approved communication
- Competency of personnel
- Sufficient members in the mooring lines team, comprising of 3 shore personnel and the mooring party on board the docking BLF vessel
- Familiarity with any specific shore requirements relating to shore moorings, passing traffic and tidal/weather conditions

All mooring equipment and practices shall comply with Peninsula Port safe working requirements. All reasonable directions from Peninsula Ports and the Harbour Master are to be complied with by Master.

Any unsafe situations shall be identified, evaluated and recorded in the vessels log. Corrective actions shall be implemented as necessary.

4.3.2 Mooring Operating Parameters

The master shall ensure that all factors affecting safe mooring of the vessel throughout the duration of the stay are monitored and recorded.

These may include:

- Weather conditions, both present and forecasted
- Tide and Current ranges
- Traffic movement in the vicinity (as applicable)
- Interval of mooring patrols depending upon above factors

4.3.3 Safety of crew during mooring operations

The master shall ensure that the safety of crew is maintained during all anticipated mooring arrangements and equipment use.

The ship's crew shall be thoroughly trained in all anticipated mooring patterns used at the loading terminal and the required preparation on board with emphasis on:

- Clear layout on deck prior to operations commencing
- The use of proper personal protective equipment
- Identification and monitoring of dangerous zones during mooring operations
- Quick and closed loop communication between stations

Where a new and different mooring pattern / arrangement is anticipated, a formal risk assessment for each type shall be carried out, to assess and minimize risk to crew associated with the operation.

Such risk assessments shall be reviewed prior to similar subsequent operations and any additionally identified risks suitably managed and recorded.

4.3.4 Cargo / Grain Loading

Cargo loading activities at Port Spencer shall be the responsibility of the grain surveyor as representative of the terminal operator. Prior to loading bulk grain in Australia, a ship must be inspected by a grain surveyor to ensure that the ship is suitable to carry the intended grain. The inspection is to determine that the ship is free from conditions that could result in contaminating, wetting or imparting an odour to the grain.

The master of a vessel must ensure that grain in bulk is loaded onto the vessel only if the master and the terminal representative have agreed on a plan for loading that complies with the BLU Code.

A plan for loading or unloading and any amendments of it must be lodged with the terminal representative at the port of loading or unloading and a copy kept on board the vessel throughout the voyage.

However, before any loading activities commence, it is the **master's** responsibility to ensure the ship is safely secured and ready in all respects for loading activities.

The master shall have overriding authority to direct all loading/unloading activities to ensure adequate stability of the vessel and safety of crew and personnel aboard is maintained. To that end, the master or a designated ships officer shall maintain a continuous watch of all loading activities on the bulk carrier, which may be carried out by the masters appointed loadmaster.

4.3.5 Safety of crew during Loading Activities

The master shall ensure that all **ship's** crew remain clear of all loading areas during loading activities. Should any of the **ship's** crew be required to enter a loading zone area of the ship or quayside, they shall first gain permission from the master.

However, in the case where a crew member may be required to take immediate action regarding an emergency issue relating to the stability of the vessel or safety of crew and personnel aboard, the crew member should take the appropriate action as required. Nevertheless, they should make their best efforts to advise the master of the issue at hand and their intended action.

4.4 Transit Voyages Between Port Spencer BLF and Bulk Carrier

4.4.1 Readiness for Departure

The tug or GPV prior to departure shall assess the prevailing weather conditions. This assessment shall take regard of relevant operating restrictions of the vessel. The vessel shall not depart in adverse weather unless the master is satisfied that it is safe to do so. At all times, the highest priority of the master shall be the safety of the crew.

The master shall ensure that the vessel is secured, and all ship's crew members and passengers are to be accounted for aboard prior to departure.

4.4.2 **Master's Presence on Bridge**

Due to a short passage time, the Master shall be personally in control of the vessel during transits, but particularly during the following conditions:

- when there is reduced visibility;
- when it is expected to arrive at and depart from the bulk carrier;

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- when entering and leaving port;
- at any time when the vessel is in danger or potentially in danger.

4.4.3 Navigation Procedures

All tugs and GPs are to be navigated at all times in strict compliance with the International Regulations for the Prevention of Collision at Sea and any local regulations relating to navigation in the Spencer Gulf.

Any necessary actions, such as altering course or reducing speed, especially if the vessel is the vessel giving way, should be positive and taken in sufficient time.

5.0 Personnel Involved

5.1 Designated Person (Ashore) for PP Vessels

As per *Marine Order 504* and the *ISM Code*, the owner has designated a person with direct access to the owner to be responsible for monitoring the safety and pollution prevention of all vessel's involved in marine operations operated by the Port and ensuring appropriate resources and shore support are provided to the vessel.

Designated Person Contact Details	
Name	TBA
Address	
Phone	
Email	

5.2 Owner

The effective owner of all marine assets involved in the port is Peninsula Ports Pty Ltd (ABN: 18 124 308 041).

Owner Contact Details	
Name	Mark Rodda
Address	Level 1, 33 Hutt Street, Adelaide, South Australia, 5000
Phone	+61 8 8232 9266
Email	info@peninsulaports.com.au

5.3 Organisational Chart

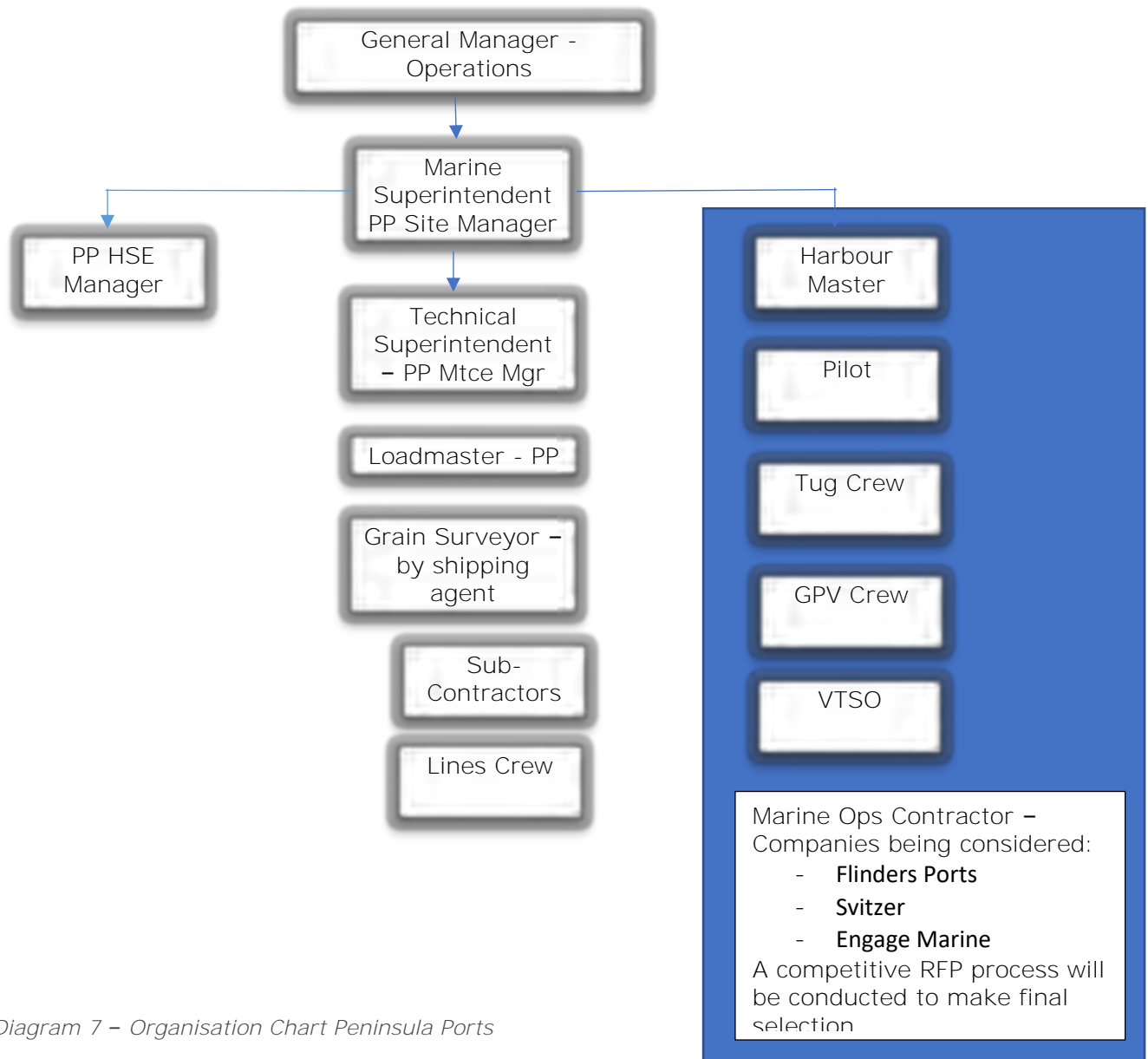


Diagram 7 – Organisation Chart Peninsula Ports

The general principle in populating the organisation chart for the export facility is that a specialist contractor will be contracted to manage all aspects of bringing vessels safely alongside and returning them to sea. Peninsula Ports will have primary responsibility for engagement with grain traders, shipping agents and others in the commercial chain of commodity management such that the right ship is loaded with the right grain to meet export regulation requirements.

A third party managing the marine operations at a port is well established at locations such as Whyalla, where both Flinders Ports and Svitzer are involved in aspects of service delivery.

5.4 Corporate Key Roles

Company Name	Registration	Company Number	Directors	Management	Assets

5.5 Operational Key Roles

Role	Key responsibilities	Incumbent	Status
Port Operator	<ul style="list-style-type: none"> • Owner's obligations under all marine regulations and law • Employer of workers • Party to service contracts 	Peninsula Ports Pty Ltd (PP)	Australian Proprietary Company
General Manager	<ul style="list-style-type: none"> • Overall responsibility for terminal and marine operations • Corporate governance • Company director 		Employee of PP

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Role	Key responsibilities	Incumbent	Status
Marine Superintendent/Harbour Master [depending on whether HM is internal to Port Operator]	<ul style="list-style-type: none"> • Designated Person Ashore for ISM purposes • Designated Person for National Law purposes • In charge of all marine activities at Port Spencer • Responsible for SMS and compliance of marine assets • Directs day to day marine activities • Point of contact for all external stakeholders, including BC, VTSO, AMSA 		Employee of PP
Technical Superintendent	<ul style="list-style-type: none"> • Implements planned maintenance schedule • Manages repairs • Manages testing and certification of equipment 		Employee of PP
Pilot (role may be combined with load master/surveyor)	<ul style="list-style-type: none"> • Conduct of all ship arrivals and departures within port limits 		Employee/contractor of PP
Grain Surveyor/Loadmaster	<ul style="list-style-type: none"> • Supervises loading and unloading BC • Completes draft surveys • Ensures compliance with cargo MO 33, MO 34, BLU and IMSBC Codes • Point of contact for BC C/O 		Employee/contractor of PP
ASD Tug Master	<ul style="list-style-type: none"> • Command ASD tug • Ensure vessel compliance with MAROPS plan and 		Employee/contractor of PP

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Role	Key responsibilities	Incumbent	Status
	SMS		
GPV Master	<ul style="list-style-type: none"> • Command GPV • Ensure vessel compliance with MAROPS plan and SMS 		Employee/contractor of PP
Vessel Crew	<ul style="list-style-type: none"> • Operate and maintain marine assets in accordance with SMS and directions of Marine Superintendent 		Employee/contractor of PP
Lines Crew	<ul style="list-style-type: none"> • Handle lines on berthing and unberthing 		Employee/contractor of PP

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5.6 Fatigue management plan

Whilst a bulk ship is in port, the BLF is intended to be a 24-hour operation.

In creating the roster below, regard has been had to the Guide for Managing Fatigue in the Workplace, published by Safe Work Australia.

Application of the roster will be fully compliant with the requirements of Marine Order 28.

An indicative roster is presented below:

	DAY 1		DAY 2		DAY 3		DAY 4		DAY 5		DAY 6		DAY 7	
	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06	06-18	18-06
Team 1	ON	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
Team 2	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
Team 3	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
	Roster: x2 Dayshifts, x2 Nightshifts, x2 Days off (12-hour shifts) Hours worked over 7 days (avg) = 56 Hours away from work over 7 days (avg) = 112													

Diagram 8 – Fatigue management roster

5.6.1 Day Hand roster

The key management positions are Monday to Friday day hands, on call on weekends. They will manage their time and fatigue levels accordance to work demands and priorities.

5.6.2 Pilot roster (if distinct from loadmaster/surveyor)

The Pilot is required 2 hours before arrival or departure.

Fatigue management is critical for this role.

5.6.3 Grain Surveyor Roster

The Grain Surveyor is required to visit the BC at anchorage and before departure.

The Loadmaster, as the ships representative, will always be on site while the vessel loading, or unloading is being undertaken.

Fatigue management is critical for this role, and adequate personnel must be available to fulfill this role.

5.6.4 Marine Crew Roster

The Marine Crew roster provides

- Four teams for each vessel on rotation, comprising of;
 - Lines crew, multi-purpose functions (x3 personnel)
- 12 on (day shift) 12 off (night shift) for 28 days
- then 28 days rest

Due to the infrequency of the berth being occupied, this function may be contracted out on an ad-hoc basis.

5.6.5 Record Keeping

All staff and crew are required to keep a record of hours worked. These records are to be kept in electronic format for an indefinite period and will be available for inspection by the relevant authorities.

6.0 Departure and Arrival Points

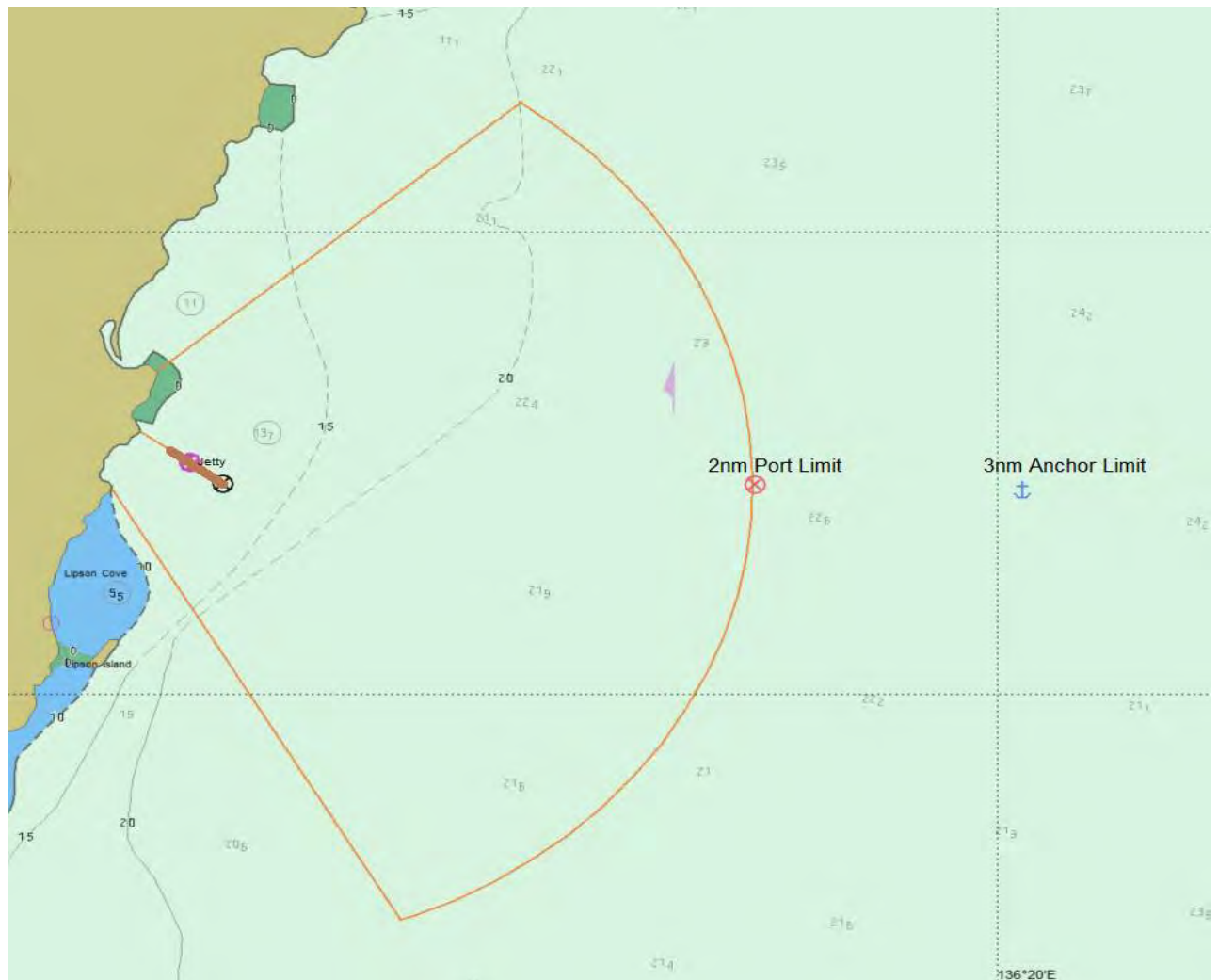


Diagram 9 – Port Limits and anchorage (indicative only)

Departure Point	Location	Nature of departures	Authority
BLF	• Jetty / Jetty		
Tug berth	• Port Lincoln		
GPV berth	• Jetty Southside		
Anchorage	• 3nm to E from Jetty		
Storm Mooring	• BLF Master decision / Port Lincoln Harbour		

7.0 Adherence to Key Government Documents

7.1 Marine Order 32 [Cargo Handling Equipment]

Section	Requirement	Adherence
18	Drawings and operational instructions for handling gear must be available on ship	
19	SWL to be determined and marked on lifting gear	
22	Equipment can only be used if inspected and certified by competent person i.e. manufacturer	
23	Certificate of test must be completed for material handling equipment	
24	Loose gear must be inspected before each use and record of inspection	
25	Register of materials handling equipment must be maintained	
26	Certificates of test and records of inspection must be kept on ship	
28	Power must not be supplied to handling equipment unless sufficient qualified personnel available to maintain watch over the equipment	
29	Repairs to handling equipment must be done by competent person properly equipped	
30	Restriction on return of service of repaired equipment – must be examined by competent person and logged	
Sch 1 Clause 2	At least 50 lux lighting in cargo working areas	
Sch 1 Clause 4	Guardrails on upper deck working spaces	
Sch 1 Clause 7	Protection on cargo handling moving parts	
Sch 2 Clause 5	Escape from bulk cargo space	
Sch 2 Clause 13	Vertical ladders not more than 6m	
Sch 3 Clause 2(2) and various	All cargo handling equipment other than wire ropes, nets and slings to be tested and examined every 5 years by competent person, and every 12 months by survey organisation	
Sch 4 Various	All cargo handling equipment to be marked with SWL if load bearing	
Sch 5 Clause 8	Grabs to be marked with SWL, tare mass and cubic capacity	
Sch 6 Div 2 Clause 3	Crane must be marked with SWL, including reductions per outreach	

Section	Requirement	Adherence
Sch 6 Div 3 Clause 1	Placement of controls must not place operator in danger but allow clear view of equipment. Must be clearly labelled	
Sch 6 Div 3 Clause 3	Must be an emergency isolating switch for electrically operated loading equipment	

7.2 Marine Order 33 (International Grain Code)

Section	Requirement	Adherence
9(2)	Master of BC must ensure grain loading documents are carried: <ul style="list-style-type: none"> - Doc of authorization - Grain stability data - Proposed loading plan - Grain stability calcs - Shear force and bending moment calcs 	
9(3)	Terminal Operator may only allow grain to be loaded in accordance with this order	
11	There must be a loading and unloading plan agreed between the terminal and vessel. Plan must be kept for 6 months	
12	Master and Terminal Operator must ensure loading is in accordance with plan	
12(3)	Master can suspend loading if plan not followed and must advise AMSA if so suspended. Loading can resume after corrective action	
13	Shipper must give at least 72 hours' notice to AMSA of intention to load grain in bulk	
14	The master of a vessel must not permit grain to be loaded on the vessel if: <ul style="list-style-type: none"> (a) the notice required has not been given; or (b) stability calculation information requested not been given; or (c) an inspector has told the master that an inspection of the vessel is required, and this has not yet occurred; or (d) an inspector has conducted an inspection and has not given 	

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Section	Requirement	Adherence
	approval after the inspection for the grain to be loaded.	
17	If the master of a vessel intends fumigation of a cargo space of the vessel when the vessel is in port, the master must, within 72 hours before arriving in the port, give report of intention to AMSA	
18	Fumigation must be carried out in accordance with <i>IMO recommendations on the safe use of pesticides in ships applicable to the fumigation of cargo holds</i>	
19	The agent must give 72 hours' notice to AMSA of intended in transit fumigation	
20	The master must give notice of an in-transit fumigation taking place 72 hours before arriving at an Australian port	
21	The master must ensure that only an approved fumigant is used	
21(3)	Fumigation must be conducted in accordance with the IMO Code above	

7.3 Marine Order 34 (BLU and IMSBC Codes)

Section	Requirement	Adherence
11(1) and (3)	Solid bulk cargo must be loaded, trimmed, carried and unloaded in accordance with Parts A and B, Chap VI of SOLAS, the IMSBC Code, the BLU Code and this order	
11 (2)	Vessel must carry documents on board to demonstrate compliance with Clause 11	
12	There must be a loading and unloading plan agreed between the terminal and vessel. Plan must be kept for 6 months	
13	Loading and unloading must be in accordance with the plan	
13(3)	Master can suspend loading if plan not followed and must advise AMSA if so suspended. Loading can resume after	

Section	Requirement	Adherence
	corrective action	
16	Shipper must give at least 48 hours' notice to AMSA of intention to load bulk vessel. Notice must include IMO number of ships, port and berth and information in 4.2 of IMSBC Code	
18(1)	Before loading bulk cargo, shipper must advise the Master of Information in 4.2 IMSBC Code	

7.4 Marine Safety (Domestic Commercial Vessels) National Law 2012

Section	Requirement	Adherence
12	Owners to ensure safety of vessels, equipment and operations	SMS compliant with Marine Order 504 for all DCVs
16	Masters to ensure safety of vessels, equipment and operations	SMS compliant with Marine Order 504 for all DCVs
Div 2	Requirement for certificate of survey	CoS held for all DCVs over 7.5m
Div 3	Requirement for certificate of operation	CoO held for all DCVs
Div 5	Unique identifiers to be displayed	All DCVs so marked
88/89	Obligation to report marine incidents	MAROPS Plan describes reporting system

7.5 Standard for Marine Construction Activities within the Port Spencer Marine Construction Activity Area

Section	Requirement	Adherence
Part 3	General recommendations are put forward for all vessel operations in the PSMCAA	
Part 4	Vessels over 10m must have AIS B fitted and an electronic chart system Passenger transfer vessels over 6m must have an electronic chart system	
4.2	Recommended min crew of 2 for all vessels	
4.2.3	Passenger transfer vessel must: <ul style="list-style-type: none"> - Display yellow flashing light while underway - Not to exceed 25 knots - Have a Passenger Numbers Verification Procedure 	

Section	Requirement	Adherence
4.2.4	All tugs must provide load test results to HM for tow hook/winch quick release	
Part 5	Ships over 50m must have a PEC master, procedure for obtaining per this section	
5.3	<p>Masters must:</p> <ul style="list-style-type: none"> - Hold correct certificate - Be familiar with AMCAA - Hold a PEC (>50m) - Ensure crew can use radios in emergency <p>Barge masters:</p> <ul style="list-style-type: none"> - Qualified per SMS <p>Deckhands:</p> <ul style="list-style-type: none"> - Hold OHS training - Hold RMDL - Hold current first aid cert - Be competency trained in vessel and radio 	
Part 6	<p>All vessels must establish and maintain comms with VTS on Channel 12</p> <p>All vessels to advise VTS of any intended movement before commencing movement, and follow any instructions from VTS in relation to that movement</p> <p>Must maintain listening watch on channel 16</p>	
6.2	Must have passenger number verification procedure	
6.3	Must have an evacuation plan	
6.4	Must have an extreme weather contingency plan	
6.5.1	Ships >35m must have SOPEP plan and kit	
6.5.2	Ships > 400GT must have Oil Record Book	
6.5.3	Sewage restrictions	
6.5.4	<p>Vessel >12m display sign re garbage restrictions</p> <p>Vessel >35m have a shipboard waste management plan</p>	
6.5.5	<p>Current and appropriate level insurance re pollution clean-up and salvage must be held</p> <p>>15m and >35m</p> <p>Certificate of currency must be carried on board</p>	
6.6	Incident reporting requirements for Nav Act vessels and DCVs	

Section	Requirement	Adherence
6.7	Marine Pollution Reporting requirements as per PP Emergency Response Plan	
6.10	Buoy moorings must be authorized by HM and marked with yellow flashing lights	

7.6 Managing Risks in Stevedoring Code of Practice 2018

Section	Requirement	Adherence
1.1	PCBU has duty of care that workers are not exposed to health and safety risks	
1.2	Workers must be consulted	
1.3	Workers must be provided information and trained	
2	Hazards must be identified, assessed and resultant risks controlled	
2.4	Controls must be assessed and reviewed	
3.1	Appropriate planning must be undertaken before the arrival of a ship	
3.2	Emergency situations must be planned for	
4	Vessel and plant must be inspected before loading or unloading	
5.1	Gangways must be safe and in good condition	
5.2	Good housekeeping must be observed	
5.3	All work areas must be adequately lit	
5.4	Air quality in all workspaces, particularly confined spaces must be safe	
5.5	The risk posed by varied weather conditions must be assessed	
5.6	Any moving traffic on land must be part of a traffic management plan, including separation of pedestrians and vehicles	
5.7	Appropriate precautions against falls are to be taken Appropriate precautions against injury from falling objects are to be taken	
5.8	Noise levels in work areas are to be assessed and abated or mitigated where possible	

Section	Requirement	Adherence
5.9	Fatigue of workers is to be managed	
6	Appropriate precautions are to be taken specific to nature of cargo and its stowage	

7.7 Harbours and Navigation Act 1993

- Part 4, Div 1 - Establishment and maintenance of Navigations aids (as per AtoN plan)
- Part 5, Div 1 - Control and management of harbors and ports including port operating agreements – role of this MAROPS plan as part of the port operating agreement
- Part 5, Div 2 – Port Management Officers – Peninsula Ports employees
- Part 5, Div 2A – powers of direction – this Marops plan to be construed as if it were a standing direction to a person in charge of a vessel in or near the port
- Part 5, Div 3 – harbour improvement work, including dredging
- Part 5, Div 4 – harbour charges
- Part 5, Div 5A – licensing, duties and immunity of pilots -
- Harbours and Navigation Regulation 2009

8.0 Public Facilities Used

There will be no public access to the wharf structure.

9.0 Navigation Equipment on Board as Required

Vessel and ID	Description	AIS B	ECS	Radar
Tug A	ASD tug – 60TBP	Yes	Yes	Yes
Tug B	ASD tug – 60TBP	Yes	Yes	Yes
GPV A	GPV <12m	Yes	Yes	No

10.0 GPV Passenger Counting Procedure

The GPV SMS specifies completion of the following manifest for each passenger/crew transfer. Records will be kept on onboard the GPV and available for inspection.

Personnel Transfer Sheet

Date	Time	Departing from	Number of Passengers on	Destination	Number of Passengers off	Sign

11.0 Vessel and Equipment Specifications

11.1 Vessels

The below table summarises key vessel particulars and compliance status.

Vessel and ID	Description	LOA and Power	Survey	Operation	Insurance
Tug A	ASD Tug	60 TBP	Class		
Tug B	ASD Tug	60 TBP	Class		
GPV A	RIB <12m	12m; x2 60HP Outboards	Class		

11.2 BLF Equipment

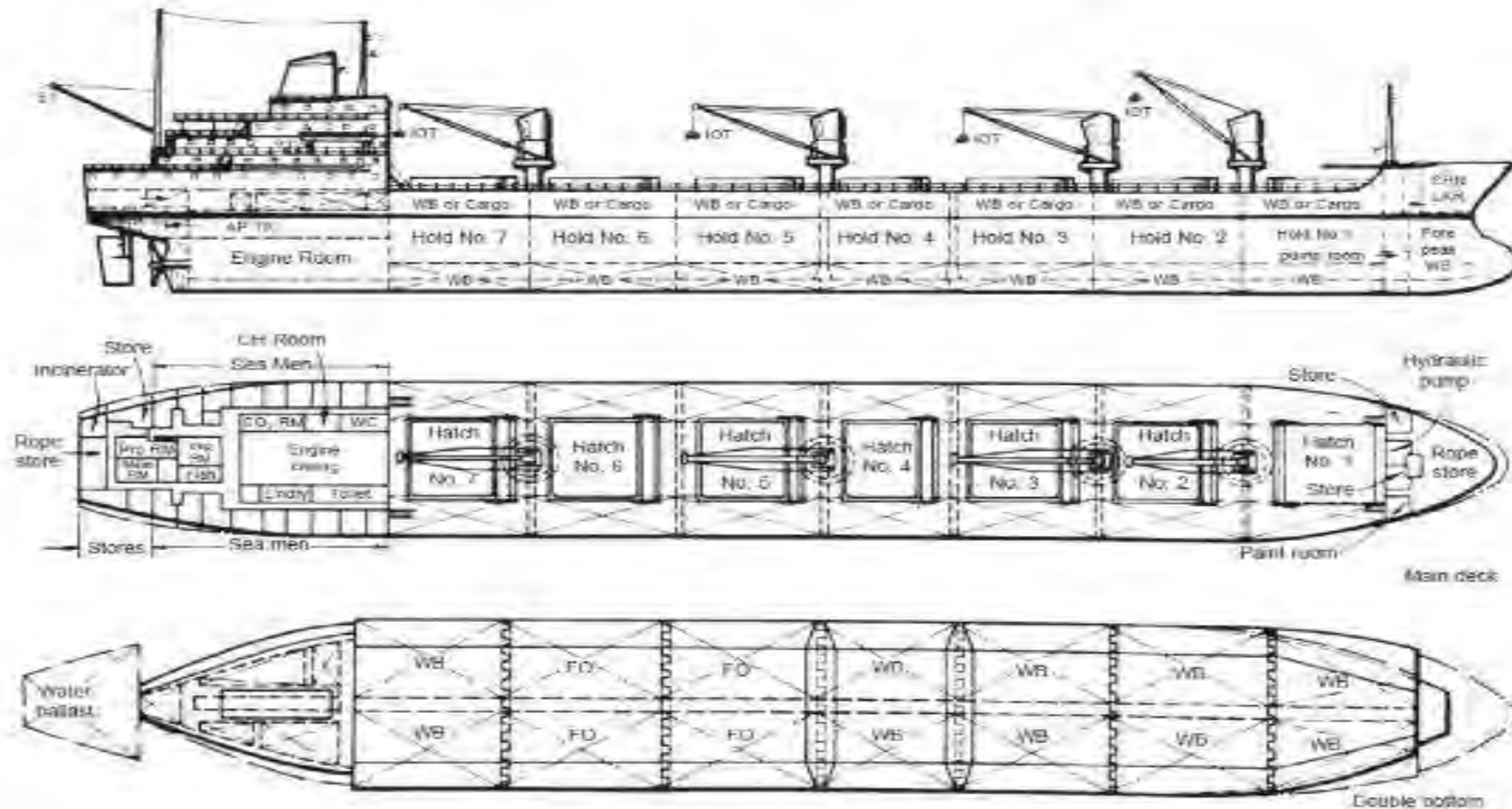
The below tables summarise key cargo handling equipment and present compliance status.

[Sample data in table]

Equipment	Description	DOM	Manufact
Hopper/Feeder	Truck fed hopper located on shore	11/2015	Thomas Manufacturing
Grasshopper 1 No. THVFCF1112015	25m Conveyor linking Hopper to Grasshopper 2 on ST47	11/2015	Thomas Manufacturing
Grasshopper 2 No. THVFCF2112015	25m Conveyor linking Grasshopper 1 to Grasshopper 2 on ST47	11/2015	Thomas Manufacturing
Grasshopper 3 No. THVFCF3112015	25m Conveyor linking Grasshopper 2 to Grasshopper 3 on ST47	11/2015	Thomas Manufacturing
Telestack TS 842 No. 1001660414	Radial telescopic conveyor linking Grasshopper 3 on ST47 to Cargo hold on IRONCLAD 1	2014	Telestack Limited, Ireland
Generator No. 87336144	130 KVA, provides power to 4 x Conveyors above	2012	AKSA
Hopper/feeder	Hopper/feeder/conveyor on IRONCLAD 1 linking cargo hold to Flip over stacker	09/2013	Thomas Manufacturing
Telestack TC 424 No. 5041R	Flip over stacker linking hopper/feeder to BC cargo hold	12/2014	Telestack Limited, Ireland

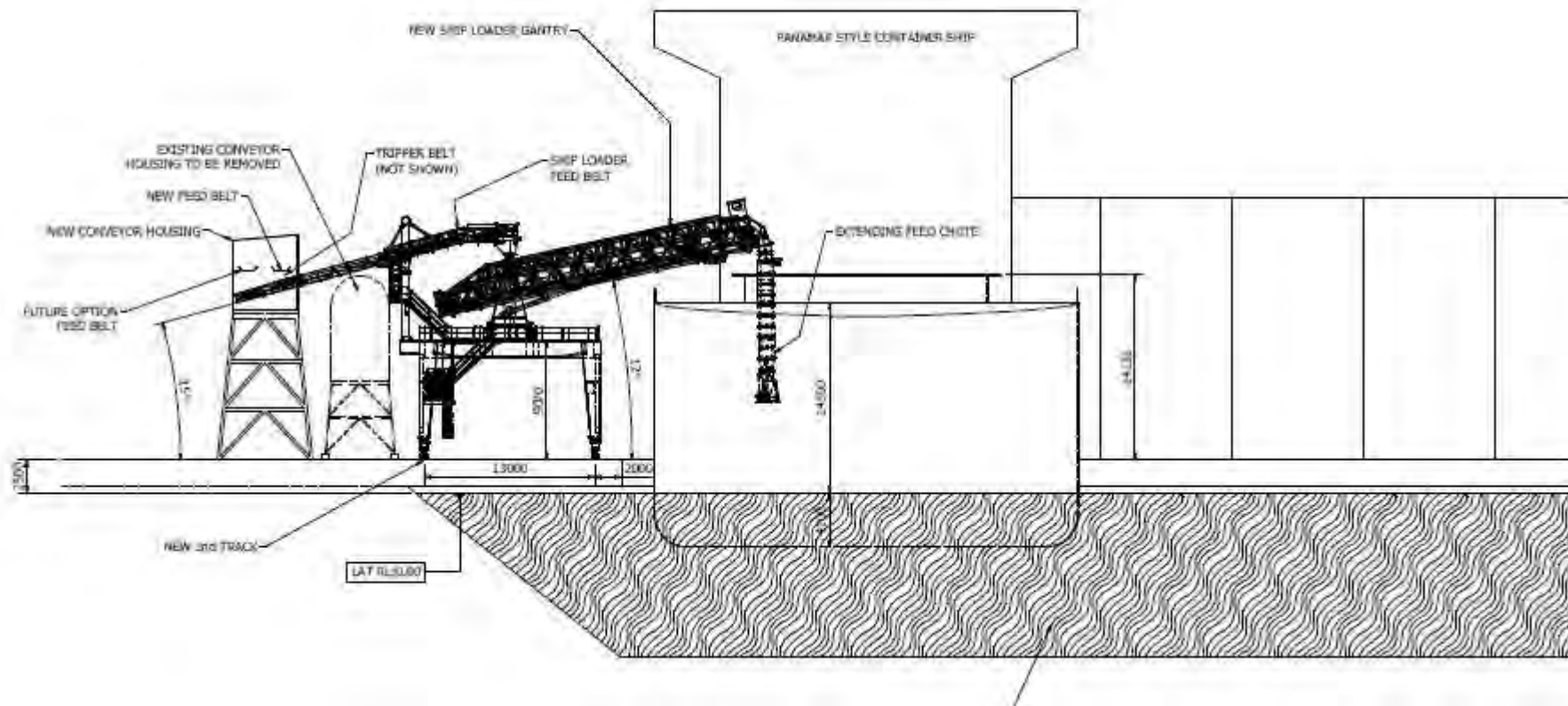
Travelling ship-loader and conveyor at 2000 tonnes per hour with reach for Panamax vessel.

11.3 General Arrangement – Typical Panamax Export Bulk Carrier

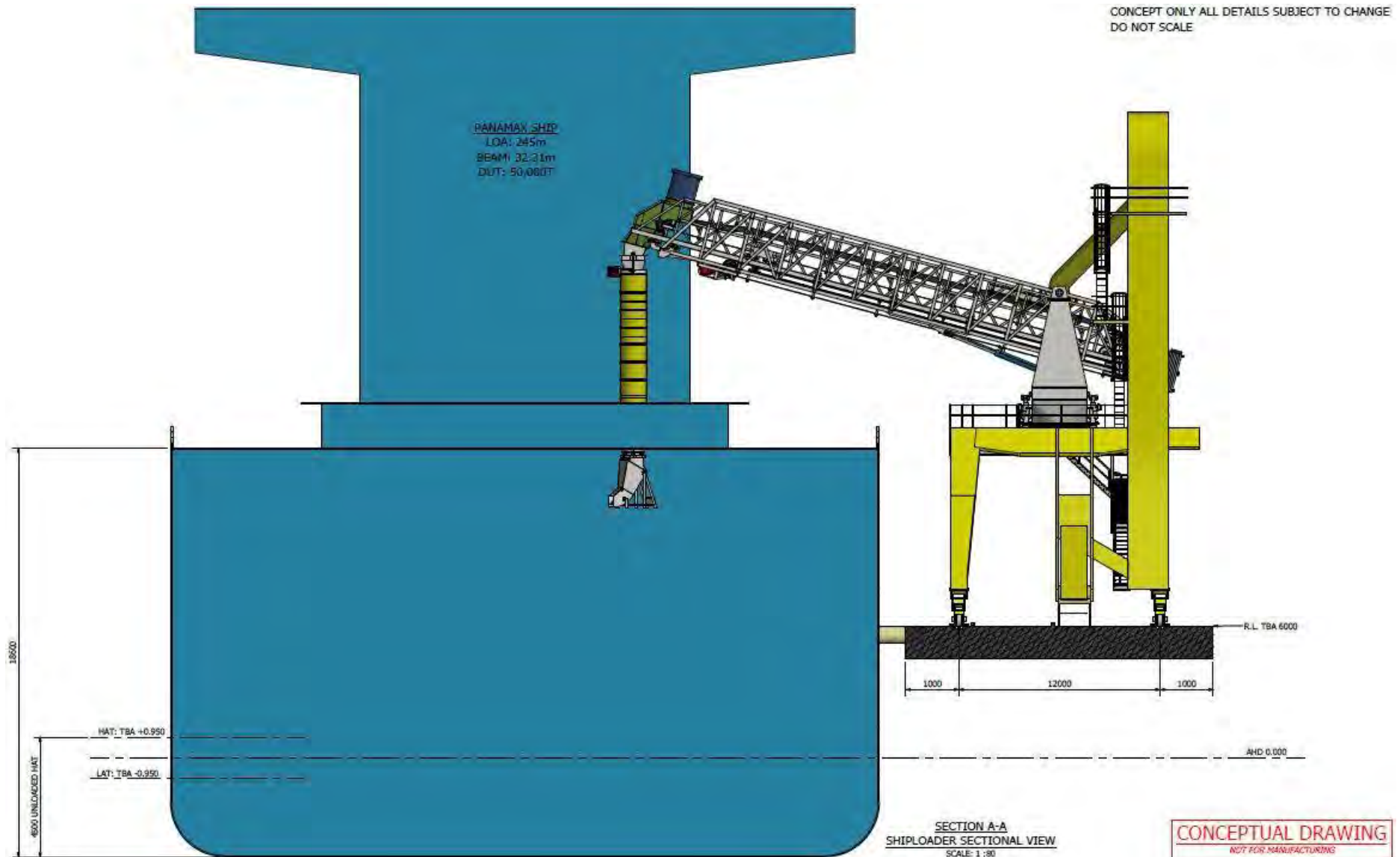


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11.4 Arrangement of Materials Handling Equipment – BLF

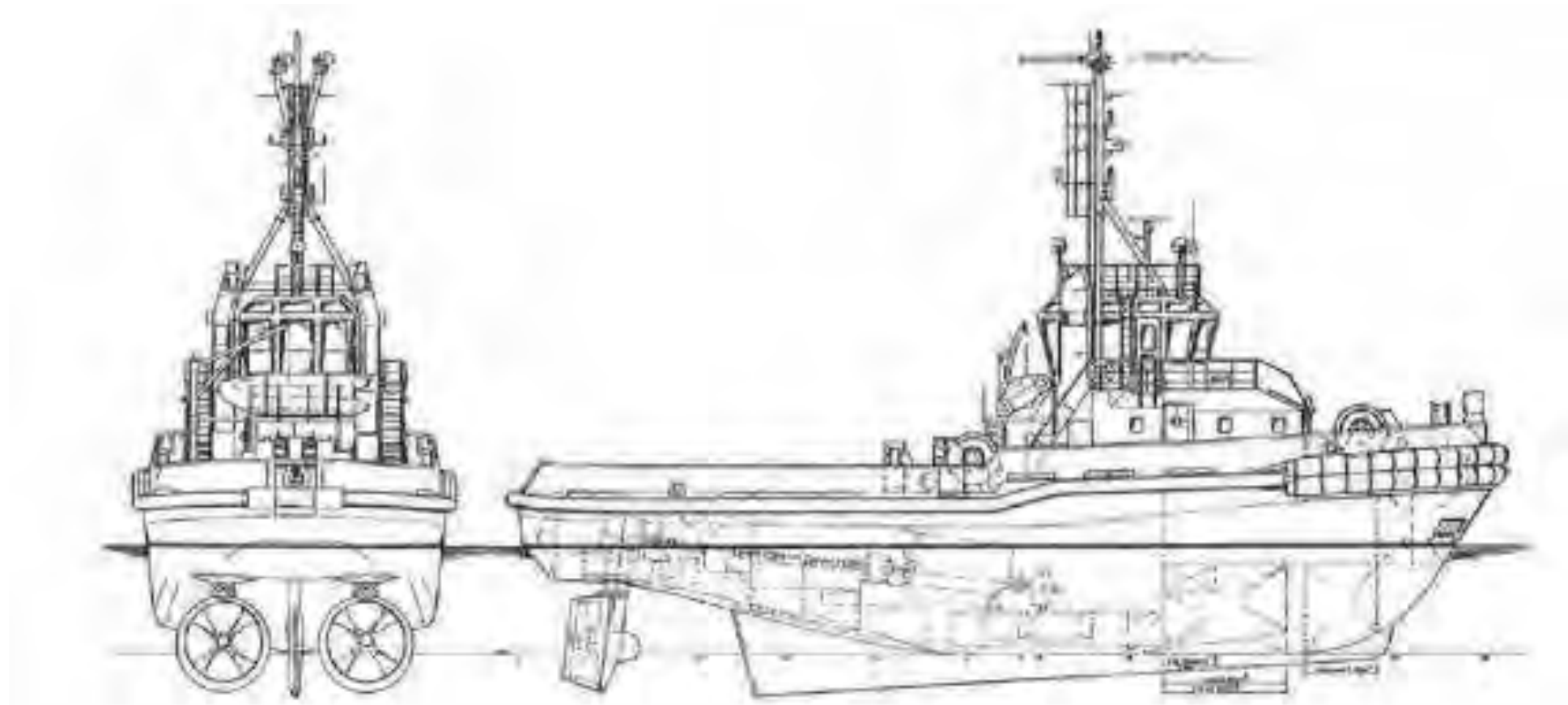


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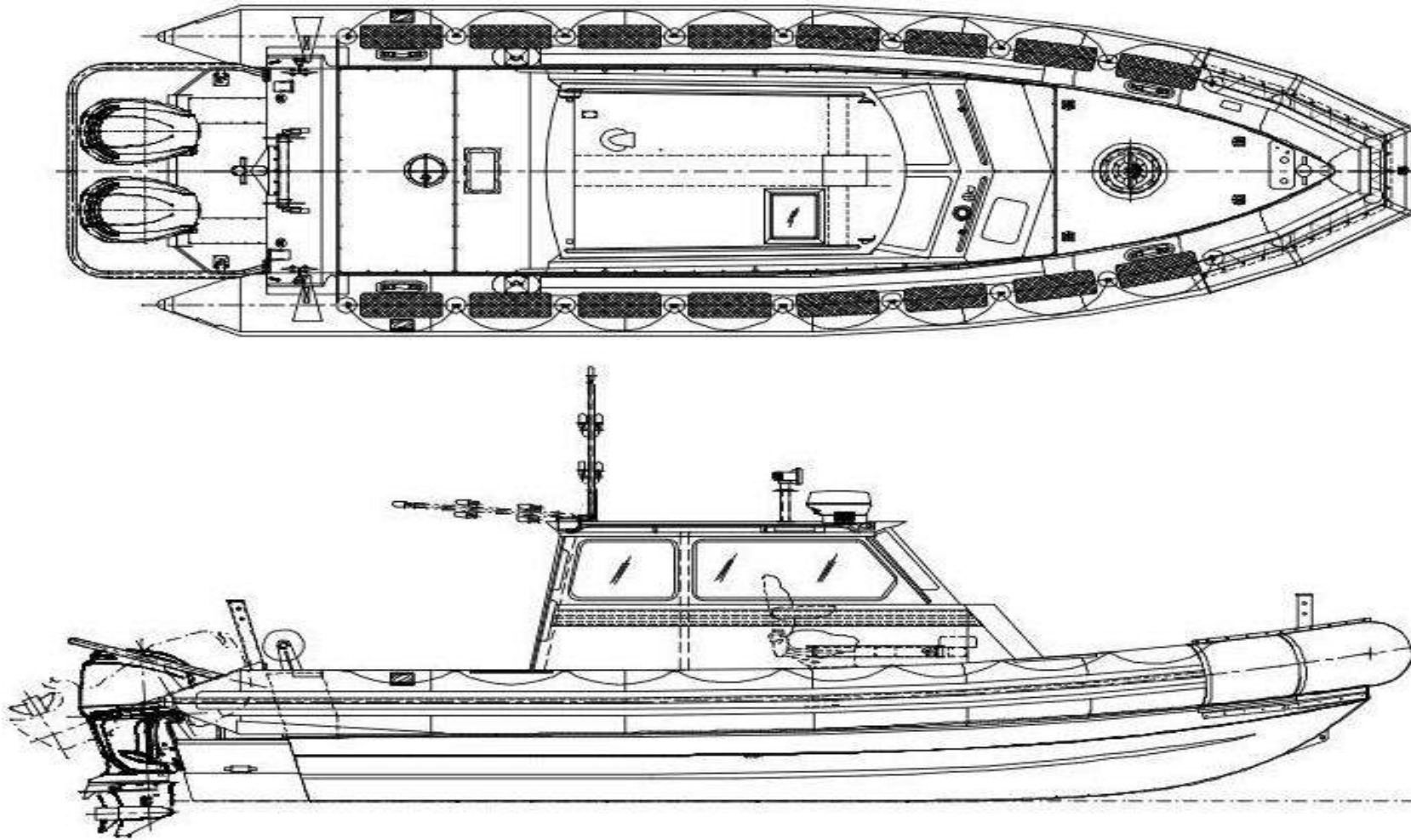
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11.5 Azimuth Stern Drive (ASD) Tug



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11.6 General Purpose Vessel (GPV)



12.0 Crew Qualifications

	ASD Tugs	GPV
Flag	Australia	Australia
Regulatory	Australia	DCV
Master	Master <35m NC	Coxswain <12m NC
Mate	Nil	Nil
Chief Engineer	MED1	Nil
Deckhand	STCW Deck AB or Integrated Rating	RMDL + first aid
Deckhand /Operator	Nil	RMDL + first aid
Total Crew	3	2

[note – all DCV crew qualifications under review by AMSA as part of a re-write of MO 505 presently under consultation. Changes to be implemented in 2020:

<https://www.amsa.gov.au/about/regulations-and-standards/marine-order-505-certificates-competency-national-law>]

13.0 Manoeuvring plan

13.1 Table of Timings and Frequency

The following table and following chart-lets summarise vessel movements – to be completed during simulation and revised with experience.

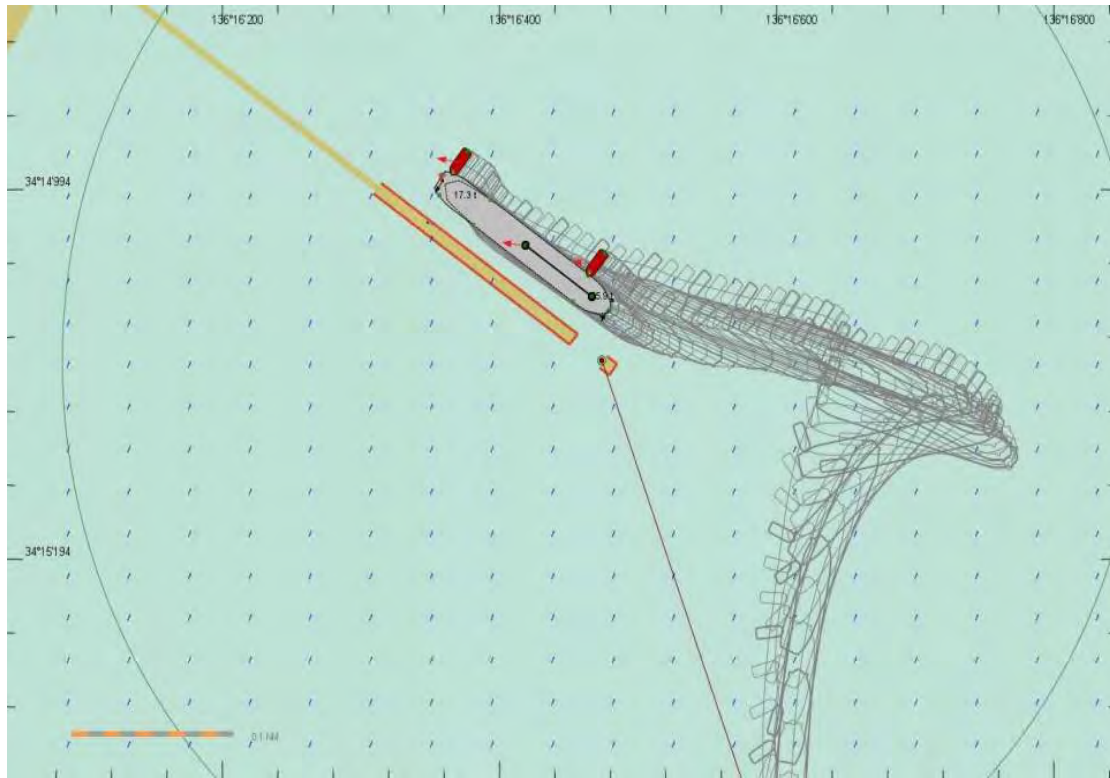
Vessel	Transit	Voyage time	Frequency
BULK CARRIER	Anchorage to BLF		
BULK CARRIER	BLF to port limits		
GPV	BLF to Anchorage and return		
GPV	Draft surveys		
GPV	Line handling		
GPV	BLF to storm mooring		
Tug	BLF to inbound escort point		
Tug	Escort inbound to BLF		
Tug	BLF to Port Lincoln storm mooring		

13.2 Bulk Carrier Approach Plan

13.2.1 Approach plan to jetty

Departure plan is the reverse of the Approach plan as shown below.





13.3 Scheduling and Port Requirements

13.3.1 Pilots

Pilots will be provided by the Port Operator. Pilots will board via the 12m GPV or tug.

13.3.2 PEC Masters

Vessel masters with a Pilot Exempt Certificate (PEC) will be required to have a PP appointed pilot on board within the harbour boundaries at all times.

13.3.3 Ship Scheduling

The movement of the bulk vessels will be facilitated through the Port Spencer VTS. Notification of pre-arrival will be given 48 hours prior to arrival at the port and updated again at 24 hours and 12 hours before arrival. Arrival information will be sent to the Harbour Master.

13.3.4 Administration of Ship Movements

The movement of all vessels of LOA 35 m or more arriving at Port Spencer is controlled by Port Spencer VTS.

Shipping agents submit booking information to the VTSO in accordance with the

reporting requirements and record their requisitions for tugs, pilot and linesmen.

The ancillary services respond to acknowledge the booking and allocate their resources

The movement is then confirmed.

A software program will be adopted so that port service providers, agents, government agencies and the general community are able to view scheduled movements at Port Spencer in real time.

13.3.5 Local Vessel Traffic Interactions

Approximately 25 bulk carrier calls per year will be required to load grain cargo within Port Spencer. Port Spencer VTSO (harbor master?) will co-ordinate the bulk vessel movements so they do not impede on existing vessel movements.

13.4 Tides and weather

13.4.1 Low tide restrictions on loading BLF

A minimum UKC of 10% of loaded draft will be maintained. The tide and draft will be calculated by the loadmaster and master at each loading.

- Air drafts – no overhead restrictions foreseen.

The seabed in the BLF has been sounded by ASR Ltd in 21 October 2011), therefore calculating an accurate UKC is possible.

A minimum UKC of 10% will be maintained. The tide and draft will be calculated by the loading master and vessel master at each loading.

13.4.2 Tidal restrictions on bulk ship transits

- Inbound drafts
- Outbound drafts

Inbound drafts are as per marine safety port Procedures. No air draft restrictions under the PP but ballast draft is as per PP: "Ships should be ballasted or loaded in order to have an even keel or trimmed by the stern with the forward draft not less than 2% LOA and the propeller fully submerged".

13.4.3 Weather restrictions on operations

Provided preparations have been made, the appropriate risk assessment has been completed and all other factors considered and found favourable, the following weather limits are recommended for conducting bulk transfers at the

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BLF:

- Wind < 25 knots
- Seas < 2.5 meters (significant wave height)
- Current <0.5knots
- Visibility > 1 mile

Arrangements shall be made for the provision of regular weather forecasts, including adverse weather warning to the vessel. Voyage plans, for movements outside Port Spencer, shall always have contingency for avoidance of adverse weather. Support Vessels are not to operate outside Port Spencer limits under normal operations.

During adverse weather the Marine Superintendent/Pilot will maintain close contact with the Harbour Master and will seek guidance when to suspend operations.

14.0 Port Spencer VTS

Vessels must have radio communications established with Port Spencer VTS at all times. Port Spencer VTS is the primary point of contact for Peninsula Ports and the Harbour Master.

Port Spencer VTS is an Information Service only (in accordance with IMO resolution A.857(20)). That is, Port Spencer VTS will, on request, transmit essential and timely information to assist in the onboard decision-making process, which may include: position, identity and intentions of other traffic, hazards and other factors which may affect a vessels transit.

During the time that a vessel is operating in the vicinity of another vessel or loading facility, a dedicated radio channel must be maintained between the vessel and the facility deck crew at all times, whether cargo is being worked or not.

With regards to marine traffic, taking into consideration current shipping movements currently employed and known future development plans expected for Port Spencer, the movements required to complete the establishment phase will not impact the port significantly.

The tugs will abide by instruction received from the Port Spencer VTS and will monitor VHF channels 12 & 16.

All Port Spencer support vessels will have AIS fitted and operational to assist them with intentions from other vessels and shipping at all times the vessel masters will abide by COLREGS.

15.0 WASTE MANAGEMENT AND POLLUTION

15.1 Ship Sourced Pollution Management

The detailed oil spill response plan is contained in separate PP-PS documents:

- Ship Sourced Pollution Prevention Management Plan
- Emergency Response Plan
- ANNEX 1 – First Strike Response Plan

Possible sources of pollution from Port Spencer operations are:

- oil and oily residues or mixtures (including diesel fuel, and bunker fuel)
- chemicals and chemical residues
- sewage
- garbage (including food wastes, paper products, rags, glass, metal, bottles, crockery, fishing gear, nets, bait boxes, deck sweepings, paints, wood products and all plastics).

It is an offence to discharge pollutants (either deliberately or negligently) into coastal waters and severe penalties apply.

All support vessels (tugs/GPV) are to carry the applicable pollution prevention

documentation and hold insurance to the relevant limits for pollution clean-up, vessel salvage and wreck removal.

15.2 Oils and Chemicals

A high proportion of the ship sourced oil and chemical pollution that enters the water comes from refuelling, vessel maintenance and bilge discharges. Operators must ensure that they use and dispose of all on board oil and chemicals correctly and safely.

Keeping bilges clean helps to reduce pollution from oil and chemicals. Use absorbents to mop up excess oil or fuel, wash bilges with biodegradable degreasers or detergents and dispose of any cleaning residue ashore.

If oil does spill into the water, use absorbents to mop it up and let the VTSO know so that it can be cleaned up as soon as possible. Do not use dispersants or other cleaning chemicals because they can increase the toxic effects of oil spills.

There are several specific oil and chemical requirements that operators must adhere to, including:

- having a shipboard oil pollution emergency plan (SOPEP) on board—applies to all ships that are more than 35 meters in length overall, or more than 24 meters in length overall, carrying oil as cargo or a vehicle that is carrying more than 400 litres of oil as cargo
- having an oil record book on board — applies to the following ships:
 - a ship that is an oil tanker of 150 gross tonnage or more
 - a ship, other than an oil tanker, of 150 gross tonnage or more that carries oil in
 - a portable tank with a capacity of 400 litres or more
 - a ship, other than an oil tanker, of 400 gross tonnage or more

Tugs will have SOPEP plans in place together with appropriate spill kits, and will have oil record books available for inspection.

15.3 Bunkering

Bunkering involves the transfer of substances between the shore and a ship.

There are no bunkering facilities for visiting bulk carriers at Port Spencer.

Fuel for terminal machinery and vehicles will be delivered by road.

Tugs will refuel at their home port – Port Lincoln and the GPV will refuel from portable fuel tanks, either at Tumby Bay, onshore or at the Port Spencer jetty.

15.4 Sewage

Port Spencer will not accommodate the discharge of sewage.

15.5 Summary of Pollution Prevention Documents

Port Spencer vessels carry documentation applicable to their type in relation to various aspects of pollution prevention, including:

- Shipboard Oil Pollution Emergency Plan (SOPEP)
- Oil Record Book
- Shipboard Sewage Management Plan
- Sewage Disposal Record Book
- Sewage Treatment System Documentation, System Service Manual and Service Records
- Placard about garbage disposal requirements
- Shipboard waste management plan (garbage)

16.0 Incident reporting

16.1 Marine incidents

The *Harbors and Navigation Act 1993* requires any accident resulting in the loss of life or personal injury or in damage to property to be reported as soon as reasonably practicable.

The *Marine Safety (Domestic Commercial Vessels) National Law Act 2012* requires an incident involving the following to be reported:

- the death of a person
- serious injury to a person
- the loss of a vessel
- the loss of a person from the vessel
- significant damage to a vessel

The *Navigation Act 2012* requires the following incidents to be reported:

- the vessel is involved in a marine incident that has affected, or is likely to affect, the safety, operation or seaworthiness of the vessel
- the death of a person
- serious injury to a person
- the loss of a vessel
- the loss of a person from the vessel
- significant damage to a vessel
- loss of cargo of a vessel

The *Transport Safety Investigation Act 2003* requires any of the following incidents to be reported to AMSA:

- breakage of gear or injury to any person during cargo work
- damage or defect to ship, machinery or equipment
- peril or a close quarters situation
- stranding or disappearance
- death, serious injury or a dangerous occurrence
- a birth.

Forms 18 and 19 will be used to report incidents.

Initial incident alerts will be sent within 4 hours of the incident.

Full reports will be sent within 48 hours of the incident.

16.2 Local procedures

When an employee becomes aware of an actual or potential incident, that employee is to notify their immediate supervisor, who will then report it to upper management and the authorities.

For this section, incidents include a dangerous occurrence (i.e. a near miss), which occurs at or near the workplace.

All incidents and near misses shall be recorded in incident data management system and made available to external regulatory bodies;

All HSE and Marine related incidents must be reported to the appropriate Regulatory Authority as soon as possible after the event.

All incidents within Port Spencer must immediately be reported to:

The Harbour Master via Port Spencer VTS (24 hours) on:

VHF radio: Channel 16, 12, 10

Phone: XXXXXXXXX

And by email: XXXXXXXXXX

16.3 Marine pollution

Any discharge or probable discharge will be reported without delay to the VTSO.

VHF radio: Channel 16, 12, 10

Phone: XXXXXXXXX

And by email: XXXXXXXXXX

The Marine Unit Coordinator for AMSA can be contacted on:

Phone: +1800 641 792 (24 hours)

17.0 Maintenance plan

All vessels and cargo handling assets are provided with a preventative maintenance plan.

The plan includes pre-start checks, scheduled servicing of key equipment per manufacturers recommendation and periodical slipping and inspection.

18.0 Evacuation procedure – Ship based

On hearing any signal or alert, all hands are to muster at the muster station for a head count and further instructions before going on duties.

<u>EMERGENCY SIGNAL:</u>	Seven short blasts followed by one long blast
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ABANDON SHIP SIGNAL: By word of mouth from the Master

PREPARE TO ABANDON SHIP: One short one long minimum three times

Evacuation procedure	
1.	Master or delegate to make the decision to abandon ship
2.	Sound abandon ship alarm using the horn one short one long minimum 3 times and crew to advise by word of mouth
3.	Crew to distribute and put on life vests
4.	Master or delegate to ensure distress kit is collected
5.	Master call mayday on channel 16 advising location, emergency and POB
6.	All crew to muster at davit area Port side aft
4.	Head count to be completed
5.	Launch life raft
6.	Evacuate to life raft

19.0 Extreme Weather contingency procedure

The storm contingency procedure is outlined in the *Port Spencer Vessel Traffic Management Plan*.

20.0 Security

20.1 General

The International Ship and Port Facility Security Code (ISPS) is administered in Australia by the Department of Infrastructure, Transport, Development and Local Government (DITRD LG).

A ship's master, prior to entering the port, must report directly to the port authority, or via their respective ship agency, the following:

- International Ship Port Facility Security Code compliance number
- current ship security level, or any change to the ship security level, whilst in port
- ship security officer contact details
- list of expected visitors/contractors
- nominated provedore
- crew list and identification
- any security incident (as defined under the International Ship Port Facility Security Code or Maritime Transport Security Legislation) whilst in port.

20.2 Security levels

The Federal Government determined, and will declare when necessary, three security levels:

- Level 1 — minimum appropriate protective security measures will be maintained at all times.
- Level 2 — appropriate additional protective security measures will be enacted because of heightened risk of a security incident.
- Level 3 — further specific protective security measures maintained for limited times when a security incident is probable or imminent, although it may not be possible to identify the specific target.

Unless otherwise advised the port will operate on Level 1.

In addition to normal security measures undertaken, additional security measures on the land and water may be implemented:

- If directed by the Australian Office of the Department of Infrastructure, Transport, Development and Local Government.
- The current ship security level is higher than security level 1 or the port/port facility security level.

Additional security measures will include:

- increased number of maritime security guards
- controlled access to the waterside security zone and/or additional security waterside patrols
- controlled access to the ship security zone and landside restricted zone
- random or compulsory inspection of all baggage/stores and vehicles.

Responsibility for the implementation of the additional security measures will be agreed via a declaration of security between the ship and the port facility operator. The port security officer must be consulted and agree with the security measures proposed to be implemented.

20.3 Port security contacts

Port security officer (Port Spencer)
Telephone: +61

Port Control (VTSO) (24 hours)
Telephone: +61

Port Spencer Bulk Grain Terminal
Telephone: +61

20.4 National security

In line with the Government's recent publications to do with the reporting of any possible terrorist activity, these procedures are to be followed.

Contact the National Security 24-hour hotline if you have any information of possible terrorist activity or have seen or heard something suspicious that may need investigating by the security agencies.

24-hour Hotline 1800 123 400

Email: hotline@nationalecurity.gov.au

21.0 Health and Safety Commitment

PP is committed to protecting the health and safety of all persons in the workplace including employees, contractors and other visitors.

PP, employees, contractors and visitors have a duty of care including; the responsibility to work safely, to take all reasonable care for their own health and safety, and to consider the health and safety of other people who may be affected by their actions.

PP will take all reasonable and practical steps to improve work safety conditions and will strive to uphold its core values of safety, knowledge, integrity and leadership in order to achieve its goal of zero harm. PP is committed to:

- Complying with all applicable health and safety laws, regulations, standards and other.
- Providing safe plant and equipment, for controlled work.
- Implementing risk and hazard management systems that are relevant and suitable **for the organisation's risk exposure as well as identify, promote and continuously improve health and safety performance.**
- Ensuring all managers remain directly responsible and accountable for the health, safety and welfare of their employees and provide adequate resources to assist managers in this cause.
- Provision of appropriate Health and Safety Training to all relevant persons.
- Maintaining relevant policies, procedures, systems, information, training, and organisational structures to support and communicate effective health and safety practices throughout the company.
- Utilising appropriate internal and/or external expertise when required in all related activities.
- Establishing clear targets and objectives on a biennial basis to improve health and safety in the workplace.
- Maintaining a positive safety culture through encouraging active participation, consultation and cooperation of all employees, contractors and visitors in promoting and developing measures to improve health and safety at work.
- Actively responding to and investigating all incidents, and ensuring injured employees are returned to suitable work at the earliest possible opportunity through equitable claims management and rehabilitation practices.

PP will implement and maintain these systems, inclusive of standards, policies and procedures. These standards will be monitored regularly to ensure their integrity and effectiveness to facilitate continuous improvement.

22.0 Terminal Superintendent/Loadmaster Instructions

Stage	Instruction	Responsibility
Pre – arrival next vessel	<ul style="list-style-type: none"> • Obtain loading sequence and pre stowage plan from vessel, • Check SF BM, max departure drafts, check for any peculiarities, • Max air draft should be less than 9m • Send back a suggested loading sequence to vessel if provided one is not acceptable • Check clear EDN / usually done by agent • Prepare and Set up and the SOF and loading log spreadsheet, • Ensure vessel is reporting ETA, and that the agent is aware, and services are booked 48 hours prior to arrival, • AMSA format Shippers Declaration issued by PP, chase for it if required • A copy of shipper's declaration must also be given to the Terminal • TML / moisture analysis certificates all in order, in case owners / masters require further info, • Find out anticipated max loading draft from port authority/VTS • Documentation / BL instructions orders from PP • Liaise with agent regarding berthing time and booking pilot and services (tentative booking must be 48 hrs in advance) • Arrange for when first barge is required • Arrange boat if required for initial draft survey • Lines boat can be used to read the drafts after it has moored the lines on the buoy • Go on the tug and observe the arrival 	
Upon boarding prior to commencing loading	<ul style="list-style-type: none"> • Take everything with you that you will need for the shift • Board vessel as soon as pilot is off • Meet the C/O and read the initial drafts, • Turn on shore radio, check communications with barge, and request they stand by to commence loading, 	

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Stage	Instruction	Responsibility
	<ul style="list-style-type: none"> • Meet with C/O and confirm sequence and request first loading hatch is opened, • Inspect the first hatch for cleanliness, to ensure fit to load, dry, clear of debris, and bilge dry and covers in, take photos if required, • Complete the ship / shore safety checklists with C/O • Complete the vessel safety inspection toolbox • Guide the barge into the first hatch • Coordinate to commence loading as soon as possible after boarding/all fast time • Give copy of sequence and shippers declaration to barge • complete initial draft survey calculations after commencement of loading – no rush 	
Commencement of loading	<ul style="list-style-type: none"> • Position loader into hatch and commence loading as soon as possible when ship confirms ok • Report commence loading time and ETC to agent / concerned parties / arrival report, • In arrival message to concerned parties include: <ul style="list-style-type: none"> - Times, POB, anchor aweigh, all fast, commence loading etc - Tonnage master is requesting to load, and to what MSD draft - Arrival condition, FO, DO, FW and drafts - ETC • Set up and update the SOF and loading log spreadsheet 	
During loading	<ul style="list-style-type: none"> • Load pours in one of the corners, then next one diagonal, • Depending on barge load size, determine which corner to load next barge, • At end of each sequence try and have the cargo reasonably well distributed in the holds, • Always follow the agreed loading sequence, consult with C/O if you wish 	

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Stage	Instruction	Responsibility
	<ul style="list-style-type: none"> to change • Check on the barge moorings and the conveyor clearance from time to time, to ensure no changes due to tide, wind etc., • Perform draft surveys from time to time to cross check figures • Regularly update the various tabs in the SOF loading log spreadsheet, and print out the load log once per day and give to C/O, • Send Daily report / progress report to the concerned parties, 	
Approaching trimming survey and pours	<ul style="list-style-type: none"> • Confirm max sailing draft with VTS as per VTSO/VTS instructions well before trimming pours, and advise to vessel and concerned parties • Ensure boat is on standby to read drafts, • Check vessel has completed stripping, get ballast figure ready, • Vessel must be upright, • Make sure shore radio is charged to avoid breakdown in comms with ship loader, • If you and or the C/O has the opportunity, do a draft survey at some stage nearing completion to get the ship/shore difference, • If ship/draft survey figure is heavy as compared to the shore figure the final pours prior to the interim/trimming draft survey will need to be reduced, • Put the C/O on notice that it must be very careful not to overload the vessel, the MSD is final, • Put the C/O on notice that he must be ready to quickly calculate his tonnage requirements for final trimming pours as soon as possible to avoid any delay, 	
Completion	<ul style="list-style-type: none"> • If possible, start putting a few hundred tonne into the trimming hatch while chief officer completes trimming hatch requirement calculations, • Double check the C/O trimming hatch calculations, • For last hatch you can often already being in the boat watching • Note, when the final trimming pour tonnages are advised by the C/O, you nearly always arrive at the draft 	

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Stage	Instruction	Responsibility
	<p>sooner and load less</p> <ul style="list-style-type: none"> • Ensure vessel is upright, at completion of cargo, • If vessel does not end up upright, you can get it upright with the excavator trimming in the finals holds, • Upon declaration of completion of loading take finals drafts, • Calculate final draft survey figure, • Organise the excavation of the final trimming hold asap, allow about 3 hours in each, including crane handling times, • If any delays, remember to let the pilot and services know, • If any change/cancellation made less than 2 hours prior the booked POB sailing time then there are financial penalties, manage your services closely !! • Make hatch wise stowage plan with draft survey adjusted figures, • Finalise statement of facts and departure report, 	
Documentation at completion of loading	<ul style="list-style-type: none"> • Send draft documentation (Mates receipt, Manifest ect) to shipper, so they can confirm the details are correct, and the banks can be very strict on all this for LC requirements etc. • The agent arranges the customs clearance and sends it direct to the master, • Documentation at end of loading, do 4 originals of each document , 2 originals to Master, and 2 originals . Sign the NOR with note "received as per the terms of conditions of the governing charter party" and do not write a time and date on it, as per usual practice, • If the master gives any other documents for you to sign, make a note on them "for receipt only, without prejudice". • Arrange for the printing out of documentation (if no printer on board) at completion of loading and excavator trimming, and for the boat to bring it out, • Send a scanned copy of cargo docs to the shippers, agent and NOBP etc. upon completion of loading, • Distribute original cargo docs as 	

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Stage	Instruction	Responsibility
	required, <ul style="list-style-type: none">• Send departure report to concerned parties, advising the completion time, total loaded, drafts, FO, DO and FW.	

end of document

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Appendix C - Post Approval Notice



NOTICE OF TRANSFER OF APPROVAL

Port Spencer Stages 1 and 2, Eyre Peninsular, SA (EPBC 2012/6590)

This decision is made under (Section 145B) of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Proposed transfer of approval

Transferor (holder of approval)	Centrex Metals Pty Limited ABN: 97 096 298 752
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Transferee (person proposing to accept the transfer of approval)	Peninsula Ports Pty Ltd ABN: 33 630 658 203
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proposed action	To construct and operate a new deep water private multi-user port, Port Spencer, on the east coast of the Eyre Peninsular, South Australia [see EPBC Act referral 2012/6590].
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Transfer Decision

Person to whom the approval is transferred	Peninsula Ports Pty Ltd ABN: 33 630 658 203
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Person authorised to make decision

Name and position	John Foster Director Post Approvals Section
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Signature

Date of decision	13 November 2019
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Appendix D - Golder's Underwater Noise Modelling Report

September 14, 2011

APPENDIX C: UNDERWATER NOISE MODELLING REPORT – PORT SPENCER FACILITY

1.0 INTRODUCTION

Acoustic modelling was performed to delineate underwater noise fields expected to result from construction and operational activities required to develop an offloading marine port (Port Spencer) in Spencer Gulf, South Australia (the Project). The receptors of concern assessed in the noise model included marine mammals and fish occurring in the Spencer Gulf region. Underwater noise sources considered in the model included impact pile driving, vibrational pile driving, underwater drilling, and vessel traffic. These sound sources can be categorised generally as pulsed (pile driving) or continuous (drilling and vessel traffic). Sounds from moving sources (ships) are considered to be transient relative to the receivers. The standard sound measurement for determining potential effects on marine organisms is root mean square (RMS) pressure, though peak pressure is often used to determine threshold values.

2.0 NOISE MODEL PARAMETERS

Noise modelling was conducted using a two-dimensional noise model designed by National Marine Fisheries Service (NMFS) specifically for pile driving/drilling activities (WSDOT 2009). Underwater noise levels were calculated on the basis of data and methods described in WSDOT's Advanced Training Manual, Biological Assessment Preparation for Transportation Projects Version 10-08 (WSDOT, 2008). In accordance with guidance from the NMFS, this analysis used the Practical Spreading Loss Model.

The Practical Spreading Loss Model is based on the following formula for geometric spreading:

$$TL = 15 \times \log (R1/R2) + \alpha R$$

Where:

TL: is the transmission loss in dB.

R1: is range in metres of the sound pressure level.

R2: is the distance from the source of the initial measurement.

αR : linear absorption and scattering loss

Solving for TL will provide the underwater sound pressure level at a given distance. To determine at what distance or range a known sound pressure level will occur, the equation must be solved for R1:

$$R1 = (10(TL/15)) \bullet R2$$



The NMFS model was used to calculate the noise attenuation in the project area to determine at what distance from the source the sound level would be expected to reach injury and behavioural threshold values for fishes and marine mammals.

3.0 ACOUSTIC THRESHOLD CRITERIA

There are presently no underwater noise impact criteria established under Australian legislation for the protection of marine fauna from injury or behavioural disturbance due to construction noise. The National Marine Fisheries Service (NMFS) in the United States has developed impact criteria based upon RMS sound pressure levels for fish and marine mammals. In the absence of regional impact criteria for underwater sound, the present modeling exercise has adopted NMFS criteria for assessing impacts to fish and marine mammals in the Spencer Gulf region. The current NMFS interim thresholds protective of injury and behavioural disturbance to fish and marine mammals are as follows:

- The underwater noise pressure threshold (RMS) for potential injury to cetaceans is 180 dB (Southall et al. 2007)
- The underwater noise pressure threshold (RMS) for potential injury to pinnipeds is 190 dB (Southall et al. 2007)
- The underwater noise pressure threshold (RMS) for behavioral disturbance to cetaceans and pinnipeds is 160 dB for pulsed sounds (Southall et al. 2007) and 140 dB for continuous sounds (Richardson et al. 1995)
- The underwater noise cumulative sound pressure threshold (SEL) for potential injury to fish ≥ 2 g is 187 dB (Stadler and Woodbury 2009)
- The underwater noise cumulative sound pressure threshold (SEL) for potential injury to fish < 2 g is 183 dB (Stadler and Woodbury 2009)
- The underwater noise peak sound pressure threshold (SEL) for potential injury to fish is 206 dB (Stadler and Woodbury 2009)
- The underwater noise pressure threshold (RMS) for behavioral disturbance to fish is 150 dB (Stadler and Woodbury 2009)
- All sound pressure levels are referenced to 1 micro Pascal (uPa) at 1 m.

The most stringent of the behavioural thresholds for each of cetacean, pinniped and fish were adopted in the model for determining the spatial limits of noise effects.

3.1 Pile Driving (Impact and Vibrational)

Certain piling activities are known to generate high intensity underwater noise that can adversely affect marine animals, particularly dolphins, whales and seals which rely on underwater sound as a primary method of navigation, orientation, communication and foraging. Pile-driving sounds result from a rapid release of energy when two objects hit one another. The characteristics of impact sounds depend primarily on the physical properties of the impacting objects. When a pile-driving hammer strikes a pile, sound from the impact radiates into the air and a transient stress wave, or pulse, propagates down the length of the pile. The impact will also create flexural (or transverse) stress waves in the wall of the pile which couple with the surrounding fluids (air and water) to radiate sound into the water and additional sound into the air. Moreover, the pulse propagating down the length of the pile may couple to the substrate at the water bottom and cause waves to propagate outward through the bottom sediment. These transient waves in the substrate can be transmitted from the bottom into the water at some distance away from the pile to create localised areas of very low and/or very high sound pressure and acoustic particle motion because of interference with the sound pulse directly from the pile that is traveling outward through the water. Typically, pile-driving sounds underwater are characterised by multiple rapid increases and decreases in sound pressure over a very short period of time. The peak pressure is the highest absolute value of the measured waveform, and can be a negative or positive pressure peak.

Typically, noise generated by pile driving consists of pulsed sounds that occur at intervals of approximately 1 to 3 seconds depending upon the equipment used. The repetitive nature of the pile driving sounds does not allow for receivers to fully recover from one pulse before the next pulse is produced. In order to assess this type of sound source, the NMFS noise model and impact criteria are based upon the peak sound pressure (RMS) and the sound exposure level (SEL) which take into account the number of pulses generated per day. Generally, the preferred method of initial pile placement into the substrate prior to drilling is to use a vibratory hammer. This technology uses rapidly pulsing vibrations to drive the piles until they encounter bedrock, or at least refusal. For the purpose of this modelling exercise, pile installation by vibratory hammer was analysed as a continuous noise source by entering a value of one as the number of strikes in the NMFS model.

Predicted noise levels were obtained for standard pile sizes and driving techniques compiled by the California Department of Transportation (2009). Three pile driving scenarios were considered in the model involving two different pile sizes and two potential driving techniques:

- Driving a 48-inch steel or cast-in-steel shell (CISS) pile with an impact hammer produces noise at a peak pressure of 200 dB (20 m), RMS of 190 dB, and SEL of 175 dB
- Driving a 40-inch steel or CISS pile with an impact hammer produces noise at a peak pressure of 205 dB (10 m), RMS of 190 dB, and SEL of 175 dB
- Driving a 48-inch steel or CISS pile with a vibratory hammer produces noise at a peak pressure of 185 dB (10 m), RMS of 170 dB, and SEL of 170 dB.

All sound pressure levels are referenced to 1 micro Pascal (uPa) at 1 m.

3.2 Pile Drilling

The anticipated method of pile setting involves drilling after the use of a piling hammer to drive the steel piles to the point of refusal. The pile will then be held in place and a drill rig will be used to bore a socket into the bedrock. Drilling was analysed as a continuous noise source by entering a value of one as the number of strikes in the NMFS model.

Predicted noise levels from drilling were obtained using measured sound levels from drilling techniques reported in Nedwell and Brooker (2008). For the purpose of this model, it was assumed that underwater noise produced from drilling into the substrate within a steel pile will have a maximum RMS pressure of 146 dB at 10 m (re 1 uPa at 1 m).

3.3 Marine Vessel Noise

The construction and operation of the marine facilities will include the operation of cargo vessels, barges, and/or tug boats. Underwater noise from these vessels will be generated primarily from propeller cavitation. Vessel noise was analysed as a continuous noise source in the NMFS model.

There are no data available for noise levels from the specific vessels anticipated for the project. Predicted noise levels were obtained using measured sound levels from similar vessels reported in JASCO (2006). It was assumed that vessels approaching or leaving the marine facilities will have a maximum RMS pressure of 175 dB (re uPa at 1 m).

4.0 RESULTS

The results of the assessment of the effect on underwater noise levels are presented in the following section in comparison to established underwater noise threshold levels for effects to marine biota. The predicted noise and sound level thresholds are summarised in Table 1.

4.1 Pile Driving (Impact and Vibrational)

Pile installation using a vibratory hammer is predicted to produce a sound pressure level of 170 dB (RMS) at 10 m. This level is below the injury threshold for both marine fish and marine mammals. The model predicts that the noise level from this activity will attenuate to the behavioral threshold for mammals (160 dB) at a distance of 46 m from each pile, and it will attenuate to the behavioral threshold for fish (150 dB) at a distance of 215 m from each pile (Table 1). Modelling assumes that the vibratory hammer will seat a given pile into position in 30 minutes or less, and a maximum of three piles will be driven on a given day.

If an impact hammer is required for pile driving, the model predicts that the noise level from this activity will attenuate to the behavioral threshold for mammals (160 dB) at a distance of 928 m from each pile, and it will attenuate to the behavioral threshold for fish (150 dB) at a distance of 4.3 km from each pile. The model also predicts that the noise level from this activity will attenuate to the lowest injury threshold for mammals (180 dB) at a distance of 431 m from each pile, and it will attenuate to the injury threshold for fish \geq 2g (187dB) at a distance of 469 m from each pile.

4.2 Pile Drilling

Once the piles are seated in position, a drilling rig will bore a socket into the bedrock. This method of drilling is predicted to produce a maximum sound pressure level of 146 dB (RMS) at 10 m. This drilling will occur inside the steel pile, and the drilling operation also includes the use of air/water injection to lift suspended material out of the pile casing. These two factors likely result in an actual attenuated sound level that is greatly reduced from the 146 dB, which was used as a conservative proxy. This level is below the injury threshold for both fish and marine mammals. If the sound pressure level during drilling reached 146 dB, the model predicts that the noise level will attenuate to the behavioral threshold for mammals (140 dB) at a distance of 25 m from each pile, and it will attenuate to the behavioral threshold for fish (150 dB) at a distance of 5 m from each pile.

4.3 Marine Vessel Traffic

Container vessels and tug boats are predicted to produce a maximum sound pressure level of 175 dB (RMS) at 1 m. This level is below the injury threshold for both fish and marine mammals. The model predicts that the noise level from these vessels will attenuate to the continuous sound behavioral threshold for mammals (140 dB) at a distance of 115 m from the vessel, and it will attenuate to the behavioral threshold for fish (150 dB) at a distance of 30 m from the vessel.

Table 1: Summary of Predicted Noise and Distances to Thresholds.

Project Activity	Predicted Noise (dB)	Injury Threshold (dB)		Distance to Injury Threshold (m)		Behavioral Threshold (dB)		Distance to Behavioral Threshold (m)	
		Mammals	Fish	Mammals	Fish	Mammals	Fish	Mammals	Fish
Impact Pile Driving	205 Peak/ 190 RMS @ 10 m	190/180	187	93/431	469*	160	150	928	4642
Vibration Pile Driving	170 (RMS @ 10 m)	190/180	187	1	1	160	150	46	215
Drilling	146 (RMS @ 10 m)	190/180	187	NA	NA	140	150	25	5
Vessel Traffic	175 (RMS @ 1m)	190/180	187	93/431	469	140	150	115	30

* Distance to cumulative SEL based up on an estimated 1800 pile strikes per day.

5.0 PREDICTION CONFIDENCE

Prediction confidence in the noise model is considered to be moderate based on the following factors:

- The activities associated with construction and operations of the marine facilities were modelled using conservative values and measured values from similar materials, equipment, and operations.
- The NMFS model is designed specifically for pile driving activities.
- There are no other significant noise sources in the project area that would need to be modelled with the anticipated project noise sources.
- The short duration of all noise sources minimises potential effects.
- Quality assurance was accomplished by implementing quality control checks on all model runs to ensure that model input parameters were correct, model output was plotted correctly and any calculations were checked.
- There are limitations of using a two-dimensional model with respect to sound attenuation in a three-dimensional environment. However, these limitations were assumed to be minor given that the zone of greatest influence corresponded with shallow water.
- The present model assumes that sound travels in a homogeneous environment. In reality, variability in the physical environment (salinity, water depth, currents, substrate type) likely exists within the area of interest. This variability could potentially influence underwater sound transmission as well as actual threshold distances, when compared to the predicted model (which assumes a constant sound velocity). It has been noted that in-field gradients in temperature, bottom topography, and current cause sound levels to attenuate more rapidly than predicted by this geometric spreading-based model.

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P E N I N S U L A | P O R T S

Appendix E - Vessel Traffic Management

10 JANUARY 2020



VESSEL TRAFFIC MANAGEMENT PLAN

(MARINE TRAFFIC)
PORT SPENCER

Version	Drafted	Checked	Approved
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1.0 Introduction

1.1 General

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

Ships, tugboats and port control use VHF radio to communicate (channels 6, 8 and 12).

The Spencer Gulf lies within South Australian State Waters.

1.2 Purpose

This document defines the standard procedures to be followed in the pilotage area of Port Spencer — it contains information and guidelines to assist ships' masters, owners, and agents of vessels arriving at and traversing the area. It provides details of the services and the regulations and procedures to be observed.

Nothing in this document is intended to relieve any vessel, owner, operator, charterer, master, or person directing the movement of a vessel from the consequences of any failure to comply with any applicable law or regulation or of any neglect of precaution which may be required by the ordinary practice of seamanship, or by the special circumstances of the case.

Should errors or omissions in this publication be noted, it would be appreciated if advice of these could be forwarded to:

The Harbour Master (Port Spencer)

Postal address: x

Phone:

Facsimile:

Email:

1.3 Datum

All water depths refer to the 'lowest astronomical tide' height (LAT). All positions in this Plan are in WGS84, however, Australia uses the Geocentric Datum of Australia (GDA94) coordinate system. All directions are referenced to True North.

All directions are referenced to true north.

1.4 Definitions

Australian Maritime Safety Authority (AMSA)

The Australian Maritime Safety Authority is the commonwealth authority charged with enhancing efficiency in the delivery of safety and other services to the Australian maritime industry.

The Australian Ship Reporting System - MASTREP

The Australian Ship Reporting System established under Section 7 of AMSA Marine Order 63.

Australian Standard – AS 3846 – 2005

AS 3846 defines the requirements for the transport and handling of dangerous goods in port areas in Australia.

Bridge Resource Management (BRM)

An internationally recognised style of interaction between the pilot and the bridge team aimed at optimising the use of the personnel resources available to assist in the safe pilotage of the ship.

Gross registered tonnage (GRT)

The measurement indicated on the international tonnage certificate of a ship. This value is used in the calculation of conservancy fees.

International Maritime Organization (IMO)

The world organisation charged with enhancing efficiency in the delivery of safety to the whole maritime industry.

International Maritime Dangerous Goods Code (IMDG Code)

This code is published by the International Maritime Organization with the purpose of providing information for the safe carriage, packing, handling, classing and transporting of dangerous goods.

Lowest astronomical tide (LAT)

This is the zero value from which all tides are measured.

Manager (pilotage services)

The person responsible for the service delivery of pilotage services within Port Spencer.
Subject to Organisational Structure Decisions

Manager Vessel Traffic Management

The person responsible for the management of the VTS Centre
Subject to Organisational Structure Decisions

Maritime Safety South Australia

The state government agency responsible for the VTS services, pollution response and the administration of all aspects of vessel registration and marine safety in the state of South Australia.

Overall Length (LOA)

The LOA refers to the extreme length of a vessel.

Peninsula Ports

Peninsula Ports is a privately-owned corporation charged with overseeing the commercial activities in the port, including the maintenance of the port infrastructure and provision of pilotage for the Port Spencer. The primary function of Peninsula Ports under the *Harbors and Navigation Act 1993* is to establish, manage and operate effective and efficient facilities and services within the port, while maintaining appropriate levels of safety and security.

Harbour Master

The person authorised to give direction under the relevant provisions of the *Harbors and Navigation Act (2003) & Regulations (2009)*.

Sailing time

The scheduled sailing time is the time of the last line.

Vessel Traffic Service Operator (VTSO)

A person, suitably qualified, delegated by the Harbour Master to monitor the safe movement of vessels and to give direction under the relevant provisions of the *Harbors and Navigation Act (2003) & Regulations (2009)*.

Vessel Traffic Service (VTS)

(The Port Duty Officer can also be the VTSO)

A VTS is any service implemented by a competent authority, designed to maximise the safe and efficient movement of water borne traffic

1.5 Contact information

1.5.1 The Harbour Master

For operational maritime questions, marine incidents, pollution, pilotage, buoy moorings, navigation aids and towage requirements please contact the Harbour Master's office located at:

Physical address:

Postal address:

Phone:

Facsimile:

Email:

1.5.2 VTS centre

(There is a decision point as to whether to describe the Port Radio as a 'VTS' as the latter has a technical meaning under Marine Orders and requires audit and accreditation. This is a decision that needs to be made once operations are imminent.)

The VTS centre, (call sign 'Port Spencer' operated by PENINSULA PORTS) is situated at the harbour master's office in Port Spencer.

For ship traffic scheduling, pollution incidents and reporting defective navigation aids please direct initial enquiries to the VTS Centre. The service is provided by Peninsula Ports and provides a 24 hour, 7 days a week marine operations service to the port community. They are contactable on:

Postal address:

VHF radio: VHF 16 or 12

Phone:

Email:

In the event of an emergency, the VTS Centre is the key notification and communications facility that will activate the appropriate response agencies.

1.6 Rules and regulations

1.6.1 General

The rules and regulations in the port contribute to the safe, efficient and environmentally responsible handling of shipping traffic. The international rules of the International Maritime Organization, such as the SOLAS convention and its amendments (for example, the IMDG code) and state, national and local port authority regulations are in force in the port.

1.6.2 Applicable regulations

The procedures outlined in this document are designed to satisfy the requirements of the following instruments and legislative requirements:

- *Harbors and Navigation Act 1993 (SA) & Regulation 2009*
- *Navigation Act 2012 (Cth)*
- *Marine Safety (Domestic Commercial Vessel) National Law Act 2012 (Cth)*
- *Environment Protection Act 1993 (SA)*
- *Maritime Services (Access) Act 2000 (SA)*
- *Customs Act 1901 (Cth)*
- *Quarantine Act 1908 (Cth)*
- *Occupational Health, Safety and Welfare Act 1986 (SA)*
- *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987 (SA)*
- *South Australian Ports (Bulk Handling Facilities) Act 1996 (SA)*
- *South Australian Ports (Disposal of Maritime Assets) Act 2000 (SA)*
- *Recreational Access Agreement to Commercial Wharves Agreement*
- *International Maritime Dangerous Goods Code (IMDG Code)*
- *Australian Standard — AS3846 — 2005. (Defines the standards to be observed by Masters, berth operators and consignors involved with the transport and handling of dangerous goods in port areas in Australia.)*
- *Maritime Transport and Offshore Facilities Security Act 2003 (Cth) and Regulations 2003.*

1.6.3 Authority

Peninsula Ports Authority's appointed Port Management Officers (appointed under Section 29 of the *Harbors and Navigation Act 1993* by the port operator) will manage the port waters in accordance with the Act.

1.6.4 Exemptions and permits

The Harbour Master may grant exemptions from specific regulations. Permission is required for special activities such as repairs, hull cleaning and painting, engine immobilisation and so on.

A. CONSTRUCTION PHASE

2.0 Description of Works

2.1 General

Building of the jetty will be conducted using incremental launching method without the need for barges at the work site - $34^{\circ} 15.090' S$ / $136^{\circ} 16.480' E$. This method involves the construction of a rock groyne from land to a length of approximately 230m, followed by driving pairs of piles from the partially completed superstructure of the wharf. On completion of each pair of piles the superstructure is launched 42m to recommence piling operations from the new position.



2.2 Construction

Marine traffic for construction will be limited to a small tender for establishing silt curtains and other similar controls, and is proposed to commence in early June 2020 and is expected to continue until late April 2021. Hours of work for marine traffic purposes during construction are 06:00 to 23:59:00 Monday - Friday, and 06:00 - 22:00 Saturday and Sunday.

Construction will generally involve the following:

- Installation of a causeway (using earthmoving equipment from land).
- Installation of steel piles.
- Installation of a steel jetty substructure and superstructure.
- Decking and associated materials handling and finishing works.
- Delivery of construction materials by road.

2.3 Vessel Particulars

All vessels are to have current certificates in accordance with their classification as either Regulated Australian Vessels (RAV) under the *Navigation Act 2012* or Domestic Commercial Vessels (DCV) under the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*. Tugs and barges will operate under their individual safety management systems (SMS) as per the relevant legislation.

Dumb barges, where applicable, will operate under the towing tugs SMS and in accordance with tug owners and tow surveyor's requirements.

2.3.1 Tugs

This is subject to change based on prevailing operational requirements, however it is not intended for tugs to be used during construction, unless required for mooring of Heavy Lift Vessels, once the wharf is complete, for positioning of the ship loader

2.3.2 Heavy Lift Vessel

Following completion of the wharf structure a Heavy Lift vessel may be used to deliver the travelling ship loader and install it onto the rails on the wharf.

The heavy lift vessel (HLV) is a vessel with a specific crane that has a large lifting capacity of up to thousands of tonnes, suitable for the job at hand.

This vessel would be moored at the wharf during this lifting operation.

2.4 Mobilisation

The PENINSULA PORTS Yard at Sheep Hill will be the primary offsite load out and set down area for the material transported to the site for construction. Piles and other steel members for the construction stage will be delivered by road to the development site and transported along the partially launched wharf superstructure .

The incremental launch method means that no barges are required for construction, other than the potential for a Heavy Lift Vessel to deliver the ship loader. It is not envisaged that any barge will be used at the Port Spencer development site.

The main plant proposed to be used are as follows:

- 400T crawler crane (assembly yard)
- Favco M2480 crane (launched with superstructure)
- Pile top drill rig with RCD and DTHH drilling hammers and air compressors.
- S280 piling hammer and vibro hammer
- Gantry crane (within fabrication shed)

- Semi-trailer (flatbed)
- Semi-trailer with mounted grout mixing and pump spread.
- Light towers
- Generators incl. welding generators, wire feeders and other welding equipment
- 20T Franna crane (assembly yard)
- 8T slew crane (minor wharf works)
- SPMTs
- Punt (rescue boat)

PENINSULA PORTS will implement and abide by the conditions as set by the State.

2.5 Vessel Movements

Note: dates and times are subject to change based on site conditions, weather conditions and State requirements.

There will be shore-side delivering of the steel piles and modules for the port project at the Port Spencer development site. Piles and steel modules will be transported along the partially launched wharf superstructure, which will then be utilised for construction.

Tugs will only be required at the site, if necessary, for the berthing of the Heavy Lift Vessel for the delivery of the ship loader.

2.5.1 Mooring specifications

Mooring arrangements for work-vessels – initially at a buoy, by anchoring, or once jetty has sufficient completion, at the Southern side of the incomplete jetty. The Heavy Lift Vessel will only berth at the completed structure.

2.6 Communication

The Site Supervisor is to email each day's work schedule to Port Spencer Vessel Traffic Service (VTS), the PENINSULA PORTS Senior Site Manager and Engineering Structures Foreman the day before the works.

The Site Supervisor will have the mobile phone number of the Tender Coxswain and Supervisor for communication as required.

Communication and radio watch between Port Spencer VTS, construction teams and any vessels will take place on VHF Channel 12, with all switching over to the working channel specified by VTS at the required time. Distress watch will also take place on VHF Channel 16.

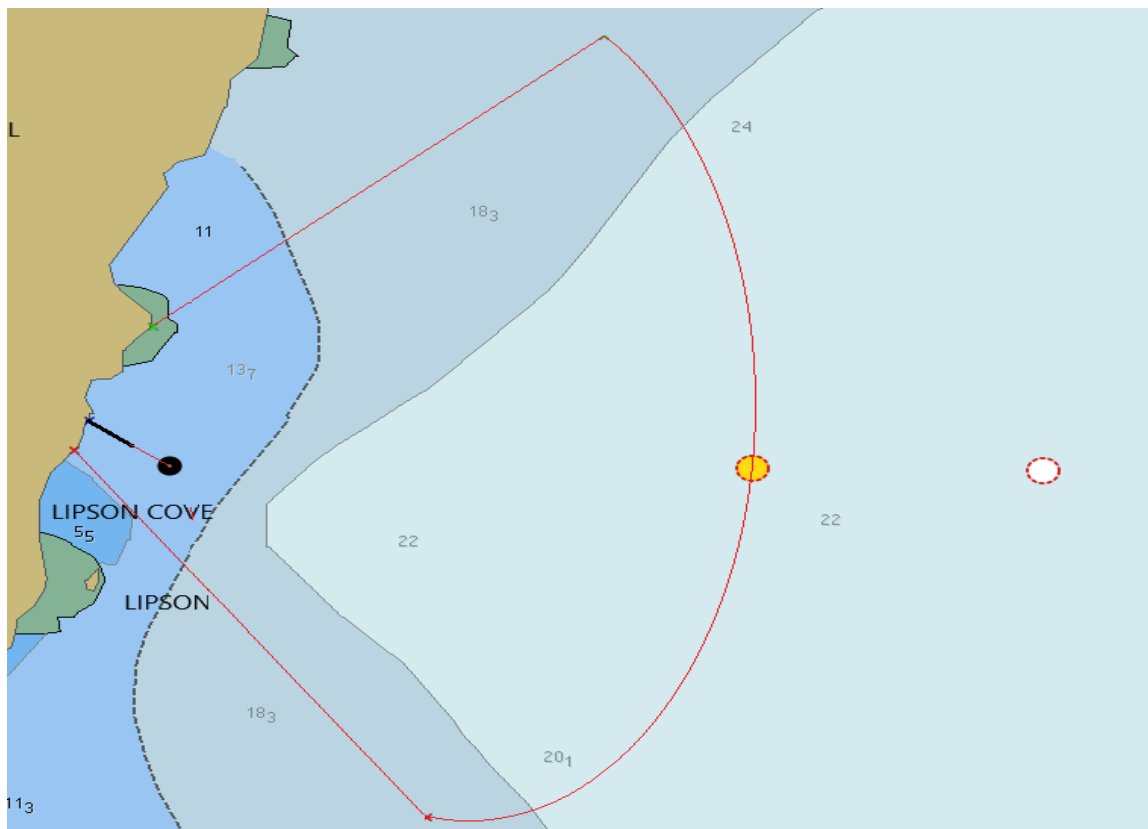
2.7 Marine Traffic Controls

2.7.1 Exclusion Zone

PENINSULA PORTS may request an Exclusion Zone to be declared from time to time during the construction phase. Such exclusion zone to be published on the South Australia Port Authority Website and broadcasted daily by Vessel Traffic Services (VTS). Exact dates and times for the VTS including onsite vessel manoeuvring involving mooring arrangements will be confirmed as per Notice to Mariners, although not envisaged.

Aus 139 is the primary chart affected by the port development works.

The boundary of the exclusion zone will be confirmed after deployment. The proposed port limits with a distance of 2 nautical miles from the end of the jetty (due East) – yellow circle) has been chosen to be consistent within development and mooring arrangement, minimise the impact on vessels navigating around the Spencer Gulf, reduce any impact to environmental attributes, and to minimise confusion with backscatter from other possible special marker lights at night.



A. Special Markers

Yellow special marker buoys with 2 nm yellow flashing lights will be deployed to mark the exclusion zone boundary, as shown below. These will be spaced at approximately 500m intervals and held in place with 1 t biscuit moorings:



B. Diving Operations

The dive vessel and dive team will be engaged to assist during the construction phase as required. The vessel will be in 2D Survey and will be navigated by a Coxswain. All divers have ADAS Diver qualifications with the Dive Supervisor qualified as an ADAS Dive Supervisor.



2.7.2 Collision Prevention

2.7.2.1 Collision Regulations

All vessel operations will comply with the relevant safety management systems for the vessel, as well as all relevant controls in the *International Regulations for the Prevention of Collisions at Sea*, Harbour Masters Directions and the practice of good seamanship.

2.7.2.2 Impact on Spencer Gulf Shipping Operations

Given the proximity of the site and exclusion zone to set up for the development zone marked by yellow special marker buoys with flashing lights, there will be little to no impact on current shipping operations within the Spencer Gulf.

The main shipping lane in the Spencer Gulf is used by bulk vessels to access Onesteel Whyalla operations. There would be no impact on these shipping lanes.

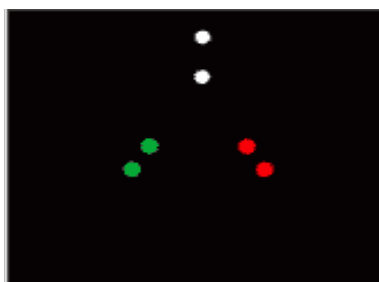
There are occasional / seasonal movements of aquaculture pens past the site that will require coordination with the Harbour Master, but otherwise be as per normal maritime navigation and operations.

2.7.2.3 Impact on recreational vessels

The route plan for the project will not impact on recreational vessels between nearby ports and the Port Spencer development outside of the Exclusion Zone.

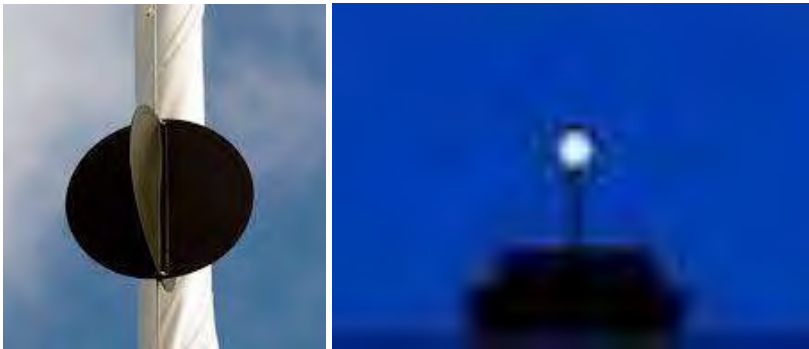
2.7.2.4 Navigational Lights and Day Shapes

If use of the tender or any other vessel is required at night or in restricted visibility, the tug will display port and starboard steaming lights, a stern light, a masthead light and an additional towing light for a tow <50 m, with the barge displaying port and starboard lights, as shown below (head on view).



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Any other vessel will display a black ball in daylight hours and an all-round white light between dusk and dawn, as shown below.



2.7.2.5 Anchor Watch

Anchor watch is not expected to be required while the tender is in operation

2.8 Vessel Safety Management Systems

All operational and emergency procedures described in vessel Safety Management System are to be followed.

2.9 Weather Forecasting

BOM weather forecasts will be monitored throughout the works via the internet and VHF Channel 16.

All lifting operations will take place within the cranes wind operating limits.

2.10 Operational and Emergency Procedures

All work vessels are to have compliant Safety Management Systems, featuring procedures for all onboard operations, as well as emergency procedures for the following:

- Man Overboard
- Fire
- Collision / Grounding
- Flooding
- Abandon Ship
- Fuel / Oil Spill
- Injury on board

All work vessels are to have firefighting equipment, first aid equipment and emergency spill kits applicable to the relevant vessel survey requirements available.

B. OPERATIONAL PHASE

3.0 Port description

3.1 General

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. The port is managed by PENINSULA PORTS and operated by PENINSULA PORTS; the wharf is approximately 300m metres in length and is connected to shore via a short jetty and 230m long rock causeway.

The seawater depth for the jetty berthing box is approximately 13.6m (*confirm against Jacobs document*) and drops to 20 m at 500m offshore which then continues to slowly increase to a depth of 27m.

3.2 Pilotage area

The pilotage area is described as Waters bounded by an imaginary semi-circle line drawn (see *overleaf drawing*):

- starting at 34° 14.607' S 136° 16.177' E on the Shoreline, a line drawn on bearing 050 (T) to a point at 34° 13.436' S 136° 17.844' E as a northerly border;
- then, a line extending in an arc from 34° 13.436' S 136° 17.844' E with a radius of 2 nautical miles centered on the end of the jetty at 34° 15.090' S 136° 16.480' E extending southwards to 34° 16.980' S 136° 17.290' E;
- then, from the point at 34° 16.980' S 136° 17.290' E, draw a line on a bearing of 330 (T) to the point on the shoreline 34° 15.110' S 136° 15.974' E as a southerly border.

3.3 Port Spencer Harbour Description – DGA94 Coordinates

Commencing at a point being the intersection of the median high-water mark with a straight line connecting a point defined by Latitude 34.2435400 degrees south and Longitude 136.2696767 degrees east with a point defined by Latitude 34.2239333 degrees south and Longitude 136.2974000 degrees east.

Thence in a north easterly direction to the second point defined.

Thence following an arc with a radius of 2 nautical miles (3704.1 metres) from the end of the jetty at 34.2515000 degrees south and longitude 136.2746667 degrees east in a generally south easterly, southerly and south westerly to a point defined by latitude 34.2830000 degrees south and longitude 139.2881667 degrees east.

Thence in a straight line on a bearing of 330 degrees true to the intersection with the median high-water mark.

Thence generally northerly along the median high-water mark to the point of commencement.

PENINSULA PORTS

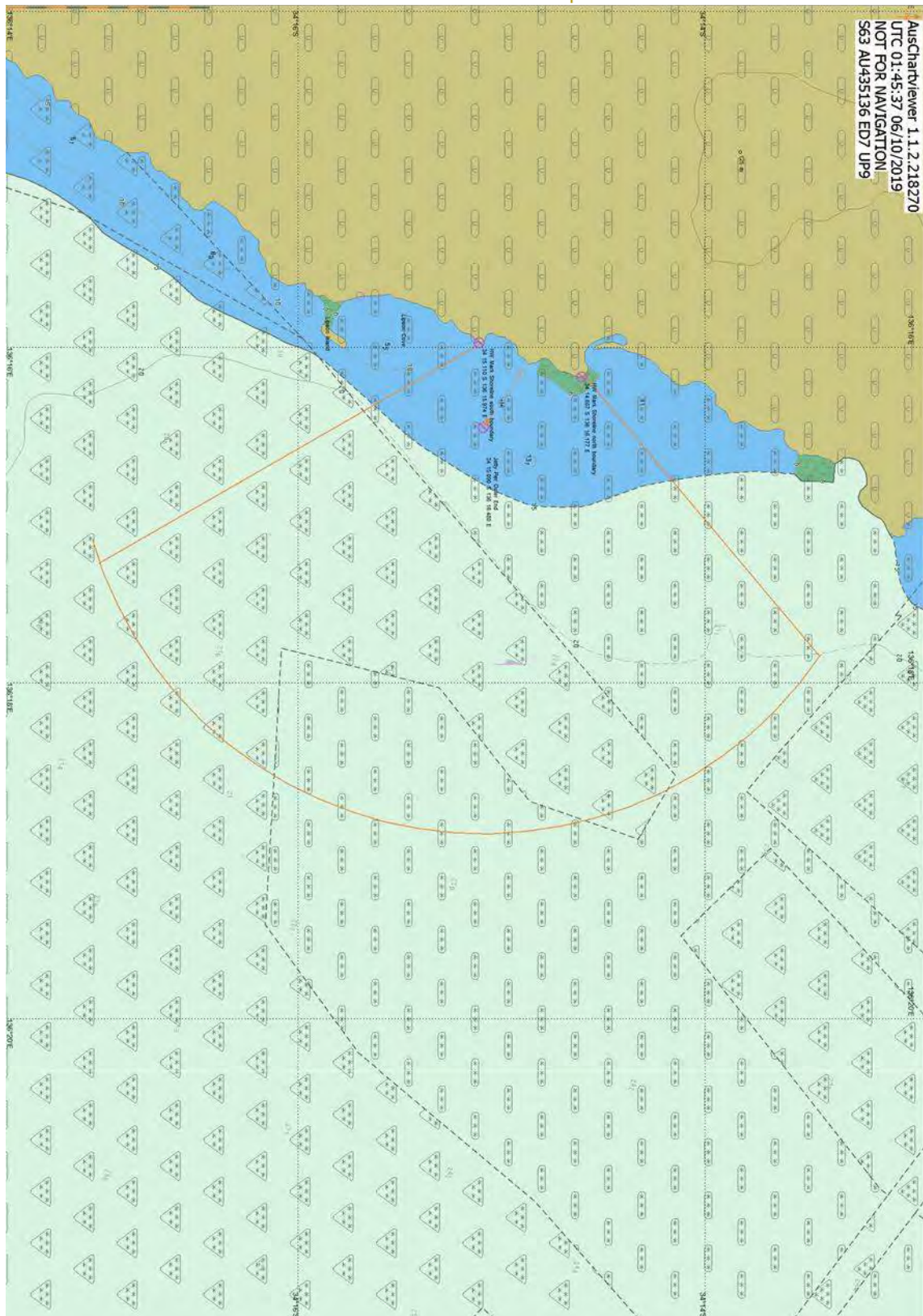


Diagram – Proposed Port Spencer Port Limits – ENC AU45136

3.4 Load lines

Port Spencer is in the Summer Zone for purposes of international load lines.

3.5 Maximum vessel size

Maximum Length overall:

- 229m with Beam of 40m (ref: *Jacobs Design Vessels 22 Aug 2019*)

Maximum berthing displacement:

- 31,000 t Maximum displacement during loading (*requires Jacobs confirmation*)
- 85,000 t Maximum displacement at departure (*requires Jacobs confirmation*)

Vessels with LOA greater than 229 metres may be considered upon written application to the Harbour Master, provided the maximum berthing displacement does not exceed that stated above. 31,000 mt.

The berth is not designed to accept vessels over 295 metres. Individual cases may require extra tugs to ensure safe berthing and is subject to Harbour Master direction.

3.6 Trim requirements

Several factors affect ship response. The following operating procedures will ensure safe and efficient use of the Port Spencer facility:

Ships should be ballasted or loaded in order to be trimmed by the stern or even keel with:

- the forward draft not less than 2% overall length; and
- the propeller fully submerged.

Ships not meeting this requirement may experience considerable delays until a solution is identified and implemented.

Ships trimmed by the head or listing may be subject to restrictions. The Manager (Pilotage Services) and Harbour Master are to be informed when bookings are made.

Ships must advise their berthing displacement, in addition to the fore and aft draught, at least 24 hours prior to arrival.

Masters should pay special attention to their loading/ballasting plans to ensure that their ships are suitably trimmed and able to put to sea at short notice.

3.7 Partly loaded conditions

Partly loaded ships must declare their berthing displacement in addition to the fore and aft draught at least 24 hours prior to arrival. Additionally, due to the capacity of the fender system and current tug power, the;

- Berthing displacement must not exceed that stated above, and

- Draughts should be adjusted for ships in ballast; and
- Trim by the stern is not to exceed 2.5 metres.

4.0 Port infrastructure

4.1 Berth Information

Approach depth to the berth is 14 metres and the depth alongside is 14.5 metres (*ref: Jacobs Design Vessels 22 Aug 2019*).

Note that depths are subject to change; please consult Notices to Mariners for latest information.

- The jetty (combination of rock causeway, jetty and wharf) is 604 metres in length and orientated in a 125°/305° (T) direction with six fender points 42 metres apart at the northern end/side.
- Mooring dolphins are situated 42 metres from each end of the wharf not recessed behind the quay line.
- The maximum wind speed for a vessel to remain alongside the berth is up to a steady 25 knots (*Jacob specifications may alter this limit*).
- The travelling grain loader installed, when in the horizontal position, has a 12-metre clearance above the jetty decking. When stowed it is recessed 4.6 metres from the jetty face.
- The jetty decking is approximately eight metres above datum (lowest astronomical tide). The distance from lowest astronomical tide to the horizontal boom is 20.7 metres.
- Maximum outreach to the centre of the telescopic chute is 17.48 metres and the average net loading rate is 2,000 tonnes per hour.

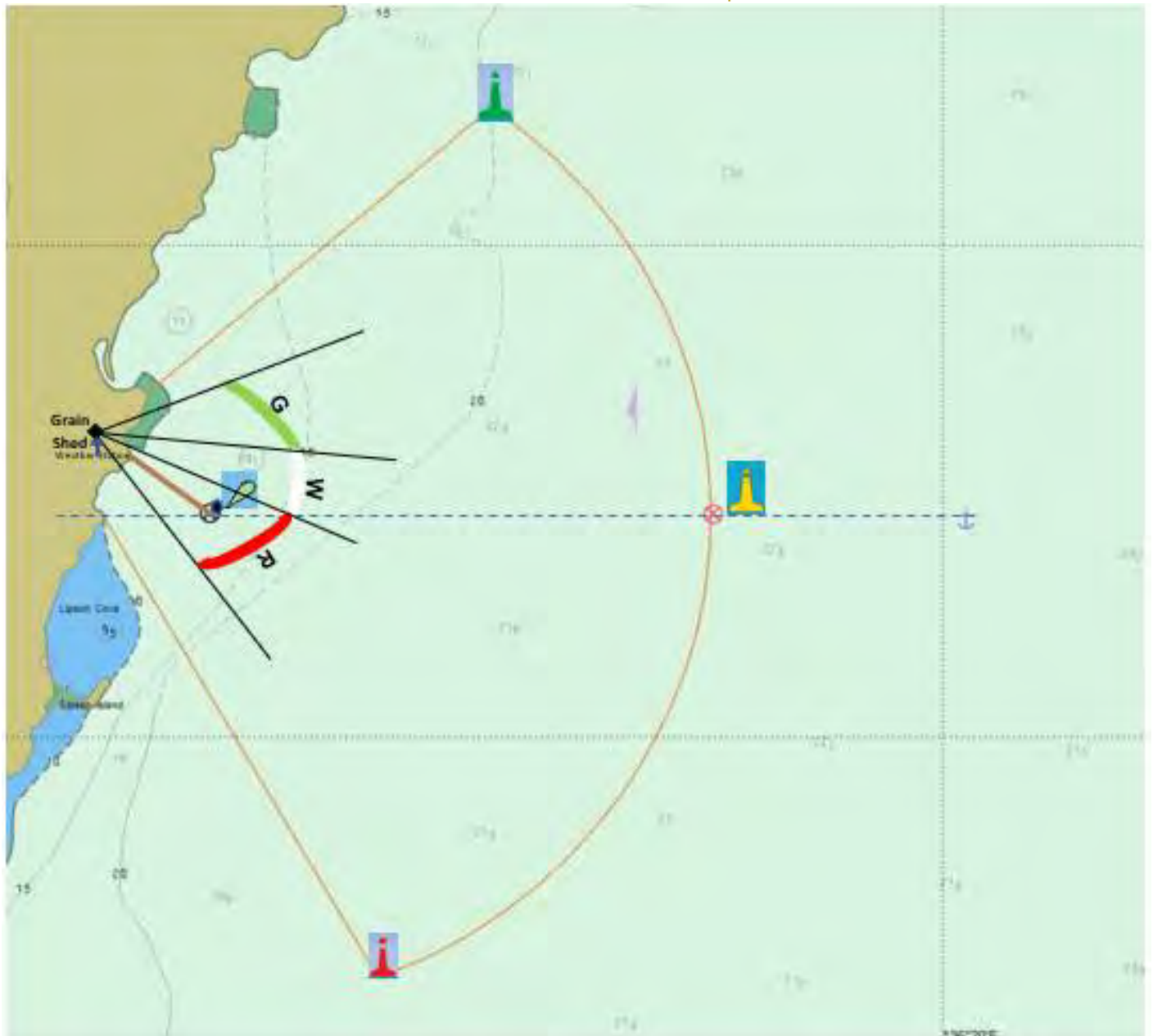
4.2 Navigation aids

For notification of navigation light defects refer to Notices to Mariners.

Aside from the sector light, all AtoN proposed to be virtual AIS AtoN:

<https://www.amsa.gov.au/safety-navigation/navigation-systems/visual-and-electronic-navigation-tools>

PORTS



4.3 Anchorage area

Vessels should anchor at least one nautical mile due east of the pilot boarding ground in approximately 20 metres of water depth. Ships are to anchor outside the pilotage area where safe to do so. Upon anchoring, ships are to advise Port Spencer VTS of their anchoring time and position.

All ships at anchor must maintain a continuous anchor watch and report if vessel is observed to be dragging anchor. Ships at anchor are to maintain a continuous listening watch on VHF channels 16 and 12.

5.0 Frequency of vessel movements inbound/outbound for port

It is estimated that 25 vessels will visit the port per year – approximately one every 18 days. With a loading rate of 2,000 tonnes per hour, a Panamax size vessel will be loaded within two days (24-hour operation).

6.0 Time zone

- UTC + 9:30 hours from April to October (Australian Central Standard Time)
- UTC + 10:30 hours from October to April (Australian Central Daylight Time)

7.0 Working hours

Port Spencer is a private port and arrivals and departures will dictate the operating hours for the port.

8.0 Charts and books

For navigation in pilotage areas, masters should refer to the nautical charts produced by the Australian Hydrographic Office and Admiralty Sailing Directions NP15 (Australian Pilot Volume III/V). Relevant charts of the area include:

- AUS 139 Plans in South Australia
- AUS 485 Spencer Gulf and Gulf St Vincent

9.0 Differential Global Positioning System (DGPS) Service

AMSA will discontinue its DGPS service on 1 July 2020 as the accuracy of GPS exceeds the accuracy provided by AMSA's DGPS service.

The Australian Maritime Safety Authority provides a network of DGPS radio beacons that improve the accuracy and integrity of the Global Positioning System (GPS) in critical areas of Australia's coastline.

A network of 16 stations are remotely controlled and monitored 24 hours a day.

10.0 Shipping announcements

A. Notices to Mariners

Maritime Safety South Australia circulates marine safety information to mariners, organisations and other interested parties, in the form of Notices to Mariners. The Notices to Mariners for South Australia are posted on the website:

https://www.dpti.sa.gov.au/latest_news/notice_to_mariners

Notices to Mariners and Advices to Mariners advise of:

- navigation warnings and hazards (such as aids to navigation which may have been destroyed, missing or unlit);
- changes to the uniform buoyage system (which assists with the correction and updating of marine charts);
- navigation depths (necessary when navigating in channels with depth restrictions); and
- any other works which may affect the safe navigation of vessels in South Australia coastal waters and ports (such as dredging operations and construction works).

11.0 Arrival and departure procedures

11.1 General

For a quick reference of what and when to report, please consult the tables below.

Masters of vessels arriving at, staying in or departing from the port are obliged to make previous notification on a variety of subjects, ranging from health to immigration to dangerous goods. This section lists all the requirements for notifying the port authorities.

11.2 Arrival check list

When	Who	What
96 hours before arrival	Master/owner	Customs notification
Not more than 96 hours or less than 12 hours before arrival	Master/owner	Quarantine notification
48 hours before arrival	Master/owner	Arrival Notification to Port Spencer Harbour Master
24 and 12 hours before arrival	Master	Arrival information update to Port Spencer VTS
2 hours before arrival	Master	VHF notification to Port Spencer VTS
2 hours before arrival	Peninsular Ports	All arrival preparations complete including pilotage and mooring arrangements

Table 1 — Arrival check list

11.3 Departure check list

When	Who	What
12 hours before departure	Master/owner	Confirm Departure information to Harbour Master
2 hours before Departure	Master/owner	Update Port Spencer VTS
2 hours before Departure	Peninsular Ports	All departure preparations complete, including pilotage and mooring arrangements
On completion of loading	Master/owner	Call Port Spencer VTS to inform that loading is complete and to confirm the departure drafts

Table 2 — Departure check list

All agents must lodge arrival reports by email to the VTS, at least 48 hours prior to the movement as required under *Harbors and Navigation Regulation 2009*. Request for the supply of a pilot, tugs and linesmen must also be made via the email notification

All agents must lodge departure reports by email to the VTS, at least 24 hours prior to the movement as required under *Harbors and Navigation Regulation 2009*.

Request for the supply of a pilot, tugs and linesmen must also be made via the online booking facility.

11.4 Ballast water information

Ships with ballast water from ports that are considered a high risk for introduced marine species and that have not exchanged water ballast in mid ocean are now forbidden to discharge this ballast into Australian waters. Vessels that do not need to discharge ballast in Australian waters are exempt from these requirements.

The Department of Agriculture (Biosecurity) provides a Ballast Water Management summary sheet for use by Masters/Agents which can be found at the following link:

<http://www.agriculture.gov.au/biosecurity/avm/vessels/ballast/australian-ballast-water-management-requirements>

11.5 Quarantine

The Australian Department of Agriculture, Fisheries and Forestry require vessels from overseas to submit their documentation no more than 96 hours and no less than 12 hours prior to arrival:

Contact details for the Australian Quarantine and Inspection Service Adelaide:

Phone: +61

Fax: +61

Postal address: GPO Box

The *Australian Quarantine and Inspection Service* (AQIS) requires information in relation to cabotage issues where foreign registered ships have a single or continuing voyage permit to move domestic cargo between Australian Ports. All cargo moved within Australia under these arrangements is subject to Quarantine in accordance with *Section 74D of the Quarantine Act 1908* (which relates to directions to the movement of goods subject to quarantine).

11.6 Customs (Australian Border Force)

Vessels arriving from overseas must submit their documentation 96 hours prior to the nominated date of arrival. If the voyage from the last port is likely to take less than 96 hours, the following timeframes will apply –

- 72 hours or more but less than 96 hours – submit documentation 72 hours prior
- 48 hours or more but less than 72 hours – submit documentation 48 hours prior
- 24 hours or more but less than 48 hours – submit documentation 24 hours prior

11.7 Arrival/Departure Report

The notification via email to the VTS is mandatory for notification of the impending arrival and subsequent movements of a vessel.

Owners or masters who are not using an agent are required to complete an arrival/departure report and lodge it with Port Spencer VTS 48 hours before a vessel's arrival.

The report is the base document for the raising of port dues and pilotage fees. The report is to be emailed to Port Spencer VTS at: vtso@peninsulaports.com.au (to be confirmed)

11.8 Dangerous goods

Dangerous goods must not be brought into or handled in the pilotage area until notification has been sent to the Harbour Master in the approved form at least 48 hours prior to arrival in port limits.

11.9 MASTREP

Participation in the Modernised Australian Ship Tracking and Reporting System (MASTREP) is designed to contribute to safety of life at sea and is operated by the Australian Maritime Safety Authority (AMSA) through the Rescue Coordination Centre (RCC) Australia in Canberra.

Participation in MASTREP is mandatory for certain vessels but others are encouraged to participate.

The Commonwealth of Australia *Navigation Act 2012* and Marine Orders Part 63 makes the provision of Position Reports mandatory for certain vessels, the following vessels must report to MASTREP:

- Foreign from the arrival at its first port in Australia until its departure from its final report in Australia; and Section 11.
- All regulated Australian vessel whilst in the MASTREP area.

Domestic commercial vessels fitted with Global Maritime Distress and Safety System (GMDSS) and AIS technology are also encouraged to participate in the system as MASTREP assists AMSA in carrying out SAR activities.

To assist Master /Agents, the MASTREP and Australian Mandatory Reporting Guide can be found on the AMSA website.

11.10 Security

All commercial vessels with a gross tonnage of 500 tonnes or more and passenger ships are required to report their security information to Peninsula Ports.

12.0 Movement notification and traffic procedures

12.1 General

Maritime Safety South Australia, through the authority of the Harbour Master, has jurisdiction over the safe movement of all shipping within the pilotage area.

The scheduling of ship movements is initiated by the agent submitting movement details for a vessel to the Harbour Master's office email in accordance with this section.

12.2 Vessel Traffic Service (VTS)

Vessel traffic service is the principal tool by which the Harbour Master manages the safe and efficient movement of vessel traffic approaching, departing and operating within the Port Spencer pilotage area.

VTS is delivered from the VTS centre at Port Spencer and is manned by trained and qualified vessel traffic service operators, under the management of the Marine Superintendent, PP Site Manager.

12.2.1 VTS role

Port Spencer VTS does not maintain a delineated formally declared VTS area pursuant to IMO Resolution A.857(20) for Port Spencer, however Port Spencer VTS will:

- interact with vessel traffic by VHF radio;
- interact with port services (tugs, pilots, loadmaster lines crew etc);
- inform participating vessels of current traffic and safety information pertaining to the pilotage area;
- communicate the directions of the Harbour Master or delegate;
- monitor compliance with the *Harbors and Navigation Act (2003)* and *Harbors and Navigation Regulation 2009*;
- record the details of shipping movements in the online portal inside the 24-hour lockout period;

- maintain a situational awareness of traffic in the pilotage area to the extent of the available information;
- participate in emergency procedures.

12.2.2 Port VHF communications

Ships intending to navigate within the pilotage area must establish two-way communications with Port Spencer VTS on marine VHF channel 16 or VHF channel 12. The designated port VHF channel is to be used for the communication of all routine operational and safety information.

VHF channel	Call sign	Service
VHF channel 16	Port Spencer pilots or Port Spencer VTS	Initial calling & Emergencies
VHF channel 6	Port User	Pilot and tugs
VHF channel 12	Port Spencer VTS	Pilot and tugs

Table 3 - Port VHF communications

12.2.3 Language

The English language is to be used in all communication. International Maritime Organization's Standard Marine Communication Phrases (SMCP) 2001 will be used.

12.2.4 Logging of voice communications

All voice communications with the VTS Centre and all radio communications on the channels monitored, are logged and kept for at least seven years thereafter. recorded against a date and time stamp.

12.2.5 Harbour contact details

Organisation	Telephone	Alternate	Email
Port Spencer VTS	1	VHF channel16/12	
Port Superintendent	+61		
Port Spencer Grain Terminal	+61		
Harbour Master	+61		
VTSO	+61	Fax: +61	

Table 4 — Harbour contact details

12.3 Prior notification of movements

Action	Minimum notice	Approved form
Prior notification of movement in	48 Hours prior to entry	Notification via email to VTSO
	24 hours prior to removal or departure	
Transport of dangerous goods in pilotage area	48 hours prior to entry	Dangerous cargo report
	Three hours prior to departure	

Table 5 — Prior notification of movements

12.4 Booking a vessel movement

When agents are advised by their principals that a ship is bound for Port Spencer then that agent shall book-in the ship arrival via email at least 48 hours prior to the movement as required under *Harbors and Navigation Regulation 2009*. Request for the supply of a pilot, tugs and linesmen may also be made via the same email notification.

The use of email notification is mandatory for the impending arrival and subsequent movements of a vessel unless exceptional circumstances preclude this.

Details of the departure movement shall be submitted at least 24 hours prior to the start time in a similar manner to the above.

Arrival advice shall be confirmed to the Marine Superintendent, Site Manager 24 hours prior to the start of the movement.

12.5 Reporting defects

The *Harbors and Navigation Regulation 2009* requires the master of a ship that is;

- underway and entering, or about to enter a pilotage area; or
- navigating a ship from a berth or anchorage

must report to the area VTS by VHF radio details of damage to, defects and deficiencies in, the ship that could affect the safety of the ship, a person or the environment;

- VTS will notify the harbour master and AMSA of the damage to, defects and deficiencies.
- In addition, Australian Maritime Safety Authority (AMSA) requires notification of any deficiencies or suspected deficiencies on ships visiting Australian ports.
- AMSA 18 – incident alert
- AMSA 19 – incident report
- AMSA 355 - Report of suspected non-compliance with Navigation Act or safety/pollution conventions

12.6 Movement scheduling

12.6.1 Schedule changes

Changes requested by the master/agent to scheduled movements must be made via email to the VTSO as soon as practicable after learning of such change. Changes within 24 hours of the scheduled start time must be communicated to VTS by phone.

12.6.2 Pilotage delays

A delay fee is payable if the programmed ship movement is delayed by more than 30 minutes but not more than one hour for the first hour. If the ship is delayed for more than one hour but not more than two hours, then for each of the first two hours; a delay in excess of two hours constitutes a cancellation. And thereby a fee for the cancelled service – fatigue issues become a concern if there is only one pilot.

12.7 Anchoring

Ships are to anchor outside the pilotage area where safe to do so, at least 3 nm from the end of the jetty, East, in an area named “mooring grounds”. Upon anchoring, ships are to advise VTS of their anchoring time and position. Ships at anchor must maintain a continuous listening watch on VHF channel 16. All ships at anchor must maintain a continuous anchor watch and report if the vessel is observed to be dragging anchor.

Ships are not permitted to immobilise engines at anchor without the written approval of the Harbour Master

12.8 Arrival reporting requirements

The master of a ship entering, or about to enter the pilotage area must report to Port Spencer VTS by VHF radio according to the following table:

	Report	Information to report
1	Ship master to Port Spencer VTS Two hours prior to entry into the pilotage area	Ship's name, position, ship's fore and aft draught, changes to ship details, defects, estimated time of arrival to pilot boarding ground
2	Port Spencer VTS/pilot to ship master Confirmation of pilot transfer and instructions for the ship	Instructions will include, boarding side, course, speed, estimated time of arrival and anticipated conditions
3a	Ship master to Port Spencer VTS On anchoring	Ship's name and anchor position
3b	Ship master to Port Spencer VTS Departing anchorage	Ship's name, anchor aweigh time

4	Pilot to Port Spencer VTS Pilot transfer (when the pilot transfer has been completed)	Ship's name, pilot onboard, pilot onboard time, pilot name, ship's fore and aft draught, changes to ship details
5	Pilot to Port Spencer VTS Vessel secure alongside	Time of first line and when secured alongside, berth and direction.

Table 6 — Arrival reporting requirements

12.9 Departure and removal reporting requirements

Masters of all vessels are to call VTS 3 hours prior to ETD to confirm readiness to depart with final sailing draughts.

The master of a ship that is departing or moving within the pilotage area must report to Port Spencer VTS by radio according to the following table:

Report		Information to report
1	Ship Master to Port Spencer VTS	Call VTS 3 hours prior to ETD to confirm readiness to depart with final sailing draughts
2	Ship master to Port Spencer VTS—clearance prior to movement	Ship's name, radio check, destination port/anchorage, ship's fore and aft draught, changes to ship details
3	Pilot to Port Spencer VTS Pilot onboard and ship ready to depart	Ships name, pilot onboard time, pilot name, fore and aft draught, changes to scheduled movements
4	Pilot to Port Spencer VTS	Time Last line
5	Ship master to Port Spencer VTS	Ships name, pilot disembarked, pilot off time

Table 7 — Reporting requirements

12.10 Access to Harbour Master

For ordinary business, and issues arising in relation to ship scheduling, agents are to contact the Port Spencer VTS Centre (Peninsula Ports Building). Agents continue to have full access to the Harbour Master on any subject should circumstances warrant, however outside normal working hours this should be restricted to emergencies.

13.0 Weather information

13.1 General

The SSE winds may blow strongly at times, making it difficult to berth. In these conditions it is prudent for the pilot, ship's master, tug masters and berth operator to liaise in order to determine whether berthing should be attempted.

Further operational limitations to be verified by SmartShip simulation on final wharf design

Weather conditions do not normally affect departures, however, a current of 0.5 knots running against the berthing location makes mooring difficult when associated with a large swell.

The Harbour Master, pilot and berth operator will jointly decide when it is not safe for a ship to be alongside.

13.2 Severe Weather Event

In the event of an extreme weather event threat the Harbour Master will take the following action:

- restrict the movement of vessels if necessary
- direct and oversee the evacuation of the port or specific areas of the port or other affected areas if applicable
- close and reopen the port if necessary.

The Harbour Master will also:

- advise mariners of relevant warnings and response requirement
- seek compliance with the response requirements.

These actions will be enacted over four distinct phases that allows for the development of appropriate responses to the threats faced.

13.2.1 Phase 1: Extreme weather event - Prevention.

An extreme weather event watch will be issued when an extreme weather event or developing event is likely to affect the area within 48 hours, but not expected to impact the area within 24 hours. This phase is a critical time for masters and owners to plan and prepare for the impact of the event.

13.2.2 Phase 2: extreme weather event – Preparedness.

An extreme weather event warning will be issued when an extreme weather event or developing event is likely to affect the area within 24 hours. This phase is critical for masters and owners to

complete all preparations in an orderly manner prior to the event occurring.

13.2.3 Phase 3: Actual extreme weather event – Response

By this phase, all vessels are expected to have enacted their vessel safety plans noting that the port may be closed and/or vessel movements restricted depending on the threat to safety of vessel movements or the environment. Mariners should note that it is likely to be too late to consider the safety of your vessel and that extreme weather conditions may limit the ability of emergency services to assist you should you run into difficulties. Your actions should be directed towards your own personnel safety.

If the port is closed, no vessel movements are expected.

13.2.4 Phase 4: After the extreme weather event has passed – Recovery

The Harbour Master will assess residual risks and determine the actions needed to be addressed. Do not assume that as the extreme weather event has passed, and it is now safe to move your vessel.

Vessels are not to leave their severe storm moorings until the official all clear is given by the Harbour Master.

Mariners should maintain a listening watch on the key VHF channels 16, 12, 11 and 6

Owners and masters of vessels should be aware that aids to navigation may be affected by the extreme weather event.

Owners and masters should reference notices to Mariners for the latest updates.

Furthermore, port infrastructure will need to be inspected to ensure that facilities are fit for purpose.

13.2.5 Port closure

The Harbour Master may close the port, wholly or in part, or restrict the movement of vessels in the pilotage area, depending on the threat to the safety of shipping or the environment. This can occur at any time prior to the event.

The closure of the port or restriction on vessel movements will, as far as practical, be implemented in consultation with key authorities and in a timely manner in order to minimise risks.

13.2.6 Reopening of the port

The pilotage area will not be re-opened until the Harbour Master is satisfied that all danger has passed, and the pilotage area is safe for vessels to re-enter and following inspections and surveys to critical maritime infrastructure (for example navigational aids, jetties) as well as clearance of navigational hazards.

The Vessel Traffic Services Centre will coordinate the safe movement of vessels following the opening of the pilotage area in accordance with normal practice.

Berths will be re-opened, and operations resumed when wind and sea conditions are within operational limits.

13.2.7 Communication

The successful implementation of this plan relies on high quality communication of information and directions.

The Vessel Traffic Services Centre will implement the *extreme weather event contingency plan* on behalf of the Harbour Master by acting as the central communications point for the duration and aftermath of the extreme weather event.

The Vessel Maritime Control Centre call sign is *Port Spencer VTS*.

VHF channels 16, 12, 13 and 14 will be continuously monitored before and during the extreme weather event. Extreme weather watches, warnings and any directions will be issued on these channels.

If the plan requires for actions such as port evacuation or closure will be coordinated by the Peninsula Ports VTS

Key Contacts are listed below:

Contact	Telephone
Harbour Master -	+61
Port Spencer VTS	+61
Water Police	+61
Peninsula Ports	+61

Table 8 – Key Contacts

13.3 Tidal information

Predicted tide heights are available from the Bureau of Meteorology website.

<http://www.bom.gov.au/australia/tides/#!/sa-tumby-bay>

Currents at the berth are made of tidal and wind generated components; the tidal component will dominate under normal conditions.

Port Spencer is NOT a standard port in the Tide Tables. The closest tide location is for Tumby Bay, located approximately 10km south of Lipson Island.

The tidal times and height predictions for standard South Australia ports are available in the South Australia Tide Tables.

Tidal stream predictions for standard South Australia ports are available upon request through the Harbour Master's office.

14.0 Port navigation and movement restrictions

14.1 Under keel clearance (UKC)

The depth alongside at datum is 14.5. metres; there are no dredged channels or swing basin leading to the berthing box.

Vessels must maintain a minimum UKC of 10% of the draught at all times alongside.
The draught on sailing must allow for an Under-Keel Clearance (UKC) of 10% of deepest draught.

Maximum departure draught = (approach depth + tide) divided by 1.06

14.2 Approaches to pilot boarding ground (AUS 259)

There are no known dangers and there is good holding everywhere between the berth and the anchoring area. Ships waiting for pilots should anchor 1 nautical mile E of the jetty on the line of the Port Spencer Point leads in the vicinity of position 34° 15.320'S, 136° 19.910'E.

14.3 Berthing requirements

Pilot and port operator will liaise on conditions (for example, weather and tide) and other factors of safety prior to berthing;

- Ships will berth starboard side to alongside facing the Spencer Gulf at the jetty.
- Two 60 TBP ASD tugs will be used for swinging the vessel and berthing.
- Ships should ensure that engines are ready and fully operational, that mooring lines with heaving lines are ready for use, and that anchors are cleared and ready.
- Cranes and derricks are to be stowed and lashed to provide clear vision forward of the bridge wings and wheelhouse.
- Gangways are not to be broken out until the ship is moored alongside.
- Discharge outlets in the vicinity of tug lashing points are not to be used unless absolutely essential to berthing operations.
- During periods of unsuitable wind and sea conditions, further restrictions may be imposed in the interests of safety.

14.3.1 Position at berth

Ship position at the berth should enable loading of all hatches of the ship (unless agreed otherwise by the terminal operator and Harbour Master)):

- ship position at the berth should limit overhang past the outermost fenders in contact with the

ship to less than 25% of the ship's LOA;

- ship position at the berth must achieve acceptable angular contact with fender frames, particularly those in contact with the flare of the ship's stern and bow;
- ship's crew must not allow mooring lines to slacken (due to tidal range and loading rate, moorings can become slack allowing the ship to shift out of position);
- at all times that a ship is alongside, the number of tugs required for departure will remain on standby within the port limits or be released as prevailing and predicted weather circumstances dictate.

14.3.2 Guidelines for berthing and departing of vessels

Due to the unprotected nature of the berth and the working limitations of the tugs following guidelines shall be adhered to:

1. Prior to commencing a berthing or departure manoeuvre the Pilot shall conduct a risk assessment and, in the process, if wind speed and swell are deemed to exceed safe working limits a vessel shall not proceed with the berthing or departure manoeuvre.

In general, the safe working conditions for the existing tugs are steady wind speeds not exceeding 20 knots and/or gusting 25 knots, as determined by simulation modelling and may be amended in future. In exceptional circumstances it may be necessary for a departure manoeuvre to be considered in conditions exceeding those described above. The departure may proceed provided a comprehensive risk assessment process has deemed it safe and practical.

2. When a strong wind warning has been forecast for the area and a vessel is expected to be alongside during that period, generally a vessel shall not berth. If the wind and swell have not exceeded safe working limits of the terminal, the Master and Bulk Terminal may, after conducting a risk assessment decide to berth a vessel. The following considerations must form part of the risk assessment process leading up to the decision.
 - The vessel may not depart with one tug if wind and swell exceed safe working limits.
 - The availability of a 2nd tug on standby to assist if the vessel is required to depart.
 - The maximum wind limitation imposed by Bulk Grain Terminal for a vessel to remain at the berth is steady winds speed 25 knots.
3. If a vessel is already alongside and a strong wind warning is forecast for the area, the Master and Bulk Grain Terminal must make arrangements for the vessel to depart the berth prior to wind speed and swell exceeding the safe working limits of the terminal. The Master and Bulk Grain Terminal may conduct a risk assessment and decide to let the vessel remain at the berth.
4. The Master must consider the unprotected nature of the berth in deciding the quantity of ballast to retain on board during berthing and loading to ensure safety of vessel and berth at all times.
5. During the entire duration of ship's stay alongside, 2 tugs with adequate bollard pull to assist

and/or sail the vessel in emergency standby within port limits.

The tugs shall always remain contactable on VHF channel 16 .

15.0 Pilotage

15.1 General

A Port pilot must be employed for all shipping movements to and from the Port Spencer bulk grain jetty terminal.

The Port Spencer pilotage area is the area of 2 nautical mile from the end of the jetty as described by the port limits.

15.2 Pilotage

The port is open for pilotage with prior arrangement.

Pilot boarding is restricted by the ability of the pilot vessel to safely transport a pilot across to the Bulk Carrier vessel. VTS in conjunction with Pilotage services will provide tidal windows for Pilot on Board (POB) times on request by shipping agents.

15.2.1 Request for pilot

Port Spencer provides a pilotage service for ship arrivals, under contractual arrangements with Peninsula Ports as Port Operator. All pilot transfers are carried out by pilot launch utilizing the Multi-Purpose Vessel or available tugs.

15.2.2 Notice required

Ships requiring the services of a pilot are required to submit arrival, removal and departure notices no less than 48 hours prior to the desired movement.

Updates to the pilot boarding time should be sent at 12 hours and six hours prior to arrival.

15.3 Pilot boarding place

Boarding position: Latitude 34° 15.306'S, Longitude 136° 18.714'E approximately 1.0 nautical miles from the berth (34° 15.090'S, Longitude 136° 16.480'E).

15.3.1 Pilot Transfers

Pilot transfer instructions will be given by Port Spencer VTS to the ship prior to pilot boarding. The instructions shall include:

- Pilot boarding time
- Restrictions/Requirements (by the Harbour Master)

Boarding and disembarkation is generally undertaken with the ship underway proceeding at a Safe speed and providing a good lee. The Pilot vessel may contact the ship directly with instructions to assist safe transfer, if required.

The Pilot ladder must be rigged in accordance with International Regulations,

- 1.5 metres above the water, and
- with two Man ropes, and
- a heaving line standing by, and
- At night, a forward-facing light is required to illuminate the ladder in accordance with IMO requirements and IMPA recommendations;
- If the ship has freeboard of 9 metres or greater, a combination ladder must be rigged.

15.4 Passage planning – bridge resource management (BRM)

The master and pilot should exchange information regarding navigational procedures, local conditions and rules and the ship's characteristics. This information should be a continuous process that generally continues for the duration of the pilotage.

The proposed manoeuvre should be well discussed with the master and any doubts/queries he/she may have should be resolved prior to commencement of pilotage. The exchange of information should include at least:

- The presentation of a completed standard pilot card (by ship). In addition, information should be provided on rate of turn at different speeds, turning circles, stopping distances and, if available other appropriate data.
- General agreement on plans and procedures including contingency plans for the anticipated passage (Pilotage – Port Spencer passage plan)
- Discussion of any special conditions such as weather, depth of water, tidal currents and marine traffic that may be expected during the passage.
- Discussion of any unusual ship-handling characteristics, machinery difficulties, navigational equipment problems or crew limitations that could affect the operation, handling or safe manoeuvring of the ship.
- Information on berthing arrangements; use, characteristics and numbers of tugs and other external facilities.
- Information on mooring arrangements.
- Confirmation of the language to be used on the bridge (normally English) and with external parties.

Any passage plan is a basic indication of preferred intention and both pilot and Master should be prepared to depart from it when circumstances so dictate.

15.5 Master/pilot responsibilities

Masters and owners of vessels are responsible for due compliance with the provisions of the *Harbors and Navigation Act (2003) & Regulations (2009)*.

When a vessel is under the direction of a pilot, the pilot is responsible for due compliance with the provisions of the *Act and Regulation*, however the responsibility of the pilot does not relieve the master and the owner of a vessel of their responsibility. Arising from these responsibilities is the obligation of persons directing the navigation of vessels to comply with directions of the Harbour Master.

15.6 Fatigue management

Professional pilotage services are maintained for the port. The service is on an **'on-demand'** basis. A pilot fatigue management plan is followed to ensure that adequately rested pilots are assigned to ships.

15.7 Alcohol consumption

The Harbors and Navigation Act (2003) stipulates that persons in charge of ships have a zero-blood alcohol level reading. The Water Police may periodically conduct random breath tests of masters and pilots on ships arriving at Port Spencer, or about to depart; severe penalties apply to infringements.

15.8 Pilotage delays

A delay fee is payable if the programmed ship movement is delayed for more than 30 minutes but not more than one hour for the first hour. If the ship is delayed for more than one hour but not more than two hours, then for each of the first two hours; a delay in excess of two hours constitutes a cancellation.

16.0 Tug procedures

16.1 General

All Port Spencer visiting ships will require two tugs for berthing and unberthing.

Towage services are provided by Port Lincoln Tugs (*to be confirmed*); their base of operation being in Port Lincoln, and servicing Port Spencer on an *ad-hoc* basis.

16.2 Vessel Particulars

	Bollard pull	H.P.	Steering system
Name TBA	60t	3600	Azimuth Screw Directional propellers
Name TBA	60t	3650	Azimuth Screw Directional propellers

Table 9 – Tug details

Company Name	
Company	
Physical	
Phone:	
Email	

Table 10 — Tug company contact information

16.3 Notification of Tugs

Generally, the vessel's agent will requisition tug services via the Tug office at Port Lincoln; amendments to booking times should be made by phone to the booking office by the ship's agent.

The operations email address is monitored from 0800 to 1800 daily.

16.4 Communicating with tugs

Port Spencer tugs call up on VHF channel 16 and use VHF channels 6 and 12 for communicating with ships during berthing operations.

16.5 Tug availability during vessel's stay in port

During the entire duration of ship's stay alongside, 2 tugs with adequate bollard pull to assist and/or sail the vessel in emergency will remain within port limits. The tugs shall always remain contactable on VHF channel 16.

17.0 Work permits

17.1 General

In order to be able to perform certain work on ships in the port masters, owners or their agents must first apply for and obtain the necessary permits before that work can proceed:

- Immobilising main engine/s — the immobilisation of ship's engines whilst alongside the Port Spencer berth or whilst at anchor within port limits is not permitted by the Harbour Master.
- Repair and maintenance work — due to the exposed nature of the berth, routine engine repairs and maintenance are not permitted. Where special circumstances create a necessity for hot work to be carried out, the master must submit a written application to Port Spencer Bulk Grain prior to any work being carried out.
- Lifeboat drills — the agent is required to notify the Harbour Master and Australian Customs Service (Australian Border Force) prior to any boat being lowered into the water.

18.0 Dangerous cargo

18.1 General

Although not envisaged, the port authority, Peninsula Ports, is responsible for the management of dangerous cargo in port, including the loading and unloading of ships alongside and movement across the jetty.

The Harbour Master will assist the port authority in controlling traffic movement in the port, maintaining on-water safety distances, and responding to any emergency situation.

Maritime Safety and other relevant authorities operate under the codes and guidelines of:

- International Maritime Organisation — IMDG Code
- International Chamber of Shipping Oil Companies, International Marine Forum
- Society of International Gas Tankers and Terminals (ISGOTT)
- Australian Maritime Safety Authority — Australian annex to the IMDG Code – Marine Orders Part 41
- AAPMA — Dangerous Substances Guidelines.

18.2 Dangerous cargo events

A dangerous cargo event is defined as the loss, or likely loss, of the cargo from a ship into South Australian waters; the report should contain the following information:

- correct technical name or names of goods
- UN number or numbers
- IMO hazard class or classes
- names of manufacturers of goods when known, or consignee or consignor
- types of packages including identification marks. Specify whether portable tank or tank vehicle, or whether vehicle or freight container or other cargo transport unit containing packages. Include official registration marks and numbers assigned to the unit
- an estimate of the quantity and likely condition of the goods
- whether lost goods floated or sank
- whether loss is continuing
- cause of loss

- a breach, or danger of a breach, of the containment of the cargo that could endanger marine safety
- anything else involving, or that could involve, the cargo that causes risk of explosion, fire, a person's death, or grievous bodily harm of a person
- for a cargo that is a material hazardous only in bulk (MHB) – an event that causes risk of explosion, fire, a person's death, or grievous bodily harm to a person.

The master and/or the person-in-charge of a place where a dangerous cargo event has occurred is required to report the event immediately to the VTS centre or relevant authority.

A full written report is to be submitted on the Dangerous Cargo Event Report – Form F3220 to the Harbour Master as soon as reasonably practical.

19.0 Emergency, pollution, marine incidents

19.1 General

The aim of this section is to alert the port community for an initial response in the event of dangerous incidents, emergencies, terrorist acts and disasters.

All marine incidents report regardless of the regulatory agency must be reported to the Harbour Master/VTSO.

Initial reports should be conveyed through to Port Spencer VTS:

Telephone: +61
VHF channel: 12 or 16

Written reports must be submitted within the relevant timeframes as specified in the respective regulations in the appropriate format to:

Harbour Master
Email:

Port Spencer Emergency Response Plan and ANNEX 1 – First Strike Response Plan are the applicable documents outlining the appropriate responses.

19.2 Authorities

The Marine Operations Group of Transport SA is responsible for the management of the National Plan in South Australia and for ensuring that State plans are maintained to deal with oil spills wherever they occur in State waters.

PENINSULA PORTS has published an emergency response plan for Port Spencer which details the required response to an emergency within the port. All emergencies should be reported to Port Spencer VTS on VHF channel 16 or 12, who will activate the emergency response plan and by calling the appropriate emergency response service fire/police/ambulance on 000.

19.3 Fire

Call the South Australia Fire and Rescue Service and notify Port Spencer VTS on VHF 16 or 12.

South Australia Fire and Rescue Service is the lead agency when the ship is at the berth and Maritime Safety South Australia when the ship is off the berth. The Harbour Master, in consultation with PENINSULA PORTS, will make the decision if the vessel is to be removed from the berth for the safety of the port.

There are fire hydrants and hose reels that are located at the berth fed by saltwater pumps. The tugs are equipped with firefighting equipment.

19.4 Marine pollution

The *Protection of Marine Waters (Prevention of Pollution from Ships) Regulations (2013)* is designed to protect South Australia's marine and coastal environment by minimising deliberate and negligent discharges of ship-sourced pollution.

Discharges of oil, noxious liquid substances, packaged harmful substances, sewage and garbage (MARPOL Annexes I, II, III, IV and V) from ships are prohibited in South Australia coastal waters and pilotage areas.

Maritime Safety South Australia has the authority to detain any vessel suspected of causing marine pollution and to intervene where there is imminent danger to the coastline. Ships should dispose of all waste ashore using the waste reception facilities available.

The Port Spencer *Ship Sourced Pollution Management Plan* contains more information on the prevention of pollution from ships.

19.4.1 Reporting a pollution incident

A prescribed incident must be notified to the State Marine Pollution Controller by means of a telephone message, a telex message, a radio message or a fax message.

The following details should be provided in a report of marine pollution to the State Pollution Controller:

1. Name and contact details (telephone, address etc) of the person requested to furnish report, being the relevant person with duty to notify of the pollution incident or discharge occurrence:
 - If ship— Master of the ship:
Where Master unable to comply, the owner, charterer, manager or operator of the ship or their agents.
2. Please tick the relevant occurrence and provide the relevant source information:
 - Pollution incident for ships

Note: Pollution incident for a ship includes damage, failure or breakdown of a ship of 15 metres in length or more that—

- (i) affects the safety of the ship, including collision, grounding, fire, explosion, structural failure, flooding and cargo shifting; or
 - (ii) results in impairment of the safety of navigation, including failure or breakdown of steering gear, propulsion plant, electrical generating systems or essential shipborne navigational aids.
- Discharge from ship

For pollution incident or discharge from ship—provide name, radio call-sign, flag of ship and type of ship (e.g. oil tanker, chemical tanker, dry cargo ship), gross tonnage and condition of ship.

- Discharge from vehicle

Provide type of vehicle and number plate.

- Discharge from apparatus (includes a pipeline, structure on land, oil rig, or any equipment used for the exploration, recovery or storage of oil) Provide type of apparatus.

3. Location of pollution incident or discharge

- If ship—latitude and longitude and also provide position, course and speed of the ship at the time of pollution incident or discharge: If vehicle or apparatus—location on water or land of the discharge, where it was reasonably likely oil or mixture would flow into State waters (latitude and longitude, if known)

4. Date and time of pollution incident or discharge (specify which time status used, e.g. UTC, CST, daylight savings)

5. Brief description of the pollution incident or discharge (what, how and why incident/discharge occurred, what damage was sustained, condition of ship/vehicle/apparatus, if any other ship/vehicle/apparatus involved etc):

6. Type and origin of discharge including the technical name (or, where the technical name is not known, the trade name), UN number, Classification in the International Maritime Dangerous Goods (IMDG) Code (where applicable), name of manufacturer, quantity and concentration, of the harmful substance discharged, or likely to be discharged

7. Volume/quantity of discharge

8. Is the discharge ongoing and/or has been contained?

9. Weather, sea and current conditions in the vicinity of the pollution incident or discharge

10. Estimated direction of discharge movement and surface area of the discharge
11. What actions have been taken since the pollution incident or discharge to contain the discharge (including any equipment that has been used)?
12. What assistance (if any) is required or has been provided?
13. Any known sensitive areas nearby (e.g. Lipson Island, power station inlets, marine parks, conservation parks, Native title or cultural significance to the Indigenous populations etc)?

19.5 Marine incidents

All vessels involved in a marine incident in Australian waters need to make a report.

Reporting involves a two-step process.

1. Submit an incident alert

As soon as reasonably practicable* after becoming aware of the incident, you must either:

- complete the incident alert form 18 and submit to AMSA online, or
- download form 18 and email the completed form to reports@amsa.gov.au

Domestic commercial vessels can provide this alert by any means such as:

- using incident alert form 18
- email reports@amsa.gov.au
- phone
- in person at your local AMSA office.

* Under *Marine Order 1 (Administration) 2013*, regulated Australian vessels and foreign vessels must submit an incident alert within 4 hours.

2. Submit an incident report

Within 72 hours after becoming aware of the incident, you must:

- complete the incident report form 19 and submit to us online, or
- download form 19 and email the completed form to reports@amsa.gov.au

All marine incidents occurring in the Port Spencer Region must be reported immediately (as soon as safe and practical) the Harbour Master through Port Spencer VTS:

Telephone: +61

VHF channel: 12 or 16.

19.6 Marine incident reporting

19.6.1 Ships under port pilotage

In addition to reporting incidents as required to AMSA, where a marine incident or a near miss occurs during the pilotage, the pilot must, in accordance with Part 11 *Harbours and Navigation Act 1993 (SA)*:

- I. As soon as practical notify Port Spencer VTS of the situation, requesting assistance as required; and
- II. Within 48 hours of the incident or near miss submit a written report to the Harbour Master providing details of the incident or near miss;
- III. Report the accident to the Chief Executive of DPTI

19.6.2 Domestic Commercial Vessels (Ships regulated under the Marine National Law Act 2012)

Under the *Marine Safety (Domestic Commercial Vessels) National Law Act 2012 (National Law)*, a *marine incident* means any of the following:

- (a) a death of, or injury to, a person associated with the operation or navigation of a domestic commercial vessel;
- (b) the loss or presumed loss of a domestic commercial vessel;
- (c) a collision of a domestic commercial vessel with another vessel;
- (d) a collision by a domestic commercial vessel with an object;
- (e) the grounding, sinking, flooding or capsizing of a domestic commercial vessel;
- (f) a fire on board a domestic commercial vessel;
- (g) a loss of stability of a domestic commercial vessel that affects the safety of the vessel;
- (h) the structural failure of a domestic commercial vessel;
- (i) a close quarters situation;
- (j) an event that results in, or could have resulted in:
 - (i) the death of, or injury to, a person on board a domestic commercial vessel; or
 - (ii) the loss of a person from a domestic commercial vessel; or
 - (iii) a domestic commercial vessel becoming disabled and requiring assistance;
- (k) the fouling or damaging by a domestic commercial vessel of:
 - (i) any pipeline or submarine cable; or
 - (ii) any aid to navigation within the meaning of the *Navigation Act 2012* of the Commonwealth;
- (l) a prescribed incident involving a domestic commercial vessel.

The *Marine Safety (Domestic Commercial Vessels) National Law Act 2012* (National Law) requires that both the owner and master of a Domestic Commercial Vessel that is involved in a marine incident, report the incident within the time frames provided for by the National Law, to the National Regulator.

As soon as possible and within 4 hours after becoming aware of the incident, you must complete and submit incident alert form 18.

You can either complete the online form below to submit an incident alert or download form 18 and email the completed form to reports@amsa.gov.au.

It is important that incidents are reported so that AMSA can analyse the occurrence and, if necessary, take steps to improve vessel safety.

19.6.3 Marine incident reporting – Australian Maritime Safety Authority

Under section 19 of the *Transport Safety Investigation Act 2003* any incident involving a ship in Australian waters including:

- breakage of gear or injury to any person during cargo work
- damage or defect to ship, machinery or equipment
- peril or a close quarters situation
- stranding or disappearance
- death, serious injury or a dangerous occurrence
- a berth.

These must be reported to the Australian Maritime Safety Authority (AMSA) using form 18 incident alert within four hours of the incident occurring. A detailed incident report must be submitted to the Australian Maritime Safety Authority, Canberra on form 19 within 72 hours of the incident occurring.

Reports are to be submitted by fax: +61 2 6230 6868 or 1800 622 153 or email: reports@amsa.gov.au

Complete details of these requirements are available on the Australian Maritime Safety Authority website.

19.6.4 Procedures subsequent to serious marine incidents

In the case of a vessel grounding or if structural damage has occurred, the vessel is to be removed to a position of safety. Immediate advice from the Harbour Master and the manager (pilotage services) should be sought in this instance.

The vessel is to be surveyed by the appropriate authority (Australian Maritime Safety Authority or classification society) to ensure the seaworthiness of the vessel before it leaves port limits.

19.6.5 Port community responsibilities

As a responsible member of the maritime community, any person witnessing an incident which was/or is capable of becoming an emergency is obliged to report the matter to the Harbour Master's office and/or the emergency response agencies of police, fire or ambulance.

The Australian Maritime Safety Authority requests pilots, stevedores, Peninsula Ports officers and others to notify them of suspected deficiencies on ships.

20.0 Port state control inspections

Australian Maritime Safety Authority (AMSA) conducts Port State Control (PSC) inspections to ensure that foreign vessels visiting Australian ports comply with the relevant international regulations are seaworthy, do not pose a risk of pollution and provide a safe working environment; accordingly, under the *Navigation Act 2012*, the Australian Maritime Safety Authority surveyors may board a vessel at any time to conduct an inspection.

Cargo ships may be inspected every six months and tankers over 15 years old may be inspected every three months.

Inspections are based on resolutions of the International Maritime Organization and the International Labour Organisation (ILO). All required certificates and documentation and areas of critical safety, for example, lifeboats, engine room firefighting equipment and cargo gear, may be inspected in accordance with a Ship Inspection Record (SIR) book which contains guidelines.

In all cases a *Form A* is completed stating that an inspection has been carried out and if any deficiencies are noted a *Form B* is issued.

Critical deficiencies can lead to a ship being detained from sailing until the problems are rectified. Details of all detentions are forwarded to the International Maritime Organization, the relevant flag state and the classification society.

Vessels that are intending to use their cargo gear to load stores or handle cargo should ensure that they comply with Marine Orders Part 32. This requires all individual pieces of cargo handling equipment to be certificated (test certificate) and clearly marked with the identifying mark and the safe working load (SWL) as stated in the certificate. This applies to all gear; shackles, chains, sheave blocks, bins, tubs rings and so on.

Periodical inspections must be entered in the cargo gear register or else the cargo gear cannot be used.

21.0 Port services

21.1 General

The nearest medical, banking and shopping facilities are located at Tumby Bay, approximately 25 kilometres to the south.

21.2 Bunkering

There are no bunkering facilities available at this port.

21.3 Fresh water

Fresh water is not available at this port.

21.4 Waste

It is an offence for a person to discard, dispose of or leave rubbish, refuse, and sewage waste of any kind (including galley waste), wastewater or other liquid waste.

There are no facilities available at Port Spencer for the collection of waste materials and all should be retained on board in covered receptacles.

end of document

P E N I N S U L A | P O R T S

Appendix F - Schedule

Project: PORT SPENCER PROJECT

Date: Thu 30/01/20

Task

Split

Milestone

Summary

Project Summary

External Tasks

External Milestone

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

Deadline

Critical

Critical Split

Progress

Manual Progress

PENINSULA | PORTS

Appendix G - Construction Methodology

1.1 CAUSEWAY CONSTRUCTION METHODOLOGY

1.1.1 LAND-BASED BLASTING

Land-based blasting is required to generate excavations for the Jetty construction launch site and silos area. This site won rock will subsequently be used to produce several products for re-use within the project:

- Causeway material – varying size to 8t.
- Pavement Source Rock – varying size up to 600 mm max to enable crushing.
- If required as general fill materials for bunker construction.

Drilling and blasting are programmed to be carried out as dayshift operations only. The drilling is completed using hydraulic drilling rigs and typically the drill hole size is 89mm diameter. This equipment is similar in size and capacity to large geotechnical investigation drilling equipment.

The blasting activity is subject to rigorous blast management procedures that require a detailed design of charge placement, size and noise profile to reduce risks to surrounding personnel and the public. This includes restrictions on the timing and detailed risk management for each blast as a separate activity.

Any blast that poses a potential risk of flying debris reaching the marine environment will be designed with strict control on the size and spacing of the charges such that the risk of debris reaching the marine environment is as low as reasonably practicable.

1.1.2 CAUSEWAY/ROCK GROUYNE

Figure 5-2 represents the construction of causeway at Port Spencer. In summary causeway construction is as follows;

- A combination of trucks and a dozer to create a platform out into the water over footprint of causeway.
- A long reach excavator is to trim the batters from the platform created by the trucks and dozer. A truck is to end the 1-2 tonne armour rock onto the trimmed core and an excavator is to place the rock on/roll the rock down the causeway batters to create a bench for 8 tonne rock to sit on.
- A truck is to end tip the 8-tonne armour rock onto the trimmed core and an excavator is to place the rock on the causeway batters

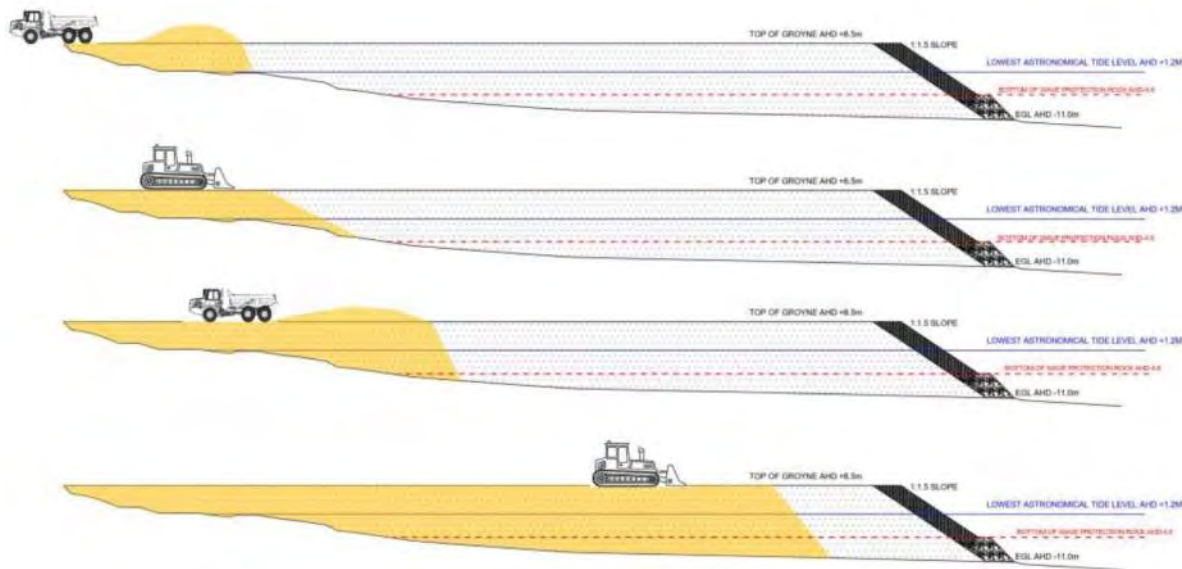


Figure Error! No text of specified style in document.-1. Causeway construction.

1.2 WHARF CONSTRUCTION METHODOLOGY

Refer the below sequence summary for pier construction in seabed.

1.2.1 PILE DRIVING

Piling will occur from bent 7 at the end of the 228m causeway. Approximately 18no steel tubular piles (1200mm diameter) will be used in the construction of the jetty and wharf. Piles are delivered to site on extendable truck. Piles are upended by crane and lowered into piling gates (frame for holding piles in place). Piles are then driven vertically into seabed using a hydraulic hammer until the piles either achieve a design depth or refuse to be driven deeper. Final pile depth shall be between 6 and 10.5m into the seabed (drilling required to achieve depth).

No sea-based blasting is programmed to be carried out during the construction of Port Spencer wharf.

1.2.2 PILE SOCKET DRILLING

After piles have been driven the pile socket is drilled to depth to install an anchor. Initially a Reverse Circulation Drill (RCD) is used to remove the overburden down to bedrock. The drill is then swapped for a Down The Hole Hammer (DTHH) that will drill a 900mm diameter hole 10m deep into the bedrock.

During the drilling activities, seawater will be extracted from the ocean and will be used to flush out the drill spoil (sand and bedrock) from the hole. This spoil will then be disposed of from approx. 6-inch outlet on the drill head back into the ocean at up to 60l/s, adjacent to the newly drilled pile.

Largest size of drill spoil will be up to 25mm diameter. The drill spoil quantity per pile will be between 14 m³ and 17 m³. The total drill spoil will be approximately 250 m³ (on current design). Due to type of material, the drill spoil will sink and dissipate quickly, leaving only a short-term impact to the water column. No other additives are used in the drill process.

1.2.3 PILE ANCHOR GROUTING

Upon completion of drilling activities, a steel tubular anchor will be lowered into the drilled hole in the bedrock. Grout will then be pumped into the pile using a tremmie pipe to fill the drilled hole and the inside of the anchor. When the braced frame is installed over the top of the piles the annulus between the pile and the braced frame will be filled with grout. A rubber seal will be pre-installed at the bottom of the braced frame to prevent grout escaping. A ~500mm plug of grout will initially be poured in the annulus and allowed to set prior to the final full length pour. All water from the annulus will be disposed of inside of the pile. Grout pump equipment will be set up in a semi-fixed location on top of the wharf. Pump lines inspected and fitted correctly prior to grout pumping.

Pile anchor grouting and annulus rate at 6 m³/hour. Total 108 hours - (4.5days) of grouting operations over the duration.

1.2.4 ABRASIVE BLASTING AND PAINTING

Structural steel and welding joints will be coated in the following steps:

1. Area to be painted will be fully encapsulated.
2. The steel surface will be blasted with an abrasive medium (industry standard inert garnet) to remove surface rust, paint and contaminants. At the end of blasting, all blast medium will be collected and reused or disposed of.
3. The cleaned steel surface will then be coated with two coats of paint using an airless spray gun.

There shall be a fixed site on land for preparatory work and various temporary locations set up in situ on the wharf itself.

1.2.5 WELDING OVER WATER

The following offshore welding activities will occur

- Welding headstock to piles.
- Welding pile caps on top of piles/braced frame.
- welding pot bearing baseplates.

1.3 OPERATIONAL ACTIVITIES

The operational phase for Port Spencer Bulk Loading consists of four main activities:

- Arrival of bulk carrier at anchorage.

- Transit to terminal and berthing.
- Loading bulk grain.
- Unberthing and departure from the terminal.

1.3.1 ARRIVAL

The first operational phase is the arrival of the Bulk Carrier (BC) and the handling of the BC. The BC will arrive at anchorage and take up a position as directed by Peninsular Ports through Port Spencer Vessel Traffic Services (VTS). The Port Limit is set at a 2nm radius from the jetty head and the anchorage is outside port limits, at location 34° 15.33' S / 136° 19.90' E, approximately 3 nm East of the jetty.

Once the jetty operations are ready for receiving the BC, a Port Spencer Marine Pilot will come aboard at the boarding ground (3nm from end of jetty, East) who will bring the ship to the loading jetty. Tug escort (Two 60 TBP tugs) will be provided by Engage Marine (Westug – located at Whyalla) under the direction of a suitably qualified master and operating under the vessel's Safety Management System (SMS).

Personnel will be transferred from Bulk Load Facility (BLF) to ship and return by General Purpose Vessel (GPV). The GPV will be moored on the Southern side of the Jetty. Whenever an alternative/emergency anchorage is required, the BC vessel will seek guidance from the Harbour Master but noting that the responsibility for the safety of the Vessel at all times lies with the Master. Once conditions are favourable for berthing at Port Spencer, the BC vessel will steam to the designated "Pilot Boarding Ground / Anchorage" area.

1.3.2 TRANSIT TO TERMINAL AND BERTHING

Once cleared for arrival, the BC will be allocated a Pilot On Board (POB) and berthing time by Port Spencer VTS. A marine pilot will be transferred to the ship by GPV. The pilot will con the ship from port limits to the berth, until the last line is secured, in accordance with the legislative requirements for compulsory pilotage in port limits.

On boarding a vessel, the pilot will discuss a passage plan with the Master, review the ship's pilot card and exchange the normal pilot/master information. Once satisfied the pilot will then commence the pilotage passage (inward/outward).

Tugs, 60 TBP ASD (one or two, depending on size of ship) will meet the BC on the inbound passage, assist the BC to berth on the Northern side with bow facing towards the Gulf, and stand by for emergency assistance within port limits. BLF lines team (two teams of two each) will secure the ship from the shore side.

1.3.3 LOADING BULK GRAIN

Once all requirements of Maritime Orders are satisfied, master and terminal operator will agree to commence loading according to the load plan, under the supervision of the grain surveyor/load master.

Traveling ship loader with effective load rate of 2000MT/hr will see most ships loaded within 48 hrs from arrival.

The relevant Authorised officer (grain surveyor/loadmaster) will clear ship for departure with master and terminal operator agreement.

1.3.4 UNBERTHING AND DEPARTURE FROM THE TERMINAL

Ship will be allocated a POB and departure time by Port Spencer VTS. Lines teams and tug(s) will be in attendance to assist unberthing under pilot's direction. Pilot will con ship from berth to port limits under escort of tugs.

On leaving port limits, tugs will return to BLF or deploy to assist incoming BC; and pilot will be either transferred to incoming BC or returned to BLF by GPV. All tugs and GPVs are to be navigated at all times in strict compliance with the International Regulations for the Prevention of Collision at Sea and any local regulations relating to navigation in the Spencer Gulf.

Any necessary actions, such as altering course or reducing speed, especially if the vessel is the vessel giving way, should be positive and taken in sufficient time.

P E N I N S U L A | P O R T S

Appendix H - Risk Analysis Framework

Table 1. Risk analysis framework consequence descriptors.

Consequence Level				
Negligible	Minor	Moderate	Major	Extreme
Minimal impact with a localized area within natural variability	Low impact in a localized or regional area with a functional recovery within less than 1 year	Medium impact in a localized or regional area with a functional recovery of 1 to 5 years	High impact in a localized or regional area with a functional recovery within 5 to 10 years	Very high impact in a localized or regional area with a functional recovery in greater than 10 years if at all
Consequences likely to be no greater than the normal population experiences and remains within natural annual and seasonal variability.	Consequences likely to be low and no greater than population experiences within natural annual and seasonal variability.	Medium impact with a potential loss of individuals leading to reduction in variability of population in a localized or regional area. Functional recovery within 1 to 5 years.	Loss of large number of individuals leads to a high impact on populations in the localized area or regional area. Functional recovery within 5 to 10 years.	Long-term impact on populations in the regional area that may not be recoverable. Functional recovery in greater than 10 years if at all.

Table 2. Risk analysis framework likelihood levels.

Likelihood Level				
Rare	Unlikely	Likely	Almost Certain	Certain
Highly unlikely to occur but theoretically possible.	May occur within the life of the project or activity	Likely to occur more than once during the life of the Project or activity	Very likely to occur during the life of the Project or activity	Will occur as a result of the Project or activity

Table 3. Risk assessment matrix.

Likelihood	Consequence				
	Negligible	Minor	Moderate	Major	Extreme
Rare	Low	Low	Low	Medium	High
Unlikely	Low	Low	Medium	Medium	High
Likely	Low	Medium	Medium	High	High
Almost Certain	Medium	Medium	High	High	Critical
Certain	Medium	Medium	High	Critical	Critical

P E N I N S U L A | P O R T S

Appendix I - Oil Spill Contingency Plan



SHIP SOURCED POLLUTION PREVENTION MANAGEMENT PLAN

(MARINE POLLUTION)
PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	
0.3	Ryan Norval	John Kavanagh	
1.0	John Kavanagh	Anthony Marinac	Pacific Maritime Lawyers and Consultants

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1.0 Introduction

Port Spencer is located 70kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region. Shipping legislation in South Australia is controlled by Maritime Safety, a state government agency attached to Department of Planning, Transport and Infrastructure (Road and Marine Services Division).

The Government of South Australia is responsible for managing local waterways, including pilotage. The Department of Planning, Transport and Infrastructure (DPTI) is South Australia's marine authority responsible for safety in South Australian waters – particularly in relation to the safe navigation of vessels, harbors and harbor facilities, movement of shipping and cargo, jetties and wharves.

The waters of Spencer Gulf are internal to South Australia. Collectively, the Harbour Master and the port authority have responsibility for managing the safe and efficient operation of the port.

PENINSULA PORTS, as the port authority and owner for Port Spencer, will be responsible for developing and managing the project.

This Ship-Sourced Marine Pollution Prevention Plan is not intended to operate in isolation, it is to be read integrates with the:

- South Australian Marine Spill Contingency Action Plan (SAMSCAP)
- National Plan for Maritime Environmental Emergencies (National Plan)
- Port Spencer Emergency Response Plan
- Port Spencer ANNEX 1 – First Strike Response Plan

This plan should be interpreted for consistency with SAMSCAP and the National Plan, and in the event of any inconsistencies, SAMSCAP is to prevail.

2.0 Ship Sourced Pollution Prevention Management Plan Overview

This section identifies specific environmental management measures including strategies, timing and actions related to the shipping activities of the project which have potential impacts on the marine environment. In most cases, management actions need to be integrated in the broader site-based management plans, documentation and any conditions of approval imposed on the project.

PENINSULA PORTS will address and meet these requirements for the activities to be carried out within Port Spencer controlled areas, consistent with any existing procedures, guidelines or permits.

2.1 Introduction of Exotic Marine Organisms (Ballast Water)

Element	Introduction of exotic marine organism
Potential impacts	Harm to marine ecosystems Incursion of marine pests through ballast water or hull fouling
Performance objective	To reduce the potential for prohibited releases of ballast water to occur To reduce the potential for environmental harm to marine environments as a result of release from shipping, or translocation on foreign arriving vessels engaged for construction phase of the project through implementation of appropriate contingency measures.
Performance indicators	No incidents of environmental harm involving ballast water releases associated with commercial ships using Port Spencer Ballast summary sheets to be provided to Maritime National Coordination Centre for relevant shipping.

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Monitoring and reporting	<p>Ballast water movements must be recorded in ship manuals for verification consistent with Department of Agriculture and Water Resources (DAWR)/ Australian Maritime Safety Agency (AMSA) requirements</p> <p>Identification of exotic or foreign species in port waters will be recorded in PENINSULA PORTS's database and advise given to DAWR/Biosecurity South Australia accordingly.</p> <p>PENINSULA PORTS to continue to facilitate access by agency staff (Biosecurity SA, Department of Agriculture and Water Resources, etc.) to enable such staff to conduct their inspections and monitoring for the presence of marine and terrestrial pests as part of routine border protection surveillance</p> <p>PENINSULA PORTS to maintain existing surveillance for potential new incursions through its existing marine pest settlement plate program, and the annual SAP process as required under NAGD or other such programs as they come into effect under agency requirements.</p>
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Management actions	Responsibility	Timing	Corrective actions
International vessels are to comply with DAWR reporting requirements for ballast water exchange/discharge and biofouling.	Ship owner/operator, DAWR and Biosecurity SA.	Prior to entry into port.	DAWR to recommend necessary corrective or disciplinary actions as required.
Full ballast water exchange to occur outside Australian territorial waters and the Spencer Gulf.	Ship owner/operator to ensure only the following approved methods are used: Sequential exchange (empty/refill) method Flow through exchange method Dilution exchange method.	Prior to entering Australian territorial waters. No exchanges in the Spencer Gulf. International ships cannot exchange ballast water until in international waters (12 nautical miles from the edge of the SPENCER GULF). Ballast water cannot be exchanged in the Spencer Gulf.	AMSA carry out audits of ballast tanks to confirm that the ships have complied with these conditions. IMO rules are to be implemented: http://www.imo.org/Pages/home.aspx
Tank-to-tank shipboard ballast water exchanges to be outside Australian territorial waters.	Ship owner/operator.	Prior to entering territorial waters. Tank to tank transfers are permissible in territorial waters, however, it is ideal they are conducted at the maximum distance possible from land.	Transfer is to stop if unauthorised discharge occurs in Australia waters. Authorities are to be notified and will advise of the next appropriate action commensurate with the level of risk.
Sediment discharges in ballast water to occur outside Australian territorial waters.	Ship owner/operator to ensure that no sediment is discharged in Australian waters.	Ongoing.	Sedimentary material from ballast tanks may be landed as quarantine waste in some Australian ports, or it can be dumped back into the sea in deep water, which is at least 200m deep and outside the 12nm limit, but preferably beyond 200nm from land.

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Only permanent vessel pumps used for ballast tank stripping.	Ship owner/operator to ensure ballast tank stripping is only undertaken via permanent vessel pumps.	Ongoing.	If ship does not have pumps capable of stripping ballast, they will be unable to dump ballast. No portable pumps can be used due to potential contamination.
Ballast Water Management Plans to be carried by vessels.	Ship owner/operator to ensure vessels carry Ballast Water Management Plans.	Ongoing.	Australian Ballast Water Management Requirements are enforceable under the Cth <i>Biosecurity Act 2015</i> . Ships without a Ballast Water Management plan may be refused entry.

2.2 Release of Shipping Waste

Element	Release of shipping waste
Potential impacts	<p>Harm to marine life through entanglement and/or ingestion</p> <p>Harm to recreation and tourism through degradation of visual amenity</p> <p>Harm to human health through release of sewage</p> <p>Potential marine pollution as a result of accidental discharge from vessel within port limits</p> <p>Damage to environmental management reputation of PENINSULA PORTS.</p>
Performance objective	To prevent or reduce the release of shipping waste into the marine environment.
Performance indicators	<p>Waste releases into the marine environment are in accordance with relevant laws and standards</p> <p>No complaints from public or government agencies regarding noticeable waste, as a result of shipping activities.</p>
Monitoring and reporting	<p>Regular visual inspections of wharf areas</p> <p>Any complaints or waste release incidents will be recorded in PENINSULA PORTS's database in order to identify areas for actions or improvement.</p>

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Management	Responsibility	Timing	Corrective actions
Vessels are to carry and maintain Garbage Record Books.	Ship owner/operator. MARPOL requires ships of ≥ 400 gross tonnage and every ship certified to carry ≥ 15 persons to have a garbage record book to record disposal and incineration operations. The date, time, position of ship, description of the garbage and the estimated amount incinerated or discharged must be logged and signed.	Ongoing. The Garbage Record Book must be kept for a period of two years after the date of the last entry.	PENINSULA PORTS and AMSA to notify ship owner/operator of obligations.
Commercial vessels required to carry a Garbage Management Plan.	Ship Owner/operator. All ships of ≥ 100 gross tonnage and every ship certified to carry ≥ 15 persons. The Garbage Management Plan designates the person responsible for carrying out the plan and is in the working language of the crew. The Garbage Management Plan is to include written procedures for collecting, storing, processing and disposing of garbage, including the use of equipment on board.	Ongoing.	PENINSULA PORTS and AMSA to notify ship owner/ operator of obligations. Garbage Management Plans are subject to inspection by State or Commonwealth officials.

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<p>No discharge of sewage at sea unless at appropriate distance from land.</p> <p>No discharge of ground food waste within 3nm of the SPENCER GULF boundary</p> <p>No discharge of non-ground food waste or cargo residues within 12 nm of SPENCER GULF boundary.</p> <p>The treatment, quality and distance requirements for different vessel types are stipulated by SPENCER GULFA and SA MARINE SAFETY requirements.</p>	<p>Ship owner/operator and SA MARINE SAFETY.</p> <p>The regulations in Annex IV of MARPOL and the requirements of SA MARINE SAFETY prohibit the discharge of sewage into the sea within a specified distance of the nearest land, unless they have in operation an approved sewage treatment plant.</p>	<p>Whenever discharging sewage to sea.</p>	<p>Ships seeking to discharge sewage must move to the appropriate offshore distance prior to discharge, in accordance with MARPOL, SPENCER GULFA, SA DEHP and SA MARINE SAFETY requirements.</p>
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P E N I N S U L A P O R T S

Management actions	Responsibility	Timing	Corrective actions
Non-Cargo Liquid Transfer Notifications to be prepared for the transfer of any non-liquid cargo.	Ship owner/operator. Notification to be submitted to the RHM's office.	Must be submitted to the RHM's office prior to conducting non-cargo liquid transfer operations in the port. It is the responsibility of the vessel's Master to notify Port Control and VTS prior to commencing transfer and at completion of transfers.	If no notification occurs, then no liquid waste transfer can legally occur. If the transfer is still required, the RHM must be notified.
Inspections of Non-Cargo Liquid Transfer operations.	SA MARINE SAFETY.	Prior to undertaking non-cargo liquid transfers. Inspections, if required, will be arranged one hour before the start of transfer operations by SA MARINE SAFETY contacting the ship's Master.	Undertake inspections for non-cargo liquid transfers.
No wastes to be discharged to port waters.	PENINSULA PORTS, ship operators and DAWR.	Ongoing.	Informal surveillance and reporting of nonconformities. Garbage record book checks by DAWR.
Provision of port side bins.	PENINSULA PORTS.	Ongoing.	Review port side waste bin types and quantities and rectify.
Provision of quarantine waste bins.	PENINSULA PORTS and ship operator.	Ongoing.	Review requirements for quarantine waste generation and amend provided facilities as necessary.

2.3 Ship Sourced Spills and Pollution

Element	Spills
Potential impacts	<p>Impacts on water quality</p> <p>Mortality or long-term impacts on sea birds, marine mammals and coastal and marine habitats</p> <p>Damage to commercial fishing resources</p> <p>Impacts on tourism and recreational activities</p> <p>Economic loss at both the regional and national level</p> <p>Impacts to public health.</p>
Performance objective	<p>To eliminate or reduce spill of any substance into the marine environment from shipping traffic generated by the port</p> <p>Prevent impacts to the marine environment as a result of pollution from shipping activities.</p>
Performance indicators	<p>Accidental releases of any substance into the marine environment are avoided or promptly managed to avoid impacts</p> <p>No complaints from public or government agencies regarding noticeable spills as a result of shipping activities and port operations.</p>
Monitoring and reporting	<p>Opportunistic visual inspection of PENINSULA PORTS's controlled areas</p> <p>Any complaints or spill release incidents will be recorded in PENINSULA PORTS's database immediately in order to identify potential adverse impacts</p> <p>Spills to be reported to environmental and public health authorities, in accordance with legislation and port notices, incident reporting requirements.</p>

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Management actions	Responsibility	Timing	Corrective actions
Review stochastic modelling during spill event which is beyond First-Strike Response Plan to aid understanding of potential spill area and trajectory to determine appropriate management responses.	PENINSULA PORTS, SA MARINE SAFETY, DEHP and AMSA.	Immediately on identification of a spill event beyond First-Strike Response Plan.	Update spill response actions. AMSA to calibrate model based on observed spill behaviours and whether to refine for future events.
All dangerous goods in the port to be handled in accordance with the International Maritime Dangerous Goods (IMDG) Code.	PENINSULA PORTS, Ship owner/operator, tenants and transport companies.	Ongoing.	If handling of dangerous goods is not in accordance with IMDG then handling procedures to be ceased and reviewed. Handling can commence when procedures are in accordance with the code.
A Notification of Transporting and Handling Dangerous Goods (Marine) required for dangerous goods transfers.	Ship owner/operator.	Form is to be lodged at the RHM's office no later than 48 hours before the vessel's estimated time of arrival.	If the form has not been obtained, signed and lodged appropriately, further handling and transport of the goods cannot take place until a legitimate form has been obtained.
Bulk Fuel Transfer Checks to be undertaken for all bunkering.	Ship owner, supplier.	48 hours prior to bunkering.	Bunkering cannot take place until approved.
A Non-Cargo Liquid Transfer Notification is required for the transfer of non-cargo liquids.	Ship owner/operator.	Must be submitted to the RHM's office prior to conducting non-cargo liquid transfer operations in the port. It is the responsibility of the vessel's Master to notify Port Control and VTS before commencing transfers and at completion of transfers.	PENINSULA PORTS to maintain a register of approved operators and conduct appropriate audits.

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Refuelling to be undertaken by licensed refuelling operators with appropriate emergency response equipment.	PENINSULA PORTS and port operators/tenants to ensure licensed refuelling operators are used.	Prior to and during refuelling event.	Report breaches to appropriate regulatory authorities. PENINSULA PORTS to maintain a register of approved operators and conduct appropriate audits.
Follow incident response procedures.	PENINSULA PORTS implement appropriate incident response measures (First-Strike Response Plan). Port users in accordance with mooring agreements for common	During and following incident.	Review incident response measures to ensure effectiveness.
Australian system for pilotage to be adhered to for ships requiring pilotage.	Ship owner/operator.	Ongoing.	Report breaches to appropriate regulatory authorities. PENINSULA PORTS to consider issuing penalties as per Port Notices.
Mandatory recording of shipping movements.	SA MARINE SAFETY VTS.	Ongoing.	Systems to be reviewed to ensure shipping movements are recorded. Internal and external audits may be required to identify deficiencies.
Shipping activities to consider the prevailing weather conditions.	Ship operator and SA MARINE SAFETY.	Ongoing.	Shipping activities to be reviewed, reduced or stopped during weather warning periods.

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Port Spencer Emergency Response Plan to be activated in the event of a major spill, as defined under that plan.	PENINSULA PORTS, SA MARINE SAFETY and DEHP.	Ongoing.	Review and revise triggers for activation of Emergency Response Plan if current triggers are considered insufficient for changing port conditions.
South Australia Coastal Contingency Action Plan may be activated.	PENINSULA PORTS, SA MARINE SAFETY and DEHP.	Ongoing.	Review and revise triggers for activation of Contingency Action Plan if current triggers are considered insufficient for changing port conditions.
No discharge of bilge water at any time. (Bilge water discharge classified as oil spill).	Ship owner/operator.	Ongoing.	PENINSULA PORTS to ensure vessels are advised of bilge water management requirements.
Spoiled cargos and cargo residues to remain on- board ships for removal to onshore.	Ship owner/operator.	Ongoing.	Licensed waste service company to remove soiled cargos.
No discharge of any other substance from any ship unless to licensed contractor.	Ship owner/operator.	Ongoing.	SA MARINE SAFETY to investigate and implement corrective action as necessary.

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Management actions	Responsibility	Timing	Corrective actions
Reduction of accidental cargo loss through implementation of appropriate cargo storage and handling.	Ship owner/operator.	Ongoing.	Mechanisms for securing cargo to be reviewed by tenants and upgraded as necessary.

3.0 Prevention of ship-sourced pollution

3.1 Introduction

The Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987 and Protection of Marine Waters (Prevention of Pollution from Ships) Regulations 2013 outline the requirements for ship-sourced pollution management in South Australia coastal waters. This legislation also implements the International Convention for the Prevention of Pollution from Ships (MARPOL).

For commercial ships in South Australia, the major ship-sourced pollutants, from an operational perspective, are:

- oil and oily residues or mixtures (including diesel fuel, petrol and oil products)
- chemicals and chemical residues
- sewage
- garbage (including food wastes, paper products, rags, glass, metal, bottles, crockery, fishing gear, nets, bait boxes, deck sweepings, paints, wood products and all plastics).

It is an offence to discharge pollutants (either deliberately or negligently) into South Australia coastal waters and severe penalties apply. All pollution incidents must, by law, be reported to South Australia Maritime Safety, as soon as practicable, to ensure the response will minimise the effects of the pollutant.

All ships operating in South Australia waters must carry the applicable pollution prevention documentation.

A summary of the overall requirements for ship-sourced pollution management is provided in this document.

For complete details on the requirements for ship-sourced pollution management in South Australia; operators should refer to the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* and *Protection of Marine Waters (Prevention of Pollution from Ships) Regulations 2013*.

The National Standard for Commercial Vessels (NSCV) is the standard prescribed in the *Marine Safety (Domestic Commercial Vessel) National Law Act 2012*. It was developed as an upgrade and amendment to the Uniform Shipping Laws (USL) Code. NSCV Part E, formerly prescribed operational requirements for on board fuelling and oil pollution, bilge pumping, waste oil disposal, disposal of sewage and disposal of garbage procedures. Part E focuses primarily on safety of operations, leaving environmental standards now resting with state legislation.

3.2 Purpose

The purpose of this section is to provide guidance on preventing ship-sourced pollution, including information on requirements for the handling of oil, chemicals, sewage and garbage and to provide guidance on the safe transfer of bunkers in South Australia coastal waters.

It is intended that this document may be utilised to assist ship's masters, ship's agents, ship management companies, bunker barges and port development proponents to carry out their responsibilities with regard to preventing ship-sourced pollution.

3.3 Definitions

Terms, abbreviations and acronyms	Meaning
Berth	Any dock, pier, jetty, quay, wharf, marine terminal or similar structure, (whether floating or not) connected to the shore, at which a ship may tie up. It does not include floating plant,
Bunkering	The act of taking in fuel on board a ship.
Bunkers	Fuel such as oil stored in tanks and used for running ship's machinery
Bunker barge/ship/vessel	A self-propelled vessel or a self-propelled barge designed for the purpose of transferring bunkers. It does not include a
Coastal waters	The coastal waters of the State and includes other waters within the limits of the State that are subject to the ebb and
Dumb barge	A barge not fitted with propulsion machinery.
Emergency	Any circumstance which causes, or gives rise to a risk of, serious injury or damage to a person, property or the environment
Independent testing entity	An entity that is accredited by NATA as competent to perform analyses and performs, in Australia, analyses.
In test	The certificates validating the compliance of the equipment with the relevant Australian Standard(s) are current.
Marina	A buoy mooring, jetty or pile mooring or combination of them where, for a fee or reward, a ship is, or may be, anchored, berthed or moored
MARPOL	International Convention for the Prevention of Pollution from Ships
Master	A person having command or charge of the vessel.

NATA	The National Association of Testing Authorities, Australia (ABN 59 004 379 748)
National Law	<i>Marine Safety (Domestic Commercial Vessel) National Law Act 2012 (Cwlth)</i>
Oil Tanker	A vessel intended primarily for the bulk carriage of cargo in liquid form (including oil, chemicals and liquefied gas), and listed in column 6 (Ship type) of Lloyd's Register of Ships, as a tanker.

Terms, abbreviations and acronyms	Meaning
Prescribed ship (for sewage only)	<p>A ship that is engaged in an international voyage with a:</p> <ul style="list-style-type: none"> • gross tonnage of at least 400; or • gross tonnage of less than 400 and certified to carry more than 15 people. Note: See Annex IV to MARPOL, chapter 1, regulation 2.
Save-all	A receptacle or enclosure around air vent heads of oil tanks or around machinery such as a windlass or winch, to contain minor leakages.
Service Records	<p>Records for a treatment system, containing the following particulars about the maintenance or assessment of the treatment system.</p> <ul style="list-style-type: none"> • For maintenance of the treatment system: <ul style="list-style-type: none"> – the name of the authorised service provider that conducted the maintenance; and – the date the maintenance was carried out and any significant maintenance required to the treatment system. • For an assessment of the treatment system: <ul style="list-style-type: none"> – the name of the independent testing entity that conducted the assessment; and – the date and results of the assessment.
Sewage treatment system	<p>A system, installed on a ship, for treating sewage that:</p> <ul style="list-style-type: none"> • is able to reduce the levels of sewage quality characteristics in sewage to not more than the levels for treated sewage; and • conforms with the standard prescribed under a regulation. <p>Note: A sewage treatment system that has an International Maritime Organization (IMO) type approval and the relevant supporting documentation is deemed to comply with the South Australia requirements for a Grade A sewage treatment system.</p>

Ship (for oil record book only)	<ul style="list-style-type: none"> • A trading ship proceeding en-route on an intrastate voyage: <ul style="list-style-type: none"> – a ship, other than a Commonwealth ship under the <i>Commonwealth Navigation Act 2012</i> or a fishing vessel, that is used for or in connection with any business or commercial activity; and includes a ship that is used wholly or principally for: • the carriage of passengers or cargo for hire or reward; or • the provision of services to ships or shipping whether for reward or otherwise. • An Australian fishing vessel proceeding en route on a voyage other than an overseas voyage: <ul style="list-style-type: none"> – a vessel that is registered or entitled to be registered in Australia or in relation to which an instrument under the <i>Fisheries Management Act 1991</i> (Cwlth), section 4(2) is in force. • A pleasure vessel: <ul style="list-style-type: none"> – a vessel used wholly for recreational or sporting activities and not for hire or reward.
Slops	A mixture of oil and water resulting from the cleaning of tanks on board an oil tanker.
Sludge	Oily residue and or liquid waste taken from engine room and/or other bilge areas on a ship.
SOPEP	Shipboard Oil Pollution Emergency Plan

Terms, abbreviations and acronyms	Meaning
System documentation	<p>Documentation from the treatment system's manufacturer or supplier that states:</p> <ul style="list-style-type: none"> the treatment system's performance specifications under normal operating conditions; and the following information about the independent testing entity that performed the analyses of the sewage after it has been treated in the treatment system: <ul style="list-style-type: none"> the name and address of the entity; and the date and the results of the entity's assessment; or documentation equivalent to the documentation for the treatment system's performance specifications under normal operating conditions.
System service manual	<p>A manual for a treatment system that states the following particulars for the treatment system:</p> <ul style="list-style-type: none"> operating instructions maintenance schedules and requirements authorised service providers.
Transfer operations	<p>The transfer between a ship and a barge or other ship; or between the shore and a barge or ship, including all activities preparatory and incidental to the transfer, of the following:</p> <ul style="list-style-type: none"> flammable and combustible fuel for main propulsion and auxiliary operations lubricating and hydraulic oil for machinery waste oils, sludge and residues slops and tank washings grey water and sewage.
Ullage	The height of space in the bunker tank above the fuel contained therein.
Vessel	A Ship, as defined under the Domestic Commercial Vessel, as defined under the "National Law".
VTSO	Vessel Traffic Services Official

4.0 Oil and chemicals

4.1 Introduction

It is an offence to discharge oil or chemicals (either deliberately or negligently) into South Australia coastal waters. Under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*, severe penalties apply. Oil and chemicals that are generally carried aboard ships can include:

- petrol
- gear box oil
- motor oil
- two-stroke oil
- diesel
- hydraulic oil
- cooling system additives
- cleaning agents
- degreasers
- acid and paints

A high proportion of the ship-sourced oil and chemical pollution that enters the water comes from refuelling, vessel maintenance and bilge discharges. Operators must ensure that they use and dispose of all on board oil and chemicals correctly and safely.

Keeping bilges clean helps to reduce oil and chemical pollution. Use absorbents to mop up excess oil or fuel, wash bilges with biodegradable degreasers or detergents and dispose of any cleaning residue ashore.

If oil does spill into the water, use absorbent pads to mop it up or boom to contain the spill and let the State Marine Pollution Controller, marina manager or port authority know so that it can be cleaned up as soon as possible.

Note: Do not use dispersants or other cleaning chemicals on oil in the water because they can increase the toxic effects of oil spills.

4.1.1 Other requirements

There are several specific oil and chemical requirements that operators must adhere to:

A. SOPEP

(1) Having a shipboard oil pollution emergency plan (SOPEP) on board for all

ships that are:

- (a) more than 35 metres in length overall; or
 - (b) more than 24 metres in length overall carrying oil as cargo or a vehicle that is carrying more than 400 litres of oil as cargo
- (2) The SOPEP must be in the approved form, in the English language and include the following particulars:
- (a) a detailed description of the action to be taken by persons on board to minimise or control any discharge of oil from the ship resulting from the reportable incident
 - (b) the procedure to be followed by the ship's master, or someone else having charge of the ship, in notifying a reportable incident that is a discharge or probable discharge of oil involving the ship
 - (c) a list of the entities to be notified by persons on board if the reportable incident happens
 - (d) the procedure to be followed for coordinating with entities notified about the reportable incident
 - (e) the name of the person on board through whom all communications about the reportable incident are to be made

B. Oil Record Book

(3) Having an Oil Record Book on board for the following ships:

- (a) oil tankers of 150 gross tonnage or more
- (b) other than oil tankers, of 150 gross tonnage or more that carry oil in portable tanks with a capacity of 400 litres or more
- (c) other than oil tankers, of 400 gross tonnage or more.

The oil record book must comply with the requirements for an 'oil record book' under the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*. Entries must be made by the ship's master for all prescribed (recordable) operations or prescribed (recordable) events.

C. Prescribed Operations

For the purposes of section 11(5) of the Act—

- (a) each of the following operations (being a machinery space operation) is a *prescribed operation* in relation to a ship (including an

oil tanker):

- (i) the ballasting or cleaning of an oil fuel tank;
 - (ii) a discharge of dirty ballast or cleaning water from an oil fuel tank;
 - (iii) a disposal of oil residues (sludge);
 - (iv) a discharge overboard or other disposal of bilge water that has accumulated in any machinery space; and
- (b) each of the following operations (being a cargo or a ballast operation) is a prescribed operation in relation to an oil tanker:
- (i) the loading of oil cargo;
 - (ii) an internal transfer of oil cargo during a voyage or in port;
 - (iii) the unloading of oil cargo;
 - (iv) the ballasting of a cargo tank or a dedicated clean ballast tank;
 - (v) the cleaning of a cargo tank (including crude oil washing);
 - (vi) a discharge of ballast from a tank other than a segregated ballast tank;
 - (vii) a discharge of water from a slop tank;
 - (viii) the closing, after an operation referred to in subparagraph (vii), of all applicable valves or similar devices;
 - (ix) the closing, after an operation referred to in subparagraph (vii), of valves necessary for the isolation of a dedicated clean ballast tank from cargo and stripping lines;
 - (x) a disposal of residues.

Prescribed operations include the disposal of oil residues that are sludge and the discharge overboard or another disposal of bilge water that has accumulated in any machinery space.

D. Prescribed Occurrences

For the purposes of section 11(5) of the Act, each of the following occurrences is a *prescribed occurrence* in relation to a ship (including an oil tanker):

- (a) the discharge into the sea of oil or an oily mixture from the ship for the purpose of—
 - (i) securing the safety of the ship; or
 - (ii) saving life at sea;

- (b) the discharge into the sea of oil or an oily mixture in consequence of damage to the ship or its equipment;
- (c) the discharge into the sea of substances containing oil for the purpose of combating specific pollution incidents;
- (d) the failure of the ship's oil discharge monitoring and control system;
- (e) the discharge into the sea of oil or an oily mixture, being—
 - (i) a discharge for an exceptional purpose other than a purpose referred to in paragraph (a) or (c); or
 - (ii) an accidental discharge other than a discharge referred to in paragraph (b).

E. Recordable Events

Recordable events include:

- (a) a discharge into coastal waters of a noxious liquid substance necessary for the purpose of securing the safety of a ship or saving life at sea
- (b) a discharge into coastal waters of a noxious liquid substance resulting from damage to a ship or its equipment
- (c) a discharge into coastal waters of a noxious liquid substance, approved by an authorised officer, to combat specific pollution incidents to minimise the damage from pollution
- (d) a discharge exempted under section 22 or 27 of the *Protection of Marine Waters (Prevention of Pollution from Ships) Regulations 2013*.

4.2 SOPEP requirements

4.2.1 Spill response procedures

Spill response procedures outlined in the SOPEP should include:

- (1) method of raising the alarm
- (2) responsibilities of personnel on board
- (3) action to minimise or control the spill

- (4) method of cleaning up the spill
- (5) equipment to be used in controlling and cleaning up the spill
- (6) method of informing appropriate personnel and agencies of the spill and subsequent action taken.

4.2.2 Ship oil spill response equipment

All ships should maintain on board sufficient oil spill response equipment to respond effectively to the most likely types of spills that could occur during normal operations. An adequate number of personnel to assist in deployment of emergency equipment must also be available.

Oil spill dispersants cannot be used without prior approval from the relevant State Marine Pollution Controller.

4.3 Reporting

Under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987*, the master of a ship must report a discharge or probable discharge of any pollutant without delay to the State Marine Pollution Controller. Pollutants are defined as harmful substances and include oils, chemicals, sewage and garbage. Even minor instances of marine pollution must be reported.

The local Vessel Traffic Service Centre is the means by which the relevant State Marine Pollution Controller should be advised of any pollution incident and can be contacted by VHF on the primary VHF communication channel 12 or 16.

Notification via VHF is to be followed by the completion of a POLREP (Pollution Report).

5.0 Safe transfer of bunkers

5.1 Introduction

Bunker transfer is not envisaged or catered for at the port of Port Spencer.

To ensure the transfer of bunkers in South Australia waters is completed in a manner that is safe and does not result in the discharge of pollution, adequate planning and preparation must be undertaken. In addition, certain limitations exist on the timing of transfer operations and the areas where this may occur along the South Australia coast. To ensure a safe standard of operation is maintained, the following considerations should be

considered when planning for bunkering.

5.1.1 Night transfer operations

The *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* places restrictions on transfers of oil or fuel between ships, between sunset and sunrise. In exceptional circumstances night transfer operations may be undertaken, subject to written approval from an Authorised Officer via the relevant State Marine Pollution Controller office and provided that the transfer operations take place in accordance with the conditions stated in the approval.

5.1.2 Double hull requirement

All oil tankers, including bunker barges that carry heavy fuel oil must be of double hull design. This requirement under MARPOL, which is administered by the Australian Maritime Safety Authority.

5.2 Planning for bunkering operations

The following aspects of the operations must be planned and communicated to all parties involved, including the relevant Harbour Master, not less than 24 hours prior to commencing bunkering.

Transfer of bunkers between ships at anchor may be undertaken provided:

- (1) the ship with greater length overall is anchored
- (2) both ships maintain their propulsion machinery ready for immediate departure.

Transfer of bunkers between ships moored alongside may be undertaken provided:

- (1) the bunker barge is securely moored to the ship using approved mooring points
- (2) both vessels are securely moored with respect to interaction from passing vessels
- (3) the deck watch maintains moorings.

A. For all bunkering operations:

- (1) weather conditions are appropriate, and moorings are adequate for anticipated weather throughout the operation; any weather limitations must be identified

- (2) moorings are adequate for predicted tidal conditions (height and current) and are tended (both ships) throughout the operation; any tide or current limitations must be identified
- (3) means of access ship to ship is maintained, whether at anchor or alongside
- (4) individual responsibilities of personnel involved in monitoring the transfer are clearly understood
- (5) all transfer apparatus to be used, including equipment, tanks and pipeline systems, should be checked to be in good working order
- (6) briefing with the fuel supplier should include the method of communication, pump rates and emergency stop procedures.

5.3 Transferring procedures

5.3.1 Preparation by ships receiving bunkers

Ships receiving bunkers should ensure the following preparations are completed:

- (1) plug scuppers to prevent spills from entering the water
- (2) check ullage and confirm volume to be supplied
- (3) check tanks, pipe system and pumps are set up and confirm any ship internal transfer processes
- (4) organise blank flanges where necessary
- (5) clean drip trays and save-alls
- (6) ensure emergency spill equipment is ready to contain and clean up any accidental spill
- (7) ensure no ignition sources are within 25 metres of any bunker flange and/or vent pipes associated with the transfer operation
- (8) ensure a visual watch is maintained throughout the entire transfer

operation

- (9) ensure all areas remain clean and spill free
- (10) the bunker hoses are well supported and are of sufficient length to allow for movement of the ship
- (11) any cargo handling in progress will not hinder bunker transfer operations.

5.3.2 Preparation by ships delivering bunkers

Ships delivering bunkers should ensure the following preparations are completed:

- (1) the bunker hoses are in good condition and are “in test” in accordance with the appropriate Australian standard, and the test certificate is available on request
- (2) the bunker hoses are well supported and are of sufficient length of allow for movement of the ship
- (3) the bunker connection has a good seal
- (4) there is a well tightened bolt in every bolthole of the bunker pipe connection flange
- (5) any hose spanning the water must be of a continuous length containing no joins or connections.

5.4 Responsibilities for ship and bunker supplier

A. Preparation

Prior to commencement of bunkering:

- (1) a bunker checklist must be completed (see Appendix A – example checklist)
- (2) spill and emergency management procedures must be agreed upon.
Once bunkering has commenced:
 - a) no smoking, naked flame or hot work is permitted
 - b) a constant visual watch is maintained throughout the entire

transfer operation, especially during start up and topping off

- c) weather and sea conditions must be constantly monitored, and moorings appropriately tended
- d) sufficient absorbent spill material is available on site to deal with any accidental spillage
- e) action must be taken to stop or contain any spill and the relevant port authority is immediately notified
- f) visual check of waters around ships to identify any spills.

5.5 Communication arrangements

During transfer operations there should be regular communication maintained between the ship and supplier. Once the method of communication is initially established, the following information should be exchanged:

- (1) confirm transfer starting and stopping procedures
- (2) confirm transfer rates, pressures and quantities
- (3) confirm emergency stop procedures
- (4) confirm method of raising the alarm in the event of an emergency.

5.6 Emergency procedures

Procedures for handling all emergencies may vary but should include as a minimum:

- (1) method of raising the alarm
- (2) responsibilities of key personnel
- (3) action taken by employees to ensure their own safety and the safety of those around them
- (4) action taken by employees to minimise the damage to property and environment
- (5) method of cleaning up a spill
- (6) method of informing Port Managers, government agencies, owners, charterers and their agents.

All ships involved in bunker transfers should maintain on board sufficient oil spill response equipment to respond effectively to the potential size of spill

that could occur during bunkering operations. An adequate number of personnel to assist in deployment of emergency equipment must also be available during the bunker transfer.

5.7 Reporting

All instances of marine pollution must be reported:

- (1) immediately to the State Marine Pollution Controller via the local VTS; and
- (2) this notification must be followed by the completion and submission of a POLREP form.

6.0 Sewage

It is an offence to discharge sewage (either deliberately or negligently) into nil discharge waters.

6.1 Requirements

There are also several specific sewage requirements that operators must adhere to, including:

- (1) All ships must be fitted with a macerator that cannot be bypassed
- (2) All declared ships must:
 - (a) be fitted with a sewage holding device (Note: The owner or master of a declared ship must not operate the declared ship in nil discharge waters for treated sewage or untreated sewage from a declared ship, unless the declared ship is fitted with a sewage holding device and each fixed toilet on the declared ship is connected to a sewage holding device.)
 - (b) carry a sewage disposal record book
 - (i) entries in the sewage disposal record book are to be made:
 - every time sewage in the ship's sewage holding device is discharged into a disposal facility
 - by the ship's master or other person in control of the discharge.

- (ii) entries in a sewage disposal record book must:
 - state the date, time, place and volume, in litres, of each discharge
 - be made in the English language
 - be signed by the ship's master or other person in control of the discharge.
 - have a shipboard sewage management plan that must:
- (iii) be written in the English language and state the following particulars:
 - name, registration number and class of ship to which the plan applies
 - size and type of the ship
 - how the plan provides for the management of shipboard sewage and prevents the unlawful discharge of sewage from the ship
 - waters, if any, where the ship may lawfully discharge sewage
 - equipment the ship is fitted with for holding or treating sewage
 - operating and maintenance instructions for the equipment
 - how the equipment is operated to prevent the unlawful discharge of sewage into the waters where the ship is operating
 - how the equipment is maintained and checked to ensure the

equipment is in proper working order.

- (3) All ships fitted with a sewage treatment system must:
 - (a) keep the sewage treatment system in proper working order
 - (b) ensure that the sewage treatment system conforms to the following minimum standard:
 - (i) include system documentation
 - (ii) include a comprehensive and durable system service manual
 - (iii) have a durable label attached to it, stating the manufacturer's name and address and the type and model number of the treatment system
 - (iv) be installed in accordance with the manufacturer's instructions
 - (v) be fitted with an indicator to indicate if the treatment system is malfunctioning
 - (vi) if sewage entering the treatment system is not macerated before it enters the treatment system—be fitted with a macerator before the treatment system's main treatment process starts to treat the sewage
 - (c) ensure that the sewage treatment system is:
 - (i) maintained, at least, at the intervals and in the way required by the treatment system service manual
 - (ii) assessed by analysing the sewage after it has been treated in the treatment system, as outlined below:

- the assessment must be performed by an independent testing entity at the following intervals after the treatment system is fitted to the ship:
 - for a declared ship, at least annually for the first two years and afterwards, at least every two years
 - for a ship other than a declared ship, at least once in the first five years and afterwards, at least every two years
 - the assessment must show that the levels of sewage quality characteristics remaining in the sewage after it has been treated in the treatment system are not more than the levels for the relevant grade of treated sewage for the treatment system
- (iii) keep the system documentation and system service manual on board and readily available for inspection at all reasonable times
- (iv) keep written service records for the treatment system and ensure they are kept on board and readily available for inspection at all reasonable times.

7.0 Garbage

It is an offence to discharge garbage (either deliberately or negligently) into South Australia coastal waters. Under the *Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987* severe penalties apply.

Items of garbage generally found on board ships include:

- food waste
- paper products
- rags
- glass
- metal

- fishing gear
- deck sweepings
- all plastics.

Operators can prevent garbage entering the water by:

- ensuring that nothing is thrown overboard
- having secure garbage bins/bags to store garbage on board until you return to shore
- retrieving garbage if it does enter the water.

Note: If shore facilities are not adequate for the disposal of your garbage, let the marina operator or port authority know.

7.1 Other requirements

There are several specific garbage requirements that operators must adhere to, including:

- all ships that are at least 12 metres in length overall must display a placard about garbage disposal that notifies the ship's crew and passengers of the prohibitions and requirements for the disposal of garbage

New international regulations requiring vessels and fixed or floating platforms to carry a garbage management plan came into effect on 1 January 2013. These requirements are part of MARPOL, which is in force in 151 countries and is applied in Australia by Commonwealth and state/territory legislation.

- if you are the shipowner/operator of a commercial or recreational vessel that is over 400 tonnes gross weight, or the vessel is certified to carry 15 or more passengers, or operate a fixed or floating platform, you are now required to carry on board a garbage management plan in accordance with the regulation.
- A garbage management plan must—
 - (a) provide written procedures for the collection, storage, processing and disposing of garbage, including procedures for the use of the garbage disposal equipment on board; and
 - (b) designate a person to be responsible for ensuring the plan is followed; and
 - (c) be in accordance with the guidelines developed by the IMO.

- If a garbage record book, in the form specified in the Appendix to Annex V of the 1978 Protocol, is not carried at all times on a ship to which this regulation applies, the master and the owner of the ship are each guilty of an offence.

8.0 Pollution prevention documentation

Ships operating in South Australia waters are required to carry documentation in relation to various aspects of pollution prevention. Failure to carry the required documentation is an offence. Penalties apply for non-compliance. The documents mentioned in this guide include:

- Shipboard Oil Pollution Emergency Plan (SOPEP)
- Oil Record Book
- Shipboard Sewage Management Plan
- Sewage Disposal Record Book
- Sewage Treatment System Documentation, System Service Manual and Service Records
- Placard about garbage disposal requirements
- Shipboard waste management plan (garbage).
- Pollution prevention for ships, required documents
- Pollution prevention documents, other than MARPOL documents, required for ships in South Australia waters.

9.0 Response Plan to Oil Spills

This plan has been prepared in accordance with the agreed arrangements of Australia's *National Plan for Maritime Environmental Emergencies* (National Plan) and the requirements for South Australia. The Marine Operations Group of Transport SA is responsible for the management of the National Plan in South Australia and for ensuring that State and Regional Plans are maintained to deal with oil spills wherever they occur in State waters.

Any pollution from a ship or notice of oil on any State waters can be reported to the nearest port operator, or:

P E N I N S U L A | P O R T S

*The Adelaide Outer Harbour signal station Telephone (+61) 8 82483505 or
Marine Operations Group, Transport SA, Telephone (+61) 8 83475025*

Port Spencer ANNEX 1 – FIRST STRIKE RESPONSE PLAN (*below*) deals with first-strike response to oil spills from ships and other marine sources within the port limits of Port Spencer, South Australia. See chart below for details of the port area.

The port limits *exclude* Lipson Island and Marine Operations (SA) is responsible for oil spill response in this area.



ANNEX 1 - FIRST STRIKE RESPONSE PLAN

(MARINE INCIDENTS)

PORT SPENCER

Version	Drafted	Checked	Approved
0.1	Ryan Norval	John Kavanagh	

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1.23

EQUIPMENT LIST

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Response Container Content

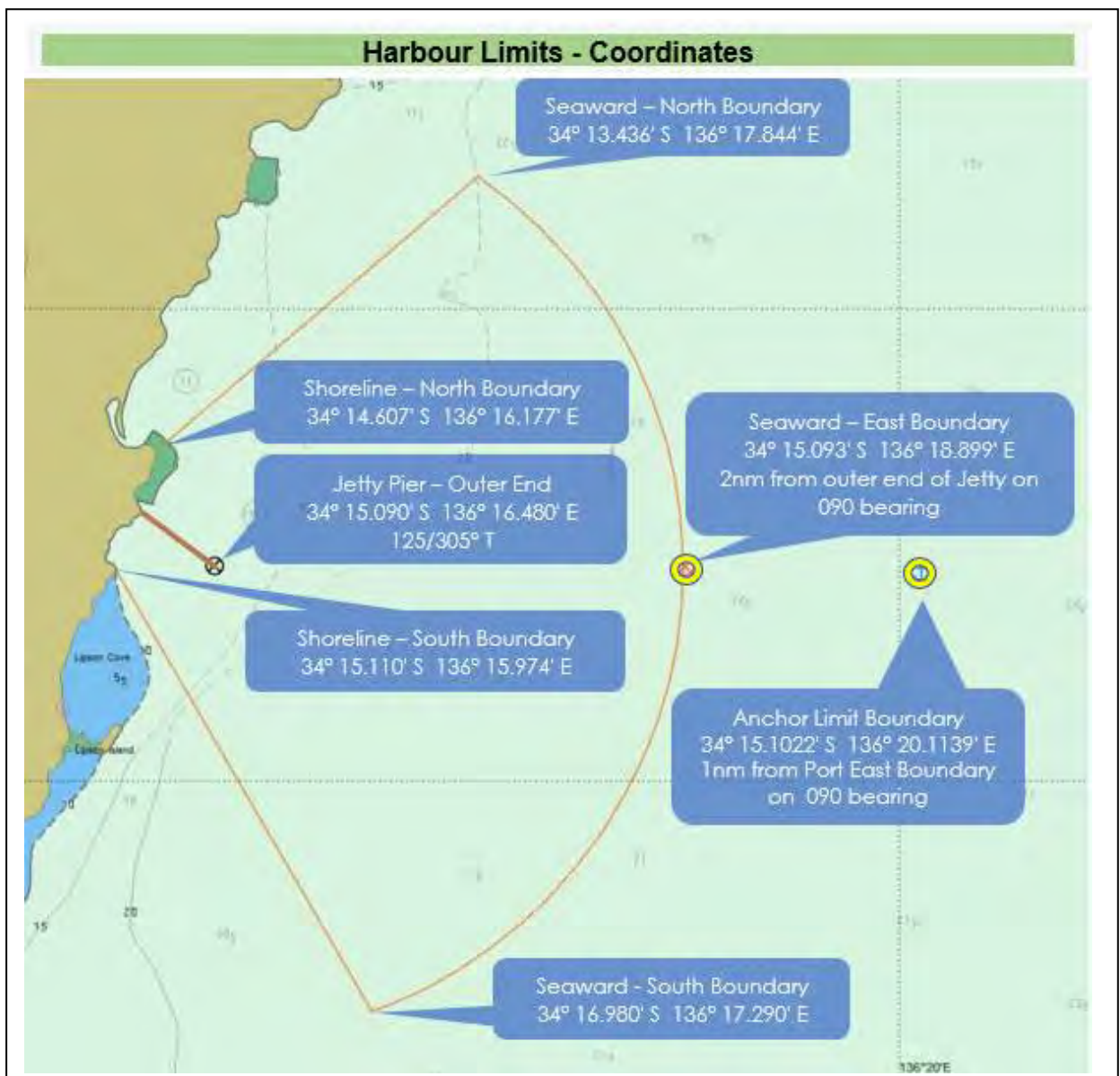
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ANNEX 1 FIRST STRIKE RESPONSE PLAN – OIL Pollutants

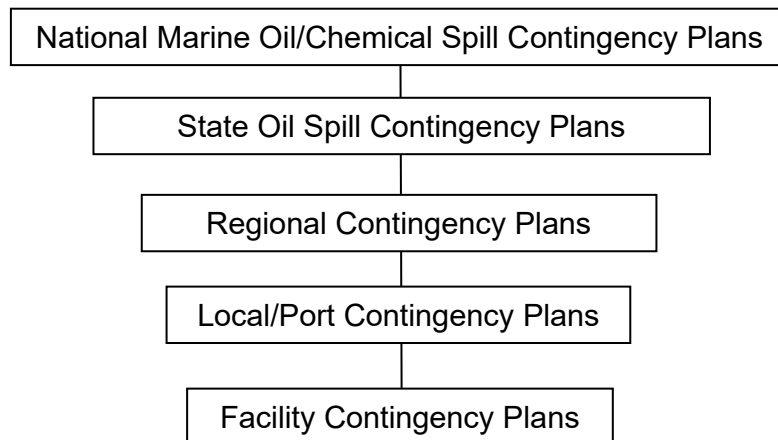
1.1 Objective

This First Strike Response Plan has been developed for the Port of Port Spencer to provide a response system proportional to the Oil Spill Risks identified within Port Limits from ships and other marine sources.

NOTE: Peninsula Port Authority – Port Spencer should be alerted to any incident involving marine pollution by oil to ensure immediate response on their behalf as well as appropriate support relating to the first strike plan.



1.2 National Plan – Hierarchy



1.3 Roles and Responsibilities

The roles and responsibilities for first strike response to oil spills within the port limits of Port Spencer are defined as follows:

- Maritime Safety South Australia (DPTI) is both Statutory and Combat Agency for ship sourced oil spills that impact South Australia Coastal waters and is the pre-designated Incident controller for all incidents within the scope of this plan.
- The port operator, PENINSULA PORTS is responsible for ensuring that an adequate first-strike oil spill response capability is maintained within the port limits of Port Spencer.
- Local councils generally assume responsibility for clean-up of oil impacted shorelines outside of National Parks. Depending upon the geographical location of stranded oil the District of Tumby Bay may be requested to undertake shoreline clean-ups operations following an oil spill within the port.
- The South Australian Marine Spill Contingency Action Plan (SAMSCAP) is managed by DPTI.
- The Marine Operations Group of Transport SA is responsible for clean-up of oil from beaches within National Parks.

Details of the roles and responsibilities may be found in *Appendix 1* to the Inter-Governmental Agreement on the National Plan.

The DPTI is the nominated SA Control Agency for oil spills in SA State marine and inland waters and will assume overall direction of emergency management activities in an emergency. Authority for control carries with it the responsibility for tasking and coordinating other organisations in accordance with the needs of the situation. The *Emergency Management Act 2004* (SA) identifies the SA Police as the coordinating agency for all emergencies.

The State Coordinator is the person for the time being holding or acting in the position of Commissioner of Police, therefore, the arrangements in SA will be;

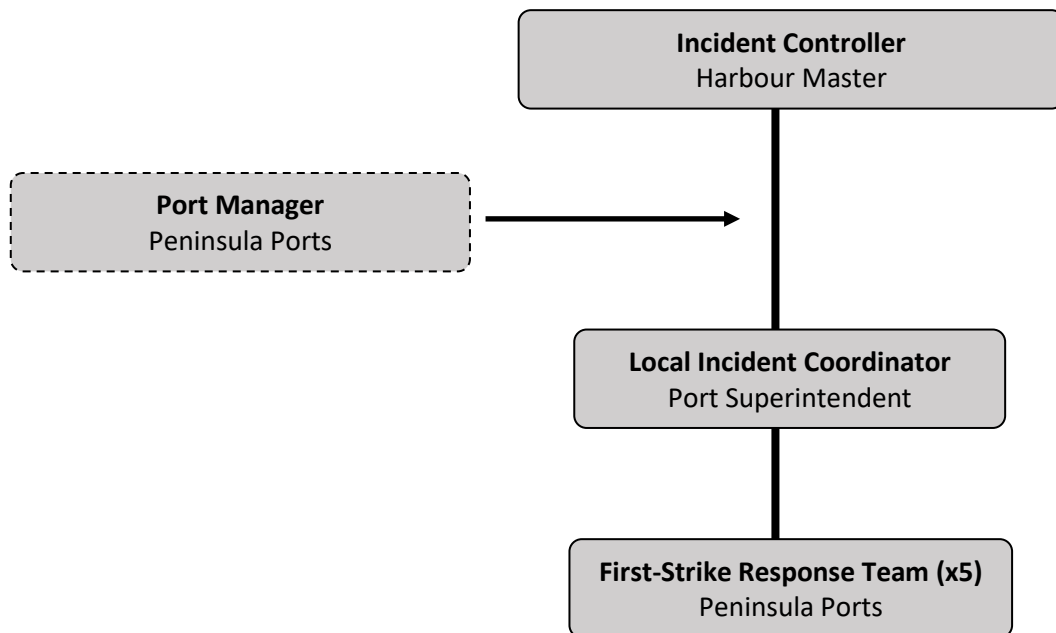
- SA Police will become the Coordinating Agency for any spill incident;
- DPTI will become the Control Agency for a spill within 3nm;
- DPTI provides the SMPC;
- DPTI will plan & execute the State arrangements for the incident within 3nm;
- DPTI will plan & execute the State shoreline arrangements for the incident within 3nm;
- DPTI will integrate the Port Spencer resources within its own command structure;
- DPTI will integrate the Port Spencer technical expertise within its own command structure

PENINSULA PORTS acknowledge that the responsibility for clean-up of a spill associated with its activities remains with PENINSULA PORTS and in the event of State or Commonwealth assistance all reasonable costs incurred will be recoverable.

The South Australia Marine Spill Contingency Action plan (SAMSCAP) is used as the basis for management of all oil spills outside port limits. This will also include an oil spill within the port limits if assessed as in excess of 10 tonnes, or otherwise agreed with the Port Spencer Incident Controller.

Port Spencer scope focuses on Level 1 marine oil spills (up to 10 tonnes) that occur.

1.4 Response Team Structure (trained personnel pursuant to



1.5 Constraints

The *Marine Parks Act 2007* (SA) and the *Marine Parks (Zoning) Regulations 2012* (SA) prohibit entering or engaging in any activity in a restricted access zone and prohibit certain activities in marine park zones (Lipson Island).

The regulations do, however, allow for a number of exemptions from prohibitions and restrictions, including for persons acting in the course of emergency. The definition of emergency provided in the regulations includes an event that causes or threatens to cause harm to the environment, so a permit may not be required. If Peninsula Ports is directed by the State to undertake spill response activities in a marine park zone, Peninsula Ports will only undertake these activities once permit requirements are confirmed.

1.6 Scope

This plan describes the specific actions to be taken in the event of a spill from any of the identified high-risk incident locations identified within the port limits.

The Basic components of this first strike plan are as follows:

- Predictions of oil trajectory, impact areas & weathering processes (predetermined);
- Response protection priorities (predetermined);
- Response strategies e.g. contain & recover with booms and skimmers (predetermined);
- OH&S involved in the operation, including hazards & control measures;
- Waste Management;
- Personnel - number of responders needed;
- Equipment – the type of equipment and the ancillaries and logistics required;
- The expected realistic timing for the operation; and
- Clear communications for the response operation.

1.7 Overview of response systems in Port Spencer

The four key response strategies considered most effective for the perceived risks at Port Spencer are,

- Stop the spill at its source
- Monitor and evaluate (Helicopter)
- Protection of key resources using containment boom (Jetty, Port shoreline)
- Containment and Recovery (on water collection and skimmer systems as soon as practicable)
- Shoreline clean-up (outer port beaches – Rogers beach, Lipson Cove beach)

The strategies were considered as most appropriate considering the brevity of available time to commence a **response facility's proximity** to immediate assistance and sensitive environmental areas close by.

These above selected strategies were also deemed appropriate in consideration of the constant changing profile of the Port waterways

during the construction of new facilities.

1.8 Environmental Protection Priorities

No FSRP can guarantee complete protection of the marine environment from an oil spill. The FSRP provides a realistic response system designed to protect the key resources identified as being under threat from a marine oil spill event within Port Limits.

1.9 Threat assessment

The most likely type of pollution incidents to occur within the port are small operational discharges from the tugs and multi-purpose vessel. However, there is also a chance of larger operational discharges of fuel oil or waste oil from the visiting bulk carriers at the berth and/or significant spills of heavy fuel oil resulting from contact incidents within the port.

1.10 Possible Spill Scenarios

The types of incidents most likely to occur within the port are small spills of petrol, diesel fuel or bilge oil from operational vessels operating in the port.

Spills of up to:

- 300 tonnes of heavy fuel oil and other oil products from Bulk Carriers involved in serious striking or grounding incidents within the port;¹
- 10 tonnes of bunker fuel or bilge oil during ships' internal transfer operations;²
- 50 litres of diesel fuel or bilge oil from operational vessels could also occur in the port.

Large spills of fuel oil and other oil products and from road tankers or other land-based sources are also possible.

¹ See for example Pacific Adventurer bunker spill in 2009: <https://www.amsa.gov.au/marine-environment/incidents-and-exercises/response-pacific-adventurer-incident-strategic-issues>

² See for example Global Peace Bunker spill in Gladstone in 2006: <https://www.amsa.gov.au/marine-environment/incidents-and-exercises/global-peace-oil-spill-report-incident-analysis-team>

1.11 Response and Handover Arrangements

Early first-strike response action should include an assessment of the time and resources required to effectively manage each incident. Where a response is likely to be prolonged or exceed the port's first-strike response capacity, Port Spencer should request assistance from Maritime Safety South Australia. When determining the need for assistance or hand-over of the response Port Spencer should consider the number and availability of local trained response personnel, their ability to work safely without the need for excessive work hours, and the capacity of the ports' first-strike response equipment. Requests for assistance should be made as soon as possible and preferably in the first or subsequent SITREPs.

Level one spills might require dispersant spraying, although approval will be sought from the State Marine Pollution Controller (SMPC). Only Prescribed officers under SAMSCAP and the National Plan may authorise the use of Dispersants.

In the first instance following a spill, Peninsula Ports Response Team and Vessels (including tugs as appropriate) may be utilised for:

- Deployment of boom
- Containment of any surface oil
- Monitoring and reporting of oil type, quantity and extent of surface coverage
- Initial clean-up response; and
- If instructed by SMPC, application of dispersants.

If approved, the surface application of dispersants may be an effective response tool on hydrocarbons, as long as they can be applied to fresh oil and during the dispersant "window of opportunity".

1.12 Peninsula Ports Incident Control Centre

Port Spencer VTS will, in the first instance for a tier 1 oil spill, act as the Incident Control Centre and communications hub for Peninsula Ports. If required, and subject to guidance from the SMPC, an Incident Control Centre may be upgraded or transferred to another location for an ongoing or higher-level Tier 2/3 response.

1.13 Initial Assessment

All Oil spills reported to the VTS should be assessed immediately and the appropriate response plan activated. The initial assessment should determine if:

- Is it safe to respond? (MSDS)
- Can we stop the spill at its source?
- Has the discharge stopped?
- Where is it going? (Ebb or Flood Tide)
- When will it get there?
- Which prepositioned system should be deployed first? (flood tide)
- What receptors will be impacted outside the harbour? (ebb tide)
- Is it safe to employ those response strategies?

1.14 Lipson Island Fauna Conservation Reserve

Lipson Island Fauna Conservation Reserve is a Category III Natural Monument or Feature (based on the International Union for the Conservation of Nature or 'IUCN' categorisation). **The Primary objective of the Lipson Island Fauna Conservation Reserve is to protect the outstanding natural features and associated biodiversity and habitats in and near to Lipson Island.** IUCN Category III is related to the conservation of the natural feature itself, in this case, Lipson Island and its immediate vicinity.

The Lipson Island Fauna Conservation reserve, established in 1967, is centred on Latitude 35.2638 S Longitude 136.2658 E, is 8 ha in area, and is primarily a marine reserve.

Any spill response must give proper attention to the protection of the Lipson Island Fauna Conservation Reserve and its natural environment.

Diagram needed for oil spill planning and training purposes:

1.15 Response considerations and options

Location	Monitor	Contain & recover	Protect Resources	Shoreline Clean-up	Apply Dispersant
Jetty	Yes	If practicable	If practicable	If practicable	If authorised
Lipson Island Fauna Conservation Reserve	Yes	If practicable	YES	YES	NO
Shoreline	Yes	If practicable	If practicable	If practicable	If authorised

1.16 Response Level Determination

Response Level Indication	Level3	Level2	Level1
Spill Details			
Release Volume	> 300m ³	10m ³ – 300m ³	< 10m ³
Continuous release	Yes	No	No
Hydrocarbon has high persistent component	Yes	Yes	No
Resolution likely to take	> 2 weeks	48hrs to 2 weeks	< 48hrs
Spill Impact			
Actual or potential threat to, or	Yes	No	No
Adverse impact on public or	Yes	Possible	No
Oil will reach the shoreline	Yes	No	No
Media coverage likely	International	National	Local
Likely Resources Required			
International resources required, International agencies and government involved	Yes	Possibly	No
Regional resources required; multiple agencies involved	Yes	Yes	No
Peninsula Ports resources on hand will be sufficient	No	No	Yes

1.17 Oil Spill Response Mechanism Overview

1.17.1 Appropriate Equipment

PPA-PS has oil spill response equipment which:

- Is capable of containing and recovering oil rapidly in accordance with the expected response time available;
- Able to contain and recover a 120-tonne spill of Heavy Fuel Oil within 2 hours of deployment
- Is able to store and transfer up to 150 tonnes of Heavy Fuel Oil recovered to two 50t storage bladders as well as two 10t towable storage bladders
- Has a dedicated first response vessels (M P V) used for towing booms into position and skimming
- Equipment for a team of 20 shoreline responders.

1.17.2 Training

The Port Spencer Port Authority has in place a targeted training regime which provides a training pathway for responders to develop their skills in mounting a first strike response with the available equipment.

1.17.2.1 Training Regime & Exercises

Table 1 is the training regime developed to prepare sufficient personnel for the required response operations as shown in the First Strike Plans.

TABLE 1 TRAINING REGIME			
TRAINING OR QUALIFICATION	NUMBER REQUIRED	PURPOSE OF TRAINING	REVALIDATION FOR TRAINED PERSONNEL
Restricted Coxswain	2	Meet legal obligations and ensure safety	As required by National regulations
Introduction to oil spills	all	Provide all site-based personnel with an understanding of oil spill response operations	2 basic courses every year
Shoreline assessment and clean-up	2	To lead an assessment team and commence clean-up operations	2 years
Aerial observers course	2	To gain skills required to make an assessment of spill location and extent	2 years
Equipment Operator	6	Capable responders to deploy on-shore and off-shore equipment in accordance with the First Strike Plans.	1 year
Oil Spill Team leader	2	Able to plan a response operation and manage offshore operations	Ongoing training provided up to 3 sessions per year

TABLE 2 TRAINING EXERCISES			
EXERCISE TYPE	PERSONNEL TO ATTEND	TESTING RESPONSE OPERATIONS	FREQUENCY
Desktop and planning	PPA- PH	Planning and cooperative	Annual
PPA-PS	Restricted Coxswains, Operators and Team Leaders	Continuous improvement of deployment operations	Annual

1.17.3 Responsibilities / Actions

Standard Work Instructions (SWI) have been formalized for all likely deployments of the leased oil spill response equipment by PPA-PS. This gives responders a prompt sheet to reference at any time rather than waiting for plans and instructions to be given. These are located at the site of the equipment as well the intranet and in the VTS office.

1.18 Floating Oil

The risk assessment, local experience and trajectory modelling all show that spilled oil will only be adrift for a few hours within the port before it enters the shoreline and beaches.

It is likely that oil emanating from all the high-risk incidents listed, could impact receptors in less than 1 hour.

First Strike response for floating oil:

Contact VTS immediately and request an on-water response operation to recover floating oil. Deploy MPV to commence skimming of floating oil, utilise MPV to tow booms into position from the Response Container.

1.19 Oiled Shorelines

The sandy shorelines provide an opportunity to recover oil which travels with the currents running parallel with the shorelines.

First Strike response for risk to or already oiled shorelines:

PPA-PS will deploy their stock of shore sealing booms and GP booms to establish several collection points on the identified beaches and to protect Lipson Island. The collection points identified also require oil recovery and storage equipment and access for servicing the equipment.

1.20 Oiled Wildlife (Shoreline Clean-up)

Only trained personnel in wildlife capture and cleaning should attempt to collect oiled wildlife.

At this stage the prompt notification of a spill and identified impact areas should be transmitted ASAP to DAW personnel to respond appropriately to the identified risks.

The highest risks to wildlife have been identified in the risk assessment as:

- Sea Birds

The OWRP will specify the estimated numbers of oiled birds, and the capture, transport, cleaning and rehabilitation of the animals.

1.21 Stopping the spill at the source

It may be possible to place a boom on the hull of the ship to capture leaking oil. This should only be attempted in close consultation with the Harbour Master and the ships Master and Chief Engineer. This should be done only after the appropriate equipment has been deployed to protect the jetty, beaches and environmental sensitive areas.

It is always a good idea to place a boom around the damaged area of a ship even if the leak has stopped in case of a secondary release; however, time does not permit this to be done prior to other protection

systems in the case of Port Spencer. As with all response systems, this should be exercised and tested.

1.22 Response Plans

The following response plans specify the potential of a spill to a particular location, along with response tactics and resource options.

1.22.1 Containment in Port Limits

Purpose: The purpose of the primary containment procedures is to reduce the likelihood of oil impacting the Port Limits.

The MPV is located at the Jetty able to capture and recovery of oil entering the Jetty area.

Response Tactics: Direct oil into the skimmer catchment area using the on-board booms, blower and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: The resources required for this operation are in the Response Container

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the Jetty.

1.22.2 Containment at Lipson Island

Purpose: To reduce the opportunity for oil to enter Lipson Island and reduce the impact.

Response Tactics: Direct the oil using the on-board booms (tugs) and deployment system and collect oil using the Foilex TDS200 Skimmer

Resources: Resources required are on board the MPV and Tugs

Timing: It is expected that this deployment operation should take approximately 25 minutes from arrival at the spill site.

1.23 EQUIPMENT LIST

Response Container Content

RESOURCES FOR CONTAINMENT	
RESOURCES	QTY
General Purpose Boom - Flex	300m
Land Sea Boom Kit (boom, pump & blower)	600m
Weir Skimmer Kit (skimmer & spate pump)	1
Flexi-Dam recovered oil storage container - 25 tons approx. - each	2
Anchor Kit	1
Sorbent Boom	120m
Sorbent Pads	500
Sorbent Mops	120
Bag of rags	1
Box of ear plugs	1
Sunscreen	1
Gloves	5
Hand cleaner	1
Tool bag	1
Inflatable life jackets	5
Box of spares	1
First aid kit	1
Shade tent	1

end of document

Appendix A: Bunker Transfer Checklist

Bunker transfer checklist			
Name of ship		Berth	
Start date/time		Finish date/time	
Product		Quantity	
Checklist			Yes/ No
1	Is the ship securely moored?		
2	Is there safe access between ships or ship/shore?		
3	Is the ship ready to move under its own power?		
4	Is there an effective and dedicated bunker watch in attendance on board?		
5	Means of communication between ship and supplier: o handheld radios o staff at manifolds o other		
6	Has emergency shut down procedure been agreed?		
7	Has the bunker tank and pipe system to be used on the ship been identified, tank ullage taken and volume to be received confirmed with		
8	Has information on firefighting & emergency procedures been exchanged?		
9	Is oil response equipment on hand and ready for use, with sufficient absorbent material available to deal with any accidental spill?		
10	Are all scuppers and other deck openings securely plugged or sealed?		
11	Is there an empty, plugged save-all or drip tray under the manifold connection?		
12	Are unused bunker connections closed, flanged and secured?		
13	Are bunker hoses: Of sufficient length to allow for ship-movement o in test o in good condition o properly rigged		

PENINSULA PORTS

14	Are all connections o bolted o fitted with secure camlocks o both	
15	Are hoses spanning the water continuous with no connections?	
16	Are "No Smoking/No Naked Flame" regulations being observed, including signage?	
17	Are sufficient personnel on board & ashore to deal with an emergency?	

Emergency contacts in event of spill

VTS VHF Ch: 16 Tel: TBA

The items in this checklist have been verified and the entries made are correct to the best of our knowledge.

Ship

Name & Rank:

Signature:

Barge/shore operations

Name & rank:

Signature:



Appendix J
Contractor's Environmental Management Plan



Port Spencer Grain Export Facility
Amendment to Public Environmental Report

VOLUME 4 OF 5

IW219900-0-RPT-0003 | 1

November 2019



Contents

Volume 1	Executive Summary and Amendment to Public Environmental Report
Volume 2	Appendix A (Review of Evaluated Project)
Volume 3	Appendix A (Review of Evaluated Project – Appendices A to J)
Volume 4	Appendix B (Draft Construction EMPs)
Volume 5	Appendices C to E

Volume 4 of 5

APPENDIX B – Draft Construction Environmental Management Plans (EMPs)



McConnell_Dowell
MCD Management System
ABN No. 71 002 929 017

CONTRACTORS ENVIRONMENTAL MANAGEMENT PLAN (CEMP)

MMS ID: HSEQ-ENV-TEM004-GEN-XXXXX

Former Id: 025-J002-100

Client: Free Eyre

Project: Port Spencer

Location: Lipson, South Australia

Project No: 5279

Revision History

Rev	Date	Details	Author	Reviewer	Approver
A	05-09-2019	DRAFT for ECI Review	M. Ross	T. Walker	N. Ayres

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COMPLIANCE TABLE

Requirement	Reference Location
TBC	TBC

TERMS AND DEFINITIONS

PLEASE REFER TO MMS DEFINITIONS (HSEQ-DOC-PRO001-GEN-GRP-ATT 2) PLUS:

Term/ Acronym	Definition
CEMP	Contractor's Environmental Management Plan
CEP	Construction Execution Procedure
CMO	HSEQ compliance database software
Contractor	#MCCONNELL_DOWELL_ENTITY#
EMS	Environmental Management System
EPI	Environmental Protection Instructions
ERP	Emergency Response Plan
HSEQ	Health, Safety, Environment and Quality
JSEA / SWMS	Job Safety and Environment Analyses / Safe Work Method Statement
PDCA	Project Development, Controls and Approvals register
MMS	McConnell Dowell Management System

1 INTRODUCTION

1.1 PLAN PURPOSE

This Contractor's Environmental Management Plan (CEMP) is part of the suite of documents required for Project activities as outlined in **PMP Document Register** (COR-GNG-TEM001-GEN-ALL ATT 1) and has been developed in accordance with ISO 14001:2015. It covers the strategies, systems and procedures to ensure the Port Spencer (hereafter referred to as the Project) meets legislative, contractual and other environmental obligations and targets as relevant.

This CEMP forms and integral part of the McConnell Dowell Management System (MMS) and applies to the activities that are anticipated to occur during the Project activities.

The purpose of this CEMP and incorporated documents is to:

- Achieve the Project's stated environmental objectives and targets.
- Ensure legal and contractual compliance.
- Outline procedures for the management of environmental protection issues relevant to the activities being performed.

The CEMP is the primary document for managing potential environmental risks and opportunities specific to the Project during the works. It provides the framework for identifying environmental aspects and impacts associated with the works. In addition, it provides a framework for managing the environmental controls and processes implemented by McConnell Dowell personnel, subcontractors and consultants in carrying out their respective responsibilities in relation to the Project.

1.2 PLAN SCOPE

In development of this CEMP the following considerations have been incorporated:

- External and internal issues.
- Compliance obligations.
- Organisational units, functions and physical boundaries.
- Activities and services.
- Authority and ability to exercise control and influence.

The scope of works in relation to the Project is outlined in Section 2.2.

1.3 INTERFACE WITH OTHER PLANS

This plan has been developed in conjunction with other management plans and strategic documents required under the Contract and should be read in conjunction with these plans. The relationship of the CEMP to other key management plans (including issues-specific sub-plans) is illustrated in Figure 1-1 below.

[TBC - flowchart figure here outlining how various key plans are related]

Figure 1-1 Relationship of the CEMP to other key management plans

1.4 PLAN DISTRIBUTION

There is no restriction on the distribution of this Plan within McConnell Dowell Group entities. The controlled copy of the current version of this Plan will be maintained on the project document control database. A controlled copy of this Plan, as well as future updates, will be provided to Free Eyre.

2 PROJECT DESCRIPTION AND SCOPE

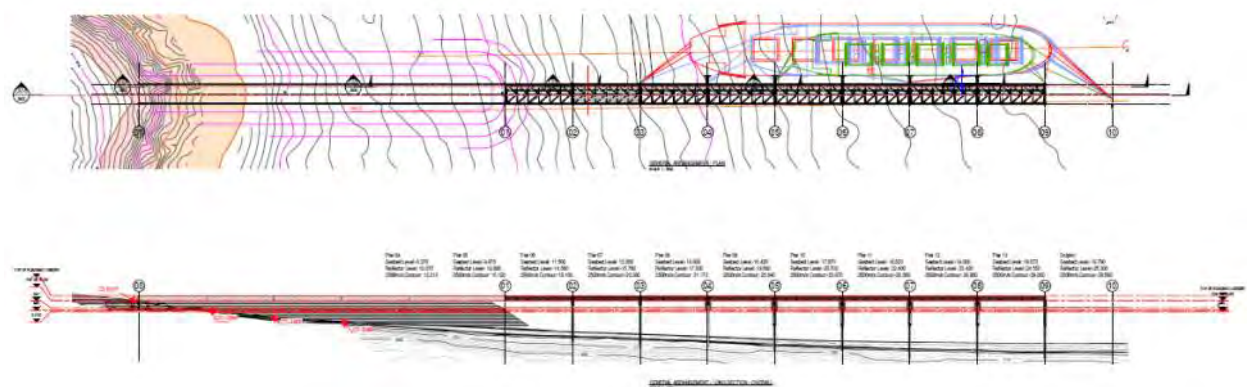
2.1 PROJECT DESCRIPTION AND CONTEXT

FREE Eyre Limited (FEL) is a public company owned by 475 EP grain growers and supporters and is proposing to develop and operate an alternate supply chain for the benefit of its shareholders and grain growers. This will include a deep-sea port (Panamax capable) at Port Spencer / Sheep Hill and up to one million tonnes of storage capacity.

The development of a Deep Water Port Facility (Port Spencer) at the Sheep Hill location was previously approved by the State Government under Section 48 for Centrex. The proposed development was the subject of a Public Environmental Report and an Assessment Report under Sections 46 and 46 C of the Act, declared a Major Development.



Various options are still being considered for the eventual wharf design, however this CEMP is based on the incrementally launch option.



2.1.1 Project Location



The environmental context of the activities and the environmental elements that may be impacted by the works or impact upon the works is outlined in Section 2.4 Environmental Context.

2.2 SCOPE OF WORKS

The main activities are outlined in Table 2-1.

Table 2-1 Key Activities

Activity	Timeframe/s
Design and logistics	October 2019 – March 2020
Offsite fabrication	May 2020 – October 2020
Site mobilisation	June 2020
Abutment preparation (excluding earthworks)	July 2020
Onsite fabrication	June 2020 – March 2021
Jetty construction using incrementally launched method	June 2020 – May 2021
Installation of piles and anchors (driven and drilled and grouted)	September 2020 – May 2021
Installation and welding of headstocks and bearings	June 2020 – June 2021
Installation of prefabricated sections	June 2020 – June 2021
Abrasive blasting and painting	June 2020 – June 2021
Mechanical and electrical works	September 2020 – June 2021
Installation and welding of ship-loader rail	September 2020 – June 2021

2.3 PROJECT STAKEHOLDERS AND INTERESTED PARTIES

2.3.1 Key Participants

Key participants in the Project will be those identified in (Table 2-2):

Table 2-2 Key Participants

Participant	Details
Free Eyre	Client / Proponent
Jacobs	Design Engineers
McConnell Dowell	Principal Contractor
TBC	Civil Contractor (directly to Client)
TBC	Offsite Fabrication
TBC	Shipping Company/ Agent
TBC	Tugs / Marine Support
TBC	Concrete Supplier

2.3.2 Interested Parties and Influential Stakeholders

McConnell Dowell takes seriously its obligations in relation to understanding the needs and expectations of interested parties. The following parties (Table 2-3) are identified as having a specific interest in the Project with particular interest in its environmental management.

Table 2-3 Interested Parties

Interested Party	Details
Statutory & Regulatory Bodies TBC	Complying with the statutory and regulatory requirements as defined from time to time Local community complaints
Other agencies/ bodies specific to the project - TBC	Complying with their respective requirements as identified in the contract and from time to time
Public Neighbouring sensitive land uses Local residences Any other public interfaces	Safety and environmental compliance of the project Does not cause an environmental nuisance
Certification Body LRQA	The environmental management system developed based on MMS is being complied with.

Consultation to understand the needs and expectations of these interested parties will be developed if and as required or necessary throughout the Project.

2.4 ENVIRONMENTAL CONTEXT

Table 2-4 describes the environmental context of the works in relation to key environmental elements and known significant environmental issues. The performance of the activities, as outlined above, have the potential to impact on or be impacted by these.

More detailed information on the environmental conditions and related management control measures on site will be developed into environmental issue-specific management Sub-Plans.

Table 2-4 Environmental Context

Environmental Element	Existing Conditions and Key Issues
Air Quality	<p>No major developments near the site and sensitive receptors are not located adjacent to the site.</p> <p>Civil contractor will be responsible for controlling dust during construction of the project works. Project will need to consider impacts of construction dust from saw cutting and blasting on adjacent marine environment.</p>
Archaeology/ Cultural Heritage	<p>A number of sites and locations were identified during background research and field studies, the majority of which are located outside the proposed development area or are registered as having no heritage value.</p> <p>Three sites of value (one non-indigenous and two indigenous) are identified within, or adjacent to, the area. Impacts can be avoid through design, and Ministerial approval is required to disturb the sites.</p>
Fauna and Flora	<p>Based on the outcomes of the Spencer Gulf proposed ports, and the approval conditions for Port Spencer, it is considered highly likely an EPBC self-assessment in the least will be needed for this proposed port development and transshipment locations.</p> <p>A key concern of the regulators for all recent port proposals has been the interaction or perceived risk of impacts to migrating whales, specifically the Southern right whale. Important to this project, the Port Spencer development was deemed a controlled action with Commonwealth approval granted provided environmental protection measures were in place to minimise harm to Southern right whales (and all cetaceans) during construction of the wharf. The main element of the approval was for the implementation of exclusion and shut down zones around the wharf construction to prevent underwater noise impacts to whales.</p> <p>The southern right whale is a baleen whale and one of three species classified as right whales. SA whale migration starts in May and finishes in October, with frequent sightings occurring between June and September.</p>
Noise and Vibration	<p>No major developments near the site and sensitive receptors are not located adjacent to the site.</p> <p>Conditions will result from impacts to marine fauna. Specific limits have been previously imposed through approval conditions.</p>
Soils and Ground Contamination	<p>Initial reports suggest slightly elevated heavy metal concentrations in the underlying soil (land) but are considered normal for the area and are a result of interaction with metamorphosed rock.</p>
Water - Groundwater	<p>No significant contamination issues.</p>

Environmental Element	Existing Conditions and Key Issues
Water – Oceanic data	<p>The wave climate and oceanic conditions at the site have been based on the Cardno Lawson Treloar report 'Wave Climate North of Lipson Cove' RM32182/LJ5577 DRAFT version 0.0 commissioned by SKM (now Jacobs) on behalf of Centrex Metals.</p> <p>This report indicates that the location of the proposed facility is largely protected from the strong swells of the Southern Ocean with a percentage exceedance for 0.5m swell height of 1.72%. The report also indicates that the swell direction ranges from East-South-East to South-South-East.</p> <p>In response to this, and to limit the mooring and berthing loads and therefore extent of infrastructure required, Jacobs has aligned the jetty options at a bearing of 125 degrees from North. It is assumed that vessels will be berthed bow into the swell.</p>
Geotechnical	<p>Golder Associates Report 087661006 031 R Rev 0 outlines a baseline geotechnical study for the proposed Centrex Export facility. The report included a program of test pitting and drilling 8 boreholes to determine the underlying conditions at the site.</p> <p>The borehole investigation found the site was underlain by weathered granite or schist ranging from medium to very high strength. It has been assumed for the purposes of concept design that the site has shallow underlying rock.</p>

2.5 EXTERNAL & INTERNAL ISSUES

The external and internal issues are identified as having a specific interest in the Project, with particular interest in its environmental management. Refer to Table 2.5

TABLE 2.5 – INTERNAL AND EXTERNAL ISSUES

External / Internal	Factor	Bias	Risk / Opportunity	Consequence	Control / Mitigation	Monitoring & Review Mechanism
Internal	Leadership	Negative	<ul style="list-style-type: none"> Delegating authority to the project environmental manager and not taking ownership 	<ul style="list-style-type: none"> Senior management not accountable for the environmental management system (EMS) 	<ul style="list-style-type: none"> Senior management ensure that measurement of effectiveness of leaders is tied to the effectiveness of the EMS 	<ul style="list-style-type: none"> Management review meetings Review KPIs
Internal	Resourcing	Negative	<ul style="list-style-type: none"> Lack of competency of personnel involved with construction 	<ul style="list-style-type: none"> More frequent and severe environmental incidents 	<ul style="list-style-type: none"> Define the skill and knowledge required for each job 	<ul style="list-style-type: none"> CVs Qualification / training certificates Competency matrix Position Descriptions
Internal	Resourcing	Negative	<ul style="list-style-type: none"> Inadequacy of personnel to perform the work 	<ul style="list-style-type: none"> Personnel overloaded with work 	<ul style="list-style-type: none"> Determine the required number of personnel at tender stage and project commencement 	<ul style="list-style-type: none"> Internal audits
Internal	Operating	Negative	<ul style="list-style-type: none"> Environmental management system not followed 	<ul style="list-style-type: none"> Non-conformances Delays in construction Additional costs 	<ul style="list-style-type: none"> Ensure inspection and monitoring plans are developed and complied with Regular monitoring 	<ul style="list-style-type: none"> Non-conformance reports Management review meetings
Internal	Operating	Negative	<ul style="list-style-type: none"> Customer dissatisfaction 	<ul style="list-style-type: none"> Future work Project takeover Loss of revenue 	<ul style="list-style-type: none"> Ensure customer requirements are met 	<ul style="list-style-type: none"> Satisfaction surveys Management review meetings Internal audits

External / Internal	Factor	Bias	Risk / Opportunity	Consequence	Control / Mitigation	Monitoring & Review Mechanism
External	Supply Chain	Negative	<ul style="list-style-type: none"> Failure to conform to requirements Supply delays 	<ul style="list-style-type: none"> Loss of customer satisfaction Production delays Non-conformances 	<ul style="list-style-type: none"> Requirements clearly stated in the contracts Perform audits / inspections on suppliers based on risk profile to the project Incoming material inspections Part B sub-contractor assessment 	<ul style="list-style-type: none"> Supplier audits Supplier monitoring reports Material receipt inspection reports
External	Legal	Negative	<ul style="list-style-type: none"> New standards/ regulatory requirements 	<ul style="list-style-type: none"> Increased costs Additional requirements missed out Non compliance due to new regulations 	<ul style="list-style-type: none"> Monitor changes to standards via SAI Global web site Change management process Review record environmental legal and other requirements Registration to regulator updates 	<ul style="list-style-type: none"> Internal audits Regular reviews of legislation requirements at a project level
External	Customer	Negative	<ul style="list-style-type: none"> Not meeting expectations of the contract 	<ul style="list-style-type: none"> Non compliance with contract requirements. Environmental incidents due to not addressing site specific aspects 	<ul style="list-style-type: none"> Contract compliance table within all project CEMPs Internal and external review process 	<ul style="list-style-type: none"> Compliance and obligations register

3 ENVIRONMENTAL MANAGEMENT APPROACH

3.1 ENVIRONMENTAL LEADERSHIP AND COMMITMENT

McConnell Dowell undertakes a reflective, resourceful, inclusive and flexible approach to environmental management and leads by example in ensuring that statutory and contractual requirements are met and positive environmental performance is maximised.

Our approach to environmental leadership is underpinned by our ISO 14001 accredited Environmental Management System (EMS) that forms part of the integrated McConnell Dowell Management System (MMS).

In line with the requirements of ISO 14001, McConnell Dowell Group top management, represented by the Executive Committee (EXCO), are committed to review and endorse this document as part of a broader review of the MMS every 12 months. This process ensures top management (EXCO):

- Take accountability for the effectiveness of the environmental management system;
- Make certain that environmental objectives are established and are compatible with the strategic direction and the context of the organisation; and
- Ensure the integration of the environmental management system requirements in to the organisation's business processes.

3.2 ENVIRONMENTAL POLICY

McConnell Dowell have established an Environmental Policy (Environmental Policy HSEQ-ENV-POL001-GEN-GRP endorsed by the McConnell Dowell Group CEO. This document directs the level of commitment to positive and proactive environmental performance for all activities (refer.

The Environmental Policy (attached at Appendix A) makes the following key commitments:

- Visible and demonstrated environmental leadership.
- Promoting innovative thinking and practices to achieve positive environmental outcomes.
- Compliance with applicable environmental obligations.
- Monitoring environmental performance and seeking continual improvement.
- Prevention of pollution and minimising environmental impacts.

3.3 SUSTAINABILITY POLICY

McConnell Dowell have also established a Sustainability Policy (Sustainability Policy HSEQ-ENV-POL002-GEN-GRP also endorsed by the McConnell Dowell Group CEO. The policy outlines the Group's commitment to one of our five core values - sustainability

The Sustainability Policy (attached at Appendix A) makes the following key commitments:

- Business sustainability leadership through professionalism, competence and industry participation.

- Client and community protection through an uncompromising commitment to safety, quality and the environment.
- Team growth through sharing and collaboration and business growth through partnerships, market knowledge, innovation and adaptability.
- Client and community sustainability through long term relationships and acting today with the future in mind.

3.4 ROLES, RESPONSIBILITIES AND AUTHORITIES

Protection of the environment is the responsibility of all individuals and organisations involved with the Project.

All personnel will be made aware of environmental issues associated with the Project and their responsibilities through training and awareness methods detailed in Section 5.3.

The Organisational Chart describes the organisational structure for environmental management in Project delivery.

The roles and responsibilities of personnel specifically responsible for implementation of this document are summarised in Table 3-1 below. Note: roles and responsibilities for specific environmental operational controls are also set out in the **Environmental Management Standard** (REF-HSEQ-ENV-GUID004-GEN-GRP) and issue-specific Sub-Plans.

Table 3-1 Roles and Responsibilities

Role	Responsibilities
Project Director	<p>Promote at all times the company's policies, procedures and standards relating to environmental management and ensure that they are complied with.</p> <p>Ensure sufficient resources are available to achieve the policy, objectives and targets and that those resources have sufficient skills to conduct the roles competently.</p> <p>Report performance on a regular basis to internal and external stakeholders.</p> <p>Report significant incidents internally and externally as required by law and Contract Conditions.</p>
Project Manager	<p>Overall environmental performance of the Project.</p> <p>Ensure the Project achieves legislative compliance.</p> <p>Provide leadership in the development of this plan and authorise its use.</p> <p>Nominate key personnel, assigning environmental responsibilities and allocating sufficient resources to achieve implementation of this plan.</p> <p>Ensure all personnel are familiar with and implement all relevant environmental controls as required.</p> <p>Monitor environmental performance to ensure compliance and continued improvement.</p> <p>Participate in the review of the Project environmental management system and this plan.</p> <p>Encourage all personnel to maintain acceptable environmental management work practices and foster awareness of environmental matters.</p> <p>Encourage the reporting of incidents, events and other concerns and ensure appropriate feedback on proposed corrective actions.</p>

Role	Responsibilities
Environmental Management Representative	<p>Functional and technical leader for the Project's environmental obligations.</p> <p>Principal contact for internal and external communication in relation to environmental matters.</p> <p>Oversee all environmental management aspects of the Project.</p> <p>Authority to stop a particular task or activity in circumstances where environmental controls or mitigation measures have not been implemented, have been implemented incorrectly / inadequately, are ineffective or where activities may otherwise be considered to lead to environmental harm. In such circumstances, prescribe corrective action that will be implemented before work recommences.</p> <p>Develop, review and ensure this document (and associated plans) is correctly implemented. Ensure measures are put in place to manage and mitigate environmental risks and issues as identified.</p> <p>Ensure that environmental plans, procedures and work instructions as applicable are prepared, reviewed and approved prior to commencement of work.</p> <p>Ensure all significant environmental issues are reflected in the significant environmental aspects identified for the Project.</p> <p>Report significant incidents internally and externally as required by law, the Project Conditions.</p> <p>Ensure that all key environmental aspects and associated impacts are incorporated into the CEMP, and that suitable control measures are proposed to minimise the Project's environmental impact.</p> <p>Ensure that all relevant environmental permits are obtained for the Project.</p> <p>Ensure all staff and contractors engaged to work on the Project are appropriately inducted and trained in environmental issues and controls relevant to the Project.</p> <p>Ensure monitoring programs, which assess the performance of the CEMP and specific Plans, are implemented.</p> <p>Report internally and externally in accordance with Project and other requirements.</p> <p>Investigate and report incidents and non-conformance and ensure corrective and preventive action is taken and is effective.</p> <p>Provide leadership sufficient to inspire and influence others to achieve the Project objectives and targets</p> <p>Manage and track compliance with all environmental approvals, licences, permits and other obligations.</p> <p>Lead the tracking of environmental and sustainability targets for the Project.</p> <p>Ensure appropriate environmental training is identified in a Training Needs Analysis and that training is provided to personnel where required.</p> <p>Review and update this plan, as required.</p> <p>Prepare environmental data for monthly reports.</p>
Engineering / Design Manager	<p>Provide effective environmental leadership.</p> <p>Ensure designs are undertaken in accordance with the requirements of the scope of works, technical requirements, relevant standards and this plan.</p> <p>Ensure design has minimal environmental impact.</p>

Role	Responsibilities
	<p>Ensure processes and resources are in place to adhere to environmental and sustainability obligations where they affect design or are affected by design.</p> <p>Participate in incident and non-conformance report investigations and ensure that corrective and preventative action proposed is implemented effectively.</p>
Supervisor / Superintendent / Foreperson	<p>Ensure that requirements of this plan are communicated to all personnel under his/ her control.</p> <p>Be aware of all environmental risks, issues and concerns relating to his/ her area of work.</p> <p>Be aware of all approval and contractual conditions relating to his/ her area of work.</p> <p>Perform surveillance and monitoring of environmental controls to ensure they are adequately established, effective and maintained.</p>
All personnel	<p>All personnel are responsible for complying with environmental controls and requirements of this plan.</p> <p>Active awareness, demonstrated by reporting inadequate environmental controls or practices to supervision.</p>

3.4.1 Supplier and Subcontractor Management

All personnel engaged on the Project are required to operate within the requirements of this plan. Subcontractor selection and engagement, including consideration of environmental management and sustainability factors, is managed through the **Part B Pre-Award Evaluation** process (*Delete/ retain as appropriate to region: Part B Pre-Award Evaluation* (CMC-PRO-FRM009-GEN-ALL)).

Subcontractors will be made aware of environmental issues related to the Project and their responsibilities through training and awareness methods detailed in Section 5.3.

In some circumstances, based on the activities to be conducted by the subcontractor, the Environmental Management Representative may determine that the subcontractor be required to develop a Project specific Subcontractor Environmental Management Plan.

Where a Subcontractor Environmental Management Plan is required, the document is to address the specific work packages awarded and will be submitted to the Environmental Management Representative for approval. Works will be unable to commence until approval has been received. Such plans must assess the level of environmental risk and implement appropriate management controls for the subcontractor's full scope of work to a standard that is consistent with this plan.

Regardless of the approach to managing a subcontractor's environmental impacts, all subcontractors will be subject to the following:

- Regular on-site auditing to assess their performance against the requirements of this plan.
- Completion of the appropriate training requirements as specified.
- Implementation, protection and maintenance of environmental management controls as set out in environmental management documentation.
- Monthly reporting of sustainability data.

4 PLANNING

4.1 RISK AND OPPORTUNITY IDENTIFICATION

Environmental risks and opportunities associated with the Project are managed through the **HSE Risk Management** (HSEQ-HS-PRO006-GEN-ALL) process and risks to the environmental management system shall be verified within the **Tender - Project Risk & Opportunities Register (CMC-RSK-TEM001-GEN-ALL)**. This process complies with the Standard AS/NZS ISO 31000:2009 Risk Management Principles and Guidelines. During Project execution, the principal objectives of risk management are to develop and monitor the implementation and effectiveness of risk treatments and to identify and evaluate changes in the risk profile of the Project.

4.2 ENVIRONMENTAL ASPECTS AND IMPACTS

Relevant environmental aspects and impacts are managed through the combined HSE Project Risk Register, (Ref. Project **HSE Risk** (HSEQ-HS-TEM003-GEN-ALL)). This is reflective of our integrated management approach and will be kept as a live document on site. It covers all aspects of the Project, including normal and abnormal operations or activities, planned, new or modified activities and any potential emergency situations.

The Risk Register is a live document, to be continually revised during the Project duration as risks or further information comes to hand. A preliminary Risk Register for the Project has been developed from available tender / planning information. This document will form the basis for future revisions.

In determining the processes of identifying risks and opportunities, consideration is to be given to the external issues, internal issues and interested parties relevant to the project and their ability to meet the needs of the environmental management system.

To mitigate the likelihood and consequences of risks identified within the Tender project Risk & Opportunities Register, additional measures will be put in place to reduce risk occurrence and improve effectiveness of the environmental management system.

4.3 ENVIRONMENTAL COMPLIANCE OBLIGATIONS

McConnell Dowell ensures compliance with all relevant compliance obligations and aims to employ best practice environmental management procedures for the Project. Environmental compliance obligations include compliance with applicable environmental legislation, standards (including ISO 14001:2015), policies, procedures and other governance processes. Compliance obligations also include requirements of and commitments outlined in Project contract and related governance documents.

4.3.1 Legislation and Approvals

The **Compliance with Legal and Other Requirements** (LGL-LGL-PRO001-GEN-GRP) procedure outlines how McConnell Dowell identifies, maintains and evaluates compliances with legal and other related requirements that are applicable to delivery of the Project. This legislation is identified and recorded within **Review Record Environmental Legal & Other Requirements**. Legislation and compliance are reviewed by Project management on at least a 3-monthly basis.

The applicable legislative and approvals-based environmental compliance obligations for the management of the Project include (Table 4-1):

Table 4-1 Relevant Legislation, Permits and Approvals

Legislation	Description	Approval/ Permit Required	Approval/ Permit Holder	Compliance
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	<p>EPBC Act provides specific protection for the following Protected Matters:</p> <ul style="list-style-type: none"> Threatened species and ecological communities. Migratory species - including those listed under International Agreements such as the Japan-Australia Migratory Bird Agreement (JAMBA), the China-Australia Migratory Bird Agreement (CAMBA), the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA), or the Convention on the Conservation of Migratory Species of Wild Animals (the Bonn Convention). 	Yes	Client	<p>Threatened species which are known to occur or may occur within proximity to the proposed site are highlighted in the Centrex PER 2012.</p> <p>Many of the marine mammals that may potentially occur in the area are listed as migratory and are protected as such within Commonwealth waters; these species are also discussed in the Centrex PER.</p> <p>It should be noted that the Centrex PER was completed several years ago and changes to threatened species status may have occurred in this time.</p> <p>A key concern of the regulators for all recent port proposals has been the interaction or perceived risk of impacts to migrating whales, specifically the Southern right whale. Important to this project, the Port Spencer development was deemed a controlled action with Commonwealth approval granted provided environmental protection measures were in place to minimise harm to Southern right whales (and all cetaceans) during construction of the wharf. The main element of the approval was for the implementation of exclusion and shut down zones around the wharf construction to prevent underwater noise impacts to whales.</p>
Environment Protection (Sea Dumping) Act 1981	Regulates the dumping, incineration, and loading for the dumping or incineration of wastes and other matter at sea.	No	N/A	<p>It is anticipated there will be no requirement for dredging based on the conceptual options proposed therefore a Sea Dumping approval and dredge permit are not considered to be required.</p> <p>If, however dredging was including in the construction the disposal of dredged material (at sea) has the potential to have a significant impact on MNES, it would then require approval under the EPBC Act.</p>

Legislation	Description	Approval/ Permit Required	Approval/ Permit Holder	Compliance
Development Act 1993	To regulate the use and management of land and buildings, and the design and construction of buildings; to make provision for the maintenance and conservation of land and buildings where appropriate; and for other purposes.	TBC	TBC	More detail about the relevance of this Act is provided in the preliminary planning review (Jacobs 2017).
Harbours and Navigation Act 1993	The Act governs the safe, efficient and reliable movement of cargo vessels within South Australia.	Yes	Client	To operate a port within South Australia the port area must be declared by the Minister and a Port Operators Agreement (POA) approved by DPTI who require a biosecurity plan and Oil Spill Contingency Plan to be provided by the port operator.
Native Vegetation Act 1991 (SA)	Controls the clearance of indigenous remnant vegetation and provides incentives and assistance to landholders in relation to the preservation and enhancement of native vegetation.	Yes	TBC	Recent port development submissions have all required hydrodynamic models to be developed in order for DEWNR and the EPA to be satisfied that impacts to the coastline along with the seabed have been considered in the design process. DEWNR have also expressed concern in regard to the build-up of seagrass wrack (dead and shed seagrass) along artificial structures and the cost implication of clearing and maintain access to harbours.
National Parks and Wildlife Act (SA)	Allows for the protection of habitat and wildlife through the establishment of parks and reserves (both on land and in State waters) and provides for the use of wildlife through a system of permits allowing certain actions, i.e. keeping, selling, trading, harvesting, farming, hunting and the destruction of native species.	TBC	TBC	There are several threatened species that were identified in the Port Spencer area during the PER investigations, it would be advised that up to date data on the presence, distribution and use of the area by fauna be confirmed in new surveys prior to detailed designs being developed.
Protection of Marine Waters (Prevention of Pollution from Ships) Act 1987	Enacts Australia's commitment to the International Convention for the Prevention of Pollution from Ships (MARPOL) in South Australia.	Yes	Client	All ships operating in and out of the proposed port will be bound by these commitments. The development of a Port Management plan would be used in addressing these requirements.

Legislation	Description	Approval/ Permit Required	Approval/ Permit Holder	Compliance
Marine Parks Act 2007	Covers 19 marine parks around the State with each park consisting of up to four zones - general managed use, habitat protection, sanctuary and restricted access.	No	N/A	The proposed port site is not located within a marine park the location. This will only be applicable for operations.
Fisheries Management Act 2007	Provide for the conservation and management of the aquatic resources of the State and the control of exotic aquatic organisms and disease in aquatic resources.	No	N/A	It is not anticipated that this development would require approvals under this Act.
Coast Protection Act 1972	Provides a legislative framework to make provision for the conservation and protection of the beaches and coast of South Australia.	TBC	TBC	<p>The Act is implemented via the Coast Protection Board who is the primary authority and prescribed body in South Australia for the management of the coast including coastal protection and advice on coastal development.</p> <p>The proposed development would need to satisfy the Coast Protection Board within DEWNR that impacts to the coastal environment would be minimised. Experience from other port approvals has shown that the use of a hydrodynamic model and sediment transport model are key tools for demonstrating whether a proposed port would negatively impact coastal erosion etc.</p>
Natural Resources Management Act 2004	Aims to achieve ecologically sustainable development in the State by establishing an integrated scheme to promote the use and management of natural resources.	TBC	TBC	Coastal development is reviewed against regional plans, in consultation with the Coast Protection Board.
Environment Protection Act 1993	Provides for the protection of the environment and defines the Environment Protection Authority's (EPA) functions and powers.	TBC	TBC	

4.3.2 Standards and Directives

4.3.2.1 Organisational Standards

McConnell Dowell operates under an organisational Directive called **Environmental Management Standard** (REF-HSEQ-ENV-GUID004-GEN-GRP), which is a suite of minimum required standards for environmental management across all McConnell Dowell Group projects, across all geographies.

The minimum standards relate to key environmental risks common to organisation-wide activities and relates to each one of the ten **Environmental Green Rules** (REF-HSEQ-ENV-GUID003-GEN-GRP), a set of rules to enforce positive messages about what is expected as a minimum standard on site.

The objective of the Environmental Management Standard and Environmental Green Rules Directives is to ensure the application of minimum environmental management standards on all projects and a consistency of approach across the organisation.

4.3.3 Contract-Specific Environmental Compliance Obligations

Environmental compliance obligations relevant to the Project works are presented in Table 4-2. These will be reviewed on a regular basis and updated where appropriate to reflect any changes that may occur to the project scope of works. Table 4-3 outlines any contract specific hold points and/ or witness points

Table 4-2 Contract Specific Environmental Compliance Obligations

Clause/ Reference	Compliance Obligation	Compliance Evidence
TBC	TBC when documents received	

Table 4-3 Contract Specific Hold Points/ Witness Points

Hold Point/ Witness Point	Objective	Compliance
TBC	TBC when documents received	

4.4 DOCUMENT ENVIRONMENTAL OBJECTIVES AND REQUIREMENTS

4.4.1 Organisational Environmental Objectives

McConnell Dowell is committed to maintaining a high level of excellence in environmental compliance and continual improvement, which is reflected in our organisation-wide environmental objectives and targets, relevant to all McConnell Dowell works. These are presented in Table 4-4.

Table 4-4 Environmental Objectives and Key Performance Indicators

Objective	Lead Performance Indicator		Lag Performance Indicator	
	Description	Target	Description	Target
Ensure compliance with all applicable environmental legislation and prevent environmental harm	Number of INR raised during internal audit program relating to environmental legislation	Zero non-compliances	Serious Environmental Incident Frequency Rate (SEIFR)	0.00
	% completion of planned weekly environmental inspections	100%	Statutory Notices received	Zero
	% of environmental actions closed out within required timescale	100%	Fines or prosecutions for an environmental offence	Zero
Ensure effective reporting of environmental data	% completion of monthly environmental data reported	100%	-	-

4.4.2 Contract-Specific Environmental Objectives

In addition to the contract-specific environmental compliance obligations, as outlined in section 4.3, there are also a number of environmental objectives and targets relevant to the Project. These include:

- TBC following discussions with client

4.5 ACHIEVING ENVIRONMENTAL OBJECTIVES

4.5.1 Environmental Management System

McConnell Dowell operates an ISO 14001 accredited Environmental Management System that forms part of the fully integrated McConnell Dowell Management System (MMS). The MMS provides the framework for managers to implement specified corporate standards and practices in a consistent manner. It defines the application of work practices, processes, and systems for engineering/design, acquisition of materials, equipment and services, construction, and other services related to tendering and project execution.

The environmental management framework applicable to the project is shown diagrammatically below (Figure 4-1) and elements of the framework explained in Table 4-5.

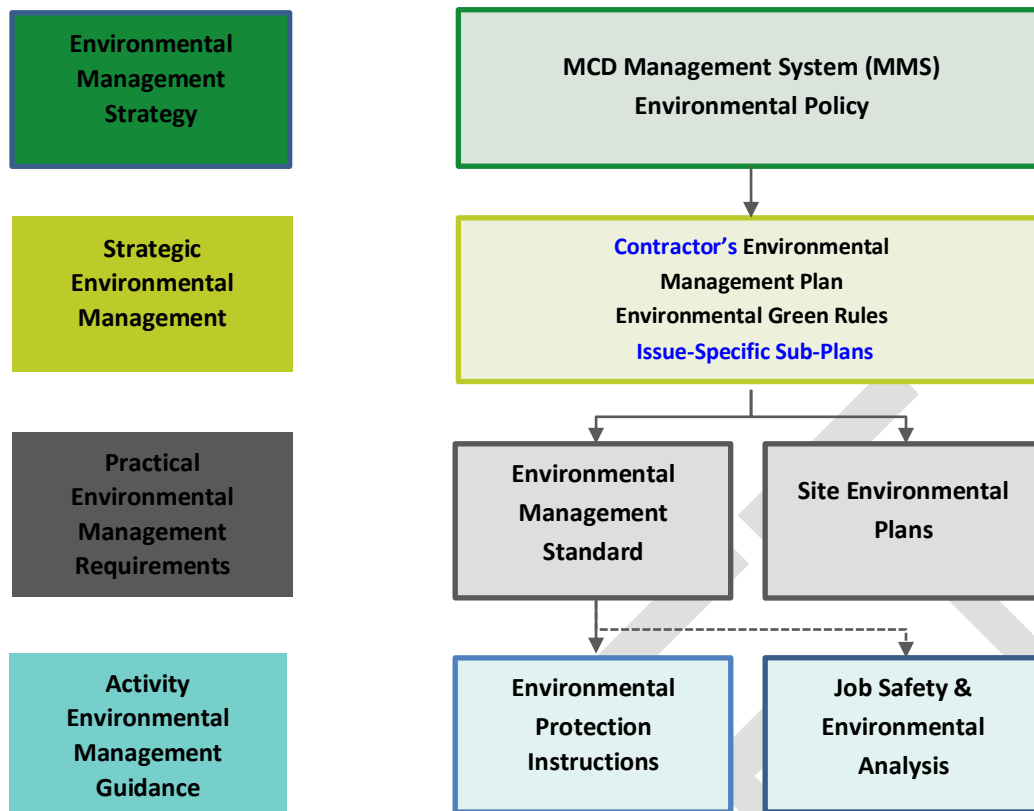


Figure 4-1 Environmental Management Framework

Table 4-5 Description of environmental management framework documents

Document Type	Description
Environmental Policy	See section 3.2
Environmental Management Standard	See section 4.3
Contractor's Environmental Management Plan	This document. This CEMP provides a system and set of procedures to ensure that sound and effective controls are established and maintained to manage potential environmental impacts throughout the Project and, wherever practicable, to deliver positive environmental outcomes. As part of our commitment to continuous improvement we will take a proactive approach to environmental management for the Project. This document is therefore based upon a risk management process where the environmental risks associated with each element of the Project are identified and assessed, and appropriate mitigation strategies implemented to eliminate or minimise the subsequent risk.
Issue-Specific Sub-Plans	Documents that focus one specific environmental issue in detail (e.g. noise and vibration), outlining risks, opportunities, mitigation and management measures in relation to that environmental issue.

Document Type	Description
Environmental Green Rules	A suite of ten environmental management rules set to enforce positive messages about what is expected as a minimum standard on site to minimise our impact on the natural environment and local community
Site Environmental Plans	Site Environmental Plans (SEPs) are spatial representations, in the form of an aerial photographs developed for a specific footprint of the Project to illustrate the key site features relating to environmental management. The SEPs provide a picture of the existing environmental values and demonstrate the location of the site environmental controls and other key environmentally relevant features of the Project.
Environmental Protection Instructions	Environmental Protection Instructions (EPIs) will be adopted from a standard suite of EPIs on REF. They will be amended if necessary, to meet specific Project requirements. These documents provide a summary of the method of implementation for a number of the environmental controls articulated in the CEMP and issue-specific sub-plans. As the Project progresses there may be a need for new EPIs to cover areas not identified during the pre-mobilisation risk assessment process. Any new EPIs will be developed by the Environmental Management Representative and will be communicated to the Construction Team through inductions and toolbox talks. If necessary, training on any new EPI will be provided by the Environmental Management Representative.
Job Safety and Environmental Analysis (JSEA)	<p>JSEAs (HSEQ-HS-FRM001-GEN -location) are a tool used to determine safety and environmental risk associated with tasks prior to commencing a component of work. Each task is reduced to individual steps and the potential hazard associated with each step identified. Risk mitigation steps are attributed to each hazard, thus providing a detailed plan for installation of control measures.</p> <p>The main strength of JSEAs prepared on the job is their ability to focus on unique risks at a particular point in time — for example, current conditions, resources, experience of workers and impact with other jobs or people. JSEAs prepared on the job are best carried out close in time and location to the execution of the associated works. It is acceptable to use a pre-existing generic JSEA as a basis to commence the process but it is essential that current circumstances such as site conditions, level of experience of the crew, prevailing weather conditions, etc. are incorporated into the job specific JSEA. A Summary of all hazard identification processes is to be maintained on JSEA /SWMS Register (HSEQ-HS-FRM004-GEN-ALL).</p>

5 SUPPORT FOR PLAN DELIVERY

5.1 RESOURCES

The Project Manager is responsible for determining and providing the necessary resources needed for the effective establishment, implementation, maintenance and continual improvement of this plan and associated documents. Specific requirements are outlined, where relevant, in the Environmental Management Standard and issue-specific sub-plans.

5.2 COMPETENCE REQUIREMENTS

The environmental competency and experience requirements for all staff positions are contained in the relevant Position Descriptions. Recruitment and procurement processes are conducted with the aim of engaging personnel with the required appropriate competency and experience.

5.3 ENVIRONMENTAL AWARENESS TRAINING

All personnel will receive training of a type and level of detail that is appropriate for the environmental aspects of their routine and emergency work assignments. As a minimum, all personnel are required to satisfactorily complete the Project Induction Training. Other mechanisms of raising environmental awareness are through toolbox talks, pre-start meetings, HSEQ alerts and more specialised training. Attendance records and assessments of all training and briefing sessions will be maintained.

Other training needs are assessed on a job-by-job, and position-by-position basis, as outlined in the **Project Location Training Plan** (HR-HR-TEM001-GEN-ALL).

Table 5-1 Environmental Awareness Training Methods

Training Method	Description
Project Induction	<p>The induction includes a presentation of the requirements of this plan and associated documents. All personnel are to attend the Project induction prior to starting work on site. The purpose of the induction is to ensure that, at a minimum, the employee or sub-contractor understands:</p> <ul style="list-style-type: none"> • Key issues relevant to the Project and existing environment. • Environmental Policy and the environmental management framework • Concepts of environmental protection, due diligence and duty of care. • Environmental permits, approvals, licences and relevant conditions. • Roles and responsibilities relating to environmental management for the Project and consequences of non-compliance.
Pre-Start Meetings	<p>Pre-Start meetings will be undertaken at the beginning of each day/ shift before work commences with all personnel present (including subcontractors as required).</p> <p>Specific environmental issues relevant to the shift's work will be raised and discussed at these meetings.</p>
Toolbox Talks	<p>Toolbox Talks will be undertaken once a week to discuss large site wide issues, upcoming works and give updates on any recent incidents and their outcomes.</p> <p>Issue-specific environmental awareness training will be provided to the workforce (including subcontractors) via Toolbox Talks, to provide site</p>

Training Method	Description
	<p>personnel with ongoing environmental training and information throughout the works.</p> <p>Examples of training includes land/marine based spill response training or correct erection of a silt fence/silt curtains.</p>
Specialised Training	<p>Training for specific staff based on position and responsibilities. For example, noise and vibration monitoring, spill prevention and control, erosion and sediment control</p>
HSEQ Alerts	<p>HSEQ alerts are descriptions of serious health, safety, environmental or quality incidents and lessons learnt from other MCD Group projects and facilities and relevant industry incident.</p> <p>They are sent out to all MCD Group management and HSEQ staff and are presented and discussed at Pre-Start Meetings and Toolbox Talks and posted on notice boards.</p>

5.4 COMMUNICATION

5.4.1 Internal Communication

Within the construction team it is important to ensure that management techniques are being adhered to, that employees have the opportunity to address concerns and outcomes of incident reviews and changes to protocols are communicated. Environmental communication will primarily be through Pre-Start Meetings, Toolbox Talks and weekly team meetings. However, communications can also occur during site inspections or through members of the environmental or management teams.

5.4.2 External Communication

The Project Manager is responsible for coordinating communications with all external parties.

Validated complaints will be recorded on CMO Incident Report Form, categorised as a complaint for tracking purposes. As a minimum, the following will be recorded:

- The date and time of the complaint.
- Personal details of the party lodging the complaint (if available, subject to privacy considerations).
- Nature of the enquiry or issue of concern.
- The outcome of the complaint investigation and any remedial actions taken by the construction team to cease the impact.

5.5 DOCUMENTED INFORMATION

5.5.1 Creating and Updating Documents

This CEMP will be further developed and revised to address any changes in the environmental management process, customer or key stakeholder comments, and changes identified through the continual improvement process.

This plan will be reviewed, at a minimum, on a twelve-monthly basis by Project leadership. The Project Manager will be responsible for ensuring this is carried out. Review of the CEMP is outlined further in Section 7.4 Performance evaluation & Improvements

The project shall conduct management review meetings where all identified risks and opportunities from the TPRR will be monitored, measured and analysed to evaluate if the risks remain relevant and that any new or emerging risks are identified and managed. Any risks and opportunities that are identified during internal/external audits and customer satisfaction surveys will be considered for inclusion into the TPRR.

The project will implement any changes necessary to its environmental management systems and processes in response to changes in risk with the intention to drive continuous improvement for the project.

Management Review.

The project shall conduct management review meetings where all identified risks and opportunities from the FPRR will be monitored, measured and analysed to evaluate if the risks remain relevant and that any new or emerging risks are identified and managed. Any risks and opportunities that are identified during internal/external audits and customer satisfaction surveys will be considered for inclusion into the TPRR. The project will implement any changes necessary to its environmental management systems and processes in response to changes in risk with the intention to drive continuous improvement for the project.

The Project Manager is also responsible for ensuring the development and authorising for use any other required environmental management documentation.

5.6 DOCUMENTED CONTROL

5.6.1 Document Control

Document control, including record keeping and archiving, will be undertaken in accordance with the relevant documents outlined in the **PMP Document Register** (COR-GNG-TEM001-GEN-ALL ATT 1).

6 OPERATION AND IMPLEMENTATION

6.1 IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT MEASURES

The implementation of environmental controls on site is the responsibility of the Project Manager and Supervisors. Environmental controls are to be implemented prior to the beginning of the works, wherever practical and relevant, and maintained through the length of those works.

The outputs from the planning of works and the specific environmental management measures and their implementation are outlined in the Appendix B: Environmental Management and Mitigation Measures (Preliminary Risk Register).

The following plans in Table 6-1 are issue-specific sub-plans that are proposed to be further developed on award of contract. This list is not exhaustive and will evolve as the project progresses.

Table 6-1 Environmental Control Documents

Document Type	Description
Biosecurity Management Sub-Plan	Includes controls for bringing overseas materials to Australia, vessel movement controls within Australian waters, and land based movements for weeds, pests, parasites and other biological contaminants.
Abrasive Blasting and Painting Control Sub Plan	Includes controls for garnet blasting and painting, encapsulation and disposal, and EPA licence application.
Pile Installation Environmental Sub-Plan	Includes controls for noise and vibration, and extraction of waste rock/ slurry mix and deposition back into the ocean.
Marine Fauna Management Sub-Plan	Including a Southern Right Whale Plan to meet approval conditions.
Spill Response Sub-Plan	Including an Oil Spill Contingency Plan to meet approval conditions.
Concrete and Grouting Management Sub-Plan	Includes controls for prevention of spill to ground or water and disposal of water. Will also include management of batch plant onsite if required.
Maintenance and Refuelling Sub-Plan	Process and procedures for equipment maintenance and refuelling both on land and over water.
Waste Management Sub-Plan	Controls on waste minimisation, segregation and management.
Marine Debris & Working over Water Sub-Plan	Includes controls for housekeeping, marine debris and retrieval.
Environmental Nuisance Management Sub-Plan	Includes interference with an environmental value caused by air emissions, light, noise, or vibration.

6.2 INCIDENT MANAGEMENT, REPORTING AND INVESTIGATION

Incidents will be managed, and reports raised, tracked and closed out in accordance with Incident Reporting and Investigation (HSEQ-HS-PRO003-GEN-ALL).

Onsite management of environmental incidents are the responsibility of the Environmental Management Representative with assistance from any other resources required to contain the incident and prevent further environmental harm.

The cause of all incidents will be subject to an investigation, convened by the Environmental Management Representative to determine the root causes of the incident and to ensure that remedial / corrective action is able to be implemented to ensure a repeat of the incident is avoided.

A summary and review of incidents for the duration of the Project and for the relevant month shall be included in the Project Monthly Report.

6.2.1 Notification Procedure

The Client and applicable Regulator (where relevant) shall be notified of incidents that trigger notification as defined in the Incident Reporting and Investigation procedure. These triggers include offsite discharges, unauthorised disturbance or destruction of fauna, flora or heritage sites and breaches and non-conformances of licences and permits issued for the Project.

The Project Manager is responsible for notifying the Client and parent companies of reportable incidents.

The Client Environmental Management Representative is responsible for notifying relevant Regulators.

6.3 EMERGENCY PREPAREDNESS AND RESPONSE

The **Emergency Response Plan** (HSEQ-HS-TEM001-GEN-ALL) to be produced for the Project will take into account the following factors:

- Parts of the site or adjoining properties likely to be affected.
- Degree of predictability of the emergency.
- Likely speed of onset.
- Likely effect of the emergency.

The contents of the Emergency Response Plan are to include:

- Description of the potential emergency.
- Person responsible for actioning the Emergency Response Plan (ERP).
- Equipment required to deal with the emergency including rescue equipment.
- Emergency contact numbers.
- Direction to site workers and other affected persons on what they are required to do.
- Methods used to deal with the emergency (e.g. How to use specific equipment).

Emergency services are to be contacted and invited to visit the site in order to become aware of site access and other emergency considerations, during development and implementation of the ERP.

The ERP will incorporate the following components:

- Emergency contact list (for the above).
- Emergency Reporting Instructions.
- Emergency Muster Point Location.

- Emergency Response Co-ordinator Action Plan.
- Emergency Personnel and Equipment.

The Emergency Response Plan will be displayed in prominent locations around the site and employees will be trained in its requirements. All relevant Project personnel, subcontractors and relevant emergency agencies will be instructed and rehearsed, as appropriate, in the requirements of this Plan.

In the event of an environmental emergency incident, McConnell Dowell will provide the Client with written notification within 2 days and will provide records of the incident, response and corrective actions as required.

6.4 MANAGEMENT OF CHANGE

Management of change will be undertaken in line with the Change Management Procedure.

7 PERFORMANCE EVALUATION

7.1 MONITORING, MEASUREMENT, ANALYSIS AND EVALUATION

7.1.1 Monitoring and Inspection

The Project's environmental performance will be tracked through regular monitoring and inspection.

A brief overview of proposed monitoring and inspection is provided in Table 7-1 and Project monitoring program is outlined in Table 7-2.

Table 7-1 Monitoring and Inspection Requirements

Monitoring/ Inspection Requirement	Description
Inspection	Regular environmental compliance inspections are carried out by the Environmental Management Representative for the Project or relevant work areas. The findings of the Inspection are recorded on Weekly Environmental Inspection (CMO), in which required remedial actions are also recorded, including a responsibility and timeline for completion. These shall be monitored to ensure that they are closed out in the required time frame.
Monitoring	Monitoring and inspection is conducted on a routine basis, however, additional monitoring may be required in the event of an incident, complaint or change in circumstances. The Environmental Management Representative is responsible for the implementation of on-site environmental measurements, including delegation to appropriate personnel on the Project.
Calibration of Monitoring Equipment	Monitoring equipment will be calibrated prior to use and in line with user manuals for the equipment. Any equipment identified as having doubtful accuracy or precision will be removed from use and recalibrated. Where any monitoring equipment is found to be out of calibration, the validity of the previous monitoring results will be assessed and documented. Calibration of monitoring equipment will be recorded on Equipment Calibration Record.

Table 7-2 Monitoring program

Item	Frequency	Record	Responsibility
TBC based on approval and contract requirements			

7.1.2 Analysis and Evaluation

Monitoring and inspection results will be used to assess the environmental performance of the Project against the relevant criteria.

The Environmental Management Representative is responsible for checking monitoring and inspection results against the environmental obligations, and identifying non-conformance. They are also responsible for raising a non-conformance, incident and/ or corrective action as necessary (See Section 8).

7.2 REPORTING

Reporting requirements will evolve as the Project progresses. In the early phases, emphasis is on the establishment of systems, controls and competence of all personnel, while later the emphasis will shift to monitoring performance. When nearing completion (as applicable) the focus will be on final reports to address approval requirements.

The Environmental Management Representative is responsible for submitting the reports required externally.

Reporting requirements are:

- Reporting to client and key stakeholders as specified within contract documents.
- Specific reporting to regulatory agencies.
- Reporting as required by legislation.
- Monthly National Greenhouse and Energy Reporting information
- Sustainability data reporting (including energy use, water use and waste generation).
- Other Project specific reporting requirements (See Table 7-3).

Table 7-3 Reporting Requirements

Reporting Requirement	Reporting Frequency	Responsibility
TBC based on approval and contract requirements		

7.3 AUDITING

Environmental audits are to be carried out and reported in accordance with the requirements of **Audit Internal** procedure (HSEQ-SYS-PRO003-GEN-GRP).

In addition to these internal audits, McConnell Dowell will cooperate with any external environmental audits conducted by an authorised party in relation to compliance with contract or legislative requirements.

7.4 PERFORMANCE EVALUATION & IMPROVEMENTS

The project shall conduct management review meetings where all identified risks and opportunities from the TPRR will be monitored, measured and analysed to evaluate if the risks remain relevant and that any new or emerging risks are identified and managed. Any risks and opportunities that are identified during internal/external audits and customer satisfaction surveys will be considered for inclusion into the TPRR.

The project will implement any changes necessary to its environmental management systems and processes in response to changes in risk with the intention to drive continuous improvement for the project.

7.5 MANAGEMENT REVIEW

7.5.1 Top Management Review

EXCO may include the Project in their regular review of the organisation's environmental management system to ensure its continuing suitability, adequacy and effectiveness.

The 12 monthly EXCO review includes consideration of:

- The status of actions from previous management reviews.
- Changes in:
 - External and internal issues that are relevant to the environmental management system.
 - The needs and expectations of interested parties, including compliance obligations.
 - Its significant environmental aspects.
 - Risks and opportunities.
- The extent to which environmental objectives have been achieved.
- Information on the organisation's environmental performances, including trends in:
 - Nonconformities and corrective actions.
 - Monitoring and measurement results.
 - Fulfilment of its compliance obligations.
 - Audit results.
- Adequacy of resources.
- Relevant communication(s) from interested parties, including complaints.
- Opportunities for continual improvement.

The outputs of the management review shall include:

- Conclusions on the continuing suitability, adequacy and effectiveness of this document and the environmental aspects of MMS.
- Decisions related to continual improvement opportunities.
- Decisions related to any need for changes to this document and the environmental aspects of MMS, including resources.
- Actions, if needed, when environmental objectives have not been achieved.
- Opportunities to improve integration of this document and the environmental aspects of MMS with other business processes, if needed.
- Any implications for the strategic direction of the organisation.

Documented information shall be retained as evidence of the results of management reviews.

7.5.2 Project Management Review

Review of the implementation and effectiveness of this plan and associated documents will be performed on an annual basis as minimum, by the Project management team. The responsibility for this review lies with the Project Manager.

The review will include:

- Progress of the implementation of this plan.
- Effectiveness of this plan.

- Adequacy of resources.
- Effectiveness of training and training requirements.
- Results of inspections and audits.
- Critical non-conformances or repeated non-conformances.
- Overall performance against environmental compliance obligations.
- Organisational changes, changes to legislation and other obligations.

Records of the review will be recorded on **Minutes of Meeting** (COR-GNG-FRM001-GEN-GRP). Any actions arising will be recorded in the Actions module of the CMO database.

8 IMPROVEMENT

8.1 NON-CONFORMITY AND CORRECTIVE ACTION

Corrective and preventative actions may be identified from inspections, audits, non-conformances, incidents, management reviews and complaints. Correctives and preventative actions will be raised, assigned, tracked and closed out in the CMO compliance database.

The CMO database is used to record and monitor close-out of all corrective actions arising from hazard reports, incident reports, audits and inspections.

CMO is to be accessible to Project Management personnel and key team members, including environmental management and HSEQ representatives for review and close out of outstanding items.

Persons responsible for close out of corrective actions are to ensure that the items are closed out prior to the end of the close out date. Unclosed items that have passed the close out date shall be raised and discussed at team meetings and elevated as required for management action.

Where any changes and improvement to working practices are identified through the investigation of environmental incidents, these will be assessed and incorporated into the CEMP as part of the incident reporting and investigation process.

8.1.1 HSEQ Alerts

Where a repeat incident occurs or where there is a significant incident, a HSEQ Alert may be issued.

HSEQ Alerts are used where incidents with broader implications and lessons that may be applicable to other Projects and Facilities are summarised and distributed to disseminate findings more widely. HSEQ Alerts from other Projects and Facilities may also be relevant to this Project. Where applicable these lessons are communicated to the work force through Toolbox Talks and Pre-Start Meetings.

8.2 CONTINUAL IMPROVEMENT

This CEMP has been developed using the best available methods, procedures, expertise and experience available to McConnell Dowell Group Entity and as such it represents best practice environmental management standards. However, consistent with the philosophy of continuous improvement, there will be opportunities during the Project work to implement new or improved procedures, aside from the annual review of this plan and associated documents.

During the contract term relevant changes in technology and work methods will be examined for opportunities to improve the processes and systems for the benefit of all Project stakeholders. The Project Manager will be accountable to Free Eyre for ensuring continuous improvement in all aspects of the design, construction, commissioning and completion of the Project.

APPENDIX A: ENVIRONMENTAL AND SUSTAINABILITY POLICIES

DRAFT

ENVIRONMENTAL POLICY



McConnell Dowell undertakes a reflective, resourceful, inclusive and flexible approach to environmental management, underpinned by a robust ISO 14001 certified integrated management system. McConnell Dowell acts today with the future in mind and commits to:

- Having visible and demonstrated environmental leadership throughout the business to equip, inspire, empower and lead our people to win and deliver environmentally sound projects.
- Complying with applicable environmental legislation, regulations, codes of practice, customer and project specific requirements.
- Establishing measurable objectives and targets to quantify our environmental performance, committing to and demonstrating continual improvement.
- Ensuring strong and positive leadership engagement with tender and project delivery teams at all levels to understand and resolve the environmental challenges they face.
- Monitoring our environmental performance and identifying initiatives that lead to improved environmental outcomes.
- Developing and implementing methods to protect the environment, prevent pollution and eliminate or minimise significant environmental impacts.
- Ensuring the efficient use of resources including energy, water and materials, and providing responsible waste management.
- Promoting innovative thinking and practices to achieve positive environmental outcomes.
- Understanding our customers, business partners and subcontractors' environmental capabilities and priorities and working together to develop common strategies to achieve shared goals.
- Identifying and communicating non-conformities, lessons learnt and corrective actions arising from environmental incidents to enhance environmental performance.
- Provision of the necessary resources and management support to achieve environmental goals.
- Equipping all employees with the knowledge, skills and resources to achieve our environmental goals. Engaging with employees, subcontractors, customers, and other key stakeholders on environmental issues.



Scott Cummins

Scott Cummins
Chief Executive Officer
McConnell Dowell Corporation Limited

HSEQ-ENV-TEM004-GEN-XXXXX
REVISION A

SUSTAINABILITY POLICY



McConnell Dowell undertakes its activities integrating social, environmental, economic and good corporate governance considerations. We do this with the objective of avoiding and mitigating harm to the environment, contributing to and enhancing the resilience of the communities in which we operate, and creating shared value for our customers and our people. We commit to:

- Industry leadership through our professionalism, competence and active industry participation.
- Industry leading approaches to shared value generation through the delivery of safe, smart and efficient infrastructure.
- Accountability and management responsibility through delivering on what we promise and understanding and meeting our customers' needs and community expectations.
- Promotion of sustainable construction practices, including the prevention and mitigation of environmental pollution, climate change adaptation, the efficient and sustainable use of resources, and the principles of inclusion, engagement, equality and diversity.
- Generating growth in our business and the industry by fostering long-term, strong and positive partnerships with customers, communities, regulators, industry bodies and other key stakeholders.
- Actively encouraging continual improvement and promoting innovation, adaptability and resilience.
- Consideration of the appropriate use of materials, including water and energy, and the resulting generation of waste and carbon emissions in all our activities. Understanding and reducing our carbon, energy, materials and water footprints.
- Creating opportunities and involving, engaging and integrating with the communities in which we work.
- Nurturing the health, wellbeing and quality of life of those we work with and alongside. Everyone goes home without harm, every day.
- Protecting our business, our partners and customers through good corporate governance, compliance and sound risk management.



Scott Cummins

Scott Cummins
Chief Executive Officer
McConnell Dowell Corporation Limited

HSEQ-ENV-TEM004-GEN-XXXXX
REV 01/03/2015

APPENDIX B: ENVIRONMENTAL MANAGEMENT & MITIGATION MEASURES (PRELIMINARY RISK REGISTER)



DRAFT

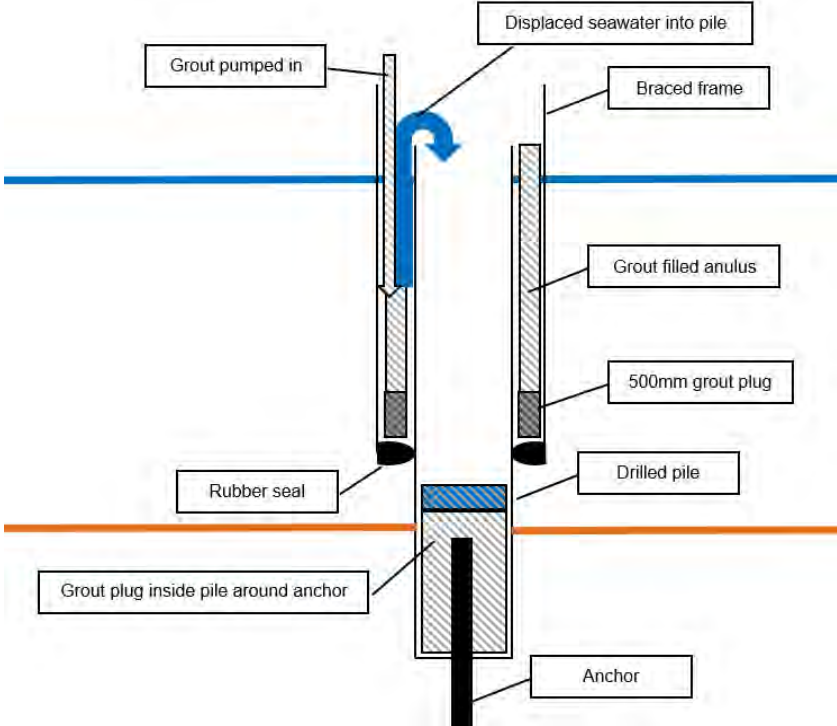


Likelihood (L) 1 = Rare, 2 = Unlikely, 3 = Possible, 4 = Likely, 5 = Almost Certain							Consequence (C) A- Low, B- Moderate, C- Serious, D-Major, E-Catastrophic									
Risk Rating (R)		LOW RISK Broadly acceptable - Manage by routine procedures.		MODERATE RISK Tolerable – With identified controls fully implemented.		HIGH RISK Undesirable risk – do not commence activity.		VERY HIGH RISK Intolerable risk – do not commence activity.				EXTREME RISK Intolerable risk – do not commence activity.				

Item No.	Work Process	Work Area	Activity / Job Step	Hazards (Potential For Harm)	Risks (Unwanted Event)	Risk Source (Health Safety Environment)	System / Current Controls	Primary Risk Assessment			Additional Controls	Hierarchy of control						Residual Risk Assessment			Review / Comments	
								Likelihood	Consequence	Risk Score		Elimination	Substitution	Isolation	Engineering	Administration	PPE	Likelihood	Consequence	Risk Score		
1 WATER QUALITY - (Spills to the Sea / Land)																						
1.1		Wharf / Dolphin / topsides	General activities including: Concrete cutting, breaking and lifting/ removing	Equipment failure, human error during operation of equipment (generators, motors for diamond saws, cranes, refuelling equipment)	Hydrocarbons released to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Plant Management Plan Hazardous Substance Management and Spill Response Sub-Plan	likely	Moderate	Moderate	Maintenance and inspections; spill trays/ drains (where applicable); self-bunded machinery; refuelling procedures for in situ refuelling. Emergency and Spill Response Plan; Monitoring; Spill kits; hydrocarbon booms. Trained response personnel.				X	X	X		Unlikely	Moderate	Low	
1.2		Marine vessels	Vessel movements Support vessel / tug operations	Equipment failure, human error during towing operations or activities on deck (crane, generators, crib facilities personnel, chemical toilet with tanks, air compressors). Bunkering failure	Hydrocarbons released to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Plant Management Plan Hazardous Substance Management and Spill Response Sub-Plan	Possible	Serious	High	Vessel certification. Competent Master and crew. Maintenance and pre-mobilisation inspections; spill trays/ drains (where applicable); self-bunded machinery. Operational procedures. Emergency and Spill Response MP; Monitoring; Spill kits; hydrocarbon booms. Trained response personnel. Biodegradable oils where possible.				X	X	X		Unlikely	Serious	Moderate	
1.3		Wharf / Dolphin / topsides	Equipment travelling on the wharf deck (excavator, mobile crane, dump trucks, light vehicles)	Mechanical failure of vehicle / plant	Hydrocarbons released to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Plant Management Plan Hazardous Substance Management and Spill Response Sub-Plan	Possible	Moderate	Moderate	Inspection and assessment of structure. Coordination and operational procedures - max. axle load and configuration. Trained personnel. Emergency and Spill Response MP; Monitoring; Spill kits; hydrocarbon booms. Trained response personnel.				X	X	X		Rare	Moderate	Low	
1.4		Wharf / Dolphin / topsides	Mobile equipment (excavator, crane) operating on traveller	Equipment failure, human error during operation or refuelling of mobile equipment	Hydrocarbons released to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Plant Management Plan Hazardous Substance Management and Spill Response Sub-Plan	Possible	Serious	High	Maintenance and inspections; spill trays; self-bunded; refuelling procedures for in situ refuelling, refueling to occur from bunded fuel cell, refueling to be monitored at all times by personnel and spill pads on hand to catch any drips. Emergency and Spill Response MP; Monitoring; Spill kits; hydrocarbon booms. Trained response personnel. Avoid mesh floor in high risk areas.				X	X	X		Unlikely	Serious	Moderate	
1.5		Wharf / Dolphin / topsides	Site sheds/ crib rooms	Equipment failure, human error during operation	Chemicals / septic released to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Plant Management Plan Hazardous Substance Management and Spill Response Sub-Plan	Likely	Moderate	Moderate	Maintenance and inspections; self-bunded / temporary bunding; refuelling procedures for in situ refuelling. Emergency and Spill Response MP; Monitoring; Spill kits; hydrocarbon booms. Trained response personnel.				X	X	X		Unlikely	Moderate	Low	
1.6		Foreshore	Mobile equipment and fuel/oil storage (excavator, crane, trucks, generators, light vehicles) operating on foreshore	Equipment failure, human error during operation or refuelling of mobile/storage equipment	Hydrocarbons released to the terrestrial environment	Environment	Contractor's Environmental Management Plan (CEMP) Plant Management Plan Hazardous Substance Management and Spill Response Sub-Plan	Likely	Moderate	Moderate	Maintenance and inspections; spill trays; self-bunded / bunding; dedicated hydrocarbon/hazardous substances storage areas; refuelling procedures for in situ refuelling, refueling on sealed surface. Emergency and Spill Response MP; Monitoring; Spill kits; Trained response personnel. Designated hazardous goods storage location on land. Biodegradable oils, hose sheething to contain and protect hoses				X	X	X		Unlikely	Moderate	Low	
2 BIOSECURITY - (Invasive Marine Species)																						
2.1		Marine vessels	Marine vessel movements to location (within defined project boundary) - towed from at risk port location	Human error, procedural failure during transportation	Invasive marine species introduced to marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Biosecurity Management Sub-Plan	Possible	Major	High	IMS Assessment prior to mobilisation. - history of vessel to be provided including location of last port and previous antifouling applications				X	X	X		Rare	Major	Moderate	
2.2		Foreshore	Operational activities on land / vehicle movements	Soil disturbance, relocation of seeds/weeds	Introduction/spreading of weed species	Environment	Contractor's Environmental Management Plan (CEMP) Biosecurity Management Sub-Plan Plant Management Plan	Possible	Serious	High	Inspection of machinery prior to mobilising to check for contaminants/weeds - machine to be confirmed clean prior to mobilisation				X	X	X		Unlikely	Serious	Moderate	
2.3		All areas	Receival of imported materials and packaging / dunnage	Imported weeds, seeds, species or pathogens present in imported materials	Invasive species / pathogens introduced to environment	Environment	Contractor's Environmental Management Plan (CEMP) Biosecurity Management Sub-Plan	Possible	Serious	High	Inspection of goods received upon arrival to site to check for contaminants; quarantine area and procedure; inspection paperwork of major items fabricated / shipped from overseas; use of reputable inspection and shipping agent				X	X	X		Unlikely	Serious	Moderate	
3 AIR QUALITY - (Dust and Particulate Emissions)																						
3.1		Wharf / Dolphin / topsides	Concrete cutting, breaking and lifting/ removing	Mechanical cutting of concrete	Wind-borne dust particles (nuisance at sensitive receptors)	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Managemetn Sub-Plan Waste Management Sub-Plan Weekly Environmental Inspection	Unlikely	Moderate	Low	Wet vacuum removal &/or water dust suppression. Significant distance from sensitive receptors. Dust monitoring.				X	X	X		Unlikely	Moderate	Low	
3.2		All locations	Equipment and vehicle use	Duel burnign equipment	Excessive and non-compliant emissions	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Managemetn Sub-Plan Waste Management Sub-Plan Weekly Environmental Inspection	Unlikely	Moderate	Low	Cleaning operation prior to work commencing. Maintenance / periodic cleaning works where practicable. Removal of oils or malfunctioning equipment				X	X	X		Unlikely	Moderate	Low	

Item No.	Work Process	Work Area	Activity / Job Step	Hazards (Potential For Harm)	Risks (Unwanted Event)	Risk Source (Health Safety Environment)	System / Current Controls	Primary Risk Assessment			Additional Controls	Hierarchy of control						Residual Risk Assessment			Review / Comments
								Likelihood	Consequence	Risk Score		Elimination	Substitution	Isolation	Engineering	Administration	PPE	Likelihood	Consequence	Risk Score	
3.3		Wharf / Dolphin / topsides	Abrasive blasting and painting	Use of uncontained blast medium and overspray of paint	Release of contaminants to air then to water	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Management Sub-Plan Waste Management Sub-Plan Abrasive Blasting and Painting Control Sub-Plan Weekly Environmental Inspection	Likely	Moderate	Moderate	Use of temporary encapsulated blast chambers built around work area. Use of inert garnet as blast medium. Prestart inspection to ensure no damage to chamber; ongoing inspection during blast to ensure no blow outs; collection of spent blast medium and waste immediately after works in sealed bags.			X	X	X		Unlikely	Moderate	Low	
4 NOISE - (Noise and Vibration)																					
4.1		Wharf / Dolphin / Caisson topsides	Concrete cutting, breaking and lifting / removing	Mechanical cutting and breaking of concrete, equipment operations	Air-borne noise and transmission of vibration (nuisance at sensitive receptors)	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Management Sub-Plan Marine Ecology Management Sub-Plan Southern Right Whale Management Plan	Possible	Moderate	Moderate	Equipment maintenance and inspection. Use of noise monitoring equipment for indicative noise levels at sensitive receptor boundary (if applicable). Construction noise criteria and requirements compliance. Hours of operation agreed for certain activities.			X	X	X		Unlikely	Moderate	Low	
4.2		Marine vessels	Activities on deck (crane, generators, air compressors)	Mechanical cutting and breaking of concrete, equipment operations	Air-borne noise and transmission of vibration (nuisance at sensitive receptors)	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Management Sub-Plan Marine Ecology Management Sub-Plan Southern Right Whale Management Plan	Possible	Moderate	Moderate	Equipment maintenance and inspection. Use of noise monitoring equipment for indicative noise levels at sensitive receptor boundary (if applicable). Construction noise criteria and requirements compliance. Hours of operation agreed for certain activities.			X	X	X		Unlikely	Moderate	Low	
4.4		Pile driving / drilling activities	Piling (includes using hammer, drill and vibrator head)	High noise and vibration generating activity	Air-borne noise and transmission of vibration (nuisance at sensitive receptors - marine mammals)	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Management Sub-Plan Marine Ecology Management Sub-Plan Southern Right Whale Management Plan	Likely	Serious	High	Equipment maintenance and inspection. Use of noise monitoring equipment for indicative noise levels. Pre-start visual observations from shore or jetty by trained MMO; exclusion zone implimented to *** radius; soft start procedures; restrictions on piling times between migration season; monitoring program.			X	X	X		Unlikely	Serious	Moderate	
4.5		Foreshore	Activities on foreshore (crane, cutting and breaking equipment, generators, air compressors)	Mechanical cutting and breaking of concrete, equipment operations	Air-borne noise and transmission of vibration (nuisance at sensitive receptors)	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Management Sub-Plan Marine Ecology Management Sub-Plan	Possible	Moderate	Moderate	Equipment maintenance and inspection. Use of noise monitoring equipment for indicative noise levels at sensitive receptor boundary (if applicable). Construction noise criteria and requirements compliance. Hours of operation agreed for certain activities.			X	X	X		Unlikely	Moderate	Low	
4.6		All areas	Activities occuring 24 hours a day - including welding, paint prep, drilling, piling, crane lifting, precast, assembly	Noise, light and traffic movements at night	Disturbance to public	Environment	Contractor's Environmental Management Plan (CEMP) Environmental Nuisance Management Sub-Plan Marine Ecology Management Sub-Plan	Possible	Moderate	Moderate	Equipment maintenance and inspection. Use of noise monitoring equipment for indicative noise levels at sensitive receptor boundary (if applicable). Construction noise criteria and requirements compliance. Minimise vehicle movements, environmentally sensitive lighting plans. Education and training of workforce			X	X	X		Unlikely	Moderate	Low	
5 MARINE ECOLOGY AND TERRESTRIAL ECOLOGY - (Protected Species)																					
5.1		Marine vessels	Vessel movements (within defined project boundary)	Impact of vessels with marine mammal	Marine mammal strike	Environment	Contractor's Environmental Management Plan (CEMP) Marine Ecology Management Sub-Plan	Possible	Serious	High	Low speed operation. Training and awareness. . Crew observations. Navigation aids with demarcation of seagrass bed area and avoidance. Anchor plans to note location of sea grass			X	X	X		Unlikely	Serious	Moderate	
5.2		Causeway	Causeway construction	Direct contact with seagrass bed or indirect disturbance (turbidity)	Seagrass bed disturbance	Environment	Activity completed by others														
5.3		Drilled pile locations	Installtion of piles into bedrock	Direct contact with seagrass bed	Seagrass bed disturbance; localised turbidity	Environment	Contractor's Environmental Management Plan (CEMP) Marine Ecology Management Sub-Plan	Likely	Serious	High	Marine ecology assessment; Controlled activity, extracted at very low speed and small seabed displacement. Monitoring of 200m zone around the turbidity generating works; project approval for disturbance to known area of seagrass.	X		X	X	X		Unlikely	Serious	Moderate	
5.4		Drilled pile locations	Drilling of piles / anchors into bedrock	Indirect disturbance from deposition of spoil material (turbidity)	Seagrass bed disturbance; localised turbidity	Environment	Contractor's Environmental Management Plan (CEMP) Marine Ecology Management Sub-Plan	Likely	Serious	High	Marine ecology assessment; Controlled activity, extracted at very low speed and small seabed displacement. Monitoring of zone around the turbidity generating works; only seawater and drill spoil (rock / sand) will be redeposited as close as possible to base of installed pile; Plume will be short lived and settle quickly due to sandy bottom; extracted material to be filtered through steel bin to capture large solids; dewatered slurry to be released as low as so far as practical to minimise plume.	X		X	X	X		Unlikely	Serious	Moderate	
5.5		Foreshore	Activities on the foreshore area	Personnel / equipment movement and wildlife presence in area	Fauna species impacts	Environment	Contractor's Environmental Management Plan (CEMP) Marine Ecology Management Sub-Plan	Possible	Moderate	Moderate	Trained and competent personnel, reporting of sightings and locations of birds/nests, identification and avoidance of nesting sites. Nesting deterrence in high use areas with the potential for nest location. 5m buffer zone, 20m observation zone for nesting sites.			X	X	X		Unlikely	Moderate	Low	
6 TRAFFIC MANAGEMENT - (Vehicle Movements)																					
6.1		Public Roads	Transport of waste from refinery site to recycling or disposal location	Heavy vehicle movements	Disturbance of public vehicle movements	Environment	Contractor's Environmental Management Plan (CEMP) Waste Management Sub-Plan Traffic Management Plan	Possible	Moderate	Moderate	Traffic Management Plan. Loads covered			X	X	X		Unlikely	Moderate	Low	
7 WASTE MANAGEMENT - (Waste to Sea / Land)																					

Item No.	Work Process	Work Area	Activity / Job Step	Hazards (Potential For Harm)	Risks (Unwanted Event)	Risk Source (Health Safety Environment)	System / Current Controls	Primary Risk Assessment			Additional Controls	Hierarchy of control						Residual Risk Assessment			Review / Comments	
								Likelihood	Consequence	Risk Score		Elimination	Substitution	Isolation	Engineering	Administration	PPE	Likelihood	Consequence	Risk Score		
7.1		Wharf / Dolphin / topsides	Mobile equipment operation (truck, cranes)	Equipment failure, human error during operation of mobile equipment	Loss of mobile equipment to marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Marine Debris & Working over Water Sub-Plan Waste Management Sub-Plan	Possible	Moderate	Moderate	Maintenance and inspections, operational procedures, trained and competent personnel. Emergency Response MP, trained response personnel.			X	X	X		Unlikely	Moderate	Low		
13.4		Wharf / Dolphin / topsides	Concrete cutting, breaking and lifting/ removing	Equipment failure, human error during operation	Loss of concrete waste to marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Marine Debris & Working over Water Sub-Plan Waste Management Sub-Plan	Possible	Moderate	Moderate	Qualified personnel. Certified and maintained equipment. Rigging concrete blocks to minimise risk of droppage to the ocean. . Dropped object Register maintained to record dropped and falling objects. Concrete/steel are inert substances. Recovery of objects is based on a risk approach - ie items which cannot be safely recovered will be left in situ if they do not pose a risk to the environment				X	X	X		Unlikely	Moderate	Low	
14.1		Wharf / Dolphin / topsides	Concrete cutting, breaking and lifting/ removing	Equipment failure, human error during operation of crane equipment	Loss of steel / rusted waste to marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Marine Debris & Working over Water Sub-Plan Waste Management Sub-Plan	Possible	Moderate	Moderate	Lift Plan in place. Complex lifts have an Engineered Lift Plan. Qualified personnel. Certified and maintained equipment. . Dropped object Register maintained to record dropped and falling objects. Concrete/steel are inert substances. Recovery of objects is based on a risk approach - ie items which cannot be safely recovered will be left in situ if they do not pose a risk to the enviroment				X	X	X		Unlikely	Moderate	Low	
14.7		Wharf / Dolphin / topsides	Portaloo	Weather conditions, human error, equipment failure	Loss of sewage / waste to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Marine Debris & Working over Water Sub-Plan Waste Management Sub-Plan	Possible	Moderate	Moderate	Secured appropriately. Regular maintenance/ pump out of tanks. regular pump out of tank			X	X	X		Unlikely	Moderate	Low		
14.8		Wharf / Dolphin / topsides	Site sheds/ crib rooms near service platform or upper manifold platform	Weather conditions, human error, equipment failure	Loss of general waste to the marine environment	Environment	Contractor's Environmental Management Plan (CEMP) Marine Debris & Working over Water Sub-Plan Waste Management Sub-Plan	Possible	Moderate	Moderate	Waste receptacles with lids; secured appropriately' segregation of hazardous and non-hazardous wastes; Implementation of waste management plan.			X	X	X		Unlikely	Moderate	Low		

	Hours of Operation Required	Duration (time of year)	Average Total hours of high impact work	Location	Process Description / Methodolgy	Diagram	Environmental Receptor(s) Affected
Pile Driving	24 hours	June 2020 to June 2021	Pile driving average 2 hours per pile. Total 36 hours of high impact work over the duration.	Marine	<p>Piling will occur from bent 7 at the end of the 238m causeway. Approximately 18no Steel tubular piles (1200mm diameter) will be used in the construction of the jetty and wharf. Piles are delivered to site on extendable truck. Piles are upended by crane and lowered into piling gates (frame for holding piles in place). Piles are then driven vertically into seabed using a hydraulic hammer until the piles either achieve a design depth or refuse to be driven deeper. Final pile depth shall be between 6 and 10.5m into the seabed (drilling required to achieve depth). Piling activity will not occur continuously, but require the option to use hammer at any point during the 24 hours.</p>		<p>1) Seagrass in direct impact zone of pile.</p> <p>2) Marine fauna impacts from noise and vibration caused by zone of influence of the piling hammer</p> <p>3) Adjacent residents - 1 nos farm house within 1km</p>
Pile Drilling	24 hours	July 2020 to June 2021	Pile anchor drilling - average 18.2 hours per pile. Total 36 days of high impact drilling work over the duration.	Marine	<p>After piles have been driven the pile is drilled to depth, and also to install an anchor. Initially an RCD (Reverse Circulation Drill) is used to remove the overburden down to bedrock. The drill is then swapped for a DTHH (Down The Hole Hammer) that will drill a 900mm diameter hole 10m deep into the bedrock.</p> <p>During the drilling activities, seawater will be extracted from the ocean and will be to flush out the drill spoil (sand and bedrock) from the hole. This spoil will then be disposed of from from approx. 6inch outlet on the drill head back into the ocean anything up to 60l/s, adjacent to the newly drilled pile.</p> <p>Largest size of drill spoil will be up to 25mm diameter. The drill spoil quantity per pile will be between 14m3 and 17m3. The total drill spoil will be approximately 250m3 (on current design). Due to type of material, the drill spoil will sink and disapate quickly, leaving only a short term impact to the water column. No other additives are used in the drill process.</p>		<p>1) Seagrass in direct impact zone of pile.</p> <p>2) Marine fauna impacts from noise and vibration caused by zone of influence of the piling hammer</p> <p>3) Adjacent seabed / seagrass / surrounding water column from water and drill spoil returned to the ocean.</p>

	Hours of Operation Required	Duration (time of year)	Average Total hours of high impact work	Location	Process Description / Methodolgy	Diagram	Environmental Receptor(s) Affected
Concrete / Grouting Works over water	24 hours	July 2020 to June 2021	Pile anchor grouting and annulus rate at 6m3/hour. Total 108 hours - (4.5days) of grouting operations over the duration.	Marine	<p>Upon completion of drilling activities a steel tubular anchor will be lowered into the drilled hole in the bedrock. Grout will then be pumped into the pile using a tremmie pipe to fill the drilled hole and the inside of the anchor.</p> <p>When the braced frame is installed over the top of the piles the anulus between the pile and the braced frame will be filled with grout. A rubber seal will be pre-installed at the bottom of the braced frame to prevent grout escaping. A ~500mm plug of grout will initially be poured in the annulus and allowed to set prior to the final full length pour. All water from the annulus will be disposed of inside of the pile.</p> <p>Grout pump equipment will be set up in a semi-fixed location on top of the wharf. Pump lines inspected and fitted correctly prior to grout pumping.</p>		1) Marine environment from unplanned grout or slurry release to water
Abrasive Blasting and Painting	24 hours	July 2020 to June 2021		Onshore/ Marine	<p>Structural steel / welding joints will be coated in the following steps:</p> <ol style="list-style-type: none">1. Area to be painted will be fully encapsulated2. The steel surface will be blasted with an abrasive medium (industry standard inert garnet) to remove surface rust, paint and contaminants. At the end of blasting, all blast medium will be collected and reused or disposed of.3. The cleaned steel surface will then be coated with two coats of paint using a airless spray gun. <p>There shall be a fixed site on land for preparatory work and various temporary locations set up in situ on the wharf itself.</p>		<p>1) Air and water surrounding the blast and paint location - unplanned migration of pollutant.</p> <p>2) Ground impacts on land based blast and paint site.</p>
Welding / Hot works over Water	24 hours	August 2020 to March 2021		Onshore/ Marine	<p>The following offshore welding activities will occur</p> <ul style="list-style-type: none">- Welding headstock to piles- Welding pile caps on top of piles/braced frame- welding pot bearing baseplates. <p>Hot welding slag, fragments, shavings and broken welding disks will all be prevented from falling into the water by use of welding mats or equivalent around the site of the hot works.</p>		1) Marine environment from housekeeping and unplanned waste / objects entering into the water.



[Project Number]

Lipson Cove (Port Spencer) Grain Facility

DRAFT Project Management Plan

Rev	Prepared by			Reviewed by			Approved by		
	Name	Signature	Date	Name	Signature	Date	Name	Signature	Date
A									

Rev	Issued To	Organisation	Format	Issue Date
A				

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1 Introduction

The purpose of this Project Management Plan (PMP) is to provide detailed information regarding the identification and management of work health and safety, environmental and quality risks for the scope of works to be performed.

The requirements detailed in this plan apply to Bardavcol employees, subcontractors and other workers under Bardavcol's control.

The PMP has been prepared with regard to:

- Bardavcol's Integrated Management Systems certified to ISO 9001, AS 4801 and ISO 14001 and accredited by the Office of the Federal Safety Commissioner;
- applicable legislative and other requirements (ie. Codes of Practice, regulatory approvals);
- Australian standards relevant to the scope of work being undertaken;
- specific requirements of the project contract and specifications; and
- other relevant factors (ie. interfaces with other contractors, site conditions).

A current copy of this PMP will be maintained at the project site for the duration of the project and will be available for all workers to review (if required). Specific requirements will be communicated to Subcontractors and other workers on site, as required.

Integrated Management System documentation referenced in this plan is available electronically to the project team and for currency concerns are not included as hard copies unless expressly required.

2 Project Overview

Project No.:	[XXXX]
Project Name:	Lipson Cove (Port Spencer) Grain Facility
Location:	Port Spencer, Eyre Peninsula, SA
Client:	Peninsula Ports
Principal Contractor:	Bardavcol Pty Ltd
Project Description (scope of works):	Blasting, crushing, earthworks, pavements, marine construction, conduit placement, stormwater drainage
Start date:	Jan 2020
Anticipated end date:	TBC
Anticipated duration:	22 months
Approximate Value	TBC

2.1 Project scope

2.1.1 Summary of key activities and timeframes

Activity	Commence Date	End Date
Mobilisation to site	January 2020	
Blasting activities	January 2020	May 2020
Crushing activities	January 2020	December 2020
Groyne construction	January 2020	April 2020
Silo and shed pad	April 2020	August 2020
Western bunkers and marshalling area	April 2020	March 2021
Demobilisation from site		June 2021

2.1.2 Summary of quantities

Material generated (and method)	Anticipated quantity
Run of quarry (blasting and sifting) Core+ abutment fill	300,000 t
8 tonne armour rock (blasting and selection)	16,000 t
2 tonne armour rock (blasting and sifting)	13,000 t
Crushed rock (blasting and crushing) for Pavement	260,000 t
Cut to Fill (OTR) – Bunkers & internal Roads	200,000 m ³
Pavement Construction - Bunkers	160,000 t
Pavement Construction – Internal Roads	60,000 t
Pavement Construction – Lipson Cove Road	25,000 t
Bunker Walls	13,000 lm
Bunker Sealing	20,000 t AC7 or AC10

2.1.3 Methodology for key activities

2.1.3.1 Blasting

- Blasting works are to be carried out in accordance with AS 2187 Explosives – Storage Transport and Use
- Vibration Limits will be set within the Blast Management Plan (BMP) and will be guided by limits set out in Appendix J of AS 2187
- Refer to Appendix A for a sample Blast Management Plan used successfully on a previous Bardavcol project
- Blasting is required to generate excavations for the Jetty construction launch site and silos area, This site won rock will subsequently be used to produce several products for re use within the project :-
 - Groyne Materials – varying size to 8t
 - Pavement Source Rock – Varying size up to 600 mm max to enable crushing.
 - If required as general fill materials for bunker construction
- Drilling and Blasting are programmed to be carried out as dayshift operations.

2.1.3.2 Groyne construction

- Prior to construction a floating silt curtain will be placed around the groyne footprint. It is likely that this will be placed progressively and extended as the works proceeds to the final footprint.
- A combination of end tipper trucks and a dozer is to place and push the mined rock to be used for the Groyne core out into the footprint of the groyne to create a ‘finger’
 - Core material is intended to be “Run of Mine” material loaded with a skeleton bucked to reduce fines content.



- Note that rocks are to be placed on the existing sea bed with no preliminary works deemed to be required
- A long reach excavator is to be used to trim the batters of the core to be 1:1.5
- As the groyne encroaches into the water and wave zone, a capping of 8 tonne rock is to be carted and placed using a combination of end tipper trucks and excavators
- As the depth of the groyne exceeds the wave impact zone depth at AHD -4.8m, a toe of 1-2 tonne rock is to be carted and placed using a combination of end tipper trucks and excavators prior to the placement of the 8 tonne rock
- It is proposed that the armour rock gets placed progressively to mitigate the risk of washout of the groyne core during a storm event
- Groyne construction is to be a day / night (double shift) operation
- No on ground personnel will be required on the groyne during construction
- A work boat will be in attendance at all times for silt curtain placement and management.

Refer to Appendix B1 for a diagrammatic representation of the above methodology.

During groyne works, aquatic sediment control in the form of floating silt curtains will be installed to minimise the impact of earthworks on the marine environment. Environmental controls specific to water quality will be managed through a Soil Erosion, Drainage and Water Quality Management Plan (refer section 9.8).

2.1.3.3 Crushing

- Crushing of blasted rock is required to produce pavement materials to be used in
 - Construction of bunkers
 - Backfill to Silo foundations
 - Internal roads and marshalling areas
 - Upgrade of Lipson Cove Road
 - Stormwater drainage materials
- Subject to crushing trials it is anticipated an “all in product” will be produced with a 2 stage (jaw crusher + secondary crusher) process. Producing approx. 7000-9000 tonne/week on a dayshift only basis.
- Subject to productivity targets short term night shift crushing may be required
- Due to the requirement to establish the Launch and Silo pads as soon as practically possible, the parent material for the crushing will be excavated from the blast site and stockpiled to the south of the site.
- Crushing and stockpiling will occur here (see attached Preliminary Layout Plan – Appendix B2), with crushed material incorporated into the works , being transported by off road trucks.

2.1.3.4 Earthworks and pavement construction

- Approximately 200,000m³ of cut/fill works are required for the bunkers, marshalling area internal roads and silo/shed pad
- All earthworks materials will be won from within the site, with the majority of the fill being generated from rock overburden and cut zones within the western bunkers.
- Off road dump trucks (ADT's) are anticipated to be the haulage units. Compaction will be carried out using standard compaction equipment (compactors and 12-15T vibrating rollers.)
- Following subgrade preparation and moisture conditioning, crushed rock will be spread to form the pavements. The pavement material will be hauled from the crushed material stockpile, condition and compacted. Compaction will be carried out using standard compaction equipment (12-15T vibrating rollers.)
- Both cut to fill (earthworks) and pavement works are anticipated to be dayshift operations

2.1.3.5 Bunker Walls

- Bunker walls are likely to be extruded concrete barriers (slip formed) with pre mixed concrete being hauled from Tumby Bay and extruded
- Bunker Wall construction will be a dayshift operation



2.1.3.6 Asphalt Works

- Portions of the bunkers , internal roads will require placement of thin layers of asphalt to reduce in service dust scouring of pavement materials
- 30-40mm of AC7 Asphalt is anticipated to be incorporated into the works
- Asphalt will be sourced from Port Lincoln to negate the need for an onsite Asphalt Plant and the placement will be carried out during daylight hours

2.1.3.7

2.1.3.8 Construction Water

- Construction water is required for all of the above activities. Fresh potable water is not mandatory (technically) except for the production of concrete.
- Subject to designer approval salt water may be used to construct pavements, earthworks and dust suppression. Salt water will be sourced by placing a sump in the location of the detention basin.

3 Integrated Management System

This PMP forms part of Bardavcol's Integrated Management System (IMS), which is certified to ISO 9001, AS/NZS 4801 and ISO 14001.

The IMS is underpinned by our commitments to Safety, Quality and Environment, which are detailed in the following policies:

- Work Health and Safety
- Quality
- Environmental

Copies of these policies are contained in Appendix C of this PMP and are to be displayed on the project notice board.

4 Planning

4.1 Project Organisation

4.1.1 Key Project Contacts

Client: Peninsula Ports			
Name	Position	Phone	Email
Mark Wilson	Project Manager / Superintendent		
	Contract Manager		

Design Team: Jacobs			
Name	Position	Phone	Email
Scott Snedden	Design Manager		
Rachel Rickards	Civil Lead Engineer		

Main Contractor: Bardavcol Pty Ltd			
Name	Position	Phone	Email
[TBC]	Project Manager		
	WHS Advisor		
	Quality, Safety and Environmental Representative (QSEMR)		
	Project Engineer		
	Construction Engineer		
	Site Supervisor		
Corporate Support:			
Darren Foster	Managing Director	0418 816 804	dfoster@bardavcol.com.au
Shane Prince	Construction Manager	0407 513 150	sprince@bardavcol.com.au
Robyn Murdey	Return to Work Coordinator	0400 805 613	rmurdey@bardavcol.com.au
Henning Klovekorn	HSE Manager	0439 280 666	hklovekorn@bardavcol.com.au
Daniel Kranixfeld	Operations Manager	0419 851 965	dkranixfeld@bardavcol.com.au

Other Contacts:			
Organisation	Description	Phone	Email

SA EPA	General Enquiries / Incident Reporting	8204 2004	epainfo@epa.sa.gov.au
Safework SA	General Enquiries Incident Reporting	1300 365 255 1800 777 209	help.safework@sa.gov.au
Department for Environment and Water	General Enquiries	8204 1910	Refer www.environment.sa.gov.au
Office of the Technical Regulator (Electrical, Gas Utility Infrastructure)	General Contact Line	8266 5500	Refer https://www.sa.gov.au/topics/energy-and-environment/electrical-gas-and-plumbing-safety-and-technical-regulation/about-the-otr/office-of-the-technical-regulator
Aboriginal Affairs and Reconciliation (Department of State Development)	General Enquiries	8226 8900	Refer https://statedevelopment.sa.gov.au/aboriginal-affairs/aboriginal-affairs-and-reconciliation
Dial Before You Dig (DBYD)	General Service	1100	sa-nt@1100.com.au
SA Power Networks	General Enquiries Faults / Emergencies	13 12 61 13 13 66	-
SA Water	Customer Service 24/7 Fault Report Line	1300 650 950 1300 883 121	-

4.1.2 Project Team Structure

An overview of the Bardavcol project team structure is presented in the project organisation chart in Appendix D.

4.1.3 Roles and Responsibilities

All workers must ensure that work is performed safely and without risk to themselves, others or the environment. This includes the authority to stop work if these objectives cannot be achieved.

Details of the specific roles and responsibilities for this project are provided in Appendix D.

4.2 Site establishment and operation

4.2.1 Site Access and Amenities

A site layout plan is provided in Appendix E, which indicate the:

- entry/exit points;
- site office(s);
- amenities (ie. lunch rooms, toilets);
- site parking;
- water source locations;
- material storage areas;
- refueling locations; and
- Contractor's Activity Zone (CAZ).

4.2.2 Working Hours

Bardavcol will typically* undertake site works within the hours outlined below. All work outside of the below times must be approved by the Bardavcol Project Manager and are subject to change depending on negotiations with the applicable subcontractors and programme commitments.

Nominated working hours (24-hour time)			
Monday – Friday	0700	to	1800
Saturday	0700	to	1800
Sundays, Public Holidays and Industry RDOs	Not worked		

*Crushing activities may require extended shifts to meet programming requirements

4.3 Objectives and Targets

The objectives and targets applicable to this project are summarised in the table below and are applicable to all workers and activities that are Bardavcol's responsibility.

Objective	Target	Measure
<i>Deliver the project with zero significant injuries</i>	<i>Zero Lost Time and Medical Treatment Injuries</i>	<i>Number of LTI and MTIs</i>
<i>Deliver the project with zero service strikes</i>	<i>Zero services strikes</i>	<i>Number of services strike incidents</i>
<i>Minimise construction environmental impacts</i>	<i>Re-use or recycle ≥80% of waste generated</i>	<i>Quantity of waste re-used/recycled Vs waste disposed</i>
<i>Construction quality to satisfy project specifications</i>	<i>Zero non-conformances for duration of the project</i>	<i>Number of non-conformances</i>
<i>Deliver the project with minimal disruption to the community</i>	<i>No justifiable community complaints</i>	<i>Number of community complaints</i>

4.4 Legislation, Contract and other requirements

Bardavcol's legal register, which is accessible through the intranet, lists legislation, codes of practice and other statutory requirements that are applicable to this project. Bardavcol will take all reasonable and practicable steps to ensure that work performed under its control complies with the:

- Work Health and Safety Act and Regulations; and
- Environment Protection Act and related Environment Protection Policies.

Contract or client specific requirements that are also applicable to this project are summarised below:

Reference/Title	Author	Date
[TBC]		

Licenses and approvals that are applicable to the project are summarized below:

Licence / Approval	Authority	Relevant Legislation	Activity	Project Responsibility
[TBC]				

4.5 Hazards, Risk Assessment and Control

4.5.1 Project Risk Review and Register

During the pre-construction phase, the project team will conduct a risk workshop to:

- identify risk sources, hazards and aspects
- identify potential consequences
- assess the risk (ie. consideration of likelihood and consequence)
- assign controls (with reference to the hierarchy of controls)
- analyse the residual risk based on the application of controls to ensure that it is acceptable (this process may need to be repeated if the residual risk is acceptable and controls are revised)
- assign responsibilities for the implementation of controls

The Project Manager must ensure that the above process includes the assessment of applicable risks identified by the Safety in Design assessment provided by the client or Design Team.

The outcome of this workshop will be documented in the Risk Register (located in Appendix F), which will be used to communicate project specific hazards and risks to workers and for reference in the development of task specific risk assessments, such as Safe Work Method Statements (SWMS).

A copy of the risk register will be made available to the client and Bardavcol workers, including subcontractors under Bardavcol's control.

The Project Manager is responsible for maintaining the risk register and ensuring that it is reviewed at least monthly.

The risk assessment process and controls are based on the intent to reduce the risk as low as reasonably possible (ALARP) in accordance with the hierarchy of controls.

4.5.2 Safe Work Method Statements (SWMS)

SWMS will be prepared for high risk construction work and other activities/tasks identified in the risk register, or as required by Bardavcol's IMS. The SWMS must provide sufficient information for the workers performing the tasks to understand the work method, associated hazards and required controls. The SWMS must also include details on:

- any plant and equipment that will be used;
- any hazardous chemicals that will be used;
- training and competencies (eg. qualifications) that are required; and
- details of emergency procedures and equipment required in addition to the project Emergency Management Plan and protocols.

The SWMS must be prepared, reviewed and accepted prior to the activity or task commencing. The development of all SWMS will be undertaken using Bardavcol's SWMS Review Record. The review and acceptance will be documented on the SWMS Review Record, with any additional conditions that may be required. All SWMS developed for high risk construction work will be provided to the client for review prior to commencing.

All workers must read, understand and sign onto the SWMS applicable to the tasks they perform prior to commencing work.

Copies of the SWMS must be retained in the site office and a register of SWMS maintained to enable them to be tracked and ensure that they are reviewed at least quarterly.

4.5.3 Job Task Cards

Job Task Cards may be completed for work that does not require a SWMS (eg. non-high risk construction work) or in addition to a SWMS for the purposes of identifying specific changes, hazards and controls that are applicable to the work to be performed on that specific day or shift.

Job Task Cards are to be completed by the work group to facilitate communication and consultation amongst the workers.

At the end of the day/shift, completed Job Task Cards are to be provided to the Supervisor for filing.

4.5.4 Plant Risk Assessment

All plant and equipment that is introduced to the project site must be made available to Bardavcol for inspection and issued a Plant Permit to Work, prior to commencing work. Bardavcol will ensure that all inspection records, plant risk assessments, maintenance records, and any operating manuals are maintained onsite. As a minimum, plant and equipment must conform to the manufacturer's specifications and any applicable legislation and standards.

Supervisors are responsible for ensuring that plant and equipment allocated to their activities are inspected prior to each shift, and that any faults or damage is reported to the Bardavcol Workshop, Subcontractor or Hire Company, as appropriate. Plant operators are responsible for ensuring that plant pre-start inspections are documented prior to operation at each shift and that any faults or damage is reported to the relevant Supervisor.

5 Implementation

5.1 Communication, Consultation and Coordination

Workers involved in the project will be kept informed of project specific hazards, risks, controls and performance requirements through a range of communication, consultation and coordination activities. These include inductions, pre-start meetings, toolbox talks and worker participation and consultation in the preparation of SWMS.

5.1.1 Induction

All workers under Bardavcol's control are required to report to the site office on arrival and attend the following inductions as a minimum, prior to commencing work:

- Bardavcol Site Specific Induction – for all workers
- Bardavcol visitor induction – for visitors;

Bardavcol's project induction will be conducted by project team personnel nominated by the Project Manager and include key information such as the project scope, amenities, legal requirements applicable to the project, high risk work, hazards and controls (including site rules) and emergency response processes. Workers must complete the induction form to confirm that they understand the information that has been provided. Induction details will be entered into an induction register that will be maintained for the duration of the project.

Visitors must complete the visitor induction and are not permitted to perform any works on the project. They must be escorted by a member of the Bardavcol project team.

Delivery drivers that frequently visit site must complete a truck driver induction and may be required to sign the prestart briefing for the day of delivery. The Supervisor will be responsible for ensuring that drivers that enter site are informed of any new or additional hazards / procedures relevant to that day's activities and conditions.

Induction records will be stored in a secure location to prevent unauthorised access of personal information.

5.1.2 Daily Pre-Start Briefings

Daily pre-start briefings will be held prior to the start of each shift to communicate and consult with workers on the day's activities, coordination and interface issues and key hazards and controls. Records of pre-start meetings will be retained on file. All workers are required to sign on to the daily pre-start before entering their designated work zone, even if they arrive at site after the shift has commenced.

5.1.3 Toolbox Talks

Toolbox talks will be held fortnightly to communicate and consult with workers on safety, environmental and quality related issues. All workers must attend and records of the talks and attendance will be retained on file.

As a minimum, the agenda will include information/update on:

- Hazards and controls
- Accidents and incidents
- Corrective actions
- Feedback on inspections and audits
- Open discussion on topics relating to hazards and controls

5.1.4 Notice board

A notice board will be located in the site compound or mobile lunchroom (as applicable) that will display key safety, environmental and quality information for the project. This includes Bardavcol's safety, environmental, quality and other corporate policies, the emergency response plan, site location and movement plan and key project contacts.

5.1.5 Bulletins

Bulletins may be issued to the project teams from time to time, which provide information on safety, environmental or quality related issues, such as alerts and lesson learnt.

Bulletins will be communicated to workers through Toolbox Talks and posted on the project notice board.

5.1.6 Community Relations

Bardavcol will notify the Client prior to commencing any construction work that is likely to affect nearby properties.

If required by Peninsula Ports, Bardavcol will liaise with property owners / residents prior to commencing any construction work that is likely to cause a disturbance. This form of notification will be in the form a letter that will have the following objectives:

- introduce Bardavcol to the property owners and businesses
- provide Contact name(s) for the property owners and businesses
- provide a contact number of the site based telephone service for complaints or enquiries

A complaints register will be established to log and manage all complaints and enquiries.

Once construction has commenced, Bardavcol will issue another letter with the aim of:

- ascertaining the specific access requirements required for each property, so that reasonable and practicable arrangements can be made; and
- providing 24 hrs notice in writing prior to undertaking any operation affecting property access.

5.2 Training and Competency

5.2.1 Competency

All workers under Bardavcol's control are required to have adequate skills and training to perform their tasks. Workers are not permitted to perform work for which they have not been adequately trained.

As a minimum, Bardavcol will retain copies of:

- Construction industry induction (ie. white card)
- Driver's licence
- Trade licences and operating certificates
- Relevant medical information
- Verification of competency

Plant and equipment operators may be assessed during the project, as a means of verifying their competence.

Documentation verifying competencies must be provided by subcontractors and labour hire organisations in relation to their workers to confirm their knowledge and skills. Evidence of verification of competency of Bardavcol workers is retained in the organisation's Training and Competency Register, which is accessible through the intranet.

5.2.2 Training

As per the previous section entitled *Communication, Consultation and Coordination*, all workers are required to complete Bardavcol's project induction prior to commencing work and any additional inductions or training required by the contract.

Additional training will be provided in accordance with the project training needs analysis, as identified by a SWMS or risk assessment, in consideration of a worker request or in response to a corrective action raised through an inspection, audit, hazard observation or incident investigation.

Records of training will be provided to the HSE Manager to update the Corporate Training and Competency Database.

5.3 Fitness for Work

Bardavcol is committed to providing a safe and healthy workplace to ensure that workers are in a suitable medical condition (ie. physical and mental) to perform their work. Bardavcol will ensure that health assessments are undertaken, as required by legislation or the contract.

Workers are required to disclose any medical or physical conditions that could limit or impair their ability to work safely. The Project Safety Advisor will maintain a register of workers who have indicated a medical or physical condition that may impact on safety (ie. to themselves and others) and, in consultation with the Project Manager, consider if any restrictions need to be imposed.

When allocating tasks and resources, consideration must be given to a worker's medical and physical condition and the effect of the actual work environment (eg. weather, manual handling) to minimise exposure to unreasonable health and safety risks. This includes new workers and those that are returning to work for the first time from injury, illness or extended periods of leave.

5.3.1 Alcohol and other drugs

Bardavcol has a zero tolerance policy to alcohol and other drugs in the workplace to ensure that workers do not place themselves or other at risk. Workers are required to disclose all medications that they are taking and where required, provide documentation from their medical practitioner to confirm that the medications will not affect their ability to perform their work, or provide details on limitations or controls to ensure that they can work safely. If the medical practitioner provides details of limitations or controls, the worker must adhere to these at all times.

Random alcohol and other drug testing will be conducted, in accordance with Bardavcol's Alcohol and Other Drugs Procedure. The scheduling of random testing will be coordinated by the HSE Manager to ensure independence from the project team.

All workers under Bardavcol's control must comply with Bardavcol's Alcohol and other Drugs Procedure.

5.3.2 Hygiene

Amenities, including lunch rooms, toilets and offices will be maintained and kept clean and tidy at all times. Work areas will be maintained in a clean and tidy condition, with waste materials frequently removed and disposed of accordingly.

5.3.3 Smoking

Smoking is not permitted, except within designated smoking areas that are identified and communicated accordingly. These areas will be located in accordance with applicable laws, regulations, policies, client requirements and hazard controls.

5.3.4 Sun and UV Protection

All workers must be protected when exposed to the sun or UV radiation by use of long sleeves, long trousers, UV factored sunscreen and shade structures. Additional controls, such as the use of tinted safety glasses and broad brim shades for hard hats are encouraged, subject to the requirements of the tasks performed.

Adequate potable water and other applicable controls will be provided to workers to minimise the risks associated with sun and heat exposure (eg. dehydration).

5.3.5 Return to Work (RtW)

The management of the return to work of Bardavcol employees following injury or illness will be the responsibility of Bardavcol's Return to Work Coordinator (RtWC). The RtWC will liaise with the Project Safety Advisor and applicable Supervisor and Project Manager to ensure that they understand any Return to Work Plans and related requirements that apply to workers on the project.

The return to work of subcontractor workers will be managed in consultation with their RtWC.

Ongoing monitoring of workers will be undertaken in accordance with the Return to Work Plan.

5.4 Work Group and Subcontractor Management

5.4.1 Bardavcol Work Group

Prior to commencing work on site, Bardavcol Supervisors that will be responsible for overseeing work groups will be briefed on the scope of works, project safety, environmental and quality requirements and hazards and controls that are relevant to their role and work group. This includes consultation on the risk register and contract requirements.

Prior to commencing work, Supervisors are required to prepare and submit SWMS for high risk construction work or work specified by Bardavcol and contribute to the following (as required):

- Verification of worker competencies (VOC);
- Preparation of quality documentation (eg. Inspection and Test Plans);
- Risk assessment of hazardous chemicals and provision of safety data sheets; and
- Ensuring that plant and equipment risk assessment, maintenance and inspection records are up to date.

5.4.2 Subcontractor management

Prior to engagement, Subcontractors and suppliers will be evaluated to confirm that they have the expertise, experience, resources and capabilities to meet the applicable project safety, environmental and quality requirements.

Where required, further communication and consultation with Subcontractors and suppliers may be undertaken to ensure that they understand and are aligned with the project requirements, hazards and controls that are relevant to their role and scope of work. Any clarifications and agreements that arise from this process will be documented and confirmed prior to engagement.

Prior to commencing work, Subcontractors and suppliers are required to provide information, including:

- Safety and Environmental Management Plans (if required)
- SWMS for high risk work or as requested by Bardavcol;
- Verification of worker competencies (VOC);
- Quality documentation (eg. Inspection and Test Plans);
- Safety Data Sheets for hazardous chemicals; and
- Plant and equipment risk assessment, maintenance and inspection records

Additional information may be required from Subcontractors and suppliers prior to and during construction to ensure that safety, environmental and quality requirements will be achieved, subject to their scope of work and risk profile. Bardavcol will communicate the additional information required to the applicable Subcontractor or supplier.

5.5 Emergency Preparedness and Response

5.5.1 Emergency Response

Bardavcol will maintain an Emergency Management Plan that describes the roles and responsibilities in the event of an emergency. This plan will be aligned with any client Emergency Management Plan or procedures that are applicable to the project.

The Project Manager will be responsible for ensuring that the Emergency Management Plan addresses potential emergency scenarios applicable to the project, its various locations and nearby activities. The Project Manager may consult with the project team and other information sources in identifying and considering the appropriateness and adequacy of the emergency management plan.

Bardavcol will ensure that the requirements of the Emergency Management Plan are communicated to all workers and visitors through the project induction, including any changes through Daily Pre-start Meetings, Toolbox Talks and specific area inductions.

The Emergency Management Plan, muster point locations and list of First Aiders will be displayed in all amenities (eg. lunch room, offices) and other areas as appropriate.

An emergency evacuation drill will be held within the first 3 months of the project commencing to evaluate the effectiveness of the Emergency Management Plan and related requirements. The evaluation will be documented with any corrective actions that need to be implemented. Further emergency evacuation drills will be held every 3 months thereafter.

5.5.2 Fire-fighting equipment

Fire extinguishers and other fire prevention equipment will be installed and maintained in locations where there is the potential for fire (eg. ignition sources, flammable fuel sources). Consideration will be given to the type, capacity and number of extinguishers or equipment required based on the fire risk and associated hazards (eg. electricity).

SWMS and the relevant work permits must include details of any task specific firefighting equipment that is required.

Information on the types, locations and use of firefighting equipment will be communicated as part of the project induction. Specific training requirements will be identified and managed through the project training and competency processes.

5.5.3 First aid and Medical Treatment

Bardavcol will ensure that access is available to appropriate first aid and medical facilities.

There will be at least one First Aider for every 15 workers under Bardavcol's control, with their details displayed on site, as detailed above (refer Emergency Response)

First aid kits will be maintained at designated locations and contain supplies appropriate to the work performed and potential injuries or illnesses that could arise. Work groups and subcontractors are required to ensure that additional task specific first aid kits or supplies are available to ensure that they can adequately respond to an incident or emergency. This may include ensuring sufficient quantities of eye wash are available when using a hazardous chemical.

All injuries and illnesses must be reported to the Bardavcol project team. Injuries or illness that require specialised medical attention that cannot be administered by a First Aider on site must be referred to the Bardavcol nominated medical facility for the project (refer below). A Bardavcol project team member will accompany the injured or ill person to the medical facility.

First Aid and Medical Treatment Details:

Location of First Aid Equipment		Equipment Type
Bardavcol Site Office		Large Occupational First Aid Box
Bardavcol Light Vehicles		Medium Size First Aid Pouch
Hospitals		
Nominated Hospital	Address	Phone No.

Tumby Bay Hospital	8 Esplanade, Tumby Bay SA 5605	8688 2007
Port Lincoln Health & Hospital Service	Oxford Terrace, Port Lincoln SA 5606	8683 2200

Note: Details of Bardavcol First Aiders for the project will be displayed on posters at various locations on site.

5.5.4 Spill response

Spill kits will be deployed in locations and work areas where there is the potential for spills or discharges that could pollute or cause environmental harm (ie. damage). Consideration will be given to the type, capacity and number of spill kits required based on the type and quantity of materials that could be discharged and any associated hazards (eg. incompatibility). This assessment will be documented in the Risk Register (as applicable) and may also identify the need for additional controls to prevent the spill or spread of materials.

SWMS and the relevant work permits must include details of any task specific spill mitigation and response equipment that is required.

Information on the types, locations and use of spill response equipment will be communicated as part of the project induction. Specific training requirements will be identified and managed through the project training and competency processes.

5.5.5 Incident Reporting and Management

All workers and visitors are required to report incidents including near misses, injuries, illness, environmental impacts or pollution, property damage and security related events. This includes incidents that involve the public and that occur external to the project site where Bardavcol or workers under its controls are involved (eg. plant-public interaction). As part of Bardavcol's reporting and management processes on site, the client will be notified of all incidents.

Incidents must be reported immediately to a Bardavcol Supervisor and Project Manager. The Project Manager or their representative must notify the HSE Manager within 4 hours of a significant incident (including a high potential near miss) and within 24 hours for all other incidents.

Supervisors and the relevant project team members are responsible for completing the incident report, incident statements and associated paperwork and undertaking a preliminary investigation. Incident reports (even if partially completed) must be forwarded to the HSE Manager within 24 hours of the incident.

The HSE Manager will typically report 'notifiable incidents' to the relevant statutory authority and will liaise with the Project Manager and other relevant workers to ensure that this occurs within the required timelines, and that the incident scene is not disturbed (unless required to prevent further injury, impact or damage).

The Project Manager or their nominated representative will ensure that the Client and other relevant project stakeholders are notified of incidents in accordance with the contract specific timelines and requirements.

Detailed incident investigations will be undertaken for high potential near misses and incidents that have an actual consequence rating of major or catastrophic in relation to injuries/illness, environmental harm and/or property damage. Investigations must commence as soon as possible after the incident and will be undertaken by the HSE Manager or nominated person.

Following the completion of the investigation, findings and recommendations will be communicated at the earliest scheduled Toolbox meeting.

Corrective actions identified during the preliminary and detailed (if applicable) investigation will be documented in the incident report and managed through this process.

5.5.6 Change Management

Change that requires a formal management process is:

- amendment to this PMP or other project related management plan;
- amendment to IMS documentation (eg. policies, procedures, work instructions);
- changes to critical project and corporate roles and responsibilities; and
- changes to legislation and other statutory requirements, contract or client compliance requirements.

A risk assessment must be conducted to identify any variation to the hazards and risk and to evaluate the effectiveness of the existing controls (if any) and management responsibilities. New or additional controls must be implemented in accordance with the hierarchy of controls to reduce the risk as low as reasonably possible.

Following this assessment, the Project Manager must ensure that:

- the PMP (including appendices) and risk register are updated accordingly;
- the change, including hazards and controls are communicated to all affected workers;
- SWMS, ITPs, IPCs and other 'process controls' are reviewed and amended, as appropriate; and
- Peninsula Ports are advised of any changes to the PMP and provided with an updated copy of the PMP.

6 Monitoring and Evaluation

6.1 Inspection

Inspections will be undertaken to assess project performance and evaluate the effectiveness of controls. This includes observation of hazards, 'at risk' and positive behaviour, hold points, non-conformance and conforming/positive behaviour.

The inspection tools that will be used, frequency and responsibilities are detailed in the table below. Inspection results will be communicated with the relevant Supervisors who will initiate corrective actions and provide records of close out. The nominated project team member(s) will ensure that the records of inspection, corrective action and close out are retained on file.

Findings, including lessons learnt from the inspection process will from time to time be communicated to workers through Toolbox meetings or Daily Pre-start Meetings.

A schedule of known inspections for the project is as follows:

Inspection Type	Scope	Frequency	Responsibility
Hazard Observation	Identify positive performance, hazards and opportunities for improvement	1 / fortnight	PM, PE, Supervisor, Project Safety Advisor
SWMS Task Observation	Evaluate task compliance with the applicable SWMS	1 / fortnight	PM, PE, Supervisor, Project Safety Advisor
Safety Inspection	Evaluate general site safety performance (eg. site establishment)	1 / month	Project Safety Advisor
Environmental Inspection	Evaluate environmental performance and controls	1 / month	EMR
Quality Inspection	As per the Inspection and Test Plan	As per the Inspection and Test Plan	QMR

6.2 Audit

During the construction period, the project may be subject to an internal, second party (ie. client) and/or third party audit. These will occur in accordance with Bardavcol's internal audit schedule, client/contract auditing requirements and the timing of third-party audit programs (eg. TQCSI and OFSC).

The audits are regarded as learning opportunities to identify the processes, actions and risks that are effectively implemented and controlled, as well as those areas that are non-complying and require action.

Non-conformances and improvement opportunities will be recorded in the project corrective action register and tracked to ensure close out within the agreed timeframes.

6.3 Health Surveillance

The project risk assessment will identify any workers, activities or hazardous materials that require health surveillance in accordance with legislation or the contract. If required, external advice will be obtained to assist in determining the health risks, controls and whether surveillance is required.

The Project Manager will ensure that a register of workers that require health surveillance is maintained and that monitoring results for Bardavcol employees are provided to the individual workers and the HSE Manager. Results of monitoring for non-Bardavcol employees will be provided to the appropriate person within their organisation to disseminate and manage.

6.4 Performance Reporting

The Project Manager will ensure that data is collected, analysed and reported to monitor and evaluate ongoing project performance and opportunities for improvement. This process will be undertaken monthly and reports provided to the HSE Manager and Construction Manager. Performance summaries will be communicated to workers through Toolbox meetings.

Client/contract specific monitoring and reporting requirements will be included in the above process. For this project, the following additional data will be collected and reported:

Report Type	Frequency	Responsibility
WHSE Report	Monthly	Project Manager
Monthly Construction Statement	Monthly	Project Manager

6.5 Daily Report Sheet

A Daily Report Sheet is maintained by the project team and is used to record daily activities and other relevant information (eg. weather conditions, subcontractors on site) that may be referenced to support performance reporting, in the event of query, claim or potential conflict in relation to the project management. Daily Report Sheets will be provided to Peninsula Ports weekly, but otherwise are available upon request.

6.6 PMP Review

To ensure the ongoing currency and effectiveness of this PMP, the Project Manager must ensure that this document is reviewed at least quarterly, with more frequent reviews required in response to changes to the scope of work and project hazards/risk and controls. The review must evaluate the:

- Currency of the information within the PMP;
- Effectiveness of project processes and controls;
- Changes to hazards, risks and statutory and contract/client requirements (if any);
- Adequacy of project roles and responsibilities; and
- Opportunities to improve project performance.

The outcome of the review process must be communicated to the relevant members of the project team and the HSE Manager.

6.7 Document and Record Management

The Project Manager will ensure that document and record management processes are established and maintained to demonstrate compliance with Bardavcol's IMS, contract and statutory requirements.

All records will be stored and retained such that they are readily identifiable, accessible and located to prevent damage or deterioration. Records identified as containing personal information (eg. details of medical conditions) will be stored in a secure location with access restricted to critical personnel. Upon project completion, all records will be transferred to Bardavcol's head office for archiving. Archived documents will be securely retained for a period of not less than 7 years from the end of the defects liability period (final completion) of the project. After this time the documents will be disposed of securely by a specialist document disposal service.

The Project Manager will also maintain on-site a means of secure document disposal for the destruction of any confidential, classified, private or commercial in confidence documentation that is required to be destroyed. This will be in the form of a document shredder machine or a lockable collection bin for an offsite secure document destruction service.

7 Quality

This section outlines the quality management practices and processes that will be implemented by Bardavcol during the project. Bardavcol's systems are designed to ensure delivery of the client's brief, project specifications and contract, as well as providing control measures for project risks affecting quality. Quality will be controlled via inspection and test plans, hold /witness points, product traceability registers and Bardavcol's quality management database.

Prior to development of our quality database, a detailed analysis of the project contract, specifications and supporting documentation will take place to extract the quality deliverables of the project. This process will identify all project hold

point/witness points that are required, testing needed to be undertaken, verification records to be maintained, and work instructions to be developed. This process will be developed by the QMR with the Project Engineers.

Once identified, Bardavcol will divide the varying work disciplines into lots/packages in consultation with the client. The definition of the lots will take place as part of this discussion. Bardavcol will then proceed to ensure that the relevant release points, test and verification certificates, in-process checklists and documented work methods are included in each lot. Once all elements of that particular work package are complete, the lot will be submitted to Peninsula Ports for approval.

7.1 Condition assessment

Prior to mobilisation to site, Bardavcol will undertake a dilapidation survey that will consist of an assessment (eg. photos, comments, video) of the current condition of the existing infrastructure on site, including any existing assets within the general construction area. The assessment will be conducted to assist in determining damage or impact on the condition of the site and related amenities and structures that is caused by the project's activities.

7.2 Quality Controls

7.2.1 Inspection and Test Plan (ITP)

Bardavcol's method for providing evidence that the project specifications are met will be through the development of a number of ITPs. The ITP will document the sequence of activities for a detailed delivery process, listing all inspection and testing requirements to complete the activity. The ITP will document the acceptance criteria, frequency and responsible personnel for the successful completion of that task. Any relevant standard, hold points and records will also be documented. Each ITP will identify the critical aspects of a particular activity and will be submitted to the client for approval before commencing work.

A register will be maintained onsite of all accepted and active ITPs and is available upon request.

7.2.2 In-Process checklist (IPC)

In-Process Checklists (IPC) may be used in conjunction with the ITPs to provide additional information where steps in the ITP require a more detailed assessment and to document any special or unusual conditions under the contract. IPCs may include the following:

- hold points and/or witness points to ensure the product is held until all verification activities required have been undertaken prior to proceeding to the next stage of the works;
- a check that materials have passed verification and are suitable for inclusion in the project;
- any survey verification required;
- compaction testing or other external testing requirements;
- environmental conditions, if any, prior to work proceeding;
- critical product specification requirements and workmanship criteria;
- parties responsible for carrying out inspections and tests;
- comments column recording checks of the above;
- assign discrete lots for sections of work.

IPCs will act as a live checklist and will be updated as the work progresses.

A register will be maintained of active IPCs and will be regularly reviewed by the QMR.

7.2.3 Work Method Statement (WMS)

Work method statements will be developed in situations where a detailed methodology is necessary (eg. high risk or complex work). The methodology will provide a step by step approach to ensure that the appropriate testing, records and control measures and undertaken in the correct order.

7.2.4 Material Tracking

A load tracking register will be developed as part of Bardavcol's method for tracking and monitoring all material movements during the project. The register will document the type and source of the material, as well as the location on site where it is being used. In order to avoid any cross-contamination of material, all stockpiles will be labelled under a unique code identifier.

As part of the tracking process, each truck driver will fill out their project provided load tracking sheet that will be submitted to the QMR or delegate at the completion of each day for entry into the register.

7.2.5 Purchasing, Supplier and Product Identification Process

Deliveries of civil construction products batched offsite and used in large quantities (eg. concrete, quarry materials) will be identified by a unique identifier code or docket number that will enable traceability of the products back to their original source batch and production process. The docket provided at point of delivery will provide information on the supplier, date and time of manufacture and date and time of delivery to site.

Multiple deliveries of homogenous material will be identified by a “Supply Lot” of a defined quantity that includes testing at the specified frequencies to confirm product conformance to the specification. Details of these tests and requirements will be included on the Inspection and Test Plans for that process.

Smaller and individual purchasing of custom manufactured non-homogenous materials that are to be incorporated into the works (eg. pipes) will involve the development of a purchasing schedule that will uniquely label the items for their placement within the works. Where possible, a labelling system that is consistent with that which is included on the project drawings will be used. At time of delivery, such items will be clearly labelled according to the schedule.

7.2.6 Handling, Storage and Delivery Procedures

Delivery of homogeneous mass-produced civil construction products that are batched offsite will be by use of purpose built heavy vehicles for that specific material. Where practicable material will not typically be ‘double handled’ and will be delivered direct from source to the point of placement within the works (eg. to the location of the concrete pour in the case of concrete or to the paver machine or spreading site in the case of quarry products and asphalt).

The person nominated on the ITP will be responsible for ensuring that the product is inspected and docket checked prior to receipt/placement, to ensure that the material is a conforming product. Depending on the process and the type of material, the ITP or IPC may require further checks of the product at the point of delivery including temperature checks or curing time confirmation.

Individual deliveries of custom manufactured, non-homogenous materials will involve handling, storage and delivery by methods appropriate to that individual material. At point of delivery a general inspection of the materials will typically occur to confirm conformance to the specification prior to unloading. Any specific inspection and testing requirements at time of delivery will be included on the ITP for that process.

Storage of materials will be in a secure location appropriate to the storage of the particular material and will include consideration of specific safety, environmental and quality requirements.

7.3 As Built Documentation

Throughout the duration of the project, Bardavcol will maintain a red-pen mark-up of a drawing set that will be maintained in the site office and managed by the QMR or delegate. This mark-up will form part of Bardavcol’s As-Built submission at the conclusion of works. This submission will also be supported by any relevant survey reports.

7.4 Non-Conformances

In the event that a non-conforming product is identified during the project, a non-conformance report will be raised in our quality database. As part of this report, Bardavcol will investigate and detail the root cause of the non-conformance, as well as provide a disposition or corrective action addressing the problem. All close outs of a non-conformance report will require approval from both Bardavcol and Peninsula Ports.

Peninsula Ports will be notified of the non-conformance as soon as practicable following its identification.

7.5 Defects Management

At the completion of project, the works will be inspected by the Contractor’s Representative and a Notice of Completion will be issued. The notice of completion will list any minor defects that remain to be corrected. These listed defects, as well as any further defects identified during the liability period will be tracked on a defects register maintained by the QMR. The register will list responsibilities and well as any defect responsibilities required to be remedied by Subcontractors. Bardavcol will act to remedy defects on the register as soon as possible and in the timeframes agreed with Peninsula Ports.

8 Safety

The sections below provide details on the minimum requirements for the control of key hazards that are applicable to this project. Any deviation from these minimum requirements must be assessed through the change management process described above and approved by the Project Manager.

8.1 Asbestos

For the purpose of this plan asbestos means asbestos containing material (ACM).

Prior to commencing work on site an assessment will be carried out to consider the potential for asbestos to be present. This assessment will involve the review of an Asbestos Register, clearance certificate or equivalent documentation applicable to the site and a site inspection to identify any objects or materials that warrant further investigation. A copy of the relevant site's asbestos register(s) or equivalent documentation will be provided to any subcontractors that undertake work on that site.

Persons attending site will be provided with asbestos management information as part of the site induction, toolbox and daily prestart meetings, as well as access to a copy of the Asbestos Register(s) or equivalent documentation, which will be maintained on site.

Bardavcol will ensure that warning signs to indicate the location of asbestos are installed and if required, exclusion zones established to prevent unauthorised access and any necessary controls documented in a SWMS.

8.1.1 Asbestos Removal

The removal of asbestos will only be carried out by a licensed contractor and only commence after an Asbestos Removal Plan has been reviewed and accepted by the Project Manager. This plan must be prepared in accordance with the WHS Regulations and Codes of Practice.

The removal of asbestos will be performed under controlled conditions as per the Asbestos Removal Plan and SWMS.

After the asbestos has been removed, a clearance inspection is to be conducted by a Licensed Asbestos Assessor and confirmation of asbestos removal obtained. Where air monitoring is required, a Clearance Certificate based on sample(s) analysed by a NATA accredited laboratory must be obtained prior to workers being allowed to access areas that involved the removal of asbestos.

The Asbestos Register is to be updated to reflect the change as a result of the clearance and workers updated on the change via a Toolbox Talk, Daily Pre-start and/or Subcontractor meeting.

If at any time the project program and/or the work method to remove asbestos are varied, work in the affected area must cease until the changes have been reviewed and accepted by the Project Manager.

8.1.2 Asbestos Disturbance or Discovery

Where construction activities are likely to disturb asbestos or result in unexpected discovery or disturbance of asbestos:

- work must not commence, or must cease immediately;
- the area must be made safe; and
- an exclusion zone established to prevent unauthorised access to the area.

If the asbestos is to be removed, it must be done under controlled conditions and by a licensed contractor before the exclusion zone is opened for access by workers.

Any unexpected discovery or disturbance of asbestos must be reported using the incident report form.

In certain circumstances, the incident may need to be reported to SafeWork SA, which will be assessed in consultation with the WHS Advisor.

8.2 Concrete Works

Concrete works must not commence until the project specific hazards and risks have been assessed, including:

- Access and egress
- Ground conditions (including gradient)
- Interaction with plant and pedestrians
- Traffic management
- Underground and overhead services

- Clean up of equipment

The hazards and controls to be implemented must be documented in a SWMS that is submitted and accepted by Bardavcol prior to work commencing.

Operators of concrete pumps and related plant and equipment must be competent and ensure that work is performed in accordance with the relevant legislation and manufacturer's requirements. Exclusion zones must be set-up around concrete pumps during operation and cleaning of lines to minimise access. Communication must be maintained between the pump operator and pump line at all times.

8.3 Demolition

Demolition works may be undertaken across site, typically through blasting activities although more detailed demolition of existing infrastructure may be required.

Demolition works must not commence until:

- The area to be demolished has been inspected and assessed for hazards (eg. overhead, underground and in-structure services, structural components);
- 'Live' services within the area/structure to be demolished have been isolated or adequate controls are in place;
- SWMS have been prepared, submitted and accepted by Bardavcol;
- Applicable WMS has been developed and are acceptable;
- Permits, as required have been obtained (eg. hot works);
- Regulatory notification of the demolition works has been undertaken, where this is required by WHS legislation

Exclusion zones must be established to the maximum extent practicable to isolate the demolition works and prevent unauthorised access.

8.4 Electricity

Electrical work must only be performed by Licensed electricians and comply with AS/NZS 3000 and AS/NZS 3012, including electrical works to establish and de-mobilise the site compound and related amenities.

All redundant wiring (eg. cables, lights, switches) must be removed or isolated and labeled accordingly. All electrical services must be treated as 'live'.

Electrical installations must be undertaken in accordance with a SWMS and commissioning and handover plan that is prepared by the electrical contractor.

Bardavcol and any subcontractors will be required to maintain a register of portable electrical leads and equipment and ensure that testing, inspection and tagging of leads, equipment and RCD protection is performed by a competent person and in accordance with AS/NZS 3012.

Socket outlets, including GPOs, lighting circuits, transportable buildings and welding equipment must be protected by a Residual Current Device (RCD) that complies with AS3190.

The location and overhead and underground electrical services must be identified prior to commencing work and controls implemented with regard to the hierarchy of controls. Electrical service locations must be communicated through the site induction and warning signage and other physical indicators (as appropriate) installed.

8.5 Excavation

Excavation work is defined as:

- The use of mechanical equipment (eg. excavator, trenching machine, dozer) to dig at any depth
- The use of manual tools and techniques (eg. shovel, crowbar) to dig to a depth greater than 150 millimetres and includes activities such as the installation of posts, droppers and survey pegs

Excavation work must not commence until an Excavation Permit has been issued by the Bardavcol Permit Issuer. The process of issuing an Excavation Permit will consider any client, services and statutory requirements applicable to the work and ensure that specific controls or conditions are detailed and communicated to the Permit Holder. The Permit Holder must ensure that

the requirements of the Permit and associated SWMS or risk assessment are communicated to all workers that are involved in the excavation works.

Additional requirements include:

- The location of underground and overhead services must be assessed and identified prior to commencing any excavation work and the hazards and controls communicated to all workers involved in the task or activity.
- Any excavation deeper than 1.5 metres must be managed in accordance with SWI 21 Excavation and Trenching Work.
- Safe access and egress from the excavation must be provided and controls in place to eliminate or minimise the associated risk of fall (including workers and objects)
- Where workers are required to enter the excavation, prior to entry a specific risk assessment must be undertaken to confirm if it is a confined space (if it is deemed to be a confined space, a permit and other controls apply)
- Plant and vehicles must be routed away from the excavation wherever possible and maintained at least 1 metre from the excavation edge
- Physical barriers must be installed at least 1 metre away from the edge of the excavated area and where reasonable and practicable suitable covers installed
- Workers must not be located in the vicinity of mechanical equipment when undertaking excavation work

Excavations will be inspected by a competent person at the start of every shift, following any change or event that may affect the strength or stability of the excavation or any accidental collapse or fall of material.

Erosion controls will be installed, appropriate to the excavation type, location and activities performed to prevent erosion and movement of sediment from the work area.

8.6 Hazardous chemicals

Hazardous chemicals intended to be used on the project must be:

- risk assessed to identify specific hazards and controls applicable to their use, handling and storage;
- recorded in a Hazardous Chemicals Register and include details of quantities that will be used, handled or stored
- accompanied with a copy of the current Safety Data Sheet (SDS)

SWMS for tasks or activities that involve the use of hazardous chemicals must include information on the hazards and controls that will be implemented and identify any special emergency response requirements, as per the SDS.

General emergency response equipment including first aid, fire extinguishers and spills kits will be maintained by Bardavcol at designated locations and where hazardous chemicals are used or stored.

Workers must ensure that any additional first aid (eg. quantity of eye wash) and other emergency response equipment, as detailed in the SDS are easily accessible.

Hazardous chemicals must be stored:

- in designated areas that are bunded (120% of net capacity of largest container) or have equivalent controls
- in appropriate containers that are clearly labeled
- such that incompatible chemicals are adequately separated

Copies of SDSs will be located in storage areas, where reasonable and practicable.

Environmental controls and disposal will be managed in accordance with the SDS and any applicable statutory requirements. The EMR will perform routine inspections of hazardous substance storage areas to ensure compliance with this management plan.

8.7 Hot Work

Hot work includes activities that involve heating, burning, cutting, soldering, welding, grinding, drilling or other similar activities that may present a fire hazard (ie. ignition source). Work that involves such activities must not commence until a Hot Work Permit has been issued by a member of the management team and complies with any fire ban or restrictions applicable to the project location. The SWMS prepared for tasks involving hot works must provide adequate details on the controls that will be implemented to eliminate or minimise the risk of a fire, injury/illness and related damage, including the management of byproducts, waste and other materials that may present a fire hazard (eg. swarf, welding rods).

Work must be performed in accordance with the Hot Work Permit and the Permit Issuer (as identified on the Permit) notified when the work has been completed.

8.8 Lifting Operations

All lifting equipment must be inspected for wear and damage prior to use. Lifting equipment must be inspected by a competent person (eg. rigger, dogman) at least quarterly and evidence of this inspection provided to the project team as requested. Annual inspections must be conducted of all lifting hooks and shackles by a certified company.

Lifting equipment that is defective or damaged must be tagged out and removed from site.

Bardavcol will maintain records of its lifting equipment in its Plant and Equipment Register, which will be made readily accessible to users. Subcontractors that bring lifting gear onto site must maintain their own register and ensure that this is available for inspection at any time.

Any lift will be undertaken by competent and licensed personnel with a dogman/rigger used to sling and control all lifts.

Crane/plant must be set up correctly in an appropriate position and exclusion zones established for all lifts.

Tag lines will be used for all lifts and under no circumstances shall a load be lifted or suspended over personnel or critical plant and equipment. Lift studies must be developed for heavy, dual and complex lifts.

8.9 Manual Handling

Manual handling risks will be assessed and controls listed within the task or activity specific SWMS or a separate risk assessment. The process will involve consultation with workers that will perform the work and regular evaluation of controls to ensure that they are effective.

8.10 Mobile Plant and Equipment, including plant/person interaction

Mobile plant and equipment must have a current registration (where applicable) and be inspected by a competent person prior to operation. A Plant Permit to Work must be completed for mobile plant prior to use on site, including Bardavcol, subcontractor and hire plant.

A register of mobile plant and equipment will be maintained, with Subcontractors required to maintain a register of their own mobile plant and equipment for periodic review by Bardavcol. Mobile plant and equipment must be inspected prior to use (ie. each shift) and documented in a daily pre-start checklist or equivalent. Any faults or damage that prevents the safe use of the mobile plant or equipment must be reported to the Supervisor immediately and be rectified prior to operation.

Verification of competency (including details of licences, certificates etc) must be provided for all workers that operate mobile plant and high risk equipment (as defined by legislation or Bardavcol) prior to commencement of work. Workers must not operate mobile plant if their licence expires, or they are not fit for work (eg. impaired by medication).

Seat belts must be worn at all times when operating mobile plant. Mobile phones must not be used when operating mobile plant and equipment.

Plant and equipment must not be left unattended unless the controls are in position for parking/stopping, parking brakes are fully applied (where applicable) and the engine is turned off.

All plant must be fitted with a reverse alarm and an amber rotating or flashing light.

Refuelling and maintenance of mobile plant must be undertaken in designated areas. Refueling of equipment should occur prior to operation. The designated areas will ensure that control measures such as physical barriers are in place to separate workers and other heavy equipment.

Mobile plant and equipment must be used for its intended purpose and in accordance with the manufacturer's specifications. Loading capacities must not be exceeded and all loads must be restrained in accordance with statutory requirements.

Mobile plant cabins must be kept tidy at all times, free of rubbish and items properly secured.

Interactions between mobile plant and workers will be controlled via the project risk management process by ensuring the hierarchy of controls are used to eliminate or reduce the risk to as low as reasonably practicable. A site movement plan detailing vehicle routes will be developed and updated as work progress. Changes to the site movement plan and controls will be communicated through daily pre-start meetings and Toolbox Talks.

Preference will be to separate plant, light vehicles and personnel where possible which may include separate routes, hard barriers, signage, warning devices, speed restrictions, traffic lights, high visibility clothing and spotters.

8.11 Night works

Should there be any project requirement for work at night, risks and controls relating to work performed will be addressed in dedicated SWMS and consider potential issues, including fatigue, illumination, visibility, communication and interactions with other workers. This process will also assess the requirement for any permits or approvals from the Client or statutory organisations.

8.12 Noise

All activities, plant and equipment that have the potential to generate noise at harmful levels will be identified and controls detailed in the Construction Noise and Vibration Management Plan, Project Risk Register and/or SWMS. Plant and equipment that has the potential to emit harmful levels of noise will be eliminated by using alternative plant/equipment or method, where practicable. Other controls applied will be in accordance with the hierarchy of controls. Minimum PPE requirements will be detailed in the relevant SWMS and communicated in the Daily Pre-start, as required. Signage advising workers of specific PPE requirements will be displayed in appropriate locations.

Noise/vibration monitoring may be conducted to assess activities that may pose a risk to workers or the effectiveness of controls that are implemented.

Ongoing maintenance of plant and equipment during the project will be required to minimise the risk of noise impacts.

Any management noise and vibration relating to blasting activities will be addressed in the Blast Management Plan.

8.13 Personal Protective Equipment (PPE)

The minimum mandatory PPE required for this project is:

- Hi-viz clothing or vest;
- Safety helmet;
- Safety boots, high cut, steel capped and lace-up
- Long sleeve and long trousers, or equivalent (ie. overalls);
- Gloves carried at all times, appropriate to the task and worn when performing work.

Task and work area specific PPE may be required, in accordance with SWMS, work permit or as directed by Bardavcol.

Task and work area specific PPE may be communicated through Daily Pre-start Meetings, Toolbox Meetings or through the use of information tags located at the entrance to a work area.

Task and work area specific PPE may include:

- Respiratory equipment
- Eye Protection
- Face shields
- Hearing protection

All PPE must conform to and be used and worn in accordance with the applicable Australian Standard and WHS Regulations.

Safety helmets are not required to be worn within vehicles or when working in the project office and amenities compound, unless specified in a SWMS or other task specific risk assessment.

8.14 Services – gas, water, sewer, communications

All services must be identified prior to work commencing to eliminate and reduce the risk of damage or injury from service strikes. This includes services that are located underground, above ground and within structures (eg. buildings, tunnels, bridges).

Identification may involve a combination of Dial Before You Dig, use of a service locator by a competent person, assessment by a licensed tradesperson (eg. electrician) or visual assessment of service location indicators (eg. service pits, distribution boards). The relevant permits must be in place where service location activities involve work such as excavation, entry to confined space, isolation and working at heights.

The location of services must be documented on site drawings and communicated to the relevant workers to inform the preparation of SWMS and ensure that risks and controls are understood and implemented.

Service information must be provided with relevant permits, such as excavation, confined space and working at heights.

Service utilities will be contacted to confirm service locations and specific controls, where these are not clear or in accordance with statutory requirements.

Services must be isolated prior to work commencing and an isolation permit issued by Bardavcol. Work must only be performed on services by competent and licensed workers

As services are installed, or further information on service locations is obtained, site drawings must be updated and controlled and the details communicated to the relevant workers.

8.15 Site Establishment

Site establishment risks will be assessed and controls listed within the task or activity specific SWMS or a separate risk assessment. Permits must be issued for activities involving working at heights, excavation, hot works and entry to confined space.

The process will involve consultation with workers that will perform the work and regular evaluation of controls to ensure that they are effective.

8.16 Traffic Management

Traffic management plans (TMP) will be developed and implemented in accordance with the Road Traffic Act 1961 (SA) where plant, vehicle and pedestrian movements are to impact roads. The only public road that is likely to be directly affected by the project is Lipson Cove Road.

TMPs will be controlled in a site register indicating their status and revision. Access to all council roads and properties will be maintained throughout the duration of the contract, as far as reasonably practicable and in accordance with the project specifications. Peninsula Ports and the Council will be notified of any changes to TMPs.

All personnel required to undertake traffic management will have current Workzone Traffic Management (WZTM) licences, and will be required to have these inspected and photocopied at the site induction.

The monitoring of TMPs and related controls will be undertaken in accordance with Bardavcol's Traffic Management Daily Workzone Report.

Traffic management risks will be assessed and controls listed within the task or activity specific SWMS or a separate risk assessment. Key hazards and issues that will be considered include:

- contact with moving road traffic or plant that could result in a serious injury, fatality, property damage and/or environmental incident;
- night works or working in periods of low light (eg. dawn, dusk) with reduced visibility;
- road user behaviour; and
- protection for Traffic Controllers.

The risk assessment process will involve consultation with workers that will perform the work and regular evaluation of controls, using the Traffic Management Daily Workzone Report and Bardavcol's standard inspection processes (eg. Hazard Observation, SWMS Task Observation). Corrective action(s) will be taken as soon as is reasonably practicable to address any non-compliance or opportunities for improvement identified.

Movement of plant, site vehicles and pedestrians within the Contractors Activity Zone will be undertaken in accordance with the Site Movement Plan. The site movement plan will be made available to workers during their induction and with the daily pre-start, with any changes to the plan addressed during the discussion of the day's activities.

8.17 Vermin/Pest animals

All Vermin/Pest animal risks will be assessed and controls listed within the task or activity specific SWMS or a separate risk assessment. The process will involve consultation with workers that will perform the work and regular evaluation of controls to ensure that they are effective.

8.18 Weather/UV

Weather/UV risks will be assessed and controls listed within the task or activity specific SWMS or a separate risk assessment. The process will involve consultation with workers that will perform the work and regular evaluation of controls to ensure that they are effective. Any work conducted in extreme heat will be proactively managed by Bardavcol to eliminate the risk of temperature related injury or illnesses.

8.19 Working at Heights/Fall from heights

Working at height risks will be assessed and controls listed within the task or activity specific SWMS or a separate risk assessment. The process will involve consultation with workers that will perform the work and regular evaluation of controls to ensure that they are effective.

When using working at heights equipment personnel must have completed working at heights training and additional training relevant to the equipment (eg. EWP >11m).

A Working at Heights Permit must be issued prior to commencing an activity that involves a worker(s) wearing a harness and/or accessing a roof.

A register is to be kept of all fall arrest/restraint equipment.

All working at heights equipment is to be inspected by a competent person prior to use and periodically as per legislative requirements.

Where there is a risk of a person falling from a height equal to or greater than 2 metres, fall protection or prevention controls must be implemented.

All mobile work platforms, temporary work platforms, equipment or machinery used for work at height must have edge protection in place.

Excavations and trenches must be risk assessed and controls put in place to eliminate or reduce the likelihood of any person, plant, tool or equipment falling into the excavation or trench.

As a last resort fall restraint or fall arrest systems can be used such as, a lanyard attached to a static line, inertia reel, attached to an adequate steel structure or fixed anchorage points, self-locking anchorages and winching equipment.

Fall protection systems will be managed in accordance with the standard Industrial fall arrest systems and devices AS 1891.1.

Ladders should only be used for access and egress or performing light work. If there are no other practicable alternatives a ladder may be used as long as appropriate risk mitigation strategies are implemented (eg. platform ladder, spotter holding ladder, fall restraint/arrest etc).

9 Environment

9.1 Contaminated Soil

Currently, no locations of known or suspected contamination exist for the Port Spencer project. As the design and site investigations progress, locations may be identified. As they are discovered, these locations will be indicated on site drawings, identified (and isolated, i.e. no blending) on site with appropriate barricading/bunting and signage and communicated to workers through the induction.

Areas of suspected contamination that form part of the scope of work must be assessed by a qualified environmental consultant to clarify the type and extent of the contamination, controls required and applicable management or disposal requirements. This will be done in consultation with the client and in accordance with statutory requirements (via the Environment Protection Act 1993 (SA) and associated regulations and guidelines). Details relating to the hazards and controls will be addressed in the Project Risk Register and SWMS.

Contaminated soil transported from site will be through registered EPA Licensed transporters and taken to appropriately EPA Licensed facilities. Copies of Transport Certificates must be obtained to confirm the receipt of the contaminated soil at the correct facility.

Any contamination of soil must be reported immediately with waste material to be removed from site as per above.

A register of stockpiled material (topsoil, excavated material, etc) will be developed and maintained by the EMR for the duration of the project. Sediment control devices will be installed where appropriate (refer section 9.6).

9.2 Dust/Fumes

Dust/fume risks have been assessed on a project-wide level with general controls listed within the risk register. Prior to works commencing on a particular site, task and activity specific SWMS will be developed and will document the relevant risks and controls. The process will involve consultation with workers that will perform the work and regular evaluation of controls to ensure that they are effective. Any complaints in relation to air quality will be documented and maintained by the EMR in the environmental complaints register.

9.3 Flora and Fauna

Flora and fauna identified as high value or requiring protection will be communicated to workers and appropriate controls implemented to minimise damage and disturbance. This may include the use of signage and exclusion zones to prevent unauthorised access.

Removal of flora (i.e. vegetation) will only occur in accordance with the project specifications, relevant approvals and with the approval of the Project Manager. All native vegetation clearance boundaries will be approved by Peninsula Ports before commencing clearing.

The Project Risk Register and SWMS will include details of controls to prevent or minimise flora and fauna impacts.

A register of flora and fauna that requires protection during the project will be maintained and controls assessed as part of the project inspection process.

9.4 Heritage (Aboriginal and Non-Aboriginal)

The project management team will liaise with the client representative to ensure adequate knowledge is acquired of any culturally significant areas or objects at the site or project. In the event that areas or objects of significance are unexpectedly discovered, Bardavcol will act in accordance with EWI 08 and the client's heritage protection procedures. An outline of these procedures will be included in the induction and displayed on site at all times.

Additional control measures for the disturbance of heritage listed artefacts can be found documented in the project risk register and relevant SWMS. It will be the responsibility of the EMR to conduct routine inspections of disturbed areas to monitor for signs of Aboriginal heritage; notwithstanding, all site personnel shall be aware of and looking for potential impacts during ground-engaging activities.

9.5 Noise & Vibrations (environmental)

Areas adjacent to the construction activity zone will be assessed to identify potential sensitive receptors to noise and vibration (e.g. residents, schools, hospitals). Amenities, plant and equipment that have the potential to emit excessive noise will be located, as far as way as possible from these receptors, where practicable.

A communication strategy will be implemented, in consultation with the client, to engage with potential sensitive receptors in relation to the project and activities that may emit noise.

Prior to commencing work onsite, any required control measures in regards to noise and vibrations will be identified and documented in the risk register or relevant SWMS and communicated to all workers.

9.6 Soil Erosion and Drainage Management

Potential impacts on site drainage, storm water run-off, vegetation works (clearing and rehabilitation), site exit and egress points and stockpile management will be assessed as part of the Project Risk Register. Where these risks are identified, a Soil Erosion, Drainage and Water Quality Management Plan (SEDMP) will be developed and implemented to eliminate or minimise environmental impacts.

9.7 Waste

The Project Manager will identify possible waste streams generated by the project and management opportunities to minimise disposal to landfill. An appropriate number and types of containers and/or storage areas will be provided onsite for each of the different types of waste, with the aim to maximise re-use and recycling where practicable. Containers/storage areas will be clearly marked and monitored for cross-contamination of wastes.

Materials will be salvaged and re-used where appropriate and safe to do so.

Hazardous waste will be transported and disposed of by EPA licensed companies and copies of Transport Certificates obtained to confirm the correct management of the waste. Any specific statutory requirements relating to the handling, transport and disposal of hazardous waste will be adhered to.

Waste re-use, recycling and disposal performance will be monitored using the Waste Tracking Register and reviewed monthly.

Anticipated waste and management options are summarised in the table below.

Waste Type	Waste Generating Activities	Applicable Contractors	Waste Management Outcome			
			Re-use	Recycle	Recover	Disposal
Waste soil (unsuitable for fill)	Excavation	Bardavcol				x
Vegetation	Topsoil strip, tree removal	Bardavcol		x		

All personnel working on site will be informed of the waste management requirements, as part of the project induction. The induction will communicate to workers the importance of keeping work areas free of loose rubbish and waste materials with an emphasis on clearing at the end of each shift.

9.8 Water Quality

Water quality risks will be primarily managed through a Soil Erosion, Drainage and Water Quality Management Plan (SEDMP), with additional controls to prevent pollution addressed in the SWMS. The management plan will be developed once site mobilisation has occurred and a topographical survey has been undertaken to establish flow paths and low points.

Specific controls will be implemented where required and practicable to prevent water quality impacts caused by project activities.

Where water quality testing is deemed to be required (as per the Project Risk Register), details relating to the water quality parameters to be tested and frequency of testing will be contained in the SEDMP.

APPENDIX A – SAMPLE Blast Management Plan

DRAFT



Project No. 1807

KANGAROO CREEK DAM SAFETY UPGRADE

Client Reference: CW6942_1

SP 19 – Blast Management Plan

Prepared	Signature	Date:	Reviewed	Signature	Date	Approved	Signature	Date	Revision
B. Vreugdenburg		7/6/16	A. Wood		16/6/16	M. Schultz		16/6/16	0
B. Vreugdenburg		30/6/16	A. Wood		30/6/16	M. Schultz		30/6/16	1
B. Vreugdenburg		9/9/16	M. Schultz		9/9/16	M. Schultz		9/9/16	2

BLAST MANAGEMENT PLAN

1. Project Location:

The blasting works are to be undertaken adjacent to the existing spillway at the Kangaroo Creek Reservoir accessed via Stone Hut Road in Castambul, SA.

2. Scope:

This Plan applies to the Drill and Blast of approximately 200,000m³ of rock for the Kangaroo Creek Dam spillway excavation.

3. Purpose:

To ensure compliance with the contract, specifications, relevant Australian Standards, Acts and Regulations.

4. Objectives:

To detail actions and procedures to be carried out during the Kangaroo Creek Dam Safety Upgrade in order to achieve the desired outcome with the minimum impact on the surrounding environment.

The desired outcomes are:

- Ensure that all obligations contained within the project documents and other legal and regulatory controls relevant to the blasting works are implemented.
- Ensure that policies, objectives and targets that satisfy the requirements of SA Water and approval authorities are established.
- Identify risks and hazards associated with the blasting works, including control and/or mitigation.
- Control the blast process from design to initiation, evaluation and misfire treatment.
- Assure the safety of the public, site personnel, SA Water infrastructure and surrounding properties.
- Identify Site Specific requirements.
- Define processes for auditing, inspecting, reviewing, updating, recording and monitoring the performance and effectiveness of the Blast Management Plan.
- Blasting impacts to be identified through monitoring and minimised where possible.

5. Surrounding Infrastructure:

The effect of the blasting on the following structures will be taken into consideration during the blast design as outlined in the blasting subcontractor's management plan:

- The existing spillway wall left abutment block and Ogee crest 12m from the blast site
- The existing dam embankment located 21m from the blast site
- The existing residential properties in the area & concrete water tanks, nearest is 811m from the blast site.
- New concrete outlet works 75m from the blast site.
- Gorge Road 172m from the blast site

Monitoring will be undertaken during blasting to ensure the vibration at these locations is within the specified limits. Refer to section 11 for further details on the monitoring.

The closest non SA Water public infrastructure to the blast area is a section of Gorge Road. To ensure public safety from any potential risks associated with blasting a temporary road closure will be implemented. Refer to section 12 Blast Warning Systems for detailed advanced notice signage for road closures and Traffic Management Plans to be implemented prior to blasting.

6. Responsibilities:

a) Project Director

- i) Review and approval of this plan
- ii) Review and approval of the traffic movement plan

b) Project Manager (Earthworks)

BLAST MANAGEMENT PLAN

- i) Engagement of a suitably qualified contractor to undertake the drilling and blasting works
 - ii) Engagement of a suitably qualified consultant to review the Blast Management Plan, initial blast designs and blast reports
 - iii) Management of blasting sub-contractor & blast consultant
 - iv) Determination of work methods in consultation with the Project Supervisor
 - v) Reviewing and approving the Safe Work Method Statement for the works
 - vi) Development and revision of this plan
 - vii) Monitoring of site works for conformance with the specification
 - viii) Ensuring all works are undertaken in accordance with this plan
 - ix) Ensuring that blast monitoring is undertaken in accordance with the specification
 - x) Provision of the Blast Report and Blast Exceedance Report to SA Water
 - xi) Manage Blast notification boards including public road boards on Gorge Road and Torrens Hill Road
 - xii) Provide training to the Blast Guards
 - xiii) Application for Blast permit
 - xiv) Issuing of Blast permit
 - xv) Notification of stakeholders prior to blasts
 - xvi) Liaise with Project Manager (Concrete Works) & Project Manager (Specialist Works) to co-ordinate and notify of upcoming blasts.
- c) Environmental & Safety Management Representative**
- i) Ensuring all workers are inducted into the site and relevant SWMS
 - ii) Liaise with SA Water over any complaints received
 - iii) Assistance with Blast monitoring
- d) Project Supervisor (Spillway Earthworks)**
- i) Ensuring all workers are inducted into the site and relevant SWMS
 - ii) Fill the role of blast controller
 - iii) Provide training to the blast sentries
 - iv) Manage the site clearance process prior to blasting
 - v) Ensuring all workers on site are aware of the blasting activities and exclusion zones in place.
 - vi) Provide safe access to site for the drill and blast contractor
 - vii) Co-ordinate works with the drill and blast contractor
- e) Quality Management Representative**
- i) Ensuring all Hold Points and Witness Points are complied with
 - ii) Ensuring that blast design reports are provided to SA Water
 - iii) Assistance with the blast monitoring and submission of reports to SA Water
- f) Drill and Blast Subcontractor**
- i) Provide SWMS for the works
 - ii) Provide risk assessment for the works
 - iii) Provide a detailed Blast Management Plan for the design of the blasts and the management of the physical blasting works.
 - iv) Provide a blasting safety procedure
 - v) Provide onsite training for blast controller and blast guards
 - vi) Coordination of works with the Bardavcol management team
 - vii) Provision of blast designs that meet the project requirements
 - viii) Ensuring blasting works are carried out in accordance with the relevant Australian Standards
 - ix) Provision of licensed explosive transport vehicles
 - x) Provide suitably licensed and experienced shot firers to manage works
 - xi) Provision of the Blast Report and Blast Exceedance Report to Bardavcol
- g) Blast Consultant**
- i) Review the Blast Management Plan and provide comment on its suitability

BLAST MANAGEMENT PLAN

- ii) Review the initial blast designs and provide comment on their suitability
- iii) Review the initial blast reports and provide recommendations on revision to the Blast Management Plan and blast designs

7. Responsible Persons / Contacts

Name	Company	Position	Mobile	Email
Michael Schultz	Bardavcol	Project Director	0400 901 114	mschultz@bardavcol.com.au
Benjamin Vreugdenburg	Bardavcol	Project Manager (Earthworks)	0488 104 464	bvreugdenburg@bardavcol.com.au
Cranstone Turner	Bardavcol	Project Supervisor (Spillway Earthworks)	0419 818 979	cranstone.turner@bigpond.com
Andrew Wood	Bardavcol	ESMR	0499 554 944	awood@bardavcol.com.au
Ron Joyce	Joyce D&B	Director	0428 126 141	Joyces4@bigpond.com
Paul Joyce	Joyce D&B	Operations Manager	0426 886 414	pauljay@adam.com.au
Peter Bellairs	Bellairs Pty Ltd	Consultant	0401 716 708	Peter.bellairs@optusnet.com.au

8. Licences:

Copies of all relevant licences for the shotfirers to undertake the works on site are attached in Appendix J.

9. Blasting Methods

Detailed methods for the blasting works as requested in the specification can be found in our subcontractors Blast Management Plan in Appendix 1.

10. Preliminary Blast Design

A preliminary blast design can be found in Appendix 1 outlining the intended blast hole diameter, burden spacing, depth, explosive and stemming details as well as estimated vibration and airblast. Final blast designs will be provided to SA Water 24 hours prior to the blast. The final blast designs will also be provided to our independent blast consultant (Peter Bellairs) 48 hours prior to the blast for comment. The independent blast consultant will review blast designs throughout the works at random to ensure ongoing suitability.

11. Blast Monitoring

Bardavcol will undertake the blast monitoring in house using Texcel GTM blast monitors. Each monitor will require calibration every 12 months; these calibration certificates will be provided to SA Water prior to use of the vibration monitors. Texcel will provide training in the use of the monitors to the Project Manager (Earthworks) and ESMR. The QMR will also maintain a calibration register for the monitors.

The specified ground vibration limits are shown in the below table:

Description	PPV (mm/s)
Residential houses	5
Concrete less than 7 days old	10
Concrete after 7 days	25
Concrete after 28 days (including existing concrete structures or concrete placed as part of the works)	50
Pressure grouted foundations	20
Grouted rock anchors less than 24 hours old	0
Grouted rock anchors greater than 24 hours old	70
Domain G	13

The locations for the blast monitors can be seen in section 15 of the Joyce Drilling & Blasting Contractors Blast Management Plan located in Appendix 1.

BLAST MANAGEMENT PLAN

The results of the monitoring will be provided to SA Water after each blast as part of the Blast Report. Should the limits be exceeded a Blast Exceedance report will be provided to SA Water in accordance with section 7.5 of the specification. The blast consultant will also review the vibration reports for the blasts in which they have reviewed the design. The blasts will also be filmed in high definition to monitor fly rock.

In addition to the above blast monitoring, the outlet tunnel at the Kangaroo Creek Dam is at its closest point approximately 100m away from the blast zone. The outlet tunnel is an unsupported rock tunnel and as such, prior to resuming work in the outlet tunnel after blasting a geotechnical engineer will inspect the tunnel and confirm that it is safe to resume work inside the tunnel.

12. Blast Warning Systems

Prior to the commencement of blasting works on site notification signs will be installed at the following locations:

- Main compound entrance gate (Gate 18)
- Embankment entrance
- Crest entrance gate
- Main Compound

Road closure signs will be installed at the northern entrance to Torrens Hill Road, Athelstone and two on Gorge Road (near Torrens Hill Road and the Playford Bridge informing the public of the *anticipated* road closure. The project road closure signage will only inform the public of the road closure locations and times for clarity. Appendix K shows the locations and details of the signs.

On the day prior to the blast the Project Manager (Earthworks) will undertake the following notifications:

- Mark the time and date of the blast on the blast notification signs
- Adjust the Road closure signs to inform the public of a closure tomorrow
- Provide blast details to the following:
 - SA Water – Eric Von Wielligh (eric.vonwielligh@sawater.com.au)
 - DPTI Traffic Control Centre (dpti.tmc@sa.gov.au)
 - Call or email the landholders within the immediate vicinity (Batchelor & Stone Hut Road)
 - SAPOL – Sergeant Allan Cuk (allan.cuk@police.sa.gov.au)
 - Safework SA – Luke Brammy (luke.brammy@sa.gov.au) & Brett Pfeffer (brett.pfeffer@sa.gov.au)

On the day of each blast the Project Manager (Earthworks) will adjust the Road closure signs to inform the public that there will be a road closure today and adjust the site blasting signs to show that there will be a blast today. The spillway earthworks supervisor will notify the project personnel of the blast during the daily prestart including an outline of the no go zone during the loading of the shot and the site clearance procedure prior to blasting. The early works compound will be informed of the information prior to the prestart to ensure the embankment and crest are evacuated prior to the scheduled blast time.

When the blast has been loaded the shotfirer will indicate to the Bardavcol Blast Controller that the site is to be cleared. The blast controller will then direct all workers on site to park their plant clear of the blast and proceed to the site offices. The Blast Controller will then request the blast sentries take up their positions as attached in Appendix 1 section 12.7, blast sentries will be located at the following locations:

- Main Compound
- Gate 18
- Dam Embankment Entrance at the early works compound
- Playford Bridge on Gorge Road
- Gorge Road Lookout approximately 500m East of the Crest Entrance

Traffic Management will be set up in accordance with the attached plan in Appendix I on Gorge Road to close the road from the Playford Bridge to Torrens Hill Road during the blast period and two Bardavcol employees and a front end loader and tandem tipper will be on standby at the early works compound in case of rock fall on Gorge Road or Old

BLAST MANAGEMENT PLAN

Gorge Road. A detour will not be implemented due to the short closure time, low traffic volume and the length of detour setup required. The traffic controllers will talk to each of the vehicles stopped at the closure informing them of the 20-45 minute wait time to allow them to determine if they wish to take a detour or wait. We do not anticipate more than one car per minute based on previous road observations on Gorge Road.

Once the sentries are in place the Blast Controller will confirm with each blast sentry via UHF radio that their area is secure. Three Siren Runs will then be undertaken by the site supervisors as follows:

- Spillway Blast Zone to Gate 18 and Fire track 18A by the blast controller
- Dam embankment toe to the early works compound along Old Gorge Road
- Playford Bridge to Dam Lookout on Gorge Road including the crest access road

On successful completion of the siren run the Blast Controller will check with each of the blast sentries that their areas are still secure and clear and he will then hand over the cleared site over to the shotfirer for blasting. The shotfirer will call "firing in 5 seconds" and give a countdown to the blast.

The blast shall be inspected by the shotfirer and if there are no misfires, shall advise the guards that it is "all clear"

Gorge Road will then be inspected for rock fall and cleaned up prior to opening the road to the public. It is anticipated that Gorge Road will be closed between 20 minutes and 45 minutes for each shot.

All personnel whom will be a blast sentry shall have specific training undertaken by the Bardavcol blast controller to outline the importance of their roles, timing and communication protocols to be used. During this training each sentry will be provided with a copy of the blasting safety procedure. At completion of the training and prior to the first blast a dry run will be undertaken to ensure the clearance procedures are implemented correctly.

Further details of the blast clearance procedures are provided in the subcontractors blasting safety procedure in Appendix 1

13. Blast Safety Management

Refer to attached Joyce Safe Work Method Statements in Appendix B & C.

14. Review and Development

After each blast the Blast Management Plan, blast design and monitoring results will be reviewed by the Bardavcol Project Manager (Earthworks), blasting subcontractor and the blast consultant (for the blasts he is reviewing) and changes implemented as required to insure the Blast Management Plan objectives and specified requirements are met.

15. Records

- Site Induction Records
- SWMS
- Plant Inspections
- Blast Designs
- Blast Reports
- Blast audits
- Safety Inspections
- Complaints Register
- Prestart Meeting Records
- Blast Guard Safety Training Register
- Blast Permits

16. References

- AS 2187.0-1998 Explosives – Storage, Transport & Use – Terminology

BLAST MANAGEMENT PLAN

- AS2187.2-2006 Explosives – Storage & Use – Use of Explosives
- AS1678 Emergency Procedure Guide – Transport
- South Australia Explosives Regulations 2001
- South Australia Explosives Act 1936
- The Australian Dangerous Goods Code Edition 7.4
- Australian Code for the Transport of Explosives by Road and Rail 3rd Edition
- Detailed Specification

17. Schedules

- Appendix 1 Joyce Drilling & Blasting: Blast Management Plan
- Appendix A Joyce Drilling & Blasting: Drilling SWMS & SDS Sheets
- Appendix B Joyce Drilling & Blasting: Blasting SWMS & SDS Sheets
- Appendix C Joyce Drilling & Blasting: Risk Assessment
- Appendix D Joyce Drilling & Blasting: Orica Capability Presentation
- Appendix E Joyce Drilling & Blasting: Drilling Standard Operating Procedures
- Appendix F Joyce Drilling & Blasting: Blasting Standard Operating Procedures
- Appendix G Joyce Drilling & Blasting: WHS Policy
- Appendix H Joyce Drilling & Blasting: Orica Licensing Transport and Personnel
- Appendix I Joyce Drilling & Blasting: Orica Emergency Procedure Guide and Transporting Explosives to and From Magazines SSOP
- Appendix J Joyce Drilling & Blasting: Licenses and Tickets
- Appendix K Road Information Signs
- Appendix L Gorge Road Traffic Management Plan
- Appendix M Vibration Monitor Calibration Certificates
- Appendix N Blast Permit

Appendix 1

Joyce Drilling & Blasting

Blast Management Plan



Bardavcol Kangaroo Creek Dam Upgrade

BLAST MANAGEMENT PLAN

PREPARED BY

**Joyce Drilling & Blasting
Contractors Pty Ltd**

ABN 64 107 522 298

FOR

Bardavcol Pty Ltd

ABN 98 007 784 732

29 June 2016

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BMPV3 - 9 SEPTEMBER 2016

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1. PURPOSE

The purpose of the Blast Management Plan is to identify the processes and manage all risks associated with drilling and the use of explosives in blasting for the Kangaroo Creek Dam (KCD) Upgrade project to ensure there is no adverse impact to community, infrastructure from flyrock or ground and air vibration and ensure blasting is carried out in a responsible and safe manner in line with the relevant State and Federal legislations, Australian Standards and Codes and industry best practices.

This Blast Management Plan has been developed for Bardavcol Pty Ltd by Joyce Drilling & Blasting Contractors Pty Ltd (JD&B). JD&B has been involved in a number of major projects including the similar undertaking at the Little Para Dam Upgrade in South Australia.

The Blast Management Plan prescribes that necessary controls to be engaged to ensure that there are no adverse impacts as a result of the drill and blast component of the project. This plan encompasses all requirements for the security, supply, on site transport, use, handling and disposal of explosives offsite.

2. SCOPE

The following Blast Management Plan outlines requirements for the drilling and blasting process including interaction between Bardavcol as Principal Contractor and all relevant stakeholders. This plan shall be read in conjunction with current and relevant statutory Acts, regulations and standards in addition to other Bardavcol site specific management plans and guidelines and JD&B Procedures.

3. REFERENCES

- AS 2187.0-1998 - Explosives - Storage, Transport and Use, Part 0: Terminology
- AS 2187.1 - 1998 - Explosives - Storage, Transport and Use, Part 1: Storage
- AS 2187.2 - 2006 - Explosives - Storage, Transport and Use, Part 2: Use of Explosives
- South Australia Explosives Act 1936
- South Australia Explosives Regulations 2011
- South Australia Dangerous Substances Act 1979
- South Australia Dangerous Substances Regulations 2002
- South Australia Work Health & Safety Act 2012
- South Australia Work Health & Safety Regulations 2012
- Australian Explosives Industry and Safety Group Inc (AEISG) Codes of Practice
- Australian Code for the Transport of Explosives by Road and Rail (AE Code)
- Australian Dangerous Goods Code

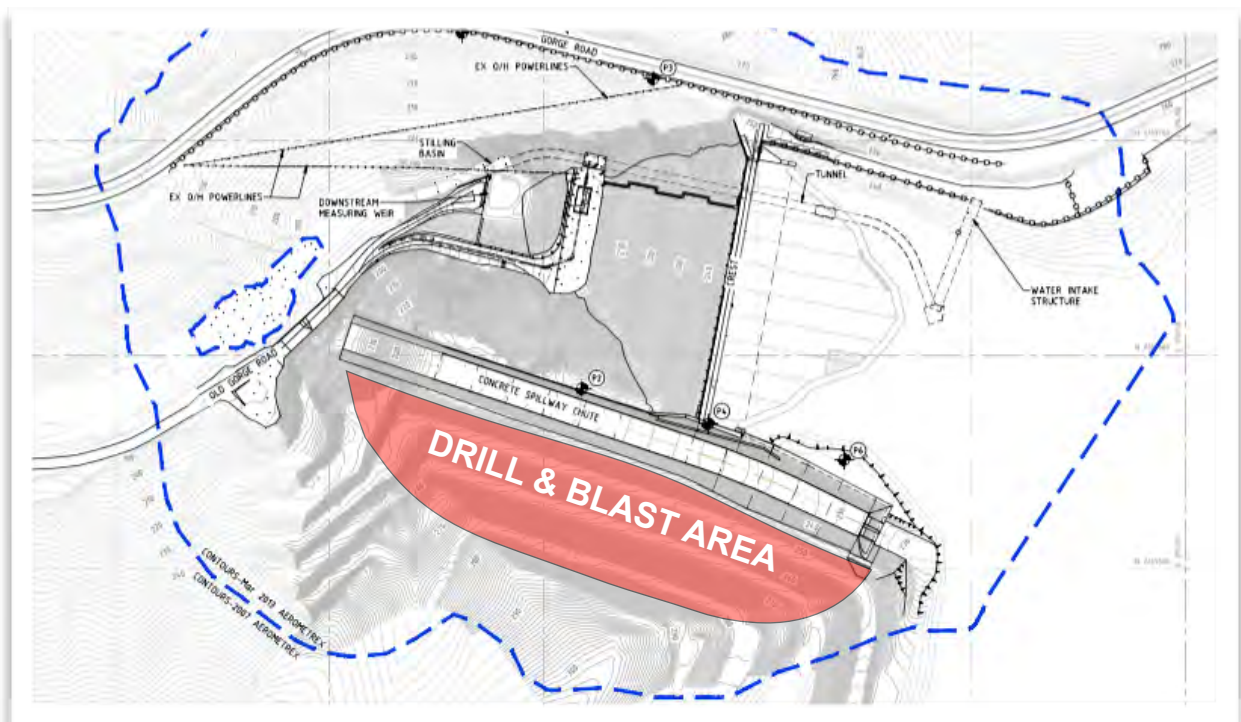
4. PLAN OBJECTIVES AND PERFORMANCE INDICATORS

Objectives	Performance Indicators
Compliance with legislative and regulatory requirements.	<ul style="list-style-type: none"> • Compliance with legislation and industry best practice. • Airblast or ground vibration not to exceed criteria nominated by Principal Contractor; • Blasting to be conducted in accordance with legislative requirements and industry best practice; • No flyrock beyond blast boundary, or unplanned flyrock events; • Minimisation of off-site odour, dust and fume emissions.
Control the blast process from design to implementation, initiation and evaluation.	Comply with project approval requirements.
Identify the risks and hazard associated with blasting, including control and/or mitigation.	Safely blast and comply with Project Approval requirements.
Implement best practice measures for the management and minimisation of dust and noxious fumes from surface blasting.	Mitigation of dust and fumes.
Assure the safety of the public, site personnel and surrounding properties from flyrock.	No flyrock incidents resulting in personal injury or infrastructure / property damage.
Limit the risk of damage to infrastructure by controlling blast vibration and flyrock.	No blast vibration exceedences or flyrock incidents.
Establish effective communications and active links between all stakeholders.	Effective communication.
Ensure the safe operation of the mechanical excavation and adjacent drill and blast activities.	<ul style="list-style-type: none"> • Effective communication. • No blast related incidents involving personnel, equipment, infrastructure.

5. EXISTING INFRASTRUCTURE AND PLANNED BLAST AREA

The KCD Project located in Castambul, South Australia and accessed via Stone Hut Road, includes the following major areas and infrastructure:

- Dam Crest, concrete faced dam wall and earth embankment
- Dam Control & Ventilation and Inlet Control Buildings
- Dam Spillway, crest, flip bucket and right hand wall
- Public access Gorge Road and SA Water access road
- Various other workings including stairs, ramps and CCTV



The planned drill and blast operations to be undertaken on the southern previously blasted batters adjacent the left hand spillway wall.

6. DEFINITIONS

Blast	Any explosive charge or shot, regardless of size or number.
Burden	Distance between blast rows, or in case of front burden the distance between the face of the blast and the front row of holes.
Spacing	Distance between blast holes within a row.
Subdrill	Length of drilling and charge which lies beneath the required grade level.
Blast Type	Softwall, Production or Presplit Blast.
Charge	Explosive or blasting agent, or both, placed in a blast hole or other position for the purpose of producing an explosion.
Flyrock	Flying rock or other material projected from a blast.
Nonel	Non-electric shock tube type delay detonator
Blast Controller	The Blast Controller is a responsible person nominated by Bardavcol for the blast or shot being undertaken and handle the logistics of the clearance of the Blast Exclusion Zone.
Shotfirer	A person who has been trained and certified/licenced by Safework SA as being able to design, supervise and undertake explosive work.
Blast Boards	Designated boards located in areas where all site personnel gather or pass, dedicated to the site blasting activities and indicating the location, time and date of any scheduled blasting and updated before the shift start on the day of firing.
Blast Exclusion Zone	The area that is determined by the risk assessment process, to ensure that all the expected / foreseen dangers and affects of the blast, are maintained within a controlled area.
Blast Guard	Industry terminology for a hard barrier consisting of a suitable person and equipment (visual indicators, suitable vehicle and communications equipment), strategically located to act as a hard barrier against unauthorised access to a designated Blast Exclusion Zone.
Post Blast Fume	The cloud of material generated after the initiation of ammonium nitrate based explosives which is sometimes yellowish through to a red / brown colour.
Down the hole delay (DTH)	The down the hole delay (DTH) in the blast hole which transmits energy from the trunkline down the hole to the primer to initiate the explosive column in the blast hole.

7. RESPONSIBILITIES

	Task Description	JD&B	Bardavcol
	General		
1	Mobilisation of equipment and personnel	Yes	-
2	Develop, review, monitor, record and report Progress of Work, Continuous Improvement Program and Key Performance Indicators	Yes	Yes
3	Develop, review and implement SWMS prior to commencing operations	Yes	Yes
4	Supply drilling and support equipment that meet regulatory and Principal Contractor operating standards including site specific requirements	Yes	-
5	Provide Drill Operators and / or Drill Fitters and support personnel	Yes	-
6	Provide transport for Drill Operators, Fitters and support personnel	Yes	-
7	Provide personnel for inductions and safety meetings	Yes	-
8	Provide \$20 Million Public Liability Insurance	Yes	-
9	Prepare WHS and other reports as requested by the Principal Contractor	Yes	-
10	Site Induction of personnel	Yes	Yes
11	Provide Waste disposal facilities for general rubbish and used filters / oils	-	Yes
12	Inspect and approve on site use of drilling and support equipment and consumables to ensure they meet regulatory and Principal Contractor requirements	Yes	Yes
13	Provide limited use of office, telephone, crib and ablution facilities	-	Yes
14	Provide area / facility for lay down and storage of drill parts, equipment and drilling consumables	-	Yes
15	Provide accommodation and meals for JD&B personnel	Yes	-
	Planning & Design		
16	Project planning	-	Yes
17	Survey positioning and control points	-	Yes
18	Prepare drill plans and schedules with hole position and quantities	Yes	-
19	Review and approve drill pattern designs prior to commencement of drilling	Yes	Yes

	Drilling Operations		
20	Drill blast holes as per approved design / drill plan	Yes	-
21	Measure and record depth and log significant changes in ground conditions	Yes	-
22	Recording and reporting of drilling performance including metres drilled, hours worked, hours down, availability and utilisation	Yes	-
23	Maintain drill pattern delineation signage	Yes	-
24	Install and maintain drill hole collar protection	Yes	-
25	Provide and maintain mine specific radios in drills and support vehicles	Yes	-
26	Undertake periodic equipment safety inspections	Yes	Yes
27	Prepare daily drilling reports	Yes	-
28	Prepare monthly drilling summary reports	Yes	-
29	Provide tramming and service time to access Principal provided fuel and water	Yes	-
30	Supply collar hole protection devices	Yes	-
31	Prepare bench for drill and blast patterns and provide clear access to patterns	-	Yes
32	Where blast services are implemented, mark out patterns as per approved design / plan	Yes	
33	Provide "Ground Engaging" consumables for drill rig including bits, shanks, rods, couplings, TAC Tubes, cheater bars etc	Yes	-
34	Provide water for water injection (dust suppression)	-	Yes
35	Provide lighting plants for night shift drilling, if required	-	Yes
36	Provide after hours access, if required	-	Yes
	Plant Maintenance and Servicing		
37	Provide for evacuation of oils during routine maintenance (if required)	Yes	-
38	Provide diesel fuel into drill rig tank and site support vehicles as required	Yes	-
39	Maintain drill maintenance and repairs records	Yes	-
40	Supply oil, grease and other lubricant consumables for drilling equipment and support vehicles	Yes	-
41	Track drill maintenance schedules	Yes	-
42	Management, coordination, implementation of blasting operations	Yes	Yes

	Blasting Operations		
43	Management of safety, health and environment for shot firing activities	Yes	-
44	Preparation of site specific "Drill & Blast Manual" including management and procedures plan	Yes	Yes
45	Drill and Blast design and planning including drilling, charging, initiation sequence etc	Yes	-
46	Review and approval of blast designs prior to commencement of blasting	Yes	Yes
47	Firing time notification	Yes	Yes
48	Provision of blast guards	Yes	Yes
49	Blast pattern delineation	Yes	-
50	Selection explosive products by blast hole in accordance with design	Yes	-
51	Supply labour to dip and charge blast holes, prime, stem and tie up	Yes	-
52	Dewatering blast holes if required	-	Yes
53	Correct over or under charging	Yes	-
54	Environmental monitoring for compliance with statutory and Principal Contractor requirements	-	Yes
55	Measurement of blast hole depths	Yes	-
56	Misfire management (retrieving lost down lines, supervision of misfire recovery etc)	Yes	-
57	Prepare blasting reports record keeping	Yes	-
58	Blast hole charging, priming, stemming and tie up initiation system	Yes	-
59	Provision of loading records of explosive / type / quantity per hole	Yes	-
60	Two way communication equipment	Yes	-
61	Blast approval	-	Yes
62	Supply suitable material for stemming 7mm-10mm	-	Yes
63	Supply equipment for placement of stemming material	-	Yes
64	Provision of blast signage	Yes	-
65	Shot firing duties including initiation, checking, appropriate clearances etc	Yes	-
	Explosives Supply		
66	Supply of all explosive product and accessories on site	Yes	-
67	Supply of explosive BULK product into blast holes	Yes	-
68	Storage of all explosive product and accessories on site if required	No	No

8. DRILLING

Following the approval of the Blast Design the Driller shall drill the pattern in accordance with the approved blast design and survey plan. As each drill blasthole is completed, the driller will check the blasthole depth and record any relevant details (including design blasthole depth, actual blasthole depth, voids, fractures, water depth and ground conditions) on the drillers' Blasthole Log (see below).

It is important to note that the penetration rate of the Drill Rig will contribute to the Powder Factor of the final blast design should it vary significantly within a given pattern and/or between blast patterns.

Potential problem blast holes are to be identified and marked with paint or a cone.

The tolerance for drilling depth is +0m and -0.2m for depth while the tolerance for collar location is the drill bit diameter. Marking out of the drill pattern is to be undertaken by surveyors to achieve a KPI of +/-1 hole diameter. Best practice drill bit tolerance KPI of +/- 5% and an azimuth and angle KPI of +/-3° and +/-2° respectively have been recommended and to be audited by the responsible shotfirer and Bardavcol.

At the time of drilling, any blastholes that are under-drilled by more than 200mm must be redrilled. Blastholes that are over-drilled by more than 200mm shall not be backfilled until final QA prior to charging. During the course of drilling a blast pattern, unused or remnant blastholes must be identified and be back filled with appropriate stemming material.

*Example Drill Documentation
to be made site specific
prior to blasting*

The image displays three example drill documentation forms from Joyce Drilling & Blasting Contractors Pty Ltd.

- Drill Operators Drill Log:** A form for recording drill operations, including location, drill operator, week ending, and a table for recording hole details (hole no, depth, diameter, etc.).
- Drillers Blasthole Log:** A form for recording blasthole details, including blast number, date, start/finish times, and a table for recording hole details (hole no, depth, diameter, etc.).
- New Site Inspection & Drilling Hazard Identification:** A form for identifying and assessing drilling hazards, including a table for recording hazard details (hazard no, description, significance, etc.).

9. SHOTFIRER

The shotfirer employed at the KCD Site must make themselves conversant with this document and ensure the following:

Explosives Usage Report:

Explosive usage report to be supplied by the Explosive Supplier and all documentation will be included in the Post Blast reporting.

Misfire Report:

Completed by the Responsible Shotfirer each time a misfire occurs or on discovery. The misfire report must determine the root cause and what actions are to be taken to minimise or eliminate the risk occurring again.

9.1. BLAST CREW ASSISTING SHOTFIRER

The shotfirer must ensure that all personnel working on site are Safework SA certified 'Under the Direct Supervision of the Shotfirer' and receive instruction on the safe handling of explosives and precautions to be followed when working on a shot, in the form of JD&B Standard Operating Procedures, SWMS, Job Safety Analysis and tool box meetings.

10. EXPLOSIVE STORAGE & TRANSPORT

All explosives will be transported to site by the preferred supplier in strict accordance with statutory legislation and regulations. **No explosives are to be stored on site.**

- Explosives will only be brought onto site in the required amount to undertake the proposed blast and with the minimum amount of time prior to commencement of loading.
- The explosives vehicle shall comply with all relevant regulations, standards and codes for the transport of explosives in South Australia.
- A "Pre Blast" checklist will be formed to verify the quantity of explosives brought onto site, used in the blast, and removed from site to ensure that all explosives can be accounted for at all times. This will be included in the post blast report.
- Whilst onsite the explosives shall remain in the approved vehicle until the vehicle reaches the blast area. The blast area shall be delineated with yellow or yellow/orange cones to a distance of 8m from the nearest blasthole.
- Explosives shall remain in this area until utilised in the blast or returned to the explosives transport vehicle. At the completion of loading the explosives transport vehicle and blast area will be checked by the designated shotfirer for any inventory still remaining. The explosives vehicle shall not be left unattended at any time whilst carrying explosives.
- Explosives must be locked in approved receptacles on the explosive vehicle when not in use and may only be accessed by the responsible shotfirer or an authorised delegate.
- Once the blasting has been completed, the explosives vehicle shall return all explosives to the designated magazine off site.

10.1. TRANSPORT OF EXPLOSIVES ON-SITE

Transport of any explosives or blasting agents at the KCD Site will be the responsibility of the explosive supplier and must be in vehicles designed and approved for that purpose and ensure each vehicle has the correct licences to transport, the drivers have licences to transport explosives and the vehicles meet the requirements to transport explosives as per AS 2187 including

Refer Appendix H - Orica Licensing Transport and Personnel

- Follow the Orica Emergency Procedure Guide that is available in every vehicle, according to function and content

Refer Appendix I - Orica Vehicle Emergency Procedure Guide and Orica Transporting Explosives To and From Magazines SSOP

- Fire extinguisher, Flashing light on cab
- Chock blocks for placing under the downhill side of the rear wheels
- Signs Front, rear and each side with the word "EXPLOSIVE" and rear appropriate hazard diamond
- Maximum speed limits are dependent on prevailing conditions that allow for safe operation. However, vehicles carrying explosives must not exceed a speed of 40 KPH, or less (if posted speed limit is less).
- Transport of explosives by vehicles between the magazine and the site must only be via the designated access roads.
- All vehicles used for transporting explosives must be inspected by a shotfirer daily before starting to ascertain that the vehicle is in good working order and all safety and warning requirements are in place.
- Detonators must be carried in approved quantities in special receptacles, which must be used only for detonators.
- No person is permitted to smoke while in or near an explosive vehicle, nor allow other persons to smoke or bring a naked flame within 8m of the vehicle.
- Empty boxes to be disposed of daily after all references to explosives and the names have been painted out and all boxes inspected to ensure no residual explosives.
- Explosive receptacle doors must be shut or the coverings must be replaced and made secure at all times, except to allow the immediate loading or removal of explosives.
- Where a fire cannot be rapidly contained by fire extinguishers, the driver must immediately endeavour to clear/evacuate the area to a safe distance (1000 metres in all directions) and give warning to and restrain all traffic.
- A vehicle carrying explosives must not be left unattended at any time.(This does not apply to working on the same shot). Except during a fire/electrical storm (refer to following point).
- If the proximity of an electrical storm is such that it constitutes an imminent or immediate hazard, all vehicles conveying explosives are to park up as specified by the Responsible Shotfirer and ensure the safe removal of the drivers and other personnel.

10.2. TIMING OF BLASTS

Every endeavour will be made to conduct Blasting at the same designated time each day.

The nominated firing time will be at a time to minimise disruption to the on site workforce and the general public travelling on the Gorge Road.

However, the blast time of **3:30pm** nominated by Bardavcol is an estimate only as the final decision will rest with the shotfirer in consultation with the PME.

The time for a blast will be dependent on weather conditions and this will be checked the day prior and morning of the blast. If adverse or extreme weather conditions are anticipated (electrical storm, heavy rain, heavy cloud cover) the blast will be postponed before loading, or if feasible, brought forward to avoid extremes of weather. Blasts will generally not be fired during adverse weather conditions, unless for safety reasons or to minimise deterioration of the blastholes and explosive product.

Following an initial series of trial blasts the blast time can be reviewed, subject to blast volumes, to a lunchtime time slot, as opposed to end of shift.

10.3. BLAST SIGNAGE

Prior to commencement of blasting works on site signs will be supplied by JD&B and installed by Bardavcol at the following locations:

- Main Compound Entrance Gate (Gate 18)
- Embankment Entrance Gate
- Crest Entrance Gate

Bardavcol will install road closure signs at the entrance to Torrens Hill and Gorge Roads near the DPTI road closure signs informing the public of anticipated road closure. These signs will not inform the public that the closure is due to blasting works.

Blast signs will also be placed in each compound crib facilities.

10.4. BLASTING PRELIMINARIES

The shotfirer must inspect the shot to be blasted and conduct a Risk Assessment / Take 5 that includes the following actions:

- Request any clean ups that are required through the Earthworks Supervisor (i.e. bench preparation and ramp access).
- Sufficient signs and cones delineation are placed to prevent unauthorised access to the shot. Signs are not to be within 8m of a blast.
- Ensure that the charge sheet details the required amount of explosive charges for each hole and tie-in plan is attached.

10.5. CHARGING

Only vehicles or personnel directly involved in the charging operation are permitted within the designated blast area.

Charging may be conducted concurrent to back-filling and clean ups as long as equipment and personnel other than that used for the charging operation are clear of the area (not closer than 8m).

In order to avoid the occurrence of vehicles interfering with explosives, the following shall be observed when charging patterns:

Before Priming

Signs displaying "Danger - No Entry Blasthole Charging & Danger Authorised Entry Only" will be placed at any access path to the blast area or blast hole loading in progress.

Priming Blastholes

On any shot, the shotfirer shall be responsible for the retrieval of unused priming devices.

- The number of priming devices used in each blast hole will be determined by the shotfirer and based upon the recommended design. Taking into account blast hole diameter, length of explosion column, water conditions, type of explosive and geology of the area.
- Where a column of explosives is, or may be, discontinuous, each part of the column will include a priming device.
- Charging of blast holes must not take place within ten (10) metres of drilling operations or within ten (10) metres of projected holes not drilled but intended in the designed blast.
- Use down the hole delay (DTH) of suitable length wherever possible to avoid having excessive lengths of tubing outside the blast hole.
- The tail of the down the hole delay (DTH) left at the top of the hole shall be secured in the drill cuttings as close as possible to the hole, parallel to the direction of loading.

Charging

No charging operations shall take place until all holes to be charged are inspected and found to be clear of any obstructions that may necessitate re-drilling.

- All persons employed in charging operations shall be under the direct supervision of the shotfirer.
- The shotfirer in charge of any blasting operation shall ensure by the provision of training that each person in the blast crew is adequately trained for the tasks they are required to perform, with respect to the particular blasting systems and materials being employed.

The following rules are to apply when charging:

- Undue force must not be used to insert the primer or the charge into the blast hole.
- Down the hole delays (DTH) should be firmly secured at the collar of blast holes to prevent them from being drawn into and lost down blast holes.
- When using packaged emulsions care must be taken to ensure continuity of the charge.
- Primers must be located in good quality explosive product approximately 300mm above the bottom of the blast hole.
- Primers must be lowered into blast holes in a controlled manner.

NOTE: Excavators that are still digging the bench face may dig to within 8m of a charged hole only when delineated by no-dig tapes, cones and signs are in place.

The recommended KPI's for charging are:

- Hole Depth KPI +/- 0m/0.2m modified by blasthole logs.
- Stemming Length KPI to be the minimum of the designed stem length based on the SDB or longer if soft or broken ground in the stemming region
- Any excess bulk explosive must be sucked out using a PVC "sucker pole" to remove any excess charge length and destroyed it with water or detergent laden water

Achieving MIC takes precedence over stem length as long as the stem length is a minimum of the final design and the recommended KPIs are to be audited by the shotfirer and Bardavcol.

Stemming

Prior to stemming, all blast holes must be measured with a tape or stemming pole to ensure that the correct length of hole is available for stemming material.

- Stemming Length KPI to be the minimum of the designed stem length based on the SDB or longer if soft or broken ground in the stemming region
- Overloaded holes must be remedied (by removing excess charge prior to stemming).
- Care must be taken to ensure that the down the hole delay (DTH) is not damaged or lost down the blast hole during the placement of stemming material.
- All production blast holes are to be stemmed with 7mm-10mm crushed rock aggregate placed carefully in the hole to prevent bridging of the aggregate as directed by the shotfirer. Following the initial trial blasts the performance of the stemming will be reviewed and if required substituted with 5mm-7mm.
- Presplit holes to have hole plugs inserted at the nominated depth and det cord covered with 400mm of sand.
- If tamping is to be under taken only tamping rods constructed of wood or other non-metallic material must be used.
- Stemming material is placed on the shot with a front end loader / IT and spotter (to assist with manual stemming of each blasthole) prior to loading.

Tie-in

The shotfirer must utilise the manufacturer endorsed method(s) and the authorised pattern for tie-in of the blast holes, including the Point of Initiation, method of tie-in and location of each delay. Unless otherwise directed all tie-ins shall use Nonel surface and downhole delay products as per the authorised design blast.

- The shotfirer must connect the control row and then tie-in can proceed from back of the shot to the control row. shotfirer must inspect the entire shot
- The use and compatibility of each product must be in accordance with the suppliers instructions or training.
- Tie-in of any blast holes shall not commence until all vehicles are removed from the charging area. Once tie-in is completed, ensure that no vehicle is allowed to re-enter the blast area and the shotfirer nominates a shot guard to remain with the shot at all times.
- At the completion of the tie-in and prior to firing the shot the shotfirer and assistant must "walk the shot" from opposing ends to confirm all connections have been correctly made and are in the correct place.

NONEL FIRING

When utilising Nonel leadlines the following procedures must apply:

- The shot primer must be stored separately to the Nonel initiating device in a locked container
- Prior to any connection to the firing device or "starter" detonators the end of the Nonel leadline must be inspected and if necessary a portion cut off and discarded.
- Ensure end caps are applied to protect the Nonel tube from ingress of foreign matter or moisture.
- Personnel and equipment must not walk, tram or drive over Nonel leadlines.
- Only manufacturer specified joiners must be used to connect Nonel tube.
- Only approved firing devices (electric firing device that converts electric energy into a shock wave and start gun firing device that requires shell shot primers No. 20) must be used for initiating Nonel leadline.
- The shotfirer is responsible for the control of the firing device and any other components required for its operation.
- In the case of firing devices that require shell shot primers No. 20, the primers must not be stored in the firing device.

10.6. BLAST EXCLUSION ZONE

The safe clearance distance or exclusion zone shall be determined by the shotfirer in consultation with the Principal Contractor, however in the initial instance the minimum clearance is to be 250m or based on the final design output, whichever is the greater on the basis of safety. Following the initial trial blasts the exclusion zone will be reduced to suit.

The type of material to be fired and previous historical flyrock data will have an influence on the safe distance required and this may be reviewed following initial blasts.

10.7. MISFIRES

A misfire must be determined as follows:

- Any suspect misfire is to have a 10m delineation with no digging permitted.
- The misfire investigation is to be undertaken to determine the cause and the best method to mitigate the misfire and systems put in place to prevent that type of misfire occurring again.
- If unfired Nonel tube is exposed in a portion of a hole that has been fired, that hole must be treated as a misfire subject to visual inspection and presence of "aluminium powder" within the tube.
- Unless cut-offs or remaining portions of holes which are suspected of containing explosives have been shown to be free of explosives, they must be treated as misfires.
- Water can be used with ANFO but detergent laded water is required to neutralise pumped emulsion explosives.

10.8. MISFIRE PROCEDURE

If the shotfirer suspects or otherwise determines a misfire, they must inform the Blast Controller and Project Manager (Earthworks) of the "Misfire" and:

- Advise of the time required to deal with it; or
- Advise of the action to be taken for the marking of the area and ensure that the Blast/Misfire Information Sheet is completed.
- Following production blasting, road closures will be reopened with traffic to resume normal operation. If the shotfirer determines that a misfire is to be dealt with by blasting then this will be treated as a separate blast.

WARNING: The shotfirer must not give the "all clear" for re-entry into the blasting area until they are satisfied that the misfire has been dealt with.

The shotfirer must report and record all misfires in the Misfire Record Book.

Precautions

The following precautions must apply after a misfire:

- If a Nonel detonator that is initiated to fire the shot fails, a waiting period of 5 minutes must be observed before any inspection is conducted, provided the leadline is disconnected from its firing device.
- If a misfire is suspected or identified and is to be left, before clearance is given, its position must be identified by signs and tapes not closer than 10m to the suspected or identified area by the shotfirer. This distance must be increased if, in the opinion of the shotfirer, it is required.

If a misfired charge consists of a blasting agent:

- The charge may be re-primed and fired (if necessary, more stemming material should be placed around the blast hole to prevent fly rock); or
- Remove stemming by applying water under pressure through a non-ferrous blowpipe, ensuring that any detonator or explosive which may be susceptible to detonation during this process is not disturbed.
- When stemming and charge have been removed from a water resistant charge, the primer must be recovered.
- If a misfire contains an explosive that is rapidly destroyed by water the explosive may be washed out, after which the primer must be recovered.

If re-firing or washing out fails to detonate/remove all explosives or blasting agents in a misfired hole, the shotfirer must:

- Clean off any rock around the misfire and determine the position of that hole; and remove the remaining portion of the hole, either by digging it out in accordance with procedures specified by the shotfirer.
- No person must leave unguarded, abandon, discard or otherwise neglect to safely dispose of any explosives recovered in the treatment of misfires.

Product Found Whilst Digging

If product is found whilst excavating following a blast the following shall apply:

- Digger Operators to be conversant with bulk / packaged product
- Contact Site Superintendent / shotfirer
- Shotfirer to delineate 10m area of concern
- Shotfirer to assess status of product and Nonel tubing
- Shotfirer to propose remedial action
- Shotfirer to directly supervise and spot should digging out of product be required
- Product made safe refer above

10.9. SECONDARY BLASTING PROCEDURES

Secondary blasts inherently pose a high risk of producing excessive and long range flyrock. Consequently, secondary blasting will not occur at the Bardavcol KCD Site.

11. WORKING NEAR CREST OF BENCHES

Explosive Suppliers have instigated a two-metre exclusion zone from crests. No personnel will enter this area at any time.

Activities on bench include survey, mark-out, drilling, boretracking, dipping, loading, stemming, firing as well as visits by supervisors, managers etc. It is seen that all these activities are exposed to the hazard of working close to the crest but that all can be executed without the need to enter into the two-metre danger zone.

- Two-metre "Danger Zone" to be identified on all blast areas with cones and/or a painted line parallel and 2 metres from the crest where there is a face height of greater than 1.8 metres. Note: the crest is defined as the edge of the face where competent ground begins.
- JD&B and explosive suppliers will not mark-out or load any holes where operators have to go within the two-metre danger zone, or allow its personnel within the two-metre zone.
- Mark-out and loading of holes between 1.5 metres and 2.0 metres of the crest should be achievable with the operator remaining behind the two-metre danger zone line.
- Explosive suppliers will conduct a pre job risk assessment on each visit to the bench by explosive supplier personnel.
- Provide safe access and bench conditions at industry best practice
- Instigate mark-out and drilling practices so that no holes are closer than 2 metres to the competent crest.
- Not to request taking the loading hose to load holes where the two-metre danger zone would be compromised.

12. BLAST GUARDING

12.1. RISK ASSESSMENT

A formal risk assessment will be completed prior to the commencement of the blasting campaign(s), identifying the potential hazards and controls that may be presented by the individual blasts at each stage, including the extent of the Blast Exclusion Zone during the firing sequence.

Any risk assessment must be approved and signed by all of the relevant parties involved in the blasting process prior to the blasting campaign(s) process being undertaken.

Factors that may be taken into account during the risk assessment may include (but not be limited to) the following:-

- The type of shot (presplit, softwall, production);
- Aim of the shot (fragmentation, maximum heave, etc);
- The ground type (hardness / bedding planes);
- Known geological abnormalities within the blast design area;
- Burden and spacing (including face row design);
- Average bench height;
- Vertical location of the bench;
- Average blast hole load;
- The designed blast powder factor;
- Timing and effects;
- Historical records of flyrock events;
- Access to and from the proposed Blast Exclusion Zone;
- The location of equipment and personnel during the blast;
- The location of protected works and/or associated works;
- The location of external infrastructure potentially affected by the blasting activities;
- The formation and management of any blast fume;
- Radio communication 'black spots';
- The expected weather conditions.

12.2. BLASTING NOTIFICATION

The site superintendent responsible will notify all persons on the morning of the scheduled blasting time and ensure the blasting information has been passed on to all personnel under their direct control (including sub-contractors and visitors) using the site pre-shift/huddle meeting and other relevant forms of communication. All blasting notification shall be presented in a format which includes an agreed or common language used for all site personnel.

Notification may include relevant external parties to the KCD site within close proximity of the blasting area as deemed necessary by the Project Manager (Earthworks).

The site Blast Boards will be updated prior to shift start on the day of firing.

The site Blast Boards will be positioned to ensure that all personnel entering the KCD site have direct visual information relating to the scheduled blast.

The use of white "Blasting Today" letters on red background denotes the 'active' nature of the Blast Board and the Blast Boards will be positioned on each of the 3 access roads into the KCD site.

A general radio announcement will be made each day at a nominal time to indicate the blasting requirements of the day.

12.3. PUBLIC 'GORGE ROAD' CLOSURE

As rock falls and mud slides are commonplace during winter and the slightest ground vibration may exacerbate this issue, it has been deemed necessary to include Gorge Road in the blast exclusion zone and to close Gorge Road to the public prior to blasting.

This responsibility is assumed by Bardavcol and will fall within the logistical process for blast guarding.

The requirements for a person to perform the Blast Guard role and close a public roadway may include the provision of a 'Traffic Controller' qualification, as per the local authority requirements and the nominated persons to perform the role under such circumstances are to be appropriately equipped and qualified for the role.

The Project Manager (Earthworks) is to ensure that the Blast Guards who are responsible for any public roadway closure, have the appropriate signage positioned on the boundaries of the Blast Exclusion Zone on Gorge Road.

12.4. THE BLAST GUARD PROCESS

The person assuming the role of the 'Blast Controller' will be responsible for the logistical elements of the blast in terms of:-

Prior to the blast guard meeting, ensuring that adequate resources are available to provision the Blast Exclusion Zone in terms of :-

- A suitable number of maps have been provided to assist each blast guard as a reference document for the individual location and specific blast information;
- The correct numbers of competent personnel required to be blast guards are available and have been advised of the blast guard meeting time and location;
- The numbers of suitable vehicles required to support/indicate the blast guard locations;
- Visual indicators associated with each blast guard location;
- Ensuring that the designated Blast Exclusion Zone is clear of all personnel and equipment, in accordance with the specification of the blast design, and in accordance with the nominated site timeframes, prior to the firing of any blast, by communication with the relevant KCD site personnel supervising non blast related activities within the designated Blast Exclusion Zone;
- Establishing the security of the Blast Exclusion Zone perimeter, including the positioning and monitoring (visually and by radio contact) of the blast guards; and
- Conducting a safety sweep of the designated Blast Exclusion Zone prior to the firing of the blast to ensure that requirements of the Blast Exclusion Zone design parameters have been met.

Each person designated as a Blast Guard will have two main roles:-

- To create a physical barrier at a defined access point to a blast area to ensure no persons can enter the Blast Exclusion Zone during the firing process;
- To immediately communicate any breach of the Blast Exclusion Zone to the Blast Controller.

NOTE: A sign or barricade is NOT sufficient to ensure that unauthorised persons are NOT within the area of danger prior to blast firing process.

Physical checks and guards are a mandatory part of any blast clearance process. The obligation of a Blast Guard is to work under the direct instructions of the designated Blast Controller and no other person for the duration of the blast guarding duties.

The Blast Guards will proceed to the designated Blast Guard points and conduct a complete clearance inspection of their area, checking for personnel and the position of equipment.

During the inspection, the Blast Guards may need to get out of their vehicle as required, to check areas that are not accessible by a vehicle or where machines have been shut down for mechanical repairs, to ensure all persons are evacuated.

- The Blast Guard must then report the results of the inspection to the Blast Controller via the 2-way radio and receive confirmation of the message from the shotfirer and Blast Controller.
- The Blast Guard should then establish and man the Blast Guard position.
- Under NO circumstances will Blast Guards leave their position or relocate their position without consultation with the Shotfirer / Blast Controller.
- Once the Blast Guard is in position at the barricade point, the access to the Blast Exclusion Zones is to be closed by a physical barrier, e.g. by parking their vehicle at a 90° angle to the Blast Exclusion Zone access.
- The Blast Controller will conduct a safety sweep of the Blast Exclusion Zone once all of the Blast Guards have confirmed that they are in the correct location and their area is clear of unauthorised personnel and equipment by the agreed radio protocol.
- Under NO circumstances will the Blast Guards leave their position until the shotfirer has given the “ALL CLEAR” and confirmed with each Blast Guard via the 2-way radio system that their duties have been completed.
- Under NO circumstances shall any unauthorised traffic or personnel be permitted to venture inside the Blast Exclusion Zone past this point until the “ALL CLEAR” from the shotfirer has been received by the Blast Guard.

In the event that a Blast Guard barricade has been breached or the Blast Guard observes personnel within the exclusion area, the blasting process MUST immediately be stopped by notifying the Blast Controller via the 2-way radio.

The Blast Guard will immediately call on the designated 2 Way Radio channel “STOP THE SHOT” twice and wait for a response.

If there is no response from the Blast Controller within 2-3 seconds the Blast Guard is to make the call again. The Blast Guard will continue to broadcast the radio alert of the unauthorised access, until receiving a suitable response from the Blast Controller.

The Blast Controller will acknowledge the radio call from the Blast Guard and:

- Immediately abort the firing procedure and, disconnect and secure, the explosives initiating (firing) apparatus;
- Confirm with the Blast Guard the details of any reported breach of the Blast Exclusion Zone;
- Communicate to all Blast Guards to hold their current positions;
- Release the radio silence;
- Document the details of the reported breach of the Blast Exclusion Zone (blast guard number, time, area, vehicle / person identification, etc.);
- Investigate the reported breach of the Blast Exclusion Zone;
- Consider what corrective actions are to be taken (e.g. restart the firing procedure / reschedule the firing of the blast).

If there is no response from the Blast Controller to the initial radio alert from the Blast Guard, a relay radio message may be required to be passed to the Shotfirer / Blast Controller from another Blast Guard, or relevant site personnel who have heard the radio alert call.

The Blast Guard who has witnessed / reported the unauthorised access within the closed Blast Exclusion Zone shall not leave the designated position, to follow or remove any unauthorised personnel, under any circumstances.

Under these conditions the firing of the blast will be delayed, and the designated Blast Controller will investigate all reports of unauthorised access within any closed Blast Exclusion Zone, before resuming the blast firing sequence.

Following investigation, the Blast Controller will provide a report of any unauthorised access to a blast exclusion zone to the Project Manager (Earthworks).

12.5. BLAST GUARD POSITIONING

Prior to the shot being fired, the Blast Guards must be in position 20 minutes before the blast.

Once asked to close access to the Blast Exclusion Zones, the Blast Guard vehicle is to be parked in a 90° position that blocks the access to the exclusion area and is clearly visible to all oncoming traffic.

Each designated Blast Guard vehicle will have a working flashing light activated (hazard lights may be used as well) and have 2 way radio communications (either hand held or vehicle mounted) with the nominated Shotfirer and Blast Controller.

In the event of the designated Blast Guard position being located in a radio 'black spot' the position may need to be relocated to an alternative position where clear radio communications can be clearly established prior to the firing of the shot. This action will be completed through consultation and with the approval of the Shotfirer and Blast Controller.

The Blast Guard position will allow clear vision of the position access along roadways and the surrounding area and shall not be located in a position that can cause confusion or place the blast guard in danger from moving traffic (e.g. on corners, directly on intersections, etc.).

Blast Guards must remain with the vehicle and ensure there is ready 2-way radio communications during the Blast Guarding process.

Once in position, no unauthorised traffic or personnel will be permitted to pass the Blast Guard location, unless evacuating the exclusion area, or in an event of an emergency.

The Shotfirer / Blast Controller must be notified immediately via the 2-way radio of any emergency condition.

12.6. CLEARING BLAST EXCLUSION ZONE

On the day prior to the blast the Project Manager (Earthworks) or designate (Blast Controller) will undertake the following notifications:

- Mark the time and date of the blast on the various blast notification signs
- Adjust the road closure signs to inform the public of a road closure tomorrow

Provide the blast details to:

- SA Water – Eric Von Wielligh (eric.vonwielligh@sawater.com.au)
- DPTI Traffic Control Centre (dpi.tmc@sa.gov.au)
- Call the landholders within the immediate vicinity via emails or telephone
- SAPOL – Sergeant Allan Cuk (allan.cuk@police.sa.gov.au)
- Safework SA - Luke Brammy or Brett Pfeffer (luke.brammy@sa.gov.au) and/or (brett.pfeffer@sa.gov.au)

On the day of each blast the Shot Controller will adjust the Road Closure signs that there will be a road closure today and the blast notification signs that there will be a blast today. The Blast Controller will notify project personnel of the blast today at the daily prestart including the outline of the blast exclusion or no go zone and the site clearance procedure

- PME or designate ensures that the Blast monitors are out and operational and contacts the Blast Controller with this information
- The Bardvacol Blast Controller will contact all the blast guards ensuring that they know of the blast and their guarding location and the time and location of the Blast Guard Meeting
- The shotfirer shall inform the Blast Controller that the blast is ready to be fired
- The Blast Controller calls for the site to be cleared over the 2 way
- The Blast Controller then calls the Blast Guard meeting ensuring that each guard knows their guard location as well as the requirement to clear as they proceed, how they are to block the road including the use of a flashing light and that they all have working radios. The traffic controllers attending to the Gorge Road road closures also move into position
- The Blast Controller calls for radio silence over the radio as blasting is about to occur.
- Once the sentries are in place the Blast Controller will confirm with every blast guard including the traffic controllers that they are in position and their area is secure by stating... BLAST GUARD NO 1 IN POSITION AND AREA SECURE
- The Blast Controller calls for the 3 sirens runs by the Supervisors covering the Spillway to gate 18 and the Fire Track 18A by the blast controller, the Dam embankment toe to the early works compound and the Playford Bridge to the Dam Lookout on Gorge Road including the crest access road

- On successful completion of the siren run confirmed by the other two supervisors the Blast Controller will check with the blast guards that their areas are still secure
- Once this is done the BC hands the area over to the shotfirer to fire the blast
- The shotfirer will give the 60 second warning and will commence insertion of the lead in line and the blast firing mechanisms
- The shotfirer will then call over the radio Blasting in 10 seconds with a count from 10 to six and then silent from 5 to 1 and call Firing the Shot over the radio. The silence from 5 seconds to 1 second enables the shot to be stopped in case of a breach of the blast clearance as the words **STOP THE SHOT... STOP THE SHOT...** are clearly heard over the radio
- The shotfirer announces over the radio that the shot has been fired and will be inspected once possible blast fume and dust have cleared indicating that radio silence is still in force and hands control of the Blast Clearance area back to the Blast Controller
- The Blast Controller indicates that all guards are to remain in position
- The shot is inspected and the shotfirer gives the ALL Clear over the radio to the Blast Controller
- The Gorge Road will be inspected by the relevant guard after the all clear and if there are debris these must be cleaned up prior to the road being reopened. This is achieved by contacting the Blast Controller who shall organise the clearing of the road after the guard contacts the Blast Controller after the guards have been stood down and the All Clear is given to the Project
- The Blast Controller then gives the All Clear to the site
- The Blast Controller contacts the blast guards requesting that they stand down one at a time... Blast Guard 1 standing down
- A misfire is covered by the misfire procedure (10.9)

A trial run of the entire procedure will be undertaken prior to the first blast.

Refer following 'Site Specific Blast Firing Checklist' and 'Instructions for Blast Guards' Section 12.7

12.7. BLAST FIRING CHECKLIST & BLAST GUARD INSTRUCTIONS

Bardavcol Kangaroo Creek Dam Upgrade**Site Specific Blast Firing Checklist**

Blast ID:		Blast Controller (BC):	
Blast Date:		BC Phone No:	
Blast Time:		Shotfirer:	
RADIO CHANNEL: UHF 24			
Blast Guard 1 (BG1):		Siren Runner 1:	
Blast Guard 2:		Siren Runner 2:	
Blast Guard 3:		Siren Runner 3:	
Blast Guard 4:		Traffic Control 1:	
Blast Guard 5:		Traffic Control 2:	

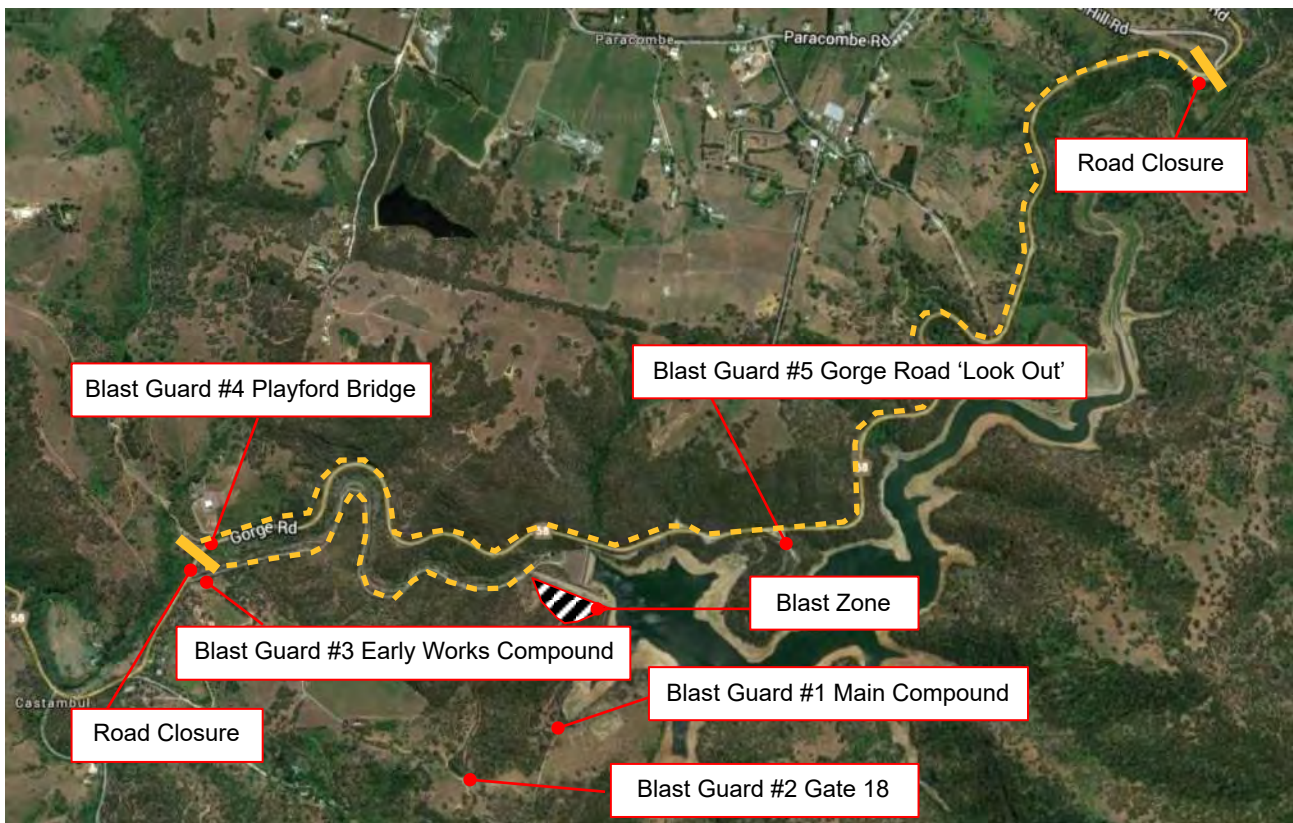
**Blast Guard locations on attached map. If unsure please refer to Blast Controller prior to the blast.*

TIMELINE	ACTIVITY	✓
Blast Boards	Blast boards are displayed with all relevant information and the Blasting Today overlay is in place at the end of shift the previous evening of the day of blast.	<input type="checkbox"/>
Notifications	Notification the day prior may include relevant external parties within close proximity of the KCD site as deemed necessary by the Project Manager.	<input type="checkbox"/>
Pre Start Meeting	Morning Pre-start meeting all relevant personnel to confirm blast clearance plan and Blast Time. At this time all guards and traffic controllers are assigned position and identification call signs.	<input type="checkbox"/>
2/3 hours prior	Blast Controller reminds all personnel of Blast Time over UHF 24 & 25.	<input type="checkbox"/>
45 mins prior	Blast Controller to instruct all onsite personnel and visitors within the blast exclusion zone to evacuate site via UHF.	<input type="checkbox"/>
40 mins prior	Blast Controller to confirm that all blast monitors are in position and recording and that the blast monitor personnel are secure.	<input type="checkbox"/>
30 mins prior	Nominated blast guards and traffic controllers move to locations and conduct radio checks with Blast Controller on UHF 24 and assume blast guard positions. Radio checks to state " BLAST GUARD (Number) (Name) IN POSITION STANDING BY ". If radio check fails, a relay will be set up (e.g. Blast Guard 4 will relay for Blast Guard 3)	<input type="checkbox"/>
20 mins prior	Blast Controller instructs traffic controllers that traffic on Gorge Road can be stopped. " TRAFFIC CONTROLLER (Number) (Name) TRAFFIC STOPPED "	<input type="checkbox"/>

15 mins prior	Blast Guards confirm with the Blast Controller that access to site at their location is now blocked with vehicle at 90° and hazard/amber lights flashing "BLAST GUARD (Number) (Name) IN POSITION AND AREA SECURE" .	<input type="checkbox"/>
15 mins prior	Blast Guard 2 for Gate 18 to acknowledge visual inspection of Fire Track 18A in their response.	<input type="checkbox"/>
15 mins prior	Blast Controller instructs commencement of siren runs from: 1. Levels 5 to 1 and Main Compound 2. The Dam embankment toe to the Early Works Compound 3. Playford Bridge to the Dam Lookout on Gorge Road including the crest access road. BC "SIREN RUNNERS COMMENCE SIREN RUN" SR2 "SIREN RUNNER 2 COMMENCING RUN" SR2 "SIREN RUNNER 2 RUN COMPLETE"	<input type="checkbox"/>
10 mins prior	The shotfirer will confirm with the Blast Controller that the blast is ready to fire.	<input type="checkbox"/>
5 mins prior	Blast Controller confirms with shotfirer that the "SITE IS SECURE" .	<input type="checkbox"/>
1 min prior	Siren is sounded by the Shotfirer and announces "Attention all personnel... we are blasting in 60 seconds... (area) and (position) of blast... Observe radio silence.....firing in 60 seconds"	<input type="checkbox"/>
10-0 secs prior	Shotfirer announces "firing in 10 seconds" with a count 10,9,8,7,6... and then silent from 5 to 1 and call "Firing the Shot" over the radio. <i>The silence from 5 seconds to 1 second enables the shot to be stopped in case of a breach of the blast clearance zone as the words STOP THE SHOT... STOP THE SHOT... can be clearly heard over the radio</i>	<input type="checkbox"/>
5 mins post	Shotfirer to inspect blast area following dissipation of dust and possible fume and confirms "ALL CLEAR" with Blast Controller	<input type="checkbox"/>
5 mins post	Blast Controller confirms traffic controllers are to remain in position and Siren runners 2 & 3 conducts a sweep of Gorge Road. Any debris is to be cleaned up by the standby loader and sweeper. "SIREN RUNNER 2 & SIREN RUNNER 3 SWEEP GORGE ROAD AND REPORT IN"	<input type="checkbox"/>
5 mins post	Blast Controller stands down each blast guard. Blast guards are to respond individually... "BLAST GUARD 3 NAME... STANDING DOWN"	<input type="checkbox"/>
10 mins post	When Gorge Road is clear Blast Controller calls for the release of traffic and stands down the traffic controllers. They are to respond individually... "TRAFFIC CONTROLLER 1 NAME... STANDING DOWN"	<input type="checkbox"/>
15 mins post	Blast Controller announces final "ALL CLEAR" to the site and resume normal duties.	<input type="checkbox"/>

Bardavcol Kangaroo Creek Dam Upgrade

Instructions for Blast Guards



1. Ensure you attend the Pre-Start meeting morning of the blast to receive confirmation of Blast Time and your position and any further instructions.
2. Attend the Pre-Blast meeting 45 minutes prior blast.
3. Be ready to take your assigned position 30 minutes before the blast. If you have been instructed to advise people of the impending blast, commence your clearance. Make sure machines are already moving out of the blast clearance area. Respond to the Blast Controller that you are in position.
4. Block access at the 15 minutes call from the Blast Controller. Keep a visual on your area and do not let anyone into the blast area. Contact the Blast Controller immediately if the blast area is breached or if you see anyone in the area. For example : **"Blast Guard 5 (name)... Stop the blast... the blast area has been breached"**. If there is no response from the Blast Controller within 2-3 seconds the Blast Guard is to make the call again. The Blast Guard will continue to broadcast the radio alert of the unauthorised access, until receiving a suitable response from the Blast Controller.
5. If there is no response from the Blast Controller to the initial radio alert from the Blast Guard, a relay radio message may be required to be passed to the Shotfirer / Blast Controller from another Blast Guard, or relevant site personnel who have heard the radio alert call.
6. Respond to the Blast Controller's calls with your blast guard ID and name **"Blast Guard 5 (name)..."**
7. If your part of the blast exclusion zone is secure, respond to the Blast Controllers final blast clearance call using the phrase : **"This is Blast Guard 5 (name)... access is blocked and the area is secure."**
8. Do not use the words **"ALL CLEAR"** these are reserved for the Blast Controller and shotfirer.
9. In the unlikely event that a misfire has occurred the Blast Controller will instruct all blast guards and traffic controllers **"Attention all personnel... a misfire has occurred... please remain in position and await instructions"**
10. In the unlikely event that a blast fume event has occurred the Blast Controller may instruct a blast guard to move away from the plume, **"There is blast fume moving to the (east). Blast guard (3) (name) please move away from your position"**.

12.8. BLAST FIRED

The shotfirer will then inspect the blast and may confirm the “ALL CLEAR” after giving due consideration to:-

- Identification of any misfire and / or the associated corrective action required to make the area safe;
- Procedures to be adopted, if the inspection reveals that the “ALL CLEAR” cannot be given;
- Continuous inspection procedures during the approach to the post-blast site that might identify unusual or abnormal results indicating possible hazards;
- Whether there is a need to wash down/or scale exposed surfaces;

The shotfirer may then communicate:

- That a misfire or other problem has been identified and the “ALL CLEAR” cannot be given and that further action is required; or
- That the “ALL CLEAR” has been given and that normal operation may recommence;
- Where the “ALL CLEAR” has been given by the shotfirer, the Blast Controller will release or “STAND DOWN” the Blast Guards;
- Blast Guards will acknowledge the “STAND DOWN” message.

NOTE: Until the “ALL CLEAR” signal is given, no traffic or personnel are permitted to gain access to the site blast area.

Following the “ALL CLEAR” Traffic Controllers will sweep Gorge Road for debris or hazards and if necessary call on the standby loader or brush to clear the road prior to allowing the public to proceed.

Refer preceding 12.7 ‘Site Specific Blast Firing Checklist’ and ‘Blast Guard Instructions’

13. BLAST DESIGN

13.1. PROCESS FOR BLAST DESIGN & APPROVAL

Prior to blasting a formal Pre Blast Plan, identified by chainage, RL and a Blast No. for each area to be blasted.

Pre Blast Report design proposals will include:

- Proposed location of the blast
- Bardavcol surveyor to supply distance information to monitors
- Date and time for firing
- Number of blastholes
- Nature of the face (free face or choked face)
- Pattern type (rectangular, square or staggered)
- Bench height
- Blasthole diameter(s)
- Blasthole inclination
- Burdens and spacings
- Stemming depth
- Size and type of stemming
- Subdrill
- Primer type and weight
- Explosives type and density
- Column rise
- Charge configuration (column, decked, decoupled)
- Blasthole loading sheet with depth, charge and stemming length per blasthole
- Total explosives for the blast
- Design powder factor
- Type of initiating system
- Plan view of the blast pattern showing tie in configuration with nominal delay times
- Nominal timing for each blasthole
- Distance to nearest sensitive monitors - Bardavcol surveyor to supply
- Maximum Instantaneous Charge (MIC) and predicted Peak Particle Velocity (PPV) vibration values calculated from the minimum distance to the nearest monitor.

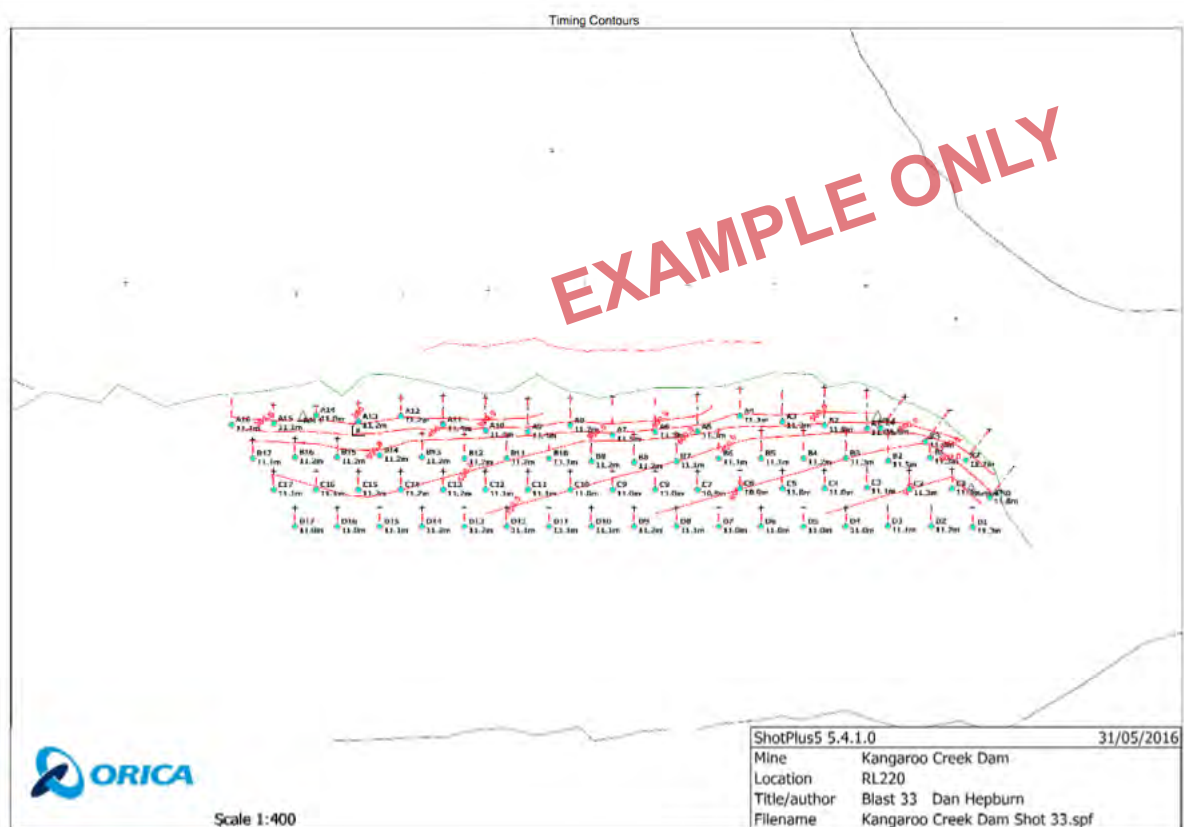
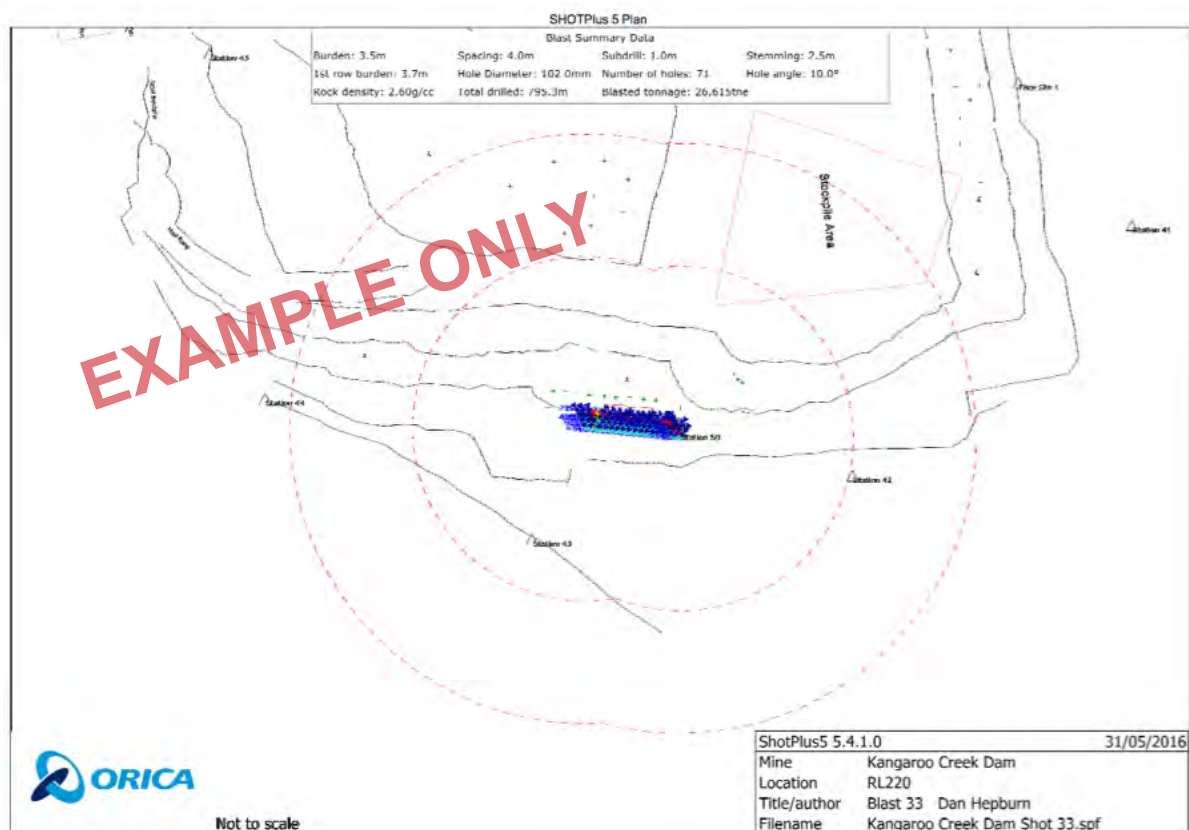
Once approval by the KCD Project Manager (Earthworks) has been given, it shall be considered the Approved Blast Design and will then be implemented.

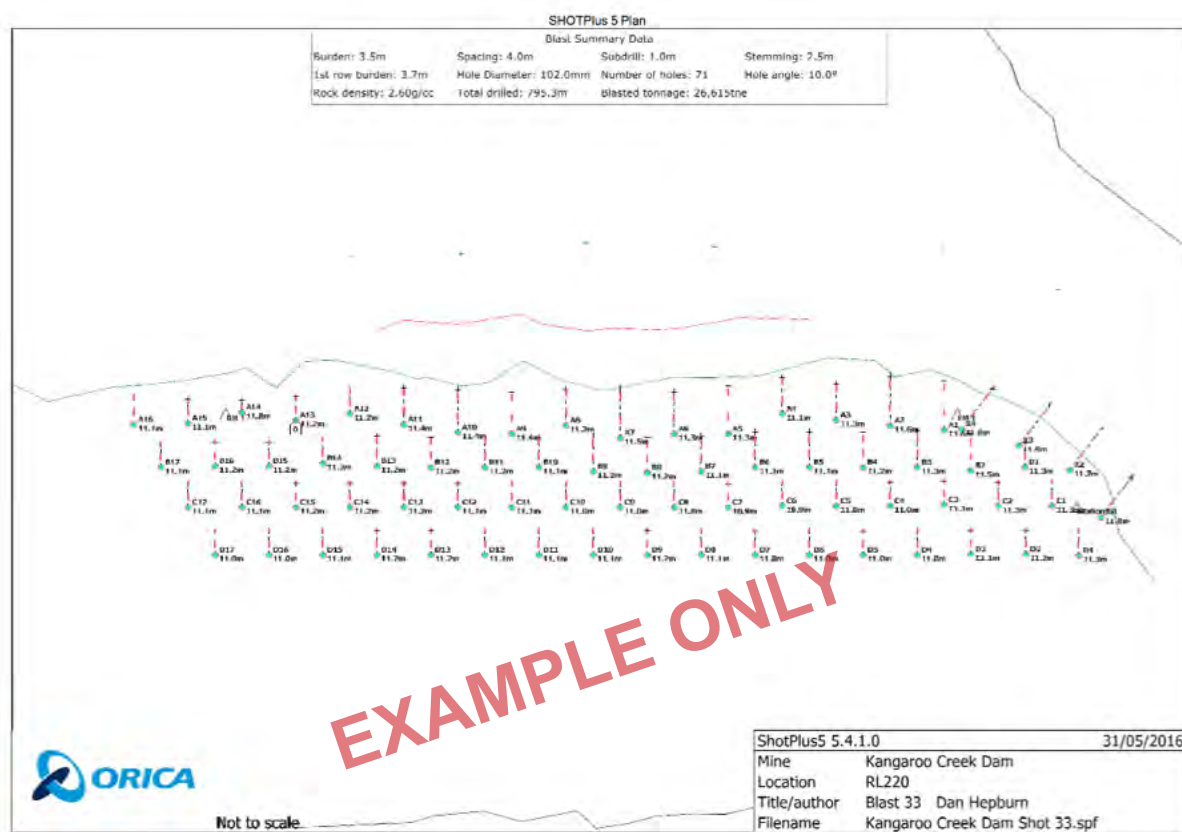
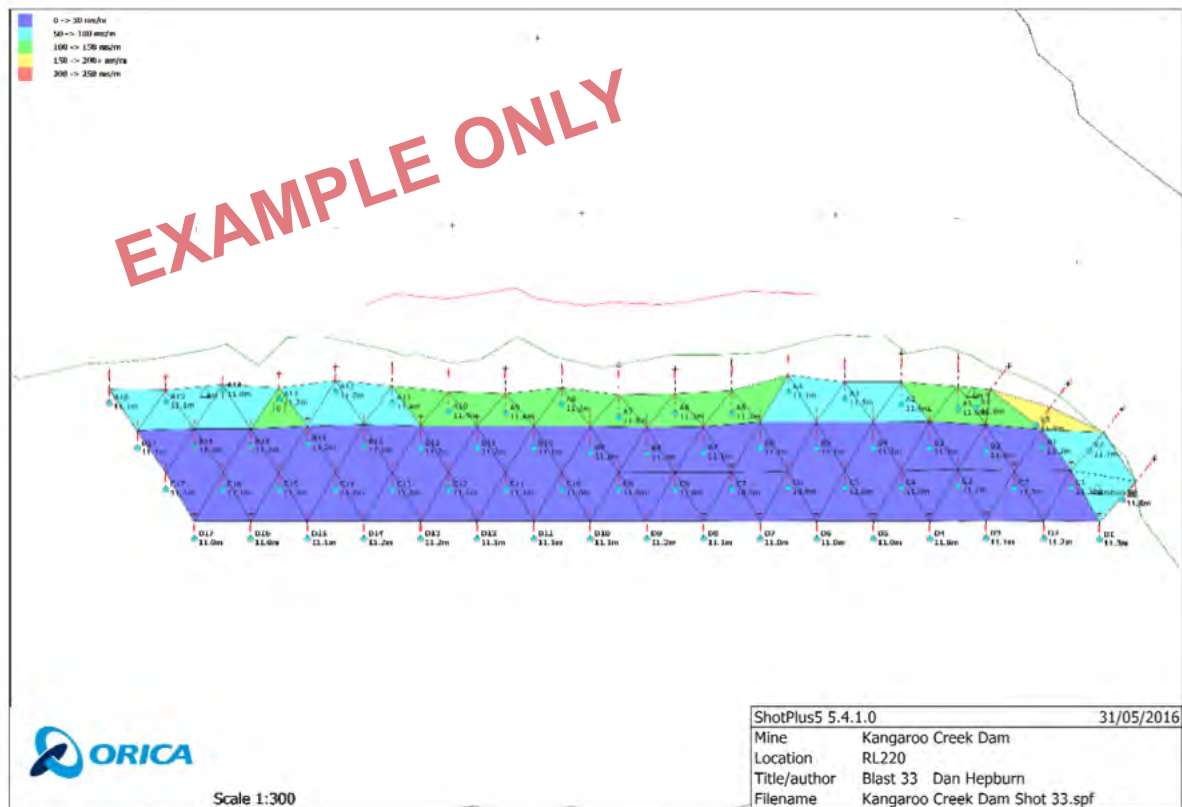
JD&B will use industry recognised blast design software to determine drill, load and initiation tie in Plans to achieve environmental and production requirements for the project.

Refer following for example Pre Blast Plan and blast design software outputs.

13.2. EXAMPLE BLAST DESIGN OUTPUTS

The following are **illustrative** examples only of blast documentation.





The Power of Partnership

Orica Australia Pty Ltd
ACN 004 117 828

188-198 Churchill Avenue
Subiaco WA 6008
Mob 0423 021 421
Email: Daniel.hepburn@orica.com
<http://www.orica.com>

June 5, 2016

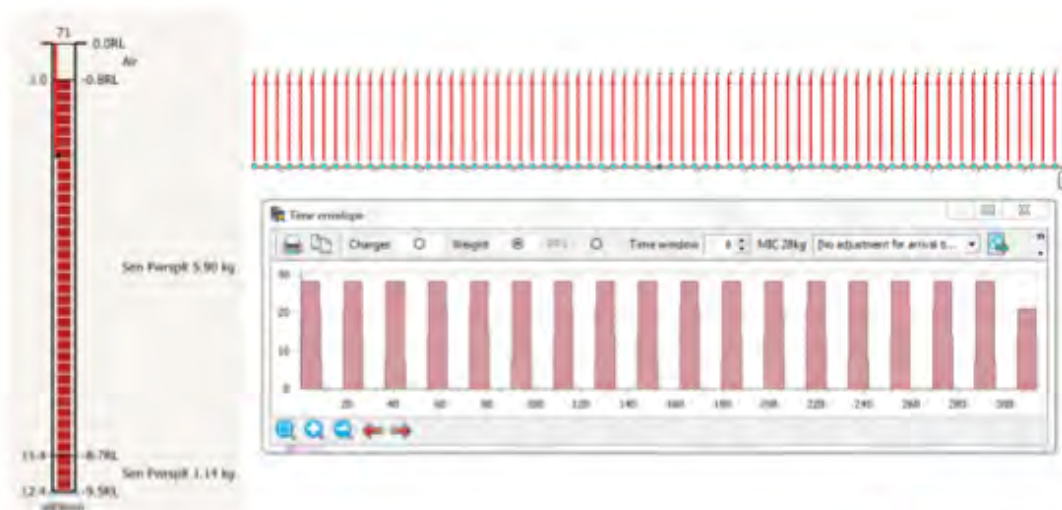
Ron Joyce
Joyce Drilling & Blasting Contractors Pty Ltd
6 Rowland Road
Magill SA 5072

Dear Ron,

Re: Presplit blast environmental predictions

As requested I have designed a presplit blast to the following blast parameters;

Blast Hole Diameter:	89 mm	Presplit Length:	70 m
Blast Hole Spacing:	1.0 m	Explosive:	26 mm Powersplit™ Packaged Emulsion Explosives
Presplit Hole Length:	12.4 m	Initiation System:	Exel 17ms MSC and 5g Plastic detonating cord.
Hole Angle:	40°	Maximum Instantaneous Charge Weight (8ms)	4 holes (28 kg)



www.oricaminingservices.com

Again as requested I have calculated a best estimate of vibration generated from this blast for a distance of 70m, and the air overpressure 'airblast' at the nearest sensor receiver approximated to be 1000m from the blast.

As discussed with no site law, or any vibration data from Kangaroo Creek Dam, all site constants and exponents have been taken from Australian Standard AS2187.2: Explosives Storage and Use.¹

Ground Vibration has been approximated using the following equation:

$$ppv = K \left(\frac{D}{\sqrt{Q}} \right)^{\frac{1}{\alpha}} \quad ppv = 1140 \cdot \left(\frac{70}{\sqrt{28}} \right)^{1.18}$$

Where

ppv = ground vibration as vector peak particle velocity, in millimeters per second.
 R = distance between charge and point of measurement, in meters.
 Q = maximum instantaneous charge (effective charge mass per delay), in kilograms.
 K, B = constants related to site and rock properties for estimation purposes. (1140, 1.18)

The Peak Particle Vibration estimated to be produced by the presplit blast at a distance of 70m is:

18.3 mm/s

Air Overpressure 'airblast' has been approximated using the following equation:

$$P = K \left(\frac{D}{\sqrt{Q}} \right)^{\frac{1}{\alpha}} \quad P = 516 \cdot \left(\frac{1000}{\sqrt{28}} \right)^{1.45}$$

Where

P = pressure, in kilopascals.
 Q = explosives charge mass, in kilograms.
 R = distance from charge, in metres.
 K = site constant (516)
 α = site exponent (1.45)²

The air overpressure 'airblast' estimated to be produced by the presplit blast at a distance of 1000m is:

0.11537 Kilopascals (kPa) or 75.2 decibels (dBL)

For if you would like any more estimations based on the above design, please let me know:

Kind regards



Daniel Hepburn
 Senior Technical Engineer
 Orica 0423 021 421

EXAMPLE ONLY

¹ These predictions must be treated as 'best guess' estimates and as no site data has been provided, as measured in field environmental results may vary significantly.

² A site exponent of 516 was adopted for the overpressure estimates as the presplit is more closely related to an "unconfined surface charge", than that of a "confined blasts hole" as described in AS 2187.2.

<h1>Pre-Blast Plan</h1> <p>Consent is given to undertake blasting operations outlined below and the attached in accordance with the Bardavcol KCD Blast Management Plan and Joyce Drilling & Blasting Standard Operating & Safe Blasting Procedures</p>		BLAST NO: KCD 159 / 02	
		BLAST DATE: 20/08/2016	
		BLAST TIME: 4:30 pm	
Authorised Shotfirer: Ron Joyce		Blast Controller: Nominated Person	
Locality: Refer attached locality plan		Description: Production Blast	
<p><i>Set Out: Refer attached plan view showing sequence and direction of firing, face type (free or choked), timing and initiation point</i></p>			
Number of Holes	150	Explosive Type	ANFO
Number of Rows	5	Exp Column Rise (lineal/m)	4.98kg
Burden (m)	2.8m	Total Bulk Explosive (kg)	1490kg
Spacing (m)	3.0m	Initiating System	Nonel
Bench Height (m)	4.2m	Primer Type / Weight	150g
Subdrill (mm)	300mm	Charge Height (kg/m)	2.00m
Hole Diameter (mm)	89mm	Powder Factor	0.28
Hole Inclination	0°	MIC (kg)	10kg
Nature of Face	Choked	Pattern Type	Square
Stemming Height (m)	2.5m	Delay Times	See attached
Stemming Material	5-7mm	Designed BCM / m ³	5290 m³
Authorised Shotfirer: Ron Joyce Assistant: TBA Date: 18 / 03 / 2016			
AUTHORISED BY BARDAVCOL REPRESENTATIVE <div> <div>NAME</div> <div>SIGNATURE</div> <div>DATE</div> </div>			

14. POST BLAST REPORTING

A Post Blast Report Package will be submitted to Bardavcol Project Manager (Earthworks) within 48 hours of the blast being fired. A completed post blast report package shall consist of:

- Approved Blast Design
- Survey Plan
- Drillers Log
- Explosives Loading Sheet
- Explosives and initiation system usage
- Surface Tie-In Plan
- Shotfirer/Blast Controller Checklist
- Post Blast Report
- Applicable Vibration Monitoring Reports
- Blast video

15. VIBRATION & OVERPRESSURE

15.1. GROUND VIBRATION / AIRBLAST

Monitoring activities are to be conducted by Bardavcol and will be carried out for each blast that occurs. The results of the monitoring shall be included in the Post Blast report.

Blasting will be monitored by video recording and blast monitoring equipment as discussed below. The peak particle velocity of each blast will be measured as well as the airblast levels to ensure compliance with the targets set in this Blast Management Plan. The monitoring requirements and limits are set out in the following table:

DESCRIPTION	PPV (mm/s)
Residential Houses	5
Concrete less than 7 days old	10
Concrete after 7 days	25
Concrete after 28 days including concrete structures or concrete placed as part of the works)	50
Pressure grouted foundations	20
Grouted Rock Anchors less than 24 hours old	0
Grouted Rock Anchors greater than 24 hours old ¹	70
Domain G	13

Note¹: After 24 hours, the peak particle velocity shall not exceed 70 mm/s at any of the recently installed bars. However, it is generally the case that if rock adjacent to the recently installed bars suffers blast damage, then the grout shall also be damaged.

Therefore, if blast damage to such rock is noted then the vibration limit shall be reduced as directed by the Superintendent.

- Monitoring and recording of air overpressure, noise and ground vibrations shall be carried out for all blasts at all relevant sensitive receivers.
- Video footage of each blast shall be taken to monitor movement of the blast and any indications of extent, direction and impact points of flyrock (if any).
- Endeavour to meet fragmentation to meet required criteria by the application of industry best practice blasting principles notwithstanding the **design limitations** required to achieve flyrock and vibration control.
- Protection of material below and beyond the final limits of excavation by ongoing review of the effects of blasting on the site material types. Generally, pattern sizes, QA tolerances and charge weights will be reduced to minimise over break on final lines and levels.
- Minimise disruption to the public using the Gorge Road through safe, effective and professional firing and post blast clearance processes

15.2. PROPOSED GROUND VIBRATION MINIMISATION KPI's

The proposed KPI's for minimising blast induced vibration are:

- Blast design predicated on the Rules of Thumb for blasting based on the hardness and the natural fracture density of the rock to be blasted
- Holes marked out using a surveyor with an accuracy of +/- 0.07m
- Hole collar accuracy KPI +/- 0.07m
- Explosive density KPI to ensure that the correct explosive of the correct density is loaded therefore obtaining the designed MIC required for bulk explosive being used as per Orica's quality assurance
- It is recommended that packaged product be used in holes close to structures (within 60m) as exact MIC's can be obtained
- Hole depth KPI aimed at ensuring the targeted MIC is obtained and no over confined explosive that increases the ground vibration
- MIC or column rise KPI – in this case MIC KPI that ensures less than design can be loaded but not over the MIC
- MIC design is based on 85% of the 95% Confidence Site Vibration Law. In the KCDSU case 90% of the 97% Free Face confidence equation using a K Factor of 2000 and a beta factor of -1.6
- For confined production blasting it has been recommended that a K Factor of 5000 be used with a Beta Factor of -1.6 with similar design percentages to free face blasting
- For Presplit blasting a 7000 K Factor is recommended with a Beta Factor of -1.6 with similar design percentages as the free face blasting
- Reduce explosive charge as required from drill hole log sheets as this reduces MIC
- Where ever possible use free face blasting to provide relief for the blast reducing ground vibration
- Use timing that promotes progressive relief as this reduces blast induced ground vibration
- Ensure that the designed timing design is implemented
- Consider using decked charging firing top deck down
- Audit bit diameter using callipers
- Bardvacol to spot audit the KPI's
- Bardvacol to accurately measure blast induced ground vibration

15.3. AIRBLAST NOISE

The air vibration limits during the limited working hours are restricted to a maximum level of 115 dBL at Monitor 1 nearest residence only. This shall be achieved through appropriate blast designs and implementation processes and strategies.

DAY	TIME	MAXIMUM LEVEL	LEVEL & FREQUENCY
Monday to Saturday	8 am to 5 pm	115 dBL	115 dBL for 9 in any 10 consecutive blasts, regardless of the interval between blasts
All other times	No blasting allowed		

Air vibration levels shall comply with the requirements of AS 2187.2-2006 when measured at the nearest residence.

15.4. BLAST MONITORING

Monitoring activities will be carried out by Bardavcol for each blast that occurs. Bardavcol have purchased 5 Texcel GTM monitors and an associated training package to assume responsibility for the ground vibration and airblast monitoring.

The results of the monitoring will be supplied to JD&B for inclusion in the Post Blast report.

The peak particle velocity of each blast will be measured as well as the airblast levels to ensure compliance with the targets set in Appendix B2 - Part 7 of the specifications and as outlined in this Blast Management Plan.

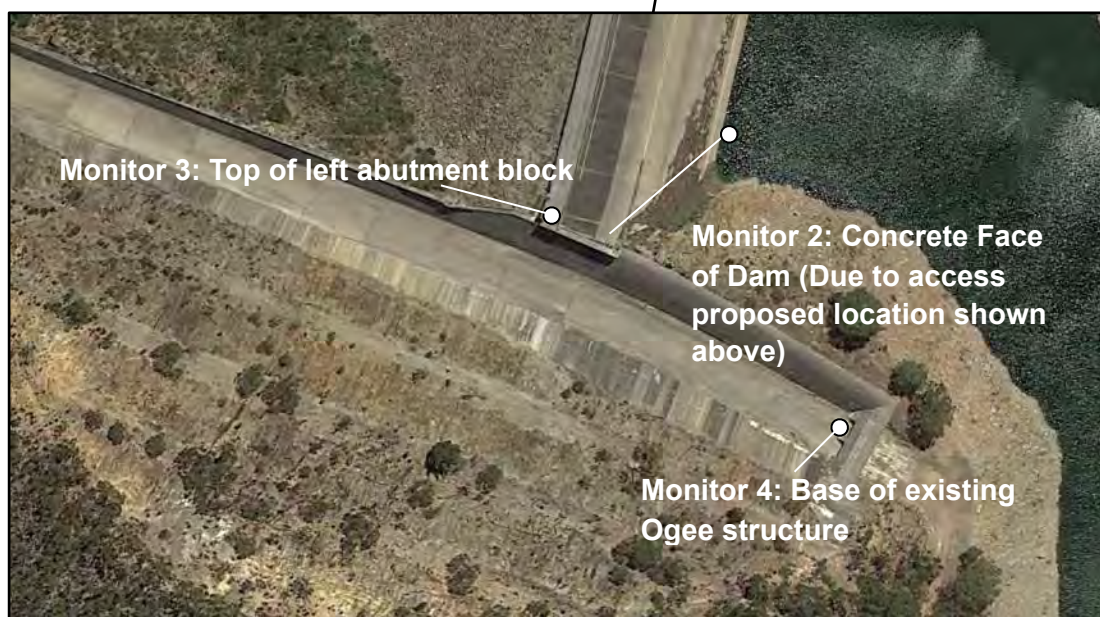
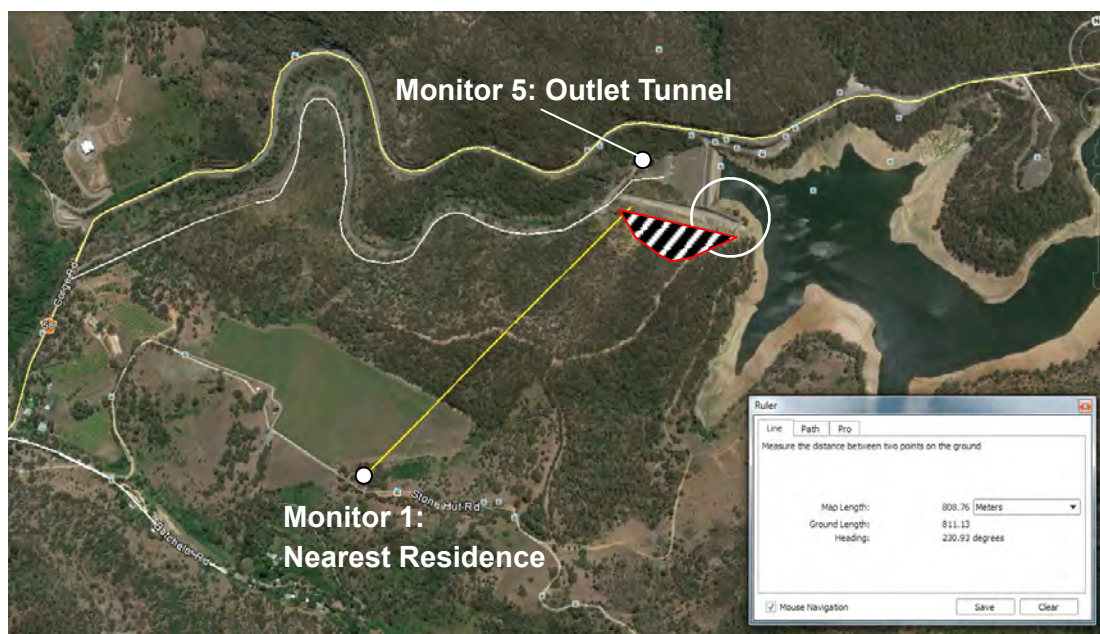
Should the monitoring activities indicate an actual or apparent non-conformance with the limits set all further blasting activities will cease and in consultation with the Bardavcol Project Manager (Earthworks), the blasting consultant and the Client take steps to address the situation to ensure future compliance.

5 monitoring stations have been nominated at the following locations:

- **Monitor 1:** Nearest Residence
- **Monitor 2:** Concrete Face of Dam
- **Monitor 3:** Top of left abutment block
- **Monitor 4:** Base of existing Ogee structure
- **Monitor 5:** Gorge Road for the first two blasts and then the outlet tunnel and concrete pours as required

Please refer following 15.5 Blast Monitor Locations Map

15.5. BLAST MONITOR LOCATIONS MAP



16. FLYROCK MITIGATION CONTROL

Flyrock is generally perceived as the rock propelled beyond the blast area.

PRIMARY CAUSES OF FLYROCK

Generally, flyrock is caused by a mismatch of the explosive energy with the geo-mechanical strength of the rock mass surrounding the explosive charge. Factors responsible for this mismatch include:

- Abrupt decrease in rock resistance due to joint systems, bedding layers, fracture planes, geological faults, mud seams, voids, localised weakness of rock mass, etc.
- Incorrect and non-compliant stemming
- High explosive concentration leading to localised high energy density
- Inadequate delay between the holes in the same row, or between the rows
- Inappropriate blast design
- Deviation of blast holes from designed directions
- Improper loading and firing practices

To ensure that flyrock control/mitigation techniques follow industry best practice with regard to flyrock control in a sensitive environment the following techniques will be adopted to achieve the objective of zero flyrock incidents:

Primary Control - Cautious Blasting Techniques

- Blast design based on scaled depth of burial (SDM) of 1.8 within 60m of structures which is increased if there is soft or well fractured rock in the stem region obtained from blast hole drilling logs
- Orica quality assured product and loading documentation
- Blasts will be designed to control flyrock risk whilst producing reasonable fragmentation. No flyrock must be projected outside the designated blast area towards infrastructure.
- The geology, rock structure and general lay of the land combined with the QA drill hole depths, drill penetration rates and the delineation of blastholes with anomalies will be inspected prior to each blast to assess the specific conditions of the blast area. Blast designs are especially intended to prevent fly-rock.
- Dipping of every blasthole and backfilling if required combined with the load sheet per hole and re-dipping of the stem height to ensure final design compliance.
- The inclusion of closely spaced unloaded 102mm or 89mm "easer holes" on the outer perimeter of each bench will be used wherever appropriate to vent gases and mitigate the potential for flyrock emanating from the existing batters. This will also have a positive effect on ground vibration.

In line with industry best practices, the following general blast parameters will be considered as a preliminary guide:

- Blasthole diameters in the range 76mm to 89mm
- Blasthole depths to be a minimum of 2.8m for 76mm blastholes and 3m for 89mm blast holes to allow sufficient stemming material to contain the resultant explosive gases.
- Powder factor should be in the range of 0.2kg/m³ to 0.4kg/m³ for effective environmentally sensitive blasting.
- Consider the use of decking
- Drilling areas shall be prepared so that drills have a reasonable, level surface to drill
- Accurate mark out and drilling of blast holes by survey where required
- Drill logs will record blasthole depths and any abnormal geology encountered or voids identified during drilling. Ensure charge length and stemming length is consistent with blast design.
- The shotfirer shall inspect each blast at the drilling, loading, stemming and tie in stage for quality assurance
- All blastholes are charged to design and are not overcharged.
- Remove any excess explosives from overcharged blastholes.
- All production blast holes are to be stemmed with 7mm-10mm crushed rock aggregate placed carefully in the hole to prevent bridging of the aggregate and accurate measurements of product column rise and stem height as directed by the shotfirer.
- Stemming operations to be conducted carefully with a stemming pole to ensure no bridges or blockages result in insufficient stemming.
- Blastholes not used (due to blocked, etc) on the blast area must be backfilled with appropriate stemming material.
- Incorporate approved, industry best practice explosive products to ensure reliable initiation and performance.
- Blast design to ensure powder factor is not excessive when compared to the drill rate penetration for each blast
- The shotfirer and assistant will walk the shot from opposing ends to ensure no holes have been missed and the tie in is correct and compliant.

Secondary Control — Blasting Mats, In-situ Material & Imported Cover

The shotfirer in consultation with the Bardavcol Project Manager(Earthworks) and/or Blasting Consultant will carry out an assessment of secondary control requirements for each blast to determine whether secondary controls such as blasting mats will be required. If the assessment determines that secondary control is required, this will be incorporated into the proposed blast design notwithstanding the extensive logistics and expense that will be incurred.

Secondary controls to be agreed and approved by Bardavcol as an integral part of the blast design submission and approval process.

17. FUME MANAGEMENT

Fume generation can widely be attributed to 6 circumstances that, either singularly or combined, can be managed to minimise or mitigate the production of NO_x:

- Explosive formulation and quality assurance.
- Geological conditions.
- Blast Design.
- Explosive product selection.
- On-Bench Practices.
- Contamination of explosive in the blast hole.

While other factors such as meteorological conditions, storage of bulk products, Sleep Time, Training and Reporting are contributing factors, the six listed above are considered to be the 'primary causes' in accordance with the AEISG Code of Practice.

To assist with the management and control of the potential blast fume risk at the KCD project a fume management and mitigation process has been included in the JD&B Blasting Operations SWMS outlining typical causes, hazards and controls associated with blast fume.

Please refer Appendix B Blasting Operations SWMS attached

It is unlikely that exposure to blast fume in a well-ventilated environment will cause impacts to human health, however NO_x gases are still considered a potential threat and will be managed accordingly. Generally NO_x plumes generated during blasting will dissipate to background levels in a relatively short time. Dissipation is highly dependent on local atmospheric conditions.

Due to the nature of the KCD project, the relatively small blasts and relatively small column rise and low MIC coupled with small diameter blastholes and Orica quality assurance standards and documentation it is not anticipated that blast fume will pose a significant risk.

17.1. FUME EXPOSURE PREVENTION

In cases where a NO_x plume does not dissipate quickly and has the potential to result in human exposure, the following actions will be taken:

- Following initiation blast guards and traffic controllers will remain in position until the Blast Controller stands down each blast guard individually via UHF after the shotfirer has given the "ALL CLEAR"
- No personnel will be permitted to enter the blast exclusion zone or potential plume
- If in a vehicle, personnel will stay inside and use recirculated air conditioning if possible.

17.2. FOLLOWING EXPOSURE

If a person has been exposed to NO_x gases, the Project Manager (Earthworks) must be notified immediately and medical attention is to be provided as soon as it is safe to do so (i.e. once the fume cloud has cleared). The possibility of delayed and life-threatening pulmonary oedema dictates that:

- Any person exposed to a visible plume of NO_x, and/or any person experiencing sudden acute effects of coughing, shortness of breath or irritation of the mucous membranes of the eyes, nose or throat following post-blast NO_x events will be examined by a medical practitioner without delay, even if no NO_x smell was noticed or symptoms are mild.
- The treating medical practitioner will be informed of the potential NO_x exposure and provided with the "Advice to Medical Staff" as per AEISIG Prevention and Management of Blast Generated NO_x Gases in Surface Blasting Code of Good Practice

17.3. NOTIFICATION OF FUME EVENT

The shotfirer will provide verbal and written notification attached to the Post Blast Report delivered to the Project Manager (Earthworks) of any blast fume incident that rates over 3 as per Appendix 2 AEISIG Prevention and Management of Blast Generated NO_x Gases at its highest extent and the plume leaves the KCD project site.

The written notification report will detail:

- Date and time of blast
- Explosives type, quantity, mixing method, depth, initiation type
- Ground geology (soft, faults, wet)
- Presence of noticeable post-blast NO_x gases
- Post-blast NO_x gas rating, eg 0 - 5 (refer Appendix 2 AEISIG Prevention and Management of Blast Generated NO_x Gases)
- Extent of post-blast NO_x gas event, eg A,B or C (refer Appendix 2 AEISIG Prevention and Management of Blast Generated NO_x Gases)
- Duration of any post-blast NO_x gas event (measure of time to disperse);
- Direction of movement of any post-blast NO_x plume;
- Movement of any post-blast NO_x gas plume relative to the established exclusion zone
- Climate conditions, including temperature, wind speed and direction, cloud cover, rain;
- Details of any person exposed to a NO_x gas event and received medical attention

17.4. POST FUME INVESTIGATION

Should a significant blast fume be generated from a blast an incident investigation to identify which of the fundamental causes was the significant contributor to the generation of NOx. Once the likely causes have been identified appropriate action plans will then be put in place to mitigate and reduce the generation of fume from future blasts under similar circumstances.

The investigation will also educate relevant personnel to ensure appropriate steps are taken in the design, loading and firing of the blast to minimise the likelihood of generating fume from the blast.

18. APPENDICES

APPENDIX A

JD&B DRILLING SWMS & SDS SHEETS

APPENDIX B

JD&B BLASTING SWMS & SDS SHEETS

APPENDIX C

JD&B KCD RISK ASSESSMENT

APPENDIX D

ORICA CAPABILITY PRESENTATION

APPENDIX E

**JD&B STANDARD OPERATING SAFE DRILLING
PROCEDURES & WORK METHOD STATEMENTS**

APPENDIX F

**JD&B STANDARD OPERATING SAFE BLASTING
PROCEDURES & WORK METHOD STATEMENTS**

APPENDIX G

JD&B WHS POLICY

APPENDIX H

ORICA LICENSING TRANSPORT AND PERSONNEL

APPENDIX I

**ORICA VEHICLE EMERGENCY PROCEDURE GUIDE AND
TRANSPORTING EXPLOSIVES TO AND FROM MAGAZINES SSOP**

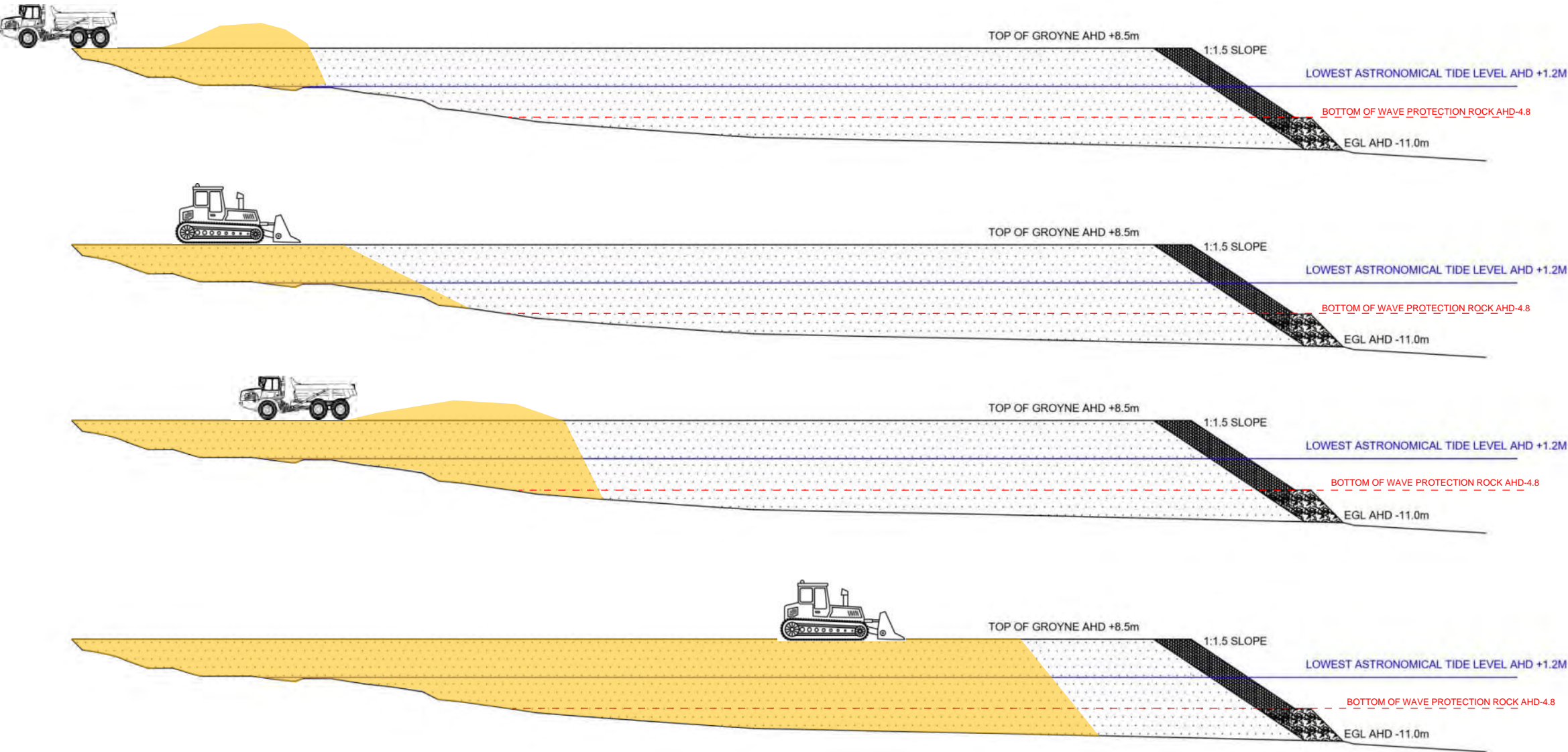
APPENDIX B –Methodology

B1 Groyne Construction

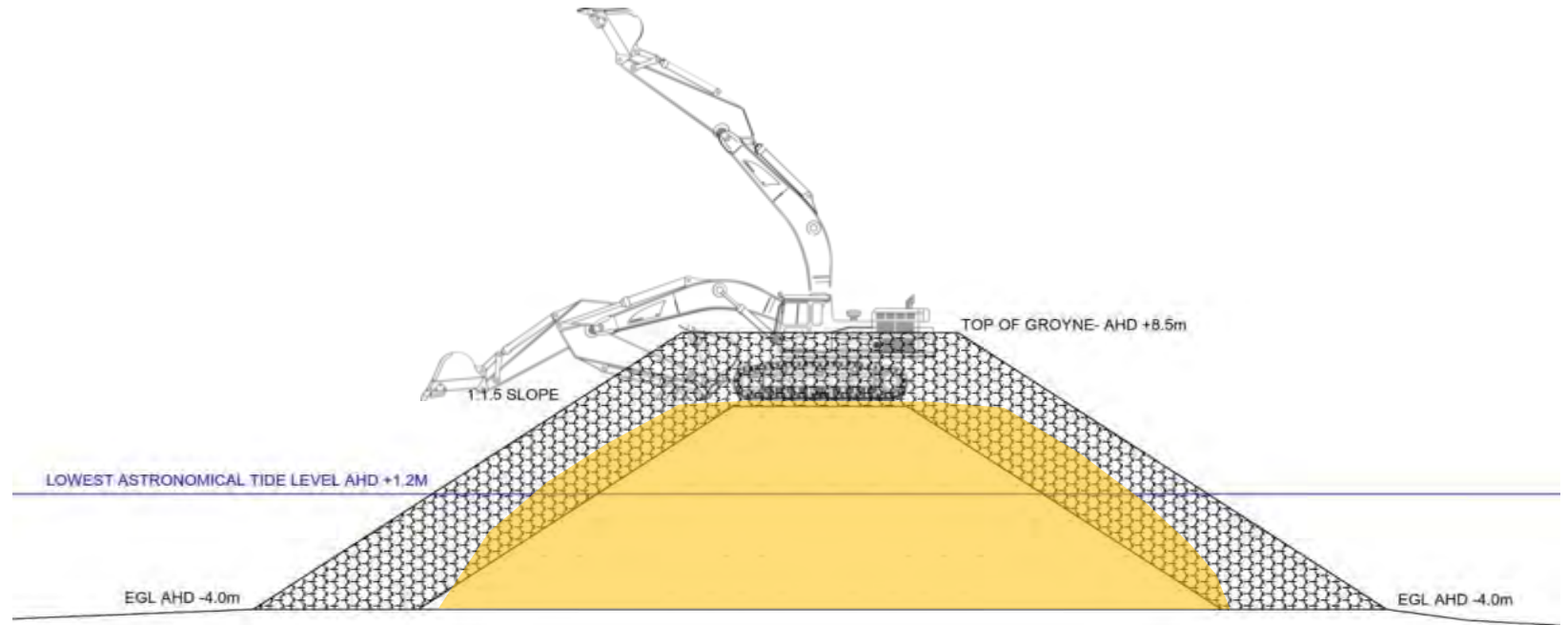
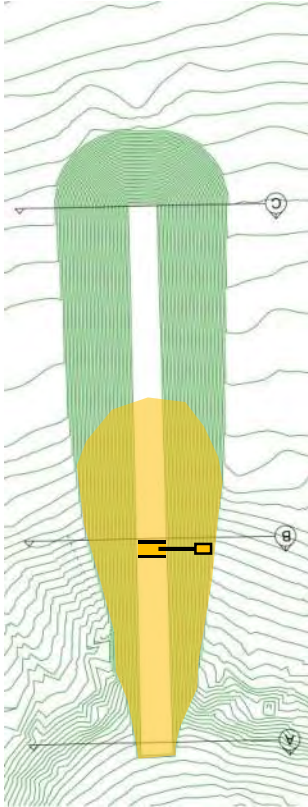
B2 Rock Processing

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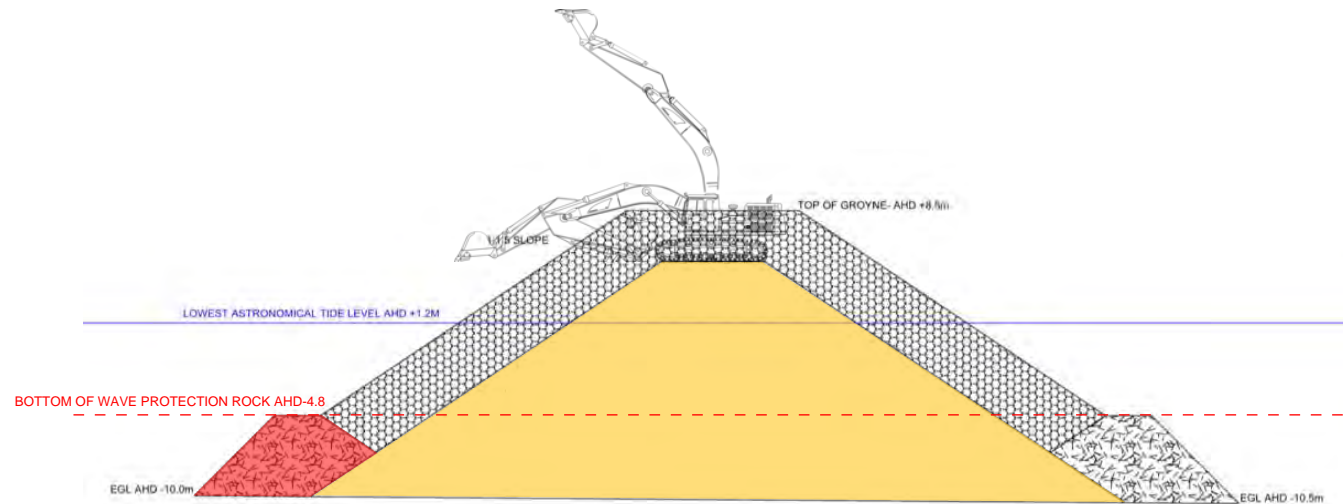
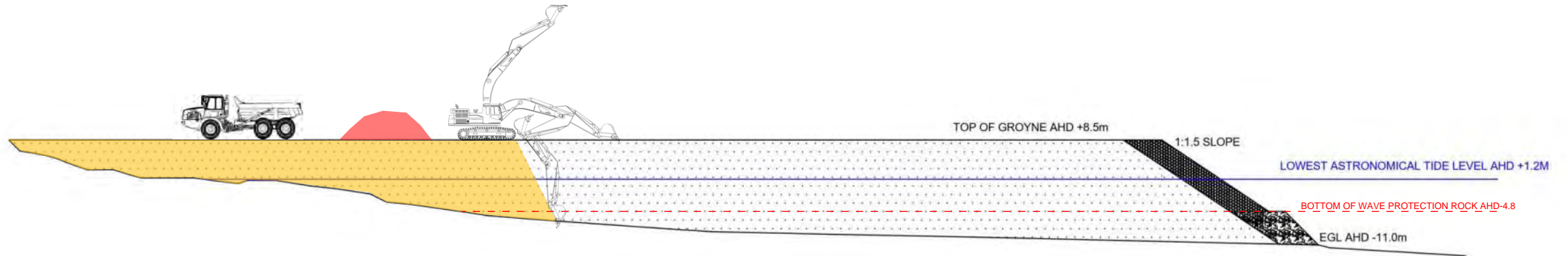
A combination of trucks and a dozer to create a platform out into the water over footprint of groyne



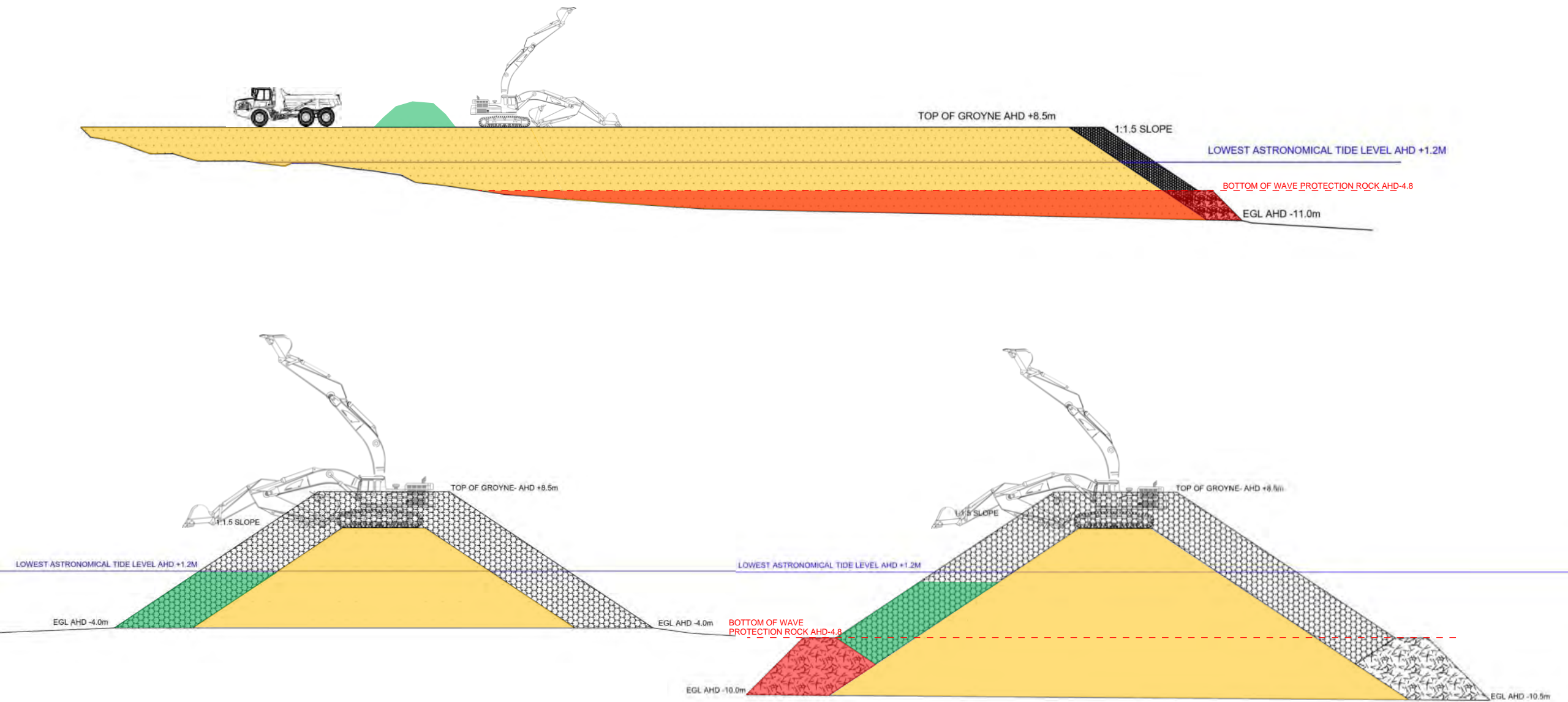
A long reach excavator is to trim the batters from the platform created by the trucks and dozer



A truck is to end tip the 1-2 tonne armour rock onto the trimmed core and an excavator is to place the rock on/roll the rock down the Groyne batters to create a bench for the 8 tonne rock to sit on



A truck is to end tip the 8 tonne armour rock onto the trimmed core and an excavator is to place the rock on the Groyne batters





CLIENT	FREE ARYE	
PROJECT	SHEEP HILL CONCEPT WHARF	
TITLE	PRELIMINARY GRAIN STORAGE SITE PLAN	
DRAWING NUMBER		REV
FREE AYRE-02-17		F

APPENDIX C – Policies

Work Health & Safety Policy

Quality Policy

Environmental Policy

DRAFT

WORK HEALTH & SAFETY POLICY STATEMENT

It is the policy of Bardavcol Pty Ltd to ensure, so far as is reasonably practicable, that all employees, subcontractors, suppliers, visitors, clients and their agents, and the general public are, whilst at or adjacent a Bardavcol worksite, safe from injury and risks to health.

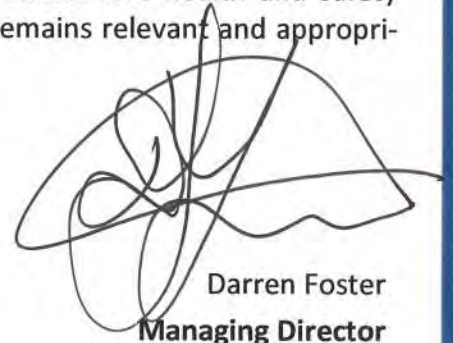
Further, Bardavcol will provide and maintain, so far as is reasonably practicable, a safe working environment and safe systems of work, in compliance with all relevant Acts, Regulations, Standards, Codes of Practice and customer requirements pertaining to Work, Health and Safety.

To achieve these objectives, Bardavcol will establish, implement and maintain appropriate policies, plans, procedures and measurable targets for the elimination of work-related injury and illness. Bardavcol will ensure plant, substances and structures are provided in a safe condition, and will provide appropriate information, instruction, training, supervision, management and facilities as are reasonably necessary. Bardavcol will integrate health and safety measures with all elements of its work, and will monitor working conditions at each workplace under its management and control to ensure compliance with the standards adopted. Bardavcol will consult with workers, health and safety representatives, health and safety committees on relevant issues, and will consult, cooperate with and co-ordinate activities with other persons who have a duty in relation to the same work health and safety matter.

Bardavcol requires that all employees, subcontractors, suppliers, visitors, clients and their agents comply with established policies, plans and procedures and take all reasonable steps to protect their own health and safety and to avoid adversely affecting the health and safety of any other person whilst at work. In particular, it is the duty of all personnel to use equipment provided for health and safety purposes, to identify and report any observed workplace hazards, and to obey all reasonable instructions in respect of health and safety.

Bardavcol is committed to a process of continuous improvement. Accordingly, Bardavcol will monitor, measure, evaluate and report its performance in the achievement of the stated objectives and targets.

This policy statement shall be displayed prominently at every Bardavcol worksite, and will be reviewed annually in consultation with Bardavcol's health and safety committee and Bardavcol's employees to ensure it remains relevant and appropriate to Bardavcol's activities.



Darren Foster
Managing Director

QUALITY POLICY STATEMENT

Bardavcol Pty Ltd is an independent company based in South Australia, undertaking Civil Engineering construction work for a wide range of South Australian and Federal Government bodies, statutory authorities, local government and private developers.

The company recognises that its customers are entitled to expect that all materials and services will conform to their specified requirements and undertakes to manage and conduct its business in a manner that will meet this expectation.

This will be achieved through planning, implementation, monitoring, control and verification of all aspects of the work as defined in this manual and in the applicable contract.

To achieve this objective it is the policy of Bardavcol Pty Ltd to establish and maintain an effective and efficient quality management system which:

- Will produce objective evidence that the customer's specified requirements are met;
- Will ensure that all subcontractors, suppliers and employees of Bardavcol Pty Ltd whose performance may affect quality will be involved and will comply with this policy and all the requirements that are derived from this policy.
- Will ensure a commitment to continually improving the effectiveness of its Quality Management System by seeking customer feedback, and by evaluating its own performance against established corporate objectives and key performance indicators at all levels of the business.

The quality management system which Bardavcol Pty Ltd use is designed in accordance with the requirements of International Standard 9001:2008 - "Quality Management Systems".

The company's Systems Procedure Manual, which describes the quality management systems, is conveyed to all staff and is available to Clients on request



Handwritten signature of Darren Foster, Managing Director.

Darren Foster
Managing Director

ENVIRONMENTAL POLICY STATEMENT

It is the firm policy of Bardavcol Pty Ltd to proactively support the protection of the natural environment for the benefit of current and future generations.

Accordingly, Bardavcol will ensure, so far as is reasonably practicable, that the environmental impacts of all its activities, products and services are controlled to prevent pollution and to comply with all relevant Acts, Regulations, Standards, Codes of Practice and customer requirements pertaining to environmental management and protection.

To achieve these objectives, Bardavcol will establish, implement and maintain appropriate policies, targets, plans, procedures and systems of work relating to environmental management. Bardavcol will integrate environmental management measures with all elements of its work, and will monitor environmental conditions at each workplace under its management and control to ensure compliance with the standards adopted.

Bardavcol will further provide appropriate information, instruction, training, and supervision as reasonably necessary to achieve these objectives.

Bardavcol requires that all persons who work for or on behalf of the company, including all employees, subcontractors and suppliers, and those persons who visit Bardavcol workplaces, comply with established policies, plans and procedures and take all reasonable steps to protect the natural environment, prevent pollution and minimise adverse environmental impacts whilst at work.

Bardavcol is committed to a process of continuous improvement. Accordingly, Bardavcol will monitor, measure, evaluate and report its performance in the achievement of the stated environmental objectives and targets, and amend its practices as necessary. Bardavcol will review this policy and objectives annually to ensure continuing relevance and effectiveness.

This policy statement shall be communicated to all persons working for Bardavcol and shall be displayed prominently at every Bardavcol worksite.



Darren Foster
Managing Director

APPENDIX D – Roles and Responsibilities

Project Organisation Chart [TBC]

Project Roles and Responsibilities

DRAFT

Project Manager

- Responsible and accountable for the overall project performance
- Development, implementation and ongoing review and maintenance of the Project Management Plan (PMP), Risk Register and related project plans
- Commit to and lead a positive safety culture and challenges all 'at-risk behaviour'
- Implement and manage Bardavcol's commercial processes and contractual requirements
- Ensure that project quality and commercial controls are established and maintained
- Monitor project performance against Bardavcol and project specific objectives and targets
- Prepare and submit project reports, as per the PMP, contract and Bardavcol's IMS
- Correct all unsafe acts and conditions and ensures issues are actioned within agreed timeframes
- Commit to and participate in safety conversations with personnel at all levels
- Actively encourages safe behaviour through immediate feedback to personnel involved
- Ensure all incidents and near misses are reported, investigated, corrective actions implemented and lessons learned shared
- Ensure all staff are competent to perform their required duties
- Ensure all work associated with the project is performed in a safe manner and complies with relevant legislation and IMS, project and contractual requirements
- Active involvement in rehabilitation and return to work processes
- Participate in project audits and inspections, as per the PMP
- Ensure there is sufficient and appropriate emergency response equipment on site and emergency response drills are performed as per the PMP
- Ensure communication and consultation occurs with all workers on key project items, including changes to hazards, risks, controls, site rules and other requirements
- Monitor the performance of the project team members to ensure behaviours reflect the expected culture and work is performed to the required standard

Supervisors and Engineers

- Promote a positive safety culture and provide leadership to other workers on site
- Conduct activities, as per the Project Management Plan, Project Risk Register, SWMS and other project plans
- Challenge 'at-risk behaviour' and actively encourage safe behaviour
- Ensure that all tasks are correctly risk assessed and that appropriate controls are implemented and that this process is documented (eg. SWMS, Job Task Cards, Permits)
- Prepare, facilitate, review and implement SWMS, Job Task Cards and other risk assessments, as required
- Perform project inspections and observations, as per the PMP and ensure that positive observations are communicated to workers and action items are closed out as soon as reasonably practicable
- Review project activities, evaluate the effectiveness of quality, safety and environmental controls
- Constructively participate in internal and external audits, as required
- Regularly inspect plant and equipment to ensure that they are in suitable condition and that the required documentation and inspections are in place
- Ensure the correct use and maintenance of Personnel Protective Equipment (PPE) requirements
- Contribute to and/or lead daily Pre-Start meetings and Tool Box Talks
- Ensure workers are inducted and have the required qualifications, training and competencies to perform their required duties
- Contribute to and support rehabilitation and return to work processes, as required
- Ensure that all work under their control is performed safely and in accordance with the project quality, safety and environmental requirements and complies with the relevant legislation, IMS and contractual requirements
- Maintain work areas under their control in a clean and tidy condition at all times
- Regularly communicate and consult with workers under their control on quality, safety and environmental issues and requirements
- Ensure that risk assessments (eg. SWMS, Job Task Cards) and work methods are reviewed and updated, as per the PMP or following a change in scope, method, hazards, risks or controls
- Initiate the reporting and investigation of all incidents and near misses associated with activities under their control and implement corrective actions
- Maintain positive interaction with other project team members, subcontractors, workers and other project stakeholders

- Proactively manage interfaces with other work groups/subcontractors to coordinate activities and ensure that safety, quality and environmental performance is not compromised
- Receive feedback constructively and either correct or escalate items raised and provide immediate feedback where possible and appropriate
- Correct all unsafe acts and conditions and ensures issues are actioned within agreed timeframes
- Engage in safety conversations with site personnel at all levels
- Contribute to the identification of training needs and make personnel available for scheduled training

Quality, Safety and Environmental Management Representative (QSEMR)

- Develop and maintain a quality management system for the project
- Assist other project personnel with completion of quality documentation
- Collate and package quality documentation into lot packages
- Prepare lot packages for submission to the Client
- Assist in the development and implementation of quality, safety and environmental plans
- Conduct activities as per the Project Management Plan, Project Risk Register, SWMS and other project plans
- Review and update the relevant parts of PMP and Project Risk Register
- Conduct and report inspections, as per the PMP
- Conduct internal audits, as required
- Assist external audits, as required
- Assist the HSE Manager with the continuous improvement of the IMS, as required

Project Safety Advisor

- Promote a positive safety culture and provide leadership to other workers on site
- Communicate and consult with the Project Team members, subcontractors, workers and other stakeholders with regard to project safety hazards, risks and controls
- Coach and mentor workers on safety expectations and performance
- Challenge “at risk” behaviour and encourage safe behaviour
- Initiate safety conversations regularly at all levels
- Liaise with external WHS agencies (as required)
- Collate and prepare project safety records and reports, including SWMS reviews, SWMS/Hazardous Chemical/Plant and other registers, inspections/observations, incident reports, communication and consultation records, risk reviews, permits
- Ensure incidents are reported to the HSE Manager and notifiable incidents to SafeWork SA and the OTR (as required)
- Review relevant drawings, specifications, programmes and schedules
- Review and update the relevant parts of PMP and Project Risk Register
- Identify and request WHS resources to achieve objectives
- Assist with work method planning, including design reviews and with a specific focus on high risk work
- Prepare subcontractor safety packs (or equivalent) and communicate and consult with subcontractors on safety expectations prior to their commencement
- Assist the HSE Manager with the continuous improvement of the IMS, as required
- Stop any unsafe works
- Convene and record toolbox meetings
- Provide input to and be involved with daily prestart briefings
- Assist with the preparation, review and implementation of SWMS, Job Task Cards and other risk assessments
- Conduct and assist incident investigations
- Develop and assist with the implementation of corrective actions from observations, inspections, audits and incident investigations (as appropriate)
- Provide specialist safety advice and assistance to workers (including Bardavcol and subcontractors)
- Assist with the preparation and delivery of inductions and ensure records of induction and training/competency are maintained and stored securely
- Assist in the review of required competencies and training gap analysis and recommend and assist in procuring and delivering project specific training
- Assist in development, implementation and evaluation of emergency response plans, procedures and drills
- Review emergency equipment requirements and provide recommendations to the Project Manager

- Provide first aid, as required and assist with Bardavcol's return to work processes as required
- Assist with the monitoring of fitness for work requirements, including any alcohol and other drugs testing
- Monitor all project activities to identify and report uncontrolled risks, non-conformances, and improvement opportunities
- Monitor and report on project safety performance, as per the PMP
- Conduct and report inspections, as per the PMP
- Conduct internal audits, as required
- Assist external audits, as required

All Project Personnel

- Ensure that they are inducted and have read and understood the project requirements relevant to their role and responsibilities (eg. SWMS, emergency requirements)
- Understand and actively participate in a positive safety culture and co-operate with project safety, quality and environmental requirements
- Engage in safety conversations with site personnel at all levels
- Has authority to stop unsafe acts
- Positively participates in Pre-Start Briefings, Toolbox Talks and other communication and consultation forums
- Participate in risk assessments and development of SWMS, Job Task Cards, ITPs and other quality control processes applicable to their role and scope of work
- Work in a safe manner at all times and have regard to their own and the safety of others
- Be aware of other activities that they may affect or be affected by and proactively manage interfaces with other workers/activities
- Inspect plant and equipment before, during and after use, document the inspections (where required), tag out and report any damaged or faulty plant and equipment
- Ensure that plant and equipment is calibrated, maintained and serviced, as per the manufacturer's requirements
- Comply with the relevant project documentation, procedures, legislation, site policies and rules
- Keep their work area clean and tidy at all times
- Attend work fit for duty and not affected by alcohol or other drugs
- Identify opportunities and initiative to improve the project safety, quality and environmental performance
- Identify, control and make safe hazards where possible
- Correct all unsafe acts and conditions and ensures issues are actioned within agreed timeframes (applicable to their role and authority level)
- Report incidents, hazards or unsafe acts immediately

APPENDIX E – Site Layout Plan

Contractor's Activity Zone [TBC]

Site Layout Plan [TBC]

APPENDIX F – Risk Register

[TBC]

Construction Environmental Management Plan



ALLIED
GRAIN SYSTEMS

Port Spencer

Quality Information

Document Construction Environment Management Plan

Date 16/9/19

Prepared by Luke White

Reviewed by

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	16/9/19	Preliminary – For Review	Luke White/ Project Engineer	

Document Control

Document Construction Environment Management Plan

The following table is to be updated with details of each revision of this document. Revised copies of this document to be provided to all relevant stakeholders and approval agencies.

Revision	Revision Date	Details	Authorised	
			Name/Position	Signature
A	16/9/19	Preliminary – For Review	Luke White/ Project Engineer	

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1 INTRODUCTION

The project is to build a new port facility at Sheep Hill, South Australia (Port Spencer) which is located approximately 70 kms north east of Port Lincoln in the heart of Eyre Peninsula's grain production region, with a natural catchment of approximately 1.6 million tonnes located economically closer to or equidistant to any other port. The Port will comprise a deep-sea port and, initially, up to 1 million tonnes of grain storage for a projected cost of \$160 million to \$200 million.

2 PROJECT INFORMATION

2.1 Project Location

Sheep Hill, South Australia (Port Spencer) is located approximately 70 kms north east of Port Lincoln. Its location is outlined in Figures 1, 2 & 3 below:



Figure 1 – Location, Port Spencer



Figure 2 – Location, Port Spencer



Figure 3 – Location, Port Spencer

2.2 Project Setting

The port site is located within a predominantly rural area. Lipson Island Conservation Park is located approximately 1.5 km to the south of the site and a Crown Land coastal corridor, approximately 50 m wide, extends along the eastern boundary of the port site. The port site is approximately trapezoidal in shape and is currently agricultural land. A fenceline runs approximately north-south through the site, designating the boundary of Allotments 386 and 388. The northern coastal portion of Allotment 388 consists of a small bay with sandy beach. The potential road and rail transport access corridor generally follows the existing alignment of Swaffers Road from the intersection with the Lincoln Highway and passes through agricultural land to the south of the road reserve.

2.2.1 Geology

The proposed port site and transport corridor is underlain by Archean age “Undifferentiated metasediments, coarse grained augen gneisses, granitoid gneisses, amphibolites, mica schists, sericite schists. Doleritic dykes abundant along eastern coast.” The site is located in the Kalinjala Shear Zone. This is a large-scale crustal structure on the Eyre Peninsula which separates the Donington Suite granites to the east from metasedimentary schist, quartzite, dolomite marble and banded iron formations of the Hutchison Group to the west. The rocks beneath the site and exposed at the nearby beach are granite, granitic gneiss (deformed and metamorphosed granite), and schist (extremely deformed sheared granite). The granites and gneiss are likely to belong to the Donington Suite. These were intruded in a long belt along the east coast of the Eyre Peninsula, under the southern Spencer Gulf and outcrop also at the foot of the Yorke Peninsula. The schists may represent a subsidiary shear zone, possibly splintering off the main shear zone.

2.2.2 Topography

The site is flanked to the north, west and south by rounded hills approximately 50 m in elevation. The coastline to the north of the port site consists of a small bay with a sandy beach. The aerial photograph of the site shows an intertidal zone to the west of the small bay in the northern part of the site. The western portion of the site slopes down gently towards an unsealed access track extending approximately north-south along the eastern allotment boundary. The headland on which the proposed port will be constructed rises from the track to approximately 25 m elevation. The headland is characterised by rocky outcrops. To the east

it slopes steeply to a rocky shoreline. The aerial photograph also shows a surface water drainage path extending from the south west of the site and curving towards the centre of the site where it becomes less well defined.

2.3 Overview of Project

In 2011, Centrex Metals Limited ACN 096 298 752 (Centrex) proposed the Port Spencer site as a deep-sea port to facilitate iron ore exports from its proposed Eyre Iron Joint Venture project. Centrex proposed a development of up to \$325 million with a capacity of 20 million tonnes per annum.

The proposed Port is a naturally deep-water port with areas of 20 metres depth within 500 metres of the shoreline. Consultants have confirmed that dredging is not required. This depth can facilitate Panamax- and Post-Panamax sized vessels (Cape-size vessels may be accommodated for in the future but is not currently within the project).

FEL partnered with Centrex at the time to include grain exports from the Port.

In 2011, the Centrex-proposed port received South Australian Government development approvals, subject to conditions, including that work was to start on the proposed port development by October 2016. However, no work commenced on it as the Eyre Iron Joint Venture project was abandoned following the decline in global iron ore prices.

As the Eyre Iron Joint Venture project was gazetted as a major project on 6 January 2011, variations to the gazetted approval are now required. Such variations will relate to changing the proposed Port from an iron ore and grain facility to a pure grain facility. Work is underway on these variations.

Since this time, new and innovative modular design and construction practices have created the potential to significantly reduce the jetty and wharf construction costs to a level that enables Port Spencer to be economically viable even if wheat is the only commodity put through it.

On 3 June 2019 the land was purchased for the proposed Port Spencer site, including 140 hectares of land suitable for commodity storage and handling with previous port approvals transferring with the land.

Preliminary scoping and design of the jetty and wharf has been and continues to be undertaken by Jacobs engineering consultants. A modular wharf system with a 650-metre-long jetty is proposed, with a travelling ship-loader, capable of loading 295-metre-long Panamax-sized vessels requiring 12 metres of draft. The minimum berth depth would be 14.5 metres and range to 20 metres at the end of the jetty. The Port will be a conventional deep-water port with industry-accepted technology and methods to load Panamax and Post-Panamax sized vessels. Larger vessels such as Cape-size ships may be accommodated for in the future but is not currently within the project scope.

Relatively new and innovative practices will be used in the construction of the jetty and wharf. It will be built in kit-form modules in China, then transported and assembled, at the proposed Port site. The final method of construction will be dependent upon consulting engineers' final assessment (time, scheduling, cost, safety etc.). The modular method of construction may reduce certain construction costs materially compared with traditional methods as are used in the mining and resource industries.

The jetty will be positioned in a south-east direction to allow for tidal movements and swell impacts on berthing and mooring. It will consist of a truss jetty spanning between the shore and multiple modular jetty jackets spanning between a series of "dolphins" (i.e. man-made marine structures that extend above the water level which are not connected to shore).

The travelling ship-loader will be rated at a minimum 2,000 tonnes per hour and be capable of loading a Panamax vessel within two days. This is consistent with industry standards and competitive with Port Lincoln and other Australian deep-water ports.

Tug and pilot operations will be sourced from the nearby ports of Port Lincoln and Whyalla. These services will be negotiated with the relevant companies when appropriate.

It is estimated that construction and commissioning of the jetty and wharf should take approximately 17 months, being 14 to 15 months for design, procurement and construction (including manufacturing of modules in China, transport and onsite construction) and a further 1 to 2 months for commissioning.

The wharf will be serviced by 50,000 tonnes of new build silo storage capacity. This storage will be capable of being fumigated and will facilitate vessel loading via an integrated conveyor system. It will be filled via a conveyor loading system from the port bunkers, and by truck directly from farms and external storage sites.

The Port site will initially have 860,000 tonnes of effective bunker storage capacity in addition to the 50,000 tonnes of silos, and related intake and out-loading equipment. After allowing for segregations, the practical capacity of these bunkers will be 730,000 tonnes. They will use approximately 40ha of land.

These estimates are subject to engineering design and costings currently being undertaken and led by Jacobs Engineering Group. The designs will be based on Western Australian operations for like facilities, which are generally more efficient than existing and ageing South Australian grain facilities.

Design and construction are based on a core function requirement that all trucks entering the site are unloaded within 1 hour, and that, once sampling is complete, the trucks are off site within 30 minutes after unloading. Fast, empty hoppers will be used for the major wheat classification grades.

2.4 Overview of AGS Works

AGS is being contracted to construct:

- Silo System (Figure 4 & 5):
 - 5 large 12,000T grain silos
 - 800TPH In-load system for silos
 - 800TPH Dual drive over hopper into in-load system
 - 2000TPH Out-load system to ship loader including screening equipment and bulkweigher
 - All towers walkways and trestles
 - Stage 2: 6 x 1500T cone bottom silos
- 600 TPH bunker conveyor system (Figure 6):
 - 4 x 2 x Truck unloading hoppers
 - 4 x Bunker loading and unloading conveyors
 - Conveyor in between bunkers and silo system

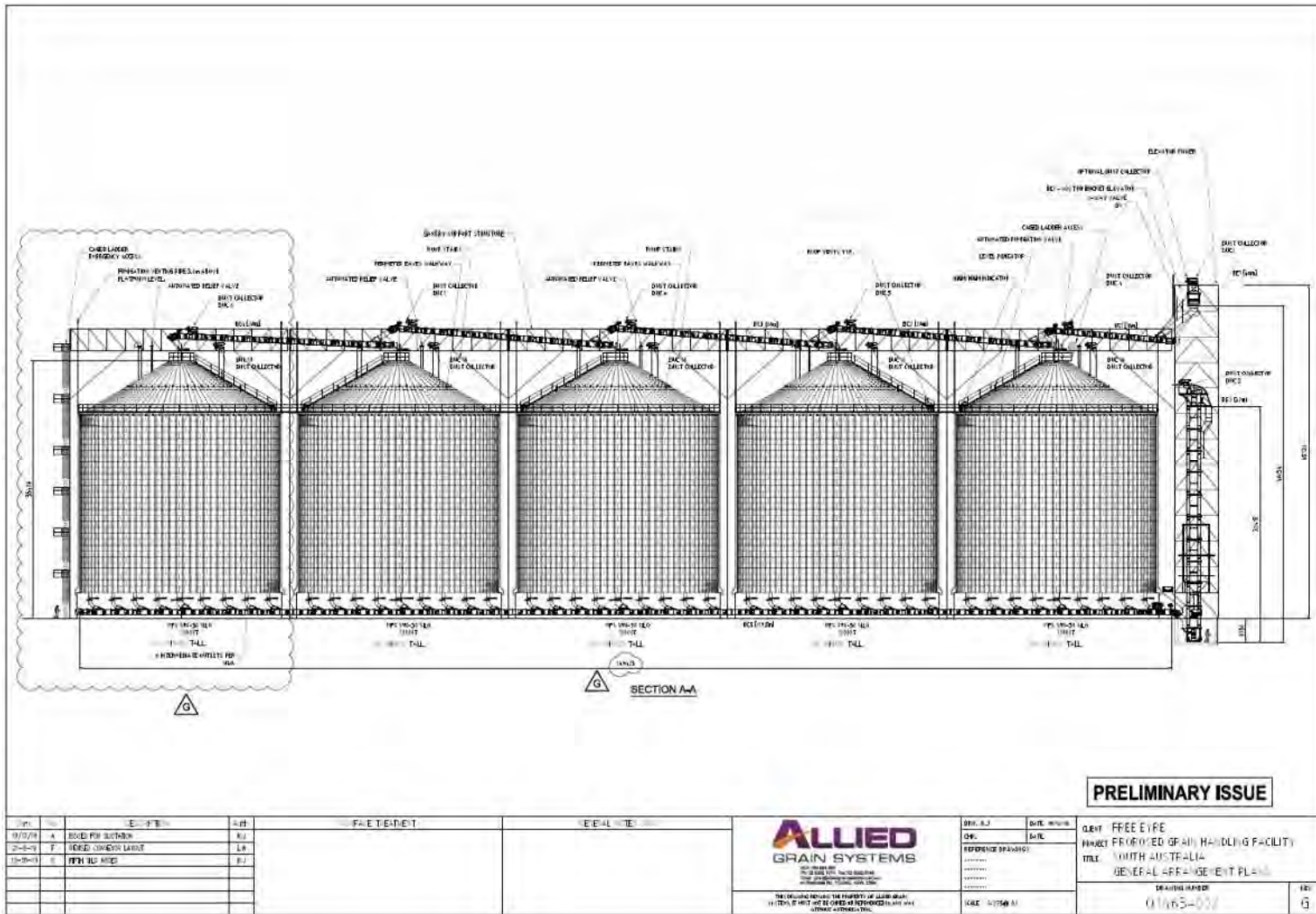


Figure 4 – Q1463-002_G

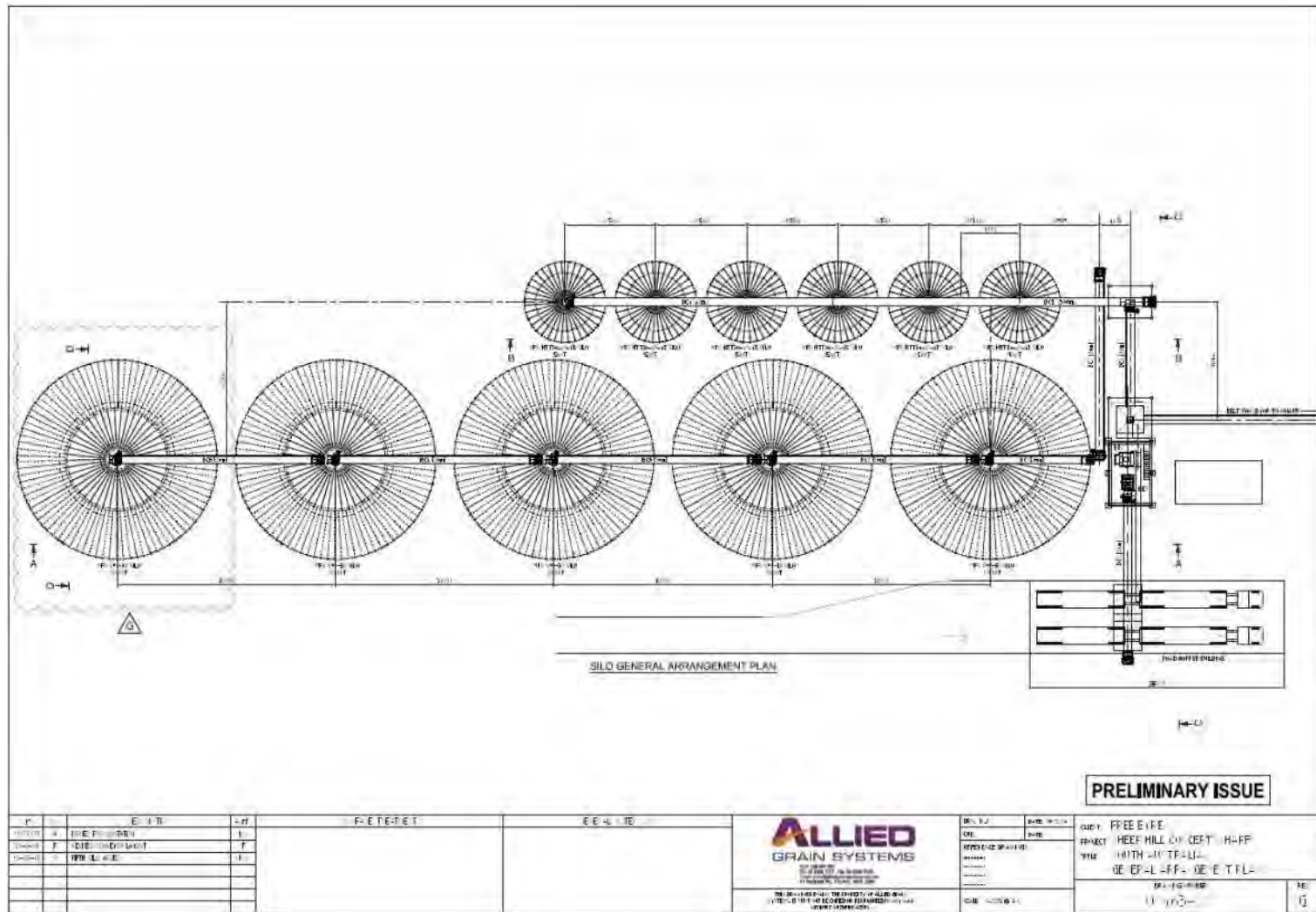


Figure 5 – Q1463-001_G

2.5 Scope of Construction Works

AGS will be supplied with a flat earthworks platform to begin their construction activities. This will most likely be on granite. This is where AGS scope starts. AGS work is outlined in section 2.4.

2.6 Description of Construction (Disturbance) Footprint

The construction area for AGS can be seen in Figure 7. The footprint will encompass the surrounding area required as a laydown area and for craneage and other construction activities. The construction will progress as follows:

1. Foundations will be constructed
 - a. Tower/trestle foundations piers will be rock drilled
 - b. Pier cages will be placed, and the surrounding area formed as to create the base for the towers and trestles
 - c. The silo foundation perimeter walls will be formed and poured into place, as designed. This includes the tunnel for the belt conveyor running up the middle of the 5 silos.
 - d. These perimeter walls will be filled with crushed rock won from site which has been geotechnically tested to meet the required specifications.
 - e. The top of the silo foundation will be poured into place to produce completed foundation ready for silo construction.
2. Silos Built
 - a. The roof of a silo is built first. This includes all hardware and perforations. Once the roof and the upper ring have been built the silo lifting sequence can commence.
 - b. The silo is lifted using hydraulic jacks, one ring at a time is added to the silo as it is jacked up.
 - c. This happens continuously until all 30 rings are correctly placed on the silos in the correct order specified by the manufacturer.
 - d. Once completed base angle is placed on the silo as well as hold down plates.
 - e. Hold down bolts are used to secure the silo to the foundation.
 - f. Throughout the silo building process special care is taken to seal it properly for fumigation purposes.
3. Towers/Walkways Built
 - a. The towers and walkways are partly assembled on ground level. Once they have been assembled into sections these sections can then be lifted into place. The sections are lifted together piece by piece to form the structure surrounding the silos.
4. Bucket Elevators
 - a. Bucket elevators are constructed as the towers are constructed. They go up the centre of the tower structure.
5. Conveyors
 - a. Conveyors are assembled in sections on the ground and then lifted into place in these respective sections.
 - b. Ground conveyors are simply assembled in sequence along the ground surface.

AGS will be operating 24 hours a day 7 days a week on site this includes all deliveries and construction activity.

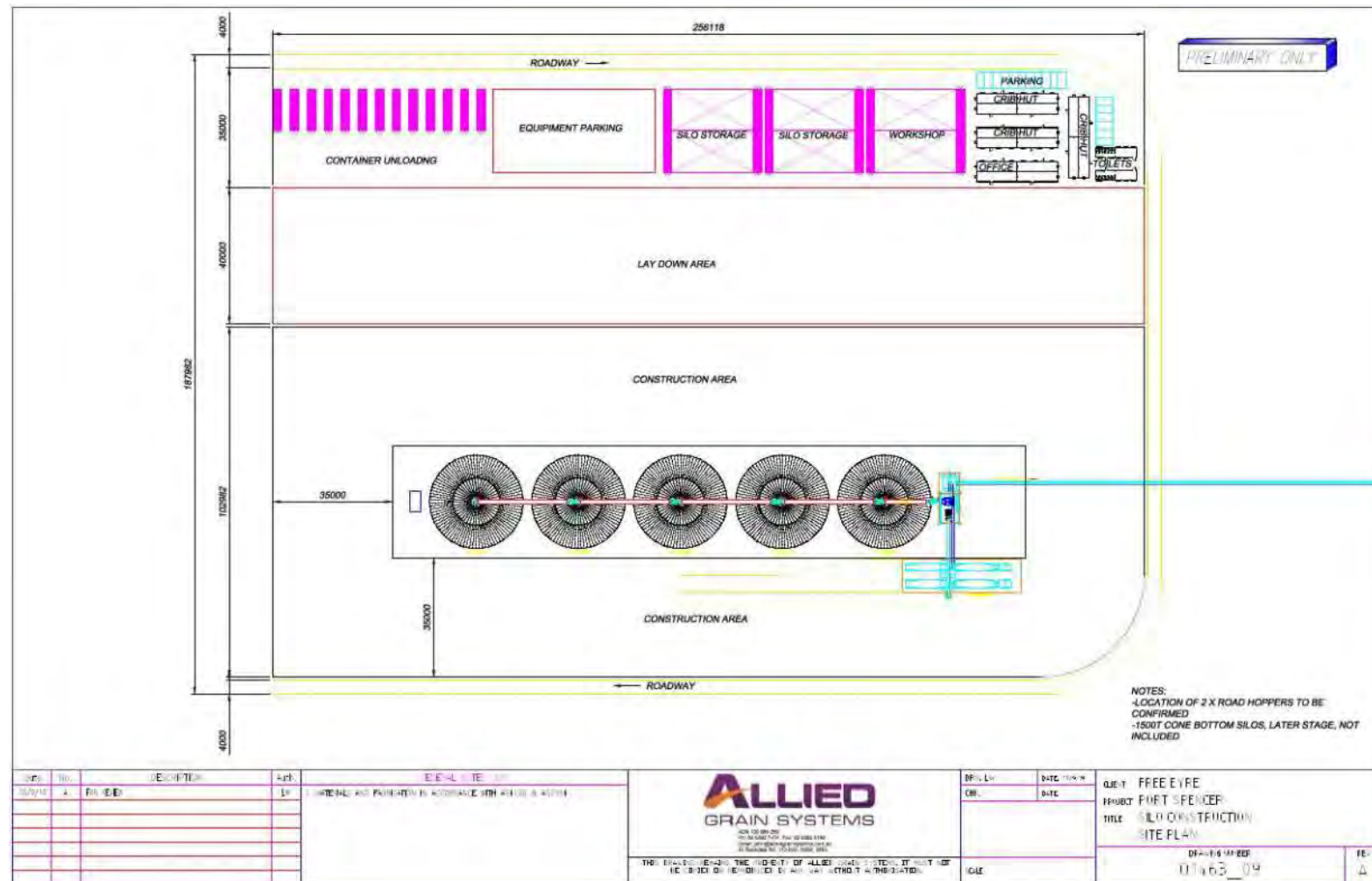


Figure 7 – Q1463-09_A

2.8 Project Schedule and Timing of Works

The schedule for the Project is outlined in Figures 8 & 9 below:

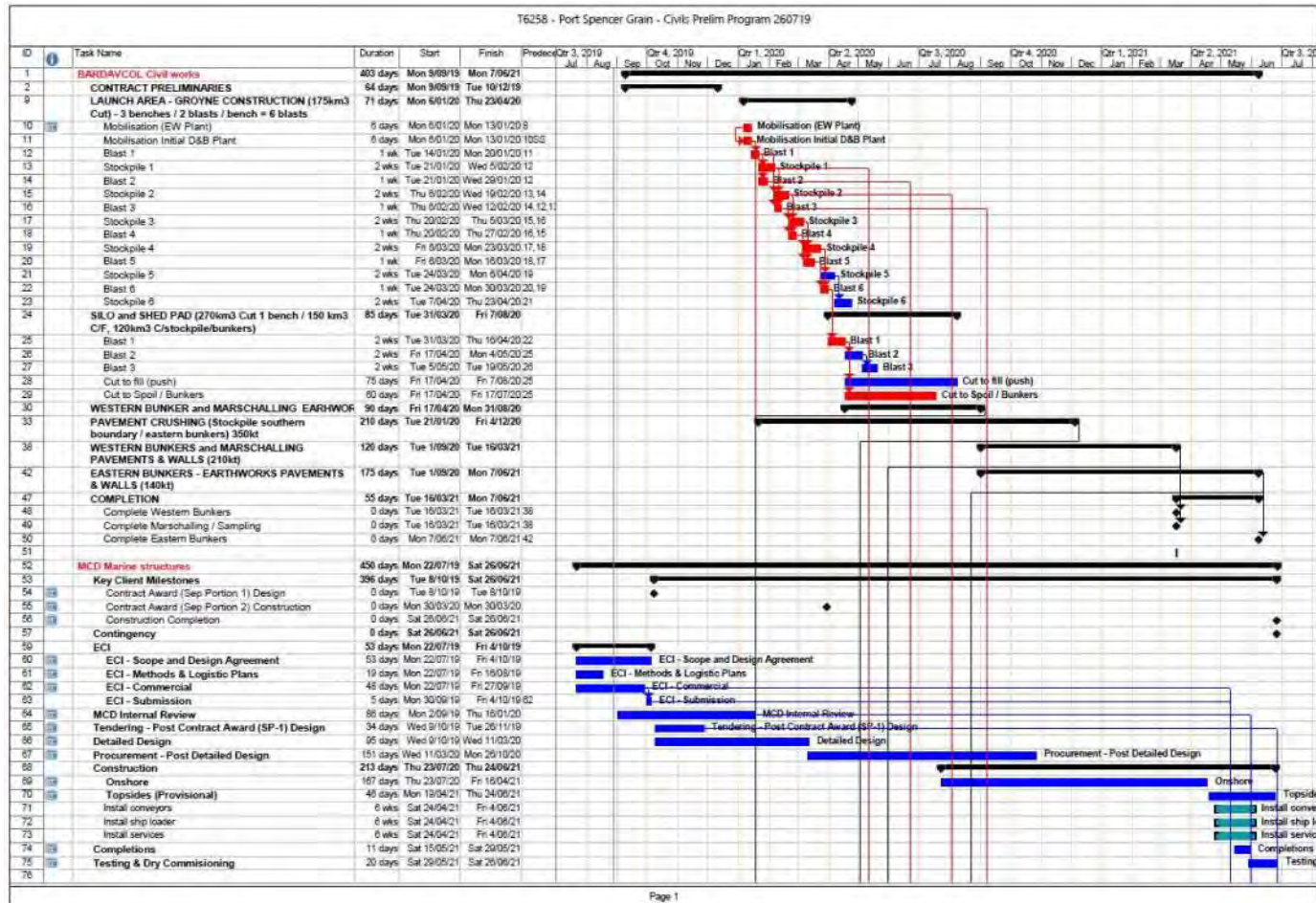


Figure 8 – Schedule

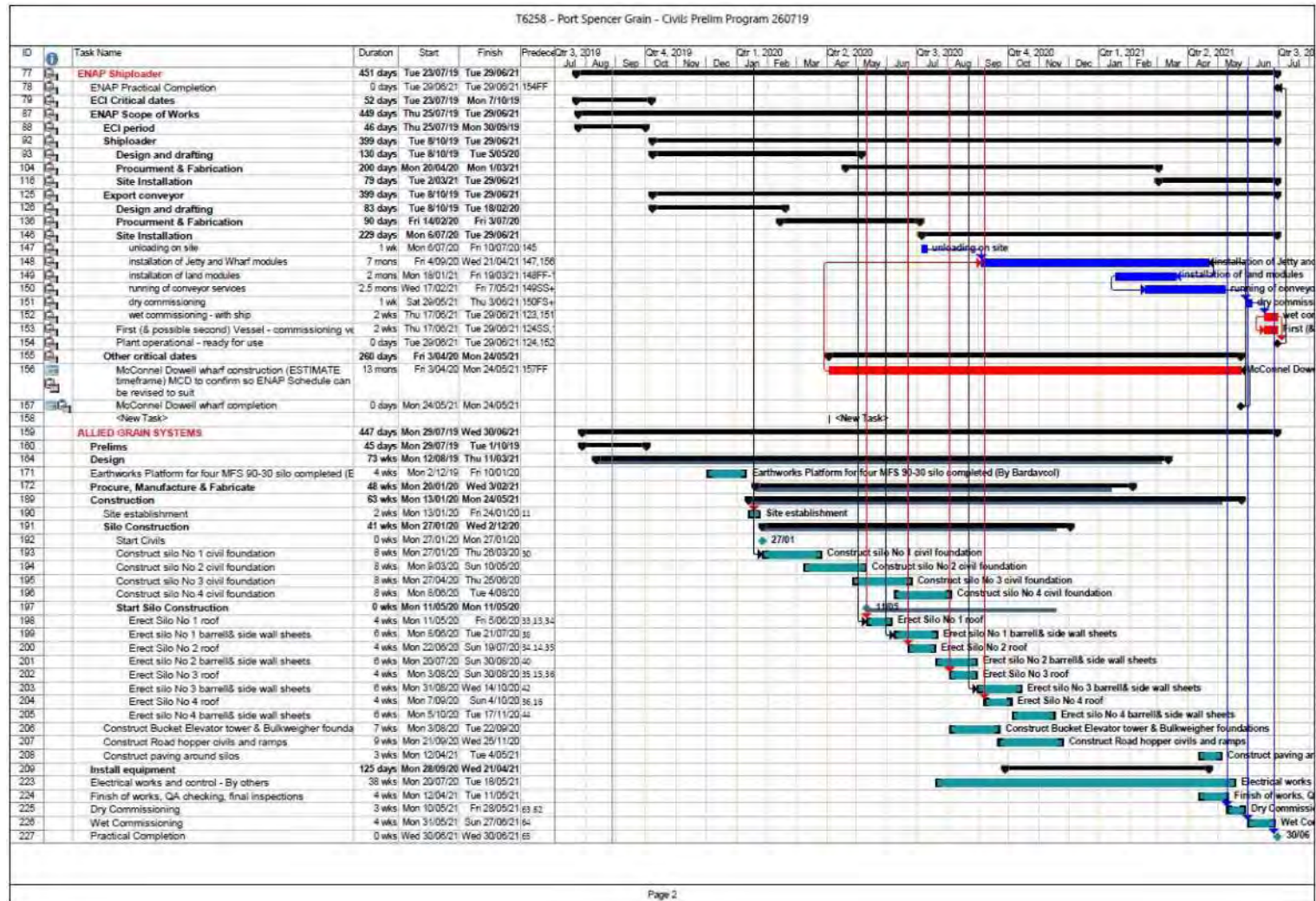


Figure 9 – Schedule

3 CONTACTS AND RESPONSIBILITIES

3.1 Key Project Personnel

All positions across the project have environmental responsibilities to some extent. These vary in relation to duties described in Table 1, but everyone has a base level Duty of Care to prevent Environmental Harm as described in the Environmental Protection Act 1986.

The interdependencies of positions on the project are shown in Table 1 (over page). Names and contact numbers are correct for this revision but may change during the project.

Table 1 – Responsibilities

Position	Responsibilities	Responsibilities to CEMP	Line Manager	Name	Contact Detail
Project Manager	<p>Reports directly to senior management</p> <p>Responsible for Project management of the construction project</p> <p>Responsible for overall implementation of the CEMP</p>	<p>Reports to senior management on environmental matters</p> <p>Ensures appropriate resources are allocated to implement</p> <p>Ensures Project approvals are in place</p> <p>Orders STOP WORK for any environmental breaches and reports incident</p> <p>Ensures environmental induction and training programs are developed and implemented</p> <p>Ensures adjoining landowners and other stakeholders are kept informed of matters relating to their interest</p> <p>Coordinates the environmental inspection and monitoring program Monitors performance against CEMP</p>			
Site Supervisor	<p>Reports to the Project Manager</p> <p>Responsible for implementing the requirements of this CEMP</p>	<p>Reports to the Project Manager on environmental matters</p> <p>Ensures appropriate contractor resources are allocated to implement</p> <p>Ensures project permits are in place</p>			

		<p>Orders STOP WORK for any environmental breaches and reports incident to Project Manager</p> <p>Ensures environmental induction and training program is implemented for all construction personnel</p> <p>Ensures landowners and other interested parties are notified of noise, dust and traffic issues or other matters relating to their interest</p> <p>Manages the daily and weekly environmental inspection and monitoring program Monitors and reports on environmental discharges to Construction</p>			
Environment Officer	<p>Provide expert guidance and monitoring of environmental performance in accordance with CEMP to Project Manager</p>	<p>Undertake internal monthly audits to ensure compliance to the CEMP. This will involve checking the daily, weekly checklists have been completed and evaluation of compliance with the CEMP</p> <p>Report the outcomes of the audit to the APA Project Manager Issue non-conformance requests on environmental issues identified during field audits</p> <p>Orders STOP WORK for any environmental breaches and reports incident to Project Manager</p> <p>The principal point of advice in relation to the environmental performance of the Project</p>			

		<p>Consider and advise the Project Manager on matters specified in the conditions of this approval, and other licences and approvals related to the environmental performance and impacts of the Project; ensure that environmental auditing is undertaken in accordance with the Authority to approve/ reject minor amendments to the CEMP</p> <p>Authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.</p> <p>Be consulted in responding to the community concerning the environmental performance of the Project where the resolution of points of conflict</p>			
HSE Representative	Provide expert guidance and monitoring of environmental performance in accordance with CEMP to Project Manager	<p>Orders STOP WORK for any environmental breaches and reports</p> <p>Consider and advise the Project Manager on matters specified in the conditions of this approval, and other licences and approvals related to the environmental performance and impacts of the Project; ensure that environmental auditing is undertaken in accordance with the Authority to approve/ reject minor amendments to the CEMP</p>			

		<p>Authority and independence to require reasonable steps be taken to avoid or minimise unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment be likely to occur.</p> <p>Be consulted in responding to the community concerning the environmental performance of the Project where the resolution of points of conflict</p>			
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4 TRAINING AWARENESS AND COMPETENCY

Environmental training awareness and competency will be delivered/assessed throughout the project, to ensure the relevant aspects of this CEMP are communicated to the project team and front-line staff (including contractors and sub-contractors).

These Include:

- Site Environment Induction
- Daily Pre-Start Meetings
- Environmental Toolbox Talks
- Incident bulletins
- Sub-contractor's kick-off meeting
- Contractor and client site kick-off meeting
- Visitor Induction
- Job Specific Environment training
- Training records

5 PROJECT MITIGATION MEASURES AND ENVIRONMENTAL SPECIFICATIONS

Summarised in the tables that follow (Sections 5.2 – 5.12) are risk management tables for areas in the project.

5.1 Noise Management

Noise Management			
Objective(s)	<ol style="list-style-type: none"> 1. To minimise the impacts of noise on the amenity of the surrounding areas. 2. Construction activities undertaken in accordance with AS 2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites. 3. Construction activities undertaken in accordance with Environmental Protection (Noise) Regulations 1997 		
Management Strategy	Noise to be managed primarily through administrative and equipment controls during the construction phase.		
		Responsibility	Timing
Control(s)	<p>All equipment used during the construction phase to be regularly maintained to ensure efficient operation;</p> <p>Pre-start checks and maintenance schedules to ensure equipment performance is as required;</p> <p>Noise-dampening equipment to be used on equipment with excessive noise generating characteristics;</p> <p>Construction activities in accordance with AS2436-1981 Guide to Noise Control on Construction, Maintenance and Demolition Sites.</p>		
Performance Indicator(s)	No complaints from adjacent commercial premises and/or community.		
Monitoring	<p>Daily inspection of works sites to occur</p> <p>Service logs for equipment/machinery used on site</p>		
Reporting	<p>Daily inspection of works sites to occur</p> <p>Service logs for equipment/machinery used on site</p>		

Corrective Action(s)	Investigate cause of excessive noise Implement corrective measures prior to the recommencement of site works Reschedule of noise-generating activities to reduce noise annoyance		
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5.2 Dust Management

Dust Management			
Objective(s)	1. To ensure the impacts of dust on adjacent areas and the community are minimised.		
Management Strategy	Dust issues managed principally by emission controls at source, and administrative controls during works.		
		Responsibility	Timing
Control(s)	<p>Area to be disturbed minimised. Clearance lots to be approved by Project Manager.</p> <p>Where dust is identified as an issue, dust control measures will be implemented. These will primarily be the use of water carts but may include surface treatments.</p> <p>Vehicle movements controlled (Traffic Management Plan) and kept to established tracks and haul roads.</p> <p>Dust awareness issues in environmental induction process</p>		
Performance Indicator(s)	No complaints from adjacent commercial premises and/or community.		
Monitoring	<p>Daily inspection of works sites to occur, including:</p> <ul style="list-style-type: none"> visual check for dust crossing the site boundaries usual check of high potential dust areas, such as haul roads, stockpiles and operational areas. 		
Reporting	Any complaints or incidents to be reported to Project Manager.		
Corrective Action(s)	<p>Investigate cause of excessive dust</p> <p>Implement controls immediately (e.g. water carts)</p>		

	Implement corrective measures prior to the recommencement of site works Implement administrative controls if required, such as rescheduling of dust generating activities to more favourable weather conditions.		
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5.3 Sediment and Erosion Control

Sediment and Erosion Control			
Objective(s)	<ol style="list-style-type: none"> 1. To ensure that the effects of erosion and sedimentation on the environment and biological communities are minimised. 2. Minimise soil disturbance, degradation and erosion. 		
Management Strategy	Ensure that direct impacts (land disturbance) are limited to the works area, and that secondary impacts do not impact adjacent areas.		
		Responsibility	Timing
Control(s)	<p>Disturbance area will be minimised and clearly demarcated.</p> <p>Works will only be conducted within the works zone.</p> <p>Vehicle movements will be restricted to the defined roads/tracks.</p> <p>Where possible, works area will be designed to ensure stormwater runoff drains into the site.</p> <p>Where runoff from the site is required, it will be via the longest flow path possible to ensure maximise sediment retention. Flows to undisturbed areas will be prioritised.</p> <p>Where required, sediment controls will be put in place. These will include, but not be limited to, rock check dams, sediment basins, sediment fences and silt socks.</p> <p>Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff).</p>		
Performance Indicator(s)	No evidence of significant sediment deposition outside the works area. No evidence of significant rilling, gullies or other instances of run-off erosion.		
Monitoring	Daily inspection of work site to occur.		

	Sediment controls will be reviewed during site inspections and/or after significant rainfall (more than 10mm in 24hrs resulting in site runoff). Review will include removal of accumulated sediments as required.		
Reporting	Incident report for non-conformance of sediment control Logging of sediment control structures - location and condition during weekly site inspection		
Corrective Action(s)	Investigate cause of sediment control failure Review flow path and determine most appropriate controls are in place, additional controls which can be place in-stream and/or changes that can be made to flow path Review similar controls on-site (even though these may not have failed) for similarities		

5. 4 Oil and Other Noxious Substances

Oil and Other Noxious Substances			
Objective(s)	1. To minimise the potential for spills of oils and other noxious substances to as low as reasonably practicable.		
Management Strategy	Reduce quantity of hydrocarbons stored to that required, implement appropriate controls and provide appropriate training and resources for a spill response.		
		Responsibility	Timing
Control(s)	<p>All hydrocarbons to be stored in an appropriate bund that can hold 110% of a spill from the largest container, or 10% of total volume of stored liquids, whichever is greater.</p> <p>Refuelling of vehicles/equipment will be undertaken on land (not over water), unless the task is not possible.</p> <p>To reduce the impact of a spill, the lowest volume of hydrocarbons required will be stored in proximity to the marine environment and in the onshore lay down areas.</p> <p>A copy of the current hydrocarbon MSDS will be kept at an appropriate location on site.</p> <p>Drip trays shall be placed under mechanical stationary equipment such as gensets if such equipment is not internally banded.</p> <p>Onsite spill response training will be carried out on a periodic basis. All deficiencies identified through training and testing of the procedures will be documented and rectified immediately.</p> <p>All equipment will be regularly serviced to reduce emissions and reduce the chance of oil leaks on site and in marine environments. Appropriate controls in place to contain hydrocarbon leaks should they occur whilst servicing. Controls may include use of drip trays when changing oil and transporting waste oils in banded containers.</p>		

	<p>Only qualified personnel are to carry out services on plant, equipment and vessels.</p> <p>A prescribed Isolation procedure must be followed prior to work on any plant or equipment.</p> <p>Training / awareness to be included in site induction (including all staff, contractors, subbies etc.).</p> <p>Appropriate volume and type of spill response materials will be available at each work site</p> <p>Spill will be contained and cleaned-up immediately. Resultant wastes (soils, rags and absorbent material) appropriately stored and disposed of by an appropriately licenced waste contractor as controlled waste.</p> <p>All spills reported and investigated as required.</p>		
Performance Indicator(s)	<p>Minor spills (<10L) to land contained, controlled and all contamination removed / cleaned-up within 24 hours.</p> <p>No spills to marine waters.</p> <p>Reporting to Project Manager within timeframes specified below</p> <p>No contamination of soil or surface / ground waters.</p> <p>No spills that require an emergency response</p>		
Monitoring	<p>Incident report outlining corrective actions taken and preventative measures to be implemented</p> <p>Statistics reported in weekly meetings and monthly reports.</p>		
Reporting	<p>All marine spills (regardless of volume) to be reported</p> <p>A spill of oil or any other hazardous or noxious substance to the deck of the Dampier Cargo Wharf, Bulk Liquids Berth</p>		

	<p>The following incidents must be reported to on a monthly basis (e.g. at KPI meetings)</p> <ul style="list-style-type: none"> ▪ If there is less than 10L spilt, the spill is contained on site and it can be fully cleaned up. <p>The following types of spill incidents must be reported immediately (including a follow-up incident investigation report within 48 hours):</p> <ul style="list-style-type: none"> ▪ Any spill greater than 10L; ▪ Any spill which cannot be fully cleaned up / contained immediately; OR ▪ Any spill which leaves the lease area (e.g. as liquid discharge or dust emission). 		
Corrective Action(s)	<p>Stop work immediately, contain spill (if safe). Investigate cause of spill and assess. Implement improvements as required.</p> <p>Investigate and assess adequacy of response – implement improvements as required.</p> <p>Implement corrective measures prior to the recommencement of site works.</p>		

5.5 Housekeeping and Waste

Housekeeping and Waste			
Objective(s)	1. Reduce waste volume, maximise recycling, reuse and recovery, prevent any construction waste/litter entering the environment.		
Management Strategy	Minimise environmental impacts through appropriate controls and site inductions of employees and sub-contractors.		
		Responsibility	Timing
Control(s)	Provide appropriate waste bins, type, volume and service frequency to accommodate anticipated waste streams. All loads arriving or leaving the site will be appropriately secured. Provide information regarding waste management in site specific inductions, including waste separation and importance of securing vehicle loads. Ensure licensed contractors are used to collect controlled wastes		
Performance Indicator(s)	Hazardous materials all appropriately disposed. Recycling of all recyclable construction metal waste Records kept of waste leaving site.		
Monitoring	Daily inspection of work site to occur. Review of waste bins (% full, time to next service). Waste volumes leaving site from waste contractors		
Reporting	Environmental incident reports.	Project Manager	Throughout project
Corrective Action(s)	Investigate cause of inappropriate waste disposal	Project Manager	Throughout project

	Review cause of issue and develop response, such as variation to bin size, service schedule or waste separation awareness. Implement controls		
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5.6 Terrestrial Fauna

Terrestrial Fauna			
Objective(s)	1. To minimise the impact to fauna 2. To prevent the spread of introduced species		
Management Strategy	Ensure impacts to fauna are minimised and impacts outside the disturbance zone are avoided.		
		Responsibility	Timing
Control(s)	<p>Provide site specific information on fauna within the Environmental Induction</p> <p>Include identification sheets in prominent locations for priority species</p> <p>Include identification of feral species in prominent locations</p> <p>Include toolbox talks for site specific fauna information during project to ensure currency of information</p> <p>Ensure no activities outside the works zone through clear delineation of the works area, and communication in site inductions</p> <p>Ensure traffic is restricted to established tracks and roads, and speed limits observed.</p> <p>Where excavations are created which may entrap fauna, suitable escape measures are put in place, and excavation are checked for fauna before backfilling.</p> <p>Contact wildlife carer groups/vet for injured fauna</p> <p>Domestic animals prohibited on-site</p> <p>Ensure appropriate waste management (lidded bins), including food scraps, to reduce potential for feral species to become established on-site</p>		

Performance Indicator(s)	<p>No disturbance outside the disturbance zone</p> <p>No injury or death of any fauna caused by vehicles or excavations</p> <p>No injury or death of protected fauna.</p> <p>No domestic animals on-site</p>		
Monitoring	Daily inspection of work site to occur.		
Reporting	Sightings and incidents reported in weekly contractor meetings. Injured native fauna to be reported.		
Corrective Action(s)	<p>Investigate cause of incident</p> <p>Review opportunities/constraints for further minimisation of potential incidents given work procedure parameters</p> <p>Implement corrective measures prior to the recommencement of site works</p>		

5.7 Native Vegetation and Weeds

Native Vegetation and Weeds			
Objective(s)	1. To minimise the disturbance to existing flora 2. To minimise the introduction and/or spread of weed species		
Management Strategy	Ensure impacts to native vegetation are minimised, impacts outside the disturbance zone are avoided and appropriate management is in place to control spread / introduction of weeds.		
		Responsibility	Timing
Control(s)	Provide site specific information on flora within the Environmental Induction Ensure that any native vegetation clearing occurs within the limits of an approved area under the whole of Port native vegetation clearing permit. Ensure no activities outside the works zone through clear delineation of the works area, and communication in site inductions Ensure traffic is restricted to established tracks and roads, and speed limits observed. Ensure effective sediment and erosion control to reduce potential impacts to non-disturbance zone. Ensure all plant and equipment coming to site has been cleaned for site access (weeds and seeds). No fires on-site.		
Performance Indicator(s)	No disturbance of vegetation communities outside the disturbance zone No introduction of weed species		
Monitoring	Daily inspection of work site and boundary to occur.		

Reporting	Any accidental clearing of native vegetation to be reported to the project representative and followed through with an incident report.		
Corrective Action(s)	Investigate cause of incident Implement corrective measures prior to the recommencement of site works Review opportunities/constraints for further minimisation of potential incidents given work procedure parameters.		

5.8 Traffic Management

Traffic Management			
Objective(s)	1. The ensure traffic movement to and from site as well as on site is effective as to not damage the environment		
Management Strategy	Effective traffic management policies on site		
		Responsibility	Timing
Control(s)	<p>All vehicle movement to, around and from the construction site will be undertaken to minimise impacts on the environment and minimise risk to the safety of persons.</p> <p>Ensure all vehicles are adequately maintained to meet Australian Road Rules and RMS standards so that safety is not compromised.</p> <p>Ensure that deliveries and heavy transport movements are scheduled outside peak traffic hours.</p> <p>Regularly inspect road condition for deterioration of pavements where practicable.</p> <p>Transport oversized equipment and machinery in accordance with the RMS guidelines for oversized movements and required permits obtained.</p> <p>Implement appropriate signage to warn road users of the presence of construction vehicles as well as changes to normal traffic conditions.</p> <p>Provide adequate onsite parking and turning areas for vehicles.</p> <p>Traffic Control Plans will be provided for approval</p>		
Performance Indicator(s)	<p>Record of complaints, investigations and responses</p> <p>Record of traffic control plan</p>		
Monitoring	Month Inspection		

	Evidence of permits obtained and record of oversized vehicle movements Signage is in place and no traffic incidents recorded Construction parking restricted to designated areas		
Reporting	Weekly checklist as required		
Corrective Action(s)	Implement corrective measures Review opportunities/constraints for further minimisation Update traffic management plan		

5.9 Aboriginal Heritage

Aboriginal Heritage			
Objective(s)	1. To minimise effect construction activities, have on aboriginal heritage		
Management Strategy	To monitor and maintain Aboriginal Heritage in the area		
		Responsibility	Timing
Control(s)	Monitoring will be undertaken in culturally sensitive areas Aboriginal Cultural Heritage Awareness Program All newly identified Aboriginal sites to be reported and managed		
Performance Indicator(s)	All currently and newly identified Aboriginal sites have been managed effectively		
Monitoring	Heritage Clearance form signed by Heritage professional Record of completed training in the training register.		
Reporting	Weekly checklist as required		
Corrective Action(s)	Implement controls		



ENGINEERING APPLICATIONS

ABN: 93 135 980 111



CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN (CEMP)



FREE EYRE / PENINSULA PORTS

Port Spencer Project

Export Conveyor and Shiploader Package



Issue	Description	Approved By	Signed	Date
A	CEMP	Anthony Davis		5/9/19



HEALTH, SAFETY & ENVIRONMENT MANUAL

Construction Environmental Management Plan

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1 Introduction

Engineering Applications (ENAP) has been engaged by Free Eyre Limited (FEL) to undertake the structural, mechanical and electrical installation of a Export Conveyor & Shiploader capable of an effective 2000t p/h (design of 2500t p/h).

This Construction Environmental Management Plan (CEMP) details the environmental management and control measures which are to be implemented for the construction activities for the ENAP controlled Workfront's to reduce adverse impacts on the environment. The site is located on the Eyre Peninsula (Spencer Gulf), South Australia, which is a critical environmental factor to be considered for this project.

Prior to undertaking any activity that involves potential environmental harm, ENAP will undertake an environmental impact assessment to identify all key risks and controls. This will include conditions to protect land and water from harm. Environmental harm includes any adverse effect on an environmental value.

ENAP will consider all key areas when undertaking construction activities that have the potential to cause environmental impact and endeavours to:

- Identify the environmental values of the site, including any significant flora, fauna and waterways associated with the land;
- Identify the possible impacts due to the proposed activity and all associated risks to the environmental values; and
- Identify the strategies to mitigate the identified risks to the environmental values.

In South Australia, the environmental impacts to land associated with Environmentally Relevant Activities are regulated under the Environmental Protection Act (1993) and subordinate legislation, including the Environmental Protection Regulation (2009).

The Environment Protection Act highlights that there are several defined activities that have the potential to cause land contamination. Where applicable, activities that are likely to cause environmental impacts will be lodged with the Department of Environmental and Heritage Protection to obtain relevant authority to conduct an Environmentally Relevant Activity. These are referred to as 'notifiable activities' and the Environment Protection Act includes provision for the maintenance of the Environmental Management Register and Contaminated Land Register.

If ENAP identify any new or potential Environmental risks following commencement of construction activities, these actual or potential risks will be recorded and actioned.

2 Legislative Compliance

The environmental compliance requirements and legislative requirements and controls to protect the environment have been identified as part of this plan.

3 Approvals, Licences, Permits

ENAP is not responsible for the necessary approvals, licenses, permits and authorizations applicable for the construction activities for the scope of this project. The approvals and permits will be / have been sourced by Free Eyre Limited and its engaged management firms.

4 Environmental Policy



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P 002 – ENVIRONMENTAL POLICY

POLICY STATEMENT

ENAP's mission is to provide a comprehensive engineering service to our clients with a key focus on Design, Fabrication, Installation and Maintenance. In an expanding and competitive market ENAP is determined to deliver products and services of excellent quality, all with an emphasis on professional, safe, dynamic and timely outcomes.

ENAP has made a firm commitment to respect and protect the environment in which it operates. Our products and services will include from its design and, throughout all phases of the project, a risk management approach that will embrace the company overall philosophy of:

- Zero Harm;
- Pollution prevention and respect for the environment ;
- Continuous improvement and;
- Sustainable development

ENAP will comply with current environmental protection legislation as the minimum acceptable standard in all its operations in the factory and at customer sites.

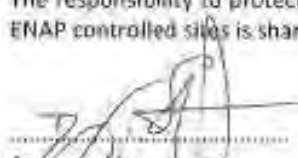
AIMS AND OBJECTIVES

The Board of Directors and their Senior Management Team have overall responsibility for implementing this policy; to this effect ENAP will embrace the following environmental objectives:

- ★ Develop and maintain an Integrated Environmental Management System as per AS/NZS ISO 14001 to encompass all ENAP controlled activities.
- ★ Establish a clear chain of command and the communication of defined environmental responsibilities at all company levels.
- ★ Develop environmental objectives and targets for all company activities and effective management plans to control environmental hazards/risks.
- ★ Ensure the company has procedures to identify environmental hazards/risks of its products and services in order to control, eliminate or reduce their impact on the environment.
- ★ Provide competency and awareness training to our personnel so they can perform their duties, not only in safe and responsible manner but, also with the highest regard to environmental protection.
- ★ Reduce pollution by continually search for better and cleaner production methods and,
- ★ Reduce waste by maximising recycling opportunities as they emerge.

ENAP's ultimate goal is to, where possible and practical, preserve energy and resources with minimal or zero discharge of pollutants and waste into the natural environment that we operate.

The responsibility to protect the environment and reduce the impact of our industrial activities on ENAP controlled sites is shared and supported by all company employees.

Approved by:

Drew Stephensen
General Manager

Date 30/6/16

5 Scope of Works

The scope of the works for ENAP for FEL Port Spencer Export Facility is the Structural, Mechanical and Electrical Installation package of the Export conveyor and Shiploader. This includes ENAP being the Principal Contractor for this scope of these works. The onsite works will be contained within FEL owner lease just North of Lipson and Tumbay Bay and comprise of the following elements:

- Structural and Mechanical assembly and installation of the approximate 950m long export conveyor
- Structural and Mechanical assembly and installation of the 2000t p/h (effective) shiploader
- Electrical and control installation of the above two pieces of equipment
- First fill activities of the above-mentioned items
- Dry and Wet Commissioning of the above-mentioned items

6 Existing Environment

The location of the project for the installation of the works for the Grain Export Terminal is in a sensitive environmental area. The proximity of the main construction area is contained within the land holding of Free Eyre Limited. Controls of potentially harmful materials need to be implemented to ensure that there is no disruption to the existing environment conditions. Such areas are identified below and will control the construction methods.

7 Environmental Risk Assessment

The potential environmental impacts during construction activity have been identified and assessed in the Risk Assessment Matrix to determine an unmitigated risk of the activity. The level of risk assessed from the matrix informs the level of mitigations required for that environmental aspect to be acceptable. These risks are to be mitigated through the identified control measures.

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Table 1: RISK LEVEL MATRIX – RISK SCORE

LEVEL OF CONSEQUENCE	CONSEQUENCES OF EVENT OCCURRING <i>What is the likely outcome of an exposure to the risk?</i>	LEVEL OF CONSEQUENCE		LIKELIHOOD OF EVENT OCCURRING									
				Almost certain	5	Likely	4	Possible	3	Unlikely	2	Rare	1
Catastrophic	-Major environmental harm. e.g. major pollution incident causing significant damage or potential to health or the environment.	Catastrophic	5	VH 25		VH 20		VH 15		VH 10		H 5	
Major	-Long term or serious environmental damage. - Numerous complaints received. - Potential for prosecution.	Major	4	VH 20		VH 16		VH 12		H 8		H 4	
Moderate	-Moderate environmental impact. - Will cause complaints. - Possible fine.	Moderate	3	VH 15		H 12		H 9		M 6		M 3	
Minor	-Minimal environmental harm. - Potential for complaints. - Fine unlikely.	Minor	2	H 10		H 8		M 6		L 4		L 2	
Insignificant	-Little or no environmental harm. - Little potential for fines or complaints.	Insignificant	1	H 5		M 4		L 3		L 2		L 1	

LIKELIHOOD OF EVENT OCCURRING		DETERMINATION OF RISK CONTROL ACTIONS		
Almost certain	Event is expected to occur in most circumstances	RISK SCORE	RISK LEVEL	ACTION REQUIRED
Likely	Event will probably occur in most circumstances	VH 10 - 25	VERY HIGH	Risk requires best practice controls to be implemented
Possible	Event might occur at some time	H 4 - 12	HIGH	Try to reduce the risk, implement better controls if possible
Unlikely	Event could occur at some time	M 3 - 6	MODERATE	Job may proceed, ensure risk control measures are in place
Rare	Event may occur only in exceptional circumstances	L 1 - 4	LOW	Job is safe to proceed, risk is negligible or under control



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Aspect(s)	Potential Construction Stage Impact(s)	Consequence(s)	Risk Rating	Control(s)
Site Security & Access:	Unauthorised access to site by public (non-inducted people to the project)	Minor	M6	Perimeter fence and/or signage to be installed around construction activity, signage to be in place
Erosion & Sediment Control:	Excavation of footings	Minor	M6	Silt fences to be established and maintained throughout works
	Overland flow	Minor	M6	Install diversions to direct flow away from excavation if rain event is predicted
Water Use & Environmental Water Quality:	Minimise water use during excavation	Insignificant	L2	Keep water use to a minimum – all excess water to be removed with vac truck if required
Air Quality:	Use of plant	Minor	L4	Turn off plant when not in use
	Dust from excavation	Minor	M6	Have hoses on standby to wet down as required
Noise & Vibration:	Use of plant	Minor	L4	Turn off plant when not in use
Hazardous Substances:	Paints & chemicals	Minor	L2	The storage of chemicals on site is to be in the appropriate bunded chemical storage container. Use of chemicals on site to be in accordance with manufacturers recommendations and in accordance with legislative requirements of the Work Health and Safety Act 2011
	Fuels/ oils	Minor	M6	Onsite fuelling activities to be facilitated by a licensed tanker operator and to be undertaken in an isolated / bunded area or have other mechanical controls in place



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Contaminated Soil Land:	No contaminated soils nominated in project documents	Minor	M6	No soils are to be removed from site
	If suspected soil arises – stop and test			
Acid Sulphate Soils:	No contaminated soils nominated in project documents			
	If suspected soil arises – stop and test			
Waste Management & Housekeeping:	General waste from workers (food scraps/ paper etc)	Minor	L4	Waste bins to be provided and utilised
	Construction waste – off cuts etc	Minor	L4	Construction waste bins to be provided and utilised
Flora & Fauna and Waterways:	Grassed area in Adjacent property to be retained	Minor	L4	Ensure delineation is kept between hardstand area and grass areas to be retained
	Contamination of the waterways from construction activities	Moderate	H9	Provide catchment protection for waste when working over water Any spillage of waste must be cleaned up as quickly as practicable Industrial standard spill kits to be located on site and inspected regularly. Staff to be trained in the use of spill kits.
Cultural Heritage:	Discovery and/or damage to cultural heritage or significant sites	Moderate	H8	FEL and its partners are to sweep, identify and note all areas of concerns. Construction zones are to build around these located areas
Introducing Contamination	Plant, equipment and materials entering site	Minor	L4	Plant and materials must be clean and free of contaminants before entering the site

8 Construction Site Facilities

The following considerations will be made when selecting the location for the construction site compound within the development:

- Within the footprint of the proposed development;
- Locate office, amenities, dry storage and any chemical storages above flood level and away from natural surface drainage lines;
- Suitable vehicle access;
- Separate storage for fuels, chemicals and hazardous goods, inside bunded area(s) above flood levels;
- Minimise potential for work near dry vegetation which could cause fire; and
- If lighting is required for night-time security, locate lights to avoid nuisance to neighbours.

All site sheds and other facilities will present a neat appearance with safety signs erected as required. The site compound area will be regularly maintained and will be kept tidy and free of rubbish. Covered rubbish bins will be provided.

9 Roles & Responsibilities

9.1 Project Manager

The Project Manager reports to the client, the role includes responsibility for the day-to-day environmental management of the project. The Project Manager is ultimately accountable for the implementation of the requirements contained within this CEMP. The Project Manager is responsible for:

- Assisting in preparing and implementing the CEMP;
- Instructing project personnel on how to comply with environmental policy and procedures;
- Ensuring the Site Supervisor is aware of and complies with the environmental obligations as detailed within this CEMP;
- Ensuring that employees, contractors and sub-contractors are aware of, and comply with, the conditions of approval and requirements of the CEMP relevant to their respective activities;
- Arranging periodic monitoring and regular site inspections by suitably trained personnel;
- Tracking and compliance for the scope of works being performed;
- Initiating remedial measures when environmental deficiencies are observed or in response to environmental complaints;
- Restriction of construction activities affected by an environmental deficiency until remedial action has been taken;
- Engaging consultants where required to provide support in relation to implementing the CEMP; and
- Investigating any incidents or complaints and ensuring necessary corrective action is implemented (in consultation with client for significant incidents / complaints).

9.2 Construction Manager / Site Supervisor

The Construction Manager / Site Supervisor will report to the Project Manager and is responsible for: -

- Managing employees / contractors and construction activities daily to ensure the appropriate environmental controls are implemented and maintained;
- Ensuring all staff are inducted into the site and undertake daily tool box talks;
- Undertake daily site inspections of environmental controls and maintain records of environmental actions;
- Reporting any environmental management concerns or incidents immediately to the Project Manager;
- Recommending improvements to the CEMP to the Project Manager; and
- Implementing any corrective actions issued because of any site inspections, audits or meetings.

9.3 Other ENAP Employees and Contractors

The Work Assistants and Contractors will report to the Site Supervisor and are responsible for: -

- Implementing the CEMP as it applies to their works; and
- Reporting any environmental management concerns or incidents immediately to the Construction Manager / Site Supervisor.

10 Contact Details

10.1 ENAP, Contractor, Client Representatives and/ or Emergency Contacts:

Name	Position	Contact Number/s	Email
Emergency Services	Fire Service, Police Service, Ambulance	000	N/A
TBC	MEDICAL CENTRE		N/A
Anthony Davis (ENAP)	Project Manager	0428 962 224	anthony.davis@enap.com.au
TBC (ENAP)	Site Supervisor – Struct & Mech		
TBC (ENAP – Sub contractor)	Site Supervisor – Electrical		
TBC (ENAP)	HSE Manager		
TBC (FEL)	Construction Manager		
TBC (FEL)	HSE Manager		

11 Environmental Training & Awareness

11.1 Site Induction

All employees and sub-contractors must undertake a Free Eyre Limited / Port Spencer site induction and ENAP Project induction prior to their commencement of work on site. The induction of employees and contractors is the Site Supervisor's responsibility.

The ENAP Project induction will inform employees of their environmental responsibilities on site. It details the most significant environmental aspects and introduces this CEMP as the management tool to address the controls and mitigation measures required to minimise environmental impact on the Project.

The induction will cover the following:

- Contents of the CEMP;
- Critical environmental protection procedures including spill responses, emergency procedures, hazardous substances and dangerous goods handling, and monitoring of imported fill quality;
- The location of the CEMP during works; and
- General obligations.

All visitors to the Site must undergo a visitor's induction. All visitors must be accompanied by a fully inducted member of staff.

Site personnel shall be encouraged to be proactive and report any instances of environmental control measures not operating properly.

11.2 Tool Box Talks & Pre-start Meetings

Tool box talks, and Pre-start Meetings will be conducted daily by the Site Supervisor for employees and subcontractors. Tool box talks will be undertaken in response to evolving issues on the ground, particularly in response to significant environmental and safety incidents and non-conformance issues.

12 Environmental Management & Controls

12.1 Site Security & Access

12.1.1 Objectives

- Prevent entrance of unauthorised people to site during construction activities; and
- Prevent dumping of external waste materials on site.

12.1.2 Management & Control Measures

- 1) Perimeter security fence may be installed around construction zones, through the construction period. Where necessary, the traffic management should be considered before establishing perimeter fencing, including maintaining thoroughfares for other area users.
- 2) All entry / exit points should be monitored / controlled while the site is open to prevent entry of unauthorised persons / vehicles. Vehicles entering / exiting site should be managed in accordance with risks identified as part of the work.
- 3) Delivery truck drivers for the project are to be escorted by a fully inducted person at all times.

- 4) Ensure that the security gates / fencing on site are locked whenever the Site is unattended.

12.1.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Visual check that perimeter fence intact	Weekly	Site Supervisor	Daily Diary
Visual check that site has been properly secured (i.e. gates locked)	Prior to closing the Site each day and prior to any occasion where site becomes vacated	Site Supervisor	Daily Diary

12.2 Erosion and Sediment Control

12.2.1 Objectives

- Ensure effective drainage: To prevent or reduce soil erosion caused by concentrated flows and to appropriately manage the movement of 'clean' and 'dirty' water throughout construction activities;
- Reduce or prevent erosion: Prevent or reduce soil erosion caused by rain impact and sheet flow; and
- Reduce or prevent sediment: To trap and retain sediment displaced up-slope erosion processes to protect the surrounding environment.

12.2.2 Management & Control Measures

- 1) Installation of temporary sediment and erosion control measures (e.g. Sediment fencing/ controls). Temporary measures to be maintained until permanent measures are in place.
- 2) Construct diversion bunds/drainage around proposed stockpile areas.
- 3) ENAP will attempt to identify any potential sources of sediment/risks of erosion. Some risks that may require attention may include but not be limited to:
 - Stormwater discharge points;
 - Existing field and other stormwater infrastructure (i.e. swales);
 - Site access and egress locations; and
 - Nearby sensitive areas.
- 4) Where necessary ENAP will rehabilitate the environment to a safe, stable, non-polluting and self-sustaining condition.

12.2.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Frequent inspection of drainage, erosion and sediment controls.	Daily	Site Supervisor	Site Diary

12.3 Water Use & Environmental Water Quality

12.3.1 Objectives

- To minimise waste water and to prevent any discharge of water contaminated by sediments or other agents.

12.3.2 Management & Control Measures

- 1) To plan for the prompt completion of works relating to drainage and sediment control to minimise exposure time of disturbed areas;
- 2) The provision of sediment and filter traps, in advance of and in conjunction with earthworks operations, to prevent contaminated run-off leaving the site;
- 3) Identify and quantify all uses of water on the site, and develop and implement practical measures to reduce water usage through water conservation fixtures/fittings, and/or substitution;
- 4) Discharge of stormwater from the site will be monitored (for both quality and discharge volume) at times when discharge occurs;
- 5) Workers will be advised of hygiene and safety standards during induction process.

12.3.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Visual inspection of drains, creeks and catchment areas for signs of spills/ contamination.	Daily	Site Supervisor	Site Diary

12.4 Air Quality

12.4.1 Objectives

- To minimise the impact to air quality from site operations.
- Ensure the relevant provisions of the Environmental Protection (Air) Policy 2008 are met.

12.4.2 Management & Control Measures

- 1) If requested or deemed necessary, air quality monitoring program or complaint-based monitoring to be undertaken;
- 2) Use of improved technology where practical to replace less efficient equipment Ensure that all relevant licences are in place and being met through confirmation by measurement;
- 3) Minimise or reduce the effect of air emissions (e.g. plant and equipment to be turned off to eliminate any unnecessary emissions);
- 4) Use of dust extraction/ suppression equipment where necessary;
- 5) Ensure roads, parking areas and stockpiles which generate dust are sealed/ covered where possible.

12.4.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Complaints register to be frequently reviewed.	Weekly	Project Manager	Complaints register.

Visual inspections to be undertaken on all items of plant to ensure that they are not producing harmful emissions.	Upon arrival to site	Site Supervisor	Plant owner/ operator to document in pre-plant inspection.
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12.5 Noise & Vibration

12.5.1 Objectives

- To minimise so far as practicable:
 - Disturbance to people on site and fauna; and
 - Noise complaints.

12.5.2 Management & Control Measures

- Where possible plant and machinery will be turned off to eliminate any unnecessary noise emissions, and the use of high efficiency mufflers and noise control equipment. Recommended noise levels outlined in AS2436: 1981;
- Prior to the use of any major plant and equipment, ENAP will be responsible for corresponding permits to be issued to the operator of the machine. Hold points within this permit will ensure such licenses are in accordance with the machinery being used;
- Hours of operation of all construction activities will be limited between the hours of 0600 and 1700 Monday to Saturdays (TBC). No construction works will occur on Sundays or Public Holidays without the prior permission of the client;
- Ensure noise from the site does not exceed the following noise levels- LAeq (15 minute) of 44dB(A);
- Where necessary, inform nearby residents of possible noise disturbance;
- Ensure that construction equipment is maintained in line with manufacturers recommended service intervals.

12.5.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Complaints register to be frequently reviewed.	Weekly	Site Supervisor	Complaints register.
Visual inspections to be undertaken on all items of plant to ensure that they are not producing harmful emissions.	Upon arrival to site, and subsequently weekly; or if change to use or working area	Site Supervisor	HSE Form 25 Daily pre-start forms in equipment log book

12.6 Hazardous Substances

12.6.1 Objectives

- To reduce environmental impacts because of exposure to hazardous chemicals.

12.6.2 Management & Control Measures

- 1) All chemicals are to be managed in accordance with Safety Data Sheets sourced from chemical manufacturer or supplier;
- 2) All chemicals will be stored in sealed containers, banded areas, roofed areas (where possible), fume/ explosion resistant cabinets with Safety Data Sheets kept nearby;
- 3) Site areas to be assessed for suitability of chemical storage;
- 4) Wherever possible, undertake refuelling off-site at approved refuelling locations;
- 5) Industrial standard spill kits to be located on site and inspected regularly. Staff to be trained in the use of spill kits.
- 6) Spills to be immediately managed and controlled via the use of bunding, sealing, containing and removing contaminated areas- all contaminated material to be appropriately disposed of.

12.6.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Chemical storage areas and spill kits will be inspected on a routine basis.	Weekly	Site Supervisor	Daily diary
General visual monitoring of worksite and activities to identify any potential spills or non-compliant storage/ handling	Daily	Site Supervisor	Daily diary

12.7 Contaminated Soils/ Land

12.7.1 Objectives

- To prevent contamination of soils/ Land;
 - Contaminated Soil is any soil that contains elements that are harmful to both the environment and to people. These can be both naturally occurring, through flora and fauna, or manmade contaminants;
- The objective is to prevent any cross contamination of affected and non-affected soils, as well as providing for the environmentally friendly disposal of any contaminated soils removed from site.

12.7.2 Management & Control Measures

- 1) Early identification of Contaminated soils through existing site documentation and registers (currently NIL)
- 2) Appropriate stockpiling with sediment controls of affected soils, separately to uncontaminated spoil;
- 3) ENAP will seek advice from the client or representatives regarding the site excavation depths and will conduct soil testing where ground disturbance or contaminated soils may cause environmental harm;
- 4) Any soils to be removed from site will be disposed of in an environmentally friendly way, with the clean soil to be re-used/ established wherever possible;
- 5) No fill material will be imported to or removed from site without confirmation, and where necessary certification is received regarding safety of materials; and

- 6) Any soil that is believed to be contaminated will be segregated and contained until further testing is complete.
- 7) Where necessary ENAP will rehabilitate the environment to a safe, stable, non-polluting and self-sustaining condition.

12.7.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Visual monitoring of soil when performing excavation activities or disturbance or importation/removal/ relocation of soils and other materials.	As required	Site Supervisor/ Contractor	Site Diary

12.8 Waste Management & Housekeeping

12.8.1 Objectives

- To reduce environmental impact caused because of construction waste, which may include but not be limited to:
 - Concrete washout water (trucks and equipment); - skip bins
 - General site waste;
 - Bulk construction waste (road profiling/demolished concrete);
 - Recyclable materials;
 - Potential building materials containing asbestos;
 - Application of bituminous material; and
 - Other waste such as chemicals, materials and substances that may detrimentally impact the environment.

12.8.2 Management & Control Measures

- 1) Appropriate waste receptacles will be provided on site as required;
- 2) Characterise all waste streams and develop measures to:
 - Minimise site waste generation;
 - Segregate waste groups; and
 - Direct all recyclable/reusable wastes away from landfill wherever possible.
- 3) Silt removed from the settling ponds/ silt traps will be incorporated into product stockpiles or overburden materials for use in progressive reclamation.
- 4) All prescribed industrial waste (PIW) such as waste oil will be stored, and transported from the site, in accordance with EPA prescribed waste transport regulations and associated guidelines.
- 5) Housekeeping checks will include the following environmental issues:
 - Chemical and fuel bunding;
 - Bund content and drainage point valve in off position (and locked);
 - Spill clean-up and spill kit equipment contents;
 - Waste container labelling;
 - Tarping practices;
 - Road and vehicle cleanliness;

- Unusual noises;
- Visual dust presence of significance; and
- Segregation of inert type wastes from solid and from industrial wastes.

12.8.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Conduct a waste survey to establish the types, quantities and recycling/ re-use percentages for all site wastes.	Monthly	Project Manager	Monthly Survey
Waste receptacles will be inspected daily and emptied weekly.	Daily	Site Supervisor	Site Diary
Site inspections to review cleanliness of site including	Daily	Project Manager	Site Diary

12.9 Flora and Fauna & Waterways

12.9.1 Objectives

- To prevent any contamination of the waterway from construction activities
- To achieve a high-quality environment for native flora and fauna and to conserve the biodiversity of the area.

12.9.2 Management & Control Measures

- 1) Encapsulate any potential contamination drop zones when working near or over the Spencer Gulf
- 2) Identify existing vegetation in consultation with land owner/ client;
- 3) Ensure speed limits to site are commutated to workers and followed;
- 4) Food waste/ products to be correctly disposed of;
- 5) Employees must:
 - Not intentionally encourage wild animals with food or shelter;
 - Avoid contact with animals and not provoke any animals in any way;
 - Wear provided PPE and insect repellent where required;
 - Not intentionally remove or relocate plant substances from one location to another;
 - Not ingest any plant material; and
 - Inform their Supervisor if wildlife or potentially toxic/noxious plants are encountered.
- 6) Where necessary ENAP will rehabilitate the environment to a safe, stable, non-polluting and self-sustaining condition.

12.9.3 Monitoring & Reporting

Monitoring	Frequency	Person Responsible	Record
Before entering a property and commencing work on site, employees must conduct a visual inspection for animals and plants that may pose a potential risk in on site (e.g. snakes/spiders/ fire ants).	As required.	All personnel	Daily pre-start

12.10 Environmental Rehabilitation

12.10.1 Rehabilitation

ENAP does not consider rehabilitation as something that begins towards the end of the operation, but rather a process that begins in the planning phase. To keep the disturbance footprint at minimum, ENAP aim to progressively rehabilitate the land to a safe, stable, non-polluting and self-sustaining condition.

ENAP will ensure that all rehabilitation has been completed satisfactorily to specified legislation and client's requirements prior to relinquishment. Where necessary, ENAP will remain responsible for the ongoing upkeep of certified areas until relinquishment.

13 Environmental Audit Program

13.1 Environmental Audits

The CEMP implementation system will be audited to ensure effective compliance with environmental controls, reporting and incident management requirements. The audits will occur a minimum of every 6 months throughout the project. This activity will be conducted through, but not limited to:

- A site visit;
- Review checklists;
- Compliance with the CEMP;
- Update on project status;
- Report on any onsite environmental incidents occurring since the last audit;
- Checks for any repeat issues; and
- Any new initiatives in environmental management.

The audits will be documented in a summary report. Audit reports raised will be provided to the Project Manager for determining corrective action and reply. On a 2 yearly basis the Project Manager shall undertake a management review of the CEMP process.

ENAP will develop and implement an auditing program upon request and agreement in contractual terms which may include an independent review of documentation, procedures and random inspections. The business procedure would be updated in response to any recommendations from compliance audits.

13.2 Environmental Monitoring

Continuous monitoring will be required during the construction. Where required measuring equipment used for monitoring shall be regularly serviced and calibrated.

13.3 Environmental Inspections

In addition to formal auditing and monitoring required as part of the construction project, the following inspections will also be undertaken:

On a daily basis, site supervisory staff will inspect the Site and any issues arising will be noted in the daily diaries and communicated to the Project Manager and client as necessary. The inspections will be conducted visually prior to commencement of each day's work and where appropriate during the working day. A final daily inspection will also be undertaken at the end of the workday to ensure that systems and structures are in place.

A weekly site inspection may be conducted by the Project Manager or delegate. Checklists may be used to record and report on activities for compliance with this CEMP and specific issues presenting significant environmental risks will be addressed, such as noisy works, sediment basin management.

Where necessary, any damage or reduced capacity of environmental control measures will be corrected. If required, environmental control measures may be upgraded.

14 Incident Management & Complaints

14.1 Environmental Incidents

An environmental incident is an unplanned event which occurs on site and has the potential to result in adverse environmental impacts either on site or in the surrounding area. Environmental incidents include spills, importation of unsuitable fill material, unintended damage to native vegetation, breaching of fenced off habitat areas or injury to wildlife.

Depending on the nature of the incident and the risk posed to site personnel, all practical steps will be taken to minimise the risk of environmental damage as soon as possible after the event.

In the case of an environmental incident, actions to be taken are:

- Notify the Site Supervisor;
- Immediately cease work in that area and remove people from the immediate area;
- Notify emergency services as/if required;
- Where safe to do so, attempt to contain the hazard and prevent it from spreading;
- If the incident is a spill:
 - Use silt fences, bunding or interception pits;
 - Use absorbent materials stored on site to clean up spill;
 - Contain contaminated soil/absorbent material waste in appropriate containers, and dispose of contaminated soil/absorbent material to an appropriately licensed offsite disposal facility;
- Notify any relevant agencies when an incident causes or threatens material harm to the environment or an exceedance of limit of the performance criteria in the approval or when legalisation requires;
- The Site Supervisor is to notify the client and Project Manager of any environmental incident;

- Temporarily repair or isolate the failed plant or equipment component;
- Sample the impacted site media be it soil and/or surface water; and
- Implement any longer term remedial measures that may be required.

14.2 Incident Notification

The Project Manager will be responsible for completion of the incident report which should include:

- Time, date, nature, duration and location of the incident;
- Location of the place where pollution is occurring or is likely to occur;
- Nature, the estimated quantity or volume and concentration of any pollutants involved;
- Circumstances in which the incident occurred (including the cause of the incident, if known); and
- Action taken or proposed to be taken to deal with the incident and any resulting pollution or threatened pollution.

In order to assist the Project Manager in providing the above information, the Site Supervisor is to collect and document (to the extent practicable) the above information and forward to the Project Manager. For example, this would include taking photographs, collecting surface water samples of any unplanned water discharges both from the source of the pollution and upstream and downstream in the receiving waterway (for analysis and comparison). Any spills or accidents, and the corrective actions undertaken, shall be documented in a Non-Conformance and Corrective Action Report.

14.3 Complaints Handling

The Site Supervisor is to be notified of any received complaints. The Site Supervisor or Project Manager (dependant on the method of complaint) is to complete the Complaints register as practicable and forward a copy to the Project Manager. The Project Manager will forward a copy to the client (if necessary).

The Site Supervisor/Project Manager is to investigate the complaint within 24 hours of the receipt of the complaint (whoever is better suited) and determine corrective actions. If warranted, immediate action will be instigated; otherwise action will be taken within 48 hours of receiving the complaint. Upon completion of the investigation, the client will firstly be notified, and a decision will made to notify the lodger of the complaint regarding any action taken.

14.4 Environmental Incidents Register

The Environmental Incidents Register will detail the issue, the corrective and preventative actions proposed, and the responsibilities and timing for completion of the actions. The register will include any comments and the completion date of corrective actions.

The Project Manager shall review the Environmental Incidents Register monthly to ensure actions are completed and that controls are performing effectively. The Project Manager shall also review the CEMP to determine if the above situations require project scope changes or if the incident identifies opportunities for improvement in mitigations or work practices.



15 Non-conformance

15.1 Non-Conformance and Corrective Action Register

All non-conformances noted in the Site Inspections, Audits, Incident Reports, or reported to the Project Manager by staff or other parties/authorities will be investigated and recorded. Details of the non-conformance, including any immediate corrective actions undertaken, are to be recorded by the Project Manager. All non-conformances are to be recorded in a Non-Conformance and Corrective Action Register.

It is the responsibility of the Project Manager to immediately initiate corrective actions. The Non-Conformance and Corrective Action Register must include details of the corrective action proposed and an appropriate close out date. Corrective Actions will include containment measures, clean-up and restoration of the affected area and of any deficient operational controls or monitoring controls. On completion, the Project Manager will re-inspect the outcomes to ensure that they are acceptable and update the Non-Conformance and Corrective Action Register. The occurrence of such an event will be brought to the attention of personnel responsible, and environmental controls will be updated to prevent a reoccurrence.



HEALTH, SAFETY & ENVIRONMENT MANUAL Construction Environmental Management Plan

Appendix A- Site Layout Plan

LAYOUT TO COME – once determined by Client

Construction activities will take place on both the wharf and mainland. Special care must be taken when working over or near the water.