ENGINEERING

Construction environmental management plan

Mount Lofty Golf Estate SA

JOB NUMBER:	S53897 - 282604
CLIENT:	Venture Capital Developments Pty Ltd
SITE:	Mount Lofty Golf Estate, 35 Golf Links Road, STIRLING, SA 5152
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Table of contents

Tables

Abbreviations

ACRONYM	DESCRIPTION
CEMP	Construction and Environmental Management Plan
CMS	Construction Method Statements
CT	Certificate of Title
DP	Deposited Plan
EIN	Environmental improvement notice
EMR	Environmental Management Representative
EPA	Environment Protection Authority
ESCPs	Erosion and sediment control plans
FMG	FMG Engineering
HSE	Health, safety and environment
HSEP	Health, safety and environment plan
HSR	Health and Safety Representatives
IR	Issue Resolution
OHS	Occupational health and safety
PPE	Personal protective equipment
PM	Project Manager
SA	South Australia
SEDMP	Soil Erosion and Drainage Management Plans
SEP	Side Entry Pit
SWMA	Safe work method statement
WMP	Waste Management Plan

Introduction

Background

FMG Engineering was engaged by Venture Capital Developments Pty Ltd (the client), to produce a construction environmental management plan (CEMP) for the construction and redevelopment of the Mount Lofty Golf Estate, 35 Golflinks Road, STIRLING, SA 5152 (the site).

Designers, clients/superintendents and contractors involved in the project have an ongoing commitment to protect the environment. The purpose of this CEMP is to identify the environmental protection measures, systems, and tools to be implemented by the appointed construction contractors during the development and construction works. These measures are aimed at preventing or minimising potentially adverse environmental impacts arising from the redevelopment and construction activities, and achieving compliance with environmental regulatory requirements. Additionally, the CEMP demonstrates a system for hazard and risk identification and determines appropriate management strategies to be adopted by appointed construction contractors to mitigate or eliminate these risks.

This CEMP has been prepared in accordance with the Guidelines for Environmental Management of On-site Remediation (SA EPA, 2019) and Guidelines for the Preparation of a Development Report, Mount Lofty Golf Estate (State Planning Commission, Department for Trade and Investment, 2002). This CEMP may be revised as the project progresses to ensure all conditions are adequately addressed.

Throughout this CEMP, all documents (i.e. drawings, diagrams, specifications, etc.) which have been developed as part of the design process, approved by the relevant authorities and issued for construction shall be broadly referred to herein as design documentation.

Objectives of the CEMP

The key performance objectives set by the CEMP are to ensure compliance with all environmental legislation and approvals, minimise the potential for pollution, reduce waste, and implement effective controls to mitigate environmental impacts. Table 1 below details specific environmental objectives and targets relevant to the redevelopment project.

Table 1 - Objectives and targets

NUMBER	OBJECTIVE	TARGET
1	To employ best management practices to ensure that the construction project meets environmental legislative requirements.	No breach of environmental legislative or regulatory requirements. No significant environmental incidents.
2	To employ best environmental management practice to ensure compliance with all planning approvals and environmental authorisations	No non-compliance with planning approvals or applicable legislative requirements.
3	To employ best environmental management practice to minimise noise and vibration impacts.	Maintain noise levels to comply with Environment Protection (Noise) Policy 2007. Maintain vibration levels within human comfort and structural damage criteria.
4	To apply best environmental management practice to soil and water (surface water and groundwater) quality management.	No breach of environmental legislative or regulatory requirements.

NUMBER	OBJECTIVE	TARGET
5	To minimise air pollution from construction and associated activities.	Levels to comply with Environment Protection Regulation 2005.
6	To protect any vegetation adjacent to the construction zone.	No impacts on trees or other native vegetation outside the construction zone.
7	To avoid pollution of the environment caused by fuels, oils or chemicals stored or used on the Project.	No major spills of fuel, oil or chemicals.

Site details

The site currently comprises the Mount Lofty Golf Estate comprising of a golf course, multiple courtyards with open grassed areas and paved areas, and an administration building in the western portion of the site. The site details are summarised in Table 2 below.

Table 2 - Site details

SITE DETAIL	RESULT
Site Address	Mount Lofty Golf Estate, 35 Golflinks Road, Stirling, SA 5152
Land Parcel	Allotment 53 in Deposited Plan (DP) 59212 Hundred of Onkaparinga
Certificate of Title (CT)	CT5891/805
Land Use	Golf Course
Zoning	Recreation
Size of Project Area	Approximately 4 hectares (Ha)
Local Government Authority	Adelaide Hills Council

Site location and surrounding land use

The site is situated approximately 13km southeast of the Central Business District of Adelaide, located in the Adelaide Hills region and is bounded by the following:

- **North**: Old Carey Gully Road and rural residential properties and vineyards beyond
- **East**: Mount George Conservation Park
- **South**: Mount George Conservation Park, Golflinks Road and residential properties, and
- **West**: Golflinks Road and residential and rural residential properties.

The regional setting and site boundaries are presented in Appendix A.

Project description

The proposed development is for tourist accommodation and golf course and associated club facilities (ancillary bar, gymnasium and function rooms), together with landscaping, subdivision, tree and native vegetation removal. The proposed development is summarised as follows:

- Construction of a 3-5 level tourist accommodation building comprising 56 units, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments. Together with, back of house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery and cafe and wellness centre.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, cafe and multipurpose function space.
- Golf course facilities building - 2-5 level building comprising function facilities, cart storage and clubhouse, pro-shop, administration areas, gym and change rooms.
- Retention of the 18-hole golf course with improvements.

● Car Parking, access and waste management including a total of 257 car parking spaces, Including:

– 200 formalised car parking spaces and a porte cochère (set-down/pick-up) facility at the tourist accommodation and golf club facilities building;
– 20 spaces adjacent to the Perfumery Building accessible from Old Carey Gully Road; and
– 37 spaces for staff only adjacent to the circulation road connecting from Old Carey Gully Road with further informal parking opportunities within the site.

● Subdivision of the land (1 into 3) allotments to formalise the areas for tourist accommodation, golf course facilities building and balance of the site for leasing purposes.

● Stormwater detention basin, creek and lake restoration activities including planting natives in the beds, erosion control works and creek crossings.

● Construction of entry wall and new entry signage at the existing Golflinks Road entry.

● New dedicated pedestrian trail adjacent Golflinks Road.

A whole of site plan is provided overleaf which details the proposed development.

Scope of works

The scope of works includes but is not limited to:

  - Prior to the commencement of works, the Contractor shall submit to Council, owners and occupants of adjoining properties written notice of their intention to commence work, expected duration of the works and a description of the type and extent of work.
  - Where the works are adjacent to existing properties / structures, the Contractor shall undertake a condition report (dilapidation) to record the condition of the existing structures prior to commencement of works. The report shall also include coverage of existing roads, kerbs, crossovers etc. adjacent the site, as a baseline of the condition of Council infrastructure. A copy of the condition report shall be forwarded to the client/superintendent prior to the commencement of works.
  - Prepare and maintain a Waste Management Plan (WMP) to track all possible waste streams.
  - Identify all existing authorities and internal services prior to commencing works. If decommissioning of an authority service is required, the decommissioning and removal shall be coordinated and allowed for by the Contractor. If a service to remain is damaged during the works, it is the responsibility of the Contractor to make good the damage to the satisfaction of the service authority at the Contractor's cost.
  - Establish any Soil Erosion and Drainage Management Plans (SEDMP) measures required
  - Establish an appropriate perimeter fence and signage to prevent public access to the site for the duration of the works. It is the Contractor's responsibility to safeguard and ensure the safety of any person who may enter or trespass upon any part of the works.
  - Locate all existing services and if live, arrange for their decommissioning and removal. Services (structures and pipes/cables) are to be completely removed and service trench excavations shall be backfilled with existing excavated material. If there is a shortfall of material and the finished level of the trench backfill is lower than the surrounds, the edges shall be battered to make safe and remove any trip hazards. Services may include:
  - Stormwater Side Entry Pits (SEP), grates and pipes
  - Sewer structures and pipe
  - Electrical including lighting, security cameras
  - Communications, and
  - Water services and/or irrigation.
- Clearing, grubbing and levelling of the site prior to beginning construction works (i.e. removal of tree/root ball resulting in open excavation to be reinstated).
- Demolition of six existing buildings.
- Document the fate, transport and destination of any removed materials and volumes.
- General tidy/levelling post clearance/grubbing to remove any sharp elevation changes or trip hazards.
- Undertake bulk earthworks (including stormwater basins) to prepare site as outlined in the design documentation.
- Construction of concrete retaining structures and associated earthworks infrastructure as outlined in the design documentation.
- Construction of pavements, drainage and associated civil infrastructure as outlined in the design documentation.
- Construction of concrete slabs as outlined in the design documentation.
- Construction of the following and all associated infrastructure
  - 3-5 level hotel building
  - New golf course facilities building incorporating a pro-shop, administration areas, gym and change rooms, and
  - Two car parking areas with a total of 200 car parking spaces.
- Conservation works and adaptive reuse of the existing perfumery, a local heritage place, to accommodate a multipurpose café, retail, and function space.

- Retention and improvements to the 18-hole golf course including relocating Hole 17's green and Hole 18's tee.
- Installation of services (i.e. electrical, communications, water, sewer) as outlined in the design documentation.

The above scope of works and the plans provided in Appendix B have been prepared with due care and identify and highlight the known works required. The contractor is to carry out a detailed site inspection in order to determine the complete scope of works, including demolition, clearing and grubbing. Any omissions to this scope that are obvious onsite shall be deemed to have been included unless they are not reasonably identifiable.

Planning

Method statements

Detailed work method statements will be developed where there is a significant risk to the environment. Work method statements will be provided for final approval prior to commencing work. Method statements will include the following as a minimum (but not limited to):

- Procedures for managing the environment
- Labour requirements including subcontractors
- Permit requirements
- Signs, labels and markers, and
- Storage and transport.

South Australia's waste strategy

South Australia's Waste Strategy 2005–2010 sets the overall framework and aims for sustainable waste management in the State. It aims for the diversion of waste in accordance with the waste hierarchy (Figure 1) to more sustainable options. This means that the recycling and reuse of waste should be an alternative to disposal (the least preferable option) but should not be at the expense of more preferable options.

Figure 1 - The waste hierarchy

Regulations and Legislative requirements

The proposed works to be undertaken will comply with applicable environmental regulatory and legislative requirements. The following provides a summary of the general requirements for the proposed works.

Table 3 - Applicable Legislation relevant to the development

LEGISLATION/REGULATION/POLICY	KEY PROJECT REQUIREMENTS
Occupational Health Safety and Welfare Act 1986	Clearance work notices given under the Occupational Health Safety and Welfare Act 1986 will continue to be recognised under the Work Health and Safety legislation (r711) where the work is scheduled to commence on or after 1 January 2013; and where they involve: · A loadbearing structure (or part of) > 6m in height

LEGISLATION/REGULATION/POLICY	KEY PROJECT REQUIREMENTS
	• Load shifting machinery on a suspended floor, and • Explosives.
Work Health and Safety Act 2012; Work Health and Safety Regulation 2012	All works undertaken onsite shall be undertaken in such a manner as to prevent harm to site workers and the general public.
Environment Protection Act 1993 (the Act) and Environment Protection Regulations 2009 Handbook for Pollution Avoidance on Commercial and Residential Building Sites, second edition, SA EPA.	Undertake all activities so as to minimise harm to the environment (in particular pollution of air and water and noise emissions) and not cause an offence under the Act. Some transporters of waste are required to be licensed under the Act. Some waste disposal/processing facilities are required to be licensed under the Act.
EPA Guidelines for Environmental Management of On-Site Remediation (2006) ASC NEPM (2013) Guideline on Investigation Levels for Soil and Groundwater. National Environment Protection (Assessment of Site Contamination) Measure Schedule B(1). National Environment Protection Council.	Works onsite associated with any disturbance of soils shall be undertaken in such a manner as to meet the mandatory requirements and expectations of the SA EPA to ensure the ongoing protection of human health and the environment.
Environment Protection (Waste to Resources) Policy 2010 Waste Disposal Information Sheet, SA EPA (2010), Current Criteria for the Classification of Waste – Including Industrial and Commercial Waste (Listed) and Waste Soil. SA EPA Guideline: Wastes containing asbestos – removal, transport and disposal [EPA414/14, April 2014] Standard for the production and use of Waste Derived Fill (WDF), dated October 2013	The project should aim to achieve sustainable waste management by applying the waste management hierarchy consistently with the principles of ecologically sustainable development set out in Section 10 of the Environment Protection Act 1993 (the Act).
ASC NEPM (1999), Schedule B(9) Guideline on Protection of Health and the Environment during the Assessment of Site Contamination National Environment (Ambient Air Quality) Protection Measure 1998 enHealth (2012), Environmental Health Risk Assessment—Guidelines for assessing human health risks from environmental hazards	Offensive vapours / hazardous ground gases that may be encountered during the works will be managed in accordance with the stated documents.
Environment Protection (Water Quality) Policy 2003 Code of Practice—Industrial, Retail and Commercial Stormwater Management (in draft at date of publication)	Ensure that all environmental values are protected during the development works, including: • maintenance of aquatic ecosystems • drinking water

LEGISLATION/REGULATION/POLICY	KEY PROJECT REQUIREMENTS
	• agriculture and aquaculture (including irrigation and livestock) • recreational uses (eg swimming or boating) and aesthetics (visual appearance and enjoyment) • industrial uses.
General Environmental Noise (May 2013), EPA Information Sheet 424/13 Environment Protection (Industrial Noise) Policy 1994 Environment Protection (Machine Noise) Policy 1994 Australian Standard (AS) 2436-1981: Guide to Noise Control on Construction, Maintenance and Demolition Sites Construction Noise (March 2005), EPA Information Sheet Handbook for Pollution Avoidance on Building Sites (2nd ed. June 2004)	Noise levels during construction works will be managed in accordance with the policies.

Hours of operations

Standard working hours of 7am to 7pm Monday to Saturday apply in accordance with the SA EPA regulations, unless negotiated otherwise with Council. Sundays and Public Holidays 9am-7pm (if work is essential).

Site establishment and security

Site establishment shall include:

- Fencing the site to prevent public access and installation of shade cloth to assist with control of dust
- The establishment of site contractors' offices and mess and associated toilet facilities
- Designated car parking areas, vehicle access and vehicle loading, unloading and lay down areas, commissioning of equipment, plant and operations and establishment, and
- Maintenance of on-site work areas.

Signage, whilst important, is a relatively unsatisfactory way of communicating information to people about the Site and in general, its use would appear limited. Potential safety measures include:

- Secure fencing around the entirety of the Site to restrict view of and access by the public and provide protection from physical hazards particularly adjacent the nearby Sturt Highway and residential properties. Any unsupervised excavations (including pits) should never be left open or unfenced as they present a hazard to site personnel and unauthorised visitors.
- *Warning Deep Excavation* signs shall be placed around the external perimeter as appropriate and where any excavation works are required
- Requirement for all visitors to report to the site office to receive further instructions
- Site induction for all workers and visitors to the Site, and
- Records of those who attend the site.

Roles and responsibilities

The responsibility and authority pertaining to environmental performance of the project is specified below.

All personnel

All personnel (including sub-contractors) have a general environmental duty of care (as defined in the Environmental Protection Act 1993) and are responsible for their own environmental performance whilst on the project.

As a minimum, personnel are required to:

- Comply with the requirements of applicable environmental legislation and environmental authorities including the specific requirements of the project approvals and supporting documentation
- Undertake all activities in an environmentally responsible manner
- Undertake all activities in accordance with this CEMP, procedures and any subsequent work method statements
- Identify and report any non-conformances with environmental management, legislative or approvals requirements
- Ensure that they are aware of the contact person regarding environmental matters and report any activity that has resulted in, or has the potential to result in an environmental harm
- Ensure that they attend any environmental training provided relevant to their role and responsibilities, and
- Support the construction team in planning and implementing environmental requirements.

Key personnel

Environmental management representative (EMR)

The EMR is an individually appointed and independent third party, with experience and qualifications in environmental management. The EMR has primary responsibility for managing all aspects of environmental management and compliance for the construction phase of the Project. The key responsibilities of the EMR are to:

- Develop and implement this CEMP and provide updates/revisions to the CEMP as necessary
- Conduct (or assist the PM in) environmental briefings and toolboxes to construction staff
- Conduct environmental site inspections
- Identify and report non-conformances to the client/superintendent
- Monitor the implementation and effectiveness of the CEMP
- Complete environmental reporting requirements
- Provide advice and direction on environmental matters, incident response and corrective actions
- Review statutory compliance and ensure check all approvals are complied with, and
- Monitor and ensure compliance with all applicable legal, approvals and project environmental obligations including but not limited to this CEMP.

Project manager (PM)

The Project Manager (PM) is responsible for delivery of the construction phase of the Project to ensure that environmental impacts are minimised, and obligations are met. The PM will be working in conjunction with the Environmental Management Representative (EMR), as required to ensure that the construction team delivers the prescribed environmental outcomes.

Key tasks include:

- Ensure compliance with all applicable legal, approval and project environmental obligations including but not limited to this CEMP
- Ensure all project staff have a clear understanding of the environmental requirements relevant to their area/scope of work
- Ensure all project staff are competent to undertake their duties including fulfilment of the general environmental duty, with regard to appropriate education, training and experience
- Ensure the necessary resources and processes are in place for implementation of required environmental controls
- Ensure all site superintendents /supervisors are familiar with environmental obligations, project approvals, CEMP and site level plans, relevant environmental management plans and associated documents, and their responsibilities within them
- Participate and provide guidance in the regular review of the CEMP and any associated documents
- Act in the event of an emergency and allocating the required resources to minimise environmental impact
- Ensure non-conformances are identified, recorded and reported and that required corrective and remedial actions are implemented, and
- Report any activity that has resulted in an environmental incident to the EMR and the client.

Site supervisor/Foreman

Supervisors/Foreman report to the PM. They will have a direct role in the compliance with identified environmental procedures and controls. They will also be responsible for checking the site on a regular basis and ensuring that regular maintenance is undertaken to minimise environmental impacts and that personnel are provided with appropriate environmental "toolbox" training, prepared by the EMR. Where applicable the Supervisor/Foreman will be responsible for ensuring that any work performed by external parties meets with the requirements of this CEMP, including identifying and documenting the environmental risks of the proposed works.

Key tasks include:

- Ensure all personnel and subcontractors are made aware of the requirements for compliance with this CEMP, environmental obligations and site-specific environmental issues
- Implement all environmental requirements as outlined in this CEMP as required to avoid and minimise actual or potential environmental harm
- Support the Environment Management Representative in planning and implementing environmental requirements
- Ensure non-conformances are identified, recorded and reported
- Ensure implementation of preventative and corrective actions
- Co-ordinate the implementation and maintenance of environmental control measures
- Provide necessary resources required for implementation of the CEMP
- Co-ordinate action in emergency situations and allocating required resources accordingly, and
- Ensure that instructions are issued, and adequate information is provided to field-based employees that relates to environmental risks on site including via regular toolbox meetings that address environmental issues and controls including the requirements of this CEMP.

Construction personnel

In addition to the key positions outlined above, with respect to environmental management, all staff working on the project including but not limited to construction workers, personnel involved in preparatory works for construction, surveyors, geotechnical consultants and any other persons undertaking investigations or works for preparatory works have responsibility for environmental performance of the project.

The responsibilities of these personnel include:

- Attend all environmental training required and adhere to and remain familiar with the principles covered in the training session(s)
- Undertake all activities in accordance with agreed procedures and work methods

- Ensure that they are aware of the contact person for environmental matters
- Ensure that any clearances are obtained from the EMR where required, and
- Report any activity that has resulted in an environmental incident.

General Site Personnel

In addition to the key positions outlined above, with respect to environmental management, all staff working on the project including but not limited to clearance workers, personnel involved in bulk earthworks construction, general concrete works, pavement construction, service contractors, mechanical plant specialists, surveyors, engineers and any other persons undertaking investigations or works for the construction of the project have responsibility for environmental performance of the project. The responsibilities of these personnel include:

- Attend all environmental training required and adhere to and remain familiar with the principles covered in the training session(s)
- Undertake all activities in accordance with agreed procedures and work methods
- Ensure that they are aware of the contact person for environmental matters
- Ensure that any clearances are obtained from the EMR where required, and
- Report any activity that has resulted in an environmental incident.

Sub-contractors

It is recognised that often sub-contractors present the greatest environmental risks to a project due to:

- Their detachment from the main construction delivery teams, and therefore the potential for poor communication regarding environmental risks
- Sub-contractors having different certification standards for quality assurance and environment
- The potential for large number of subcontractors on site, and
- Sub-contractors operating under a different management system from the rest of the construction team.

It is the PM responsibility to ensure that all persons on the Project including sub-contractors and their employees are notified on their need to comply with the relevant environmental requirements. As a minimum, sub-contractors and their employees will be required to comply with the CEMP in full.

All sub-contractors' personnel are considered equivalent to the construction team personnel in all aspects of environmental management and control, and their responsibilities in this respect mirrors those of the construction team personnel.

Sub-contractors working on the Project will be required to:

- Observe sub-contract and statutory requirements relating to environmental protection and other environmental legislation and to follow instructions issued by the Project Manager and supervisory personnel
- Nominate Site representatives to liaise with the construction team with respect to, and take responsibility for, environmental requirements for the Site activities
- Adhere to the Site management system as it applies to their operations on the site
- Co-operate fully with Site emergency incident procedures and consultative arrangements, and
- Follow procedures incorporated in this CEMP.

The PM will ensure that the work of sub-contractors is monitored through the Site inspection process. Observations will be made by relevant personnel to assess the effectiveness of the environmental protection measures being used on site by the sub-contractor and to determine compliance with the requirements of the CEMP.

Environmental aspects, impacts and risks

Environmental aspects, as referred to in this document, are those activities associated with the project that have the potential to cause, or result in, adverse environmental impacts. Due to the nature of the development, different aspects of the Project would present different degrees of environmental risk which need to be managed accordingly.

Effective environmental management should be proactive rather than reactive. In order to facilitate a proactive style of environmental management, a risk management style of assessment has been utilised to identify and assess environmental aspects associated with the Project, and to implement appropriate mitigation strategies to minimise the likelihood of environmental risks associated with each aspect. This process involves:

- Identifying the risk/aspect
- Analysing the risk/aspect (determining likelihood and consequence)
- Evaluating the risk/aspect, and
- Treating the risk.

All identified aspects are assessed based on the risk assessment matrix displayed in Table 4. Risk assessment is based on:

- The likelihood of an impact occurring as a result of the aspect, and
- The consequences of the impact if the event occurred.

Following this assessment, each impact is assigned a risk category which range from "low" (low likelihood and consequence) to "extreme" (high likelihood and consequence). A risk category identified as having an extreme or high risk (a significant impact) may be downgraded if appropriate environmental controls and measures are implemented and maintained. Proactive planning, installation and maintenance of appropriate environmental controls and ongoing monitoring will reduce the risks associated with each environmental impact identified for the project.

Table 4 - Risk Matrix and Qualitative Measures of Likelihood Scale

		CONSEQUENCES				
LEVEL	**LIKELIHOOD**	**1**	**2**	**3**	**4**	**5**
		Negligible Discharge	Uncontrolled Discharges in minor quantities	Moderate breach of environmental statutes	Major breach of environmental statutes	Shutdown of project due to environmental breach
A	Almost Certain	H	H	E	E	E
B	Likely	M	H	H	E	E
C	Moderate	L	M	H	E	E
D	Unlikely	L	L	M	H	E
E	Rare	L	L	M	H	H

LEVEL	CATEGORISATION OF LIKELIHOOD	DESCRIPTION
A	Almost Certain	Is expected to occur during the project, 90% or > probability
B	Likely	Will probably occur during the project, ~50% probability
C	Moderate	Might occur at some time during the project, ~10% probability
D	Unlikely	Could occur at some time during the project, ~1% probability
E	Rare	Only occur in exceptional circumstances, < 1% probability

Table 5 details the environmental aspects identified for the Project, the initial risk category prior to appropriate management strategies, the proposed management strategy, and a revised risk category. Control measures and safeguards to minimise and manage environmental risks are also presented following in Table 5.

Table 5 - Key Aspects, Potential Impacts and Risk Analysis for the Project

ITEM	POTENTIAL IMPACT	POTENTIAL RECEPTORS / TRANSPORT MECHANISM	UNTREATED RISK CATEGORY	MITIGATION MEASURE	REVISED RISK CATEGORY
Soil and Groundwater Impact	Spills and leaks during plant maintenance / operation resulting in soil / groundwater contamination.	Future site users, all onsite workers and Biota (particularly relevant to the upper 2 m of the soil profile), / downward leaching through soils and infiltration to groundwater, exposure (dermal contact) during piling works and excavation works	(C2) Medium	The use of dangerous substances at the site should be undertaken in accordance with the requirements of the SA Dangerous Substance Act and Regulations. Refuelling of vehicles should be undertaken off-site. No fuel should be stored on site other than small jerry can-like containers used to top up portable pumps such as flex-drives. If any re-fuelling and emergency servicing is required, it is to be undertaken on a quarry rubble hardstand area created for this purpose. The quarry rubble is to be underlain by an impervious plastic membrane. At the end of the works, the hard stand is to be scraped up and disposed of in accordance with SA EPA requirements. The cleaned surface under the hardstand is to be inspected and validated by the Environmental Consultant. The potential for loss of chemical substances on site, be it through deliberate or accidental means, and the type and toxicity of the chemical substances to be used, should be considered when management procedures and emergency response plans are formulated. Chemical substances should be separated according to their respective class and should not be stored in the vicinity of sensitive structures. The storage and refuelling areas are to be equipped with emergency spill kits appropriate to the level of risk and potential volume of any potential spill. If a spill occurs it is to be responded to and cleaned up immediately. A non-conformance is to be raised. If necessary, Emergency Services shall be notified, and any required Regulatory Notifications made in consultation with the Environmental Consultant. Specified personnel will be provided with spill management and emergency response training including the location and application of spill kits and associated remediation products.	(E2) Low
	Soil contamination as a result of the importation of contaminated fill material for backfilling or site preparation		(B4) Extreme	Only fill material that meets the physical and chemical requirements of waste derived fill (WDF) in accordance with the *Standard for the production and use of Waste Derived Fill* (WDF), dated October 2013 can be imported onto the site for backfilling or site levelling purposes. The supplier of the material (virgin and waste fills) is to provide certification that material is chemically and aesthetically suitable and not contaminated prior to acceptance by the authorisation holder. Records of all imported material shall be maintained on site and made available to the EMR for review prior to delivery of the material to site. All soils intended for importation and reuse onsite must firstly be approved by the environmental consultant.	(E1) Low
	Cleaning of trucks resulting in ground contamination and/or water pollution, particularly the coastal and marine environment		(C3) High	Trucks, pumps and equipment must not be washed down in roadways, footpaths or reserves. Suppliers shall be informed that where practical, wash-down must be delayed and carried out at their respective depots. Where absolutely necessary these vehicles and equipment should be washed down within the designated contained vehicle wash-down area within the site.	(D2) Low
	Surface water/ waste water being incorrectly disposed offsite resulting in off-site contamination	Storm water, construction workers / dermal contact.	(D4) Extreme	Surplus wastewater, including that from brick cutting activities should be recycled, disposed to sewer (with SA Water Trade Waste approval) or discharged into the nominated on-site soakage area for drying by soakage. Site mixing of concrete, either by hand or by mechanical means, shall be carried out in the designated vehicle, plant and equipment cleaning area of the site which is capable of containing all excess water for disposal by a licensed contractor. If dewatering processes are required, personnel conducting dewatering activities must be provided with adequate instruction. The area dewatering processes may be controlled using a variety of sheet piles, containment berms, cut off trenches, sand bags, hay bales, clean rock, geotextile, etc. All persons carrying out dewatering activities (in any form) shall take all reasonable and practical measures to ensure: • dewatering wastewater is treated to meet requirements and is discharged or disposed in a way that does not cause environmental harm or environmental nuisance, • all water treated offsite is done so in accordance with relevant legislation, and • no offensive odours or nuisance noise are released as a result of dewatering.	(E2) Low

ITEM	POTENTIAL IMPACT	POTENTIAL RECEPTORS / TRANSPORT MECHANISM	UNTREATED RISK CATEGORY	MITIGATION MEASURE	REVISED RISK CATEGORY
Stormwater, site erosion and sedimentation	Tracking of sediment onto public roads from fleet leaving site.	Storm water, construction workers, off-site users, biota / impact on water quality and biota due to off-site migration pathways, dermal contact, inhalation, ingestion	(B3) High	The Contractor Project Manager is to ensure that all exiting vehicles are to be inspected; where mud or debris is found, the vehicle is to be turned back for cleaning and reinspection. If there is a breakdown of the environmental management controls and excess dirt, dust, debris that may cause a nuisance is trafficked into the public roadway, the Contractor Project Manager will immediately arrange for the roadway to be cleaned using a street sweeper.	(D2) Low
	Increased rates of erosion and sedimentation of hardstand areas and unsealed surfaces.		(B4) Extreme	Establish appropriate sediment and erosion control onsite, which complies with applicable state and council legislative requirements, namely *Environment Protection (Water Quality) Policy 2003* and *Local Government Act 1999*. Sediment control planning shall incorporate the usage of hay bale barriers, silt fences and side inlet pit sediment traps as per the requirements of the Stormwater Pollution Prevention, Code of Practice for the Building and Construction Industry, SA EPA, March 1999 (SA EPA, 1999). Regular inspections during construction activities and after significant rain events (>10mm/24h) to ensure they are operational and undertake maintenance repair works as required. Stormwater Management Plans for the site will be prepared prior to commencement of works and may include site grades, temporary perimeter bunding and temporary drainage channels and retention basins. During excavation works and as necessary, temporary drainage channels and detention pondage may be installed to appropriately manage stormwater. If required, diversion drains will be constructed to minimise runoff from rainfall flowing into the works area and the flow of waters from stockpiles. All liquids encountered on site displaying a visible sheen or odour whether they be pooled rainwater or perched groundwater must be retained on-site (unless assessed and approved for off-site disposal by appropriately licensed waste haulage personnel) or released to the stormwater system following approval from SA Water.	(D2) Low
	Erosion and sedimentation of potentially contaminated and natural soils resulting in pollution off site to adjacent storm water and coastal and marine environment		(A5) Extreme		(D2) Low
	Poorly maintained or inadequate erosion and sediment control measures not effectively treating construction run-off on site resulting in a pollution event.		(B5) Extreme		(D2) Low
	Inappropriate management of sediment trap discharge resulting in storm water pollution.		(B4) Extreme		(D2) Low
	Inappropriate stockpiling of material potentially resulting in a pollution event.		(C3) High		(D1) Low
Asbestos	Discovery of asbestos materials identified onsite.	Construction workers, adjacent sensitive site users / inhalation of fibres	(D5) Extreme	All asbestos containing materials must be identified and removed by a *Class A* licensed asbestos removalist contractor prior to commencement of demolition works. Under regulation 475 air monitoring must be conducted at all licensed asbestos removals by an independent licensed asbestos assessor. This requirement also applies to Class B removals via transitional regulation 726.	(D1) Low
Wind	Excessive dust emissions during clearance works resulting in a community complaint.	Construction workers, adjacent site users / direct dermal contact, inhalation, accidental ingestion	(B4) Extreme	Dust may cause potential health and environmental impacts if generated at unacceptable levels adjacent to sensitive receptors, with finer dust particles able to be transported offsite for considerable distances in prevailing winds. Small dust particles are respirable and thus can cause serious respiratory health problems by entering the lungs, whilst larger particle sizes are generally caught in the respiratory tract and may result in less serious conditions such as sinus congestion, sneezing or coughing. Dust dispersion may also impact the surrounding area, particularly where dust becomes wet and/or enters the stormwater system. Construction activities, with a particular focus on demolition and earthworks exercises, will be undertaken in a manner which minimises the generation of dust emission on site. This includes utilising water carts for dust suppression, restricting vehicle speeds on site, modifying construction activities during high wind period, stabilising hardstand areas, and covering vehicle loads prior to leaving site. Stockpiles of material, if not correctly managed, can represent a considerable source of dust, due to their height and un-compacted nature. Additional information relating to the management of stockpiles is provided in Section 5.2. Dust levels during works shall be monitored (visually) by the Contractor during all external works.	(C1) Low
	Exposed areas/surfaces contributing to increased dust emissions on site.		(B4) Extreme		(C1) Low
Protection of trees and vegetation	Inadvertent removal of trees during works.	Biota	(D3) Medium	There are a small number of trees which will require demolition, particularly to facilitate the new access road, the contractor shall ensure trees to be demolished are inspected and approved with a suitably qualified arborist/representative from Council prior to demolitions. Trees to be demolished or protected are to be clearly marked prior to demolition works beginning. If damage to native vegetation occurs, the contractor on behalf of the owner of the land, will be responsible for obtaining approval for their removal if required.	(E1) Low

ITEM	POTENTIAL IMPACT	POTENTIAL RECEPTORS / TRANSPORT MECHANISM	UNTREATED RISK CATEGORY	MITIGATION MEASURE	REVISED RISK CATEGORY
Noise and Vibrations	Excessive noise and vibration construction works resulting in a community complaint.	Surrounding residents, adjacent site users, buildings, and structures	(C2) Medium	Construction activities will occur in a manner which minimises the potential for noise and vibration impacts on sensitive receivers, recreational users, heritage structures etc. This includes operating during the approved weekend construction hours, turning off machinery and equipment when not in use, minimising reversing and horn signals, ensuring plant and equipment are operated and maintained in a satisfactory manner and abiding by proximity limits. Vibration from the use of heavy machinery at the site can cause structural damage to nearby structures. The zone that will be potentially affected by vibration shall be determined prior to the commencement of site works. The selection of equipment shall take account of the degree of vibration compatible with adjacent structures. If vibration becomes excessive, the offending machine/ work will cease operation until appropriate vibration levels can be achieved. Where potential for damage to occur exists, construction trials including vibration monitoring at structures at risk are to be carried out. Appropriate measures should be undertaken by the contractor to maintain the integrity of the surrounding infrastructure. In the event that public complaints are received, methodologies will be reviewed, and alternate methods implemented. Involvement and communication with the neighbouring residential site occupants is necessary to prevent undue concerns regarding management of the initial earthworks and risks associated with the works. A complaints register will be established by the Project Environmental Manager. The register will comprise a system or protocol for the receipt, recording and response to community complaints, and methods for dealing with complaints. Complaints about environmental matters associated with earthworks activities will be treated as non-conformances.	(D2) Low

Health, safety and environment plan (HSEP)

A detailed Health Safety and Environment Plan (HSEP), which will include a health and safety risk assessment for the planned construction works will be prepared by the Contractor for the Site.
The HSEP shall include, but not be limited to:

- Naming key personnel responsible for Site safety
- Describing the risks associated with each operation conducted
- Confirming that on-site personnel are adequately trained to perform their job responsibilities
- Describing the protective clothing and equipment (i.e. gloves, boots and hard hats) to be worn by personnel during various Site operations
- Describing the actions to be taken to mitigate existing hazards to make the work environment less hazardous
- Describing the type of emergency equipment to be available during the works, and
- Setting out a contingency plan for safe and effective response to emergencies.

The plan would include telephone numbers for emergency services and a map showing the route to the closest hospital.

Traffic control

All traffic to and from the Site will be through the main Site entry point. Parking for Site workers and visitors will be provided on-site at a designated area.

Transportation of "over-sized" equipment will be performed outside peak hours with appropriate signage and in accordance with DPTI regulations.

In addition to the above:

- Only designated transport routes will be used over the duration of the proposed works which will be communicated to haulage contractors
- No vehicles are to arrive at the Site outside the Site working hours
- Site workers are to utilise local public transport system and car sharing wherever possible, and
- Trucks will only leave the Site when they have reached their capacity loads wherever possible.

Project specific OHS and environmental procedures

Occupational health safety (OHS)

The Construction Manager should prepare and administer an Occupational Health and Safety (OHS) plan in accordance with the Work Health and Safety Act 2012 and the Work Health and Safety Regulations 2012. Reference shall also be made to approved codes of practice and standards.

The plan shall take into account all potential safety issues highlighted in or arising from the General Specification, the CEMP and site specific OHS plans including the following:

- Specific OHS requirements such as vapour monitoring
- Personal protective equipment (PPE)
- Engagement of a qualified occupational hygienist, and
- Contractor responsibilities.

The following issues should be addressed as part of the development of the plan in order to ensure appropriate health and safety conditions exist for workers and the general public:

- Evaluation of hazards
- Assessment of risks
- Determination of safety equipment and procedures, and
- Determination of measures to ensure general public health.

All personnel involved in site works inducted by the site OHS representative, will read and understand the OHS requirements and sign a compliance agreement. Copies of the plan shall be available and accessible to site personnel for reference and review. The construction manager should ensure that regular OHS meetings with site workers are conducted to review safety requirements and ensure any non-conformance issues are adequately addressed.

The OHS plan would include details of:

- Site specific hazards
- Exposure risks
- Site control procedures
- Contaminants and hazard identification and precautions
- Warning symptoms from exposure to contaminants
- Protective equipment requirements and usage
- Decontamination facilities and procedures
- Prohibitions, and
- Emergency response procedures.
- Responsible persons
- Nearest medical facilities
- Appropriate supervision
- Safe operating procedures
- Procedures for confined space entry
- Safety equipment and procedures for First Aid, and
- Training and education of employees and supervision.

The Contractor will ensure that at least the minimum number of Designated First Aiders (in accordance with SafeWork SA Approved Code of Practice for First Aid in the Workplace), including the OHS representative, holds a current accredited first aid certificate and will supply a specified area (First Aid Room) for treatment/assessment purposes.

Personal Protective Equipment

Earthmovers, contractors and others involved in the redevelopment earthworks must be equipped with safe work clothes and PPE including items such as:

- Eye protection for example, safety goggles and glasses
- Foot protection for example, safety shoes and boots
- Head protection for example, hard hats, helmets and broad brimmed hats
- Body protection for example, long-leg trousers, overalls, gloves, long-sleeved shirts and high visibility clothing
- Hearing protection for example, ear plugs and earmuffs, and
- Any substance used to protect health, for example, sunscreen.

In the event that dust is generated by the works, appropriate mitigation measures will be implemented, ensuring the risk level is mitigated to safe working levels (i.e. dust masks etc. are not required) in the first instance.

Management strategies

General approach

The timing of installation of control measures will be critical to ensuring that environmental obligations are met within the required timeframe and that controls are effective in achieving their purpose.

Control measures and safeguards to minimise and manage environmental risks identified in the sections below. A program of routine maintenance will be conducted on environmental controls. Daily inspections of work areas will be undertaken by PM and Site Foreman and inspections will be undertaken by the EMR as required. These inspections will provide a means for identifying maintenance requirements before they reach a critical stage.

Vehicular access

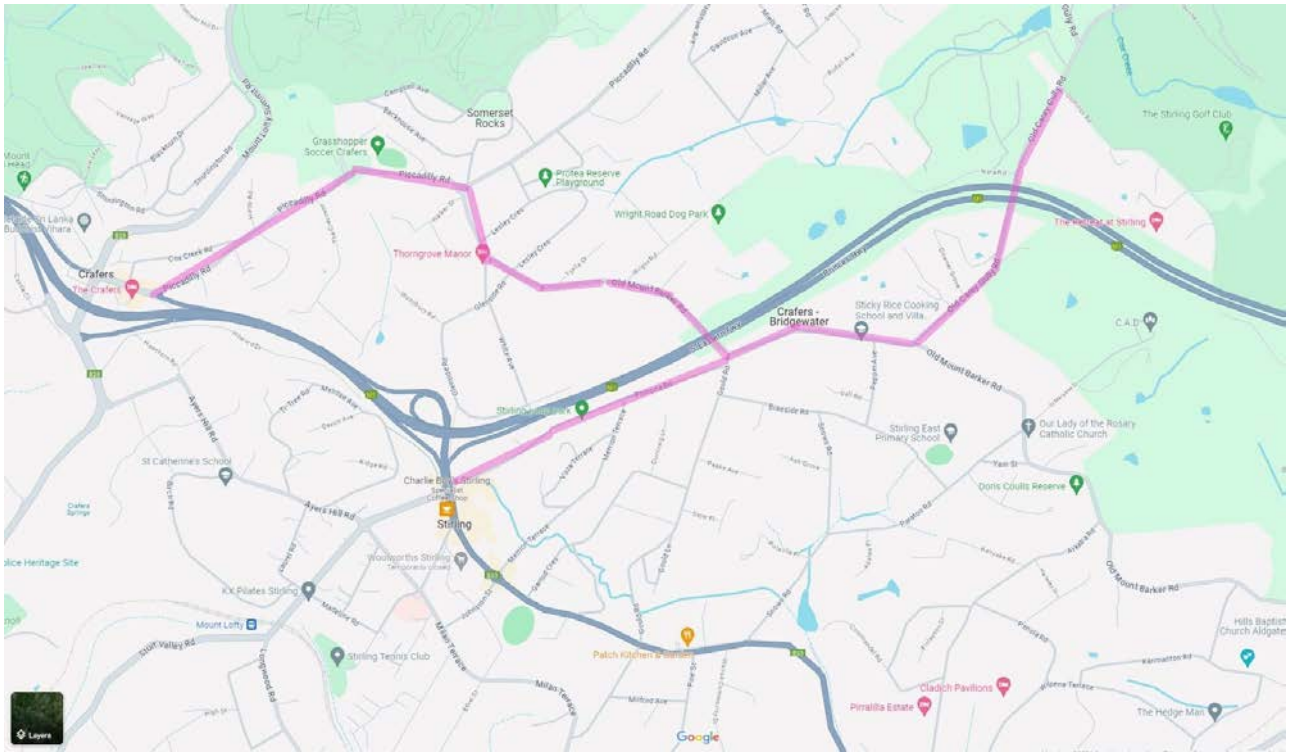
Traffic movements from the site should be limited where possible, including allocating dedicated site vehicles/machinery (water trucks, excavators, tipper trucks etc.) that shall remain on site during the program rather than traversing to and from site each day.

The transport route should be subject to the same levels of management as the site, including hours of operation/use, dust, noise and sedimentation management.

All vehicles should have loads covered (where applicable) and should be appropriately washed-down before leaving the site to limit transport (drag-out) of material/dust off-site. The Construction Manager should provide a specified area for the wash-down and construct a “shaker” if conditions warrant.

All vehicle movements to and from the site, within the near vicinity of the site, should be strictly within site operating hours.

A markup has been provided below for the preferred construction routes to and from the site during construction.



Erosion and sediment control plans (ESCPs)

The PM and Superintendents will be responsible for the development and implementation of ESCPs on site as required. This will ensure that erosion and sediment management is incorporated into the planning phase of construction activities. Erosion and sediment controls are outlined in Table 6 and in the ESCP provided in Appendix C. However, it is expected that minor adjustments to ESCPs will be required on site to complement construction activities.

Noise

Noise should be managed to ensure impacts to onsite workers and neighbouring residences are minimised. This can be achieved through selection of appropriate equipment and timing of use, noise suppression equipment (mufflers, etc.) on any excessively noisy machinery (eg. compressors, air scrubbers) and keeping machinery in good repair. Specific noise controls are outlined in Table 7.

Reference should be made by the Project Manager to the SA EPA *The Environment Protection (Noise) Policy 2007 and its impact on existing and proposed developments 2007*.

Vibration control

The use of large excavators, rollers etc. should be kept to a minimum along boundaries to reduce the impacts of vibration on neighbouring properties.

Appropriate measures should be undertaken by the Project Manager to maintain the integrity of the surrounding infrastructure.

In the event that complaints are received methods should be reviewed by the Project Manager and alternate methods implemented.

Air quality (dust)

Dust control measures should be implemented during any upgrade works. For the purposes of this CEMP, dust refers to particulate matter including airborne dust, and organic solids.

Dust dispersion may cause problems with impacting the surrounding area, particularly where dust becomes wet and/or enters the stormwater system.

Dust suppression, as part of all site works, should be adequate at all times during and outside of normal working hours. Dust suppression mechanisms should be applied by the Contractor when:

- Unsealed access routes and exposed ground surfaces are dry, and wind and vehicle movements result in visible dust generation
- Exposed surfaces of potential material stockpiles are dry and wind or handling activities result in dust generation
- Dust generation is visible during excavation activities on the site, and
- Dust is generated from loads in trucks.

Stockpiles are to be managed to limit the emission of and exposure to particulates (dust). Stockpiles will be managed with consideration given to the following:

- The height of a stockpile should not exceed 3m, or not exceed the average height of surrounding structures (whichever is the lesser)
- The height of a stockpile should be reduced if in close proximity to the site boundary. The height of a stockpile should be below the fence line within 5m of the boundary
- Stockpiles will be covered with an appropriate material dependent on the content of the stockpile, and
- Stockpiles/soils will contain a significant level of moisture before handling.

Specific dust controls are outlined in Table 8. A detailed dust management and monitoring procedure shall be provided by the PM prior to the commencement of works.

Water used for dust control may be sourced from on-site and of a suitable quality that it meets SA EPA irrigation quality guidelines.

Surface water- Stormwater

The PM should implement a surface storm water management strategy that effectively controls surface runoff entering and leaving the site.

Stockpiles constructed in un-bunded areas should be lined beneath with a HDPE liner and bunded with hay bales may be used to minimise the potential for sediment run off.

During excavation works, a temporary sump/stormwater basin should be constructed at the base of the excavation to collect perched water seepage and rainfall. The location of the proposed stormwater basin at the site is presented in Appendix C. The water in this basin should be disposed of by a suitably licensed waste disposal contractor to be engaged by the PM.

Excavations

Excavation work should be undertaken in stages to limit potential impacts and disruptions to site boundaries, in particular the shared access roads.

Where necessary, special precautions shall be undertaken to ensure safe working conditions exist and to protect neighbouring properties. These may include construction of appropriate batters to address potential soil collapse.

Where necessary the PM shall take precautionary action in order to minimise potential risk of damage to structures or vegetation on adjoining properties in close proximity to the excavation works.

The contractor should seek direction from the PM to ensure necessary action is taken to limit potential damage to any adjoining buildings, properties and services. For example, this may require the preparation of a dilapidation survey prior to commencing site works. Suitable stabilisation and retention techniques will be employed as required to manage potential collapse of material.

In addition to the sidewall treatment, other precautionary requirements may be required in some areas and shall be at the direction of the PM and may include soil stabilisation and/or underpinning.

A detailed excavation and slope stability management procedure should be provided by the Construction Manager and approved by the Superintendent prior to the commencement of works.

Contingencies and 'discovery'

Work should cease following the identification of any unanticipated areas of contamination and the Environmental Consultant should be contacted.

The unanticipated areas of contamination will be subject to further environmental investigation to confirm the remediation strategy and validation required of the remediated area. This could be as simple as excavating out contaminated material and validating the excavated area.

Waste management

Various waste streams will be generated during the upgrade works. The PM shall prepare a Waste Management Plan (WMP).

The waste management hierarchy of reduce, reuse and recycle is to be adopted for waste management at the site. No burial or burning of wastes is to occur on site.

Waste management controls are outlined in Table 13. The PM is responsible for monitoring and enforcing the site WMP. General waste resulting from site development works (ie. domestic wastes) will be collected in bins and disposed of off-site.
Litter is to be controlled and regularly picked up from site and prevented from entering surrounding areas and stormwater systems.

Waste receptacles (bins) must be provided at the site and marked to show their expected contents (recyclables, general waste). All site workers are to be made aware of the location of site bins.

Waste storage areas will be protected from wind and rain to minimise impact to the surrounding environment.

Transport and disposal to licensed landfill

Prior to the offsite disposal of any surplus material, it must be classified in accordance with SA EPA requirements.

The Construction Manager will engage an Environmental Consultant to undertake the waste classification works.

Surplus soil intended for transport and offsite disposal including 'Waste Fill' will then be disposed of at a licensed landfill in accordance with its classification and SA EPA requirements.

Transporters carrying the surplus material will be appropriately licensed by the EPA. Licensed transporters will comply with all of their conditions of licence including transporting the material to a licensed waste depot and completing 'Waste Transporters Certificates' in accordance with EPA Regulations.

The load must be wetted down and covered to ensure dust suppression.

Any fill materials removed from site for the full duration of the construction works will be tracked, identifying areas of origin and disposal locations.

All loads (including 'Waste Fill') will be tracked, and the quantities tallied by the PM.

Specific project control

Erosion and sediment control

Objective:

To minimise the potential for soil erosion on-site and the off-site transport of sediment.

Target:

No erosion and/or sedimentation impacts during the construction phase.

Table 6 - Erosion and sediment controls

EROSION & SEDIMENT CONTROL			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise Erosion	• Areas of land cleared and the period of time that they remain cleared will be kept to a minimum. • As appropriate, works will be undertaken in phases designed to minimise land disturbance. • Upstream stormwater run-off will be directed around the site where practical. • All vehicles will be kept to well defined access roads where possible. Areas where ground cover is not to be disturbed will be identified and enclosed by bunting, therefore prohibiting construction traffic. • A stabilised entry/exit point will be constructed to minimise the tracking of sand, soil and clay off site. If required, regular clean-ups will occur throughout the construction phase. • Sediment control measures will be installed along identified natural and constructed drainage lines before construction commences where applicable. • Sediment control devices will be installed downstream of areas of disturbed soils when applicable. • Disturbed topsoil will be stockpiled and maintained for use in rehabilitation if suitable. • Stockpiles will be located at least 10 metres from drainage lines and natural waterways. • The number of stockpiles, areas and time stockpiles that are exposed will be minimised. • Stockpiles and batters that remain bare for more than 30 days shall be stabilised by whatever means. • Sediment controls will be established around excavations and stockpiles as per the ESCP and as necessary.	Contractor	During construction

EROSION & SEDIMENT CONTROL			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Monitoring	• All construction activities will be monitored for compliance with the CEMP. • The effectiveness of the CEMP will be reviewed on a regular basis.	Contractor	During construction
	• All erosion and sediment control devices shall be visually inspected on a regular basis. • Adjoining roadways shall be visually inspected on a regular basis for evidence of sediment carted from the site.	Contractor	Daily and during and after heavy rainfall events
Reporting	• A log of the effectiveness of the erosion and sediment control devices will be prepared, including recommended improvements to the system where appropriate.	Contractor	During construction
Corrective Action	• Erosion and sediment control devices will be cleared, repaired or replaced whenever inspections show signs of non-compliance or ineffective capability or capacity. • Where erosion and sediment control devices are found to not be in accordance with the CEMP, work in the affected area will cease and corrective actions taken prior to recommencing works.	Contractor	During construction

Noise

Objective:

To minimise nuisance noise emissions during construction activities.

Target:

Zero noise complaints for the duration of the construction phase.

Table 7 - Noise controls

NOISE			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on surrounding environment	• The hours of operation should not detract from the amenity of any residential zone. Work hours shall be restricted to those stated in *Hours of Operation* • Approval shall be sought from the Administering Authority for all works that are proposed outside of these hours. • Fit and maintain appropriate noise attenuation equipment to on-site plant in accordance with manufacturer's specifications. • Noise generated from construction should not exceed 75 dB(A), at the site of a sensitive receptor – Reg 2.02 s (Environment Protection) Regulations 1997	Contractor	During construction
Monitoring	• No routine qualitative noise monitoring is required. However, if noise complaints are received, qualitative or quantitative monitoring may be required to confirm complaint.	Contractor	If required
Reporting	• Non-conformances and complaints shall be logged and include the date, time, name and contact number (where relevant) subject of complaint or non-compliance and weather conditions.	Contractor	Weekly
	• The date, time and nature of high noise activities shall be logged.		
	• Non-conformance and complaint details shall be forwarded to the Administering Authority as soon as practicable.	Contractor	During construction
	• In the event that qualitative noise monitoring is required, the results shall be kept in the office of the Project Manager and available for inspection at any time during normal working hours.	Contractor	As required
Corrective Action	• In the event that nuisance noise becomes the basis for consistent complaints that are not considered frivolous or vexatious, strategies for noise abatement as outlined in the Guide to Noise Control on Construction, Maintenance and Demolition Sites (AS 2436-1981) shall be considered and implemented where practicable.	Contractor	During construction
	• AS 1055 to be utilised in determining the amount of noise generated from construction, maintenance or demolition of a building or other structure at an – Reg 4.01 (Environment Protection) Regulations 1997.		

Dust

Objective:

To minimise dust during construction activities.

Target:

Zero dust complaints for the duration of the construction phase.

Table 8 - Dust controls

DUST			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on surrounding environment	• Lining of chain mesh fences around portions of the site to help shield surrounding properties from dust • All dust generating areas shall be watered as required to suppress dust throughout the construction phase. • Watering equipment shall be readily available and used on-site as required during construction. Other dust suppressants such as chemical foams, resins and polymers if considered necessary • Pre-wet material to limit dust generation • Sealing of all associated roadways, site entrances and main traffic area to minimise adverse effects of dust on the amenity of an area. • Dust generating activities shall be avoided or minimised, wherever practical, during windy conditions. • Drivers are to obey the on-site speed limit and adopt a driving practice where dust generation is minimised. • Cover loose excavation faces at the end of each day or as required on high wind days with suitable cover material. • Locate and manage stockpiles with consideration to prevailing wind directions, and • Traffic speeds kept below 15 km/hour to minimise dust generation.	Contractor	During construction
Monitoring	• Dust emissions and potential dust generating activities and areas shall be monitored visually during construction activities.	Contractor	Daily during construction
	• Monitor and review activities for non-compliances or complaints.	Contractor	During construction
Reporting	• Non-conformances and complaints shall be logged and include the date, time, name and contact number (where relevant) subject of complaint or non-compliance and weather conditions. • The date, time and nature of dust suppression activities shall be logged.	Contractor	Weekly

DUST			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
	• Non-conformance and complaint details shall be forwarded to the Contractor as soon as practicable.	Contractor	As soon as practicable during construction
Corrective Action	• Dust generating areas shall be watered to achieve compliance targets. • If necessary, dust generating activities shall cease until corrective actions result in achievement of targets or wind conditions are such that targets are achieved.	Contractor	During construction

Water Quality Management

Objective:

To ensure that the quality of surface water leaving the site is acceptable during the construction phase.

Target:

Maintain or improve pre-construction surface water quality.

Table 9 - Water quality management controls

WATER QUALITY MANAGEMENT			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on surrounding waterways	• Construction should not commence until adequate and coordinated drainage of the land is assured. • Stormwater shall be diverted around the site wherever practical. • Stormwater generated within the development should be managed by a minor system and a major system for the gap flows between the minor system.	Contractor	Prior to construction.
	• The volume of stormwater run-off flowing from the site to the adjacent drainage lines and waterways shall be minimised, as far as practical.	Contractor	During construction
	• Groundwater from dewatering activities will not be directed to stormwater drains. Contractor to obtain all necessary approvals/permits prior to the commencement of dewatering/pumped groundwater activities.	Contractor	As required
	• Treated stormwater to be discharged either: o Into grass swales, vegetation strips adjacent to carparks o Into stone filled trenches either open to surface or underground o By a method approved by a hydrological specialist • Plant (including concrete trucks) shall not be washed down within 15 metres of drainage networks/watercourses. • Refuelling of vehicles shall not be undertaken on-site. • All fuel, oil, chemicals, and hazardous chemicals generated or used during the construction process shall be stored and ultimately disposed of off-site in accordance with current regulatory requirements. • Safety precautions and contingency plans shall be developed and maintained to ensure accidental spills will not escape into groundwater, stormwater, and waterways.	Contractor	During construction

WATER QUALITY MANAGEMENT			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Monitoring	• No routine water quality monitoring is proposed. However, if complaints are received or the client/superintendent believes that the stormwater quality is being affected by construction activities, qualitative monitoring may be required to confirm any impact.	Contractor	If required
Reporting	• Should monitoring be required a suitably qualified person/organisation shall review the water quality data as it becomes available and advise the Contractor regarding compliance with quality targets.	Contractor	As required
Corrective Action	• Corrective action shall be undertaken in accordance with the outcomes and recommendations of the water quality-monitoring program (if required).	Contractor	As required

Flora

Objective:

To minimise negative impacts on significant, protected or natural areas of vegetation on or adjacent to the site.

Targets:

To ensure that the significant and protected area of vegetation that has been identified, is retained and not adversely affected by the construction works.

Table 10 - Flora protection controls

FLORA			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on flora and surrounding environment	Areas of significant and protected vegetation, if present, shall be identified prior to the commencement of works. • The area identified as significant and protected shall be surrounded by bunting to ensure that there is no access to this area. • All construction traffic shall be confined to designated access roadways. • No vehicle or pedestrian traffic shall be permitted beyond the boundary of the construction site unless along approved roadways or authorised to do so. • Stockpiles shall be located no closer than 10 metres from designated or constructed drainage lines	Contractor	Prior to construction.
Monitoring	• Routine monitoring shall be undertaken to check the integrity and positioning of the bunting surrounding any protected vegetation.	Contractor	Weekly
Reporting	• Non-conformance and complaint details shall be forwarded to the Project Manager as soon as practicable.	Contractor	During construction
Corrective Action	• Corrective action shall be undertaken in accordance with the outcomes of the inspections or notification by other project personnel.	Contractor	During construction

Fauna

Objective:

To minimise the negative impacts on fauna during construction.

Targets:

Carry out construction activities with no disruption to wildlife corridors or destruction of native species.
Zero fauna injuries or deaths during construction.

Table 11 - Fauna protection controls

FAUNA			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on fauna and surrounding environment	• Restrict work to standard working hours. • The Project Manager will be contacted in the unlikely event that sick, injured or orphaned fauna are found during construction.	Contractor	During construction
Monitoring	• Spotting of fauna shall occur during vegetation clearance works.	Contractor	During vegetation clearance
Reporting	• A record shall be made of all species injured or killed during construction works. • The Project Manager, HSE Advisors shall be contacted regarding all fauna related incidents.	Contractor	As required during construction
Corrective Action	• Corrective action shall be in accordance with advice from the Project Manager, HSE Advisors and Regulatory Agencies.	Contractor	On advice

Land contamination

Objective:

To minimise the potential for the contamination of the site.

Targets:

No contamination of the site during the construction phase.

The containment, collection, and appropriate disposal of all solid, chemical and fuel wastes generated on the site.

Table 12 - Contamination controls

LAND CONTAMINATION			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on surrounding environment	• Proof that all fill is free of contamination must be provided prior to the fill being brought onto site. • No waste products shall be disposed of on-site other than selected soil, rock and cleared vegetation that has come from the site. • If any known or suspected contaminated soil or waste is encountered, contact the PM and cease work until instructed otherwise by the PM and HSE Advisors. • All equipment maintenance and cleaning shall preferably be carried out at an off-site location. Where this is not practical, equipment maintenance and cleaning shall be carried out on a bunded low permeability surface to ensure soil contamination does not occur. • Emergency or breakdown maintenance will be conducted in such a manner as to minimise the potential for spills. • Leaking vehicles or containers (fuel, chemical) will not be allowed on site, and if found will be removed or repaired immediately. • All necessary spill response materials shall be made available and readily accessible. • All staff shall be made aware of the location, composition and use of spill response materials.	Contractor	During construction
Monitoring	• All vehicles shall be serviced and maintained to the manufacturer's specifications.	Contractor	During construction
Reporting	• All vehicle maintenance activities, inspection logs, spills, outcomes of clean-up activities and any emergency or incidents involving spills or land contamination shall be logged by the Contractor. • In the event of a chemical/fuel spill, the Contractor will notify the PM as soon as possible.	Contractor	During construction

LAND CONTAMINATION			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
	• Non-conformance and complaint details shall be forwarded to the HSQE Department as soon as practicable.	Contractor	As soon as practicable during construction
Corrective Action	• In the event of a chemical/fuel spill, containment and clean up action will be undertaken immediately. • Negatively impacted areas shall be remediated to pre-spill or incident conditions, in accordance with the Environment Protection Regulations 1997 and other relevant regulations.	Contractor	During construction

Waste management

Objective:

To minimise the potential for environmental impact of wastes generated on site.

Targets:

No contamination or environmental impact of the site by waste during the construction phase.

Table 13 - Waste management controls

WASTE MANAGEMENT			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on surrounding environment	• No waste products shall be disposed of on-site other than selected soil, rock and cleared vegetation originating from the site.	Contractor	During construction.
	• Designated waste bins will be on-site to ensure no litter is on site. All bins will have a secure fitted lid, capable of receiving all waste from building and construction activities. • Bins are to be emptied regularly to ensure waste does not overflow the provided skips.	Contractor	During construction, emptied as required.
	• All waste materials from the construction phase shall be regularly cleaned from the site and disposed of off-site in accordance with current regulatory requirements.	Contractor	During construction, once per week as a minimum
	• All waste materials to be removed off-site shall be contained on-site prior to disposal, using appropriate storage containers or facilities until removed off-site, including the covering of containers/facilities to prevent litter escaping from the site. Waste containers shall be kept screened from the public's view to the reasonable satisfaction of Council. • Maintain a high quality of housekeeping and ensure that materials are not left where they can be washed or blown away to become litter.	Contractor	During construction
	• Provide bins for construction workers and staff at locations where they consume food. • Regular inspection of the property boundary shall be undertaken to ensure litter or waste does not escape from the site into neighbouring properties.	Contractor	Weekly during construction and daily during windy conditions

WASTE MANAGEMENT			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
	• All staff shall be trained in waste clean-up procedures.	Contractor	During construction
Monitoring	• Property boundaries shall be inspected regularly.	Contractor	Weekly during construction and daily during windy conditions
	• All waste containment and disposal activities shall be logged, including type and volumes of materials and location of licensed receiving facility.	Contractor	As required during construction
Reporting	• Non-conformance and complaint details shall be forwarded to the Project Manager as soon as practicable.	Contractor	During construction
Corrective Action	• In the event of a non-conformance, containment and clean up action will be undertaken as soon as practicable. • If litter has escaped from the site or is negatively impacting the boundary, the litter shall be immediately collected and appropriately contained for disposal off-site.	Contractor	During construction

Cultural heritage

Objective:

To minimise impacts arising from site activities on items or areas of cultural heritage significance.

Targets:

No impact from site activities on areas of cultural heritage significance identified during the course of the project.

Table 14 - Cultural protection controls

CULTURAL HERITAGE			
MANAGEMENT REQUIREMENT	**ACTION**	**RESPONSIBILITY**	**TIMING**
Minimise impact on areas of cultural heritage significance	• Where artefacts or areas of potential cultural heritage significance are found or suspected, works shall cease until further investigation or assessment is conducted.	Contractor	During construction.
Monitoring	• Operational staff shall remain vigilant during excavation and treatment operations.	Contractor	During construction
Reporting	• The Contractor shall notify the Project Officer of finds or potential finds immediately and stop all work until the area has been inspected. • The AEM shall be contacted for management advice immediately.	Contractor Contractor	Immediately on discovery Immediately
Corrective Action	• Corrective action shall be in accordance with advice from the Project Manager, HSE Advisors and relevant Regulatory Agencies.	Contractor	On advice

Training, awareness, and competence

General

Three main forms of training will be provided on site:

- Site induction
- Environmental management training, and
- "Toolbox" training.

Site induction

Prior to working on site, all personnel and sub-contractors will undertake an induction incorporating Environmental and OHS requirements. The induction will address a range of environmental awareness issues including, but not limited to:

- The CEMP (purpose, objectives and key issues)
- Legal requirements including due diligence, duty of care and potential consequences of infringements
- Environmental responsibilities under State and Federal legislation
- Conditions of licences, permits and approvals
- Significant environmental issues and areas of the Site including identification of boundaries for location of refuse bins, washing, refuelling and maintenance of vehicles, plant and equipment
- Incident management and emergency plans, and
- Reporting process for environmental harm/ incidents.

All 'one-off' visitors (unlikely to return) to the workplace are accompanied at all times by a person that has undertaken the workplace induction. All visitors sign a Daily Pre-Start Meeting form which shall include the visitor sign in record upon arrival and departure (including time of entry and exit).

"Toolbox" Training

"Toolbox" training will help to ensure that relevant information is communicated to the workforce and that feedback can be provided on issues of interest or concern. "Toolbox" training will generally be prepared and delivered by the EMR or by their delegate. These toolboxes can be integrated into Construction Method Statements (CMSs) delivered to personnel prior to commencing specific high-risk activities or can be used as a stand-alone training tool.

"Toolbox" training topics may include:

- Efficient use of plant and materials
- Waste management, minimisation and recycling
- Noise and vibration minimisation
- Dust control
- Wastewater control
- Installation and maintenance of erosion and sediment control devices
- Storm management procedures, and
- Other general site issues.

Consultation, communication and reporting

Consultation and issue resolution are managed in accordance with the relative contractors and project contract Consultation and Issue Resolution (IR) documentation. The consultation procedure and relevant OHS/IR legislation requires project personnel to consult, share and supply project information with all workers or their representatives and provide the opportunity for workers to respond and contribute to Environmental issues that affect them through the workplace toolbox meetings, health, safety and environment (HSE) Committee and/or Health and Safety Representatives (HSR).

The meetings which shall communicate environmental matters at this workplace are listed below:

- Pre-start and Toolbox meetings
- Site Meetings, and
- Client/Superintendent meetings.

The Site Manager or nominated representative retains a record that demonstrates workers, including employees and subcontractors, were consulted on the method of environmental consultation agreed at the workplace consultation includes the requirement for all employees, subcontractors and other workers to report hazards and incidents.

Workers and their supervisors conduct toolbox talk meetings, pre-start talks or other consultative arrangements with those employees or workers under their direct supervision and record the meetings on the relevant forms.

Each workplace/subcontractor supervisor are to discuss environmental matters from the previous day, the current day's activities, interfacing trade activities, changes to emergency access and related control measures, conducts the pre-start talk daily.

Other HSE related meetings are recorded formally where required, e.g., where discussing a HSEP, safe work method statement (SWMS) for high-risk construction work or equivalent for a specific work task or other relevant HSE matters. Toolbox talks are undertaken at intervals that keep employees and other workers informed of conditions and changes to the workplace and recorded.

Consultation includes the requirement for all employees, subcontractors and other workers to report environmental hazards and incidents as follows:

- Report hazards by speaking directly to their supervisor, and
- Report all incidents immediately on becoming aware of the incident and not later than 24 hours after the incident.

Further details on HSE consultation, communication and reporting shall be outlined in the contractor's HSE Management System.

Incident and emergency planning, preparedness, and response

Any environmental or health and safety issues that arise should be reported immediately to the PM so that specific management measures can be implemented.

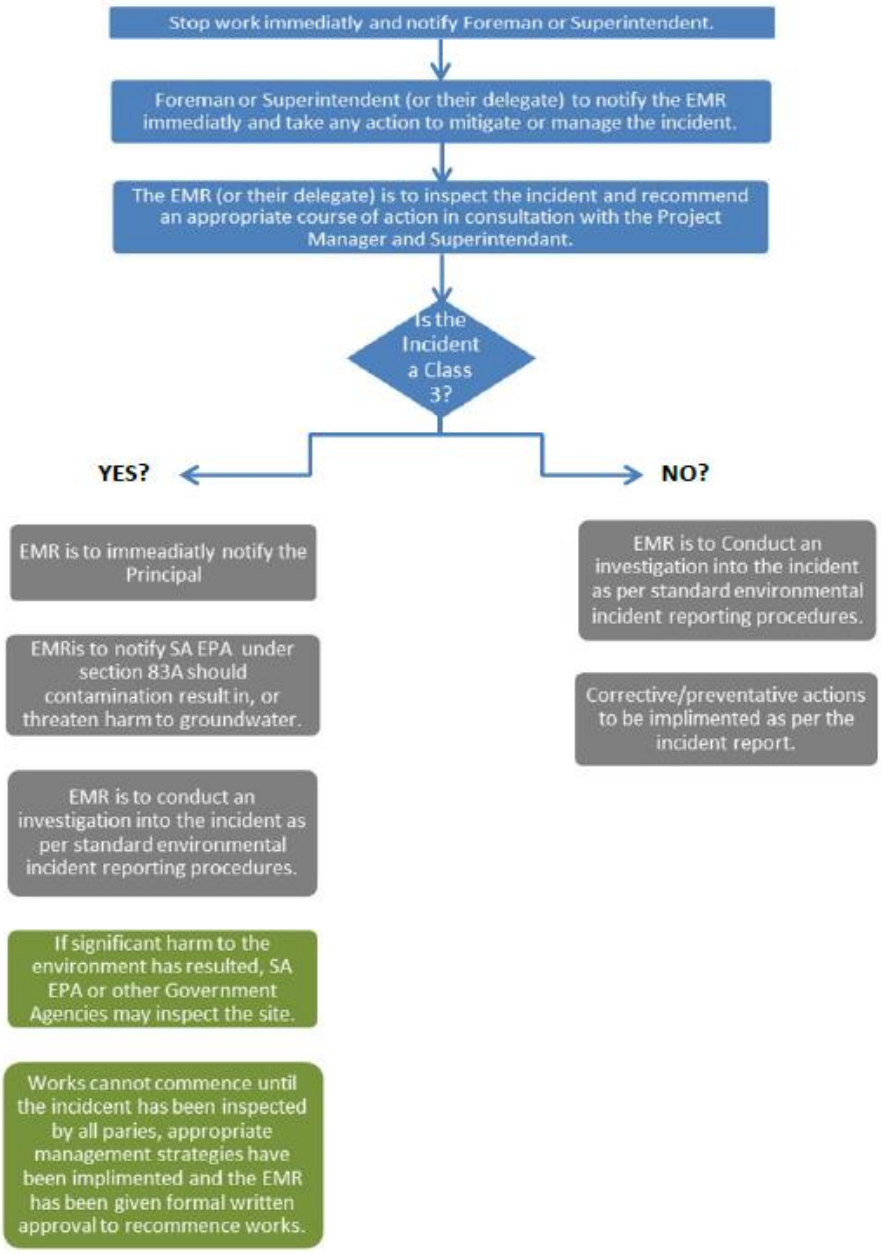
Emergency planning

Emergency planning and incident management procedures are included in Table 15, Table 16 and Table 17. Included is a list of emergency contact details and various specific management procedures for potential emergencies. Prior to any action, identify materials involved and obtain appropriate PPE.

Figure 2 refers to environmental incident classes. The classes are defined as follows:

- Class 1 – Causes or has the potential to cause permanent environmental damage and results in remediation costs of >$100,000
- Class 2 – Causes or has the potential to cause damage to the environment which can be rectified and in results in remediation costs of >$5,000 to $100,000
- Class 3 – Causes or has the potential to cause damage to the environment which can be easily rectified and results in remediation costs of <$5,000.

Figure 2 - Procedures in dealing with environmental incidents



Notes:
*An unexpected event may result in harm to the environment and requires some action to minimise the impact or restore the environment.
* All site complaints/incidents shall be reported to the superintendent in the first instance. Following this, all escalation of complaints shall be directed to the respective contractor's executive.

Although the potential exists for a number of minor incidents to occur onsite, the following three generalised examples of potential minor incidents details the procedures that should be implemented and the responsibilities of the reporting person.

Table 15 - Environmental incident management procedure for minor chemical spills

	ACTION	RESPONSIBILITIES	COMMENTS
1	Stop further leak	Person causing/ finding leak	If leak from drum take action to stop the leak. For example, roll drum so that leak area is uppermost. If leak from pipe close valve.

	ACTION	RESPONSIBILITIES	COMMENTS
2	Inform Project/Supervisor	Project Manager/ Supervisor	Stop human and vehicular traffic and isolate area.
3	Determine the magnitude and destination of the leak	Supervisor	For major spills on site or If spill has escaped off site contact the EMR immediately.
4	Form a barrier around leak/spill to contain	Project Manager/ Supervisor	Soil or sand can be utilized. Absorbent booms (usually provided within spill kits) are effective.
5	Empty the spill source	Project Manager/ Supervisor	Transfer fuel/ oil from failed container into another drum etc.
6	Place barriers around drains and outlets	Project Manager/ Supervisor	Seal drain entry points by blocking with sandbags or other available material.
7	Obtain oil spill kit and apply absorbent material	Project Manager/ Supervisor	Use 'absorbent' or equivalent.
8	Clean up and remove absorbent material to waste bin	Project Manager/ Supervisor	Either shovel or use bob cat loader for larger quantities.
9	Clean up surface soil by excavating	Project Manager/ Supervisor	Stockpile contaminated material in designated area. Validate remediation by sampling.
10	Inform EMR and complete incident log	Project Manager/ Supervisor	Record incident and investigate.

Table 16 - Environmental incident management procedure for impending wet weather

	ACTION	RESPONSIBILITIES	COMMENTS
1	Keep aware of weather conditions and impending significant storm events and inform all supervisors.	Project Manager/ Supervisor	Forecasts from Weather Bureau
2	Inspections to be undertaken of sediment control devices in critical areas	Supervisor	Assessment of their condition or status
3	Ensure silt fences/hay bales/ sandbagging repairs performed	Supervisor	Sediment build-up removed, controls in good condition.
4	Sumps to be able to function at full capacity and diversion drains are in place.	Supervisor	It should be assumed all surface water is contaminated. Onsite storage and removal of waters must be by licensed waste transport company.
5	Ensure stockpiles are in a state of stability and not in a position to impact on public thoroughfares/watercourses	Supervisor	Sealed/covered with plastic, surrounded on low side with sediment fencing.
6	Ensure that hazardous substances storage areas/ bunds are in order	Supervisor	Stored appropriately

	ACTION	RESPONSIBILITIES	COMMENTS
7	Ensure adequate supplies of control devices are on hand	Supervisor	Supplies sediment fencing/sandbags/hay bales.
8	Personnel to be on hand for emergency work during storm event	Supervisor	Pumping of excavations, handling of excess potentially contaminated surface water.

Table 17 - Environmental incident management procedure for finding asbestos containing materials

	ACTION	RESPONSIBILITIES	COMMENTS
1	All activities in the area should cease	Person finding asbestos containing material	
2	Inform Project Manager /Supervisor	Project Manager/ Supervisor	Stop human and vehicular traffic and isolate area.
3	A suitably qualified Environmental Consultant or Occupational Hygienist requested to attend site to provide guidance and sample the material to confirm the presence of asbestos (otherwise the material must be assumed to contain asbestos).	Supervisor	Where adjacent works have the potential to be affected by the presence of asbestos, these works shall cease and continue in unaffected areas until the Environmental Consultant or Occupational Hygienist details the conditions under which works can recommence
4	Erection of temporary barricades to isolate the hazardous area(s) and to restrict access by unauthorized personnel	Project Manager/ Supervisor	this may be physical barriers, bunting or flagging that provides a continuous physical barrier
5	Installation of signage along the barriers in accordance with AS 1319-1994 Safety Signs for the Occupational Environment, clearly identifying the area as a danger zone accessible by authorized personnel only	Project Manager/ Supervisor	
6	Minimize dust generation by covering or wetting excavations or stockpiles containing exposed ACM fragments	Project Manager/ Supervisor	
7	Notify all site personnel and instructing them to remain clear of the area until further notice	Project Manager/ Supervisor	
8	Implement a permit to work system to prevent unnecessary or uncontrolled access by unauthorized persons and therefore minimise the exposure risk.	Project Manager/ Supervisor	

Notification

In the event that an incident has caused, is causing, or is likely to cause material or serious environmental harm, whether the harm occurs on or off the site, the construction team will follow the procedure in dealing with environmental incidents (Figure 2).

In addition to notifying key government agencies in accordance with the procedure detailed in Table 15 to Table 17 the Construction/ Project Manager and Environmental Consultant will also liaise closely to ensure the EPA and any other responsible agencies are kept well informed.

Emergency contact details are presented in Table 18.

Table 18 - Emergency contact list

ORGANISATION	NAME	NUMBER
Project Manager	Trice: • Sonia Mercorella, and • Tiana Della Putta	TBA
Site Foreman	TBA	
SA EPA/Emergency (After Hours)	Pollution Line	1800 623 445
SA Police		000 Mobile 112
Adelaide Metropolitan Fire Brigade		000 Mobile 112
SA Ambulance Services		000 Mobile 112
Poisons Information		131 126
Nearest Hospital	Stirling Hospital	(08) 8339 0200
Local contractor services (eg. waste collection, spill clean-up)	TBA	

Incident investigation and reporting

All incidents will be documented, investigations conducted, and action plans established in order that the event does not occur again.

Where lessons are learnt from the investigation or current procedures are identified as being ineffective, the CEMP, and any associated documentation, will be revised, to include the improved procedures or requirement.

In complying with EPA's expectations regarding incident reporting, an environmental investigation report is expected to include the following basic elements:

- Incident or activity that has caused contamination or environmental harm
- Nature of contamination and chemicals of concern
- Area affected (on or off site)
- Aspects of the environment affected, and
- Any other relevant information.

Further to this, an environmental investigation will also include:

- Identifying and implementing the necessary corrective action
- Identifying the personnel responsible for carrying out the corrective action
- Implementing or modifying controls necessary to avoid a repeat occurrence of the incident, and
- Recording any changes in written procedures required.

All Incident Investigation Reports and associated documentation will be forwarded to the client and the Project Manager. The findings, outcomes and corrective actions required will be communicated back to the construction team as to the outcomes of lessons learnt.

Compliance

Environmental monitoring, inspections and auditing

Site checklists

The site Foremen and/or Superintendents will be required to track activities on the construction site. Information recorded will include, but not be limited to:

- The general conditions on the Site including weather conditions and status of environmental controls, and
- Activities carried out on the Site.

Environmental site inspection checklist

The effectiveness of environmental protection measures will be assessed from time to time by Superintendents, or their nominated delegate, unless otherwise specified. The purpose of the checklist is to:

- Provide a surveillance tool to ensure that safeguards are being implemented
- Identify where issues might be occurring and
- Facilitate the early resolution and action of issues.

Any actions that are identified in these site inspections and recorded on these checklists are prioritised. The checklist will remain "open" until:

- The issue has been resolved / closed out
- A new or revised procedure has been established and implemented, and
- Training has been provided to relevant personnel/ sub-contractors.

Environmental monitoring

Environmental monitoring will involve monitoring the CEMP to assist in the auditing of safeguard measures to ensure they achieve their objectives and to facilitate modification where necessary.

Monitoring would address the following aspects:

- Air quality monitoring (if and when required)
- Water quality
- Erosion and sediment control
- Implementation of Construction Method Statements (CMS)
- Wastes and hazardous substances, and
- Marine environment.

Monitoring technique and frequency

Irrespective of the type of monitoring conducted, the results will be used to identify potential or actual problems arising from construction processes. Where monitoring methods permit, results will be obtained at the time of the assessment and analysed by the EMR.

Generally, monitoring by the EMR will be undertaken on an as needs basis, and may include but not be limited to the following specific tasks/events:

- Prior to off-site disposal of any surplus soils (stockpiled or direct loaded), and
- After any significant rain events (surface water and erosion control).

Monitoring non-conformances

Where a non-conformance is detected, or monitoring results are outside of the expected range:

- The results will be analysed by the EMR in more detail with the view of determining possible causes for the non-conformance
- A site inspection will be undertaken by the Project Manager or EMR
- Relevant personnel will be contacted and advised of the situation, and
- An agreed action plan will be identified, or an action will be implemented to rectify the problem.

An environmental incident report (EIR) or an environmental improvement notice (EIN) may be issued by the Project Manager/ EMR to the non-conforming party in response to the problem if it is found to be construction related. The timing for any improvement will be agreed between the Project Manager and the EMR based on the level of risk. For example, a significant risk will require immediate action.

Review and improvement of CEMP

The CEMP, its operation and implementation should be reviewed from time to time. Between the reviews, a register of issues will be maintained to ensure that any issue raised are recorded for later inclusion into the CEMP. The purpose of the review is to ensure that the system is meeting the requirements of the standards, policies and objectives and, if not, to amend the CEMP to facilitate continuous improvement. The review will consider:

- Client/Superintendent comments
- Site personnel comments
- Authority comments
- Audit findings
- Environmental monitoring records
- Complaints
- Details of corrective and preventative actions taken
- Environmental non-conformances
- Incident reports
- Changes in organisation structures and responsibilities
- The extent of compliance with objectives and targets, and
- The effect of changes in Standards and Legislation.

Limitations

This CEMP is the subject of copyright and shall not be reproduced either wholly or in part without the prior written permission of FMG Engineering. This CEMP is intended for the sole use of the client/superintendent, contractor and associated sub-contractors and should not be relied upon by any other party.

It has been prepared to meet the objectives of the client and associated sub-contractors with reference to the proposed earthworks, services and infrastructure construction as understood by FMG Engineering. Those objectives may not necessarily be the objectives desired by any other third party.

This report relies on Principal-supplied information and information gather by The Principal and relayed to FMG.

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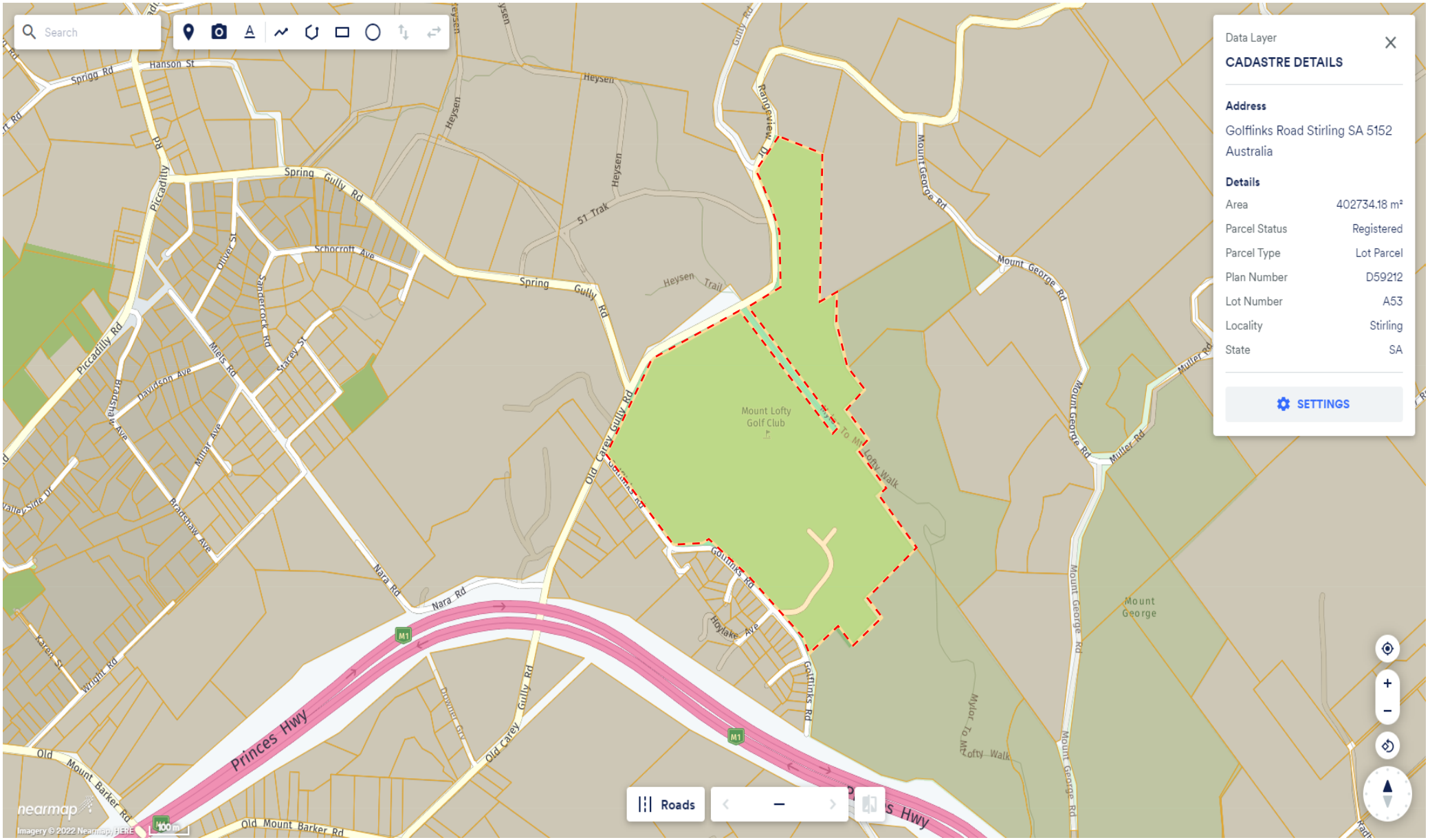
Appendix A

Regional setting and site location plan



REV	DESCRIPTION	DATE	INIT	APP

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FMG ENGINEERING

CLIENT	Venture Capital Developments Pty Ltd
TITLE	CEMP
SITE ADDRESS	Mount Lofty Estate, 35 Golflinks Road, STIRLING, SA 5152
DRAWING TITLE	Regional setting and site location plan

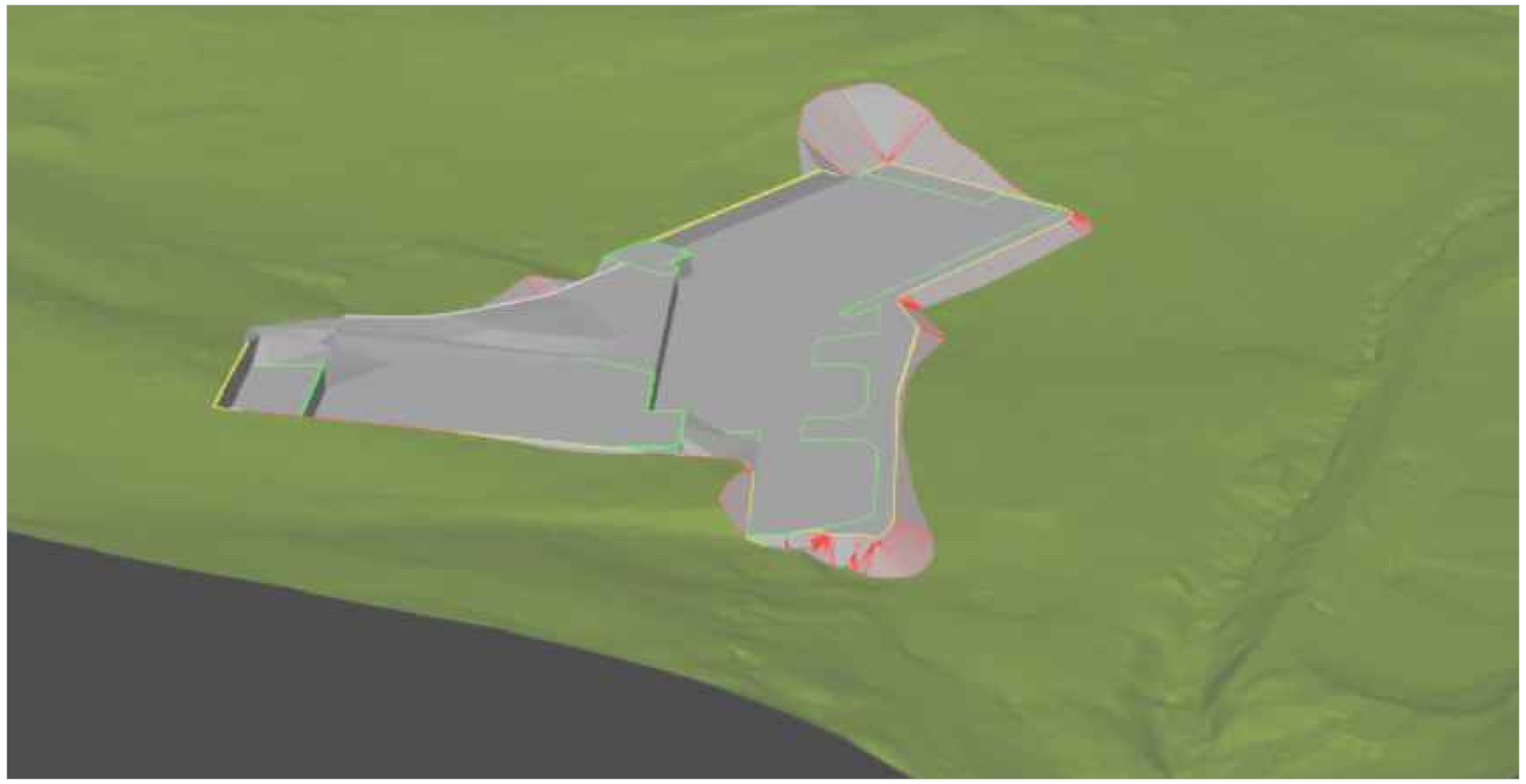
DESIGNED K.A.	DRAWN K.A.
CHECKED D.G.	No. OF SHEETS
SCALE NTS @ A4	DATE STARTED
SITE ID & JOB No.	REV.
DRAWING No. Figure 1	

Appendix B

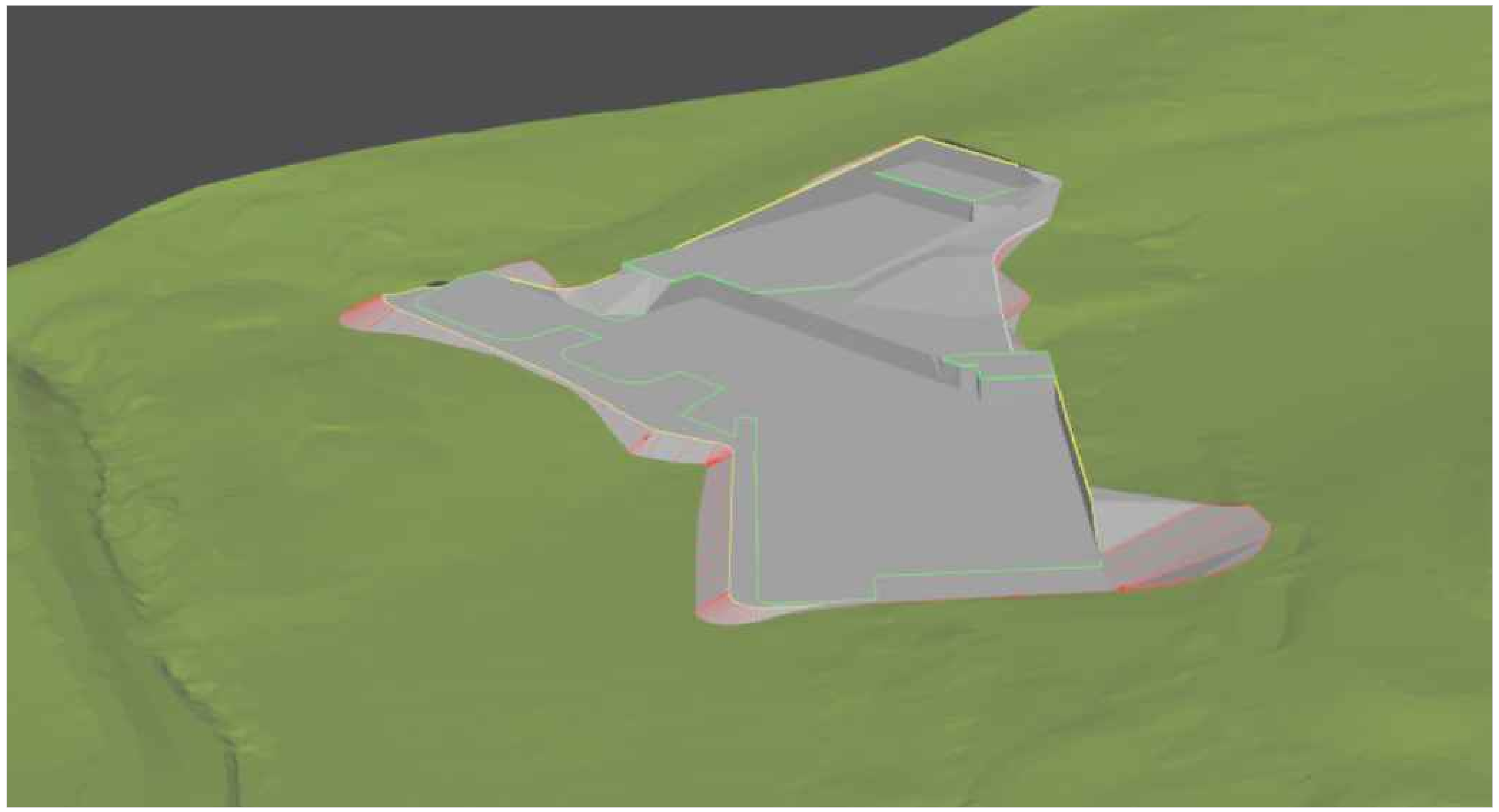
Civil work plans

NORTH ELEVATION
SCALE NTS

SOUTH ELEVATION
SCALE NTS



EAST ELEVATION
SCALE NTS



WEST ELEVATION
SCALE NTS

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	INIT	APP
A	PRELIMINARY ISSUE	23.09.2022	JS	JC

CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE.

ALL WORK MUST BE EXECUTED IN ACCORDANCE WITH THE RULES, REGULATIONS, BY LAWS AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION OVER ANY PART OF THE WORK.

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ENGINEERING

SIGNATURE

CLIENT	VENTURE CAPITAL DEVELOPMENTS PTY LTD
PROJECT TITLE	MOUNT LOFTY GOLF ESTATE
SITE ADDRESS	35 GOLFLINKS RD, STIRLING SA
DRAWING TITLE	PERSPECTIVE IMAGES
DESIGNED	JS
DRAWN	JS
CHECKED	JC
No. OF SHEETS	-
SCALE	NTS
DATE STARTED	23.09.2022
SITE ID & JOB No.	S53897_282604
DRAWING No.	C110
REV.	A

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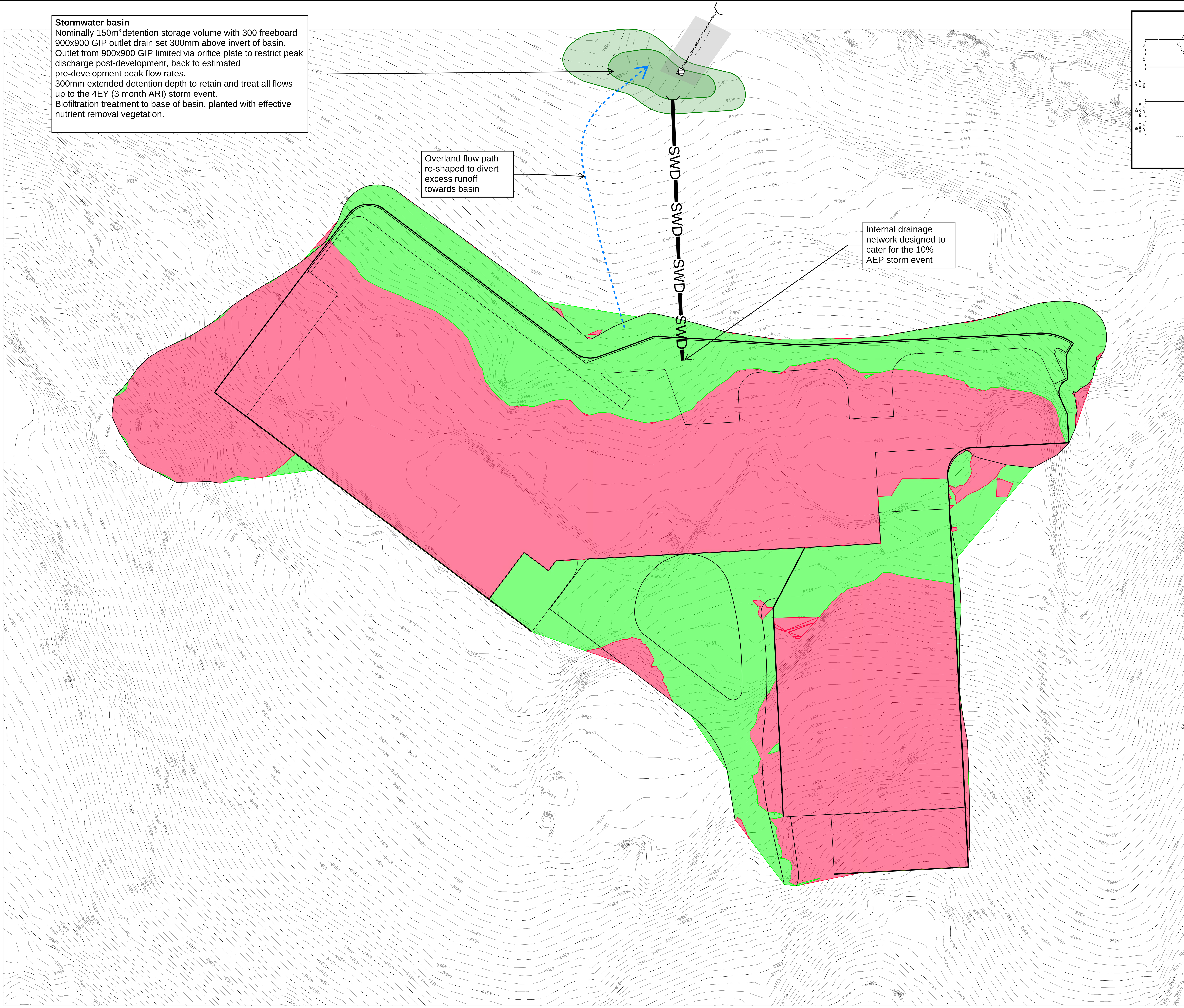
INDICATIVE EARTHWORKS VOLUMES:
CUT = -15838m3
FILL = 3008m3
NET = 12829m3 EXCESS OF CUT OVER FILL

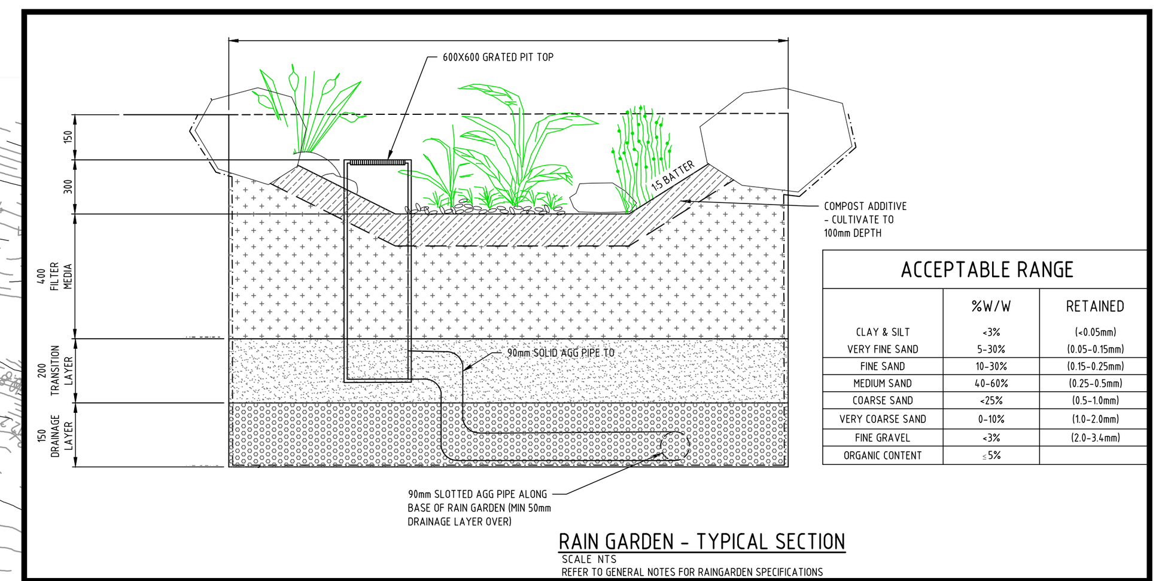
ASSUMPTIONS:
- 100mm TOPSOIL STRIP
- COMPACTION/EXPANSION FACTORS IGNORED
- VOLUMES TO FINISHED LEVELS
- STRUCTURAL FOOTINGS NOT CONSIDERED AT THIS TIME.

NOTE:
CUT/FILL VOLUMES ARE UNRELIABLE & CONTRACTOR SHALL UNDERTAKE THEIR OWN DUE DILIGENCE TO DETERMINE SUITABLE EARTHWORKS ALLOWANCES.

EARTHWORKS LEGEND

EXTENT OF EARTHWORKS CUT (red)
EXTENT OF EARTHWORKS FILL (green)





ACCEPTABLE RANGE	%W/W	RETAINED
CLAY & SILT	<3%	(<0.05mm)
VERY FINE SAND	5-30%	(0.05-0.15mm)
FINE SAND	10-30%	(0.15-0.25mm)
MEDIUM SAND	40-60%	(0.25-0.5mm)
COARSE SAND	<25%	(0.5-1.0mm)
VERY COARSE SAND	0-10%	(1.0-2.0mm)
FINE GRAVEL	<3%	(2.0-3.4mm)
ORGANIC CONTENT	≤5%	

RAIN GARDEN - TYPICAL SECTION
SCALE NTS
REFER TO GENERAL NOTES FOR RAINGARDEN SPECIFICATIONS

SCALE 0 4 8 12 16 20 METRES

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	INIT	APP
A	PRELIMINARY ISSUE	23.09.2022	JS	JC

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SIGNATURE

CLIENT: VENTURE CAPITAL DEVELOPMENTS PTY LTD
PROJECT TITLE: MOUNT LOFTY GOLF ESTATE
SITE ADDRESS: 35 GOLFLINKS RD, STIRLING SA
DRAWING TITLE: EARTHWORKS PLAN

DESIGNED	DRAWN
JS	JS
CHECKED: JC	No. OF SHEETS: -
SCALE: 1:400 AT A1	DATE STARTED: 23.09.2022
SITE ID & JOB No.: S53897_282604	REV.: A
DRAWING No.: C120	

Appendix C

Soil erosion and sediment control plan (SECP)

N

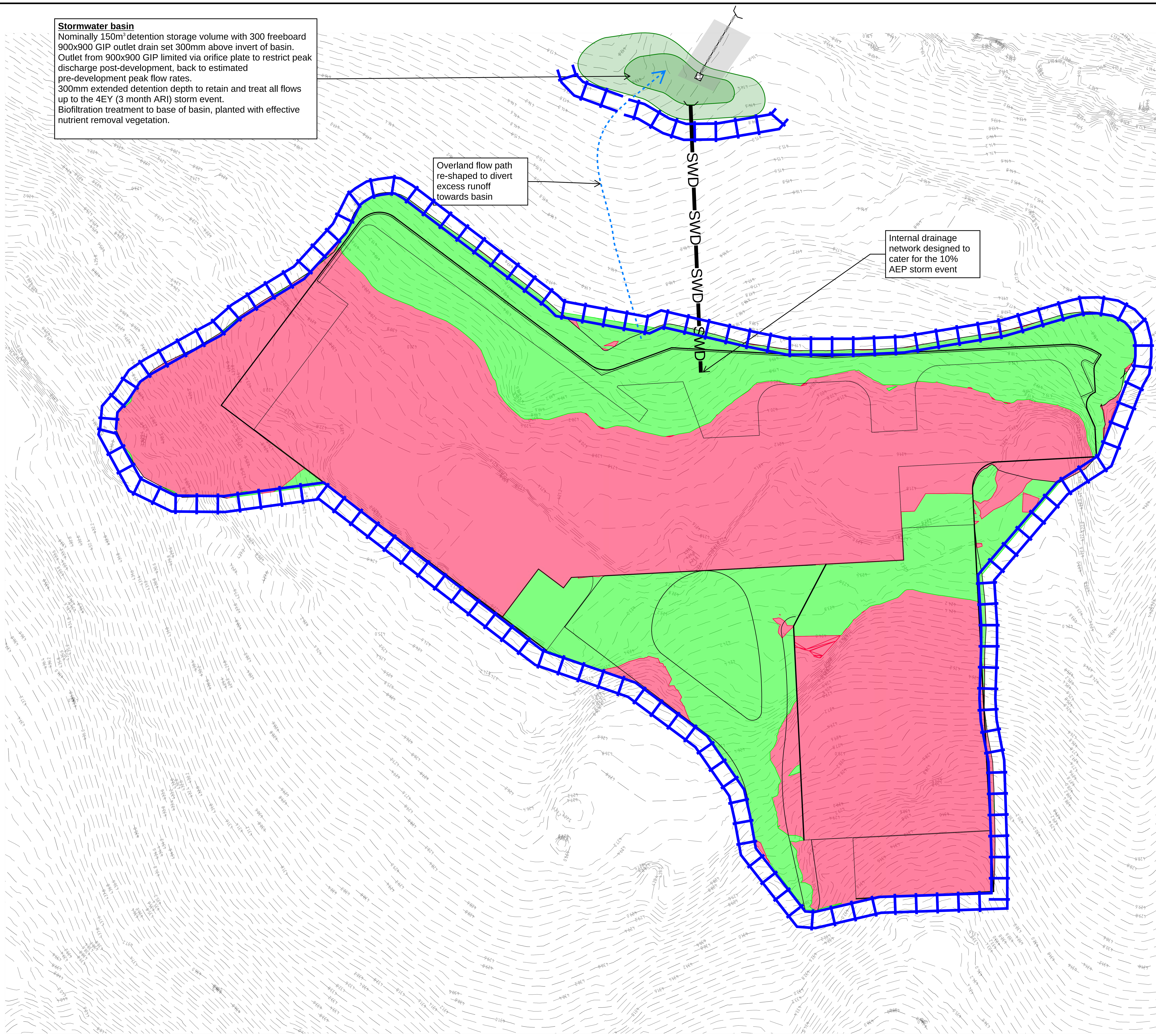
INDICATIVE EARTHWORKS VOLUMES:
CUT = -15838m3
FILL = 3008m3
NET = 12829m3 EXCESS OF CUT OVER FILL

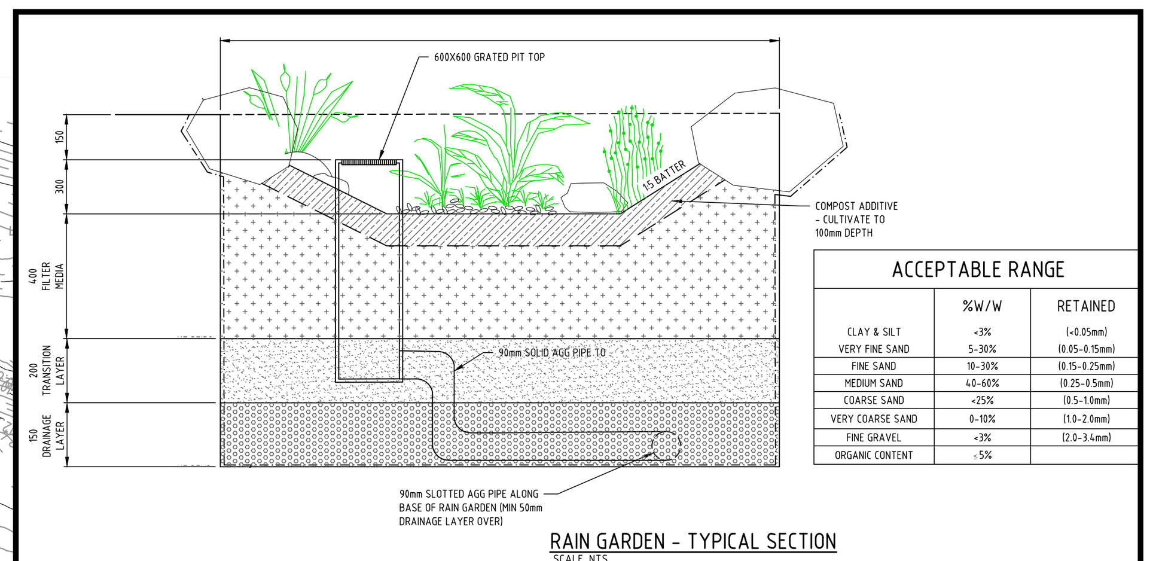
ASSUMPTIONS:
- 100mm TOPSOIL STRIP
- COMPACTION/EXPANSION FACTORS IGNORED
- VOLUMES TO FINISHED LEVELS
- STRUCTURAL FOOTINGS NOT CONSIDERED AT THIS TIME.

NOTE:
CUT/FILL VOLUMES ARE UNRELIABLE & CONTRACTOR SHALL UNDERTAKE THEIR OWN DUE DILIGENCE TO DETERMINE SUITABLE EARTHWORKS ALLOWANCES.

EARTHWORKS LEGEND

- EXTENT OF EARTHWORKS CUT
- EXTENT OF EARTHWORKS FILL
- PROPOSED LOCATIONS OF SILT FENCES





ACCEPTABLE RANGE

	%W/W	RETAINED
CLAY & SILT	<3%	(<0.05mm)
VERY FINE SAND	5-30%	(0.05-0.15mm)
FINE SAND	10-30%	(0.15-0.25mm)
MEDIUM SAND	40-60%	(0.25-0.5mm)
COARSE SAND	<25%	(0.5-1.0mm)
VERY COARSE SAND	0-10%	(1.0-2.0mm)
FINE GRAVEL	<3%	(2.0-3.4mm)
ORGANIC CONTENT	≤5%	

RAIN GARDEN - TYPICAL SECTION
SCALE NTS
REFER TO GENERAL NOTES FOR RAINGARDEN SPECIFICATIONS

SCALE 0 4 8 12 16 20 METRES

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	INIT	APP
A	PRELIMINARY ISSUE	23.09.2022	JS	JC

CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE.

ALL WORK MUST BE EXECUTED IN ACCORDANCE WITH THE RULES, REGULATIONS, BY LAWS AND REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION OVER ANY PART OF THE WORK.

ELECTRONIC COPIES OF THIS DRAWING ARE NOT TO BE USED FOR DIMENSIONAL SETOUT.

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Quality Management Systems ISO 9001 Certified
FMG ENGINEERING

SIGNATURE

CLIENT: VENTURE CAPITAL DEVELOPMENTS PTY LTD	DESIGNED: JS	DRAWN: JS	
PROJECT TITLE: MOUNT LOFTY GOLF ESTATE	CHECKED: JC	No. OF SHEETS: -	
SITE ADDRESS: 35 GOLFLINKS RD, STIRLING SA	SCALE: 1:400 AT A1	DATE STARTED: 23.09.2022	
	SITE ID & JOB No.: S53897_282604		REV.
DRAWING TITLE: EROSION AND SEDIMENT CONTROL PLAN	DRAWING No.: C120		A

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Appendix U

Integrated Water Management Plan and Stormwater Management Plan – FMG

ENGINEERING

Integrated Water Management Plan

IWMP for Mount Lofty Golf Estate

JOB NUMBER:	S53897 - 282604
CLIENT:	Venture Capital Developments Pty Ltd
SITE:	Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152
DATE:	2/04/2024
REVISION:	3

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SYDNEY

Document Status

Rev No.	**Status**	**Author**	**Reviewed by**	**Reviewed Date**
0	For Approval	J Colbert	J Clapp	21.03.2023
1	For Approval	J Colbert	J Clapp	28.03.2023
2	**For Approval Updated Masterplan**	J Colbert	J Clapp	02.04.2024
3	**RFI (PLUS)**	G.Ashtijou	J Clapp	28.05.2024

Table of Contents

Introduction and scope

An Integrated Water Management Plan (IWMP) is a comprehensive approach to managing water resources, namely water supply, rainwater harvesting, stormwater, wastewater, and groundwater resources. The aim of an IWMP is to promote sustainable water use, minimize the impact of development on water resources, and ensure the long-term availability and quality of water resources. This report outlines an IWMP for the proposed development at Mount Lofty Golf Estate, situated within the Adelaide Hills Council. The plan is designed to comply with best practice guidelines and requirements, namely the South Australian Environmental Protection Authority (EPA) and the SA Public Health wastewater requirements.

The Guidelines for the preparation of a Development Report for Mount Lofty Golf Estate, supplied by the State Planning Commission outline the significance of the site, surrounding environment and the risk level surrounding the environmental sustainability, flooding and water quality, surface water and waste management considerations.

Mount Lofty Golf Estate is located within a sensitive watershed catchment, and it is essential to ensure that its water management practices are sustainable and environmentally responsible. This report will provide a roadmap for the implementation of best-practice water management practices that will ensure the long-term viability of the development while protecting the environment and meeting regulatory requirements.

Proposed works

The proposed development is for tourist accommodation and golf course and associated club facilities (ancillary bar, gymnasium and function rooms), together with landscaping, subdivision, tree and native vegetation removal. The proposed development is summarised as follows:

- Construction of a 3-5 level tourist accommodation building comprising 56 units, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments. Together with, back of house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery and cafe and wellness centre.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, cafe and multipurpose function space.
- Golf course facilities building - 2-5 level building comprising function facilities, cart storage and clubhouse, pro-shop, administration areas, gym and change rooms.
- Retention of the 18-hole golf course with improvements.
- Car Parking, access and waste management including a total of 257 car parking spaces, Including:
  - 200 formalised car parking spaces and a porte cochère (set-down/pick-up) facility at the tourist accommodation and golf club facilities building;
  - 20 spaces adjacent to the Perfumery Building accessible from Old Carey Gully Road; and
  - 37 spaces for staff only adjacent to the circulation road connecting from Old Carey Gully Road with further informal parking opportunities within the site.
- Subdivision of the land (1 into 3) allotments to formalise the areas for tourist accommodation, golf course facilities building and balance of the site for leasing purposes.
- Stormwater detention basin, creek and lake restoration activities including planting natives in the beds, erosion control works and creek crossings.
- Construction of entry wall and new entry signage at the existing Golflinks Road entry.
- New dedicated pedestrian trail adjacent Golflinks Road.

A whole of site plan is provided overleaf which details the proposed development.

A site plan and or supporting documentation has been provided within the appendices displaying all water related features and infrastructure for each section of this report as applicable.

Water Balance assessments

DSquared Consulting has undertaken a water balance assessment of the proposed development, summarising the findings below;

The development will achieve at least a 10% reduction in potable water use when compared to a reference building in accordance with the Green Star Buildings v1 rating tool requirements.

Preliminary water balance modelling indicates the development will achieve a 33% reduction in potable water demand when compared with a 'standard practice' reference case as defined by the Green Building Council of Australia. This exceeds Green Star Water Use requirements under the Buildings v1 rating tool.

A 50 kL rainwater storage tank will be provided and harvest rainwater for landscape irrigation, laundry services, and washdown of bin rooms and golf carts, which will contribute 13% of the buildings' total annual water demands, or 25% of the buildings' non-potable water demands.

	Standard practice	**Mount Lofty Golf Estate**
Total water demand (kL p.a.)	6,380	4,884
Rainwater contribution (kL p.a.)	Nil	639 (13% of demand)
Resultant potable water demand (kL p.a.)	6,380	4,245 (33% reduction over standard practice)

Table 1 - Water Balance summary

A copy of the sustainability assessment has been included in Appendix A.

Wastewater Management

FMG Engineering has undertaken an analysis of the wastewater which will be generated from the proposed development (including the Hotel, perfumery and Golf Course facilities) in accordance with the SA Health and WSAA code requirements. This analysis has assessed the volume of sludge accumulated on an annual basis, and the maximum daily effluent flow during a full capacity event such as a function. This value is currently estimated as 51,630 L per day, conservatively taken as 60,000L per day for the purpose of sizing balance tanks and pumping arrangements.

The wastewater generated from the development will be stored within a balance tank with sufficient storage to cater for a power failure period of 1 day, totalling 120,000 L. Effluent from this balance tank will be pumped towards an existing Adelaide Hills Council pump station (Stirling Catchment PS2) which is located within the Golflinks Road Reserve, which shares a boundary adjacent the subject site to the south. This pump station elevates wastewater to ultimately discharge into the SA Water Heathfield Wastewater Treatment Plant (WWTP).

FMG has liaised with Adelaide Hills Council who have advised the existing capacity and pump sizes of the PS2 pump station. Using this information FMG has nominated a new pump flow rate specification (2.6 L/s) to replace the existing pumps (1.5L /s) and provide supplementary emergency storage which will ensure the pump station remains compliant with WSA-04 Sewage Pumping Station Code of Australia. The proposed peak flow within the rising main will remain under 1.5m/s and hence an upgrade of the rising main itself is not necessary.

This approach has been reviewed by the Adelaide Hills Council and preliminary endorsement has been provided by written email which has been included as an appendix to this report.

SA Water was initially contacted in August 2023 when Council supplied preliminary endorsement of the approach, however have been unable to resource the network analysis to confirm additional flows will be able to be received by their sewer reticulation system, and ultimately the Heathfield wastewater treatment plant. FMG will continue to liaise with SA Water to seek confirmation this can be accommodated, however in our experience and anecdotal conversations with SA Water, it seems unlikely that there will be a scenario where additional flows cannot be incorporated into the network, with the only unknown being whether any external augmentation will be required.

Full design calculations, and correspondence with Adelaide Hills Council has been included in Appendix B.

Stormwater

The majority of existing buildings which affect water on site consists of a number of small golf facility buildings (referred to here within as the clubhouse), associated asphalt hardstand for carparking and deliveries, and the perfumery, which is located discretely away from the clubhouse. These buildings are generally located in the location of future development on the site.

To the north and north-east of the existing clubhouse (which coincides with the future hotel location), Cox's Creek can be observed, along with a man made dam which harvests runoff from the northern side of the Cox's Creek and is used for irrigation of the golf course. No works or modifications are proposed to the existing dam or golf course irrigation methods.

1% AEP flood levels within Cox's Creek have been estimated on a high level basis, with results indicating a maximum flow depth of 2.5m from the invert of Cox's Creek. The lowest Finished Floor Level (FFL) within the development is located approximately 5.5m above the invert of the adjacent watercourse, ensuring a minimum freeboard in the order of 3m. This freeboard is sufficiently large enough to mitigate the need for

further studies of the watercourse or flooding. No anecdotal reports of flooding of the current clubhouse buildings were reported by the asset owners.

Cox's Creek runs through the site, flowing in a south easterly direction. Generally, this is located at the low point of the entire golf course site, with smaller tributaries flowing into Cox's Creek. All runoff from the existing buildings flow into Cox's Creek, through a series of formal and informal flow paths. Drainage for the minor system consists of roof drainage, stormwater inlet pits and pipes which can be observed on site and in aerial imagery, but condition, capacity and alignment are not well documented, and assumed to be beyond useful life. To the south of the existing buildings, an upstream catchment of approximately 6ha is observed, and is generally funnelled around the east and west of the clubhouse buildings informally under current conditions.

Under the proposed development, runoff from upstream catchments will be safely routed around the east and west of the proposed building, mimicking existing conditions and protecting the development from inundation. Runoff intercepted by the roof area will be harvested for reuse as outlined within the Water Balance section of this report. Runoff captured at surface level within the hotel will be collected into a minor stormwater pit and pipe network fitted with gross pollutant intercepting baskets, or conveyed via overland flow during a major storm event, towards a stormwater basin located adjacent Cox's Creek. Within this basin a tertiary level water quality improvement will be achieved through use of a bioretention raingarden capable of treating at least the volume of runoff generated by the 4EY ARI in accordance with the EPA and Water Sensitive SA best practice guidelines.

Stormwater collected into the basin will also be detained to ensure post-development peak runoff does not exceed the pre-development peak runoff figures for the minor and major storm respectively. The detention volume held within this basin during the 1% AEP storm event is estimated to be in the order of 150m^3. Should further investigations determine this basin is required to be enlarged, sufficient room exists along the length of Cox's creek to increase the basin size. The basin is likely to be nominated beyond the 1% AEP flood level, however could be designed to be adequately protected within the floodway if required.

All wastewater infrastructure, general waste infrastructure and equipment storage facilities will be nominated within the footprint of the proposed hotel facility, which will be at or above the minimum FFL of 419.80mAHD, and adequately protected from upstream catchments which will be safely diverted around or away from the building along existing overland flow routes.

The detailed stormwater management plan can be found within Appendix C where further calculations are provided.

A review of SARIG mapping suggests a depth to groundwater in the order of 5-10m throughout the subject site. No works are proposed which will affect groundwater, however groundwater may be encountered during construction depending on proposed footing systems.

Conclusion

It is the conclusion of this report that the proposed works can be suitably designed and developed to holistically manage water both on site and within the surrounding catchment to mitigate negative effects on the environment. This assessment has been undertaken with consideration to the EPA, SA Health and WSAA code requirements, along with best practices for stormwater management.

This report will be updated upon receipt of final approvals for proposed wastewater management solutions when received from authorities.

Appendix A

Dsquared Sustainability Report

dsquared

Mount Lofty Golf Estate

Sustainability Strategy Report

D Squared Consulting Pty Ltd
Trading as dsquared
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ABN 38 159 612 067

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Project Number: 2623

Issue	Date	Change	Checked	Approved
01	07/09/2022	Development Report Issue	JB	DD
02	03/03/2024	Minor updates to suit revised Master Plan	JB	DD

Our vision is to think beyond the square.

Our mission is to reduce the impact on the environment of our client's actions by providing innovative solutions, challenging perceived thinking, and pushing the boundaries of achievement whilst using all resources in a sustainable way.

We confirm that all work has been undertaken in accordance with our ISO 9001 accredited quality management system.

Acknowledgement of country

The dsquared team wish to acknowledge the Traditional Custodians of all country throughout Australia, and their cultural, spiritual, physical, and emotional connection with their land, waters, and community. We pay our respects to all Elders past, present, and emerging.

Contents

1 Introduction

1.1 Introduction

This report presents the Sustainability Strategies and Ecologically Sustainable Design (ESD) initiatives proposed for the Mount Lofty Golf Estate development, which will reduce the development's impact on the environment in both construction and operation.

The proposed development has been designed with a holistic approach to ESD, creating an exemplar environment for all users including visitors, guests, and staff, while minimising energy use and greenhouse gas emissions.

This report follows the development of the master plan and building designs by the design team led by R-Architecture. Computer building simulation design techniques have been employed to inform the design initiatives and to assess the sustainability performance of the built form.

1.2 Strategy

The sustainability strategy and outcomes proposed are summarised as follows:

2 Performance

2.1 Green Star certification

The project is registered with the Green Building Council of Australia to obtain a certified Green Star As-Built rating using the new Green Star Buildings v1 rating tool, which is the GBCA's next-generation rating tool replacing the previous 'Design and As-Built v1.3' tool.

The project is targeting a 5 Star outcome under the GBCA's new Buildings v1 rating tool. The GBCA defines 5 Stars as 'Australian Excellence' in sustainable building design.

Obtaining a third-party certified Green Star rating acts as a verification method for the project's ESD design initiatives and modelled performance outcomes. This approach will ensure ESD remains a core part of the project scope throughout the detailed design and construction phases.

2.2 Energy

The development is being designed and will be constructed to meet the energy efficiency requirements of the Green Building Council of Australia's Green Star Buildings v1 rating tool, which are as follows:

- The development will achieve at least 10% better energy and greenhouse gas emissions performance compared with a NCC / BCA 2019 deemed-to-satisfy reference case; and
- The façade and building fabric will exceed the NCC / BCA 2019 deemed-to-satisfy requirements for energy efficiency and thermal performance.

Preliminary modelling of the proposed concept design indicates that the development's **energy consumption will be 25% lower** than a NCC 2019 deemed-to-satisfy reference case, and its **carbon emissions from energy use will be 18% lower**. Refer to section 3 for a list of energy efficiency initiatives which will contribute to achieving these outcomes.

	Reference Building (NCC 2019 code compliant)	Mount Lofty Golf Estate	Improvement
Energy use (MJ p.a.)	3,412,264	2,557,868	25%
CO_2 emissions (kg CO_2e p.a.)	365,214	298,418	18%

Energy modelled performance summary

	Reference Building (NCC 2019 code compliant)			Mount Lofty Golf Estate		
	Electricity kWh p.a.	Gas MJ p.a.	CO_2 emissions kg CO_2e p.a.	Electricity kWh p.a.	Gas MJ p.a.	CO_2 emissions kg CO_2e p.a.
Hotel	375,681	443,790	185,390	387,452	0	162,730
Facilities Building	404,465	159,948	179,824	323,067	0	135,688
Total	**780,146**	**603,738**	**365,214**	**710,519**	**0**	**298,418**

Energy modelled performance results

2.3 Carbon emissions

The development will be all-electric and will not use fossil fuels (natural gas) for heating, cooling, or hot water services, promoting the transition to 100% renewable energy from off-site and on-site sources.

20% of the development's annual electrical demand will be supplied by on-site renewable energy via a rooftop solar PV system.

A Zero Carbon Action Plan will be prepared and will include strategies for how the project will achieve net zero carbon emissions in operation. This includes strategies for phasing-out and eliminating all fossil fuels from the development and transitioning away from petrol- and diesel-powered golf carts and grounds maintenance vehicles and equipment.

2.4 Daylight

All hotel suites and public facilities (golf club, restaurant, and function rooms) have access to daylight in accordance with Green Star standards.

The daylight access has been verified using IES Virtual Environment building computer simulation software, with modelled results as follows. Sample plots from the daylight modelling are provided in Appendix A.

	Occupied floor area (sqm)	Compliant area (sqm) *(Note 1)*	Compliant % *(Note 2)*	Green Star result
Facilities Building	1,802	993	55%	Complies
Hotel Building	3,084	1,488	48%	Complies
Whole development	**4,886**	**2,481**	**51%**	**1 out of 2 points achieved**

Daylight modelling results

Note 1: Compliance target is a minimum of 160 lux of daylight achieved during >80% of daytime hours.
Note 2: Green Star targets are 40% compliant area for 1 point, or 60% for 2 points.

Refer also to Appendix A for sample daylight modelling plots.

2.5 Water

The development will achieve at least a 10% reduction in potable water use when compared to a reference building in accordance with the Green Star Buildings v1 rating tool requirements.

Preliminary water balance modelling indicates the development will achieve a 33% reduction in potable water demand when compared with a 'standard practice' reference case as defined by the Green Building Council of Australia. This exceeds Green Star Water Use requirements under the Buildings v1 rating tool.

A 50 kL rainwater storage tank will be provided and harvest rainwater for landscape irrigation, laundry services, and washdown of bin rooms and golf carts, which will contribute 13% of the buildings' total annual water demands, or 25% of the buildings' non-potable water demands.

	Standard practice	Mount Lofty Golf Estate
Total water demand (kL p.a.)	6,380	4,884
Rainwater contribution (kL p.a.)	Nil	639 (13% of demand)
Resultant potable water demand (kL p.a.)	6,380	4,245
Improvement achieved	-	33%

Water modelling results

3 Initiatives

3.1 Passive Design

The following passive design features are included:

1. Buildings are oriented north which captures free heating from the winter sun. External shade elements and balconies provide shade protection from the summer sun.
2. The building form, façade shading elements, and glazing system specifications have been informed by energy performance modelling and computer simulation techniques.
3. High performance double-glazed facades are provided throughout the development. Glass systems' solar heat gain coefficients (SHGCs) have been optimised for each building type depending on solar exposure, to provide an optimum balance between summer and winter comfort.

   Façade glazing systems will meet the following performance specifications.

	U-value Whole of system $W/m^2.K$	Solar Heat Gain Coefficient (SHGC)	Visible Light Transmittance (VLT)	Glazing system type
Hotel Building	3.2 or less	0.40 or less	45% or higher	Double-glazed Neutral glass with low-E performance coating
Facilities Building	3.2 or less	0.40 or less	45% or higher	Double-glazed Neutral glass with low-E performance coating

Façade glazing performance specifications

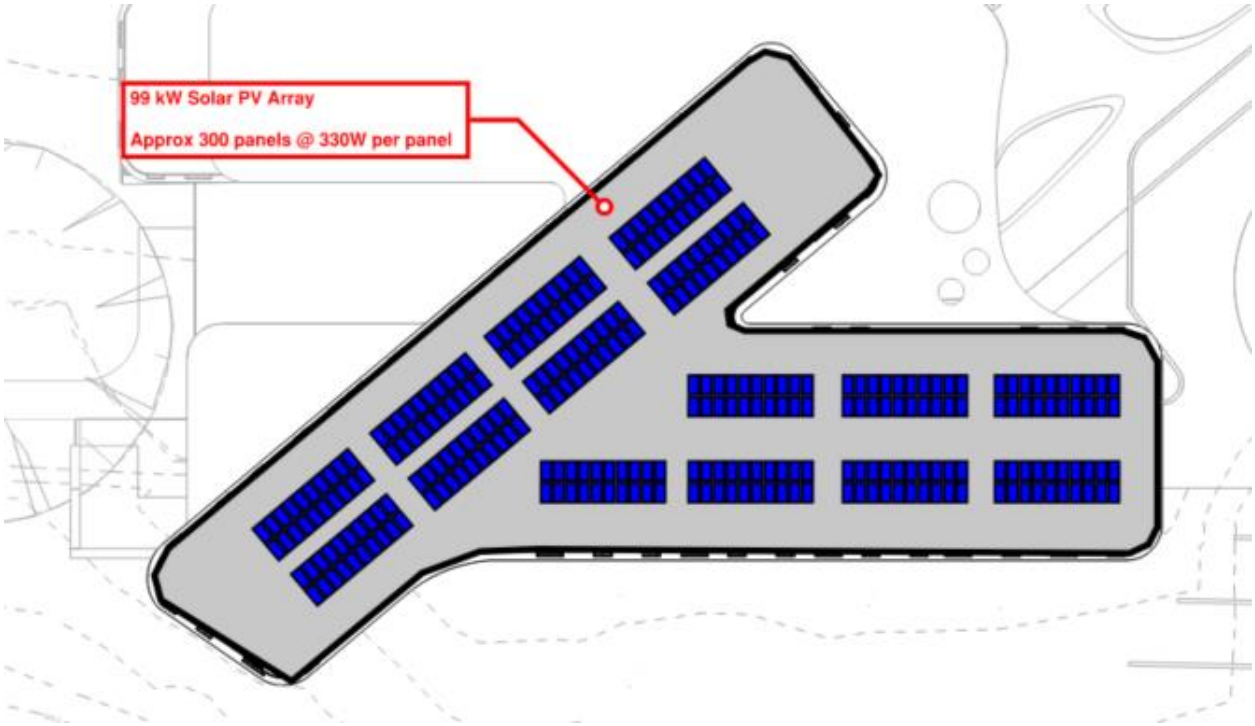
4. Natural ventilation is available in all hotel rooms and the gallery/café space, thereby reducing mechanical cooling demands.
5. The external façade will be subject to air leakage pressure testing to ATTMA standards, and the façade supplier required to meet prescribed air leakage rates as per GBCA / Green Star Standards. As well as significantly reducing the air conditioning energy consumption, this will also improve the indoor air quality, particularly during high external air pressure conditions.
6. Passive cooling from green roof, façade planters, and green landscaping around the buildings. Water transpiration from the plants and landscaping provides a natural cooling effect.
7. Light-coloured roof finishes and landscaping finishes will minimise heat absorption and reduce the heat island effect in accordance with Green Star standards. Roof finishes will have a solar reflective index (SRI) of minimum 82 and hardscaping elements at ground level will have a solar reflective index (SRI) of minimum 39.
8. Daylight is provided to all hotel rooms and indoor public spaces (Restaurant, Function Room, Golf Club and Sports Bar) which reduces artificial lighting demand.

3.2 Energy

The following Energy initiatives are included:

1. The buildings are fully electrified including cooling, heating, hot water, and cooking. No fossil fuels / natural gas services are provided to the buildings.
2. A rooftop solar PV array provides renewable energy to power the building. Energy balance modelling demonstrates the system will provide at least 20% of the site's annual energy demand.

   A solar PV layout sketch is shown as follows (refer also to Appendix B).



Proposed solar PV array

3. HVAC systems comprise high-efficiency air-cooled heat pump thermal plant for heat rejection and heat injection. All central plant is contained within distinct plant enclosures which minimises acoustic impacts and visual obtrusiveness of plant equipment.
   - A ground-loop heat exchange system is being explored as an alternative heat rejection strategy, in collaboration with specialist consultants GeoExchange. This option will further improve heating and cooling system efficiencies and will provide a natural and renewable source of thermal energy from the ground.
4. A shared condenser water loop system will provide heating and cooling energy to the Hotel and Facilities buildings using an efficient centralised approach.
5. Heat recovery between HVAC and domestic hot water systems via the shared condenser water loop system. In summer when HVAC systems are in cooling mode and rejecting heat from the occupied spaces into the condenser water loop, the rejected heat energy will be recovered and used to heat water for showering and other domestic hot water uses.
6. High-efficiency electric heat pump domestic hot water plant. System efficiency rating (Coefficient of Performance) will be in excess of 300% efficient.

7. All hotel rooms have access to natural ventilation via private balconies. Air-conditioning will shut down automatically whenever the balcony door is left open, to save energy when guests choose to open up their room and allow natural ventilation and external breezes to enter.
8. Air-conditioning and lighting in hotel rooms will switch off automatically when rooms are unoccupied.
9. Economy cycle HVAC mode provides free-cooling in public spaces (Restaurant, Function Room, Golf Club and Sports Bar).
10. Demand-controlled ventilation including indoor CO_2 monitoring will reduce thermal loads in public spaces (Restaurant, Function Room, Golf Club and Sports Bar) whilst maintaining a high indoor air quality at all times.
11. Automatic BMS controls for retail and commercial HVAC systems with distinct thermal zoning to suit the comfort needs of individual areas.
12. Energy efficient LED lighting throughout.
13. Energy metering and sub-metering of distinct load centres, connected to a fully integrated BMS.

3.3 Water

The following Water initiatives are included:

1. A rainwater capture and reuse system will provide rainwater for landscape irrigation, laundry services, and washdown of golf carts/waste storage rooms. A 50 kL rainwater storage tank will contribute 13% of the development's total water demand / 25% of non-potable water demand.
2. Landscaping comprises native and drought-tolerant planting species which have low irrigation water demands.
3. Water efficient fittings with the following minimum WELS ratings:
    - Taps 6 Stars
    - WCs 4 Stars
    - Urinals 4 Stars
    - Showers 4 Stars
4. Selecting water-efficient washing machines and dishwashers which are within one Star of the highest available water rating.
5. No water will be consumed for HVAC heat rejection purposes, i.e. no cooling towers. All HVAC heat rejection will be air-cooled or via ground heat exchange.
6. Stormwater systems designed such that pre-development peak stormwater outflows will not be exceeded, and all stormwater run-off will be appropriately treated before discharge to the local waterways. The use of stormwater detention tanks will contribute to meeting these outcomes.

3.4 Waste

The following Waste initiatives are included:

1. Construction waste will be minimised through efficient design techniques including standardisation and off-site pre-fabrication wherever practicable. A minimum 90% diversion from landfill rate will be targeted.
2. Separate bins will be provided for organic waste, recyclable waste, and general waste, to encourage and facilitate diversion of waste from landfill.

3. Waste storage facilities for the collection and disposal of general, recyclable, organic waste, and bulky waste, which will be separated on site to facilitate ease of disposal for recycling.
4. A site-specific Operational Waste Management Plan will be developed in accordance with Green Building Council of Australia guidelines for best practice waste management. The Plan will inform the design of waste storage and handling facilities, waste bin provisions, and signage requirements.

3.5 Indoor Environment Quality

The following Indoor Environment Quality initiatives are included:

1. All hotel suites have access to natural ventilation via private balconies.
2. Mechanical ventilation will be provided to hotel rooms when balcony doors are closed, and to all public spaces. Outside air supplies will be in accordance with Green Star and AS1668.2 minimum requirements.
3. Daylight access is provided in all hotel suites and public spaces (Restaurant, Function Room, Golf Club and Sports Bar) in accordance with Green Star criteria (minimum 160 lux of daylight during at least 80% of daytime hours).
4. Glare from sunlight is managed through a combination of external shade elements, internal blinds, and building orientation (north-facing aspect).
5. Views to the surrounding natural landscapes are available in all occupied spaces.
6. The use of low VOC and low formaldehyde paints, sealants, adhesives, carpets, coverings, and furniture.
7. Acoustic performance in occupied spaces will be in accordance with Green Star and AS 2107 standards. Façade systems, acoustic treatments to internal ceilings and walls, and services plant will be designed to meet Green Star acoustic standards. This includes background noise levels, reverberation levels, and acoustic privacy requirements.
8. Air conditioning systems will be centralised, concealed, and located in acoustically sheltered plant areas, such that external noise will not impact on the amenity of guests, customers, or staff.

3.6 Construction

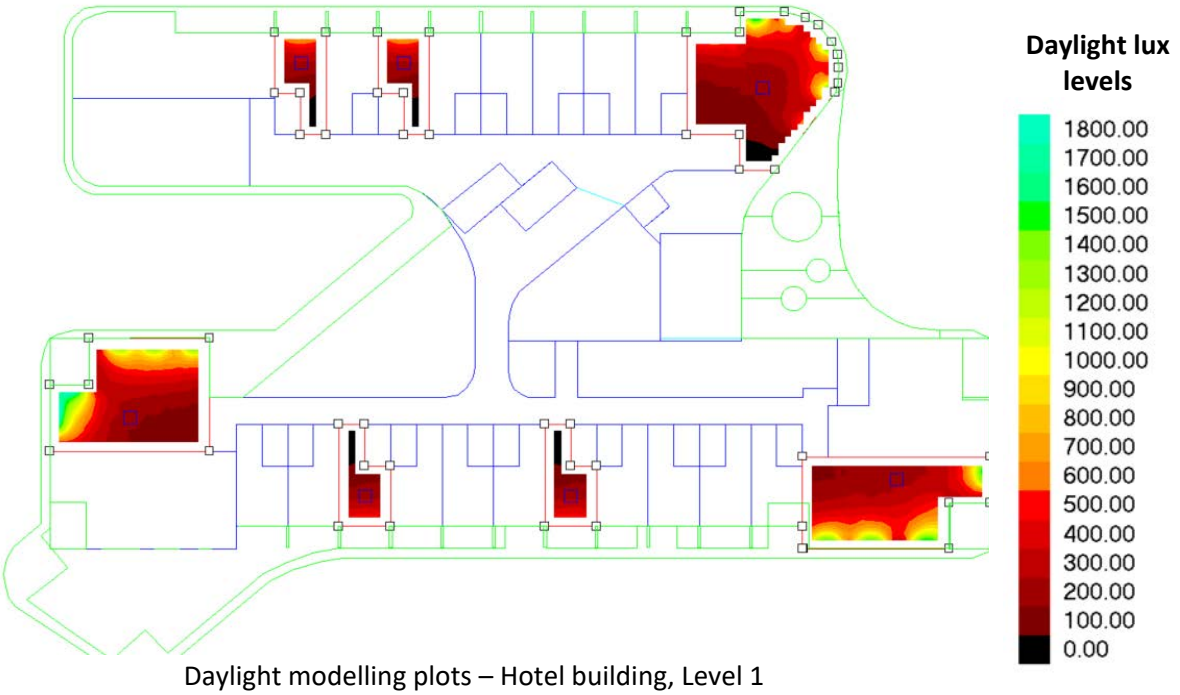
The following Construction initiatives are included:

1. Embodied carbon of construction (i.e. ‘upfront emissions’) will be at least 10% lower than a reference case, in line with Green Star requirements.
2. Refrigerants with low Global Warming Potential (GWP) ratings will be specified for central thermal plant and hot water plant.
3. Building materials which are made from recycled materials e.g. fly ash in concrete, reinforcement bar, recycled content floor coverings, and recycled insulation products, wherever viable.
4. Head contractor will be required to implement an Environmental Management Plan compliant with Green Star standards.
5. Using off site pre-fabrication techniques to reduce on site construction time, waste, and greenhouse gas emissions, wherever practicable.
6. Locally sourced materials and labour will be sought wherever viable.
7. Using Building Information Modelling (BIM) as a design and construction management tool to minimise on-site clashes and abortive/wasteful work.

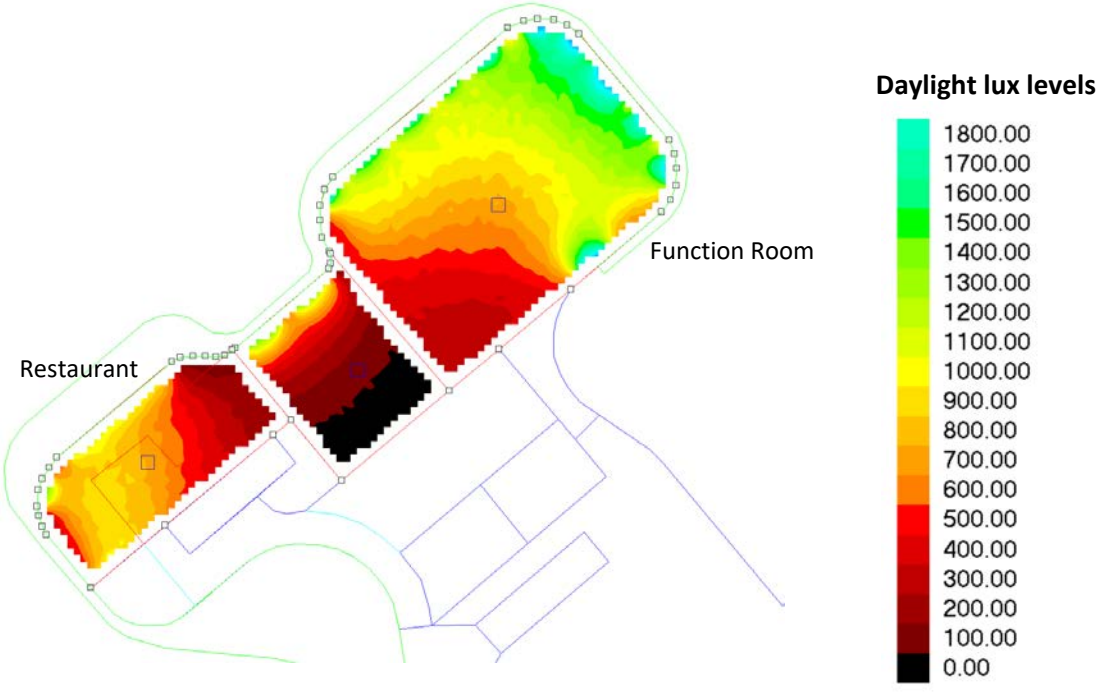
3.7 Community and Social Sustainability

The following social sustainability initiatives are included:

1. The development includes a Wellness Centre, Gym, and extensive common outdoor amenity space.
2. The Facilities building is designed and located as a shared gathering point for various users and visitors including golf players, hotel patrons, restaurant customers, gym users, and Function Room guests. Shared outdoor terraces encourage interaction and community between the various user groups.
3. A communal creche / childcare is provided in the Hotel building.
4. All public spaces have good access to daylight, ventilation, and views to the surrounding landscapes.
5. Heritage listed Scent Factory building from the historic Mount Lofty Flower Farm will be restored as part of the development works, and incorporated as an attraction feature for guests and visitors to the development.
6. Local ecology and vegetation will be featured and integrated into the development.

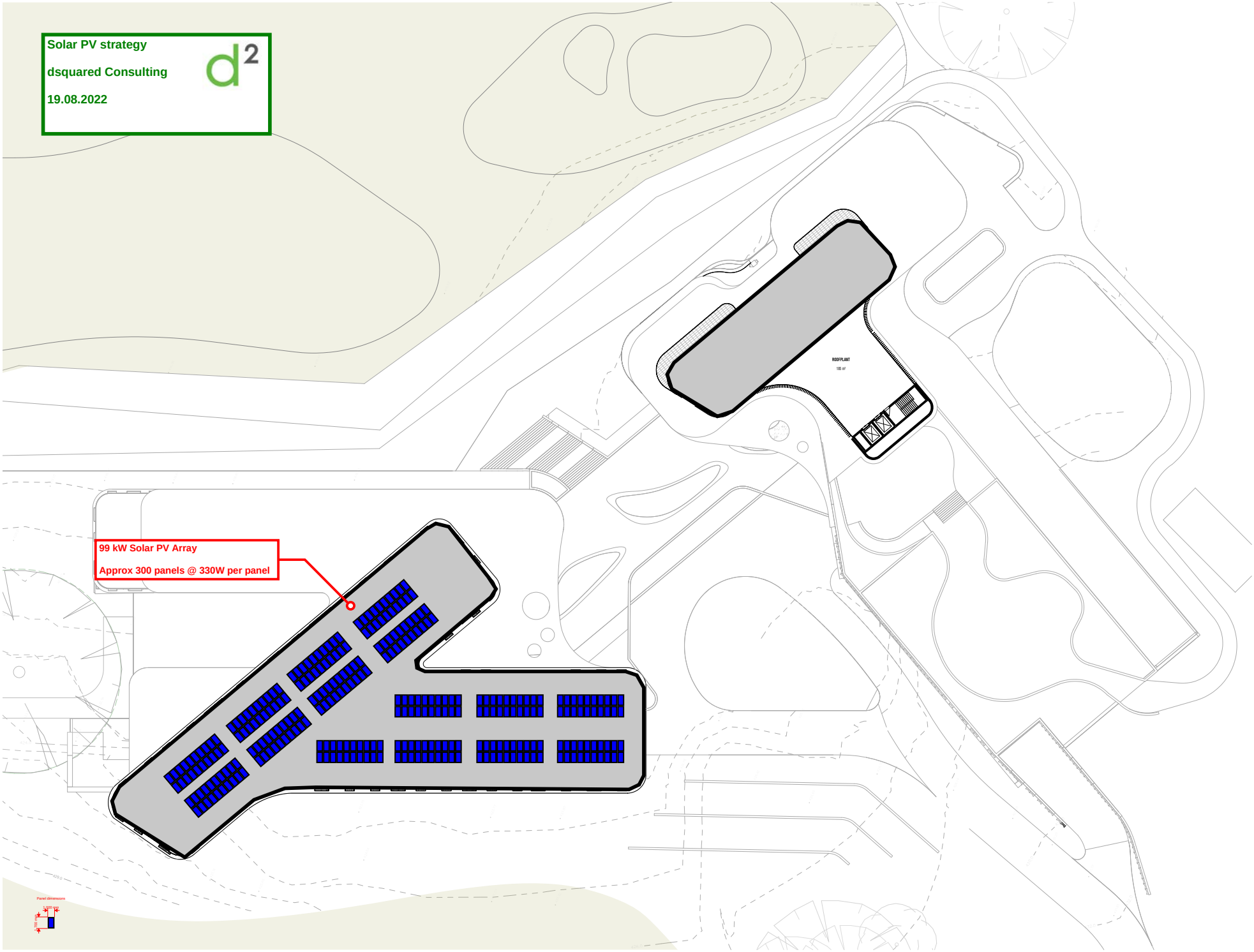


Daylight modelling plots – Hotel building, Level 1



Daylight modelling plots – Facilities building, Level 1

Appendix B Solar PV sketch layout



HOTEL DEVELOPMENT SUMMARY

35 GOLFLINKS RD, STIRLING, SA.

DEVELOPMENT SITE AREA	
HOTEL	
SUITES	56 SUITES
SERVICED APARTMENT - 2 BED	15 APARTMENTS
SERVICED APARTMENT - 3 BED	15 APARTMENTS
PENTHOUSE APARTMENTS	2 APARTMENTS
TOTAL	88 UNITS
PODS	
TOTAL	20 UNITS - 1 BEDROOM
PARKING	
CAR SPACES - MAIN BUILDING	200 SPACES
CAR SPACES - PERFUMERY OVERFLOW	50 SPACES

AREA SUMMARY

AREA TYPE	AREA
FACILITIES	
BACK OF HOUSE / SERV. - LG	1039 m²
BACK OF HOUSE / SERV. - LVL 1	233 m²
GROUND FLOOR - F&B	325 m²
GROUND FLOOR - GOLF	429 m²
LEVEL 1	1393 m²
LEVEL 2	570 m²
LEVEL 3	447 m²
LOWER GROUND	937 m²
SERVICES CORE-L3	54 m²
	5426 m²
FACILITIES CARPARK	
FIRST FLOOR CARPARK	1461 m²
GROUD FLOOR CARPARK	1886 m²
LOADING BAY	67 m²
	3413 m²
HOTEL	
GROUND FLOOR	1095 m²
LEVEL 1	2334 m²
LEVEL 2	1659 m²
LEVEL 3	1921 m²
LOWER GROUND	1149 m²
	8157 m²
HOTEL CARPARK	
HOTEL CARPARK	1352 m²
LOWER GROUND CARPARK	1515 m²
	2867 m²
Grand total: 19	19864 m²

No.	Description	Date
A	CONSULTANT REVIEW	20.10.21
B	DA SUBMISSION	01.12.21

PROJECT
MOUNT LOFT GOLF ESTATE

ADDRESS
35 GOLF LINKS ROAD, STIRLING SA 5152

Scale@A1	1:250
Scale@A3	1:500
Date:	01.12.21
Drawn:	Author

SHEET NAME
LEVEL 3 PLAN

SHEET NO.
TP06

REVISION:
B

PRELIMINARY *NOT FOR CONSTRUCTION*

r architecture
architecture | interior design | urban design | landscape
ph: 8362 0328 e: studio@rarchitecture.com.au

Appendix B

Preliminary Wastewater Management Plan
Council Endorsement of preliminary plan

ENGINEERING

Engineering your success.

ADELAIDE
MELBOURNE
SYDNEY

Ref: 282604 / S53897
28/03/2023

Re: Wastewater proposal at Mount Lofty Golf Estate

FMG Engineering has been engaged to prepare a plan for managing wastewater generated by the proposed development at Mount Lofty Golf Estate.

The subject site is located within the Adelaide Hills Council (Council), which operates and maintains a number of community waste management schemes (CWMS) to service areas which cannot drain sewer via gravity to SA Water infrastructure, as is the case with the subject development site. Adjacent to the site, no SA Water infrastructure is present, however a Council owned and operated pump station is present on the corner of Old Carey Gully Road, and Spring Gully Road.

FMG Engineering has presented a preliminary wastewater management plan to Council that has been endorsed and supported which can be summarised as;

- Collection of wastewater from all wastewater generating facilities into septic tanks which are desludged on a yearly basis
- Residual effluent from the septic collection will be conveyed into a holding tank, and pumped to the existing Council pump station on Golflinks Road at nominally 1.4 L/s.
- Council's existing pump station will be upgraded from the current 1.5L/s capacity, to a new pump capacity of 2.6L/s within the existing rising main. Additionally, a further 20m^3 of emergency storage will be provided below ground at the Council pump station.

On the above in principal support, FMG has prepared preliminary wastewater calculations in accordance with SA Health and WSAA code requirements which provides indicative minimum sizing of septic tanks. Final details will be confirmed to the satisfaction of Adelaide Hills Council and SA Water during detailed design. A schematic has also been attached for reference.

This letter outlines a feasible plan for managing wastewater which can be assessed for planning purposes, with final details to be confirmed and approved by SA Health and referred to Adelaide Hills Council as the approving authorities.

Yours sincerely

Jordan Colbert

National Civil Manager
FMG Engineering

Attached: Wastewater calculations
Schematic plan

Desludge Rate 1 years

Accommodation

Sludge/Scum Rate (S)	48	L/person/year
Daily Flow (DF):	100	L/person/day

Non-resident staff

Sludge/Scum Rate (S)	25	L/person/year
Daily Flow (DF):	30	L/person/day

Function centre (Seminar/Conference)

Sludge/Scum Rate (S)	35	L/person/year
Daily Flow (DF):	40	L/person/day

Restaurant

Sludge/Scum Rate (S)	35	L/person/year
Daily Flow (DF):	20	L/person/day

Sports Bar

Sludge/Scum Rate (S)	5	L/person/year
Daily Flow (DF):	10	L/person/day

Gallery Café

Sludge/Scum Rate (S)	30	L/person/year
Daily Flow (DF):	10	L/person/day

Perfumery Restaurant

Sludge/Scum Rate (S)	35	L/person/year
Daily Flow (DF):	20	L/person/day

Golf course facilites included in numbers above

Number of single bed equivalents (P1)	Number of single bed equivalents (P2)	
305	305	45140 L

Number of staff per shift x number of shifts (I	Number of staff per shift x number of shifts (P2)	
101	101	5555 L

Total seating capacity (P1)	Total seating capacity (P2)	
270	270	20250 L

Average daily number over 7 days (P1)	Highest daily number over 7 days (P2)	
50	100	3750 L

Average daily number over 7 days (P1)	Highest daily number over 7 days (P2)	
80	160	2000 L

Average daily number over 7 days (P1)	Highest daily number over 7 days (P2)	
85	170	4250 L

Average daily number over 7 days (P1)	Highest daily number over 7 days (P2)	
50	100	3750 L

Sludge	39515	L/year		
Total Daily Flow	51630	L	**Tank Size**	**84695** L
			(SxP1xY) + (PSxDF)	

All commercial kitchens are to have grease arrestors fitted and sized using SA Water guidelines

Desluge rate to be every **1 years**

	Project				Job Ref.	
FMG ENGINEERING	Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152				282604 - S53897	
	Section				Sheet no./rev.	
	Balance Tank Calculations				1 / D	
	Calc. by	Date	Chk'd by	Date	App'd by	Date
	Jarrad Barford	23/03/2023	Jordan Colbert	23/03/2023		

Internal wastewater pump and holding tank design

As per Wastewater Calculations total maximum daily effluent flow is 51,630L.

To allow for an additional buffer round this volume up to 60,000L.

Due to the size of the development it is assumed that backup generators will be installed on site. Allow for a worst-case power failure period of 1 day.

Balance tank to be 120,000L in size.

This volume is to be completely emptied before the next peak cycle occurs. This is assumed to be the following day, i.e. subsequent events. On this basis the total tank volume must be empited within 24 hrs.

120000 L/ (24x60x60) = 1.389L/s ≈ 1.4L/s

Two pumps of pump rate 1.4L/s shall be provided, the two pumps shall be configured to automatically alternate as the duty pump.

Downstream receiving pump station capacity

Adelaide Hills Council has provided a series of calculations outlining the current capacity of the Stirling STEDS network;

- We understand there are two pump stations as part of the Stirling STEDS network;
  - PS1 on Golf Links Road (at the eastern end of Golflinks Road) which pumps effluent towards PS2
  - PS2 at the intersection of Golf Links Road, and Golf Links Close, which receives flow from PS1, and is then assumed to pump onwards to SA Water infrastructure outside of AHC's control.
- To mitigate upgrading two pump stations, we have revised our proposal to show the rising main to be connected to PS2
- Due to the increased inflow rate (an additional 1.4 L/s as per the attached balance tank sizing calculations sheet, the pumps within PS2 will need to be upgraded. Our review of the calculations package suggests a new pump capacity of 2.6L/s may be appropriate, as this keeps velocities within the 50mm rising main to <1.5m/s and approximately 80m of head loss.
- The increased inflow results in a deficiency in emergency storage at PS2. As a result, an additional 20m^3 of supplementary emergency storage is proposed to augment to the existing pump station. This will take the form of a concrete chamber below ground adjacent the pump station which will be linked. All storage will be provided between the invert and high level alarm elevation. Provision of this additional storage ensures an emergency storage % of ADF of 50.7% is achieved, aligning with the WSAA requirements for >50% emergency storage.

Stirling STEDS - Pump Stations Summary

							Entire Network power failure			Local station failure			
Pump Station	Location	Pump discharge (L/s)	Peak Inflow (L/s)	Pump Rate > Peak Inflow	Pump rate achieves % of peak inflow	Storage above HLA (m^3)	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	Comment
PS1	End of Golf Links Road	1.000	0.221	Yes	452%	6.795	25.60	Yes	106.7%	25.60	Yes	106.7%	
PS2	Golf Links Road near Golf Links Close	1.500	0.953	Yes	157%	14.379	16.38	Yes	68.2%	12.58	Yes	52.4%	

Council capacity summary under Existing Conditions at the Stirling STEDS pump network

Stirling STEDS - Pump Stations Summary

							Entire Network power failure			Local station failure			
Pump Station	Location	Pump discharge (L/s)	Peak Inflow (L/s)	Pump Rate > Peak Inflow	Pump rate achieves % of peak inflow	Storage above HLA (m^3)	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	Storage at ADF (hours)	> 5 hours (20%) storage @ ADF?	emergency storage % of ADF	Comment
PS1	End of Golf Links Road	1.000	0.221	Yes	452%	6.795	25.60	Yes	106.7%	25.60	Yes	106.7%	
PS2	Golf Links Road near Golf Links Close	2.600	2.353	Yes	111%	34.379	39.16	Yes	163.2%	12.18	Yes	50.7%	Additional 1.4L/s inflow, accordingly pump discharge has been increased to 2.6 L/s. Additional 20m3 of storage volume also to be provided at PS2 to achieve a minimum 50% emergency storage volume

Council capacity summary following connection of proposed 1.4 L/s additional inflow.

SITE MASTERPLAN

LEGEND

1. Old Carey Gully Road Access
2. Staff carpark
3. Perfumery carpark
4. Perfumery courtyard
5. Tree orchard
6. Perfumery gardens
7. Cox Creek improvements
8. Heysen trail connection
9. Stormwater quality improvement basin
10. Deck
11. Lawn terrace
12. Practice putting green
13. Tourist accommodation drop-off
14. Pedestrian concourse
15. Golflinks road main access
16. Entry Avenue
17. Emergency maintenance vehicle access only
18. Dedicated pedestrian trail

KEY

- Internal path
- Internal driveway
- Heysen trail connection
- Carpark entries
- Sewer holding tank
- Perfumery sewer tank
- Stormwater basin
- Roof rainwater drainage pipe
- Internal drainage pipe
- Overland flow direction
- Gravity sewer from hotel
- Sewer rising main to pump station
- Perfumery gravity sewer
- Existing rising main to pump station
- Existing rising main to treatment plant

ECOLOGY

- Creek Revegetation zone
- Revegetation zone
- Trees to be removed

OLD CAREY GULLY ROAD

HEYSEN TRAIL

PERFUMERY

COX CREEK

TOURIST ACCOMMODATION

35M BUFFER

35M BUFFER

GOLFLINKS ROAD

GOLFLINKS ROAD

MANNA GUM AVE

TO S.E. FREEWAY

WASTEWATER GENERATED AT PERFUMERY TO BE COLLECTED INTO SMALLER SEPTIC TANK LOCATED AT THE PERFUMERY AND THEN PUMPED TO HOLDING TANK

PROPOSED GRAVITY SEWER FROM HOTEL, AND GOLF FACILITIES TOWARDS SEPTIC TANK SIZED TO MEET SA HEALTH REQUIREMENTS.

EFFLUENT TO BE CONVEYED INTO HOLDING TANK, AND PUMPED AT APPROVED FLOW RATE VIA RISING MAIN TO EX. ADELAIDE HILLS COUNCIL PUMP STATION PS-2. HOLDING TANK, PUMP SPECIFICATION TBC IN CONJUNCTION WITH PUMP STATION UPGRADE DISCUSSIONS WITH ADELAIDE HILLS COUNCIL.

EXISTING ADELAIDE HILLS RISING MAIN CONVEYING FLOWS SOUTH TO SA WATER TREATMENT PLANT

EXISTING ADELAIDE HILLS COUNCIL STIRLING STEDS SYSTEM PUMP STATION 2 - PS2.

UPGRADE EXISTING PUMPS TO NEW PUMPS CAPABLE OF 3 L/S. NO MODIFICATION TO EMERGENCY STORAGE BELIEVED TO BE REQUIRED.

EXISTING ADELAIDE HILLS RISING MAIN PS1 TO PS2

EXISTING ADELAIDE HILLS COUNCIL PUMP STATION - PS1 .

PS1 PUMPS TO PS2

Mount Lofty Golf Estate

oxigen

1:1500 (A1), 1:3000 (A3)

0 10 25 50m

N

Jordan Colbert

From: Kim Krieg <kkrieg@ahc.sa.gov.au>
Sent: Friday, 24 March 2023 7:13 AM
To: Jordan Colbert
Cc: Ari Mudugamuwa
Subject: Stirling Golf Course Development
Attachments: RE_ MLGE - Preliminary Wastewater discussions current proposal.eml

Hi Jordan,

Thanks for the chat yesterday regarding the above development. I can confirm that Council has in principle support for the proposed development including upgrade to Council's Golflinks Rd CWMS pump station 2 infrastructure located opposite Golflinks Court, Stirling. The developer will be responsible for all augmentation charges associated with the proposed pump station 2 upgrade and must seek approval from SA Water to discharge into their infrastructure.

Once the application is lodged further discussions can take place regarding the necessary upgrade.

Kind regards

Kim

Kim Krieg (Pearson)
Community Wastewater Management System (CWMS) Technical Officer
Adelaide Hills Council

p 08 8408 0410
e kkrieg@ahc.sa.gov.au
w ahc.sa.gov.au

Visit me at: 63 Mount Barker Road, Stirling SA 5152
Postal: 63 Mount Barker Road, Stirling SA 5152

Appendix C

Stormwater Assessment Report

ENGINEERING

Stirling Golf Course

Stormwater Management Plan

JOB NUMBER:	S53897 - 275203; 282604
CLIENT:	Venture Capital Developments Pty Ltd
SITE:	Stirling Golf Club, 35 Golflinks Road, STIRLING, SA 5152
DATE:	02/04/2024
REVISION:	E

Engineering your success.

ADELAIDE
MELBOURNE
SYDNEY

Document Status

REV NO.	STATUS	AUTHOR	REVIEWER			APPROVED FOR ISSUE		
			NAME	SIGNATURE	DATE	NAME	SIGNATURE	DATE
A	For Lodgement	J Colbert	Jeremy Clapp	JHC	28.11.2021	Jordan Colbert	JTC	28.11.2021
B	For Approval	J Colbert	Jeremy Clapp	JHC	24.11.2022	Jordan Colbert	JTC	24.11.2022
C	For Approval	J Colbert	Jeremy Clapp	JHC	1.12.2022	Jordan Colbert	JTC	1.12.2022
D	For Approval	J Colbert	Jeremy Clapp	JHC	02.04.2024	Jordan Colbert	JTC	02.04.2024
E	RFI (PLUS)	G.Ashtijou	Jeremy Clapp	JHC	28.05.2024	Jeremy Clapp	JHC	28.05.2024

Table of Contents

Introduction

FMG Engineering has been engaged by Venture Capital Developments Pty Ltd to undertake a preliminary stormwater assessment and develop a preliminary Stormwater Management Plan for a proposed development of the Stirling Golf Club. The Stirling Golf Course is located in the Adelaide Hills approximately 18km south east of the Adelaide CBD between Stirling and Bridgewater and is situated on the north side of the South Eastern Freeway. T

This preliminary Stormwater Management Plan describes the assessment undertaken and addresses the requirements provided by Adelaide Hills Council's engineering and planning departments.

Site Description

The site is located at 35 Golflinks Rd, Stirling SA 5152 as shown in Figure 1. The site is bounded by Old Carey Gully Rd to the North West, Golflinks Rd to the South West and Mount George Conservation Park to the East and South East. The Golf Course is surrounded by several land use zones including Country Living, Watershed (Primary Production) and Public Purpose zones.

The Cox Creek runs through the site in a south easterly direction. The site is undulating with a general downwards slope towards the south east. The catchment area of the Cox Creek upstream of the Golf Course has been estimated using local contour data available in NatureMaps.

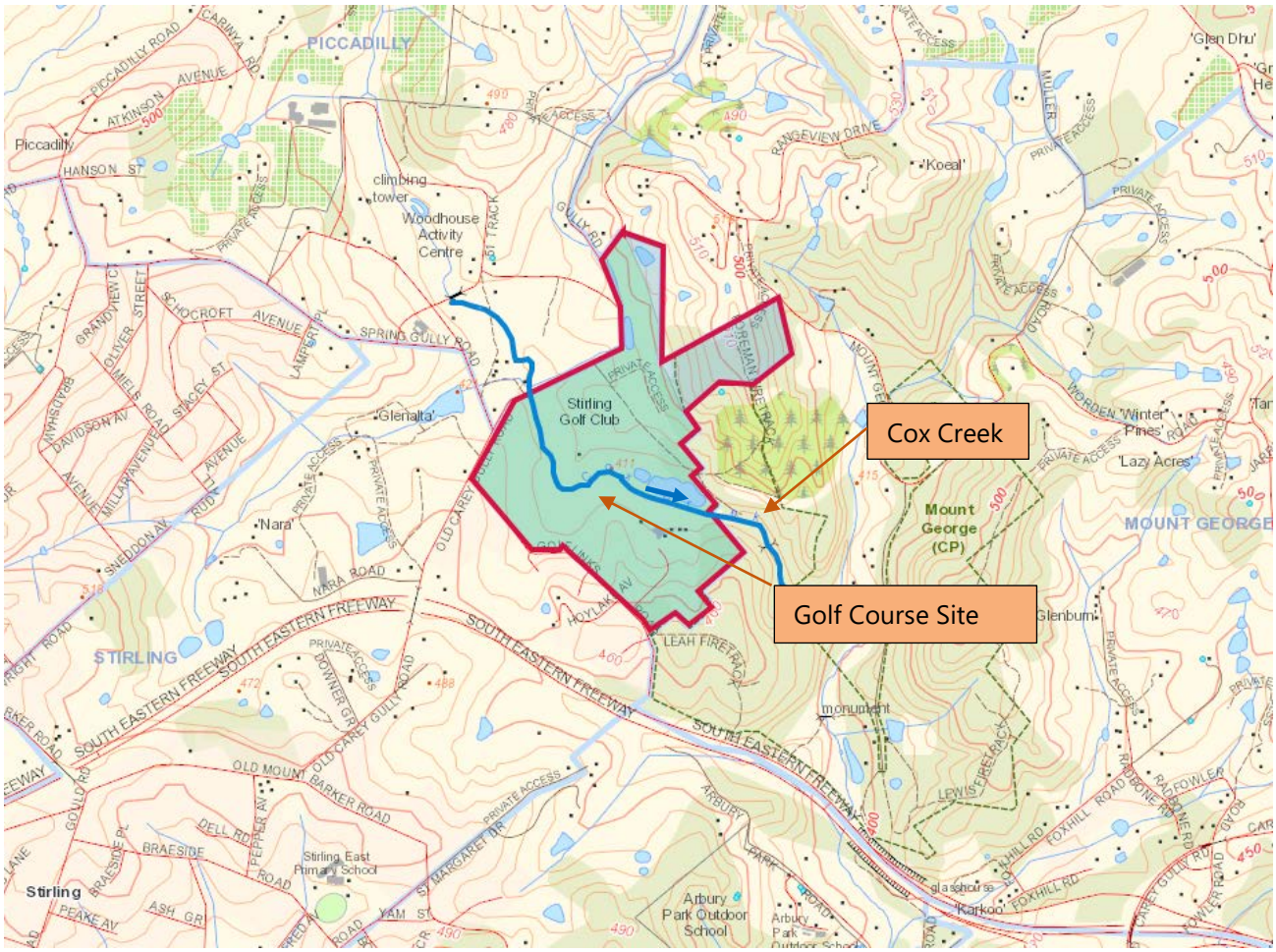


Figure 1 - Site locality plan (Nature Maps)

Proposed Development

The proposed development is for tourist accommodation and golf course and associated club facilities (ancillary bar, gymnasium and function rooms), together with landscaping, subdivision, tree and native vegetation removal. The proposed development is summarised as follows:

- Construction of a 3-5 level tourist accommodation building comprising 56 units, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments. Together with, back of house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery and cafe and wellness centre.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, cafe and multipurpose function space.
- Golf course facilities building - 2-5 level building comprising function facilities, cart storage and clubhouse, pro-shop, administration areas, gym and change rooms.
- Retention of the 18-hole golf course with improvements.
- Car Parking, access and waste management including a total of 257 car parking spaces, Including:
  - 200 formalised car parking spaces and a porte cochère (set-down/pick-up) facility at the tourist accommodation and golf club facilities building;
  - 20 spaces adjacent to the Perfumery Building accessible from Old Carey Gully Road; and
  - 37 spaces for staff only adjacent to the circulation road connecting from Old Carey Gully Road with further informal parking opportunities within the site.
- Subdivision of the land (1 into 3) allotments to formalise the areas for tourist accommodation, golf course facilities building and balance of the site for leasing purposes.
- Stormwater detention basin, creek and lake restoration activities including planting natives in the beds, erosion control works and creek crossings.
- Construction of entry wall and new entry signage at the existing Golflinks Road entry.
- New dedicated pedestrian trail adjacent Golflinks Road.

A whole of site plan is provided in the Appendix which details the proposed development.

The current building and carpark facilities situated up the hill and to the south west of the lake have a total hard surface area of approximately 5,000m^2. Preliminary measurements indicate that the proposed development buildings and carparks have a total hard surface area of approximately 8,300m^2. This increased hard surface area of 3,300m^2 represents <1% of the golf course area.

Stormwater Management

Current Site Drainage

Cox Creek enters the golf course site from the north as it passes under Old Carey Gully Road and runs through the site in a south easterly direction. The creek exits the site to the east, continues in a south easterly direction and passes under the South Eastern Freeway approximately 1,250m downstream of the site.

Preliminary investigations indicate the catchment area of Cox Creek upstream of the site exit point is approximately 2,000Ha. This catchment area includes sections of Summertown, Carey Gully, Crafers and Piccadilly and includes residential, primary production and public purpose land use areas. The approximate catchment area of Cox Creek upstream of the golf course site is shown in Figure 3.

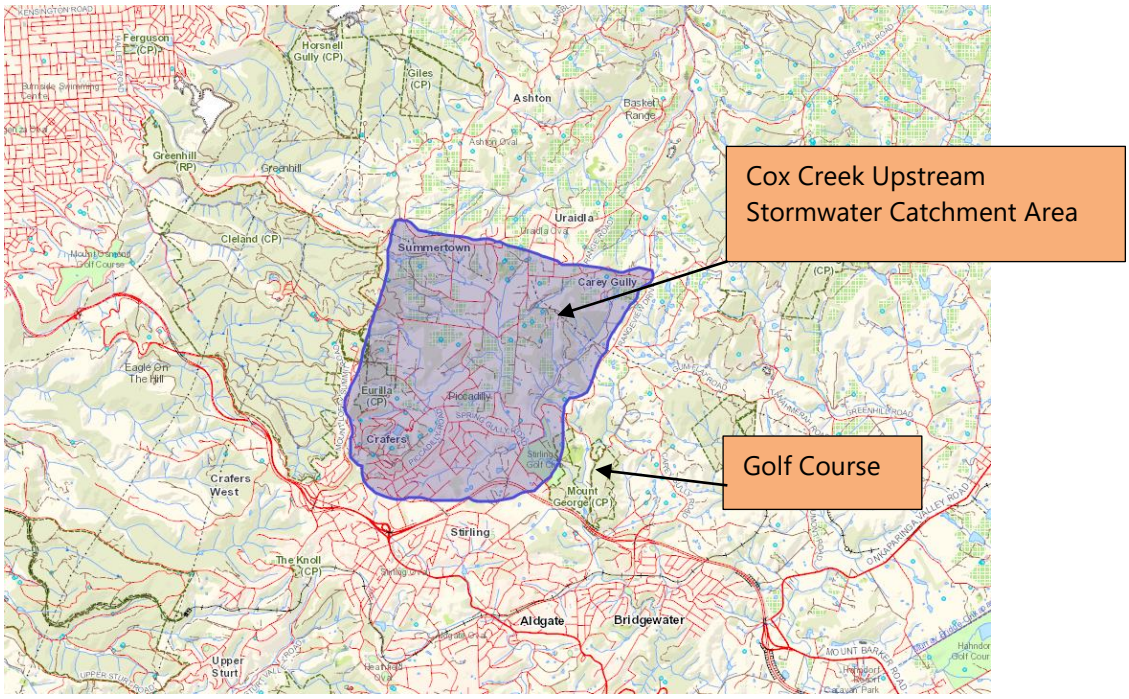


Figure 2 – Approximate Upstream Catchment Area of Cox Creek (Nature Maps)

BOM Rainfall data for Piccadilly Station 23891 indicates an average annual rainfall of 1068mm with the highest rainfalls occurring in the winter months as expected. A summary of the previous 20 years of data is provided in Table 1.

Table 1 – Piccadilly Rainfall Data Summary

Month	Mean (mm)	5th percentile (mm)	95th percentile (mm)
Jan	37.5	11.2	81
Feb	34.6	1.3	83.9
Mar	38.6	11.7	80.3
Apr	68.9	6.6	167.2
May	133.3	68.3	191.1
June	149	19.2	226.1
July	160.6	66.6	276.6
Aug	147.9	43.6	243
Sep	119.4	48.5	222.8
Oct	68.1	2.8	179.4
Nov	51.5	13.8	120.7
Dec	53.3	20.1	141.5
Annual	1068.6	933.1	1227.4

Source: BOM Rainfall Data 2001 – 2020 Piccadilly Station 23891

Stormwater Management Requirements

This stormwater management plan will address the following State Planning Commission requirements (with other items within the specialist reporting provided by others);

- Integrated Water Management Plan (IWMP);
    - Infrastructure for the storage and treatment of stormwater
    - Predicted stormwater generation volumes and details of stormwater quality improvements, including the location and sizing of the bio-retention swales and basins, anticipated quality improvements and details of any other proposed stormwater quality treatment features.
    - Whole site, upstream catchment and downstream stormwater discharge point
    - (balance of IWMP provided by others reporting)
- Demonstration of no stormwater nuisance or flooding to occur on downstream properties due to the development
- Compliance with Council and Natural Resource Management Board requirements

It is noted that a surface water management plan has been included within the Construction Environmental Management Plan (CEMP) prepared by FMG as a separate report.

Adelaide Hills Council Stormwater Drainage Design Guidelines for Submission of Engineering Plans for New Developments require the following to be considered;

- The designer ensure that the proposed development within the drainage reserves such as fences of facilities shall not obstruct the path of flows from major storm events
- The major drainage network shall have the capacity to control stormwater flows under normal and minor system blockage (50% blockage) conditions for an ARI 1 in 100 years
- The drainage system shall be designed to ensure that the landform of watercourses is stabilised and that erosion is minimised
- All dwellings must be protected from inundation during a flood of 1 in 100years ARI
- The drainage system shall be designed to ensure that flows downstream of the site are restricted to pre-development levels, unless council approves increased flows
- Underground stormwater systems designed to convey the minor 1 in 10 year ARI storm event
- Minimum 300mm freeboard to the 100 year ARI flood / ponding level

Further to the above, FMG recognises the sensitive urban environment the proposed development is located within, and following feedback from the EPA during pre-lodgment meetings, understand there to be a need for a tertiary level stormwater quality system to be implemented on site which fully complies with the South Australian EPA water quality reduction targets for runoff generated by the development;.

- 80% retention of the typical urban annual load for Total Suspended Solids (TSS)
- 60% retention of the typical urban annual load for Total Phosphorus (TP)
- 45% retention of the typical urban annual load for Total Nitrogen (TN)
- 100% retention of the typical urban annual load for Gross Pollutants (litter)

Stormwater Assessment

Proposed Development Drainage

Stormwater drainage of the golf course facilities situated to the south west and uphill of both Cox Creek and the existing dam / lake observed on site. Lake levels are managed through pumping of stormwater local storage ponds throughout the golf course, and is utilised for irrigation. Peak levels within the lake are managed via a weir which spills into Cox Creek when full.

Surface run off from the subject development area, and further upstream catchments drains into open drains associated with the carpark retaining wall and runs into entry pits and underground stormwater pipes. This runoff is currently diverted towards Cox Creek.

It is envisaged that where possible, existing drainage pits and pipes will be retained to minimise the construction impact of the development. Generally, the new stormwater pit and pipework will be laid within the building footprint and collect all rainwater runoff for storm events up to the minor storm event (10 year ARI) into a below ground drainage pipe. Major storm events which exceed the drainage pipe capacity will travel overland towards the north. Roof runoff will be collected into downpipes and conveyed into a rainwater retention tank (designed and documented by others with water balance calculations to support) with 100 year ARI overflows connected into the below ground outlet drain.

Discharge from the underground drain, and major storm overland flow will be conveyed into a new detention and water quality improvement stormwater basin located adjacent Cox's creek. The stormwater basin will be sized during detailed design to achieve the following performance requirements;

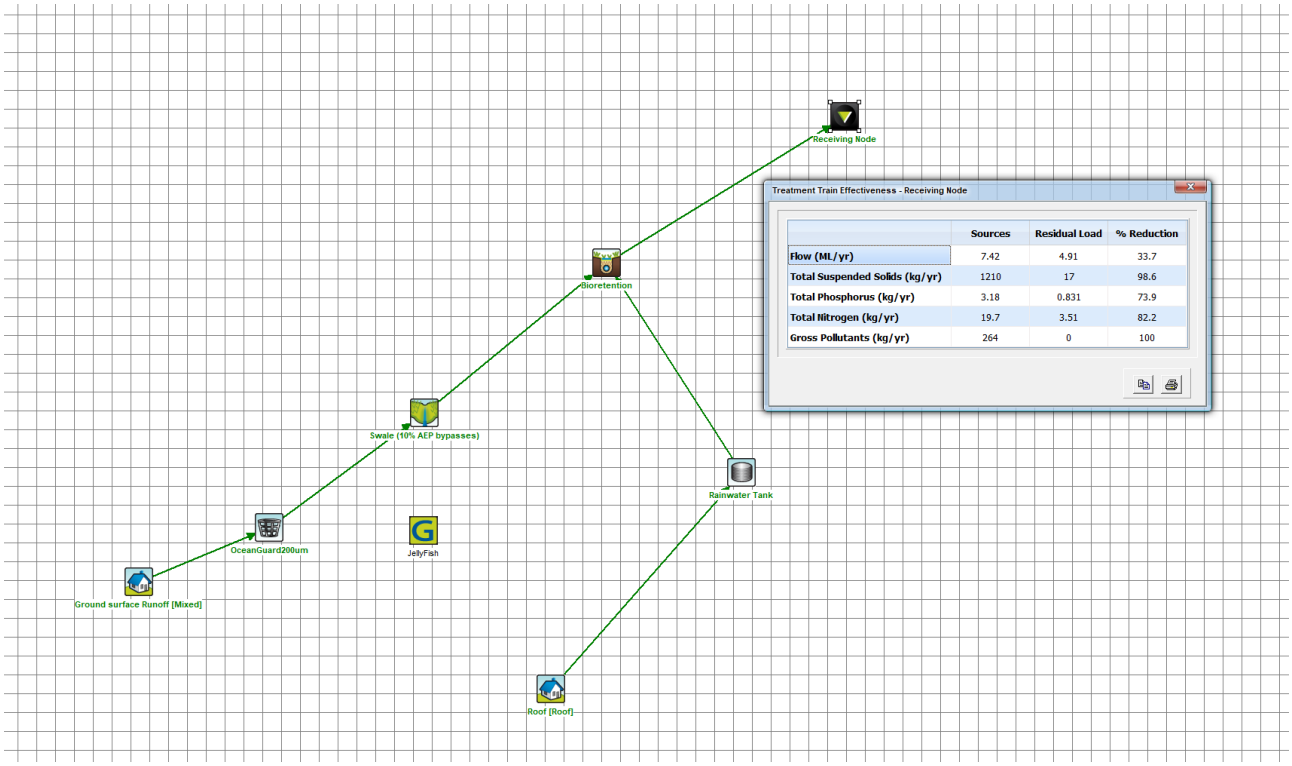
- Approximately 150m^3 detention storage with a staged flow control (i.e. dual orifice control or similar) over the outfall to Cox's creek to limit post-development flow rates to pre-development flow rates. Detention volume will be calculated and adjusted as necessary to ensure peak outflows do not exceed pre-development flow rates for the minor and major storm events respectively.
- Minimum 300mm freeboard from peak 1% AEP storm event basin water level, to emergency overflow weir to Cox creek
- Provision of 300mm of extended duration detention depth, sized to capture and treat the 3mo ARI (4EY AEP) storm event for all runoff from the ground surface areas of the basin.
- Provision of 200micron stormwater filter baskets within all stormwater inlet pits within the development to remove
- Basin floor to be planted with effective nutrient removal native vegetation, deep filter media, transition layers and drainage layers in accordance with EPA / Water Sensitive SA best practice guidelines.
- Provision of a emergency overflow to Cox creek via a rock lined weir or similar approved to mitigate erosion and protect the existing watercourse in the event of a blockage.

Internal drainage pipe capacity requirements will be determined during detailed design of the proposed development, however as a minimum requirement all below ground pipes will be designed to ensure conveyance of the 10% AEP (10 year ARI) storm event, and a minimum pipe diameter of 225mm to mitigate the likelihood of blockages in this environment.

A plan showing the stormwater concept, with bulk elevation estimates and earthworks renders is included as an appendices to this report.

Music modelling results

A Music model was developed to assess the reduction in pollutants based on the proposed treatment train consisting of bioretention raingardens and grassed roadside swales. This assessment was undertaken in accordance with the Water Sensitive SA MUSIC modelling guidelines. The results of the model can be seen in Figure 9 with a summary of reductions shown in Table 1. A filter cartridge based device was considered (Jellyfish) however was not necessary to achieve adequate water quality improvements.



Pollutant	Water Sensitive SA Target	Reduction achieved
Total Suspended Solids	80%	98.6%
Total Phosphorous	60%	73.9%
Total Nitrogen	45%	82.2%
Gross Pollutants	90%	94.1%

Table 1 – Summary of MUSIC model results

Cox Creek Preliminary Drain Model

A preliminary stormwater assessment was undertaken to assess required floor levels for the proposed development. The following parameters were used to develop a preliminary Drain Model using an extended rational model.

- Upstream catchment area of 2,115Ha
- Impervious area 10%, pervious area 90%
- Flow in 1% AEP major storm event of approximately 47.5m^3/s
- Irregular channel cross section based on contour data

Calculations indicate the water depth in Cox Creek and the associated lake may approach 2.5m increase in height with a maximum velocity of 5m/s during a 1% AEP major storm event. According to contour plans, Cox Creek is at an elevation of approximately 412m AHD at the location directly downhill from the proposed development. The proposed development area is at an elevation between 418m – 420m AHD which is 6m-8m above the creek. An increase in creek level of 2.5m would not impact the floor level of the proposed development. The preliminary creek cross section showing an increased water level of 2.5m is provided in Figure 4.

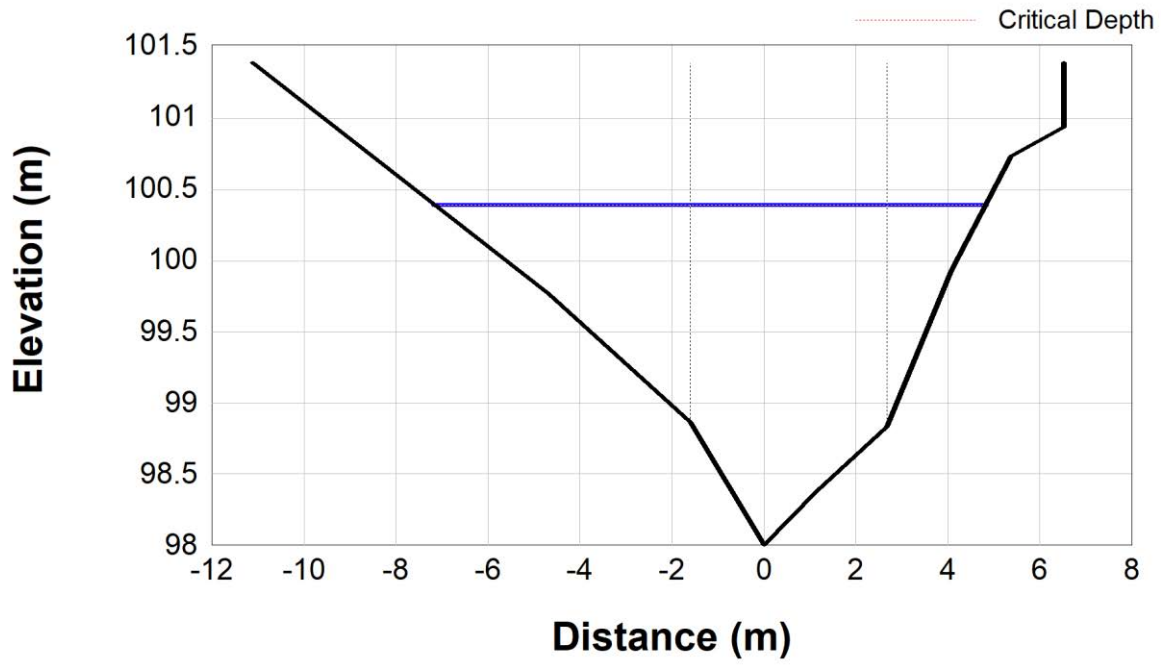


Figure 3 – Cox Creek Cross Section Preliminary Stormwater Assessment

Note that the creek invert on the model is an arbitrary datum. Elevation 98 equates approximately to the Cox Creek invert level of 412m AHD (from contour plans)

Conclusion

This Preliminary Stormwater Management Plan has been prepared prior to detailed design and outlines the general intent for managing stormwater runoff from the site. The requirements set out in this document should be adhered to within final detailed design to ensure compliance with the requirements of the Adelaide Hills Council and EPA.

Specifically, site stormwater should be retained and detained on site to ensure post development peak flows do not exceed pre-development peak flows for an equivalent storm event. Furthermore, management and reduction of pollutants within stormwater runoff is of high importance within this sensitive environment, and EPA water quality targets must be adhered to.

Minimum finished floor levels shall be 300mm above the maximum flood level within Cox Creek, which is estimated at 414.5m AHD. Concept site plans suggest this will be easily incorporated with all structures sited around the existing development at 419-420m AHD.

Detailed stormwater design including MUSIC and DRAINS modelling will be completed to verify the performance of the drainage network in meeting the retention/detention and water quality parameters in line with Adelaide Hills Council and EPA requirements.

Appended;

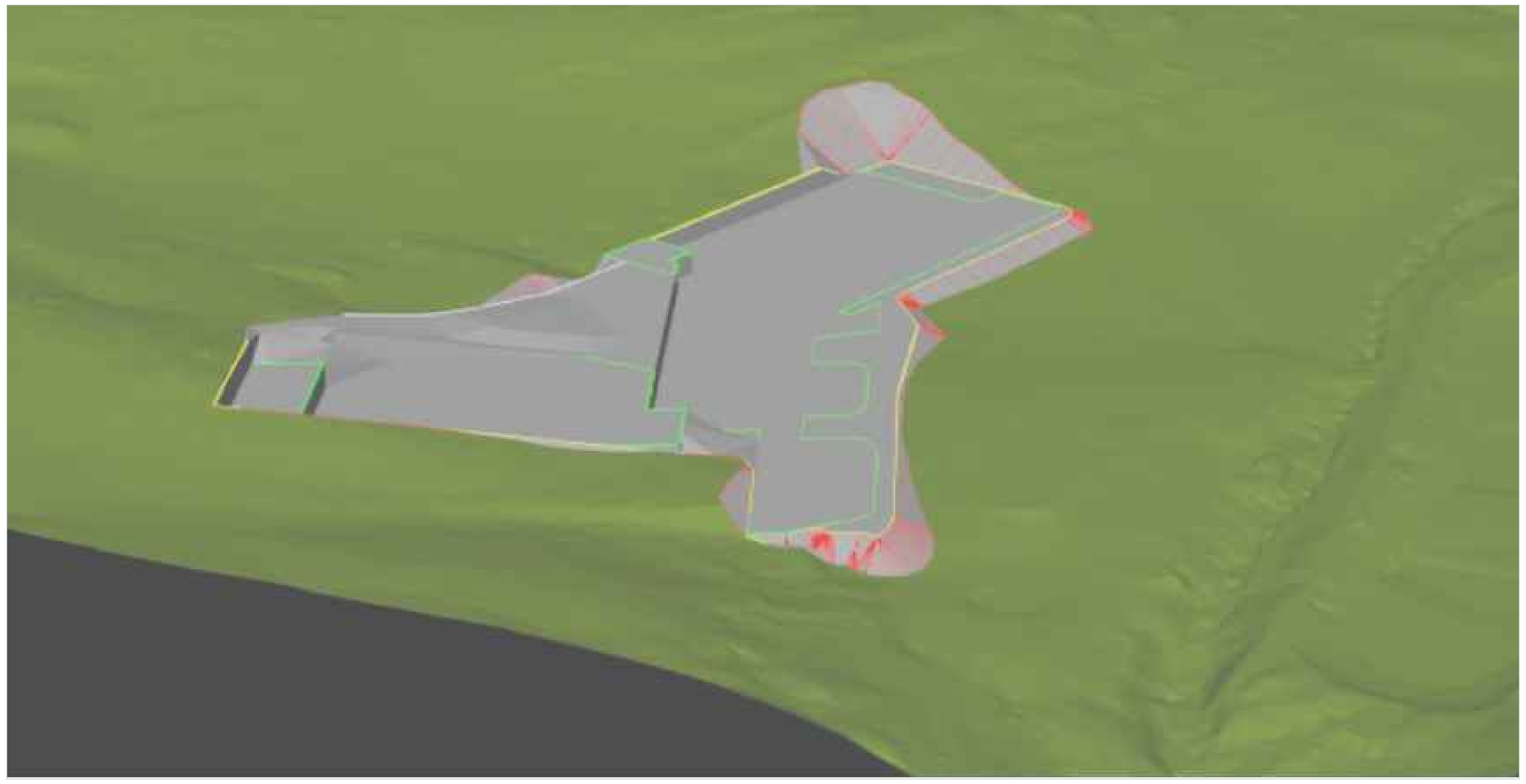
C110 Perspective Images

C120 Earthworks Plan

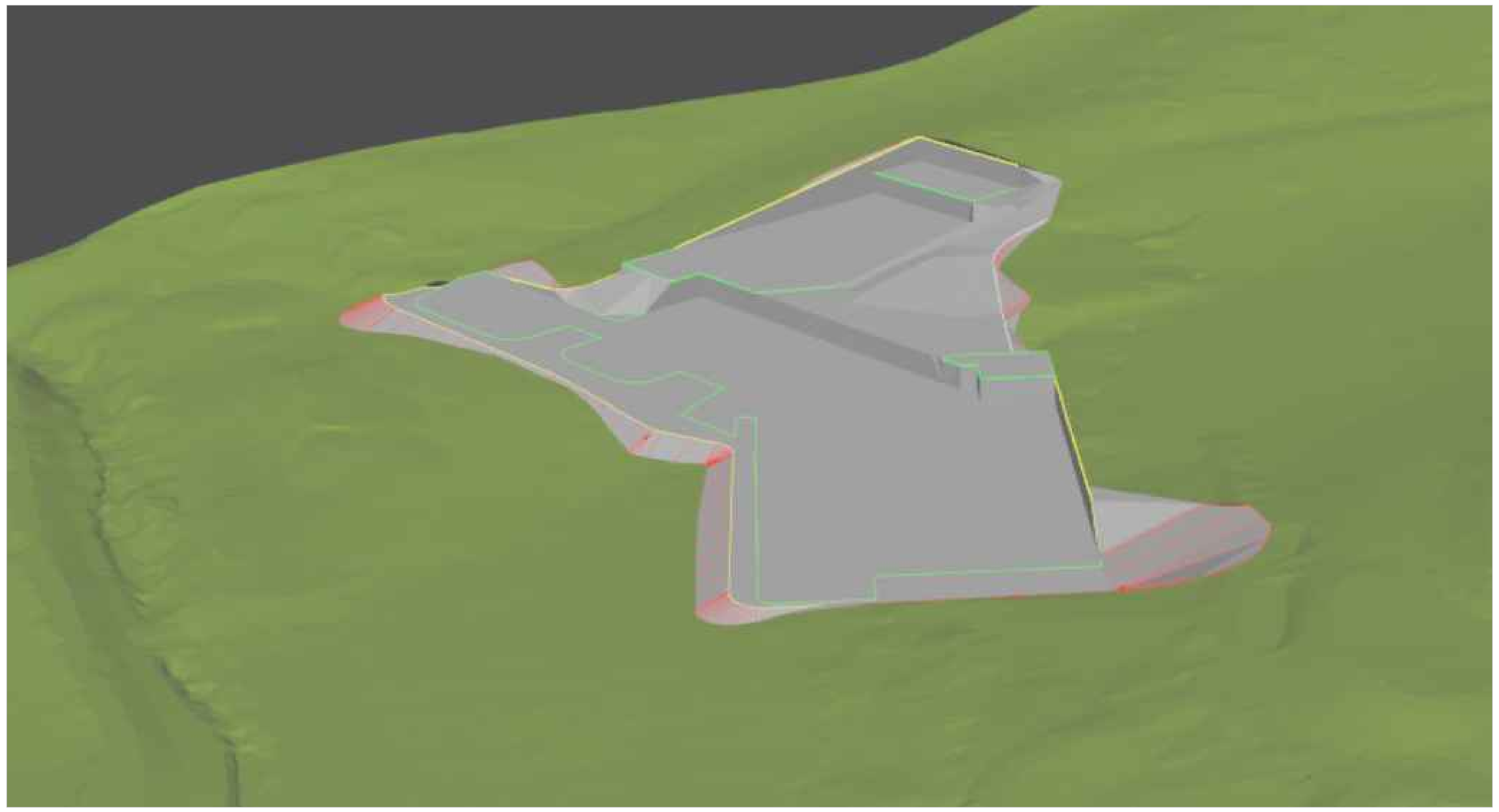
C130 Stormwater Management Plan

NORTH ELEVATION
SCALE NTS

SOUTH ELEVATION
SCALE NTS



EAST ELEVATION
SCALE NTS



WEST ELEVATION
SCALE NTS

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	INIT	APP
A	PRELIMINARY ISSUE	23.09.2022	JS	JC

CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE.

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ABN 58 083 071 185
Quality Management Systems ISO 9001 Certified

FMG ENGINEERING

SIGNATURE

CLIENT	VENTURE CAPITAL DEVELOPMENTS PTY LTD
PROJECT TITLE	MOUNT LOFTY GOLF ESTATE
SITE ADDRESS	35 GOLFLINKS RD, STIRLING SA
DRAWING TITLE	PERSPECTIVE IMAGES

DESIGNED	JS	DRAWN	JS
CHECKED	JC	No. OF SHEETS	-
SCALE	NTS	DATE STARTED	23.09.2022
SITE ID & JOB No.	S53897_282604	REV.	A
DRAWING No.	C110		

N

INDICATIVE EARTHWORKS VOLUMES:
CUT = -15871m3
FILL = 2978m3
NET = 12892m3 EXCESS OF CUT OVER FILL

ASSUMPTIONS:
- 100mm TOPSOIL STRIP
- COMPACTION/EXPANSION FACTORS IGNORED
- VOLUMES TO FINISHED LEVELS, NO ALLOWANCE FOR SLAB, FOOTINGS OR BENCHING AT THIS TIME.

NOTE:
CUT/FILL VOLUMES ARE UNRELIABLE & CONTRACTOR SHALL UNDERTAKE THEIR OWN DUE DILIGENCE TO DETERMINE SUITABLE EARTHWORKS ALLOWANCES.

EARTHWORKS LEGEND

(red)	EXTENT OF EARTHWORKS CUT
(green)	EXTENT OF EARTHWORKS FILL

SCALE 0 4 8 12 16 20 METRES

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	INIT	APP
A	PRELIMINARY ISSUE	23.09.2022	JS	JC

CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE.

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SIGNATURE

CLIENT
VENTURE CAPITAL DEVELOPMENTS PTY LTD

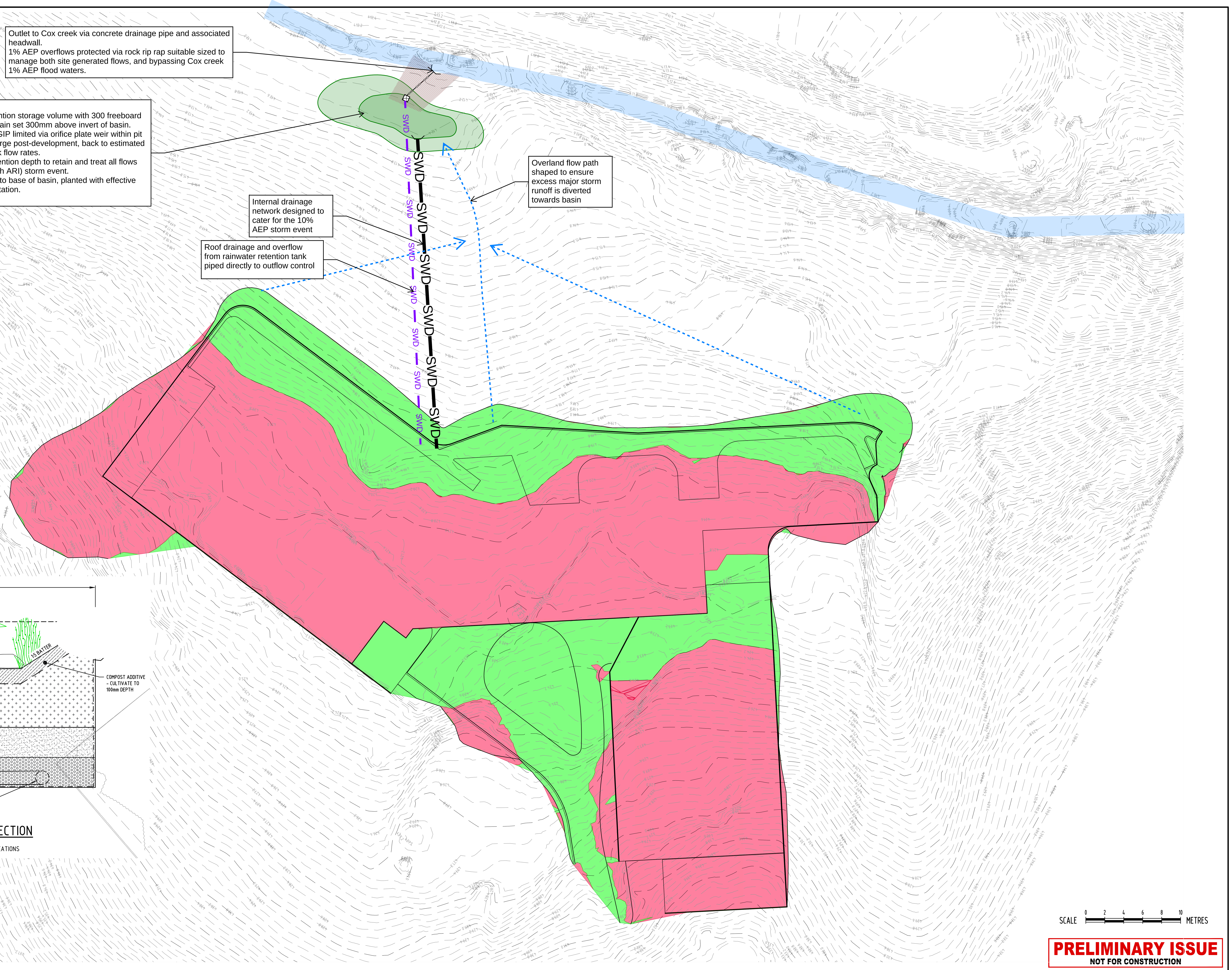
PROJECT TITLE
MOUNT LOFTY GOLF ESTATE

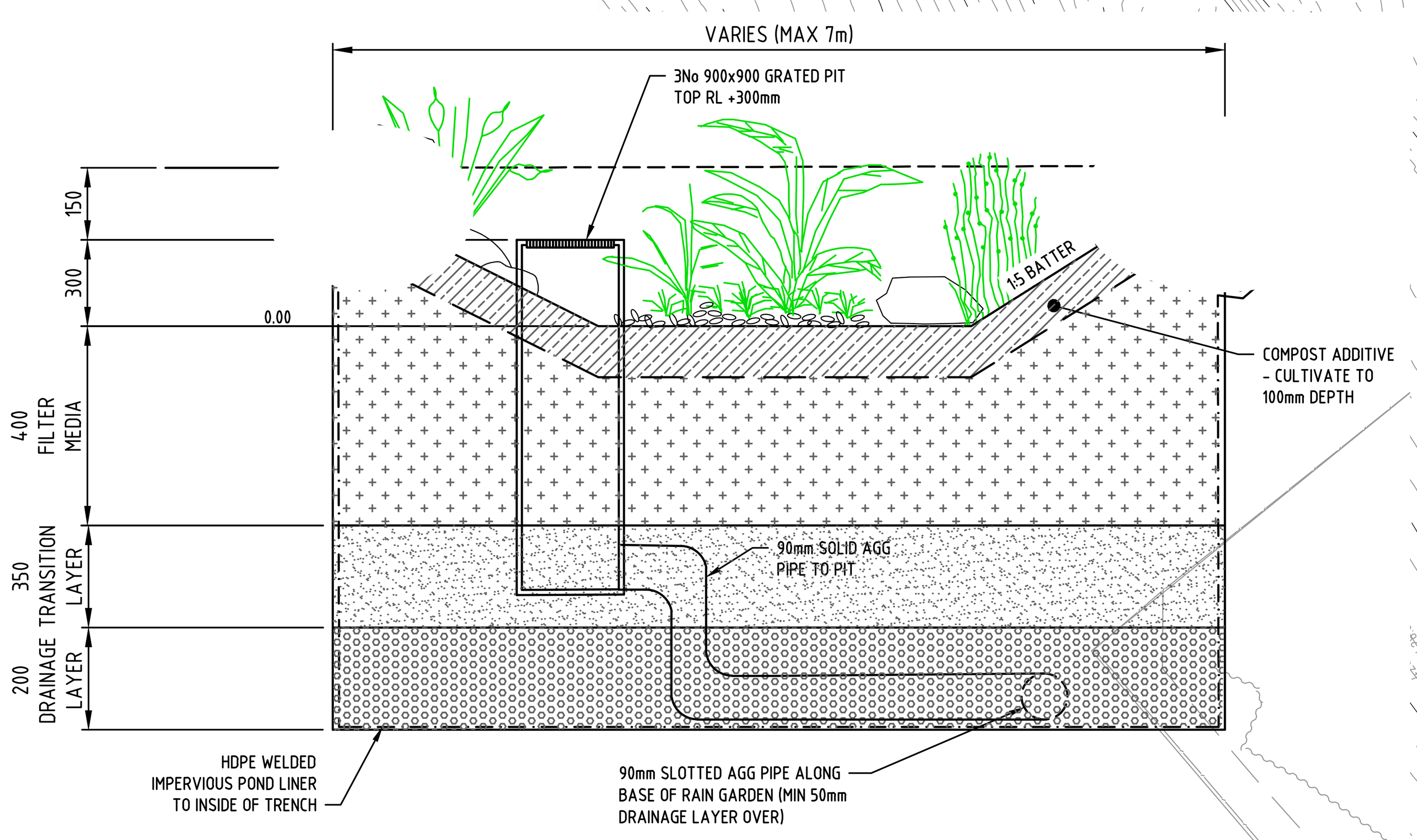
SITE ADDRESS
35 GOLFLINKS RD, STIRLING SA

DRAWING TITLE
EARTHWORKS PLAN

DESIGNED JS	DRAWN JS
CHECKED JC	No. OF SHEETS -
SCALE 1:400 AT A1	DATE STARTED 23.09.2022
SITE ID & JOB No. S53897_282604	REV.
DRAWING No. C120	A

DRAWING M:\FMG\ID2\B20B1909-4257-4414-8350-1A82A9751CEE\0\29536000-29536999\29536443\L\L\S53897_282604_C001 (ID 29536443).DWG (LAST SAVED ON 28/09/2022 11:43:12 PM). PLOTTED ON 28/09/2022 11:44:10 PM BY JORDAN COLBERT





RAIN GARDEN - TYPICAL SECTION
SCALE NTS
REFER TO GENERAL NOTES FOR RAINGARDEN SPECIFICATIONS

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

REV	DESCRIPTION	DATE	INIT	APP
A	PRELIMINARY ISSUE	28.09.2022	JS	JC

CONTRACTORS MUST SET OUT ALL WORK AND VERIFY ALL CONDITIONS, LEVELS AND DIMENSIONS ON SITE PRIOR TO COMMENCEMENT OF ANY WORK OR MAKING OF ANY SHOP DRAWINGS WHICH MUST BE SUBMITTED AND APPROVED PRIOR TO ANY MANUFACTURE.

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SIGNATURE

CLIENT	VENTURE CAPITAL DEVELOPMENTS PTY LTD
PROJECT TITLE	MOUNT LOFTY GOLF ESTATE
SITE ADDRESS	35 GOLFLINKS RD, STIRLING SA
DRAWING TITLE	STORMWATER MANAGEMENT PLAN
DESIGNED	JS
DRAWN	JS
CHECKED	JC
No. OF SHEETS	-
SCALE	1:400 AT A1
DATE STARTED	23.09.2022
SITE ID & JOB No.	S53897_282604
DRAWING No.	C130
REV.	A

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Appendix D

IWMP Masterplan

SITE MASTERPLAN

LEGEND

1. Old Carey Gully Road Access
2. Staff carpark
3. Perfumery carpark
4. Perfumery courtyard
5. Tree orchard
6. Perfumery gardens
7. Cox Creek improvements
8. Heysen trail connection
9. Stormwater quality improvement basin
10. Deck
11. Lawn terrace
12. Practice putting green
13. Tourist accommodation drop-off
14. Pedestrian concourse
15. Golflinks road main access
16. Entry Avenue
17. Emergency maintenance vehicle access only
18. Dedicated pedestrian trail

KEY

- Internal path
- Internal driveway
- Heysen trail connection
- Carpark entries
- Sewer holding tank
- Perfumery sewer tank
- Stormwater basin
- Roof rainwater drainage pipe
- Internal drainage pipe
- Overland flow direction
- Gravity sewer from hotel
- Sewer rising main to pump station
- Perfumery gravity sewer
- Existing rising main to pump station
- Existing rising main to treatment plant

ECOLOGY

- Creek Revegetation zone
- Revegetation zone
- Trees to be removed

STORMWATER FROM MINOR CARPARKING AREAS TO BE COLLECTED INTO GRASSED SWALES. OVERFLOWS FROM SWALES TO BE CONVEYED INTO THE NEARBY WATERCOURSE VIA PIPED / OPEN SWALES

WASTEWATER GENERATED AT PERFUMERY TO BE COLLECTED INTO SMALLER SEPTIC TANK LOCATED AT THE PERFUMERY AND THEN PUMPED TO HOLDING TANK

PROPOSED GRAVITY SEWER FROM HOTEL, AND GOLF FACILITIES TOWARDS SEPTIC TANK SIZED TO MEET SA HEALTH REQUIREMENTS.

EFFLUENT TO BE CONVEYED INTO HOLDING TANK, AND PUMPED AT APPROVED FLOW RATE VIA RISING MAIN TO EX. ADELAIDE HILLS COUNCIL PUMP STATION PS-2. HOLDING TANK, PUMP SPECIFICATION TBC IN CONJUNCTION WITH PUMP STATION UPGRADE DISCUSSIONS WITH ADELAIDE HILLS COUNCIL.

EXISTING ADELAIDE HILLS RISING MAIN CONVEYING FLOWS SOUTH TO SA WATER TREATMENT PLANT

EXISTING ADELAIDE HILLS COUNCIL STIRLING STEDS SYSTEM PUMP STATION 2 - PS2.

UPGRADE EXISTING PUMPS TO NEW PUMPS CAPABLE OF 2.6 L/S. NO MODIFICATION TO EMERGENCY STORAGE BELIEVED TO BE REQUIRED.

EXISTING ADELAIDE HILLS RISING MAIN PS1 TO PS2

EXISTING ADELAIDE HILLS COUNCIL PUMP STATION - PS1 .

PS1 PUMPS TO PS2

OLD CAREY GULLY ROAD
HEYSEN TRAIL
PERFUMERY
COX CREEK
TOURIST ACCOMMODATION
35M BUFFER
35M BUFFER
GOLFLINKS ROAD
GOLFLINKS ROAD
MANNA GUM AVE
TO S.E. FREEWAY

Mount Lofty Golf Estate

oxigen

1:1500 (A1), 1:3000 (A3)
0 10 25 50m
N

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Appendix V

Social Impact Assessment - URPS

Mount Lofty Golf Estate
21ADL-0939
24 May 2024

Social Impact Statement

Mount Lofty Golf Estate

SHAPING GREAT COMMUNITIES

URPS

Social Impact Statement

24 May 2024

Lead consultant	URPS 27 Halifax Street Enter via Symonds Pl Adelaide SA 5000 (08) 8333 7999 urps.com.au
In association with	TRICE
Prepared for	Mount Lofty Golf Estate
Consultant Project Manager	Anna Deller-Coombs, Associate Director adellercoombs@urps.com.au
URPS Ref	240422_R1_v1_Mount Lofty Golf Estate Social Impact Statement

Document history and status

Revision	Date	Author	Reviewed	Details
V1	2/05/24	A. Deller-Coombs	N. Halsey	Initiation of report
V2	6/05/24	A. Deller-Coombs	N. Halsey	Final

We acknowledge the Kaurna People as the Traditional Custodians of the land on which we work and pay respect to their Elders past, present and emerging.

https://urpsau.sharepoint.com/sites/Synergy/Shared Documents/Projects/21ADL/21ADL-0939 - Mount Lofty Golf Estate Engagement Services/SIS/240524_R1_v1_Mount Lofty Golf Estate Social Impact Statement.docx

Contents

Executive Summary

This Social Impact Statement (SIS) has been prepared at the request of the Department for Investment and Trade - Planning and Land Use Services (DTI PLUS) as part of the development application for the Mount Lofty Golf Estate. This SIS presents the 'state of play' of the local community in context of potential positive and negative impacts that may arise from the proposal. It does not form a full assessment that might be anticipated from a Social Impact Assessment.

The proposal is for tourist accommodation, golf course and associated golf club facilities together with landscaping, land division, tree and impacts to native vegetation. The 18-hole golf course will continue to be an operating golf course.

The site is located approximately 2.5 kilometres from the closest township of Stirling, in the Adelaide Hills. Stirling and the Adelaide Hills more broadly is a popular tourism region and is well serviced by health, education and community services.

The demographic composition of the local community (including high levels of home ownership, low unemployment, higher educational attainment and low levels of socio-economic disadvantage) indicates a community with strong social capital and connections who are likely to have access to more resources and information, and may in turn enable them to better navigate potential challenges.

There are a range of activities and interventions that would occur as a result of the proposal that have varied positive and negative responses to the corresponding impacts. A range of mitigation measures are already proposed that seek to eliminate, minimise or manage impacts to a greater or lesser extent. Amendments were made to the development proposal following public exhibition and assessment by the DTI PLUS that reduces the impact of the proposal significantly. This included the removal of the 17 accommodation pods resulting in a reduction in the amount of native vegetation impacted by nearly 1 hectare and 95% of scattered trees previously proposed to be impacted. The amendments also include the introduction of a new dedicated pedestrian trail adjacent Golflinks Road.

The proposal will not lead to any permanent population increase, or significant increase in visitors to the site, nor is it likely to include the kinds of activities that might increase risk and require access to medical facilities (with the exception of construction). As a result, it is not anticipated that there will be any impacts on local schools, hospitals, or social services. Impacts on infrastructure and emergency services (bushfire risk) have been assessed to be able to be accommodated within existing capacity, or improved by the applicant as a requirement of approval.

Negative impacts are likely to be localised to a small residential community in proximity to Golflinks Road with a range of other positive regional-level advantages. These include strong positive impacts on regional tourism and local job creation. Investment in improving Cox Creek and weed reduction will have net positive benefits on the site and beyond.

1. Introduction

1.1 Scope of the Social Impact Assessment

This Social Impact Statement (SIS) has been prepared at the request of the Department for Trade and Investment - Planning and Land Use Services (DTI PLUS) as part of the development application for the Mount Lofty Golf Estate. It is noted that DTI PLUS initially advised that the draft Development Report was suitable for public exhibition without the requirement for a separate stand-alone Social Impact Assessment. This has since been reviewed and DTI PLUS have requested a SIS that encompasses:

Consolidation of documentation and findings related to the effect on local services, facilities and infrastructure within the local Stirling community and Adelaide Hills region more generally from increased visitation, traffic movements, facility employment and use of the development (i.e. effect on schools, hospitals, infrastructure, services etc).

It is noted that there are no guidelines provided by DTI PLUS on the content or requirements of a SIS.

In the absence of any guidelines, this SIS covers the identification and analysis of the potential social impacts of the project, both positive and negative. The SIS determines the extent of the affected community (through establishing a baseline) — who it comprises, how they live, work, play, move and interact etc), and identifies and assesses potential social impacts of the proposed Mount Lofty Golf Estate development on this community.

A SIS is not a full Social Impact Assessment which is typically far more comprehensive and includes detailed assessment of primary and secondary data sources, community and stakeholder engagement, and strategies for mitigation and management of impacts. This SIS presents the 'state of play' of the local community in context of potential positive and negative impacts that may arise from the proposal. It does not form a full assessment that might be anticipated from a Social Impact Assessment.

The depth of research and analysis for this project is commensurate to a SIS and as a result is a desktop analysis of the following information sources:

- Representations (177) from the public exhibition of the development application in July-August 2023.
- Agency and Council comments received as part of the referral process of the development application.
- Verbal questions and feedback received from the public at two information sessions held on 25 July 2023.
- Verbal questions and feedback received from Adelaide Hills Council Elected Members at a briefing on 31 July 2023.
- Australian Bureau of Statistics (ABS) 2021 Census data for Statistical Area 1 40102100416 and 40102100406.

As a result, this SIS presents the following information:

- A description of the proposal along with the amendments made.
- A description of the context of the community and locality highlighting history, culture and social and community services.
- Social profiling of the directly impacted community against the broader community, highlighting implications of the demographic profile of the community in relation to the proposal.

- A Social Impact Identification outlining the activities causing impact, the likely perception of these impacts (positive and negative) and any mitigation measures.
- A summary of findings.

The authors use their significant experience of the development application, social impact and community views in relation to development of this nature and development in this region, to identify and analyse social impacts. URPS are qualified urban and social planners, with experience and expertise in undertaking social impact assessment.

2. Mount Lofty Golf Estate

2.1 Background

The Mount Lofty Golf Estate was declared a major development on 15 December 2020. The Minister for Planning is the relevant authority on the advice of the State Planning Commission (Commission). The application under went public exhibition from 5 July 2023 to 16 August 2023.

The proposal is for tourist accommodation, golf course and associated golf club facilities together with landscaping, land division, tree and impacts to native vegetation. The 18-hole golf course will continue to be an operating golf course.

Vehicle access for golf club members and guests of the tourist accommodation will remain from Golflinks Road, with some access from Old Carey Gully Road. The existing golf club buildings and tourist accommodation will be demolished. This will be replaced with new golf club buildings and tourist accommodation in a 2-5 level building.

The site will be able to host events (up to 300 people) and will include tourist accommodation of 88 rooms in the main building.

Car parking on site is to be increased from 71 parks to 257.

2.2 Amendments

Following public exhibition and further assessment by SCAP amendments were made to the development proposal. These comprise:

- Removal of the 17 accommodation pods and 1 service Pod, that previously were proposed to the west of the main Tourist Accommodation and Golf Club Facilities buildings.
- A reduction in the amount of native vegetation impacted from 1.716 hectares (ha) and 151 scattered trees to 0.757 ha and seven scattered trees. This equates to a reduction in the amount of native vegetation impacted of almost 1 ha and a 95% reduction in the amount of impacted scattered trees.
- A reduction in the Significant Environmental Benefit (SEB) Offset payment from $615,436.80 to $117,794.39 (includes admin fee) to account for the reduction in native vegetation proposed to be impacted.
- Reconfiguration of Perfumery Gardens and Orchard to retain additional trees.
- Additional detail regarding externally lit areas, together with night-time imagery of the proposal.
- Relocation and additional car parking for staff, now accessible from Old Carey Gully Road, to reduce forecast daily traffic movements on Golflinks Road.
- A new dedicated pedestrian trail adjacent Golflinks Road to increase pedestrian safety and separate cars from pedestrians.

2.2.1 Amended Project Description

The proposal is for tourist accommodation and golf course and associated club facilities (ancillary bar, gymnasium and function rooms), together with landscaping, subdivision, tree and impacts to native vegetation. A whole of site plan is provided overleaf which details the proposed development. The proposed development is summarised as follows:

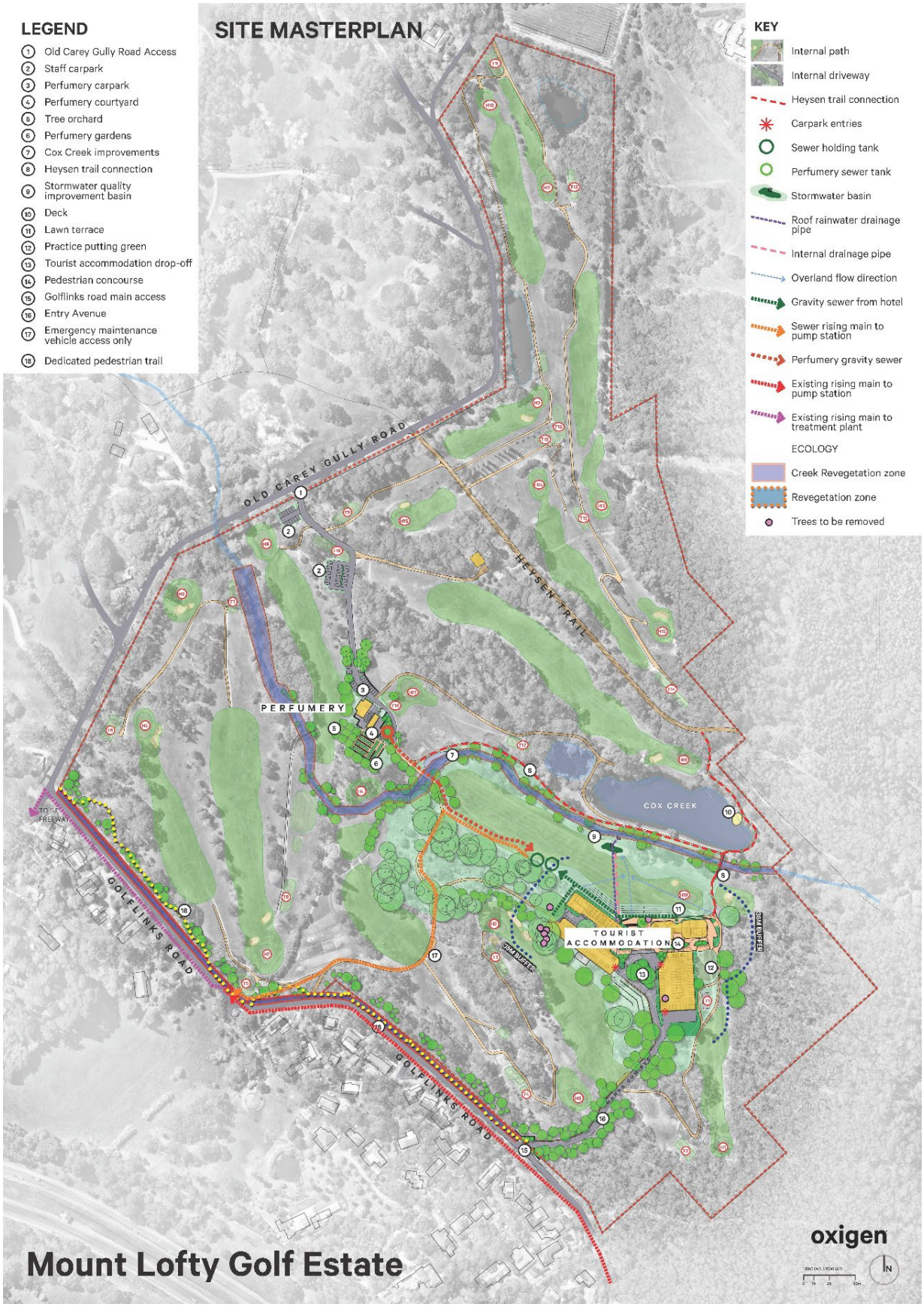
- Construction of a 3-5 level tourist accommodation building comprising 56 units, 15 two bedroom serviced apartments, 15 three bedroom serviced apartments and 2 penthouse serviced apartments. Together with back of house, plant storage and maintenance areas, function room, restaurant and external terrace, sports bar, gallery and cafe and wellness centre.
- Adaptive reuse of the Local Heritage Perfumery building as a retail, cafe and multipurpose function space.
- Golf course facilities building - 2-5 level building comprising function facilities, cart storage and clubhouse, pro-shop, administration areas, gym and change rooms.
- Retention of the 18-hole golf course with alterations to hole 17 and 18.
- A total of 257 car parking spaces. Including;
  - 200 formalised car parking spaces and a porte cochère (set-down/pick-up) facility at the tourist accommodation and golf club facilities building;
  - 20 spaces adjacent to the Perfumery Building accessible from Old Carey Gully Road; and
  - 37 spaces for staff only adjacent to the circulation road connecting from Old Carey Gully Road with further informal parking opportunities within the site.
- Subdivision of the land (1 into 3) allotments to formalise the areas for tourist accommodation, golf course facilities building and balance of the site for leasing purposes.
- Stormwater detention basin, creek and lake restoration activities including planting native plants in the beds, erosion control works and creek crossings.
- Construction of entry wall and new entry signage at the existing Golflinks Road entry.
- New dedicated pedestrian trail adjacent Golflinks Road on Golf Course land.

2.3 Construction and operation

Should the development application be approved, construction is likely to commence shortly thereafter and take approximately 2-3 years. Construction is likely to create in the order of 274 jobs and the golf course will remain operational during construction. Construction traffic will use existing access points on Golflinks Road as well as from Old Carey Gully Road.

Once constructed, operation of the site is still to be confirmed as to how the various customer facing elements of the site (tourist accommodation, golf course, pro shop, restaurant, function room, café, wellness centre etc) will be managed. Hours of operation are anticipated to be similar to the existing facility.

Figure 1 Mount Lofty Golf Estate Site Plan



3. Community and Locality Context

3.1 Locality

The site of the proposal is located approximately 2.5 kilometres from the closest township of Stirling. Located near the Piccadilly Valley in the Adelaide Hills, this area is known for its stunning landscapes, greenery, and cool climate, and the valley is punctuated by vineyards and orchards.

Located near the site are the Mount Lofty Botanic Gardens, the Scouts Woodhouse Adventure Park and several vineyards and cellar doors. Many homes and small and medium scale primary production properties are scattered through this area with the greatest concentration of homes being approximately 25 dwellings located on Golflinks Road. Four non-through roads intersect Golflinks Road (Golflinks Close, Muirfield Avenue, Hoylake Avenue and St Andrews Avenue) and are home to approximately 25 additional homes that are reliant on Golflinks Road for access. The dominant development type comprises predominantly single storey, large homes on generous allotments.

3.1.1 Stirling

Situated in the Adelaide Hills of South Australia, Stirling traces its origins back to the 1850s. Originally named Basket Range, it served as a stopover point for travellers en route to the goldfields in Victoria during the gold rush era. In 1880, the town was renamed Stirling in honour of Sir James Stirling, the Governor of South Australia at the time.

Primarily driven by agriculture, particularly fruit growing and dairy farming, Stirling gradually developed into a notable settlement. Its strategic location amid the scenic Adelaide Hills attracted tourists and day-trippers from nearby Adelaide, fostering its growth.

Throughout its history, Stirling has maintained its agricultural roots while diversifying its economy with the emergence of a vibrant arts scene, along with the establishment of boutique shops, galleries, and cafes. Its historic buildings and tree-lined streets contribute to its popular appeal.

Today, Stirling remains a significant tourist destination and residential area, valued for its picturesque setting, historical significance, and relaxed atmosphere.

3.1.2 Site history

The site was historically used as an iron mine, timber mill, orchard and perfumery. The Mount Lofty Golf Estate was established in 1925 by members of the Royal Adelaide Golf Club seeking a cooler climate course during the summer. The first nine holes were laid by influential members of four Adelaide golf clubs; Kooyonga, Glenelg, Grange and Royal Adelaide. In 1963 the second nine-holes were added. The current clubhouse was opened in 1968 amid architectural awards for its use of timber. The club changed its name to The Stirling Golf Club in 2013.

3.2 Social services and infrastructure

Often referred to as a series of villages, Stirling and its neighbouring towns of Crafers, Aldgate and Bridgewater supply a range of local retail, education, health and community services. Mount Barker is the closest regional centre providing a wider range of retail, government and community services.

A small private hospital is located within Stirling, along with several General Practices and allied health services including physiotherapy, podiatry and chiropractors.

The closest public hospitals are located in Mount Barker (17 kms or approximately 15 minute drive), or Adelaide (18 kms or approximately 30 minute drive).

A range of public transport services – all bus – service Stirling, with several daily services to and from Stirling and the City, traversing routes through Blackwood, Carey Gully and Leawood Gardens. Bus services also link Stirling to Mount Barker and Lobethal. The 822 bus between Adelaide and Stirling (via Carey Gully) services the northern boundary of the site.

The Adelaide Hills Council have a service centre in Stirling, along with a library (Coventry Library), and community services. Key social services and infrastructure are identified in figure 2.

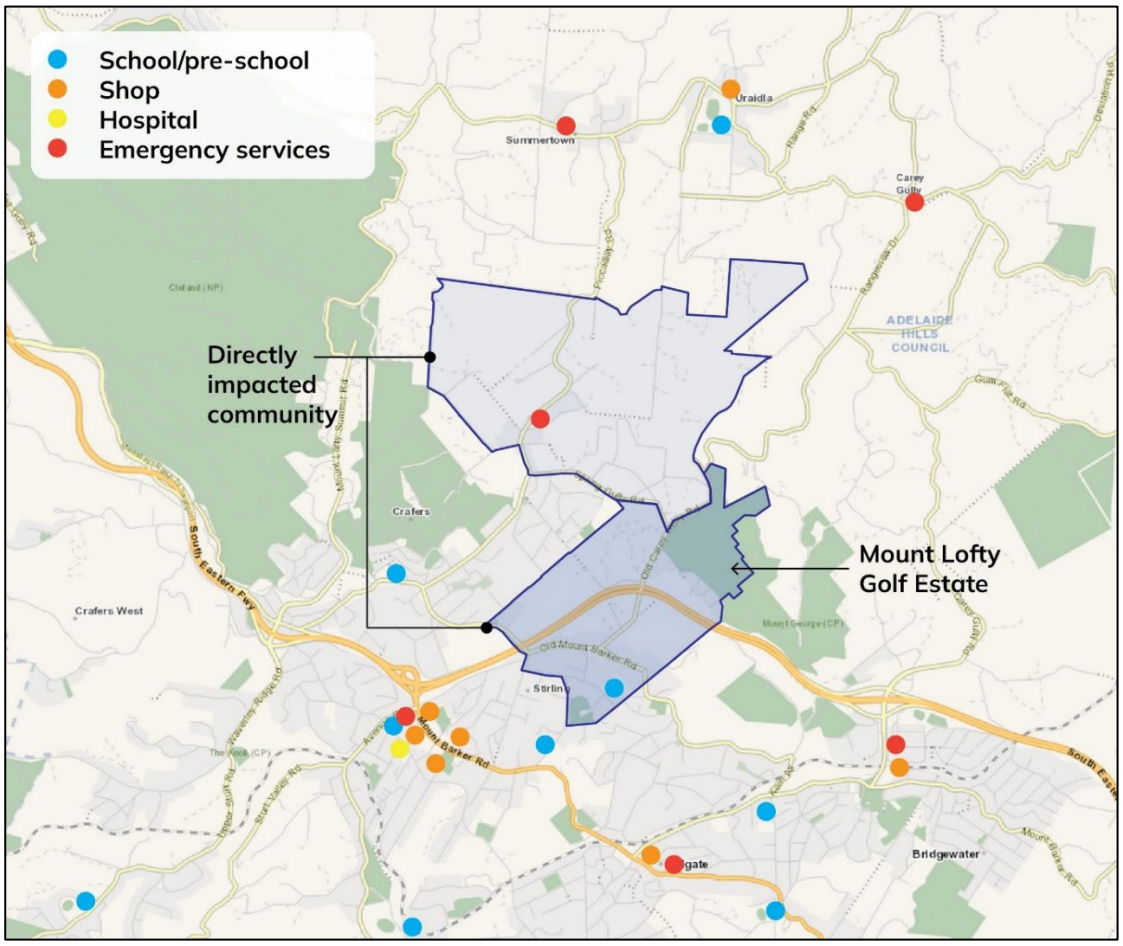


Figure 2 Social services and infrastructure in proximity to the proposal

3.3 Tourism context

Key attractions within the region include food and wine, and cultural and art festivals. The Adelaide Hills is often used as a jumping off point to other regions including McLaren Vale, Barossa and Fleurieu Peninsula which allow for accessible half or full day touring destinations. Hahndorf (located 10 minutes from Stirling) is Australia's 7th most visited town and receives 1 million visitors per year.

Tourism to South Australia has returned to pre-pandemic levels in the year ending June 2023, after disruptions in 2020 and early 2021, including bushfires, international and state border closures, and mobility restrictions in the state. Domestic overnight trips and domestic nights in South Australia have increased when compared to June 2022 (+24% and +20% respectively). In the year to June 2023, visits to regional Tourism Regions as a proportion of South Australian visits decreased compared to the previous two years, reflecting a return to the 'Adelaide-centric' experience of the past.

4. Social Profiling

4.1 Description of interested and affected peoples

There are a range of individuals and groups who may be impacted by or interested in the proposal as described below. It is noted that individuals may be a member of more than one group of affected peoples (e.g., immediately impacted community may also be future employees).

4.1.1 Immediately impacted community

The immediately impacted community comprise those that live or work in proximity to the Mount Lofty Golf Estate. Primarily this comprises the residents of Golflinks Road (and other non-through roads intersecting Golflinks Road), and those along Old Carey Gully Road near the boundary of the Golf Estate or close to the intersection with Golflinks Road.

They can be further understood as residential neighbours and neighbours of other land uses (e.g., recreation or primary production land) and the impacts on these two types of neighbours will differ.

For the purposes of this demographic analysis, the community impacted by the Mount Lofty Golf Course development is identified as those within the Statistical Area Level 1 (SA1) 40102100416 and 40102100406. SA1s are the smallest unit for the release of Census data (refer figure 4).

Importantly, the SA1 to the east of the site (40102100407) was intentionally excluded. The reason for this is that the population that sits within this statistical area is predominantly clustered a significant distance from the proposal. This population is separated from the site by Mount George Conservation Park and is unlikely to be regularly using the same road network used by the Golf Estate. The SA1s used as the directly impacted community are shown in blue and the SA1 not included in green, in figure 3 overleaf.

4.1.2 Wider community

The wider community will not experience the direct impacts of those described above but may feel some of the real or perceived economic or safety impacts. This wider community is defined as those within the Adelaide Hills. The wider Adelaide Hills community is considered to be Statistical Area Level 3 (SA3) Adelaide Hills (refer figure 5).

4.1.3 Other interested and affected people

There are potential additional groups of interested and affected people that are not (or not directly) geographically linked to the site. These comprise **existing and future employees** and **existing and future golf club members.**

Existing and future employees are likely to reside within the wider community or its bounds but may travel further for employment. This may be more so for future employees who may have specialist skills or experience related to the facilities at the Mount Lofty Golf Estate (for example, high-end tourism, golf course employees).

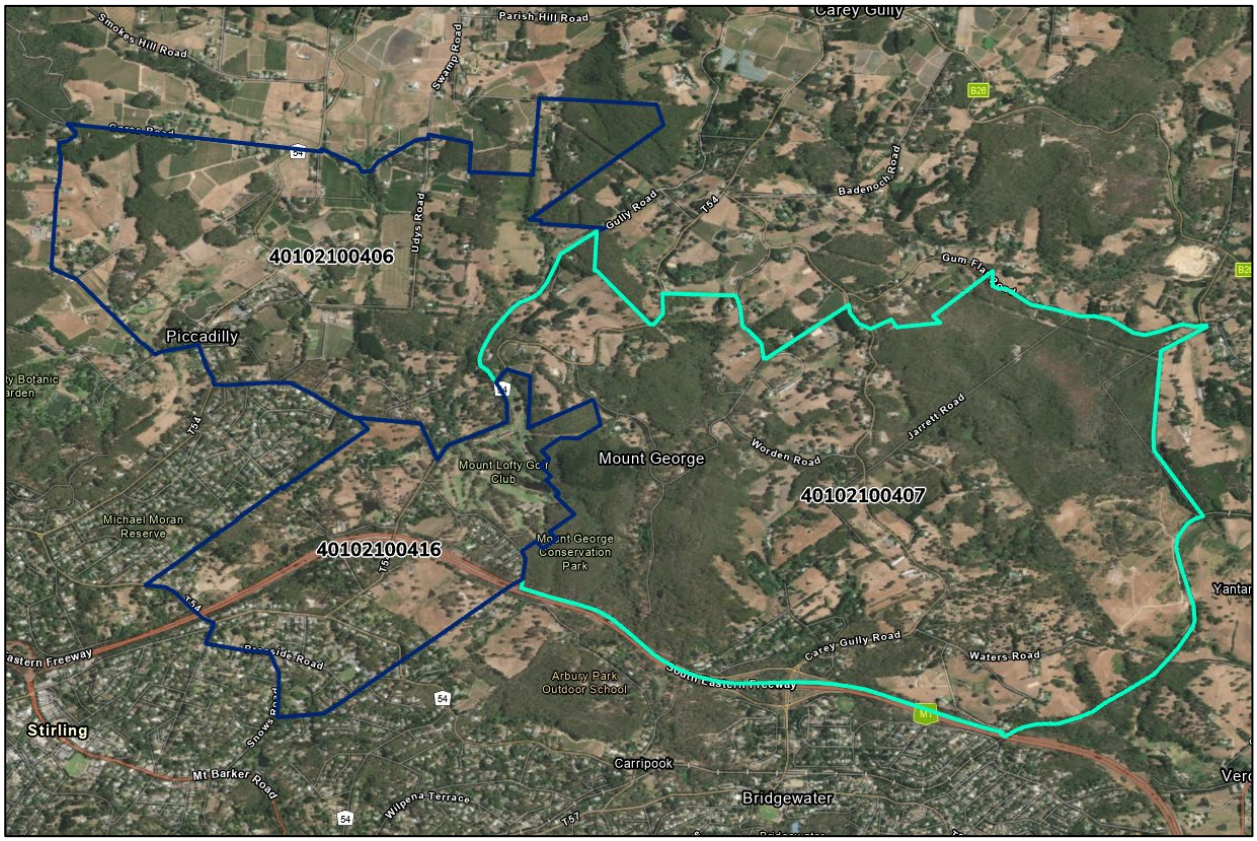


Figure 3 Statistical Area Level 1 included (blue) and not included (green)

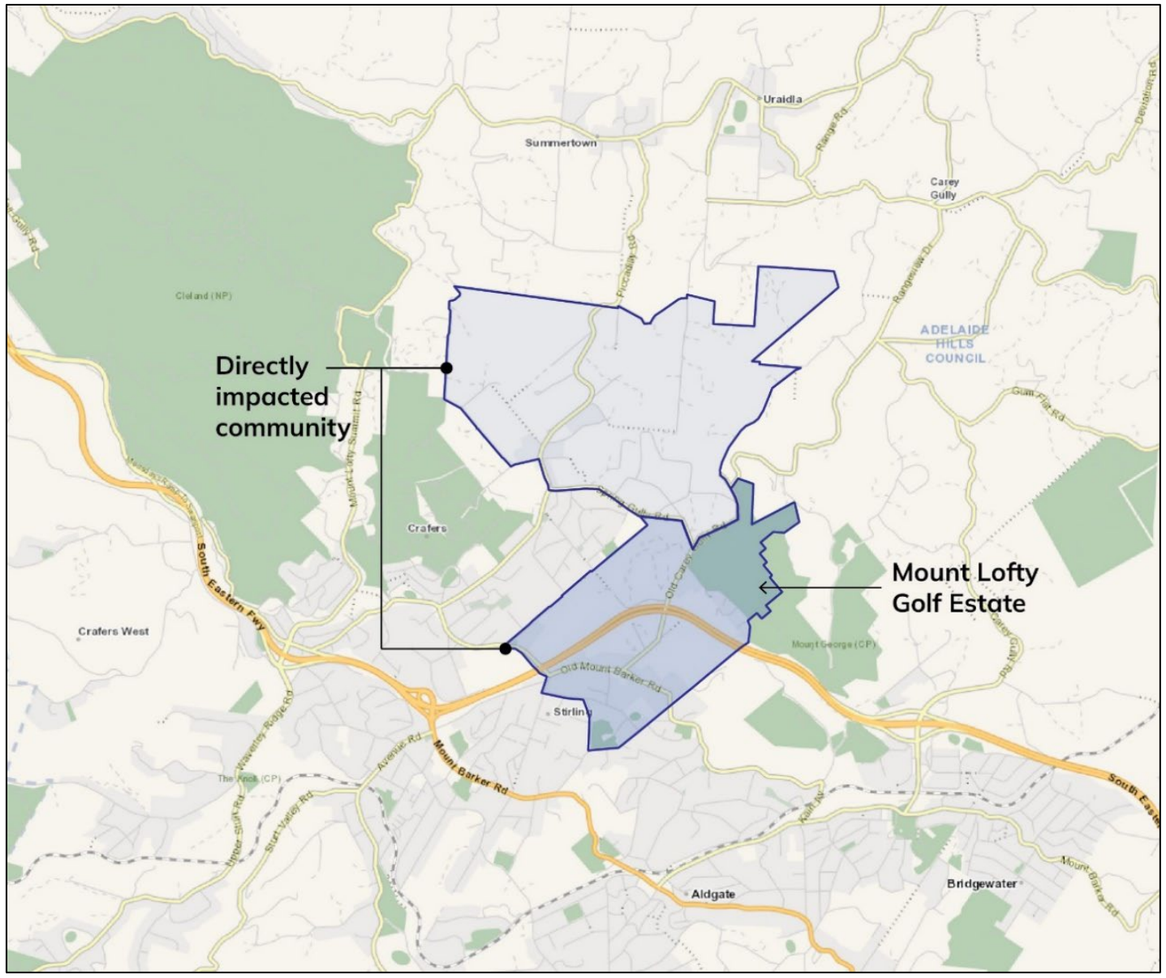


Figure 4 Catchment area for directly impacted community (Statistical area 1s)

Figure 5 Wider community data collection (Statistical Area 3)

4.2 Demographic analysis

All data in the following sections is sourced from the 2021 Australian Bureau of Statistics Census.

4.2.1 Population and age

Table 1 Population and age

	Impacted community (number)	Impacted community (%)	Wider Adelaide Hills community (%)	Difference (%)
0-9 years	96	10.1%	11.8%	-1.7%
10-19 years	158	16.6%	13.3%	3.3%
20-29 years	77	8.1%	10.3%	-2.2%
30-39 years	100	10.5%	11.7%	-1.2%
40-49 years	143	15.0%	13.1%	1.9%
50-59 years	140	14.7%	14.2%	0.5%
60-69 years	111	11.6%	12.7%	-1.1%
70-79 years	103	10.8%	9.1%	1.7%
80 plus years	25	2.6%	3.9%	-1.3%
Total	953 people		79,723 people	

The impacted community has a population of 953 people. The wider Adelaide Hills community has a population of 79,723 people.

The age profile of the impacted community is similar to the wider Adelaide Hills community. The largest differences in the age profiles between the two communities is seen in the lower age brackets, with a slightly higher proportion of 10-19 year olds and a slightly lower proportion of 20-29 year olds.

Implications

There is a strong working age population in the immediately impacted and wider community who may benefit from the job opportunities created by the proposal.

A higher proportion of people aged 10 to 19 years may have implications for safety and pedestrian and cycling access. Younger people may tend to have less road safety awareness and be at greater risk of conflicts on or near the road.

4.2.2 Households

The impacted community has a similar average number of people per household to the wider Adelaide Hills community at 2.8 people per household.

Table 2 Household composition and home ownership

	Impacted community (number)	Impacted community (%)	Wider Adelaide Hills community (%)	Difference (%)
Average number of people per household	2.8	N/A	2.6	0.2
Family households	271	83.4%	77.3%	6.1%
Single (or lone) person households	54	16.6%	20.8%	-4.2%
Owned outright	132	41.5%	34.7%	6.8%
Owned with a mortgage	150	47.2%	45.9%	1.3%
Rented	25	7.9%	16.0%	-8.1%
Average number of bedrooms per dwelling	3.4	N/A	3.3	0.1

There are a greater proportion of households that are family households in the impacted community (83.4%) compared to the wider community (77.3%). There are a smaller proportion of households that are single or lone person households (16.6%) compared to the wider community (20.8%).

There are a greater proportion of households who own their homes outright in the impacted community (41.5%) compared to the wider Adelaide Hills community (34.7%). There are a smaller proportion of households who rent their homes (7.9%) compared to the wider Adelaide Hills community (16.0%).

Dwellings in the impacted community have a similar average number of bedrooms to the wider Adelaide Hills community at 3.4 bedrooms per dwelling.

Implications

A comparatively high proportion of family households and a low proportion of single or lone person households as well as a higher rate of those who own their own homes mean that the impacted community may have lower levels of loneliness and greater social capital and connections.

People with greater social connection and capital tend to have a stronger support network to rely on during difficult times. When faced with a negative event, they are likely to receive more emotional and practical support that can help them cope with the event more effectively and reduce feelings of isolation or helplessness.

Additionally, individuals with higher social capital often already have access to more resources and information, which can enable them to better navigate potential challenges.

4.2.3 Language

90% of households in the impacted community speak only English at home, a similar proportion to the wider Adelaide Hills community. 36 or 11.1% of households speak a non-English language of home.

Table 3 Languages spoken at home

	Impacted community (number)	Impacted community (%)	Wider Adelaide Hills community (%)	Difference (%)
Households where English is the only language used at home	850	89.8%	90.8%	-1.0%
Households where a non-English language is used	36	11.1%	7.2%	3.9%
People who speak English not well or not at all	4	0.4%	0.4%	0.0%
Top 3 languages other than English spoken at home	German (21) Mandarin (7) Korean (6)	N/A	German (447) Mandarin (369) Italian (335)	N/A

Of those people who speak a language other than English, only 4 people or 0.4% of the impacted community speak English not well or not at all.

Of those who speak a language other than English, the top languages spoken include German, Mandarin and Korean.

Implications

Only four people in the impacted community do not speak English well or at all.

This means that the level of English literacy in the impacted community is extremely high and is unlikely to introduce any significant language or cultural barriers in communicating about the proposal. The area also does not appear to have any clusters of people who may be more challenged by housing impacts due to their cultural or linguistic background.

4.2.4 Income, employment and education

The impacted community has a similar number of people in and out of the labour force to the wider Adelaide Hills community.

2.7% of the impacted community who are in the labour force are unemployed, slightly less than the 3.5% unemployment rate across the wider Adelaide Hills community.

Median weekly household income is significantly higher in the impacted community at $2,510 than in the wider Adelaide Hills community at $1,895.

Table 4 Income, employment and education

	Impacted community (number)	Impacted community (%)	Wider Adelaide Hills community (%)	Difference (%)
In the labour force	521	67.9%	65.4%	2.5%

	Impacted community (number)	Impacted community (%)	Wider Adelaide Hills community (%)	Difference (%)
Not in the labour force	220	28.7%	30.4%	-1.7%
Unemployed	14	2.7%	3.5%	-0.8%
Household median weekly income	$2,510	N/A	$1,895	$615
Bachelor Degree level and above as highest level of educational attainment	325	42.9%	27.8%	15.1%

The proportion of the those who are highly educated with a bachelor's degree level or above as their highest level of educational attainment is significantly higher at 42.9% in the impacted community than those in the wider Adelaide Hills community at 27.8% - a difference of 15.1%.

Implications

The impacted community have significantly higher weekly median household incomes, education levels and employment levels than the wider Adelaide Hills community. Generally, households with higher incomes and education levels tend to experience less negative health and social outcomes, and greater resilience specifically in relation to experience of 'life shocks'.

While unemployment levels are low, the proposal does offer employment opportunities that may be taken up by the local community, further reducing unemployment.

4.2.5 Disability

Table 5 Need for assistance with core activities

	Impacted community (number)	Impacted community (%)	Wider Adelaide Hills Community (%)	Difference (%)
Has need for assistance with core activities	17	1.8%	3.8%	-2.0%

1.8% or 17 people in the impacted community have need for assistance with their core activities. This is lower than the 3.8% of people who have need for assistance with their core activities in the wider Adelaide Hills community.

Implications

The impacted community have a low proportion of people who need assistance with core activities. Despite this there are a number of factors that may impact these people within the local community including accessibility (particularly in the event of a bushfire or other emergency event). Access to community, social or health services are not likely to be impacted by the proposal.

Should any of these people have mobility limitations, this may have implications for safety and pedestrian access should vehicular traffic increase on Golflinks Road.

4.2.6 Socio-economic disadvantage

Table 6 Socio-Economic Indexes for Areas (SEIFA) – Index of Relative Socio-economic Disadvantage Scores

	Impacted community		Wider Adelaide Hills community	
	SA1 - 40102100416	SA1 - 40102100406	LGA - Adelaide Hills Council	LGA - Mount Barker
Index of Relative Socio-economic Disadvantage score	1112	1116	1081	1037
Rank	4048 / 4157 SA1s	4076 / 4157 SA1s	70 / 71 LGAs	62 / 71 LGAs
Percentile	98	99	98	87

Socio-Economic Indexes for Areas (SEIFA) is a product developed by the ABS that ranks areas in Australia according to relative socio-economic advantage and disadvantage. SEIFA indexes are only provided for SA1 and local government association (LGA) areas. Therefore, an overall SEIFA score cannot be determined for the combined impacted community and wider Adelaide Hills community areas. However, the impacted community is made up of two SA1 areas, and the wider Adelaide Hills community is made up of two LGAs. Therefore, the scores of each of these SA1s and LGAs can be analysed individually as a proxy for the larger areas.

The Index of Relative Socio-economic Disadvantage score of both SA1s in the impacted community area are in the 98th and 99th percentile. These means that these areas have an extremely low level of socio-economic disadvantage compared to other SA1s across South Australia.

The Index of Relative Socio-economic Disadvantage scores of the SA1s in the impacted community area are higher than the LGAs in the wider Adelaide Hills area. This means that the impacted area experiences a lower level of socio-economic disadvantage than its surrounding community.

Implications

The impacted community has an extremely low level of socio-economic disadvantage.

This means that this community is likely to have the social and economic ability to be resilient to change and impacts as discussed in sections 3.3 and 3.5.

5. Social Impact Identification

The following section outlines the elements or activities associated with the proposal that are likely to cause an impact and describes what the impacts are likely to be. It then describes the positive and negative impacts that are likely to be perceived by stakeholders or the community, and any mitigation or management measures that have already been identified.

Table 7 Social Impact Identification table

Activity likely to cause impact	Prediction/analysis of likely impacts	How stakeholders may respond to impact	Mitigation measure
New and changed building(s) and built form	Visual impact of new buildings including their placement on the site, height, design and massing and contrast within a natural/golf course environment. The development will be able to be glimpsed at a distance and through vegetation from Golflinks Road residents. The buildings will be able to be easily seen, though at a distance, from the Heysen Trail.	**Negative response** to the building height, design and massing and its contrast within a natural/golf course environment. The perception that no further buildings should be constructed on site due to a historical proclamation about how the site could/could not be developed in the future. **Positive response** to a modern, architecturally designed building that is sensitively located within its environment.	The proposal is setback in excess of 200 metres from the dwellings situated on Golflinks Road. The distance and topography levels, together with the existing extent of vegetation, indicate that the visibility of the proposal will be reduced. The Heysen Trail traverses golf course land, such that it directs walkers of the trail through the centre of the site, as opposed to directing them around the site. The scale of the proposal as viewed from the Heysen Trail and views to the built form are occurring from within the site. Open Space proclamations were used before the introduction of up-to-date land use zones in the planning system and were used as a way to protect privately held land from further subdivision for housing. It is not the intent to subdivide this site for housing. Should the proposal be approved, the applicant will seek for this proclamation to be revoked, on the basis the current zoning of the land will suitably assess future development.
New and changed land uses	A new and improved facility with additional services and facilities (including modern and increased tourism accommodation offering, wellness centre, Perfumery attraction) will change the way the site is currently used. It is noted that the primary use of the site remains as a Golf Course.	**Negative response** as the Adelaide Hills is valued and regarded as a quiet, low activity area that is characterised by a high-quality natural environment by many residents and visitors. Community responses may vary as to whether the development is well suited or not well suited to this environment and location. Some may consider that this new and changed land use may undermine property prices due to decreased access, amenity or livability as a result of the development. This may be particularly so to those who were planning to sell their property in the short term (during construction phase). **Positive response** may be held by some, who are supportive of and may be users or employees of the expanded facilities. They may see this as a positive utilisation of the site and for the region. The economic uplift as a result of this investment may extend to other property prices in the area, adding value to local property values. Others are supportive of the revitalisation of the Stirling Golf Club which will encourage new membership and increase vitality of the Club.	Economic assessment has been undertaken that indicates that there is a shortage of quality, large accommodation in the Adelaide Hills region, and that this fills a gap. Strong industry support was received for this development in providing a greater supply of 'experience development' and golf tourism for the region and the state.
Increased activity	As a new facility attracts increased patronage it is likely to result in more road users (patrons, visitors, staff coming to and from site) and more	**Negative response** to increased activity, traffic, or noise. This could alter what is currently perceived to be a quiet, tranquil, low activity area.	The increase in activity and people on (and coming to and from) site has been carefully mitigated and managed through a series of assessments.

Activity likely to cause impact	Prediction/analysis of likely impacts	How stakeholders may respond to impact	Mitigation measure
	deliveries (by heavy/commercial vehicles), particularly on Golflinks Road. While there is no proposal to extend current hours of operation or the capacity of the function centre, it is likely that activity will increase inside current operative hours with greater numbers of people visiting the site as a result of improved facilities on the site.	Increased traffic movements on Golflinks Road in particular will be perceived as having impacts on amenity and safety. Bushfire risk is a pervasive concern for Hills residents that causes anxiety. It may be perceived that increased activity on site increases the chance that a fire may start, resulting in bushfire. Further, bushfire evacuation may be perceived to be more difficult as a result of the development, with larger numbers of patrons and staff needing to exit the site in a hurry, which may cause congestion on Golflinks Road, reducing the ability for local residents to easily evacuate. All of these factors may also be perceived to impact negatively on property values of neighbours. **Positive response** to the investment in and improvement of a tired facility, which will result in greater economic activity in the region, job opportunities and an overall improvement in the perception of the quality of the tourism offering in the Adelaide Hills.	The buildings where most of the activity will occur have been sited to 'nestle in' to the land, reducing any noise, light or visual impact on neighbours. The proposal will result in the distribution of additional movements along Golflinks Road. The future traffic volumes on Golflinks Road remain well below the capacity of a local road which is typically taken to be 1,500 vehicles per day. The traffic analysis recognised that the access point and key intersections surrounding the site would easily accommodate the additional movements with minimal impact on the existing road system. Therefore, while other road users would experience an increase in movements, the additional traffic activity is not considered excessive nor unreasonable. Importantly, the proposal would not change the nature or function of Golflinks Road. Relevant bushfire planning and management has been undertaken for the assessment of the proposal. Evacuation practices at the Estate are clearly documented to significantly reduce the number of people on site on higher risk days, as well as how to safely evacuate should the site be well patronised. The site can accommodate emergency vehicles.
New lighting	New or improved lighting to new and existing buildings, car park and pathways will increase the light on the site.	**Negative response** with the perception that upgraded lighting will cause light spill into neighbouring properties or impact on wildlife. **Positive response** that safety of patrons at night is being well considered. Research indicates that lighting at night can play a positive role in the real or perceived sense of safety particularly for women who report higher rates of feeling unsafe in low lit areas at night.	No floodlighting or high-level lighting is proposed. No direct lighting will reach local residents. Lighting is designed and assessed to be sympathetic to the needs of native wildlife so that darkness remains across the majority of the site. No light pollution into Mount George Conservation Park.
Construction	Construction of the new facility will inevitably result in noise (excavation, hammering, drilling, reversing beepers), increased movement of heavy vehicles (that may be moving slowly), dust and vibrations. It may require temporary traffic management or road closures or detours. It may impact on the natural behaviours or safety of wildlife.	**Negative response** as those directly impacted will have a sense of frustration and inconvenience by the impacts of construction. There is likely also to be concerns about safety such as increased heavy vehicle movement or use/management of hazardous materials. Some will be concerned about the noise, vibration and other direct impacts on flora and fauna. The concern may be that flora and fauna may be damaged, destroyed or moved on from the area due to impacts on habitat. There may be concerns about the impact of nearby construction on property values. Some residents fear that the noise and disruption could decrease the attractiveness of the neighbourhood and lower property values. **Positive response** may be felt that despite the inconvenience, there is a sense of excitement or anticipation about the new development. They	Construction impacts will be required to be managed in line with a Construction Environmental Management Plan consistent with Council and EPA requirements. This will include impacts and measures to protect flora and fauna. Construction vehicles will be required to use Old Carey Gully Road, directing this traffic movement away from local residents on Golflinks Road. Speed reduction around this intersection will reduce potential near misses should a slow vehicle accelerate/decelerate in proximity to other vehicles travelling at speed.

Activity likely to cause impact	Prediction/analysis of likely impacts	How stakeholders may respond to impact	Mitigation measure
		may look forward to new amenities, better infrastructure, or increased property values in the longer term. Living near a construction site can sometimes lead to increased community engagement as residents come together to voice concerns, advocate for their needs, and stay informed about the progress of the project. This can result in people feeling more connected to their local community and creating new relationships, resulting in improved social cohesion.	
Increased demand on infrastructure	An upgraded facility with increased capacity will require more of utilities and infrastructure, including power, water, sewerage and communications.	**Negative response** from some who may consider that infrastructure is already at capacity or sufficiently utilised, and that additional use will impact on their quality of service (for example, decreased water pressure, lower internet speeds, power outages).	Assessments have been made that recommend that the additional demand can be accommodated and where any upgrades should occur. This will be a condition of the development approval.
Increased roof/hard surfaces	Increased stormwater runoff as a result of changed or increased hard surfaces and roofs.	**Negative response** to pollution caused by runoff picking up pollutants that then enter water bodies impacting on aquatic ecosystems and human health. Concern about erosion which may destabilise water courses or even undermine infrastructure such as roads. Increased flooding risk during heavy rain events as a result of the reduction of the natural capacity of the land to absorb water. **Positive response** to the upgrades and improvement to Cox Creek that will manage run off and improve the aquatic and riparian environment.	Assessments have been made by independent authorities (EPA and Council) and the stormwater system will be designed in consultation with them. Improvements to Cox Creek will be made, resulting in benefits to downstream water quality, as well as the potential for weed removal to improve biodiversity.
Increased traffic on Golflinks Road	Increased traffic volumes of staff, visitors, employees, deliveries/servicing to the site using Golflinks Road.	**Negative response** that Golflinks Road in particular cannot accommodate additional traffic without causing amenity and safety impacts. These will impact on residents along the road who may feel like they can no longer safely enter or exit their property. Safety of pedestrians and cyclists will be impacted as traffic volumes increase. **Positive response** that Golflinks Road has long required upgrading and was unlikely to be funded by Council. The development has necessitated upgrades including shoulder widening and pruning of vegetation on the roadside (improving sightlines) and a new pedestrian and cycle path for the community. These will be provided to the community at no cost to Adelaide Hills Council ratepayers.	Shoulder widening is proposed in key locations along Golflinks Road which will make an improvement to this. Road design has been independently assessed to be able to adequately support the projected traffic volumes. A new trail on the site adjacent to Golflinks Road will provide a safe alternative for walkers and cyclists in a natural setting. The trail is designed to minimise vegetation impacts. This is new infrastructure that will create a safe off-road place for pedestrians and cyclists that is not currently accommodated on Golflinks Road. The future traffic volumes on Golflinks Road remain well below the capacity of a local road which is typically taken to be 1,500 vehicles per day. Traffic data recorded by Adelaide Hills Council indicates that the Average Annual Daily Traffic (AADT) volume of Golflinks Road is in the order of 444 vehicles per day (vpd). Applying the forecast increase range of 290-560, this equates to 734-1034 vpd. Therefore, there is additional capacity in Golflinks Road even with the proposal accommodated. Therefore, while other road users would experience an

Activity likely to cause impact	Prediction/analysis of likely impacts	How stakeholders may respond to impact	Mitigation measure
			increase in movements, the additional traffic activity is not considered excessive nor unreasonable.
Vehicles moving slowly or stopping on Old Carey Gully Road	A new entry point to the site on Old Carey Gully Road will require vehicles (staff, construction vehicles and Perfumery visitors) to stop and give way to traffic before safely turning into the site (and vice versa).	**Negative response** as a result of increased chance of collision, accident or 'rear end'/'t-bone' due to traffic using Old Carey Gully Road not anticipating traffic to be stopped, slowing, or pulling out into traffic. **Positive response** to the speed reduction which may improve overall safety in this area.	Speed reduction near the Old Carey Gully Road entry will improve safety for traffic entering and exiting the site. New signage on Old Carey Gully will also provide advance notice to motorists of the appropriate entry points and providing them warning to adjust their speed accordingly.
Impacted trees / native vegetation	Reduction in habitat, reduction in flora and fauna biodiversity, reduction in tree canopy coverage.	**Negative response** is likely to be felt strongly within the immediate and wider community, with the native environment of the Adelaide Hills being highly valued. Concerns that this removal will reduce biodiversity, cause habitat loss and contribute to climate change, as well as having amenity impacts. There is also concern that any offset levy required has not been accurately calculated. **Positive response** may be that reducing vegetation on the site reduces the corresponding fire load, therefore potentially reducing the severity and risk of bushfire.	To minimise impacts to native vegetation, the site of the tourist accommodation building occupies the area where the existing clubrooms and accommodation for the Stirling Golf Club are located. The offset levy has been recalculated and confirmed by the Native Vegetation Council. Concessions are being made to reduce this impact, with the 'pod' accommodation located amongst native vegetation being eliminated from the development application. This equates to a reduction in the amount of native vegetation impacted by almost 1 ha and a 95% reduction in the number of scattered trees impacted, compared to the earlier proposal. Significant revegetation and contribution to financial offsets will have longer term benefits but will take time to be realised.
New tourism offering and increased tourist accommodation	Increased visitation and patronage.	**Negative response** that the Golf Estate may 'cannibalise' business from other accommodation or function venues in the region. **Positive response** by encouraging additional spending in the region, which in turn brings business to other existing operators. In addition, the project may be a catalyst for additional investment and economic uplift in the area.	The Cost Benefit Analysis undertaken suggests the project will generate a net benefit to the community of $9.2 million over a 30-year period. The South Australian Tourism Commission have indicated strong support for the proposal, citing an undersupply of the offerings provided at the facility.
Adaptive re-use of local heritage item	Building work and restoration to dilapidated local heritage place. Adaptive re-use as a tourism destination. Increased visitation to the site.	**Positive response** as it allows the retention of important historical, cultural, and architectural elements, ensuring that the heritage item remain a part of the cultural landscape.	Promotes sustainable development by repurposing existing structures rather than demolishing them and constructing new ones. This reduces waste and preserves embodied energy.
Major development approval	If approved, the assessment and approval may demonstrate that this kind of development can be well accommodated on this type of site/in this region.	**Negative response** with a concern that the approval of this kind of land use or development may cause a 'slippery slope' of approvals of other land uses or developments that are not considered to be suitable to the Adelaide Hills.	The Major Development process is managed by DTI PLUS for the Commission in line with clear legislative processes which includes public consultation requirements.

Activity likely to cause impact	Prediction/analysis of likely impacts	How stakeholders may respond to impact	Mitigation measure
		That this runs contrary to a sense of fairness with local residential property owners (or those in different neighbouring zones) having not been permitted to develop their properties, but which comparatively are much lower impact than the Golf Estate. **Positive response** may be held by some, as this demonstrates that the Adelaide Hills is a good place to invest and that approvals for complex developments such as these can be achieved (if approved).	
Land division	One allotment to be divided into three to formalise the areas for tourist accommodation and golf course facilities to balance the site for leasing purposes.	**Negative response** that the land division will cause a proliferation of housing or other development by breaking the land up into smaller parts. That the land division is unlawful because it contravenes a legal instrument – the "1975 Proclamation" which seeks the land to be retained as open space.	Open Space proclamations were used before the introduction of up-to-date land use zones in the planning system and were used as a way to protect privately held land from further subdivision for housing. It is not the intent to subdivide this site for housing. Should the proposal be approved, the applicant will seek for this proclamation to be revoked, on the basis the current zoning of the land will suitably assess future development. Current planning policy restricts the site for future development for housing.

6. Summary of findings

6.1 Summary

This SIS has identified the community and locality context and characteristics, and then worked through a systematic identification of impact causing activities and mitigatory measures. It outlines that there will be a series of real and perceived, positive and negative impacts as a result of the proposal.

Much has already been done to reduce negative impacts with a range of concessions through the amendment process which greatly increased social and environmental benefit and reduced negative impact. This includes a significant reduction in the amount of native vegetation impacted, which has been a key community concern raised in the public exhibition. The amendments are detailed in table 8 below.

Table 8 Impacts mitigated as a result of amendments

Alternative or amendment made	What impacts this alternative/amendment mitigates
Removal of the 17 accommodation pods and 1 service pod.	• Amount of trees/vegetation impacted • Visual impact • Scale of development
A reduction in the amount of native vegetation proposed to be impacted from 1.716 hectares (ha) and 151 scattered trees to 0.757 ha and seven scattered trees.	• Amount of trees/vegetation impacted • Removal of fauna habitat
Reconfiguration of Perfumery Gardens and Orchard to retain additional trees.	• Amount of trees/vegetation impacted
Relocation and additional car parking for staff, now accessible from Old Carey Gully Road to reduce forecast daily traffic movements on Golflinks Road.	• Impacts on Golflinks Road residents • Traffic increases
A new dedicated pedestrian trail adjacent Golflinks Road to increase pedestrian safety and separate cars from pedestrians.	• Pedestrian and cyclist safety

The proposal will not lead to any permanent population increase, or significant increase in visitors to the site, nor is it likely to include the kinds of activities that might increase risk and require access to medical facilities (with the exception of construction). As a result, it is not anticipated that there will be any impacts on local schools, hospitals, or social services. Impacts on infrastructure and emergency services (bushfire

risk) have been assessed to be able to be accommodated within existing capacity or improved by the applicant as a requirement of approval.

Negative impacts are likely to be localised to a small residential community in proximity to Golflinks Road (and other non-through roads that intersect Golflinks Road) and may comprise activities such as increased traffic and construction. These will either be for a limited time (in the case of construction) or may over time become a 'new normal' for the directly impacted community as they become accustomed to more people on local roads, and other changes to the site.

The road has been assessed to be designed to accommodate the anticipated vehicle numbers. Despite this, the increase in traffic may have perceived impacts on the safety and amenity of residents and other road users. This can be somewhat mitigated through the sealing of shoulders and pruning to improve sightlines which the applicant has already agreed to.

The local and broader community have identified their concerns about impacts on local flora and fauna. This has been eliminated to a significant extent (through the amendment of the proposal) which significant reduces the amount of impacted native vegetation originally anticipated.

While local impacts will be felt or perceived, there are also a range of other positive regional-level advantages. These include strong positive impacts on regional tourism and local job creation. Investment in improving Cox Creek and weed reduction will have net positive benefits on the site and beyond.

The demographic analysis of the directly impacted community and the wider Adelaide Hills community suggests that this community will have high levels of social resilience, stability and education levels, indicating their ability to more readily adapt with change and access established support networks and systems.

6.2 Proactive mitigation measures and social benefit

There are a range of proactive mitigatory measures that may assist in further minimising perception of negative impacts and contribute to creating lasting social benefit. These include:

Skill development

The applicant may wish to consider ways in which it can engage local people in skills development linked to employment opportunities at the facility. Employing local people increases the resilience and sustainability of the facility and the local community and increases personal investment in the facility. This could take the form of apprenticeships and cadetships and involve collaboration with local schools.

Information sharing and relationship building

There is a significant opportunity to share a range of additional 'good news' stories that may not have been identified during the development assessment process, such as the significant investment in reducing and managing weed species on the site. This will have a range of positive environmental outcomes, as well as reducing vegetation loads that contribute to bushfire risk. The applicant may wish to consider opportunities to share information with the local community. This may take the form of a project update that could be letterboxed, or a community information night.

Bushfire management and capacity building

The operator of the facility may like to consider providing information to the local community around bushfire risk and management. This would be a community capacity building exercise to manage risk at a broader neighbourhood level. We know from the research that too few households in bushfire risk areas have an active and actionable Bushfire Survival Plan. Mount Lofty Golf Estate may wish to consider holding a community information session which would include a speaker from the CFS, and materials and information for the local community about how to create their own Bushfire Survival Plans. This would also be a positive opportunity to inform neighbours about how Mount Lofty Golf Estate manage their risk and activities on site – for example through early evacuation and reducing numbers on site. This may go some way to alleviating unnecessary concern within the community and further encourage neighbours to manage risk at their own household/property level.

Citizen science projects

The representations received from the public exhibition process demonstrate very high levels of interest, concern and attachment to the flora and fauna on and around the site. The applicant may consider working with local interest groups to develop a citizen science program. This would enhance a sense of community acceptance and ownership of the site.

SHAPING
GREAT
COMMUNITIES

URPS

Appendix W

Industry Letters of Support

Government of South Australia
South Australian Tourism Commission

28 September 2022

Mr. Sam Jayathilaka
Mount Lofty Golf Estate PTY LTD
35 Golf Link Drive
Stirling SA 5152

Dear Mr. Jayathilaka,

Re: Mount Lofty Golf Estate development plan.

The South Australian Tourism Commission (SATC) writes in strong support of the proposed development plan for the Mount Lofty Golf Estate (MLGE) – currently known as the Stirling Golf Club – and the plans to develop the property into boutique hotel style accommodation.

The MLGE proposed development boasts 80 spacious hotel rooms and 20 chalets, which will take advantage of the pristine Mount George views and premium local food and wine experiences and offer unique 'on course' accommodation to cater for all travellers including golfing groups, leveraging the regions demand for sporting and recreational event-style accommodation.

The MLGE development will create a new opportunity for visitors to experience what will be a significant regional catalyst for economic growth, bringing great benefit to local businesses and increased employment both within the Adelaide Hills region and surrounding towns.

The SATC exists to promote the state as a desirable tourism destination, and new and enhanced South Australian accommodation is necessary to add variety and compete with international locations. The Regional Visitor Strategy 2025 (RVS2025) identifies Experience and Supply Development as a priority and acknowledges that encouragement of experiential accommodation development linked to an appealing landscape or activity, including golfing, is critical to support the development of additional regional accommodation.

The RVS2025 also identifies it a priority for the Adelaide Hills region to develop and expand overnight visitation from intrastate, interstate, and international markets, focusing on experiences around touring routes that appeal to the self-drive markets. The offering of the proposed MLGE development will be a key draw card for self-drive groups.

The MLGE development delivers an important tourism asset of scale to improve visitor amenity and access, enhance visitor experience, and create opportunity for the self-drive market. This development has the potential to drive more consumer spend, increase the number of night stays in the region and maximise its proximity to Adelaide.

SATC supports this development which will deliver significant tourism and economic outcomes.

Yours Sincerely

Nick Jones
Executive Director, Destination Development
South Australian Tourism Commission

THE STIRLING
GOLF CLUB

To Whom It May Concern,

RE: GOLF CLUB & MEMBER LETTER OF SUPPORT

I, Andy Moritz, President of the Mount Lofty Golf Club also referred to as the Stirling Golf Club, can confirm that URPS and the developer have met with Club executive members (General Manager, President and Captain) and socialised the proposed development and an engagement process with members and neighbours.

The Stirling Golf Club was founded by five members of the Royal Adelaide Golf Club in 1925 and was originally named Mount Lofty Golf Estate. The club has a small but loyal membership base who are excited to see a commitment from the developer to recognise the potential of the unique Golf Course by creating a destination venue.

This project will ensure that Mount Lofty Golf Estate joins an exclusive group of golf clubs that have reached a centenary in 2025, marking its 100th year in operation. Our club has had various obstacles, with lack of facilities, unlike the other nearby Golf Courses namely Blackwood, Aston Hills and Mt Osmond, which offer better facilities. The opportunity to redevelop the site will provide a competitive edge to MLGE, attracting national and international guests, increasing memberships and in turn providing for greater capex and maintenance budgets.

We are recognised as a challenging course due to the undulating terrain which will only further attract skilled payers to our Club upon completion of the Hotel and accommodation offerings. The realised development will reimagine the accommodation and tourism support facilities in the Adelaide Hills to build on the retention of the golf offering at the site. It will also see the adaptive reuse and reinvigoration of the deteriorating heritage listed Perfumery Building, allowing the community to re-engage with this piece of local history.

The vison is to revitalise the club and upgrade the property to a world class resort whist bringing back the original name preserving its cultural and historic importance for the future. We are proud to be affiliated with the proposed eco-friendly sustainable design solution which will not only contribute to the economic health of our club but the broader Adelaide Hills region, in particular the township of Stirling.

Yours Sincerely

Andy Moritz

President – Stirling Golf Club

To whom it may concern,

MT LOFTY GOLF ESTATE REDEVELOPMENT LETTER OF SUPPORT

As a PGA Golf Professional and representative of the PGA of Australia based in SA, I would like to register my support for the proposed redevelopment of the Mount Lofty Golf Estate located at 35 Golf Links Rd, Stirling SA.

There is a rich history attached to the Golf Club in South Australia, first founded in 1926 as a 9-hole golf course. The Golf Club still follows the same values since its conception of being inclusive, family friendly and welcoming to visitors, with the course the only Golf Club in or surrounding areas that currently offer accommodation.
For South Australia, accommodation on and near golf courses are truly limited. There are only 6 resorts or accommodation currently for golfing tourists. These are based in the areas of Barossa, the Riverland and The Fleurieu.

Based on the National Golf Report 2020-21, in South Australia participation levels have increased 21% and members member increase of 7.2% based on 1,204,000 participants (15+years old). Golf is a dynamic and growing activity for tourists globally and is proven as a very successful and profitable tourism product around Australia.
South Australia's golf tourism industry is a key economic growth opportunity for Adelaide and regional South Australia. Golf courses are an attraction for tourist destinations, as proven in all other states around the nation. Golf tourism attracts investment, improves employment and regional competitiveness, and compensate for the seasonality of traditional tourism. On average from statistics from SA Tourism, the golf tourist spends 75% more than the average tourist and stays longer, (up to 3 more days on average).

The location of the Mt Lofty Golf Estate redevelopment in the township of Stirling and being only 20mins from the Adelaide CBD, is an ideal destination for Golfers and their families.

South Australia's golf tourism industry is a key economic growth opportunity for Adelaide and regional South Australia and in my belief, untapped. With the inclusion of the world class accommodation facilities, MLGE could be recognised as a one of the great golf courses of Australia collection and seen a pinnacle of Australian golf venues, offering a remarkable layout, as well as first-class facilities and hospitality.

The proposed redevelopment of the Mt Lofty Golf Course will improve the state's competitive standing as a golf tourism destination. Broader investment in the Adelaide Hills will improve the capacity of the region to be marketed as a year-round golf destination, especially to domestic markets. I strongly believe that the MLGE estate location and offering of complimentary tourism experiences will attract golf visitors and to encourage them to stay longer, in turn contributing positively to the local economy as well as raise the profile of South Australia as a Golf destination.

Yours Sincerely,

Warwick Hazel
SA PGA MSO
0403 213 992 whazel@pga.org.au

Sam Jayathilaka
Director - Mount Lofty Golf Estate Pty Ltd
35 Golf Link Drive
Stirling
South Australia

12 September 2021

Dear Sam,

I write on behalf of Adelaide Hills Tourism to express support for the initiative proposed by Mount Lofty Golf Estate Pty Ltd to undertake considered improvements and expansions to tourism and events infrastructure at its existing site in Stirling.

In the Adelaide Hills, the visitor economy is critical to the ongoing health, wellbeing, harmony, and prosperity of the community. As our region continues its recovery from the devastating 2019 bushfires, and then COVID-19, it is essential that we continue to enhance and develop infrastructure that drives increased visitation to the region, whilst also best supporting the local environment and community.

Of particular importance is accommodation capacity. If the region is better equipped to accommodate larger overnight groups, then it will be able to grow tourism contribution to the local economy by attracting more people to stay for longer.

Adelaide Hills Tourism understands the proposed development will drive the following benefits for the region.

- Significant contribution to the local economy by driving approximately 20,000 annual visitor room nights for the region, in addition to significant other expenditure linked to events, golf, wellness activities, and food & beverage attractions.
- Generate new jobs for locals, both during construction and once the development is fully operational.
- Much-needed improvements to a 100-year-old golf course, that is central to local community and heritage.
- Achieve the optimum green rating, ensuring responsible and sustainable use of the site in the short and long term. This includes sensitive care of surrounding vegetation, landscapes, and wildlife.
- Generate profile for the Adelaide Hills Region, for example by attracting professional golf events.
- Support surrounding local businesses, with visitors likely to spend time exploring surrounding wineries, attractions, main street precincts etc.

Adelaide Hills Tourism respects the thorough and important development approval processes of state and local government, and has every confidence that the proposed development has fully considered the surrounding environment, community and heritage, so as to ensure beneficial outcomes for all concerned.

Should this development be approved, Adelaide Hills Tourism looks forward to working closely with Mount Lofty Golf Estate Pty Ltd, to maximise the benefits for the Adelaide Hills region, whilst also supporting long term sustainability and success of another local business.

Yours sincerely

Martin Radcliffe
Chair - Adelaide Hills Tourism

martin@visitadelaidehills.com.au
+61 402 313 228

Appendix X

Operational Environmental Management Plan - Environmental Projects

Operational Environment Management Plan

Mount Lofty Golf Estate

5 December 2022

Level 3/117 King William Street Adelaide 5000
environmentalprojects.com.au
Phone +61 8 8470 9030

Document Control

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Table of Contents

List of Tables

List of Figures

List of Appendices

Appendix A

Site Location

Appendix B

Environmental Performance Management

1. INTRODUCTION

An Operational Environment Management Plan (OEMP) is required as part of Development Application conditions, to address obligations for management of the potential environmental impacts of Mt Lofty Golf Estate and associated amenities on the surrounding environment.

1.1 Purpose of this OEMP

The purpose of this OEMP is to document the controls that will be applied to activities associated with the proposed golf course and tourist accommodation use of the Mt Lofty Golf Estate.

The key objective of the OEMP is to ensure that Mt Lofty Golf Estate onsite activities do not cause environmental nuisance or harm or impact on the environmental values for the site and its surrounds by:

- conducting all activities in accordance with applicable legislation
- conserving and protecting the natural environment through protection of ecosystems and promoting efficient use of all resources
- minimising negative environmental outcomes through reducing wastes, potential impact sources, emissions and other pollutants, whilst minimising energy usage
- clearly identifying the environmental roles and responsibilities of staff and contractors
- providing appropriate resources and environmental training commensurate with the roles and responsibilities of staff, workforce and persons undertaking activities
- communicating the company's environmental objectives and performance indicators to employees, contractors, clients and the community.

1.2 Design Statement

The Design Statement for the proposed redevelopment offers the following key principles:

- Minimise impact to existing site topography
- Preserve and enhance native flora and fauna
- Preserve and enhance the original publicly accessible golf course
- Respect for Traditional Owners
- Reflect the history and character of the Adelaide Hills
- Optimise the views
- Showcase environmentally sustainable design
- Showcase local produce

- Preserve and enhance local amenity
- Grow regional tourism and make a positive economic contribution
- Restore the heritage building usage (perfumery) and gardens.

The OEMP is designed to align with these key principles.

2. PROPOSED SITE DEVELOPMENT

The proposed development is summarised as follows:

- Hotel - 3-5 level hotel building comprising:
  - 56 hotel suites.
  - 15 x two bedroom serviced apartments.
  - 15 x three bedroom serviced apartments.
  - 2 penthouse serviced apartments.
  - Back of house, plant storage and maintenance areas.
  - A 537m^2 function room.
  - A 212m^2 restaurant with 89 m^2 external terrace.
  - 186m^2 sports bar.
  - A 189m^2 gallery and cafe.
  - A 94m^2 wellness centre with 125m^2 gym and spa/massage treatment rooms.
- Private retreats – 'Pods'
  - 17 x one bedroom units.
  - 1 x back of house Service Pod.
- Adaptive reuse of the existing perfumery:
  - Refurbishment of the existing local heritage place to accommodate a multipurpose space for use as café, retail or functions.
  - Extension to the Perfumery to include a covered outdoor dining area.
  - Orchard and perfumery garden plantings to reimagine the former use of the building as a "Scent Factory".
  - Note: the perfumery building will temporarily house the golf club whilst construction is occurring.
- Golf Course Facilities Building - 2-5 level building comprising:
  - Retention of 18-hole golf course with improvements.
  - Refurbished function facilities, cart storage and 138m^2 clubhouse in new building.
  - New 97m^2 pro-shop, administration areas, gym and change rooms.
- Car Parking, Access and Waste Management

- A total of 200 car parking spaces in two car parking areas.
- Emergency vehicle access via western entry from Golflinks Road.
- Main access point via Golflinks Road.
- Designated service bay for waste collection and service vehicles.
- Porte cochere and valet area for guests and buses.
- A separate entry from Old Carey Gully Road to provide maintenance vehicle access and public access to the perfumery building.
- Designated waste storage areas.

- Subdivision – following construction of the proposed development, it is proposed to divide the site into three (3) allotments:
  - Allotment 532, with an approximate area of 9,924m2 together with a right of way 'A', comprising the hotel building and pods.
  - Allotment 533, with an approximate area of 5,056m2 together with a right of way 'B', comprising the golf club and facilities building.
  - Allotment 531, with an approximate area of 38.4 hectares, comprising the balance of the golf course, subject to easements 'A' and 'B'.

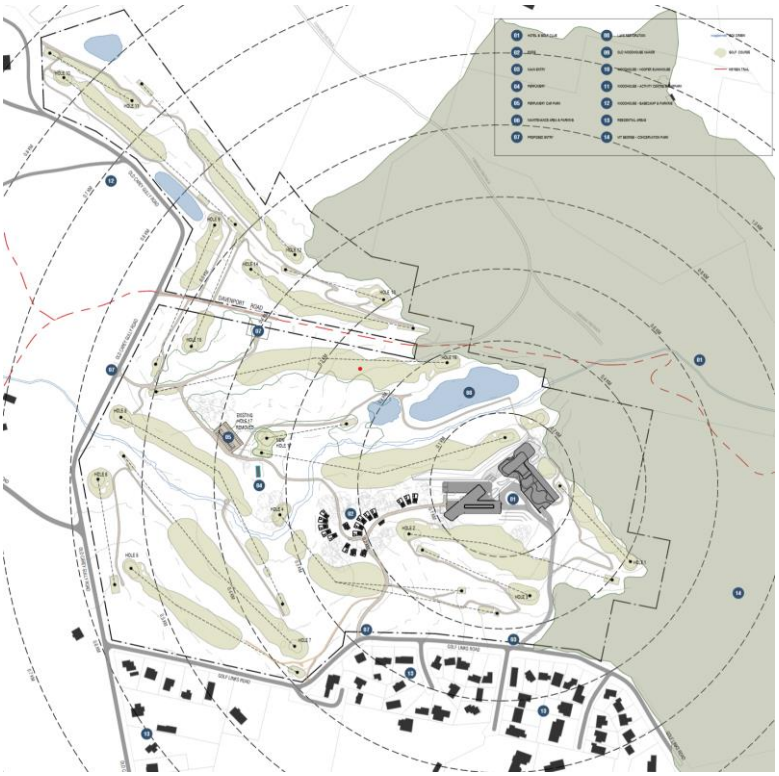

Figure 1 Development Plan

3. EXISTING ENVIRONMENT

3.1 Development site

Mount Lofty Golf Estate will redevelop the Stirling Golf Course, located at 35 Golflinks Road, Stirling, South Australia.

An ecological flora and fauna assessment (EBS Ecology 2022) identified pockets of remnant native vegetation, scattered trees and landscape vegetation associated with the golf course. Few patches of native remnant vegetation remain on the site, and they are generally impacted by weeds and lack understorey. EBS however considers vegetation on the golf course to have high habitat value as it provides corridors for movement of fauna to better quality vegetation. The remaining trees were observed to contain a large number of hollows which might be used by birds and other fauna.

3.2 Surrounding land use and sensitive receptors

Surrounding land uses consisted primarily of rural residential dwellings and agricultural use.

Sensitive receptors to potential environmental impacts from the proposed development include:

- nearby residents, in relation to nuisance issues associated with visual amenity and noise
- Mount George Conservation Park to the east, which reportedly is “supporting a large assembly of both nationally and state listed flora and fauna”, (DEH 2006).

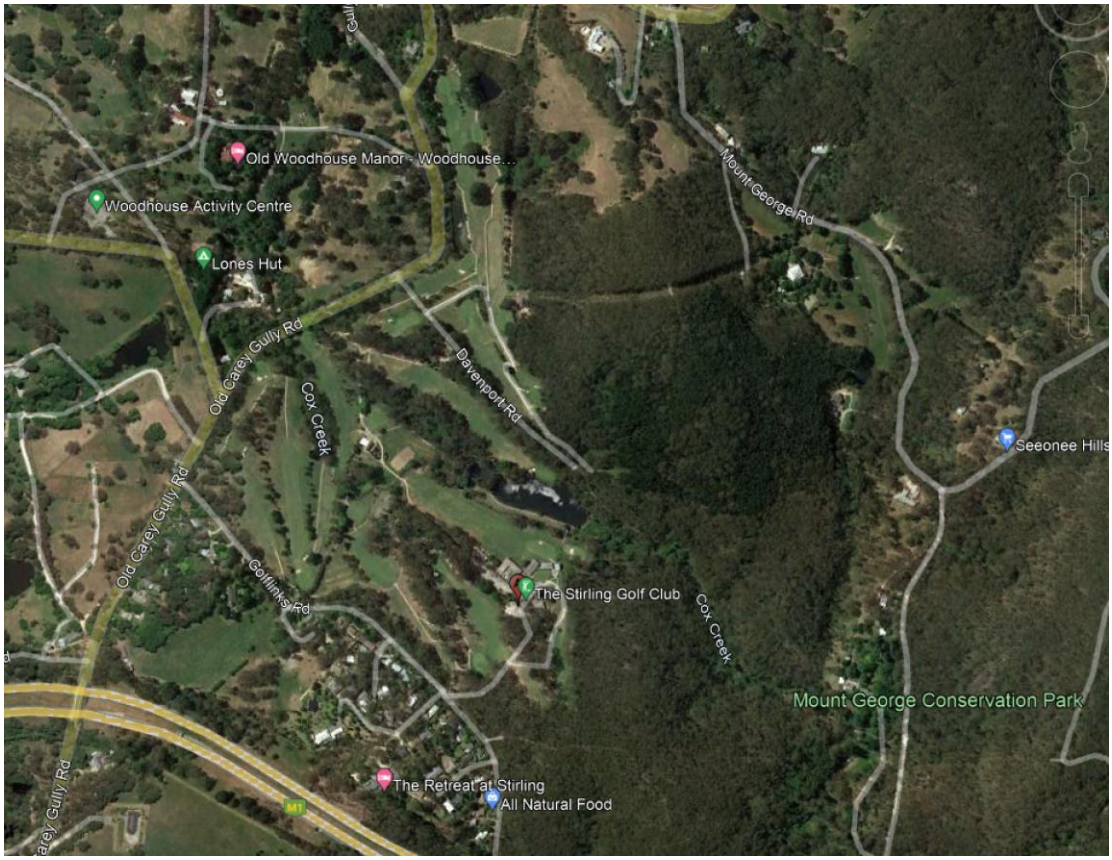

Figure 2 Site Setting

See Section 7 for the identified environmental aspects and associated impacts of this project.

4. DEVELOPMENT DESIGN

Specifications have been incorporated into the design to minimise environmental impact.

4.1 Waste management

Waste management design is detailed in:

- Mount Lofty Golf Estate Golflinks Road, Stirling, Waste Management and Minimisation Plan, CIRQA.

The Waste Management and Minimisation Plan (WMMP) states that operational activities relevant to waste will relate to:

- the continued use of the golfing facilities
- accommodation of tourists
- operation of the food, beverage and hospitality uses
- various servicing and maintenance activities associated with the various facilities within the site. This will include the collection, segregation, reuse, recycling, and removal of waste materials generated by the site's uses in line with the WMMP.

It is expected that waste management and minimisation will be undertaken in accordance with industry standards and the WMMP. Hence the only environmental aspect of waste disposal to be considered in this OEMP is appropriate storage prior to collection by licensed contractors for off-site re-use, recycling or disposal.

4.2 Stormwater management

Water management is detailed in:

- Mount Lofty Golf Estate Sustainability Strategy Report (DSquared).

A rainwater capture and reuse system will provide rainwater for landscape irrigation, laundry services, and washdown of golf carts/waste storage rooms.

A 50 kL rainwater storage tank will contribute 13 per cent of the development's total water demand and 25 per cent of non-potable water demand.

Landscaping comprises native and drought-tolerant planting species which have low irrigation water demands.

The stormwater system is designed such that pre-development peak stormwater outflows will not be exceeded, and all stormwater run-off will be appropriately treated before discharge to the local waterways. The use of stormwater detention tanks will contribute to meeting these outcomes.

5. REGULATORY REQUIREMENTS AND GUIDANCE DOCUMENTS

Mt Lofty Golf Estate are required to implement and maintain an OEMP to manage potential environmental impacts during operation.

5.1 Environment protection and pollution prevention

Management of the environment and any pollution from this project must comply with:

- *Environment Protection Act 1993*
- Environment Protection Regulations 2009
- Environment Protection (Water Quality) Policy 2003 and 2015
- Environment Protection (Noise) Policy 2007.

5.2 Flora and fauna management

Management of flora and fauna from this project must comply with:

- *Environment Protection and Biodiversity Conservation Act 1999* – Commonwealth
- *Native Vegetation Act 1991*
- *National Parks and Wildlife Act 1972*
- *Landscape South Australia Act 2019*
- *Planning Development and Infrastructure Act 2016.*

5.3 Waste management

Management of waste must comply with:

- *Environment Protection Act 1993*
- South Australia's Waste Strategy 2020-2025

Management of waste soils at the site must comply with:

- EPA Guidelines 416/07 Waste Tracking Form and 415/10 Waste Transport Certificate
- Standard for the Production and Use of Waste Derived Fill 2013
- Current criteria for the classification of waste – including Industrial and Commercial Waste (Listed) and Waste Soil, SA EPA 889/10 2010.

6. ROLES AND RESPONSIBILITIES

The Site Manager assumes the responsibility for environmental matters and is advised by the Director, generally located at head office. Specialist advice may be sought from an appropriately qualified and experienced environmental consultant from time to time, as required.

Site personnel must report all environmental matters to the Site Manager, who is responsible for development and implementation of the OEMP, incident response, cessation of works order, communication of environmental issues, record keeping, training and other matters to satisfy the requirements of the OEMP. Should the Site Manager be off-site, responsibility for environmental matters is delegated to an appropriately trained and experienced person or the Director. Table 6-1 summarises the key areas and responsibilities under the OEMP.

Table 6-1: Roles and responsibilities

Key Tasks	Director	Site Manager	Employees
Annual review of OEMP including objectives, impacts, risks and controls	☑	☑	
Allocation of resources to meet environmental objectives	☑	☑	
Development and maintenance of the environmental management system, incorporating any changes to legislation, regulations or guideline documents		☑	
Disseminate environmental management information to all staff		☑	☑
Adherence to environmental management policies and procedures	☑	☑	☑
Completing environmental risk assessments as necessary		☑	☑
Periodic internal monitoring and environmental compliance inspections		☑	
Raising environmental non-conformance where required, implementing preventative and corrective actions		☑	☑
Emergency response and notification of incidents		☑	☑
Annual summary report on environmental compliance		☑	

7. ENVIRONMENTAL PERFORMANCE REVIEW

Environmental aspects are defined as the elements of the organisation's activities, products or services that could interact with the environment. A significant environmental aspect has, or could have, a significant environmental impact (AS/NZS ISO 14001:2016).

A range of significant operational environmental aspects have been identified and are shown in Table 7-1: Significant environmental aspects, as well as the potential impacts and risk ratings for each aspect.

Table 7-1: Significant environmental aspects

Aspect	Potential impact	Risk level	Key control mechanisms
Vehicle traffic and parking	Generation of dust and emissions Damage to ecology by off-designated road traffic Spread of weeds from vehicle tyres	Low	Speed limits to slow down traffic movements reducing dust generation Designated and maintained roads and parking areas Sealed roads and parking areas Signage to discourage off road traffic
Pedestrian traffic in hotel area and golfers across greens	Spread of weeds Litter	Low	No un-authorised access to revegetation areas Marked access tracks
Pedestrian or buggy access into revegetation areas	Damage to vegetation and regrowth potential Disturbance to fauna Habitat disruption	Moderate	No un-authorised access to revegetation areas Marked access tracks
Inappropriate waste management	Increase of abundance or diversity of pest and vermin i.e. mice, rats, mosquitos Litter	Moderate	All general waste will be removed through council commercial waste collection services CIRQA 2022 WMMP Section 4.2
Grounds maintenance – mowing, slashing and weed control	Damage to plants and revegetation potential Disturbance and injury to fauna Habitat disruption Noise impacts to neighbours	High	No unplanned slashing of vegetation where native vegetation is present Areas of revegetation clearly identified Managed vegetation areas – development of specific SOPs Good communications with neighbours to notify of potentially noisy activities
Importation of soil for golf course	Importation of contaminated fill Spread of weeds	Moderate	All soil to be imported to site to be of known provenance (for weed propagation control) and tested to ensure it meets SA EPA Waste Fill criteria
Application of herbicides and pesticides	Damage to plants and revegetation potential Injury to fauna	Moderate	Experienced weed management contractors appointed to ensure appropriate measures are

Aspect	Potential impact	Risk level	Key control mechanisms
			adopted for weed management in areas of native vegetation
Workshops – equipment maintenance	Potential for spills/leaks (from vehicles, equipment and hazardous materials storage and use) to ground causing on and off-site contamination	Low	All vehicle servicing and maintenance will occur at licensed mechanics premises or in designated workshops onsite Any onsite workshops will be fitted out with appropriate controls for any potential risks identified for environmental impacts
Vehicle and equipment use on site	Potential for spills/leaks (from vehicles, equipment and hazardous materials storage and use) to ground causing on and off-site contamination	Low	There will be minimal pieces of plant/equipment onsite at all times Spill kits are located onsite and contain relevant quantities of collection materials. All contaminated materials to be disposed of by licensed contractors Staff will be trained in spill response
Waste generation-house keeping	Litter and storage of waste materials causing impacts to land, habitat, flora and fauna, aesthetics, or becomes a nuisance issue	Low	All general waste will be removed through council commercial waste collection services. CIRQA 2022 WMMP Section 4.2
Site Contamination	Spread of contaminated soil	Low	Testing of soil prior to movement or reuse to ensure it is suitable for the proposed use
Water management	Surface water runoff contaminated by site activities		Onsite surface water detention capacity shall be designed to cater for expected runoff from hardstand and rooves

7.1 Environmental Elements and Objectives

The key objective of this OEMP is to review the likely environmental performance of the proposed development from a design perspective (with further improvements such as energy efficiency to be developed with final design).

Table 7-2: Design Environmental Element and Objectives

Design environmental element	Objectives
Soil Management	Minimise disturbance of ground surfaces and implement sediment, erosion and drainage management. Design to minimise erosion and sediment transport.
Stormwater Quality	Minimise the effect on water quality/stormwater runoff by minimising disturbance to ground surfaces and implementing effective erosion controls where required.

Design environmental element	Objectives
	Minimise increased surface water runoff by adopting infiltration designs for large areas such as car parks. Contain and reuse stormwater where possible. Minimise increased or uncontrolled runoff onto adjoining land and into council stormwater system. Treat stormwater runoff to remove debris and sediment.
Waste Management (including wastewater)	Apply the waste management hierarchy: Avoid/Minimise, Re-use/Recycle, Recover, Treat, Dispose. Minimise pollution by employing appropriate waste storage, handling and disposal methods.
Biodiversity and Nature Conservation	Minimise the impact of the development on native flora and fauna by confining activities to public areas and roads. Protect significant trees. Maintain established exclusion zones around existing vegetation areas. Protect and regenerate native vegetation areas.
Social Values / Health	Minimise aesthetic impact to neighbouring residents. Minimise impact of vine spraying drift on guests or restriction on vine management caused by presence of building. Minimise energy usage.
Cultural Heritage	Avoid harm to cultural heritage by developing plans for management of any known heritage sites.

7.2 Environmental performance review

Environmental performance reviews have been undertaken for the specific design elements identified in Table 5-1.

Reviews (attached as **Appendix B**) have been developed for the following:

- soil management
- stormwater management
- waste management
- vegetation management
- social and cultural value.

7.3 Environmental performance summary

Application and improvement of the OEMP will ensure that the proposed development will have minimal negative environmental impact on surrounding land.

The site layout allows management of environmental aspects to enhance opportunities for improvement of ecological value, such as increased planting of higher quality native vegetation.

8. REFERENCES

The OEMP framework uses several reports, which form part of the OEMP framework. Reports include:

- R Architecture - Design Statement
- Mount Lofty Golf Estate Architecture- DA Further Info DRAFT
- EBS Heritage_GX220701 Heritage Impact Statement DRAFT 220908
- Mount Lofty Golf Estate Hazard Management Plan_V.02
- Support Letter - Mount Lofty Golf Course - September 2022
- CIRQA Mount Lofty Golf Estate Waste Management and Minimisation Plan 15Sep22 Draft
- CIRQA Traffic and Access Impact Statement
- DSquared - 2623_Mount Lofty Golf Estate Sustainability Strategy Report
- EBS Ecology GX220701_Mt Lofty Golf Course EHIAR Draft V1 20220909
- EBS Heritage CHMP Framework
- EBS Ecology - Fauna and Flora Mt Lofty Estate Eco Assessment_Draft_V1_20220909
- EBS Heritage - Heritage Impact Statement DRAFT 220908

9. LIMITATIONS

Scope of Services

This environmental site assessment report ("the report") has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and Environmental Projects (EP) ("scope of services"). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on Data

In preparing the report, EP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report ("the data"). Except as otherwise stated in the report, EP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. EP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to EP.

Environmental Conclusions

Preparation of this report has been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for Benefit of the client

The report has been prepared for the benefit of the client for the specific purpose of this project. EP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of EP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other Limitations

EP will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

Appendix A

Site Location

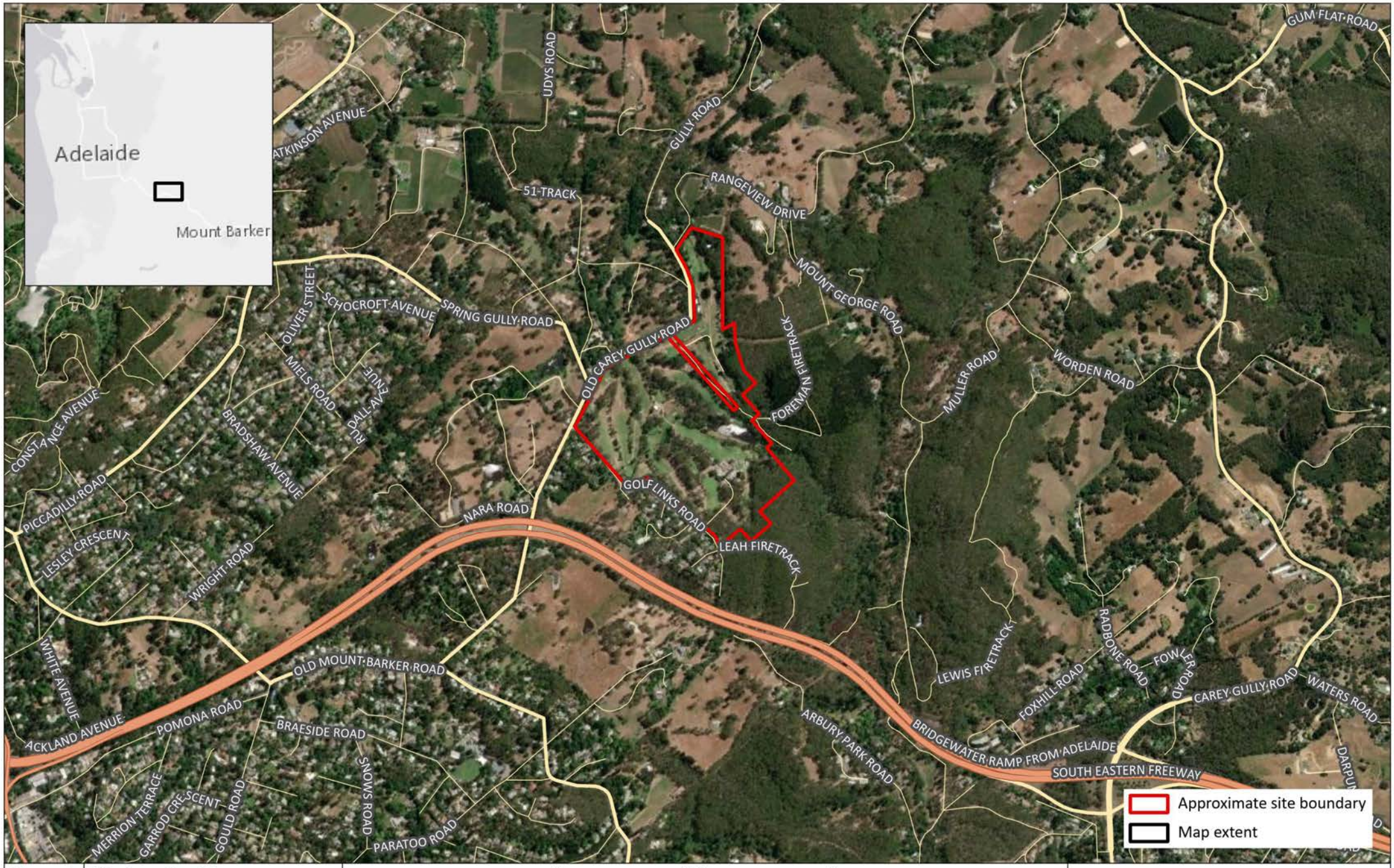

Figure 1 | **Site Location Plan**

35 Golflinks Rd,
Stirling SA 5152

Drawn: Chathuri Nisansala
Date: 28/09/2022

Rev: A

Job number:
22151.01

0 0.5 1 km

N

environmental projects

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Appendix B

Environmental Performance Management

B1– Soil Management

Outcome:	No negative impacts on soil quality on and off-site
Performance Indicator	Site erosion is minimised and soil condition protected. Sediment transport onto adjoining properties or waterbodies is minimised. Off-site soil quality is not compromised.
	Details
Management Measures	The proposed development design includes landscaping post-construction to reinstate vegetation and grasses surrounding the building to minimise exposed soil. Exposed soil will be stabilised Formal entry and exit point will be established for all vehicle traffic to minimise soil disturbance. If not hard paved, any traffic areas will be constructed of compacted sub-grade, covered with a 200 mm layer of 40 mm aggregate. Cars will only be parked in designated parking areas so as to prevent unnecessary disturbance of soils.
Performance Review:	The proposed development design minimises impact on site soils.

B2 – Stormwater Management

Outcome:	**No negative impacts on stormwater quality and quantity on and off-site**
Performance Indicator	Erosion and sediment transport, and adverse impacts to water quality are minimised, on and off-site. Sediment transport into council stormwater system is prevented. The volume of water running off the site will not change significantly. Water is captured for reuse. Water quality not affected by development activities such as car parking.
	Details
Management Measures	The proposed design includes open grassed land to allow stormwater infiltration. Stormwater discharge to the municipal stormwater system minimised. Swales will be installed to capture, direct and treat stormwater runoff. Sediment traps will be installed where erosive affects could potentially be enhanced and sediment run-off likely. A detailed inspection of the drainage pattern across the site will be undertaken and any drainage lines that are in the area of development will be redirected to maintain natural flow across the site. Stormwater runoff will be captured and stored in a retention basin and tanks. Where possible water will be used for irrigation and other uses.
Performance Review	The proposed development design minimises impact on stormwater runoff.

B3 – Solid Waste Management

Outcome:	**No impacts to the environment as a result of the generation and management of waste**
Performance Indicator	No spills or leaks to ground from storage or handling of waste. Minimisation of waste generation and no loss of waste from storage areas. No contaminated material used as site fill. No off-site movement of soils or waste without classification and receipt by an approved facility.
	Details
Management Measures	Storage, handling and management of wastes are to be in accordance with relevant guidelines. Wastes likely to be generated that will require management and disposal include: • domestic waste • recyclable materials • waste oils/chemicals (controlled waste) The hierarchy of reduce, reuse and recycle for waste will be implemented. Wastes will be segregated and stored appropriately to ensure spills, leaks and odour is avoided. Clear labelling of waste storage areas/bins will be maintained. Any off-site movement of waste will be in accordance with EPA and council requirements, including the use of appropriately licensed vehicles and completion of appropriate documentation. Housekeeping activities will include daily litter pick up and will ensure waste storage areas are neat and tidy. A suitably qualified contractor must be engaged to remove all waste,
Performance Revie	The proposed development design minimises impact on receiving environment.

B4 – Biodiversity and Nature Conservation

Outcome:	**Improvement to onsite existing vegetation and no harm to vegetation in the surrounding environment**
Performance Indicator	No unauthorised clearance or damage to native vegetation during golf course maintenance activity. No damage from application of herbicides and pesticides. Retention of significant trees. Enhancement of native vegetation areas for aesthetic and ecological value. Protection of areas with habitat value. No importation of plant pathogens or weeds. No impacts on nearby sensitive receptors.
	Details
Management Measures	No native significant vegetation to be disturbed by maintenance activity. No new access roads or tracks to be developed. 'No – go' zones will be flagged off for any identified vegetation protection areas. Significant tress will be identified and protected. Tree understorey will be planted out with endemic native species to improve ecological value. Proposed new vegetation areas will be populated with endemic species and will include planting of the understorey, creating a revegetation area.
Performance Review	The proposed development design minimises impact on vegetation and provides good environmental management.

B5 – Social and Cultural Values

Outcome:	**No nuisance issues to neighbours as a result of operation.** **Retention of heritage value.** **Management of discovered heritage items.**
Performance Indicator	Noise criteria are met. Visual amenity is maintained at highest standard. No complaints are received in relation to noise, odour, lighting, vibration or dust. Highest energy management standards are met. Protection of recognised “perfumery” European heritage value. No damage to cultural heritage values.
	Details
Management Measures - Social	Energy usage will be minimised operationally however solar panels will be fitted to augment power supply to the building. Any discoveries of cultural heritage will be managed appropriately and protected during and after development.
Management Measures - Cultural	Any discoveries of cultural heritage will be reported, managed appropriately and protected.
Performance Review	The proposed development design minimises impact on receiving environment.

Appendix Y

Bushfire Management Strategy - BSP Design

BUSHFIRE MANAGEMENT STRATEGY

Mount Lofty Golf Estate

35 Golf Links Road
STIRLING SA 5152

Document Status

Date	Version	Purpose of Issue	Author	Reviewer
2 December 2022	V1	DRAFT Issue for Preliminary Review	Peter Murton	-
8 December 2022	V1b	Preliminary Issue	Peter Murton	-
20 April 2024	V1c	Preliminary Issue	Peter Murton	-

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REPORT No 1684.BPSD.01

Mount Lofty Golf Estate
Bushfire Management Strategy

DOCUMENT CONTROL

File Reference	
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Document reviewed by xxxx (Position Title)	
Document endorsed by xxxxx(Position Title)	
Date approved	
Filepath Reference	

INDEX

FIGURES

Mount Lofty Golf Estate
Bushfire Management Strategy

INTRODUCTION

This document has been prepared to set the guidelines for the processes and procedures in the preparation for bushfires, particular responses and the actions required in the recovery following any bushfire event.

The Management Strategy (Plan) is a fluid document and must be reviewed on a regular basis and amended / upgraded as necessary, particularly prior to any bushfire season.

During significant bushfires, there will be conflicting demands on fire brigade resources and reliance should not be placed on fire brigade intervention to protect any specific property. It should therefore be assumed that there will be no fire brigade intervention with respect to protecting a specific property, and it is therefore the duty and responsibility for the Estate to be fully committed to providing the resources and appropriate actions in their duty of care to prepare for, prevent, mitigate, respond to, and support recovery from bushfire. There can be no absolute guarantee that the safety of all guests, staff and associated persons from bushfire.

All bushfires are different. Bushfires are complex and dynamic events. Safe responses will always depend on specific circumstances, so there is a need to plan for a variety of situations.

Bushfire safety depends on people having access to a range of safety options. All options other than being out of the fire area involve varying degrees of danger. Not all options will afford the same degree of protection from a bushfire

Bushfire safety involves effective planning and preparation prior to a fire, making informed decisions during the event, and having access to a range of safety options, in particular places to shelter from the effects of the fire.

Many of the actions required by this Management Plan are encompassed within the *Bushfire Survival Plan* for the Estate. This is a separate stand-alone document that should be read, referenced, and taken as an integral part of this Management Strategy.

OBJECTIVES

The objectives of this Management Strategy ('Plan') is to provide the detail necessary for the framework of measures to be considered.

The principal object of the Plan is to ensure such measures are taken towards the protection of human life, be it persons associated with a facility or the fire-fighting personnel that will attend during and following any bushfire event.

Bushfire management comprises three planks: *preparation, response and recovery.*

Preparation involves managing fuel loads and vegetation, maintaining access to tracks and fire breaks, planning fire response and ensuring sufficient human capacity and resources to respond to worst-case scenarios

Activities undertaken in advance of the occurrence of an incident decreases the impact, extent and severity of the incident and to ensure more effective response activities. Arrangements to ensure that, should an event occur, all those resources and services which are needed to cope with the effects can be efficiently mobilised and deployed.

Measures are to be taken to ensure that resources and services are capable of coping with the effects.

Response encompasses actions taken in anticipation of, during, and immediately after an event to ensure that its effects are minimised, and that people affected are given immediate relief and support.

Recovery is the restoring or improving of livelihoods and health, as well as economic, physical, social, cultural and environmental assets, systems and activities affected, aligning with the principles of sustainable development and "build back better", to avoid or reduce future disaster risk.

ROLES and RESPONSIBILITIES

Emergency Planning Committee

The first step is to establish an Emergency Planning Committee (EPC) if one has not yet been established. An EPC is most likely convened as an integral part of the management of the Estate.

The EPC is a consultative group made up of a representation of those who may work, live or otherwise are occupants at the premises. The group normally consists of senior management, tenants, staff, chief and deputy chief wardens.

The role of the EPC is to actively participate in the planning process and identifies the roles and likely participants who will be responsible for the implementation of the plan and its procedures during an emergency.

The role of the EPC is to:

- Establish and implement emergency plans and procedures;
- Identify duties and responsibilities of positions;
- Formulate emergency procedures;
- Educate & train employees and other occupants;
- Make all occupants aware of the emergency procedures for the development; and
- Conduct an annual exercise of emergency procedures for the development prior to the Bushfire Season.

Roles and responsibilities are required to be assigned to staff such as:

- Co-ordination and arranging transport;
- Physically relocating occupants from one place to another;
- Ensuring all buildings are properly secured to limit the impact of a bushfire;
- Initiating any bushfire protection measures such as sprinkler systems; and
- Liaising with emergency services.

REFERENCE : refer to the Bushfire Survival Plan

Examples of Roles and Responsibilities

Chief Warden

The Chief Warden is the person who is responsible for coordinating the emergency procedures and may also include:

- Managing and overseeing of any emergency procedures;

- Arranging training of employees in emergency procedure;
- Reviewing the effectiveness of emergency procedure exercises and arrange for procedure improvements; and
- Accounting for all persons during the emergency procedures.

Wardens / Employees

The wardens/employees are responsible for;

- Maintaining a calm atmosphere among the occupants;
- Following established procedures;
- Following the direction of the Chief Warden;
- Assisting with moving of occupants; and
- May be required to act as Chief Warden.

Note: The number of Wardens is dependent on the number of discrete business units, areas or buildings within which occupants may need to supported during a bushfire event, including the possibility of evacuation.

FIRE FIGHTING PROVISIONS

[DETAILS TO BE ADDED FOLLOWING DESIGN AND DOCUMENTATION]

MITIGATING THE BUSHFIRE RISK

Vegetation Management

Fire Management Zones are to be established and maintained in order to control the fuel loading created by the varying vegetation types.

The topography of the site and the large areas of native vegetation leads to the increased reliance of vegetation management to protect native vegetation in addition to retention of radiant heat that may be impinged on the assets (Bushfire Attack Level).

Appendix A provides a description of the types of vegetation management zones and there intended application.

Figure A1 in Appendix A indicates the planned areas of management and details the maximum levels of fuel loads that need to maintained.

ASSET MANAGEMENT and RECORDS

As a facility located within a High Bushfire Prone area, there are minimum requirements set for materials used and construction methods adopted fir the Estate in compliance with Australian Standard AS 3959 – 2018 *Construction of buildings in bushfire prone areas*

The details of construction including approved 'as constructed' documentation will be assembled within a manual for ongoing reference throughout the life of the facility, including critical advice for any subsequent owners and occupiers.

It is a part of this Bushfire Management Strategy that these records identifying the construction details as baseline data be maintained, with this Bushfire Maintenance Strategy and the associated Bushfire Survival Plan, included with copies maintained at the property.

APPENDIX A

VEGETATION MANAGEMENT

FIRE MANAGEMENT ZONES

Fire Management Zones (FMZ) provide a coordinated and consistent approach to bushfire risk mitigation and land management, and support the relevant fire and land manager/s by defining the minimum requirements an area must meet to comply with the relevant FMZ category. FMZs also determine the type of treatment activities that are permissible.

Where significant risks, either from bushfire or inappropriate fire regimes, are identified in an approved fire management plan, FMZs may be applied as a strategy to identify where fire management activities are considered a priority to mitigate the identified risk/s.

Fire Management Zones comprise the following categories:

- Asset Protection Zone (A-zone)
- Bushfire Buffer Zone (B-zone)
- Strategic Fuel Management Zone (S-zone)
- Conservation Zones (C-zones)
- Exclusion Zones (X-zone)

If fire management activities occur in areas that are not zoned the land manager must conduct the activities in accordance with the principles and regulation of the *Fire and Emergency Services Act 2005* (FES Act), and the *Native Vegetation Act 1991* (NV Act), and the Ecological Fire Management Guidelines (EFMG).

ASSET PROTECTION ZONE

Definition

An A-zone is an actively managed fuel reduced area that surrounds or is adjacent to assets for the purpose of minimising risks to life, property, and environmental assets, particularly aimed at stopping the spread of fire and preventing direct flame contact, intense radiant heat, and reducing short distance ember attack from the immediate environment.

The distance from the asset and the width has been determined by the Australian Standard 3959.

Fine fuel levels in the A-zone shall be maintained to keep surface and shrub level fine fuels at Moderate or lower (as an average across the zone) as defined in the Department for Environment and Water's *Overall Fuel Hazard Guide for South Australia*.

A-zones can include the 20 m Native Vegetation Council defendable space around dwellings[6]. A-zones can extend beyond this width, when identified in an approved fire management plan:

- to protect multiple dwellings, settlements, larger civil infrastructure, major road corridors, and defined environmental assets

- where slopes occur downhill from the asset or where vegetation types have High fuel levels (refer to AS3959 2018)

An A-zone may similarly be less than 20 m where the ground slopes uphill from assets or where vegetation fuel levels are low.

Managing Asset Protection Zones

A-zones should be maintained so that the overall fuel hazard (as an average throughout the zone) does not exceed Moderate.

• Dry grass in an A-zone should be maintained at 10 cm or less.

• A-zone incorporate existing cleared areas, roads, paths, fairways and tees which already have low fuel levels, rather than clearing further land. ,

Asset Protection Zone Vegetation management

Available fine fuels (fuel particles less than 6 mm in diameter – such as leaves, twigs, and small sticks up to pencil size) within an A-zone are to be reduced and maintained so that:

• fine fuel levels close to the asset are significantly lowered to reduce fire intensity and flame contact with assets

• fine fuel levels in surface, shrub, and canopy are significantly reduced and continuity (spread across the area) interrupted.

Note that mature trees are not fine fuel. Loose bark and dead leaf litter from mature trees are included in fine fuel assessment.

Fuel levels should be modified and maintained to keep the zone at Moderate or lower overall fuel hazard levels for the duration of the fire danger season. This may be achieved by utilising the methods identified below. Appropriateness of individual actions is dependent on land use and vegetation type.

Tree canopies within the A-zone should be separated by at least 2 m [8]. Keep the lower branches on mature trees pruned to a minimum of 2 m above the ground.

• Manage understorey plants in the A-zone so that the leaf area of the vegetation is not vertically or horizontally continuous. A disconnected ‘clumping’ of shrubs is more desirable than even connected coverage. Separate shrubs and trees to minimise vertical fuel ‘ladders’.

• Dead shrubs/understorey plants within the A-zone should be removed.

• Grasses within the A-zone should be reduced to an average height of 10 cm.

• No heath or shrub understorey species are to be within 2 m of the asset to be protected.

• Vegetation clearance can be undertaken within 20 m of an approved dwelling (apart from large trees with a trunk circumference of 2 m or greater (measured 1m from the base of the tree) (NV Act).

• Where the asset is a building, tree branches overhanging the roof should be removed or trimmed to at least 2m clear of the roof.

• *Where approved*, prescribed burning can achieve the desired fuel reduction outcome

• Fine fuel levels in the A-zone should be maintained to keep surface and shrub level fine fuels at Moderate or lower (as an average across the zone) as defined in the *Overall Fuel Hazard Guide for South Australia*.

BUFFER ZONES

Definition

A B-zone is an area maintained to not exceed High overall fuel hazard levels (as an average throughout the zone) aimed at minimising risks by slowing the fire's rate of spread, reducing its intensity, and minimising fire spotting potential over short to medium distances.

Purpose of Bushfire Buffer Zones

A B-zone may be created beyond an A-zone to provide additional fuel management to reduce the risk of bushfire and is often best utilised to complement an A-zone around a significant asset or settlement. However, it is not intended that B- zones will be created for single dwellings in rural areas.

• A B-zone is designed to:

o reduce fire spread, intensity, and short-medium distance spotting

o increase the area of reduced fire behaviour near significant assets

o provide an area of potential advantage for firefighters to suppress a larger bushfire

o reduce the impact of bushfire burning a whole large block of native vegetation or several adjacent smaller areas of native vegetation

o reduce the potential for a bushfire to burn out of vegetated land into surrounding land.

Managing Bushfire Buffer Zones

B-zones should be maintained to ensure that the overall fuel hazard does not exceed High (as an average throughout the zone).

Specification for Bushfire Buffer Zones

General design principles of Bushfire Buffer Zones

• B-zones may complement an A-zone, where necessary or to replace an A-zone where keeping fuel levels below High is sufficient to protect the asset and may result in a lower environmental impact.

• The location of a B-zone should incorporate existing fuel reduced areas such as cleared areas, roads, golf courses, and ovals where available.

• A B-zone should be wide enough that a majority of short-medium distance spotting will not occur beyond the zone. Recommended zone width is: o Grassland – up to 20 m

o Grassland with scattered trees – up to 20 m or 2x tree height (whichever is greater)

o Heathland/Coastal Scrub/Shrubland – up to 100 m

o Mallee – up to 1000 m

o Forest/Woodland (no stringybark trees present) – up to 500 m

o Forest/Woodland (stringybark trees present) – up to 1000 m

• The width of a B-zone can vary between 20 m and 1000 m depending on the vegetation type, fuel hazard levels, expected fire behaviour, and available control lines. Other factors influencing width may include topography (aspect and slope), the size and extent of native vegetation and environmental assets, known or expected fire paths or fire behaviour, and the level of risk to assets (including human settlement, cultural, or biodiversity).

Bushfire Buffer Zone Vegetation management

Fuel levels within a B-zone are to be managed so that:

• overall fuel hazard does not exceed High (as an average throughout the zone)

• potential spotting and fire intensity in the zone is reduced to provide a suppression advantage to assist in containing bushfires within defined areas

• spotting, fire intensity, and spread in the zone is reduced for safer access for firefighters

• spotting, fire intensity, and spread in the zone is reduced to provide strategic fuel reduction for a landscape, reserve, or large vegetation block

• by implementing B-zones, a range of activities could achieve the required fuel reduction, including but not limited to, prescribed burning, targeted woody weed control, selective thinning, or mechanical treatment. The selection of treatment method will be influenced by the effectiveness of the technique, the environmental impact of the activity, and cost of the operation.

(SITE PLAN WITH FIRE MANAGEMENT ZONES IDENTIFIED TO BE INSERTED)

FIGURE A1 – FIRE MANAGEMENT ZONES

APPENDIX B

FIRE FIGHTING PROVISIONS

Fire Water Storage

[DETAILS TO BE ADDED FOLLOWING DESIGN AND DOCUMENTATION]

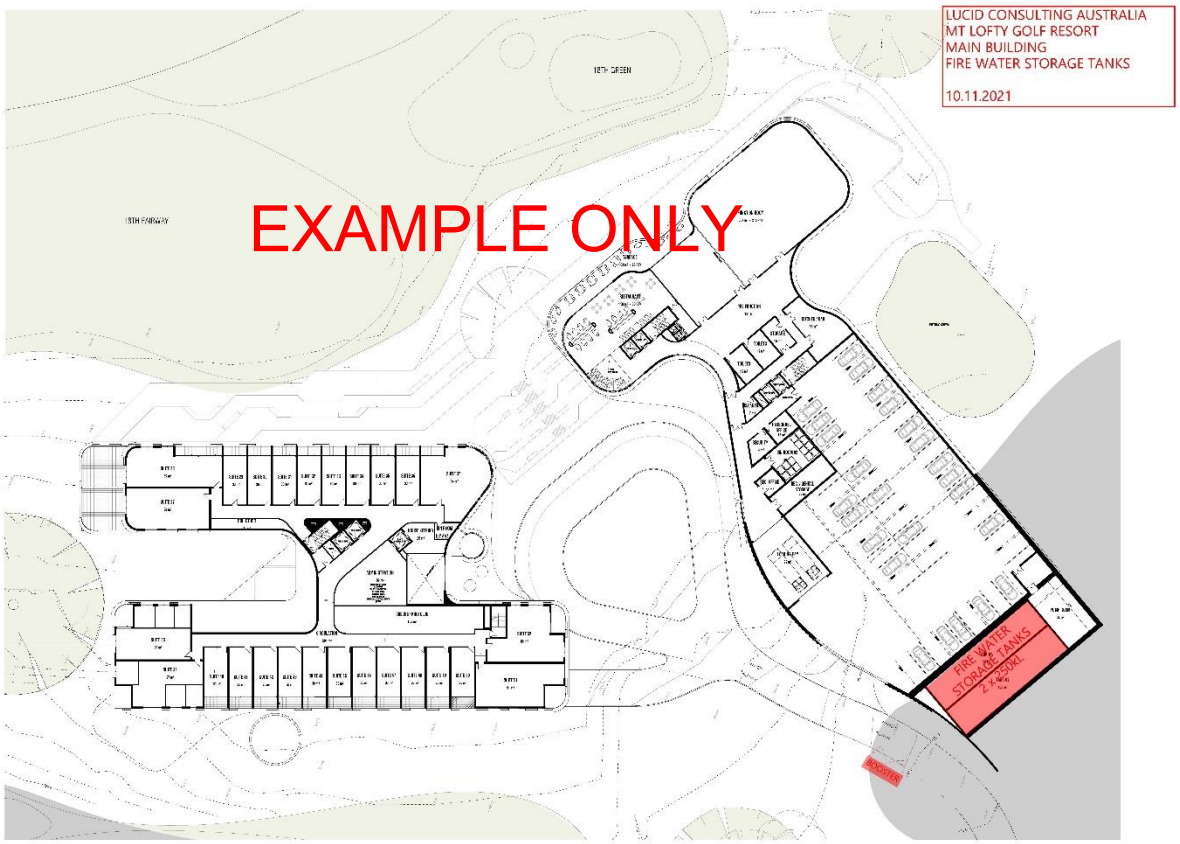


FIGURE B1 – FIRE WATER STORAGE

Fire -fighter External Hosereels

External hosereels are provided at strategic locations in accommodation areas for the prime use of bushfire fighters. Hosereels are located that they can be used for pre-wetting vegetation prior to arrival of any fire front, and for post-fire use in clean-up, extinction of spot fires, and ongoing extinction of flareups in the days following the fire.

FIRE EQUIPMENT REGISTER and CHECK LIST

[DETAILS TO BE ADDED FOLLOWING DESIGN AND DOCUMENTATION, AS WELL AS ADDITIONAL MOBILE FIREFIGHTING EQUIPMENT THAT MAY BE ACQUIRED FOR USE ONCE AN OPERATOR HAS BEEN APPOINTED]

FIRE EQUIPMENT TRAINING REGISTER

[ESTABLISH A REGISTER RELATIVE TO FIRE EQUIPMENT TO RECORD STAFF WHO HAVE UNDERTAKING TRAINING IN THE OPERATION AND USE OF ANY FIRE EQUIPMENT]

Appendix Z

Memo - Native Vegetation

MEMO – Native Vegetation

The Native Vegetation Council (NVC) provides a detailed definition of impacts to vegetation in the "Guide for applications to clear native vegetation".

They provide definitions for Direct, Indirect and Cumulative impacts (Page 9 of the Guide), copied below.

- Direct impacts – areas of vegetation that needs to be removed to facilitate the development.
- Indirect impacts – areas of vegetation that may be impacted either immediately or in the near future (within the next 10 years) as a result of the development. This may be as a result of, amongst other things, movement of dust, herbicide impacts, weed invasion, altered hydrology (raised or lowered water table, flooding, reduced water supply), fire mitigation management, safety management, infrastructure maintenance or any other matter that may inhibit the growth of native vegetation or result in the degradation or death of native vegetation.
- Cumulative impacts – where multiple closely positioned clearances will impact the viability and functionality of larger area of vegetation.

They also provide a minimal example for what must be considered in calculating the area of impact (Page 9):

When determining the full extent of native vegetation clearances for a proposed development, any impacts associated with the following activities, must be considered as a minimum:

- The footprint of any building, dwelling or other structure or infrastructure.
- Any vegetation within 20 metres of a dwelling.
- Any vegetation within 10 metres from a building.
- Clearance required for vehicle access – generally a 5 metre clearance envelope.
- Clearance required for ancillary structures such as tanks.
- Clearance required for new fences – allow 5 metre clearance envelope for internal tracks, 10 metres for property boundaries (except where the property boundary is adjacent a road reserve, then apply 5 metres into the property and 1 metre into the road reserve).
- Clearance required for septic (including irrigation areas) or wastewater systems – septic and waste water systems may not have a direct impact on native vegetation, however the discharge of additional water and nutrients into areas of native vegetation (including the root zone of trees) can result in the decline in the health of vegetation over time. These impacts must be considered and addressed.
- Any clearance required for connection to services, including power, water, telecommunications, storm water, gas or sewer.
- Any clearance required for electricity connection – the assessment should consider any clearance that is permitted by the Electricity (Principles of Clearance) Regulation 2011.
- Any clearance required by the SA Country Fire Service such as fuel reduced zones around houses and building, but also any clearance for fire mitigation measures such as fire breaks, fire access tracks and turn around points.
- Any altered hydrology (raised or lowered water table, flooding, impounding water or reduced water supply) that will impact of the condition or health of native vegetation.
- Clearance for access of construction machinery or material access.
- Any possible impacts from dust generation, including smothering of vegetation.
- Any potential impacts on the root zone of vegetation, such as adding fill to adjust ground level, compaction of soils, severing of roots through trenching for infrastructure, and the construction of hard surfaces which may reduce the infiltration of water.
- Any vegetation that will be significantly reduced in size and isolated from other vegetation such that it will compromise its long-term ecological function and viability.

Appendix AA

DCCEEW Correspondence and Self Assessment

06 February 2024

Tanya Stacpoole
Department of Climate Change, Energy, the Environment & Water
Environment Assessments West Branch
John Gorton Building – King Edward Terrace, Parkes ACT 2600 Australia
GPO Box 3090 Canberra ACT 2601

Delivered via email: *EADSAandNTSection@dcceew.gov.au*

Dear Tanya Stacpoole

Mt Lofty Golf Estate | Re: Redevelopment of Stirling Golf Course, SA and the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

This letter confirms that Trice, on behalf of Mt Lofty Golf Estate Pty Ltd, has recently received the letter dated 30 November 2023 from the Department of Climate Change, Energy, the Environment & Water (DCCEEW) regarding the proposed vegetation removal for the redevelopment of the Stirling Golf Course at the Stirling Golf Club, Stirling, South Australia.

Trice has been commissioned by Mt Lofty Golf Estate to oversee the EPBC referral and assessment process and can confirm that at such time that it is identified that a controlled action is being undertaken, the applicant will undertake the EPBC Self-Assessment process to ascertain the necessity of a referral.

Should you require any further information or have any questions regarding this project, please feel free to contact me directly.

Yours sincerely
TRICE PTY LTD

SONIA MERCORELLA
Director

sonia.mercorella@trice.com.au ; 0404 443 308

Australian Government
Department of Climate Change, Energy, the Environment and Water

Mount Lofty Golf Estate Pty Ltd
C/-Matthew King
URPS
Suite 12/154 Fullarton Rd
Rose Park SA 5067

Via email: mking@urps.com.au

Redevelopment of Stirling Golf Course, SA and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

Dear Mr King

Based on the Plan SA website I understand that Mount Lofty Golf Estate Pty Ltd is proposing vegetation clearance for the redevelopment of the Stirling Golf Course at the Stirling Golf Club, Stirling, South Australia. This letter sets out how the EPBC Act could apply to this proposal.

I encourage you to engage with our department early in your planning process as my team can assist you navigate the EPBC referral process and provide you with information about your obligations under the EPBC Act.

The EPBC Act is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage the environment, in particular nationally and internationally important flora, fauna, ecological communities, and heritage places. Under the EPBC Act, actions that have, or are likely to have, a significant impact on nationally protected matters require approval from the Australian Government Minister for the Environment and Water (or delegate). Substantial penalties apply to a person who takes such an action without approval.

Based on public information regarding the location and nature of the proposed action, nationally protected matters considered relevant to this proposed action are as follows:

Listed threatened species and communities (section 18 & 18A)

For your convenience, I have attached a Protected Matters Report for the proposal site, which includes a 10 km buffer (a standard practice for projects yet to be referred). The report lists a number of protected matters that may occur in the area for your consideration. Please note, the attached report is based on the limited information available to the Department of Climate Change, Energy, the Environment and Water at this time and may not reflect the true extent of protected matters that may be impacted by the proposed action.

Please note that a person proposing to take an action that is likely to have a significant impact on a matter of national environmental significance must refer their proposal for assessment under the EPBC Act. The department's significant impact guidelines should be used to determine whether the impact of an action is likely to be significant, and must consider all direct, indirect and facilitated impacts. These guidelines are designed to help you decide whether you need to refer your proposal to the department.

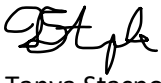
The department's referral and assessment process provides instructions for submitting a referral through the department's online services, together with further information on the EPBC Act.

You may also wish to arrange a pre-referral meeting to discuss whether the action should be referred.

Considering the EPBC referral process as a critical pathway to obtaining relevant approvals can avoid unnecessary project delays and we would welcome a further discussion.

Please contact us by email at EADSAandNTSection@dcceew.gov.au to set up a mutually convenient time to discuss the proposal within 28 days of receipt of this letter.

Yours sincerely



Tanya Stacpoole
Director, SA & NT Section
Environment Assessments West Branch

30 November 2023

Enclosed EPBC Act Protected Matters Report – 14 December 2023

From: Tiana Della Putta
To: Sonia Mercorella
Subject: FW: Mt Lofty Golf Estate Pty Ltd | DCCEEW Response Letter [SEC=OFFICIAL]
Date: Monday, 27 May 2024 2:45:37 PM
Attachments: image003.png

Email from DCCEEW

Tiana Della Putta
Development Coordinator

Trice – Solutions Beyond Property
P: 08 8232 0655 | M: 0413 123 405
225 Fullarton Road, Eastwood SA 5063
www.trice.com.au

From: EAD SA and NT Section <EADSAandNTSection@dcceew.gov.au>
Sent: Friday, February 9, 2024 3:35 PM
To: Tiana Della Putta <tiana.dellaputta@trice.com.au>
Cc: Sonia Mercorella <sonia.mercorella@trice.com.au>; Matthew King <mking@urps.com.au>; Parker, Kylie <Kylie.Parker@dcceew.gov.au>; EAD SA and NT Section <EADSAandNTSection@dcceew.gov.au>
Subject: RE: Mt Lofty Golf Estate Pty Ltd | DCCEEW Response Letter [SEC=OFFICIAL]

Hi Tiana,

Thank you for confirming your receipt of our letter dated 30 November 2024. The department notes that the proponent will undertake the EPBC Self-assessment process as part of their obligations under the EPBC Act to determine if a referral is required.

Please do not hesitate to contact us if you would like to discuss the project and how we might be able to assist you navigating the EPBC referral process, including things to consider in the self-assessment.

The department's significant impact guidelines should be used to determine whether the impact of an action is likely to be significant, and must consider all direct, indirect and facilitated impacts. These guidelines are designed to assist in deciding whether a project needs to be referred to the department.

We acknowledge not all actions affecting matters protected by the EPBC Act will have a significant impact and require approval. However, if the question of significance is unclear, you can refer this project and the department will make a determination under the EPBC Act.

The department's referral and assessment process provides instructions for submitting a referral through the departments online services, together with further information on the EPBC Act. When convenient, you can arrange a pre-referral meeting to discuss whether the action should be referred. To arrange this, please contact the South Australian and Northern Territory

Assessments Section at eadsaandntsection@dcceew.gov.au.

Kind regards,

Kyle Mitchell
Assessment Officer

Nature Positive Regulation | Environmental Assessments West Branch| SA & NT Section
Kaurna Country, 60 King William St Adelaide SA 5000
Department of Climate Change, Energy, the Environment and Water
T 08 7071 7795 | **E** kyle.mitchell@dcceew.gov.au

DCCEEW.gov.au ABN 63 573 932 849

From: Tiana Della Putta <tiana.dellaputta@trice.com.au>
Sent: Tuesday, February 6, 2024 3:51 PM
To: EAD SA and NT Section <EADSAandNTSection@dcceew.gov.au>
Cc: Sonia Mercorella <sonia.mercorella@trice.com.au>; Matthew King <mking@urps.com.au>
Subject: Mt Lofty Golf Estate Pty Ltd | DCCEEW Response Letter

Hello

Trice Project & Development Managers have been engaged by Mt Lofty Golf Estate Pty Ltd to liaise with the Department of Climate Change, Energy, the Environment & Water (DCCEEW) regarding the proposed vegetation removal at the existing Stirling Golf Club and the subsequent EPBC referral and assessment process.

On behalf of Sonia Mercorella, please find attached response document to the letter dated 30 November from DCCEEW.

If you have any questions or wish to discuss this project further, please feel free to contact Sonia (details below).

Sonia Mercorella
sonia.mercorella@trice.com.au
0404 443 308

Please confirm that you have received this email and the attached document at your earliest convenience.

Thank you

Tiana Della Putta
Development Coordinator

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"The way I see it, if you want the rainbow, you gotta put up with the rain." — Dolly Parton

27 May 2024

Tanya Stacpoole
Department of Climate Change, Energy, the Environment & Water
Environment Assessments West Branch
John Gorton Building – King Edward Terrace, Parkes ACT 2600 Australia
GPO Box 3090 Canberra ACT 2601

Delivered via email: *EADSAandNTSection@dcceew.gov.au*

Dear Tanya Stacpoole

Confirmation of Self-Assessment for Vegetation Clearance Proposal at Mt Lofty Golf Club, Stirling, South Australia

I am writing to confirm that Mount Lofty Golf Estate Pty Ltd has undertaken a self-assessment regarding the proposed vegetation clearance for the redevelopment of the Mt Lofty Golf Estate development at the Stirling Golf Club, Stirling, South Australia. After careful consideration and evaluation by Succession Ecology in line with the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), it has been determined that a referral is not required at this time.

Attached to this letter, you will find the completed self-assessment documentation for your reference. This assessment has taken into account the potential impacts on nationally protected matters, including listed threatened species and communities as outlined under sections 18 and 18A of the EPBC Act.

We believe that this self-assessment demonstrates compliance with the obligations set forth under the EPBC Act, and we respectfully request confirmation that this matter is now considered closed. If there are any further requirements or if additional information is needed, please do not hesitate to contact us.

Thank you for your attention to this matter, and we look forward to your confirmation. Should you require any further information or have any questions regarding this project, please feel free to contact me directly.

Yours sincerely
TRICE PTY LTD

SONIA MERCORELLA
Managing Director
sonia.mercorella@trice.com.au ; 0404 443 308

succession ecology

Mount Lofty Golf Estate

EPBC Self-assessment

DOCUMENT SPECIFICATION

Client:	Trice
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DOCUMENT HISTORY

Version	Issue Date	Prepared By	Reviewed By	Status
1	22/03/2024	Rachael Coggan and Luisa Gonzalez	Dr C. E. Timothy Paine	Draft v1
2	26/03/2024	Rachael Coggan and Luisa Gonzalez	Dr Briony Horner	Draft v2
3	02/04/2024	Luisa Gonzalez	Dr Briony Horner	Draft v3

ACKNOWLEDGEMENT OF COUNTRY

Succession Ecology acknowledges and pays respect to the past, present and future Traditional Custodians and Elders of this nation and the continuation of cultural, spiritual and educational practices of Aboriginal and Torres Strait Islander peoples.

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CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

Succession Ecology was engaged by Trice on behalf of Mount Lofty Golf Estate Pty Ltd to conduct a Self-assessment under the *Environmental Protection and Biodiversity Conservation Act, 1999* (*EPBC Act*) for the redevelopment of the Stirling Golf Club (The Project). The results of this assessment determine whether the project requires referral under the *EPBC Act*. This Self-assessment has been undertaken in accordance with guidelines provided by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) *Matters of National Environmental Significant: Significant Impact Guidelines 1.1* (Department of Environment, 2013) and relevant considers strategic assessments being undertaken, the Matters of National Environmental Significance (MNES) listed under the *EPBC Act*, the direct, indirect and facilitated potential impacts on MNES, addresses the mitigation hierarchy, and assesses potential impacts against the Significant Impact Guidelines (Department of Environment, 2013).

A Significant Impact on a MNES is one which is "important, notable or of consequence, having regard to its context or intensity" (Department of Environment, 2013). Particular criteria may be applied to the various types of Protected Matters to determine whether an action will have a Significant Impact.

Results of the identification of strategic assessments and MNES relevant to the Project are:

- No applicable strategic assessments
- One wetlands of international importance are 'known or likely to occur' in the Project area.
- Two Threatened Ecological Communities are 'known or likely to occur' in the Project area.
- 13 Threatened flora species are 'known or likely' to occur in the Project area.
- 13 Threatened fauna species are 'known or likely' to occur in the Project area.
- No National Heritage Place are 'known or likely to occur' in the Project area.
- No Migratory species are 'known or likely to occur' in the Project area.

Based on the EPBC Self-Assessment it was concluded that no MNES are certain or likely to be impacted.

Key mitigation actions that are recommended to be employed include:

Avoidance – Project has implemented design changes and realignments to avoid impacts to native areas of vegetation.
Minimise – Project design has minimised impacts via siting the development on the footprint of existing infrastructure.
Restore – Project seeks to provide rehabilitation in key areas that are currently infested with exotic vegetation.

Based on the EPBC Self-Assessment it was concluded that no MNES are certain or likely to be impacted. Therefore, this assessment indicates that the proposed action **will not require** a Referral under the *EPBC Act*.

1 INTRODUCTION

Succession Ecology was engaged by Trice on behalf of Mount Lofty Golf Estate Pty Ltd to conduct a Self-assessment under the *Environmental Protection and Biodiversity Conservation Act, 1999* (*EPBC Act*; EPBC Self-assessment) for the redevelopment of the Stirling Golf Club (The Project). The results of the EPBC Self-assessment aim to determine whether the proposed action triggers a referral under the *EPBC Act*.

This EPBC Self-assessment has been undertaken in accordance with *Matters of National Environmental Significant: Significant Impact Guidelines 1.1* (Department of Environment, 2013). It considers Matters of National Environmental Significant (MNES) listed under the *EPBC Act*, the direct, indirect, and facilitated impacts on MNES, addresses the mitigation hierarchy, and assesses potential impacts against the relevant significant impact criteria.

1.1 Project Background

The redevelopment of the Stirling Golf Course and Club intends to rebrand as the Mount Lofty Golf Estate, which was the original name of the course when it first opened in 1925. The redevelopment aims to improve on the tourism market, as well as improving access and drawing more visitors and tourists to the club.

The Stirling Golf Club is located at 35 Golflinks Road, Stirling, SA (Figure 1), which is approximately 2.5 km northwest of Bridgewater and 15 km southeast of the Adelaide Central Business District (CBD). The Project is located adjacent to the Mount George Conservation Park (MGCP), with Cox Creek running directly through the Project area.

Figure 1: The Project area (outlined in red).

1.1.1 Proposed Action

This EPBC Self-assessment report relates to the proposed redevelopment of the Stirling Golf Club, which is anticipated to include:

Construction of a new multi-story hotel (including a 35 m Country Fire Service (CFS) buffer).
Upgrades to the existing golf course.
Construction of two new carparking areas of approximately 200 spaces.
Adaptive reuse of the existing "Perfumery", an existing local heritage building.

The adaptive reuse of the perfumery will include a refurbishment, which will provide a multipurpose space for use as a café, retail, or function events. The extension of the Perfumery will include a covered outdoor dining area, the planting of garden species and the addition of an orchard. The Perfumery is currently set to temporarily house the golf club during the construction phase of the hotel. The golf course will retain the 18-hole course, and undergo improvements, along with the facilities building and the refurbishment of the facilities and golf cart storage areas. The redevelopment will include a clubhouse in the new building, along with a new pro shop, administration area, gym, change rooms.

Emergency vehicle access will be located via the western entrance from Golflinks Road, with the main access point located via Golflinks Road. A designated service bay for service vehicles and waste collection will be developed, along with a porte cochere and valet areas for buses and guests. This report has been developed in line with the scope above and the MLGC Landscape Masterplan Rev06 provided to Succession Ecology from the Client (Figure 2).

The impacts from the Proposed Action are anticipated to be restricted to the new multistorey hotel, which will involve the clearance of one vegetation association (0.757ha) and seven native scattered trees. Project designs have gone through several iterations that have reduced the extent of impacts on the environment. These revisions included:

- Removal of accommodation pods. Early designs included as many as 50 free-standing accommodation 'pods', in addition to the multi-storey hotel, which would have had a substantial impact on native vegetation. The current design has eliminated the proposed accommodation pods.
- Retention of internal access roads. Early designs had included revisions of internal access roads, which may have had a substantial impact on native vegetation. The current design retains the current design of access roads, reducing the scope of environmental impact.
- Re-alignment of a car park. The car park to the north of the perfumery has been moved to an open area to the north to avoid impacts to native vegetation.
- Re-alignment of the Perfumery Gardens and Orchard. This will be moved to the northwest to avoid native vegetation impacts and be-redesigned to integrate with existing amenity vegetation.
- Redesign of the multi-storey hotel. The proposed multi-storey hotel has been subject to multiple design iterations to reduce the impact footprint and reduce native vegetation removal as far as possible.

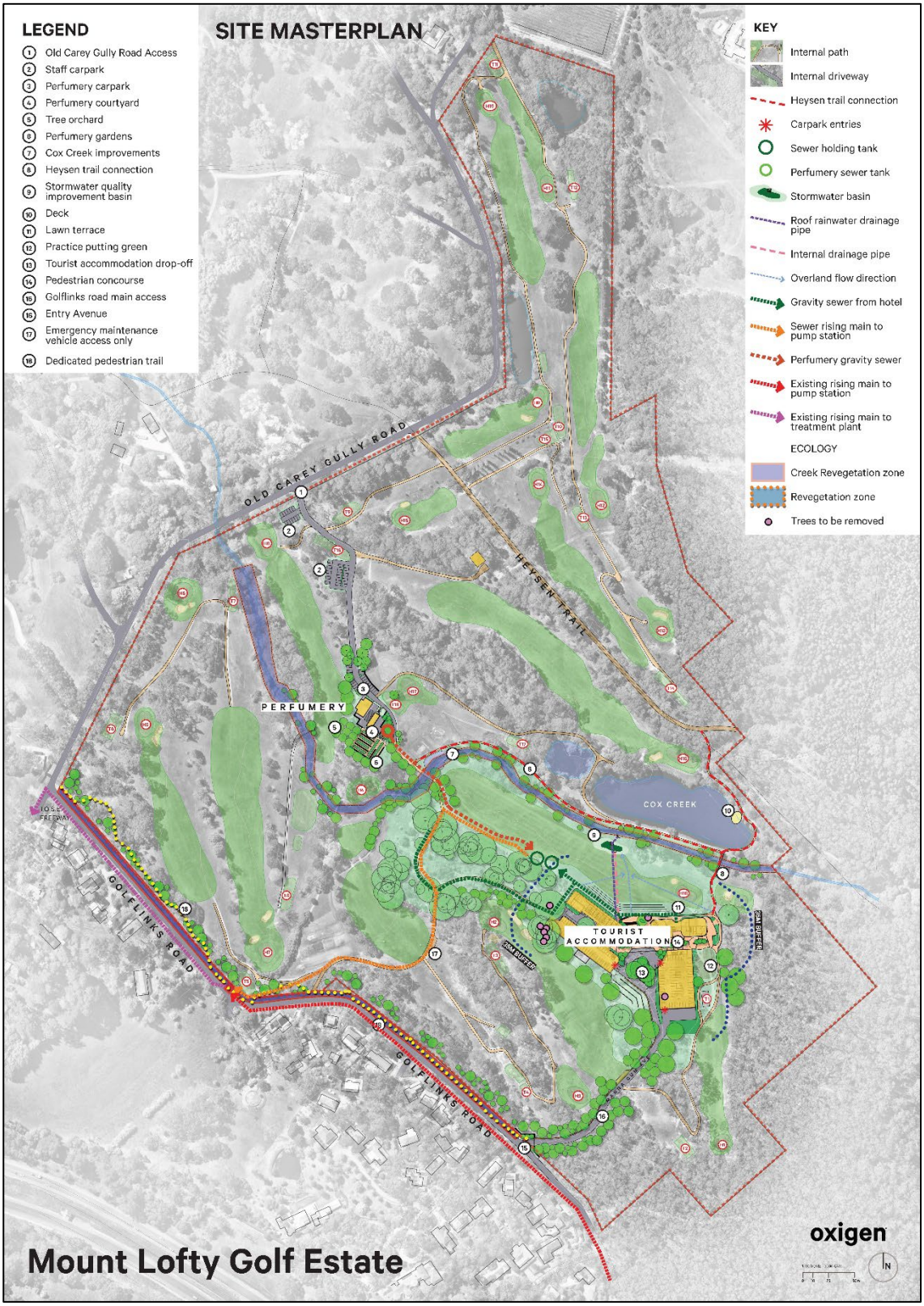

Figure 2: Mount Lofty Golf Course Estate Site Master Plan Rev06 28/03/2024 (provided by the Client).

1.2 Environmental Context

The Project area is sited within the Adelaide Hills Local Government Area (LGA) and the Hills and Fleurieu Landscape Management Region. Land use in the surrounding locality to the Project area includes Mount George Conservation Park (northeast, east and southeast to the Project area), residential dwellings, the Southern Expressway (south) and agricultural land uses.

A review of NatureMaps indicated that the native vegetation remnancy within 5 km of the Project area is 22% (eastern buffer) and 28% (north, south and west). The Mount Lofty Ranges has undergone significant vegetation clearance. Approximately 10% of the original native vegetation of the Mount Lofty Ranges region remains, and is now highly fragmented with only 22% of this formally managed for conservation purposes (Adelaide Hills Council 2019). Within the Project Area, there are remnant patches of vegetation that cooccur with large remnant scattered trees and planted vegetation, including exotic vegetation associated with the golf course.

The Project lies within the Interim Biogeographical Regionalisation of Australia (IBRA) Uraidla Association, the Flinders Lofty Block Region, and the Mount Lofty Ranges Sub-region (Table 1). The Flinders Lofty Block bioregion overlays southeast South Australia and also includes the Flinders and Olary Ranges. The climate within this region varies from north to south, with the northern section having a semi-arid to arid climate with hot dry summers, and cool mild winters. In comparison, the southern part of the bioregion hosts a Mediterranean climate with cool moist winters and warm to hot summers. The region receives between 250 to 650 mm of rainfall per year, however areas in the higher parts of the Mount Lofty Ranges can receive more than 1000 mm per year. Rain falls most commonly in winter and is more reliable in the south. Mountain ranges and wide flat plains largely make up this bioregion. Large areas in the south have been previously cleared for agriculture during the early days of European settlement. Vegetation types within the region vary, as they include chenopod and samphire shrublands, tussock grasslands, *Callitris* forests and woodlands, *Acacia* forests and woodlands, mallee woodlands and shrublands, and hummock grasses.

Table 1: Flinders Lofty Block IBRA Description

Feature	Description
Land type	Erosional / depositional
Landscape	Low hills
Landform	Ranges and hills with extensive rock outcrop and shallow soils; stony pediments and small basin plains; some remnants of stony downs; narrow valleys, some with gorges. Ranges and hills in form of hogback ridges in quartzite.
Geology	Bare rock; some alluvium & colluvium (sand, silt & clay); less common dune sand & some sand mantles. Calcreted gravels derived from silcreted deposits & probably equate with Ripon Calcrete. Younger Telford gravels (Middle Pleistocene).
Soil	Loamy soils with weak pedologic development; crusty loamy soils with red clayey subsoils.
Vegetation	Chenopod Shrub, Samphire Shrub and Forbland.
Climate	Semi-arid climate that is too dry to support field crops. Soil moisture tends to be greatest in winter.

1.3 Vegetation and Habitat in the Project Area

A field survey was undertaken by Succession Ecology on 13 February and 19 March 2024. Vegetation observed during the field survey consisted of small areas of remnant vegetation scattered throughout the golf course, large native and non-native scattered trees, and species of planted exotic vegetation associated with the golf course. Areas of remnant vegetation were dominated by species of *Eucalyptus obliqua* (Messmate Stringybark), *Eucalyptus viminalis ssp. viminalis* (Manna Gum), *Acacia melanoxylon* (Blackwood), with patches of *Pteridium esculentum ssp. esculentum* (Bracken Fern) in the understorey. The areas of remnant vegetation within the Project area, but not directly associated with the golf course, appeared to be heavily degraded with a dense understorey dominated by introduced flora species such as *Genista monspessulana* (Montpellier Broom), *Cytisus scoparius* (English Broom), and *Hedera helix* (English Ivy). Across the Project Area, the dominant weed species identified was *Rubus fruticosus* (Blackberry), which is a Declared Plant under the Landscape South Australia Act 2019 (LSA Act). No flora or fauna species listed under the *EPBC Act* were recorded during the field survey. However, Manna Gum (*Eucalyptus viminalis ssp. viminalis*) and Scented bush pea (*Pultenaea graveolens*) are listed under the *NPW Act* as Rare.

Surveys were conducted by Succession Ecology on 13 February and 19 March 2024. The vegetation present within the Project area consists of pockets of remnant open forest vegetation scattered throughout the golf course, along with large native and non-native scattered trees. Species of planted exotic amenity vegetation is associated with the golf course and around the existing clubhouse. Areas of remnant vegetation were dominated by species of *Eucalyptus obliqua (*Messmate Stringybark), *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum)*, Acacia melanoxylon* (Blackwood) and *Exocarpos cupressiformis* with pockets of *Pteridium esculentum* ssp. *esculentum* (Bracken Fern) found within the Project area. The areas of remnant vegetation within the Project area, but not directly associated with the golf course, appeared to be heavily degraded with a dense understorey dominated by introduced flora species such as *Genista monspessulana* (Montpellier Broom), *Cytisus scoparius* (English Broom) and *Hedera helix* (English Ivy). Across the whole Project Area, the dominant weed species identified was *Rubus fruticosus* (Blackberry), which is a Declared Plant in South Australia. No flora species listed under the *EPBC Act* were recorded during the field survey. Two species listed under the *NPW Act* as Rare (*Eucalyptus viminalis* ssp. *Viminalis* and *Pultenaea graveolens*) were recorded within the Project area.

One vegetation association (VA) was identified and mapped within the Project area, listed below:

- VA1a and VA1b – *Eucalyptus obliqua* open forest over open shrub and sparse native grasses, tussocks and weed species.

Both VA1a and VA1b represent the same vegetation association, with VA1a indicating sections of the vegetation association fully impacted by the development, while VA1b represents partial clearance, i.e., only the understorey (refer to Mount Lofty Golf Estate Native Vegetation Clearance Data Report, Succession Ecology, 2024). Vegetation within VA1 consists of an open forest of tall *E. obliqua* and sparse *Eucalyptus viminalis ssp. Viminalis.* The midstorey largely consisted of *Exocarpos cupressiformis* and *Acacia melanoxylon* and few scattered *Bursaria spinosa*, with an understorey of *Lomandra micrantha*, *Dianella revoluta*, *Pteridium esculentum ssp. Esculentum* and sparse *Rytidosperma* species and *Austrostipa* species. Other natives observed within VA1 include *Pultenaea graveolens* (*NPW Act: Rare*), *Acrotriche fasciculiflora* and *Hibbertia exutiacies*. Leaf litter was dense and continuous throughout, and some fallen timber and debris was observed. Fox Tail (*Alopecurus* sp.), Plantain (*Plantago* sp.), Blue Periwinkle (*Vinca major*), Flax-leaf Broom (*Genista linifolia*), and English Broom (*Cytisus scoparius*) were the dominant weeds recorded during the 2024 survey Overall, VA1 was in good condition, VA1 provides dense tree canopy cover, fallen timber and tree hollows. However, Declared Plants and other weeds persist within the VA.

A total of 35 scattered trees were surveyed by Succession Ecology on the 13 February and 19 March 2024, which included 23 *Eucalyptus viminalis* ssp. *viminalis* (Manna Gum) listed as Rare under the *NPW Act,* seven *Eucalyptus obliqua* (Messmate Stringybark), five *Acacia melanoxylon* (Blackwood) and one *Cupressus macrocarpa* (Monterey Cypress) within the Project area. As a result of design changes since the field surveys, a total of seven scattered trees and VA1 (0.7578 ha) are proposed anticipated to be impacted, as a result of the construction of the new multi-story hotel (the impact area; Figure 3). The remaining 28 trees will not be impacted by the proposed development.

Scattered tree to be impacted are summarised below:

- T1 - Manna Gum - *Eucalyptus viminalis ssp. Viminalis*, (*National Parks and Wildlife Act 1972 (NPW Act)* Rare)
- T2 – Manna Gum (*Eucalyptus viminalis ssp. Viminalis*), *NPW Act* Rare
- T3 – Messmate Stringybark (*Eucalyptus obliqua*)
- T4 –Messmate Stringybark *(Eucalyptus obliqua*)
- T5 – Messmate Stringybark (*Eucalyptus obliqua*)
- T6 – Manna Gum (*Eucalyptus viminalis ssp. Viminalis*), *NPW Act* Rare
- T7 –Manna Gum (*Eucalyptus viminalis ssp. Viminalis)*, *NPW Act* Rare.

Patches of exotic and amenity vegetation within the multistorey hotel impact area will also require removal.

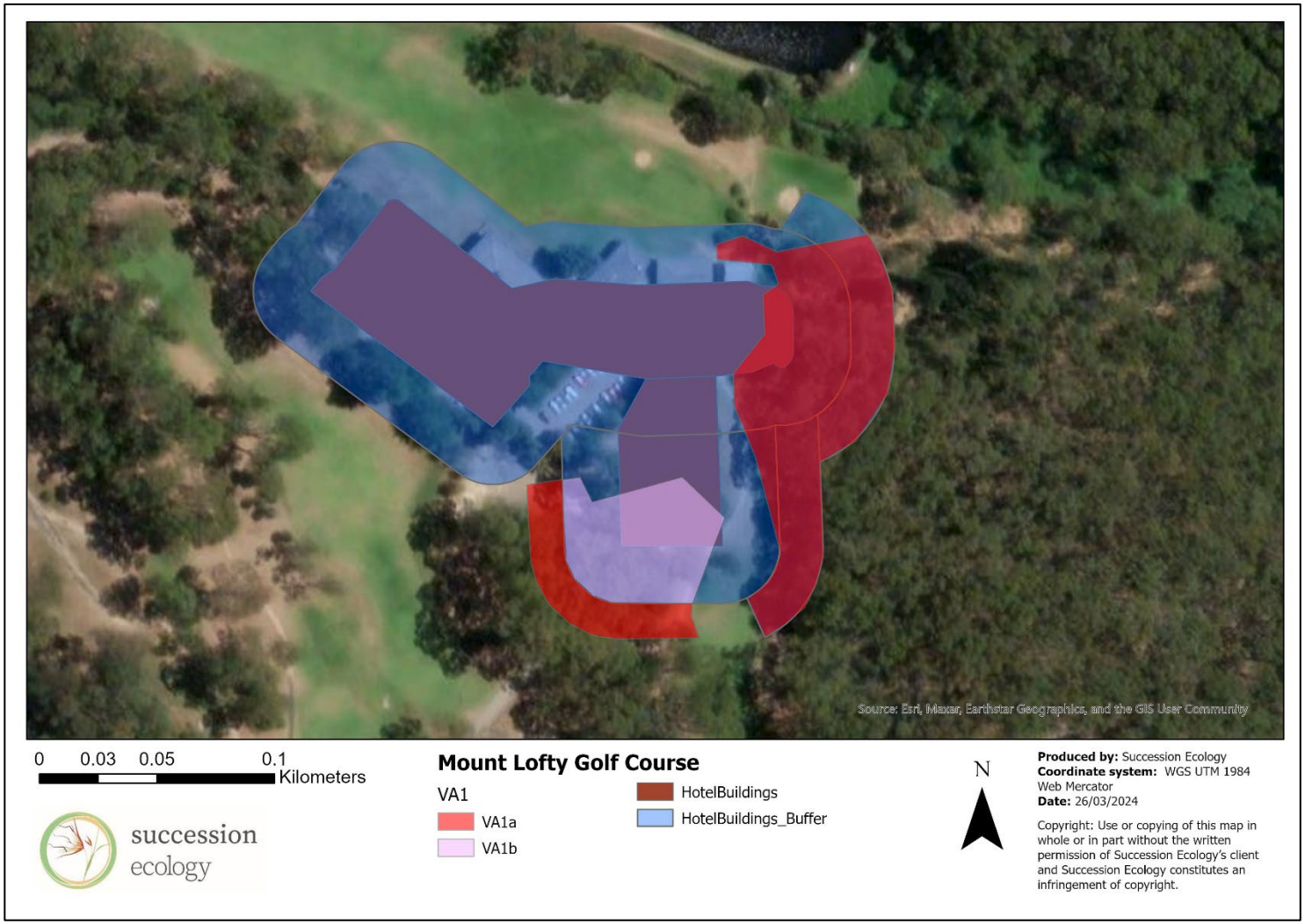

Figure 3: The impact area for the proposed development of the Mount Lofty Golf Estate including areas covered by relevant CFS buffers.

1.4 Legislative Requirements

The proposed action is subject to both state and federal legislation, including the *Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC* Act). Under Part 3, Division 1 of the *EPBC Act*, any proposed action that *will*, or is *likely* to have, a Significant Impact on a MNES requires approval from the Australian Government Environment Minister. To determine if the proposed action requires further assessment and subsequent approval, a EPBC Self-assessment against the *EPBC Act* and Significant Impact Guidelines 1.1 is required. Based on the outcome of the EPBC Self-assessment, if the proposed action is *likely* to have a Significant Impact, a Referral to the minister is required. The Referral is a necessary stage for the Minister's decision on whether assessment and approval are required under the *EPBC Act.*

There are nine MNES which are protected under the *EPBC* Act, of which three are relevant to this EPBC Self-assessment of the proposed action and are discussed within this report. Two other MNES may be applicable to the proposed action and would require assessment by a qualified heritage consultant. The remaining four MNES are not relevant to the current proposed action. (Table 2).

Table 2: MNES protected under the EPBC Act and how they are treated within this EPBC Self-assessment.

MNES	Applicable (Yes/No)	Assessed within this EPBC Self-assessment Report
World heritage areas	No	No. This would require assessment by a qualified heritage consultant.
National heritage places	No	No. This would require assessment by a qualified heritage consultant.
Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)	Yes	Yes (section 3.2.1)
Listed threatened species and ecological communities	Yes	Yes (section 3.2.2, 3.2.3 and 3.2.4)
Listed migratory species	Yes	Yes (section 3.2.5)
Commonwealth marine areas	No	N/A. The proposed action is inland and not within a Commonwealth marine area.
Great Barrier Reef Marine Park	No	N/A. The proposed action is not within the Great Barrier Reef Marine Park.
Nuclear actions (including uranium mining)	No	N/A. The proposed action does not include scope for nuclear actions.
Water resources in relation to coal seam gas development and large coal mining development	No	N/A. The proposed action does not include scope for water resources in relation to coal seam gas development and large coal mining development.

1.4.1 Significant Impact Guidelines 1.1 Matters of National Environmental Significance

A Significant Impact on a MNES is one which is "important, notable or of consequence, having regard to its context or intensity" (Department of Environment, 2013). It will be dependent on the sensitivity, value, and quality of the environment as well as the extent, duration, and characteristics of the action, including mitigation measures. Where a proposed action is deemed to *have, will have* or *is likely to have* a Significant Impact on a MNES, a referral is required under the *EPBC Act*.

The Significant Impact Guidelines 1.1 present assessment criteria which are to be applied to the various types of MNES to determine whether a proposed action will have a Significant Impact. Criteria varies depending on the MNES and species threatened listing. The relevant Significant Impact Guidelines 1.1 criteria is presented in Appendix A.

To decide whether the action proposed is likely to have a significant impact, one must consider:

The environmental context;
Potential impacts likely to be generated by the action, including indirect consequences of the action;
Whether mitigation measures will avoid or reduce these impacts; and
Taking into consideration the above, whether the impacts of the action are likely to be significant.

2 METHODOLOGY

2.1 Desktop Assessment and Field Survey

2.1.1 Database searches

Environmental data was collected during a desktop assessment undertaken for the proposed action to inform this EPBC Self-assessment. Several database searches were undertaken to determine the range of threatened flora and fauna species and threatened ecological communities protected under the *EPBC Act 1999* and *NPW Act 1972*, that are 'known' or 'likely' to occur within a 10 km search area from the Project area. Database searches include:

The DCCEEW Protected Matters Search Tool (PMST) - used to identify any relevant MNES, including threatened flora and fauna species and threatened ecological communities listed under the EPBC Act *Part 13 – Species and communities – Division 1- Listed threatened species and ecological communities – Subdivision A – Listing – 178 Listings of threatened Species*
Section 178 (c) – Critically Endangered
Section 178 (d) – Endangered
Section 178 (e) – Vulnerable

Results of the PMST list MNES that 'may occur' (or have habitat that may occur), 'are likely to occur' or 'are known to occur' within the search area. For the EPBC Self-assessment and referral purposes, the MNES which were identified as 'known' or 'likely to occur' within the search area are of foremost concern. Expert knowledge for relevant MNES was also applied.

A NatureMaps search - undertaken for both threatened flora and fauna, to capture other nationally threatened species that may not be captured in the PMST. Records of species since 1995 were considered.
BDBSA data extract – a Biological Databases of South Australia (BDBSA) search was obtained from the Department of Environment and Water (DEW) to identify threatened flora and fauna species that have been recorded within 10 km for the Project Area (data extracted 14/02/2024). The BDBSA is comprised of an integrated collection if species records from the South Australian Museum, conservation organisations, private consultancies, Birds SA, Birdlife Australia, and the Australasian Wader Study Group. Only species with records since 1995 and a spatial reliability of less than 1 km were assessed for their likelihood of occurrence.
Atlas of Living Australia (ALA) - used to identify any further threatened flora and fauna species not captured in the PMST. Records from 'citizen science' initiatives were excluded from search results.

2.1.2 Field Survey

A vegetation survey was conducted on 13 February and 19 March 2024. Ground truthing of vegetation communities identified in the desktop assessment was carried out and the vegetation subject to clearance was surveyed using the Bushland Assessment Methodology (Native Vegetation Council 2020a) and Scattered Tree Assessment Methodology (Native Vegetation Council 2020b), as appropriate. Careful inspection was undertaken to identify any threatened flora and threatened fauna species known to occur in the region.

A formal fauna assessment was not undertaken for this site. However, an opportunistic observation-based survey was conducted to identify any fauna species using the vegetation as habitat. Opportunist observations included incidental records of non-target species observed while conducting the specified survey technique, or while walking to/from or around the Project area.

2.1.3 Likelihood of Impacts assessment

Results from all database searches were reviewed to determine which MNES were relevant for the assessment of likelihood of impacts, and which should be excluded from assessment. MNES were excluded from assessment if:

They ranked as 'may' occur within the search area;
Habitat present within the Project area was unsuitable for the MNES; or
The distribution of the MNES did not occur within the Project area.

For all relevant MNES, a likelihood of impacts assessment was undertaken following the metric within Table 3.

Table 3: Descriptions of likelihood of impacts on MNES.

Likelihood of Impact	Description
None	The MNES, or relevant habitat, does not occur within the defined project area, nor within adjacent properties.
Unlikely	The MNES, or relevant habitat, does not occur within the defined project area nor within adjacent properties, however there is some possibility that offsite impacts could occur.
Possible	The MNES, or relevant habitat, may occur within the defined project area, or it is known to occur in adjacent properties.
Likely	The MNES, or relevant habitat, is known to occur within the defined project area and may overlap with the infrastructure footprint.
Certain	The MNES, or relevant habitat, is known to occur within the defined project area and is known to overlap with the infrastructure footprint.

2.2 Application of DCCEEW Self-assessment Guidelines

The EPBC Self-Assessment presented here refers to the Significant Impact Guidelines 1.1 (Department of Environment, 2013). In accordance with these guidelines, this EPBC Self-assessment considers the following:

- Any Strategic Assessments (developed under section 146 of the *EPBC Act*) that may apply to the Project area.
- MNES potentially impacted by the development and the nature of those impacts.
- Mitigation actions that may be applied under a mitigation hierarchy.
- Assessing any potential impacts to MNES against the Significant Impact Guidelines.

Further, specific referral guidance in relation to the relevant MNES was also consulted (such as published conservation advice for threatened species). EPBC Self-assessment results, discussion and recommendations in relation to an EPBC Act referral for this Project are presented in following sections.

3 RESULTS

3.1 Strategic Assessments

Strategic assessments carried out by the DCCEEW adopt a 'big picture' approach to managing and protecting MNES, in which impacts to MNES are considered over time. The DCCEEW is currently undertaking a number of Strategic Assessments across Australia. Those within South Australia include:

Fire Management Policy – for lands under the care and control of the SA Minister for Sustainability Environment and Conservation (i.e. SA Government lands)
Offshore petroleum activities in SA coastal waters
Osborne Submarine Construction Yard.

None of the three Strategic Assessments being undertaken in South Australia are applicable to the proposed action.

3.2 Matters of National Environmental Significance Identified

The desktop assessment results are presented in Table 4 to Table 8 below along with an indication of the likelihood of impacts, as defined in Table 3. The complete results of the PMST are presented in Appendix B.

3.2.1 Wetlands of International Importance (Ramsar Wetlands)

One Wetlands of International Importance (Ramsar Wetlands) was identified in the PMST. These wetlands were assessed as not being impacted by the proposed action (Table 4).

Table 4: Likelihood of impacts to Wetlands of International Importance.

MNES	MNES Record Details	Likelihood of Impacts
The Coorong, and Lakes Alexandrina and Albert Wetland	RAMSAR Site No.25 30 – 40 km upstream from Ramsar site	**None.** The Project area occurs more than 50 km from the Coorong RAMSAR site, in the upper areas of the catchment. The Proposed Action including any (limited) off-site impacts will not impact on this wetland site.

3.2.2 Threatened Ecological Communities

Two Threatened Ecological Communities (TEC) were detected as potentially occurring within the Project area. None of them are assessed to be impacted by the proposed action (Table 5).

Table 5: Likelihood of impacts to Threatened Ecological Communities.

MNES	MNES Record Details	Likelihood of Impacts
Peppermint Box (*Eucalyptus odorata*) Grassy Woodland of South Australia	*Critically Endangered* *May occur*	**Unlikely.** This TEC occurs within a small portion inside the buffer area only, approximately 9 km north from the Project area. The TEC was not observed during the field survey. Therefore, it is unlikely to be impacted by the proposed action.
Grey Box (*Eucalyptus microcarpa*)	*Endangered*	**Unlikely**. This TEC occurs within the buffer area only within Cleland Conservation Park and Belair National Park

MNES	MNES Record Details	Likelihood of Impacts
Grassy Woodlands and derived Native Grasslands of South-eastern Australia	*Likely to occur*	(approximately 8 km from the Project area). Therefore, this TEC is unlikely to be impacted by the proposed action.

3.2.3 Threatened Flora

The PMST identified 13 threatened flora species listed under the EPBC Act as 'known to occur' or 'likely to occur' within 10 km of the Project area (Table 6). None of these threatened flora species were identified during the field survey.

The likelihood of impacts was assessed as 'possible' for seven flora species. All species assessed as 'possible' or 'likely' to be impacted by the proposed action have been included in the Significant Impact Assessment within section 3.5 of this report.

Table 6: Likelihood of impacts to threatened flora identified in the desktop assessment that are 'known' or 'likely' to occur within the Project area.

MNES	MNES Record Details	Species habitat preferences	Likelihood of impacts
Caladenia argocalla (White-beauty Spider-orchid)	*Endangered* *Known to occur*	Open grassy woodland with herb understorey and fertile soils. Found with *Eucalyptus macrorhyncha* and *E. leucoxylon* (DEH 2008a).	**Unlikely.** Suitable habitat is not present within the Project area, as the understorey is dominated by weeds and no associated species occur. Nearest record of occurrence is approximately 4 km from the Project area and is an isolated occurrence.
Caladenia behrii (Pink-lipped Spider-orchid)	*Vulnerable* *Known to occur*	Loamy soils in association with *Eucalyptus goniocalyx*, *E. obliqua*, *E. fasciculosa* or *E. microcarpa* woodland, usually on moderate slopes. Very sensitive to grazing by native and introduced herbivores and does not persist in weed infested areas (DEH 2008b).	**Possible.** The nearest record of occurrence is approximately 7.5 km from the Project area, with majority of records located greater than 10 km from the Project area. The Project area falls within the known distribution of this species and suitable habitat is present including *E. obliqua.* However, suitable habitat is limited by the presence of a dense weedy understorey Despite this species not being identified during the field survey, this may be due to the field survey occurring outside of the species flowering period (August - September). Whereafter, it dies back to its perennial tuber. As such the species could possibly have occur within the Project area.
Caladenia gladiolata (Bayonet Spider-orchid)	*Vulnerable* *Known to occur*	Woodland, grassland, and grassy open forest on fertile loam soils (SA Landscape 2022).	**Possible.** The nearest record of occurrence is approximately 10 km from the Project area. The Project area falls within the known distribution of this species, some suitable habitat is present. However, suitable habitat is limited by the presence of a dense weedy understorey. Despite this species not being identified during the field survey, this may be due to the field survey occurring outside of the species flowering period (August -

MNES	MNES Record Details	Species habitat preferences	Likelihood of impacts
			September). Whereafter, it dies back to its perennial tuber. As such, the species could possibly occur within the Project area.
Caladenia rigida (Stiff White Spider-orchid)	*Endangered* *Known to occur.*	*Eucalyptus obliqua*, *E. fasciculosa*, *E. leucoxylon*, *E. goniocalyx*, *E. microcarpa* open forests with a relatively open shrub layer. This habitat type has been extensively cleared or degraded in the Southern Mount Lofty Range since European settlement, but intact tracts exist in native forest reserves, water reserves, and reserves in the Kersbrook area (DEH 2008c).	**Possible.** The nearest record of occurrence approximately 4 km from the Project area. The Project area falls within the known distribution of this species, some associated flora species are present, such as *E. obliqua*. However, suitable habitat is limited by the presence of a dense weedy understorey. Despite this species not being identified during the field survey, this may be due to the field survey occurring outside of the species flowering period (August - October). Whereafter, it dies back to its perennial tuber. As such, the species could possibly occur within the Project area.
Caladenia tensa (Greencomb Spider-orchid)	*Endangered* *Likely to occur*	Red-brown sandy loams, on rises in open woodland, mallee woodland and mallee/heath sites (DAWE 2022).	**Unlikely.** Limited suitable habitat is present within the Project area. The nearest record of occurrence is approximately 10 km from the Project area.
Euphrasia collina subsp. *osbornii (*Osborn's Eyebright)	*Endangered* *Known to occur*	Moist open habitat, in mallee scrub but also in woodlands and coastal heath (DEH 2010).	**Unlikely.** Some suitable habitat is present within the Project area. This species has been recorded within adjacent areas of the Project area such as Mount George Conservation Park.
Glycine latrobeana (Clover Glycine)	*Vulnerable.* *Known to occur*	*Eucalyptus viminalis* woodland and open woodland with *E. leucoxylon*, and understoreys ranging from mid-dense to very sparse and dominated by either *Leptocarpus brownii*, or *Acacia pycnantha*, *Leptospermum myrsinoides*, *Gonocarpus elatus*, and *Themeda triandra*; or *Pteridium esculentum*, *Acaena* sp., and *Ajuga* sp. and *Eucalyptus goniocalyx* grassy woodland, and *E. fasciculosa* low open forest (DEH 2008d).	**Possible.** Some suitable habitat is present within the Project area for this species, as there is an associated species present within the Project area, *Eucalyptus viminalis* ssp. V*iminalis.* However, suitable habitat is limited by the presence of a dense weedy understorey. Nearest record of occurrence is < 1 km from the Project area, dated 1990. All other records occur greater than 7 km from the Project area.
Olearia pannosa (Silver Daisy-bush)	*Vulnerable*. *Likely to occur*	Sandy, flat areas and in hilly, rocky areas in woodland or mallee. This species also often occurs in narrow roadside remnants (SA Landscape 2014).	**Unlikely.** Limited suitable habitat is present for this species. Nearest record of occurrence is located approximately 9 km from the Project area. Surrounding records predate 1995.
Prasophyllum pallidum (Pale Leek-orchid)	*Vulnerable*. *Known to occur*	Fertile soils of woodland and well-grassed open forests (Seeds of SA 2019).	**Possible.** Nearest record of occurrence is located approximately 9.5 km from the Project area The Project area is within the known distribution of this species However, suitable habitat is limited by the presence of a dense weedy understorey. Despite this species not being identified during the field survey, this may be due to the field survey occurring outside of the species flowering period (September - November). As such, the species could possibly occur within the Project area.

MNES	MNES Record Details	Species habitat preferences	Likelihood of impacts
Prasophyllum pruinosum (Plum Leek-orchid)	*Endangered* *Known to occur*	Found in the Adelaide and MLR region (AMLR) recorded in a range of open woodland habitats, usually with an overstorey of *Eucalyptus fasciculosa* and/or *Eucalyptus leucoxylon* (DCCEEW 2010).	**Possible.** Nearest record of occurrence is approximately 3 km from the Project area, with majority of records occurring greater than 10 km from the Project area. The Project area falls within the known distribution of this species. Some suitable habitat is present. However, suitable habitat is limited by the presence of a dense weedy understorey. Despite this species not being identified during the field survey, this may be due to the field survey occurring outside of the species flowering period (September - November). As such, the species could possibly occur within the Project area.
Pterostylis cucullata (Leafy Greenhood)	*Vulnerable* *Known to occur*	*Eucalyptus leucoxylon* Open Forest, often with *E. viminalis*, *E. camaldulensis* or *E. obliqua*. Within the AMLR the preferred broad vegetation group is Grassy Woodland (DEH 2008e).	**Possible.** Limited suitable habitat is present for this species given the presence of *Eucalyptus obliqua* and *E. viminalis*, however the habitat is not an open forest and a dense weedy understorey dominates the habitat. The nearest record of occurrence is approximately 6 km from the Project area. This species may be present during its flowering period (August – December). As such, the species could possibly occur within the Project area.
Thelymitra matthewsii (Spiral Sun-orchid)	*Vulnerable* *Likely to occur*	Open forests and woodlands in well-drained sand and clay loams. It is a post-disturbance coloniser that is usually found in open areas around old quarries, gravel pits, on road verges, disused tracks and animal trails (DAWE 2021).	**Unlikely.** Suitable habitat is not present for this species, as there are no open forests or woodlands located within the Project area. There are no recent records of this species occurring within 10 km of the Project area.
Veronica derwentiana (Mount Lofty Speedwell)	*Critically Endangered* *Known to occur*	Beside streams and waterfalls or associated with limestone caverns. Occurs in moist sites in gullies or near creeks in high rainfall areas. The subspecies has restricted habitat requirements for high moisture, with excellent drainage and high light requirement (DEH 2008f).	**Unlikely.** There is some suitable habitat present within the Project area due to the presence of a creek. However, it does not occur within the area proposed to be impacted. Nearest record of occurrence is approximately 5 km from the Project area.

3.2.4 Threatened Fauna

The PMST identified 13 fauna species listed under the EPBC Act as 'known to occur' or 'likely to occur' within 10 km of the Project area. These are presented in Table 7. None of these threatened fauna species were identified during the field survey. Two threatened fauna species are assessed as Likely to be impacted by the proposed action, based on the current design footprint. Moreover, the likelihood of impacts was assessed as 'possible' for three species. All species assessed as 'possible' or 'likely' to be impacted by the proposed action have been included in the Significant Impact Assessment (section 3.5).

Table 7: Likelihood of impacts to threatened fauna identified in the desktop assessment that are 'known' or 'likely' to occur within the project area.

MNES	MNES Record Details	Species habitat preferences	Likelihood of impacts
AVES			
Aphelocephala leucopsis (Southern Whiteface)	*Vulnerable* *Known to occur*	Wide range of open woodlands and shrublands where there is an understorey of grasses or shrubs, or both. These areas are usually in habitats dominated by *Acacia* or *Eucalyptus* on ranges, foothills and lowlands, and plains (DCCEEW 2023a).	**Possible.** There is some suitable habitat within the Project area. Nearest record of occurrence is approximately 8 km from the Project area, with majority of records located greater than 10 km east.
Botaurus poiciloptilus (Australasian Bittern)	*Endangered* *Known to occur*	Occupies swamps and wetlands usually associated with *Baumea* sp., *Gahnia* sp., and *Typha* sp., and low shrubs such as *Melaleuca* sp. (DBCA 2018).	**None.** Suitable habitat is not present within the Project area. Dam on site has little to no reedbeds. Nearest record of occurrence is approximately 7.5 km from the Project area.
Falco hypoleucos (Grey Falcon)	*Vulnerable* *Likely to occur*	Arid-zone open woodlands and open *Acacia* shrublands. Especially stony and sandy plains, hummock and tussock grasslands, low shrublands and wooded watercourses (DAWE 2020).	**Unlikely.** There is limited suitable habitat present within the Project area for this species. Despite a creek located in the wider Project area, it falls outside of the impact area for this project. There are no records within the past 10 years for this species.
Grantiella picta (Painted Honeyeater)	*Vulnerable.* *Likely to occur*	Boree/Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) woodlands, box-gum woodlands, and box-ironbark forests. Specialist feeder on the fruits of mistletoes, especially *Amyema,* growing on *Eucalyptus* and *Acacia*. (Department of the Environment 2015a).	**Unlikely.** There is limited suitable habitat present within the Project area. There is mistletoe sp. within the Project area, which is a potential food resource for this species. There are no recent records of occurrence.
Hylacola pyrrhopygia parkeri (Chestnut-rumped Heathwren)	*Endangered* *Known to occur*	Heath and dense undergrowth within *Eucalyptus* forests and woodlands, most commonly found in rocky areas. Although the vegetation type varies throughout their range, the presence of a dense understorey appears to be a chief characteristic of their habitat (DEH 2014).	**Possible.** There is some suitable habitat present for this species within the Project area. Records of occurrence are in adjacent National and Conservation Parks, where there is more suitable habitat available. Nearest record of occurrence is approximately 2 km from the Project area.
Leipoa ocellata (Malleefowl)	*Vulnerable* *Likely to occur*	Semi-arid to arid shrublands and woodlands but mainly in mallee woodland habitat that has not recently been burnt (DEH 2021).	**None.** Suitable habitat is not present for this species within the Project area. There are no recent records of occurrence.

MNES	MNES Record Details	Species habitat preferences	Likelihood of impacts
Melanodryas cucullata cucullata (South-eastern Hooded Robin)	*Endangered* *Likely to occur*	South-eastern subspecies found in *Eucalyptus* woodland and mallee and *Acacia* shrubland (DCCEEW 2023b).	**Unlikely.** Limited suitable habitat is present within the Project area for this species. There are no recent records of occurrence.
Stagonopleura bella samueli (Western Beautiful Firetail)	*Endangered* *Known to occur*	Populations known to occur within stringybark, mallee, and bull-oak scrubs across the ironstone plateau. They favour areas which are characterised by Drooping Sheoak (*Allocasuarina verticillata*) woodlands, and eucalypt woodlands (DCCEEW 2022a).	**Unlikely.** Limited suitable habitat is present within the Project area. Nearest record of occurrence is located approximately 9 km from the Project area.
Stagonopleura guttata (Diamond Firetail)	*Vulnerable* *Known to occur*	Occurs in a wide range of *Eucalyptus* dominated habitat with a grassy understorey (DEWNR 2019a).	**Unlikely.** Limited suitable habitat is present within the Project area. Nearest record of occurrence is approximately 5 km from the Project area.
Zoothera lunulata halmaturina (South Australian Bassian Thrush)	*Endangered* *Known to occur*	Damp E*ucalyptus* Forest or woodland. Its habitat consists of densely forested areas and gullies, usually with a thick canopy overhead, a thick understorey of small trees and tall shrubs, and leaf-litter below (DEH 2008g).	**Likely.** Suitable habitat is present within the Project area. Nearest record of occurrence is < 1 km from the Project area, within the golf course. There are recent records occurring approximately 1 km from the Project area within the adjacent Mount George Conservation Park.
MAMMALIA			
Isoodon obesulus obesulus (Southern Brown Bandicoot)	*Endangered* *Known to occur*	Inhabit a variety of habitats including heathland, shrubland, sedgeland, heathy open forest and woodland and are usually associated with infertile, sandy and well drained soils, but can be found in a range of soil types (DCCEEW 2022b).	**Likely.** There is suitable habitat within the Project area for this species. Nearest record of occurrence is approximately < 1 km from the Project area. This species may use the Project area to travel between adjacent Conservation Parks, and surrounding areas where there are recent records of occurrence.
Pteropus poliocephalus (Grey-headed Flying-fox)	*Vulnerable* *Likely to occur*	Typically roost in tall dense trees next to a water source. They will move up to 20km from their roost site to forage (DEWNR 2020).	**Possible.** There is some suitable habitat present within the Project area. Nearest record of occurrence is approximately 1 km from the Project area. This species occurs in the adjacent National and Conservation Parks and is known for travelling between areas to forage.
REPTILIA			
Aprasia pseudopulchella (Flinders Ranges Worm-lizard)	*Vulnerable* *Known to occur*	Open woodland, native tussock grassland, riparian habitats and rocky isolates (DEWNR 2019b).	**None.** Suitable habitat is not present for this species within the Project area. Nearest record of occurrence is approximately 6 km from the Project area and is undated.

***Zoothera lunulata halmaturina* (South Australian Bassian Thrush) –EPBC Act: Vulnerable - *Likely* to occur.**

The AMLR distribution of the *Zoothera lunulata halmaturina* is distinct, as it is isolated from other extant occurrences within South Australia. This subspecies has been described as 'probably declining' within the AMLR, with the relative area of occupancy classified as 'Very Restricted'.

The South Australian Bassian Thrush favours damp, densely forested areas and gullies, and areas which provide a thick canopy overhead and dense leaf-litter below. Within the AMRL the preferred broad vegetation habitat groups are heathy woodland and grassy woodlands.

The Project area provides suitable habitat for this species, especially given the high density of leaf litter, canopy cover, and flora species such as blackberry, which are known to be utilised by this species. This species was however, not identified during the field survey.

***Isoodon obesulus obesulus* (Southern Brown Bandicoot)- EPBC Act: Endangered - *Likely* to occur.**

The AMLR distribution of the species is distinct, as it is isolated from other extant occurrences within South Australia. Within the AMLR, this species' relative area of occupancy is classified as 'Extremely Restricted'.

The Southern Brown Bandicoot within the AMLR is 'known' to occur from immediately north of the River Torrens, through the Adelaide Hills, and in the northern and southern Fleurieu Peninsula regions. This species occupies a range of woodlands, forest, scrubland, and heathland communities, as well as some grassland communities. Predominantly, they occur in open forests, tall shrublands and woodlands containing key flora species such as *Eucalyptus obliqua* (Messmate), *E. fasciculosa* (Pink Gum), *Leptospermum juniperinum* (Prickly Trea-tree), *Leptospermum myrsinoides* (Heath Tea-tree), *Banksia marginata* (Silver Banksia), *Pultenaea daphnoides* (Large-leaf Bush-pea), *Pteridium esculentum* (Bracken), *Platylobium obtusangulum* (Common Flat-pea), *Xanthorrhoea semiplana* (Yacca), *Lepidosperma semiteres* (Wire Rapier-sedge), and *Acacia pycnantha* (Golden Wattle).

The presence of dense vegetation, exotic or native, has been found to be a common attribute of corridors used by bandicoots. For example, in areas where native habitat has been degraded or diminished, exotic vegetation such as Blackberry (*Rubus fruticosus*) provides an alternative and important habitat for the Southern Brown Bandicoot. They utilise thickets of Blackberry for nesting, travel corridors and protection from predators (Department of Sustainability, Environment, Water, Population and Communities 2011). Completely removing blackberry from the site all at once would increase the risk of exposing the species to predators. *Rubus fruticosus* is a Weed of National Significance and a Declared Plant in South Australia. *Rubus fruticosus* will need to managed appropriately to minimise impact on potential Southern Brown Bandicoot habitat, while also meeting the Declared Plant Policy requirements.

3.2.5 Migratory and Marine Species

The PMST identified three migratory and marine fauna species listed under the EPBC Act as 'known to occur' or 'likely to occur' within 10 km of The Project. These are presented in Table 8. None of the migratory or marine species were identified during the field survey, and no migratory or marine species were assessed to be potentially impacted by the proposed action based on the current design footprint.

Table 8: Likelihood of impacts to migratory/marine fauna identified in the desktop assessment that are 'known' or 'likely' to occur within the project area.

MNES	MNES Record Details	Species habitat preferences	Likelihood of impacts
Gallinago hardwickii (Latham's Snipe)	*Vulnerable* *Likely to occur*	Usually inhabits open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands, or heathlands, around bogs and other water bodies) (DCCEEW 2022c).	**Unlikely.** Limited suitable habitat is present within the Project area, given the presence of Cox Creek however, this will not be directly impacted by the proposed action. Nearest dated record of occurrence is approximately 9 km from the Project area.
Hirundapus caudacutus (White-throated Needletail)	*Vulnerable* *Known to occur*	Almost exclusively aerial, however, certain preferences of habitat are exhibited by the species. Although they occur over most types of habitats, they are most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland (Australian Museum 2022).	**Unlikely.** This species is almost exclusively arial. There is limited suitable habitat available within the Project area. Nearest record of occurrence is approximately 10 km from the Project area, with surround records predating 1995.
Tringa nebularia (Common Greenshank)	*Endangered* *Likely to occur*	Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats, saltmarsh, mangroves, or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms (DCCEEW 2023c).	**None.** There is not suitable habitat present for this species within the Project area. Nearest record of occurrence is approximately 4 km from the Project area, however there are no recent records of this species occurring.

3.3 Project Impacts to MNES

3.3.1 Direct Impacts

The proposed action will result in the direct clearance of seven scattered trees and 0.757 ha of VA1 for construction works and areas of exotic vegetation. Two species of fauna listed under the *EPBC Act* are considered 'likely' to occur within the Project area, although they were not identified during the field survey (South Australian Bassian Thrush and the Southern Brown Bandicoot).

Overall, the direct impacts to MNES are limited and the removal of the seven scattered trees and 0.757 ha of VA1 is unlikely to significantly impact on foraging, perching or habitat resources for the assessed species, considering the surrounding landscape consists of National and Conservation Parks it is likely the species have a preference for less disturbed areas adjacent to the Project area and in the wider MLR region. Additionally, a number of trees within the Project will be retained and is likely to still act as a habitat corridor between patches of native vegetation. The removal of exotic vegetation is beneficial for majority of the

species (such as the threatened orchids) and its removal is likely to be insignificant for the Southern Brown Bandicoot.

3.3.2 Indirect Impacts

Potential offsite impacts for a construction project can include the alteration of hydrological processes, weed invasion or spread, dust impacts on neighbouring vegetation, contamination from waste, and negative facilitated impacts (i.e., secondary impacts due to increasing general access to the site through the development of new infrastructure). These types of indirect impacts are temporary.

Indirect impacts from this proposed action are limited, these include indirect construction impacts such as noise and vibration; erosion and soil run off into nearby water courses, such as Cox Creek and increased risk of weed incursion and dispersal and movement of *Phytophthora cinnamomi*. These indirect impacts are to be mitigated appropriately via various management plans including the Project's Construction Environmental Management Plan (CEMP) to minimise any impacts to the surrounding environment.

Indirect impacts which could occur during operation due to increased activity in the area include weed invasion or spread, movement of *Phytophthora cinnamomi,* increase of pest species due to higher volumes of waste or litter at the golf course, and the retreat of shy and elusive native species due to increased traffic and activity within the golf course.

3.4 Management and Mitigation Measures to Avoid or Reduce Impacts

The mitigation hierarchy refers to a set of tiered management and mitigation measures implemented to avoid or reduce impacts from the proposed action to acceptable levels. They include, in order of importance: avoid, minimise, restore and offset. A number of these measures can be implemented for the proposed action that fit within this hierarchy to assist with reducing on-ground impacts to any MNES to within acceptable levels, as far as practicable (Table 9).

Table 9: Management and mitigation measures to be enacted to avoid and reduce impacts to MNES.

Mitigation Hierarchy	Management and Mitigation Measures	Project Phase / Instrument
Avoid	The Project has implemented design changes and realignments to reduce impacts to vegetation, specifically the removal of the proposed accommodation pods. The accommodation pods underwent several iterations including the reduction, and then removal, which in early designs included up to 50 pods. This has reduced impact and direct clearance of vegetation and scattered trees substantially, including retaining the vegetation that was previously would have been impacted due to being within the CFS buffer zone clearance area.	Planning and design phase via planning schedule
	The Project's design has been designed to leverage the current footprint of existing infrastructure for the hotel, as well as utilising open areas or areas of exotic/planted vegetation species for the development of the carparks and the refurbishment of the existing perfumery.	Planning and Design Phase via planning schedule
Minimise	A vegetation assessment was undertaken and incorporated into the Project's design to ensure the minimum amount of vegetation disturbance, with efforts being made to minimise the extent, duration, and intensity of impacts on the proposed clearance of native vegetation.	Planning and Design Phase via planning schedule
	Prior to clearance, a suitably qualified ecologist /wildlife handler or fauna catcher will conduct a pre-clearance check of the impact area and each scattered tree to ensure no threatened fauna or flora are in the construction footprint.	Construction Phase via the CEMP

Mitigation Hierarchy	Management and Mitigation Measures	Project Phase / Instrument
	Signage and exclusion fencing will be implemented to limit the impacts of clearing to vegetation and aid in minimising disturbance within the Project area. Clearing of vegetation and in consequence, native vegetation and fauna habitat will, where feasible, will be avoided or minimised through the selection of machinery to avoid further impacts and retain trees where possible.	Construction Phase via the CEMP
	Implement a series of control measures to prevent and minimise the establishment and spread of Weeds of National Significance, Declared Plants and environmental weeds.	Construction Phase via the CEMP and Weed Management Plan
	Confine construction activities, including laydown and stockpiles, to a defined construction footprint. The construction footprint is to be restricted to the minimum area practicable and occur an appropriate distance away from watercourses. Access roads will be limited to existing roads and driveways.	Construction Phase via the CEMP and the Traffic Management Plan (if applicable)
	The Construction Environment Management Plan will outline soil, erosion, drainage, and stormwater management. In particular, the CEMP will outline pollution prevention of drainage lines and waterways in the areas located downstream. The construction footprint should be of a reasonable distance from Cox Creek to avoid potential pollution and spills impacting the creek.	Construction Phase via the CEMP
Restore	An indicative Revegetation Zone mapping was provided to the Client (Appendix C). These zones centre on Cox Creek and the frontage along Golflinks Road. the zones have high potential for revegetation, as they contain dense stands of Blackberry and are public-facing areas of the Project site. Restoring them would allow the Developer to implement highly visible revegetation and facilitate ecologically beneficial outcomes. Due to CFS requirements, some other areas will not be able to be rehabilitated, as they need to be maintained for specific Bushfire Attack Level Ratings. Revegetation of the Project area will have a preference for species that are endemic to the AMLR region. In conjunction with these efforts, a Weed Management Plan will also be developed to support natural regeneration of native species.	Project Design Weed Management Plan
	Patches in the Project area that where Blackberry (*Rubus fruticosus*) is identified for removal must be undertaken in a manner that is not detrimental to Southern Brown Bandicoot (*Isoodon obesulus obesulus*). The control of weeds, such as Blackberry, could be detrimental in some cases and a strategic approach should be considered) (Department of the Environment 2016). The EPBC Act draft referral guidelines for the endangered Southern Brown Bandicoot recommend mitigation measures when removing weed species which provide habitat for it (Department of Sustainability, Environment, Water, Population and Communities 2011). The mitigations which could be applied to the proposed action include: • Conduct staged removal of important exotic vegetation (in this case Blackberry) • Prevent exotic vegetation spreading. • Clear exotic vegetation in stages over several years. It is noted that this suggested timeline is unlikely to be achievable for the Proposed Action. Therefore, the Project's weed management plan should present a more realistic timeline for clearing of *Rubus fruticosus*. Considering the size and context of the Project, a timeframe of a couple months would be more reasonable. A staged approach to weed removal and subsequent revegetation should include a staggered method for weed removal followed by revegetation in the areas which have recently undergone weed removal. This methodology would allow for Blackberry to be controlled while also establishing native vegetation, ensuring there is habitat present at all times for the Southern Brown Bandicoot.	Weed Management Plan

Mitigation Hierarchy	Management and Mitigation Measures	Project Phase / Instrument
	• Provide suitable native habitat by regenerating (preferred) and/or revegetating native dense understorey species containing a vegetation structure with 50-80% average foliage density in the 0.2-1 m height range; and • Ensure suitable native vegetation structure is established before clearing.	

3.5 Impacts to Threatened Species under *Significant Impact Guidelines 1.1*

As outlined in section 1.4.1, a Significant Impact on a MNES is one which is 'important, notable or of consequence, having regard to its context or intensity' (Department of Environment, 2013). It will be dependent on the sensitivity, value, and quality of the environment as well as the extent, duration, and characteristics of the proposed action, including mitigation measures. A significant impact assessment has been conducted in accordance with the Significant Impact Guidelines 1.1 (Department of Environment, 2013) and relevant criteria on those MNES for which likelihood of impacts (Table 3) are considered 'possible', 'likely' or 'certain' based on Table 6 and Table 7. A total of 12 MNES qualified for assessment, all of which are threatened species:

1. *Caladenia behrii* (Pink-lipped Spider-orchid) (VU)
2. *Caladenia gladiolata* (Bayonet Spider-orchid) (VU)
3. *Glycine latrobeana* (Clover Glycine) (VU)
4. *Prasophyllum pallidum* (Pale Leek-orchid) (VU)
5. *Pterostylis cucullata* (Leafy Greenhood) (VU)
6. *Aphelocephala leucopsis* (Southern Whiteface) (VU)
7. *Pteropus poliocephalus* (Grey-headed Flying-fox) (VU)
8. *Caladenia rigida* (Stiff White Spider-orchid) (EN)
9. *Prasophyllum pruinosum* (Plum Leek-orchid) (EN)
10. *Hylacola pyrrhopygia parkeri* (Chestnut-rumped Heathwren) (EN)
11. *Zoothera lunulata halmaturina* (South Australian Bassian Thrush) (EN) and
12. *Isoodon obesulus obesulus* (Southern Brown Bandicoot) (EN).

The Significant Impact Assessments for Vulnerable and Endangered species are presented in Tables 10 and 11, respectively.

3.5.1 Referral Guidance for the Grey-headed Flying Fox

The PMST indicates that the Grey-headed Flying Fox (GHFF) is 'likely to occur' within the Project Area. The GHFF has specific referral guidelines which predominantly relates to recognised GHFF camps of national significance, or other camps suspected to meet the criteria for national significance (Department of the Environment 2015b) The GHFF referral guidance has been reviewed appropriately to determine if the guidelines are applicable to this proposed action. It was concluded the GHFF referral guidance is not applicable to this proposed action for the following reasons:

> The GHFF referral guideline relates to management actions taken at or in GHFF camps. The Project area is not within a camp of national significance. The nearest GHFF camp of national significance (Botanic Park) occurs approximately 15.5 km northwest to the Project area; and
> The GHFF referral guideline specifically states that it does not apply to "actions which may impact on the foraging habitat of EPBC Act-listed Flying-fox species. Proponents of actions of this kind should refer to the Significant Impact Guidelines 1.1"(Department of the Environment 2015b).

As the Proposed Action does not currently contain a camp of national significance, but does include the action outlined above, a Significant Impact Assessment for the GHFF was undertaken using the Significant Impact Guidelines 1.1 (Department of Environment 2013).

Table 10: Significant Impact Assessment for Vulnerable Species identified as 'possible' or 'likely' to be impacted by the Proposed Action. RPTTO: Recovery Plan for Twelve Threatened Orchids in the Lofty Block Region of South Australia (Government of South Australia 2010).

Criteria	***Caladenia behrii*** **(Pink-lipped Spider-orchid)**	***Caladenia gladiolata*** **(Bayonet Spider-orchid)**	***Glycine latrobeana*** **(Clover Glycine)**	***Prasophyllum pallidum*** **(Pale Leek-orchid)**	***Pterostylis cucullata*** **(Leafy Greenhood)**	***Aphelocephala leucopsis*** **(Southern Whiteface)**	***Pteropus poliocephalus*** **(Grey-headed Flying-fox)**
Lead to a long-term decrease in the size of an important population of a species	**No**. No important populations will decrease in size due to this development. Additionally, the nearest record of occurrence is approximately 7.5 km from the Project area, with majority of records located greater than 10 km from the Project area. Additionally, Based on BDBSA records and RPTTO, there are no important populations within the Project area.	**No**. No populations will decrease in size due to this development. Additionally, the nearest record of occurrence is approximately 10 km from the Project area and only two records of occurrence are within a 10 km buffer of the Project area. Additionally, based on RPTTO there are no important populations within the Project area.	**No**. No important populations will decrease in size due to this development. The nearest record of occurrence is < 1 km from the Project area However, all other records occur greater than 7 km from the Project area. It is unlikely the Project area provides habitat for an important population.	**No**. No important populations will decrease in size due to this development. Additionally, the nearest record of occurrence is approximately 9.5 km from the Project area, with majority of records located greater than 10 km from the Project area.	**No**. No important populations will decrease in size due to this development. Additionally, the nearest record of occurrence is approximately 6 km from the Project area. Additionally, based on the RPTTO there are no important populations within the Project area.	**Unlikely**. No important populations will decrease in size due to this development. Additionally, the nearest record of occurrence is approximately 8 km from the Project area, with majority of records located greater than 10 km east, it is unlikely the Project area provides habitat for an important population.	**No**. A nationally significant permanent camp at the Botanic Park occurs approximately 15.5 km northwest to the Proposed Action and therefore will not be impacted. No camps of national significance occur within the Project area. Removal of known or suspected foraging trees will be avoided under mitigation actions. Even if some trees must be removed, the long-term impact to the local population is unlikely to be significant.
Reduce the area of occupancy of an important population	**No**. The Project area is small, limited to a defined footprint and largely occurs within areas of existing infrastructure. Based on BDBSA records and the RPTTO there are no important	**No**. The Project area is small, limited to a defined footprint and largely occurs within areas of existing infrastructure. Based on BDBSA records and the RPTTO there are no important populations within 10	**No**. The Project area is small, limited to a defined footprint and largely occurs within areas of existing infrastructure. The Project area is well within the large distribution of the species and therefore	**No**. The Project area is small, limited to a defined footprint and largely occurs within areas of existing infrastructure. Based on BDBSA records and RPTTO there are no important populations within 3	**No**. The Project area is small, limited to a defined footprint and largely occurs within areas of existing infrastructure. Based on BDBSA records and RPTTO there are no important populations within 6	**Unlikely**. The Project area is small, limited to a defined footprint and largely occurs within areas of existing infrastructure, the Project area is well within the large distribution of the species and therefore is unlikely to reduce	**No**. The nationally significant camp at the Botanic Park occurs approximately 15.5 km northwest to the Proposed Action and therefore will not be impacted. Removal of known or suspected foraging trees will be avoided under mitigation

Criteria	*Caladenia behrii* (Pink-lipped Spider-orchid)	*Caladenia gladiolata* (Bayonet Spider-orchid)	*Glycine latrobeana* (Clover Glycine)	*Prasophyllum pallidum* (Pale Leek-orchid)	*Pterostylis cucullata* (Leafy Greenhood)	*Aphelocephala leucopsis* (Southern Whiteface)	*Pteropus poliocephalus* (Grey-headed Flying-fox)
	populations within 7.5 km of the Project area.	km of the Project area.	will not reduce the species' range.	km of the Project area.	km of the Project area.	the range that they occupy.	actions. Even if some trees must be removed, the long-term impact to the local population is unlikely to be significant.
Fragment an existing important population into two or more populations	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**Unlikely.** The proposed action will only have a small area of impact and is unlikely to fragment any populations.	**No.** GHFF are highly mobile and will travel up to 20 km from their camp to forage, and many hundreds of kilometres between camps. It is unlikely that the Project area provides significant foraging habitat.
Adversely affect habitat critical to the survival of a species	**No**. This species does not persist in weed infested areas. The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**No.** The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**No**. The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**No**. The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**No.** The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**Unlikely.** The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**No.** The proposed development is not located within a known or suspected nationally significant camp. Removal of known or suspected foraging trees will be avoided under mitigation actions wherever possible. Even if some trees must be removed, the long-term impact to the local population is unlikely to be significant due to the long-range foraging of this species.

Criteria	*Caladenia behrii* (Pink-lipped Spider-orchid)	*Caladenia gladiolata* (Bayonet Spider-orchid)	*Glycine latrobeana* (Clover Glycine)	*Prasophyllum pallidum* (Pale Leek-orchid)	*Pterostylis cucullata* (Leafy Greenhood)	*Aphelocephala leucopsis* (Southern Whiteface)	*Pteropus poliocephalus* (Grey-headed Flying-fox)
Disrupt the breeding cycle of an important population	**No**. There are no known important populations within the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**No**. There are no known important populations within the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**No**. There are no known important populations within the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**No**. There are no known important populations within the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**No**. There are no known important populations within the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**Unlikely.** The species has a large distribution range where breeding occurs from July to October, it is unlikely the location of the small Project area will disrupt breeding activities.	**No.** The nationally significant permanent camp at the Botanic Park occurs approximately 15.5 km northwest to the Proposed Action and therefore will not be impacted. It is currently unlikely that a camp in which individuals will breed occurs within the Project area.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**Unlikely.** The removal of this small area of vegetation is unlikely to impact any populations. Further, the species has broad habitat preferences and a broad distribution, therefore it can utilise much of the non-developed areas in the region and nearby National and Conservation Parks.	**No.** Removal of known or suspected foraging trees will be avoided under mitigation actions wherever possible. However, if some trees must be removed the overall impact to the local colony and overall population is likely to be insignificant, given the small amount of foraging habitat to be disturbed and ability of the species to range far to source food.
Result in invasive species that are harmful to a	**No.** It is unlikely that this small development will introduce or increase the density of	**No.** It is unlikely that this small development will introduce or increase	**No.** It is unlikely that this small development will introduce or increase	**No.** It is unlikely that this small development will introduce or increase	**No.** It is unlikely that this small development will introduce or increase	**No.** It is unlikely that this small development will introduce or increase	**No.** Management of weeds and pests will form part of the environmental

Criteria	*Caladenia behrii* (Pink-lipped Spider-orchid)	*Caladenia gladiolata* (Bayonet Spider-orchid)	*Glycine latrobeana* (Clover Glycine)	*Prasophyllum pallidum* (Pale Leek-orchid)	*Pterostylis cucullata* (Leafy Greenhood)	*Aphelocephala leucopsis* (Southern Whiteface)	*Pteropus poliocephalus* (Grey-headed Flying-fox)
vulnerable species becoming established in the vulnerable species' habitat	any invasive species in the region.	the density of any invasive species in the region.	the density of any invasive species in the region.	the density of any invasive species in the region.	the density of any invasive species in the region.	the density of any invasive species in the region.	management for the development.
Introduce disease that may cause the species to decline, or	**No**. It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on this orchid species, *Phytophthora* does affect the native vegetation which grows in association with this orchid species. The nearest confirmed Phytophthora sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records the adjacent areas to the Project and wider MLR. Therefore,	**No**. It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on this orchid species, *Phytophthora* does affect the native vegetation which grows in association with this orchid species. The nearest confirmed *Phytophthora* sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records the adjacent areas to the Project and wider MLR. Therefore,	**No**. It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on *Glycine* genera, *Phytophthora* does affect the native vegetation which grows in association with this species. The nearest confirmed *Phytophthora* sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records the adjacent areas to	**No**. It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on this orchid species, *Phytophthora* does affect the native vegetation which grows in association with this orchid species. The nearest confirmed *Phytophthora* sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records	**No.** It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on this orchid species, *Phytophthora* does affect the native vegetation which grows in association with this orchid species. The nearest confirmed *Phytophthora* sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records	**No.** It is unlikely that this small development will introduce any animal diseases.	**No.** Construction and operational activities are very unlikely to introduce disease risk to the species.

Criteria	***Caladenia behrii* (Pink-lipped Spider-orchid)**	***Caladenia gladiolata* (Bayonet Spider-orchid)**	***Glycine latrobeana* (Clover Glycine)**	***Prasophyllum pallidum* (Pale Leek-orchid)**	***Pterostylis cucullata* (Leafy Greenhood)**	***Aphelocephala leucopsis* (Southern Whiteface)**	***Pteropus poliocephalus* (Grey-headed Flying-fox)**
	Phytophthora hygiene measures are to be implemented as part of the CEMP.	*Phytophthora* hygiene measures are to be implemented as part of the CEMP.	the Project and wider MLR. Therefore, *Phytophthora* hygiene measures are to be implemented as part of the CEMP.	the adjacent areas to the Project and wider MLR. Therefore, *Phytophthora* hygiene measures are to be implemented as part of the CEMP.	the adjacent areas to the Project and wider MLR. Therefore, *Phytophthora* hygiene measures are to be implemented as part of the CEMP.		
Interfere substantially with the recovery of the species	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No.** There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No.** Currently, the proposed development will not cause direct impacts to the nearby nationally significant camp. The GHFF colony in Adelaide has been steadily increasing. Their population fluctuates annually and is highly mobile, where the removal of beneficial resources may only insignificantly affect populations.

Table 11: Significant Impact Assessment for Endangered (EN) and Critically Endangered (CR) Species identified as 'possible' or 'likely' to be impacted by the Proposed Action.

Criteria	***Caladenia rigida (Stiff White Spider-orchid)*** **(EN)**	***Prasophyllum pruinosum*** **(Plum Leek-orchid) (EN)**	***Hylacola pyrrhopygia parkeri (Chestnut-rumped Heathwren)*** **(EN)**	***Zoothera lunulata halmaturina*** **(South Australian Bassian Thrush) (EN)**	***Isoodon obesulus obesulus*** **(Southern Brown Bandicoot) (EN)**
Lead to a long-term decrease in the size of a population	**No**. No populations will decrease in size due to this small development. The Proposed Action is restricted to a defined footprint which leverages areas of existing infrastructure. There are no known or likely important populations within the Project area.	**No**. No populations will decrease in size due to this small development. The Proposed Action is restricted to a defined footprint which leverages areas of existing infrastructure. There are no known or likely important populations within the Project area.	**Unlikely**. It is unlikely populations will decrease in size due to this small development. The Proposed Action is restricted to a defined footprint which leverages areas of existing infrastructure.	**Unlikely**. It is unlikely that populations will decrease in size due to this development.	**Unlikely**. It is unlikely that populations will decrease in size due to this development. Where trees and *Rubus fruticosus* must be removed the overall long-term impact to MLR population is unlikely to be significant.
Reduce the area of occupancy of the species	**No**. The area of occupancy is unlikely to be reduced and only a small area of vegetation will be cleared. The Project area is largely limited to existing infrastructure areas. The species populations are largest within the National Parks and Conservation Parks in the MLR region.	**No.** The area of occupancy is unlikely to be reduced and only a small area of vegetation will be cleared. The Project area is largely limited to existing infrastructure areas. The species populations are largest within the National Parks and Conservation Parks in the MLR region.	**Unlikely.** The area of occupancy is unlikely to be reduced and only a small area of vegetation will be cleared. The Project area is largely limited to existing infrastructure areas. The species populations are largest within the National Parks and Conservation Parks in the MLR region. The Project area lacks the presence of a dense shrub understorey and is dominated by weedy vegetation.	**Unlikely.** The area of occupancy is unlikely to be reduced and only a small area of vegetation will be cleared.	**Unlikely.** The area of occupancy is unlikely to be reduced and only a small area of vegetation will be cleared. In areas where *Rubus fruticosus* is identified for removal, the Project should take a staged approach to the removal of this species to ensure these potential habitat patches and corridors are not simultaneously impacted. The Project should have suitable native vegetation structure established before clearing.
Fragment an existing population into two or more populations	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**No**. The proposed action will only have a small area of impact and will not fragment any populations.	**Unlikely**. The species is a small, sedentary and territorial bird. This species populations are largest within a small number of National Parks and Conservation Parks within the MLR region. The	**Unlikely.** The species is shy, secretive and likely sedentary with low flight. Records of occurrence indicate the species population is most prevalent within a small number of MLR	**Unlikely**. Records indicate the species population is largest within the MLR National Parks and Conservation Parks. The Proposed Action will only have a small area of vegetation clearance and is unlikely

Criteria	*Caladenia rigida (Stiff White Spider-orchid)* (EN)	*Prasophyllum pruinosum* (Plum Leek-orchid) (EN)	*Hylacola pyrrhopygia parkeri (Chestnut-rumped Heathwren)* (EN)	*Zoothera lunulata halmaturina* (South Australian Bassian Thrush) (EN)	*Isoodon obesulus obesulus* (Southern Brown Bandicoot) (EN)
			Proposed Action will only have a small area of vegetation clearance and is unlikely to fragment any populations.	National Parks and Conservation Parks (including Mount George Conservation Park, adjacent to the Project area). The proposed action will only have a small area of vegetation clearance and is unlikely to fragment local populations.	to fragment any populations. Areas of *Rubus fruticosus* will need to be appropriately managed to ensure these potential habitat patches / corridors are not impacted within a short period of time and the home range of the species is not affected by the removal of *Rubus fruticosus*.
Adversely affect habitat critical to the survival of a species	**No**. The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**No**. The vegetation within the Project area is dominated by a weedy understorey. The small area of vegetation identified for clearance is not likely to be critical to the survival of this species.	**Unlikely.** The small area of vegetation identified for clearance is not likely to be critical to the survival of this species, the Project area lacks the presence of a dense shrub understorey, which this species relies on. The Project area is dominated by a weedy understorey and is situated on areas of existing impermeable surfaces.	**Unlikely**. The small area of vegetation identified for clearance is not likely to represent habitat significant to the survival of the species. While the Project area provides *Eucalyptus* spp., it lacks a thick understorey of small trees and tall shrubs. It is dominated by weedy vegetation. Cox Creek within the Project area is likely to provide some suitable habitat for foraging, however it is not within the immediate impact area.	**Unlikely**. It is unlikely the Project area provides habitat critical to the survival of the species, while the Project area provide some alternative habitat (*Rubus fruticosus)* it is not considered critical habitat.
Disrupt the breeding cycle of a species	**No**. There are no known important populations within the Project area, the nearest record of occurrence is approximately 4 km from the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**No**. There are no known important populations within the Project area, the nearest record of occurrence is approximately 3 km from the Project area. It is unlikely the location of the small Project area will disrupt recruitment or pollination.	**Unlikely.** The Project area is unlikely to provide important breeding habitat or disrupt the breeding cycle as there is an absence of low shrubs suitable for nesting. If some trees must be removed the overall impact to the MLR population overall is likely to be insignificant.	**Unlikely**. The Project area is unlikely to provide important breeding habitat or disrupt the breeding cycle. If some trees must be removed the overall impact to the species nesting habitat is likely to have insignificant.	**Unlikely**. The Project area is unlikely to provide important breeding habitat or disrupt the breeding cycle. Areas of *Rubus fruticosus* identified for removal must implement a staged approach so potential habitat and nesting areas are not removed within a short period of time.

Criteria	*Caladenia rigida (Stiff White Spider-orchid)* (EN)	*Prasophyllum pruinosum* (Plum Leek-orchid) (EN)	*Hylacola pyrrhopygia parkeri (Chestnut-rumped Heathwren)* (EN)	*Zoothera lunulata halmaturina* (South Australian Bassian Thrush) (EN)	*Isoodon obesulus obesulus* (Southern Brown Bandicoot) (EN)
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**No**. The existing vegetation in the Project area is highly infested by weeds. The removal of this small area of vegetation is unlikely to impact any habitat for the species.	**Unlikely.** The removal of this small area of vegetation is unlikely to impact any populations. Further, the species has broad habitat preferences and a broad distribution throughout the MLR, therefore it can utilise much of the non-developed areas within the MLR and neighbouring National and Conservation Parks.	**Unlikely.** The removal of this small area of vegetation is unlikely to impact any populations. Further, a broad distribution throughout the MLR, therefore it can utilise much of the non-developed areas within the MLR and neighbouring National and Conservation Parks.	**Unlikely.** The removal of this small area of vegetation is unlikely to impact any populations. Further, the species is able to adapt to differing habitat qualities and types and has a broad distribution throughout the MLR, therefore it can utilise much of the non-developed areas within the MLR and neighbouring National and Conservation Parks.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	**No**. The Project will not result in harmful invasive species within the Project area. The Project area is already dominated by a weedy understorey.	**No**. The Project will not result in harmful invasive species within the Project area. The Project area is already dominated by a weedy understorey.	**Unlikely**. The Project will not result in harmful invasive (flora or fauna) species within the Project area. The Project area is already dominated by a weedy understorey.	**Unlikely**. The Project will not result in harmful invasive (flora or fauna) species within the Project area. The Project area is already dominated by a weedy understorey.	**Unlikely**. The Project will not result in harmful invasive (flora or fauna) species within the Project area. The Project area is already dominated by a weedy understorey.
Introduce disease that may cause the species to decline, or	**No**. It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on this orchid species, *Phytophthora* does affect	**No**. It is unlikely this small development will introduce diseases which will cause species decline. While the direct effect of *Phytophthora* is unknown on this orchid species, *Phytophthora* does affect	**Unlikely.** It is unlikely that this small development will introduce any animal diseases.	**Unlikely.** It is unlikely that this small development will introduce any animal diseases.	**Unlikely**. It is unlikely that this small development will introduce any animal diseases.

Criteria	*Caladenia rigida (Stiff White Spider-orchid)* (EN)	*Prasophyllum pruinosum* (Plum Leek-orchid) (EN)	*Hylacola pyrrhopygia parkeri (Chestnut-rumped Heathwren)* (EN)	*Zoothera lunulata halmaturina* (South Australian Bassian Thrush) (EN)	*Isoodon obesulus obesulus* (Southern Brown Bandicoot) (EN)
	the native vegetation which grows in association with this orchid species. The nearest confirmed *Phytophthora* sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records the adjacent areas to the Project and wider MLR. Therefore, *Phytophthora* hygiene measures are to be implemented as part of the CEMP.	the native vegetation which grows in association with this orchid species. The nearest confirmed *Phytophthora* sp. record is approximately 3.5 km from the Project area and numerous confirmed and suspected records the adjacent areas to the Project and wider MLR. Therefore, *Phytophthora* hygiene measures are to be implemented as part of the CEMP.			
Interfere substantially with the recovery of the species	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No**. There will be no direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No.** There will be no significant direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No.** There will be no significant direct impact to the species, and no indirect impacts that will affect the recovery of the species.	**No**. There will be no significant direct impact to the species, and no indirect impacts that will affect the recovery of the species.

3.5.2 Significant Impact Results

The Project area is restricted to a small footprint which is largely situated on areas of existing infrastructure. Additionally, the vegetation within the Project area is heavily infested with weed species. Records of occurrence of the MNES assessed within this report were largely located in nearby Belair National Park such as Belair and Mount George Conservation Park, or Cleland Conservation Parks, implying that the MNES are likely to preferentially utilise these areas of native vegetation and other undistributed areas in the region, rather than the relatively small and relatively disturbed Project area.

The proposed action is limited to short-term construction. Upon completion of the proposed action impacts arising from construction, such as the removal of vegetation and indirect impacts such as noise, vibration and dust, are likely to subside. During operation the Mount Lofty Golf Estate is likely to have a similar level of disturbance as is caused by the currently operating Stirling Golf Course.

In consideration of all assessment results and the mitigation actions recommended to be implemented, it is **unlikely** that there is a "real chance or possibility" for the Proposed Action to cause a Significant Impact to any Matter of National Environmental Significance.

4 DISCUSSION & RECOMMENDATIONS

4.1 Referral Requirement for the Project

Results from this EPBC Self-Assessment indicate that the current proposed action for the Mount Lofty Golf Estate **will not require** a Referral under the *EPBC Act 1999*. This assessment is contingent on the current design plans. Should design be altered in any substantive way, the results of this assessment will need to be reviewed to ensure the risk of impacts to MNES have not increased.

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APPENDIX A – SIGNIFICANT IMPACT CRITERIA

Significant Impact Criteria – Critically Endangered or Endangered Species

Significant Impact Guidelines 1.1 (Department of Environment 2013), page 9

With regards to criteria for threatened species, a proposed action is likely to have a Significant Impact on a Critically Endangered or Endangered species if there is a real chance or possibility that it will:

- Lead to a long-term decrease in the size of a population
- Reduce the area of occupancy of the species
- Fragment an existing population into two or more populations
- Adversely affect habitat critical to the survival of a species
- Disrupt the breeding cycle of a population
- Modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that the species is likely to decline
- Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
- Introduce disease that may cause the species to decline, or
- Interfere with the recovery of the species.

Significant Impact Criteria – Vulnerable Species

Significant Impact Guidelines 1.1 (Department of Environment 2013), page 10

With regards to criteria for a Vulnerable species, an action is likely to have a Significant Impact if there is a real chance or possibility that it will:

- Lead to a long-term decrease in the size of an important population of a species
- Reduce the area of occupancy of an important population
- Fragment an existing important population into two or more populations
- Adversely affect habitat critical to the survival of a species
- Disrupt the breeding cycle of an important population
- Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
- Introduce disease that may cause the species to decline, or
- Interfere substantially with the recovery of the species.

Significant Impact Criteria – Critically Endangered or Endangered Ecological Community

Significant Impact Guidelines 1.1 (Department of Environment 2013), page 11

With regards to criteria for Critically Endangered or Endangered ecological communities, an action is likely to have a Significant Impact if there is a real chance or possibility that it will:

- Reduce the extent of an ecological community
- Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines
- Adversely affect habitat critical to the survival of an ecological community

- Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns
- Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting
- Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
    - assisting invasive species, that are harmful to the listed ecological community, to become established, or
    - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community or,
- Interfere with the recovery of an ecological community.

Significant Impact Criteria – Listed Migratory Species

Significant Impact Guidelines 1.1 (Department of Environment 2013), page 12

With regards to criteria for migratory species, an action is likely to have a Significant Impact on a listed migratory species if there is a real chance or possibility that it will:

- Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles, or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.
- Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or
- Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Significant Impact Criteria – Wetlands of International Importance

Significant Impact Guidelines 1.1 (Department of Environment 2013), page 13

With regards to criteria for wetlands of international importance, an action is likely to have a Significant Impact on a listed migratory species if there is a real chance or possibility that it will result in:

Areas of the wetland being destroyed or substantially modified
A substantial and measurable change in the hydrological regime of the wetland, for example, a substantial change to the volume, timing, duration and frequency of ground and surface water flows to and within the wetland
The habitat or lifecycle of native species, including invertebrate fauna and fish species, dependant upon the wetland being seriously affected
A substantial and measurable change in the water quality of the wetland – for example, a substantial change in the level of salinity, pollutants, or nutrients in the wetland, or water temperature which may adversely impact on biodiversity, ecological integrity, social amenity or human health, or
An invasive species that is harmful to the ecological character of the wetland being established (or an existing invasive species being spread) in the wetland.

Similar criteria are available for Commonwealth Marine Areas, National Heritage Places, World Heritage Places, Nuclear Actions, Great Barrier Reef Marine Park and Protection of Water Resources from Coal Seam Gas and Large Coal Mining Development (Department of Environment 2013).

APPENDIX B – PMST MNES RESULTS

APPENDIX C – REVEGETATION ZONES (06/03/2024)

Figure 4: Potential Revegetation Zones

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