TMK Consulting Engineers

Adelaide | Melbourne | Riverland

2406124_L1
12 September 2024

BACKGROUND INVESTIGATION
DUBLIN EMPLOYMENT CODE AMENDMENT
PRELIMINARY SERVICES ASSESSMENT

Prepared for

Leinad Land Developments (Dublin) Pty/Ltd

CONTENTS

Our Ref: 2406124_L1
12 September 2024

Leinad Land Developments (Dublin) Pty/Ltd
C/- Ekistics Planning & Design
3/431 King William St
Adelaide SA 5000.

ATTENTION: Frank Vounasis **email:** frank@leipzig.com.au

Dear Frank,

RE: DUBLIN EMPLOYMENT CODE AMENDMENT
Background Investigation – Preliminary Services Assessment

TMK Consulting Engineers have undertaken preliminary infrastructure investigations to review and provide advice on infrastructure availability, capacity and capability for infrastructure augmentation where required.

These investigations relate to the proposed future Employment land adjacent to the existing township of Dublin and address the requirements of the Minister in approving the initiation of the 'Dublin Employment Code Amendment.'

The primary focus of this preliminary investigation was undertaken on the following:

- Electrical reticulation
- Water reticulation (Potable)
- Water reticulation (Non-potable)
- Wastewater Disposal
- Telecommunications
- Gas reticulation
- Stormwater Management

The report seeks to identify existing infrastructure capacity and augmentation capability, identifies potential infrastructure augmentation solutions, and options that identifies likely responsibility including potential mechanisms for required infrastructure contributions and implementation.

CARLO TALLADIRA
Associate Director

E ctalla@tmkeng.com.au
D 08 8238 4113 **M** 0419 002 689

DANIEL PERILLI
Senior Engineer / Discipline Leader

E dperilli@tmkeng.com.au
D 08 8238 4148 **M** 0420 484 662

For and on behalf of
TMK Consulting Engineers

1. LAND PARCELS

The proposed Dublin Development is within the Adelaide Plains Council and is currently located in the Rural Zone.

Leinad aims to position "Dublin Park" at the forefront of sustainable residential and industrial development in Australia, through leveraging principles of circular economy and sustainability.

In 2023, Leinad prepared an ''Urban Framework Plan'' illustrated in Figure 1.1, to guide the future development 1,373-hectare (ha) land holding comprising of:

- An extension of the township for around 1,300 dwellings or 3,250 people. (not forming part of the current proposed Code Amendment)
- 400 ha of employment land to accommodate a range of commercial and industrial activities integral to a Green Circular Economy.
- A new 224 ha mine (subject to a separate process under the *Mining Act*, 1971)
- Around 600 ha of green open space.

This plan demonstrates the proposed land use distribution with neighbourhood structure, key linkages, open space and recreation facilities as well as overall employment and housing population/density.

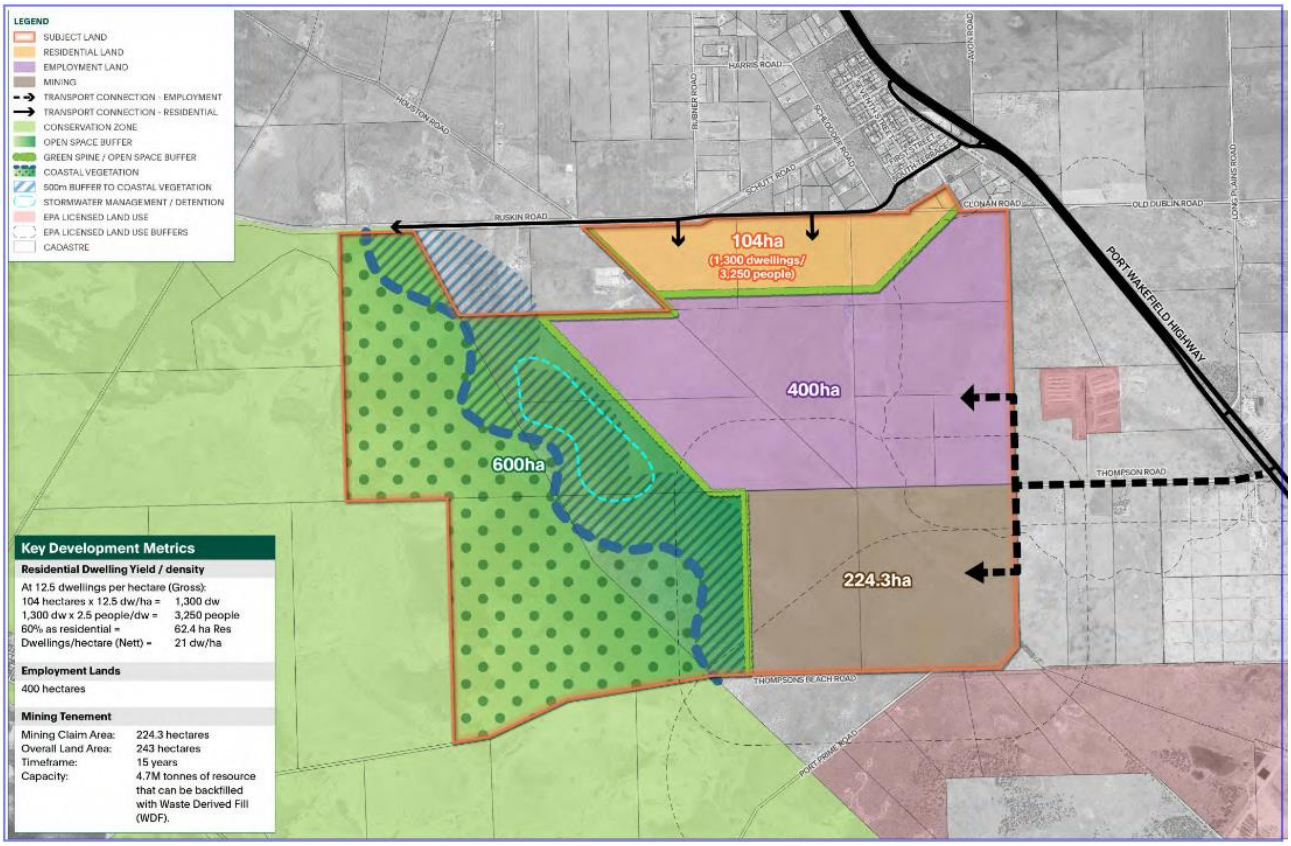

Figure 1 – Dublin Urban Framework Plan

The Minister for Planning has given approval to proceed with the preparation of the ''Dublin Employment Code Amendment''. Thus, this report reviews and provides advice on the existing infrastructure availability and capacity as it relates to the proposed Employment Area as well as capability for infrastructure augmentation where require.

In approving the initiation of the Code Amendment, the Minister has specified that the following matter be addressed in the future investigations to inform the Code Amendment:

''Provide a comprehensive infrastructure analysis by an appropriately qualified expert(s) that identifies all future infrastructure works required to accommodate the development of the affected area as proposed by the Code Amendment and provide a strategy which offers a funding and delivery solution for all required infrastructure works. This should also take into consideration the potential impact on, or integration with, existing employment and urban activities in the area.

Leinad has prepared the following concept layout, as illustrated in Figure 2 – Employment Land, which provides a guide to potential future arrangement of the proposed employment area. The concept layout shows 37 allotments ranging from 3.5 hectares to 68.5 hectares.

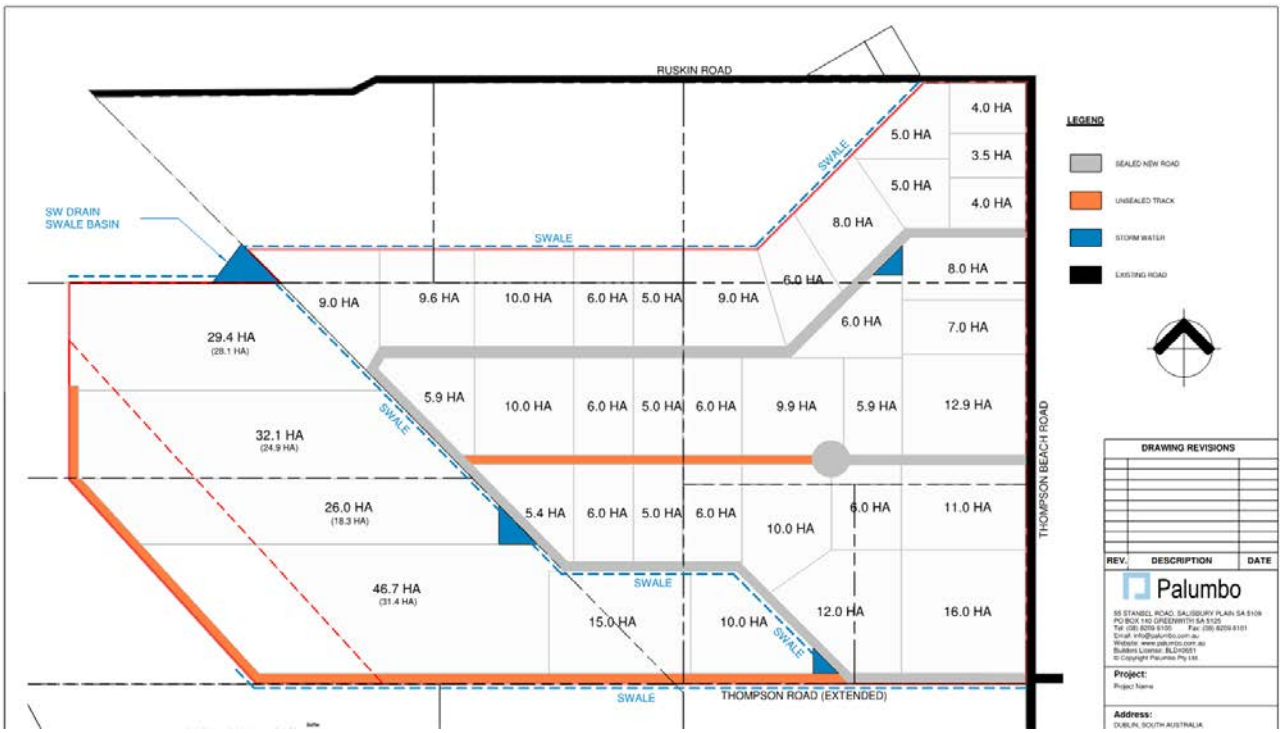

Figure 2 – Employment Land

2. ELECTRICAL RETICULATION

2.1 EXISTING SA POWER NETWORKS (SAPN) INFRASTRUCTURE

Existing SA Power Networks Infrastructure is near capacity with augmentation required where large new electrical loads are required to service the development from SAPN.

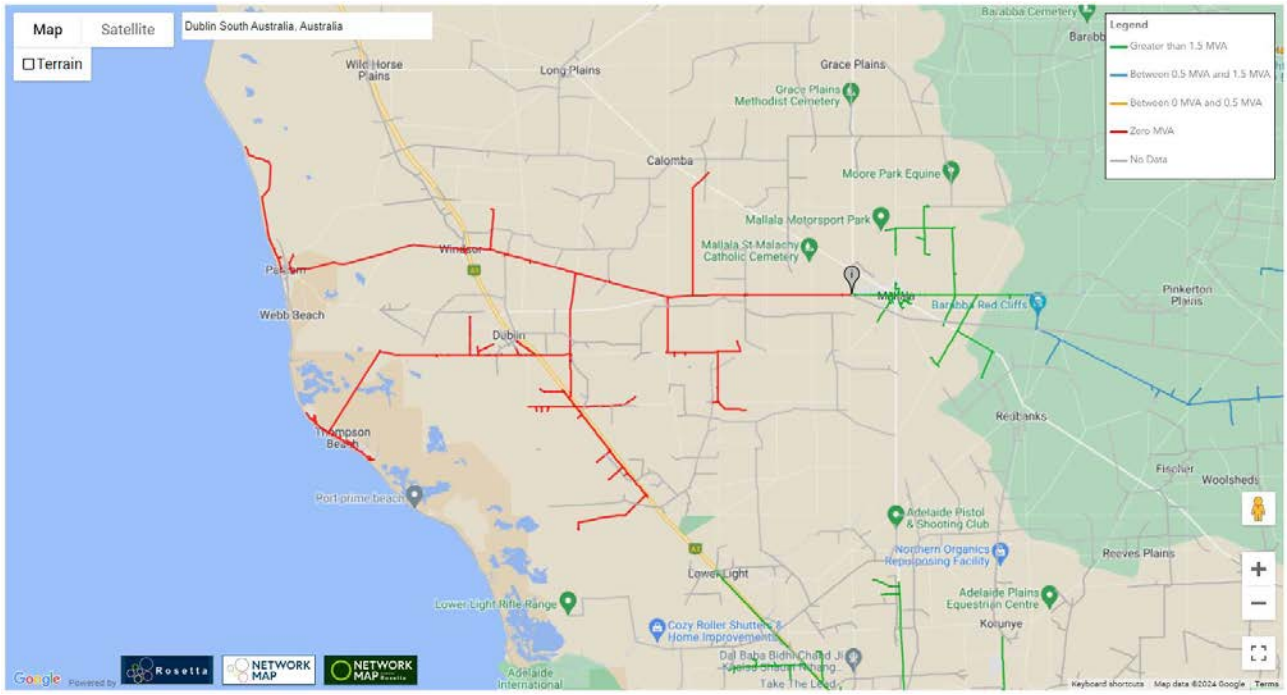

Figure 3 – Existing SAPN Network Capacity In Wider Dublin Area

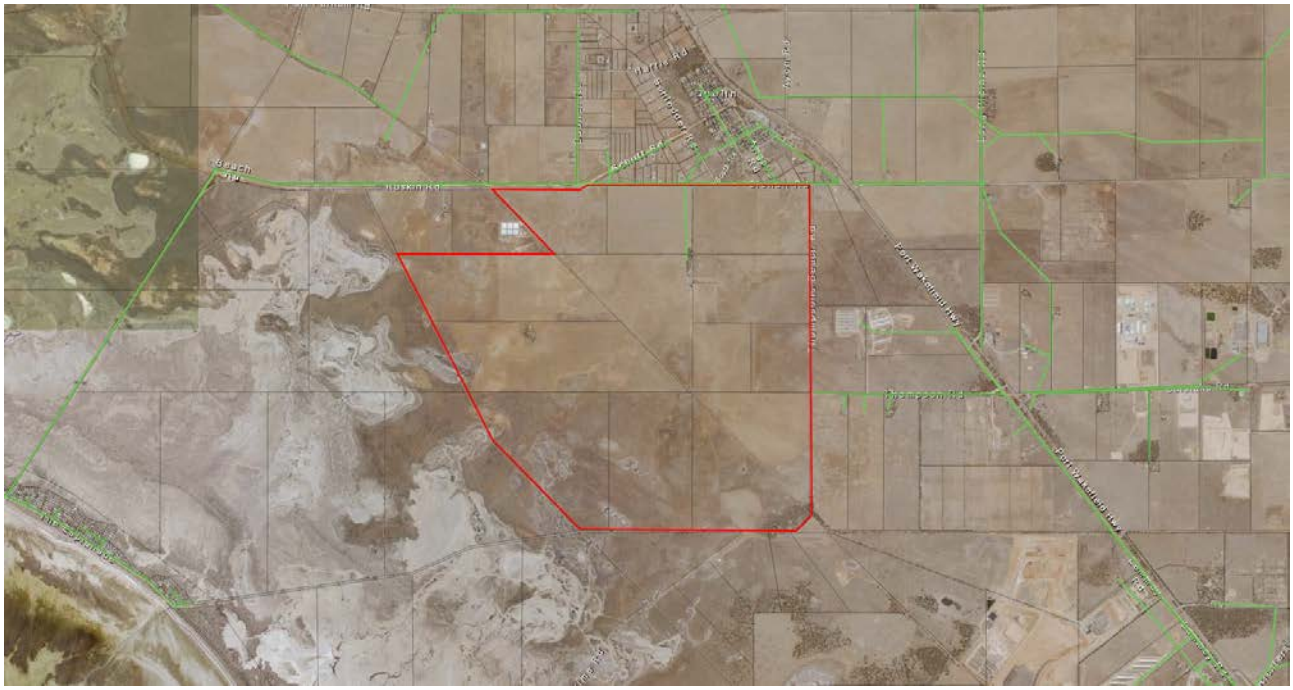

Figure 3 – Existing SAPN Network Capacity In Vicinity of Subject Site

The red lines are the 11kV network and there is currently limited available capacity in the area surrounding Dublin. The grey lines are 19kV Single Wire Earth Return (SWER) infrastructure in which only rural developments (farms, etc) would be able to be connected to it.

2.2 Augmentation Options and Solutions

The following augmentation options and solutions are likely available to provide sufficient electrical reticulation for the proposed employment area:

2.2.1 SAPN Network Augmentation

A new substation with new sub-transmission lines somewhere within 5kms of the development would be required to supply the proposed plan from the SAPN network. The total load for this would be approximately 20MVA. Any network extensions would be at the developers cost and would take place over the next 5 - 10 years.

SAPN has identified a future location for a 33/11kV substation supplied from fed from Mallala or a 66/11kV Substation fed from Two Wells. The 66/11kV substation would be required for the portion of the development identified in this report. The 33/11kV substation would only be able to service the proposed residential portion, however it would future-proofed to allow for an upgrade to 66/11kV. The substation would be required to be fully serviced with Hydraulic and Communications.

SAPN's provides augmentation costs available in their network standards for situations such as these. The augmentation for new sub-transmission lines and a substation is approximately $1450/kVA.

2.2.2 Bio-Reactor

An alternate source of electricity generation for this development is a Bio-Reactor that produces bioenergy in the form of biogas which is derived from organic waste. The Dublin Green Circular Economy Project report prepared by Enpro Envirotech Pty Ltd, Adelaide in August 2024 details this proposal.

It is possible to generate about 40,000MWh of electricity in a year from the Bio-Reactor which would be able to service not only this development but also the wider Dublin area. This solution to supply electricity to the development would ease the requirements of augmentation on SAPN's network and can be constructed in stages due to scalability from sourcing waste supply.

Should the Bio-Reactor ever not have enough waste supply, a solar farm + battery backup and/or gas storage solution can be utilised. This would be sized large enough to supply the development while additional waste supply is procured.

2.2.3 Hybrid Solution

Utilizing a hybrid solution of the above-mentioned Bio-Reactor and augmenting the SAPN network for redundancy is also a solution to the long-term power requirements of this development. The Bio-Reactor would be constructed in the initial phases while the SAPN network is constructed in line with section 2.1 above.

Any implications of connecting this additional source of electricity to the SAPN network will be managed through the connection agreement process when required.

3. WATER RETICULATION (POTABLE)

3.1 EXISTING SA WATER NETWORK

Currently the water supply to the existing Dublin Township comes from DN 200mm main along Clonan Road immediately adjacent the subject land with DN 80mm main that dissects the subject land from Houston Road down through the site across to Thompson Beach with multiple water meters connected and are currently in use.

SA Water metered connections are supplied at a reduced flow and are serviced by the existing network.

3.2.1 SA Water Network Augmentation

SA Water has commenced a preliminary investigation to determine if expansion is required and liaison with the department is ongoing. A network analysis by SA Water is currently being undertaken with a commitment that if augmentation is required, costs will be borne by Leinad.

3.2.2 Alternative Network Solution (Alano Utilities Pty Ltd)

Potable water is currently located onsite for use via existing water meters. Alano Utilities Pty Ltd could expand their network for Leinad utilising the existing water meter connections which would provide services to the Employment Zone, with connection and expansion of existing network on site.

Alano Utilities Pty Ltd is continuing to work with Leinad and are currently finalising an Infrastructure Agreement (IA) to ensure that the ultimate solution provided to service the development which integrates into the master plan.

The Alano Utilities option is deemed to be an acceptable and feasibly option with a commitment that if augmentation is required, costs will be borne by Leinad.

3.2.3 Hybrid Solution

A Hybrid portable solution consisting of combining multiple technologies or methods such as:

- Filtration Systems
- Desalination
- Rainwater Harvesting
- Advanced Oxidation Processes

Provide a safe reliable drinking water solution which Leinad is committed to investigating and if deemed to be an acceptable and feasibly option with a commitment that if augmentation is required, costs will be borne by Leinad.

4. WATER RETICULATION (NON-POTABLE)

4.1 EXISTING SA WATER NETWORK

Currently within the Dublin Township area there is no formal system for non-potable water supply to the area.

4.2.1 SA Water Network Augmentation

Currently SA Water have been working on augmenting non-potable water supplies through several initiatives such as recycling and reuse of wastewater and developing infrastructure that allows for separate systems however at this point in time SA Water has no appetite to service the area with non-potable water

4.2.2 Alternative Network Solution (Alano Water Pty Ltd)

Alano Water Utilities Pty Ltd could supply Non-Potable water to open space and the future Employment land in the Affected Area as required through the construction and development of a wastewater treatment plant.

Alano Utilities Pty Ltd is continuing to work with Leinad and are currently finalising an Infrastructure Agreement (IA) to ensure that ultimate solution is provided to service the development which integrates into the master plan and is deemed an acceptable and feasible option with a commitment that if augmentation is required, costs will be borne by Leinad.

4.2.3 Hybrid Solution

The use of non-potable water for applications which do not require drinking water quality has become common in residential, industrial, and commercial developments.

There are several incentives with supplying non-potable water to consumers such as: non-potable water is cheaper than potable water and can be used for such applications as toilet flushing, irrigating reserves, construction use etc.

There are four main potential systems that could be considered for use on the subject land:

- Treated wastewater i.e., from a community wastewater system (CWMS)
- Treated stormwater and
- Combination of both treated wastewater and stormwater
- SA Water NAIS (Northern Adelaide Irrigation Scheme) recycled water infrastructure exists approximately 16.5km southeast of Dublin at Porter Road Korunye. There are two large storage facilities of 200ML each, and a new pump station.

Given the proposed gross area of the proposed future employment precinct, the above-mentioned schemes are potential solutions in providing non-potable water to not only the proposed development but the existing Dublin Township.

Leinad is committed to investigating and if deemed to be an acceptable and feasibly option with a commitment that if augmentation is required, costs will be borne by Leinad.

5. WASTEWATER DISPOSAL

5.1 EXISTING SA WATER NETWORK

Currently within the Dublin Township area there is no formal system for the collection of wastewaters.

5.2.1 SA Water Network Augmentation

SA Water has commenced a preliminary investigation to determine if expansion is part of their regulatory business plan and liaison with the department is ongoing. A network analysis by SA Water is currently being undertaken with a commitment that if augmentation is required, costs will be borne by Leinard.

5.2.2 Alternative Network Solution (Alano Water Pty Ltd)

Alano Utilities Pty Ltd will be able to provide services to the Employment lands within the Affected area, with connection into an internal wastewater treatment facility network to be constructed on site.

Alano Utilities Pty Ltd is continuing to work with Leinad and are currently finalising an Infrastructure Agreement (IA) to ensure that ultimate solution is provided to service the development which integrates into the master plan and is deemed an acceptable and feasibly option with a commitment that if augmentation is required, costs will be borne by Leinad.

5.2.3 Hybrid Solution

Currently within the Dublin Township area there is no formal system for the collection of wastewaters.

New wastewater infrastructure will therefore be required to serve the proposed development. This presents the opportunity to investigate further a potential combination of wastewater collection systems as noted below:

- Vacuum
- Community wastewater system (CWMS)
- Onsite storage and soakage
- Aerobic

The above-mentioned systems (or combination thereof) schemes are potential solutions in providing a feasible wastewater solution.

Leinad is committed to investigating and if deemed to be an acceptable and feasibly option with a commitment that if augmentation is required, costs will be borne by Leinad.

6. TELECOMMUNICATIONS

6.1 NBN

Leinad have established Development Agreements with NBN to ensure NBN connection is provided to the site as required for each stage of its future development.

7. GAS RETICULATION

7.1 LOCAL SUPPLY

The township of Dublin is currently serviced by individual gas bottles. This development is not proposed to have a gas supply however this does not prevent the land from being rezoned for employment purposes and any future uses.

7.2 NATURAL GAS MAIN

Reticulation throughout the future development of the Affected Area can be assisted with the proposed bioreactor which may create opportunities for onsite gas supply generation.

Should there be a need to extend the existing gas network in the future to the Affected Area, Virginia offers the closest suitable point to extend a high-pressure gas main to Dublin. In due course it may be as close as Two Wells.

Highway 1 between Virginia to Dublin is the ideal route for the proposed high-pressure gas main to the development. DIT are receptive to services being installed within their road reserve.

8. STORMWATER MANAGEMENT

The development can be achieved through best stormwater management practice incorporating Water Sensitive Urban Design (WSUD). This component includes but is not limited to the following.

- Pre and post development runoff flow control to management environmental flows
- Water quality management to achieve better runoff flow quality from the post developed area than in the predevelopment state
- Water conservation and
- Harnessing opportunities for stormwater harvesting and reuse

For a detailed overview on stormwater management, please refer to ‘’SLR Consulting’’ Report.

9. CONCLUSION

Leinad is seeking to position ‘’Dublin Park’’ at the forefront of sustainable development in Australia, through levering the principles of a circular economy and sustainable development outcomes.

This report reviews and provides advice specifically in relation to the intent to rezone land for employment purposes in the *‘’Dublin Employment Code Amendment’’.*

Our investigations have identified a need to augment existing servicing to the site to enable the future use for Employment Land. As this significant sized land holding is in single ownership, this makes it conducive to being able to implement a variety of different arrangements for the supply of essential services either through extension of existing service or through alternative arrangements. Based on the information made available at this time, the proposed on-site power generation and entering into private arrangements for the supply of infrastructure capacity for electricity, water supply and wastewater are all viable options for consideration.

From our preliminary investigations, Leinad have Development Agreements either in place, or in progress, that would deliver the necessary essential services to the Affected Area with funding and delivery solutions for all required services being borne by Leinad.

In our opinion, the shear critical gross mass of the proposed development presents various viable options to supply essential services in addition to augmenting existing services.

If you have any further queries regarding any aspect of the above, please do not hesitate to contact this office.