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Landfill Closure and Filling Plan

Leeton Landfill and Recycling Depot

LEETON
SHIRE COUNCIL

Prepared for Leeton Shire Council

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Name	Position	File Reference
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Signature		

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1 Introduction

Leeton Shire Council (the Council) commissioned Talis Consultants Pty Ltd (Talis) to prepare a Landfill Closure and Filling Plan for the Leeton Landfill and Recycling Depot (the Site), which is located at 732 Corbie Hill Road, Leeton New South Wales (NSW) 2705. The locality of the Site is shown in Figure 1. The Site was established in 2005 and is owned and operated by the Council under Environmental Protection Licence (EPL) No 11863.

1.1 Project Objectives

The Site is currently approved to undertake landfill operations within the Active Landfill Stage 1 using a series of engineered trenches. The Council intends to continue this trench method within the Active Landfill Stage 1 for its short-term landfill disposal requirements until all proposed trenches are filled in accordance with the existing approvals and to maximise the available land use in this area.

For its long-term landfill disposal obligations, the Council proposes to adopt a typical land raise landfilling practice within the western section of the Site (Future Landfill Stage 2). This approach will include the development of a variety of cells and the progressive filling and capping of these cells to result in one uniform waste mass. This method is in accordance with typical standards for landfilling including the NSW Environment Protection Authority (EPA) *Environmental Guidelines: Solid Waste Landfills (2016)* (NSW Landfill Guidelines) and will ensure better void space utilisation as well as environmental performance.

There is approximately ten years of landfill capacity within the Active Landfill Stage 1. The Council will be able to utilise this time to undertake the pre-construction activities for commencing landfill disposal activities within the Future Landfill Stage 2. This includes undertaking the necessary site investigations and assessments, preparing the relevant design works, acquiring the appropriate environmental approvals, developing the required management plans and undertaking procurement processes for its construction. The advancement of the Future Landfill Stage 2 will provide the Council with long term security for the provision of critical waste disposal services to its community.

This Landfill Closure and Filling Plan was prepared for the Site to provide the Council with a clear direction on works and operations required to facilitate the future rehabilitation of the landfill disposal areas in accordance with the NSW Landfill Guidelines as well as detail landfill rehabilitation and post-closure management requirements.

The key objectives of the Landfill Closure and Filling Plan are to provide:

1. A final capping system profile in accordance with the NSW Landfill Guidelines;
2. A filling plan to provide direction for the proposed filling operations having regard to the final closure profile;
3. Remaining void space calculations;
4. Environmental engineering and management measures for landfill gas & surface water in accordance with NSW Landfill Guidelines;

5. A comprehensive phased closure plan which will form the basis of a future detailed design for the whole site and subsequent construction drawings and contract documentation required for the phases of the project;
6. Post-closure monitoring plan for the rehabilitated landfill;
7. Cost estimates for rehabilitation and post-closure management; and
8. Implementation plan to guide the Council towards achieving the outcomes in this Closure and Filling Plan.

This Plan also includes conceptual design drawings for the proposed landfill capping profile.

1.2 Scope of the Report

To satisfy the objectives outlined in Section 1.1, this report contains the following sections:

- Introduction;
- Site Description;
- Site Waste Management Activities;
- Rehabilitation Design;
- Filling Plan;
- Capping System;
- Surface Water Management;
- Landfill Gas Management;
- Leachate Management;
- Post-Closure Management and Monitoring;
- Closure Cost Estimates; and
- Implementation Plan.

2 Site Description

The following sections provide an overview of the key aspects of the Site, including its location, EPA Licence, environmental attributes and surrounding land uses.

2.1 Site Location and Access

The Site is located approximately 10 km east of Leeton town centre and is licenced under EPL No. 11863. The Site Boundary encompasses Lot 4 (DP 833946), excluding an excised portion that is utilised for separate composting activities not managed by the Council. A locality plan of the Site is provided in Figure 1.

Access to the Site is from Corbie Hill Road off Yanco Avenue and allows vehicles to enter and exit the Site from the centre of its northern boundary.

2.2 Site Activities

The Site has been used as a putrescible and non-putrescible landfill since 2005. Prior to the purchase of the land by the Council, the land was used for grazing. There is also evidence to suggest that the area was also previously used for cropping.

The Site is rectangular in shape and covers an area of approximately 56 hectares (ha). However, all current waste management activities occur within the eastern half of the Site, spanning an area of approximately 30ha. There is a weighbridge, community recycling centre and reuse shop (Tip Shop) in the centre of the Site with a greenwaste processing and stockpiling area directly east. There are two liquid waste ponds in the northeast corner of the Site. To the west of the ponds, there is the former landfill area which consisted of trenches orientated east to west. The Council does not intend to undertake any future landfill operations in this northern area of the Site. Along the Site's southern boundary, there is the asbestos disposal area and Active Landfill Stage 1, in which the Site's landfill operations are currently undertaken. These trenches are orientated north to south. There is minimal infrastructure in the western section of the Site with three onsite surface water ponds and a material stockpile area.

Figure 2 highlights the current key activities undertaken at the Site.

2.3 Site Licence

The current Licence for the Site was issued on 18 July 2018. The Site is licensed (EPL No. 11863) under *Protection of the Environment Operations Act 1997* to undertake the following waste management activities as outlined in Table 2-1.

Table 2-1: Waste Details in EPL No. 11863

Waste	Description	Activity
Liquid wastes	Grease trap and septic waste, rice/water mixtures	Waste disposal (application to land)
General Solid Waste (non-putrescible)		

Waste	Description	Activity
General Solid Waste (putrescible)	As defined in Schedule 1 Protection of the Environment Operations Act 1997 (POEO Act), as in force from time to time	Waste disposal (application to land)
General Solid Waste (non-putrescible)		
Asbestos		
Tyres		
General or Specific exempted waste	Waste that meets all the conditions of a resource recovery exemption under Clause 51A of the Protection of the Environment Operations (Waste) Regulation 2005	As specified in each particular resource recovery exemption
Waste	Any waste received on Site that is below licensing thresholds in Schedule 1 POEO Act, as in force from time to time	

The maximum total annual waste tonnage that can be disposed of onsite is 20,000 tonnes (t).

According to Condition O6.1, the Council must prepare and submit to the EPA within three months prior to the last load of waste being landfilled a closure plan in accordance with section 76 of the POEO Act. Under Condition O6.11, cover material must be applied to a minimum depth of 15 centimetres (150mm) over all exposed surfaces of the landfilled waste at the premises. There are no other Licence conditions regarding landfill closure and filling.

2.4 Surrounding Land Use

The Site is surrounded by agricultural land, which is primarily used for both dryland and irrigated cropping. With regards to the closest sensitive receptors, Fivebough Swamp, which is listed on the Directory of Important Wetlands in Australia (DIWA), is located 5km north-west of the Site boundary, the Main Canal is 3.4km west of the Site boundary and an established irrigation area (mainly horticultural) is located 900m southwest of the Site boundary. The closest single residential properties are located approximately 600m southeast, 1000m east and 900m south from the Site as shown in Figure 3.

According to the NSW Landfill Guidelines, the separation distance between a putrescible landfill (less than 50,000 tonnes of waste per annum) and a sensitive receptor (e.g. residential dwellings, school, hospital, etc.) "not associated with the facility" is 250m. Therefore, all Site current and future activities will maintain the appropriate separation distances.

2.5 Environmental Attributes

The following section outlines the key environmental attributes of the site, including topography, climate, geology, groundwater and surface water that are particularly relevant to the landfill closure and rehabilitation.

2.5.1 Topography

The Site comprises a relatively flat terrain with a gentle from approximately 150m Australian Height Datum (AHD) in northeast fall to 146mAHD in the southwest corner of the Site. In the northern section of the Site, the elevation range is between 148mAHD to 152mAHD with the higher elevations in the former landfill area. In the south-eastern section of the Site, which contains the Active Landfill Stage 1, the elevations range from 149mAHD to 147mAHD. The Site's western section is relatively flat with sparse, low lying vegetation and has an elevation range from 148mAHD to 147mAHD.

Site topography is shown in Figure 4.

2.5.2 Climate

The local and regional climate data sources will be utilised for evaluation the Site's surface water and leachate management systems, including rainfall and pan evaporation.

The Site is located within a region that experiences a semi-arid climate with hot summers and cool winters. Historic weather data is typically sourced from the Bureau of Meteorology (BOM) website. The Bureau of Meteorology's (BOM's) closest weather station to the Site that has been recording long-term data is Yanco Agricultural Institute (Station Number: 074037), approximately 8km southwest of the Site. The prevailing wind speed and direction data has been sourced from this weather station.

However, there is limited quality controlled BOM data available for rainfall and pan evaporation. Therefore, this data was sourced from SILO, a database of Australian climate data from 1889 to the present that is hosted by the Queensland Department of Environment and Science (DES). It provides daily meteorological datasets for a range of climate variables in ready-to-use formats suitable for biophysical modelling, research and climate applications. The datasets are constructed from observational data obtained from BOM, using mathematical interpolation techniques to infill gaps in time series and construct spatial grids. The spatial grid selected (Latitude: -34.55, Longitude: 146.50) is for Corbie Hill, NSW and encompasses the Site in its entirety.

2.5.2.1 Rainfall

Being a semi-arid zone, rainfall is minimal but continuous throughout the year at the Site. Table 2-2 presents the summary of rainfall records for the Site from 2000 to 2019.

Table 2-2: Rainfall Overview in Millimetres (2000-2019)

Aspect	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average	24	42	36	22	29	43	35	37	34	30	41	34	**404**
90th Percentile	70	66	247	12	20	17	39	27	6	8	45	20	**576**
Highest	60	13	37	16	81	114	50	73	148	50	23	69	**734**

The mean annual rainfall for the Site is calculated as 404 millimetres (mm) with the highest recorded annual rainfall at 734mm.

2.5.2.2 Pan Evaporation

The approximate average daily pan evaporation rates for the Site are based on the calculated monthly rates from SILO. Table 2-3 outlines the average pan evaporation data for the Site from 2000 to 2019.

Table 2-3: Pan Evaporation Average Data for the Site in Millimetres (mm)

Description	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Monthly	310	234	194	114	64	40	43	66	109	173	226	283	1,853
Daily	10.0	8.4	6.3	3.8	2.1	1.3	1.4	2.1	3.6	5.6	7.5	9.1	

The daily average pan evaporation ranges from 1.3mm to 10.0mm and monthly from 40mm to 310mm. The total annual pan evaporation for the Site is calculated as 1,853mm. This is a significant potential evaporation rate that is more than two times greater than the wettest rainfall year experienced at Site.

2.5.2.3 Prevailing Winds

Diagram 2-1 indicates that winds are predominately northly in the morning (9am), switching westerly in the afternoon (3pm).

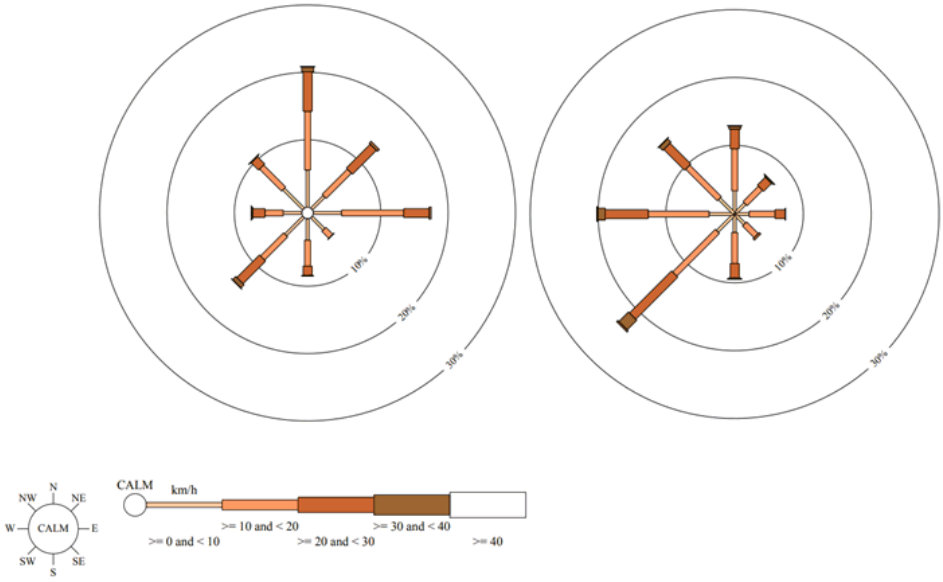


Diagram 2-1: Annual Average Wind Rose Data for 9am (left) and 3pm (right)

2.5.3 Geology

According to NationalMap (https://nationalmap.gov.au/), the surface geology at the Site is within the Shepparton Formation consisting of "unconsolidated to poorly consolidated mottled variegated clay, silty clay with lenses of polymictic, coarse to fine sand and gravel; partly modified by pedogenesis, includes intercalated red-brown paleosols." This type of surface geology "forms extensive flat alluvial

floodplains." This is generally consistent with the NSW Resources and Geoscience's geological survey of NSW, which characterises the area as "undifferentiated colluvial and residual deposits" (Q_cr). This geological data is provided in Figure 5.

In September 2000, the Principal contracted Coffey Geosciences Pty Ltd (Coffey) to conduct a hydrogeological assessment of the Site, in which its geology and underlying groundwater were discussed. The surface geology has been described as sandy clay/clayey sand topsoil, with low plasticity, fine to coarse grained sand, and to a depth of about 0.2m and as sandy and silty clay, with medium to high plasticity, fine to coarse grained sand, and to more than 9m depth. The site-won clayey soil has previously been deemed to have an adequately high clay content for the development and construction of the landfill trenches.

2.5.4 Groundwater

The Site has had a total of ten groundwater monitoring bores, which were monitored on a quarterly basis as per EPL No. 11863. BH1-BH6 were drilled in 2002, while MW3, MW4, MW5a, and MW5b were drilled in 2015. In 2016, the Council commissioned Coffey to update its hydrogeological assessment of the Site from 2000 utilising data from the ten historic monitoring bores. According to the assessment, it was inferred that the groundwater flow in a "south-westerly to westerly direction across the site, based on the topography and location of the Murrumbidgee River."

Of the ten monitoring bores constructed at the Site, four are actively monitored as per EPL No. 11863. Table 2-4 outlines the current condition of each historic monitoring bore as well as the most recent static water levels (metres below ground level, mbgl) taken from the active monitoring bores.

Table 2-4: Summary of Groundwater Monitoring Bores at Site

Bore ID	Condition	Static Water Level (mbgl)		
		01/07/2020	22/07/2020	10/10/2020
BH1	Decommissioned	-	-	
BH2	Decommissioned	-	-	
BH3	Decommissioned; relabelled Test Well 1	-	-	
BH4	Decommissioned	-	-	
BH5	Monitored; relabelled Test Well 3	7.4	7.2	7.9
BH6	Monitored; relabelled Test Well 2	5.3	6.2	6.9
MW3	Decommissioned	-	-	
MW4	Monitored; relabelled Test Well 4	9.4	8.9	8.7
MW5A	Decommissioned	-	-	
MW5B	Monitored; relabelled Test Well 5	DRY	DRY	17.2

Based on the most recent monitoring data, the groundwater depth ranges from 5.2mbgl to 9.4mbgl across Test Wells 2-4. For Test Well 5, it was dry for many months following a purge event in April 2020. During the latest monitoring event, the groundwater depth was at 17.2mbgl for Test Well 5. Figure 6 provides a layout of the active groundwater water monitoring bores at the Site.

Talis recommends that additional monitoring bores are installed in the western section of the Site as there is little information available within this proportion of the Site. The Detailed Design for the future landfill cells will require more detailed and up-to-date information.

2.5.5 Surface Water

As shown in Figure 7, there are three surface water ponds at the Site with two of them located along the Site's northern boundary and one at the centre of the Site. There is a fourth pond located on the Site's western boundary. A series of surface water ditches across the Site divert surface water toward these ponds. There are also two liquid waste ponds in the northeast corner of the Site.

There are no significant bodies of water within 2km radius around the Site. There are only a few man-made dams within the neighbouring farms surrounding the Site.

3 Site Waste Management Activities

3.1 Waste Activities

The Site is an integrated facility and provides a range of recycling and waste disposal activities, namely:

- The gate house/weighbridge for secure access to the Site;
- Community Resource Recovery Area:
  - Scrap metal;
  - Construction and Demolition (C&D) waste;
  - Greenwaste;
  - Cardboard and recyclable containers;
  - Batteries;
  - Waste Oil;
  - E-waste;
  - Mattresses;
  - White goods;
  - Fire extinguishers;
- Greenwaste Processing Area;
- Putrescible Landfill;
- Asbestos Disposal; and
- Liquid waste disposal facility.

The Council currently undertakes the majority of its waste disposal activities in the southern section of the Site. The locations of the various Site activities are shown in Figure 2 and Drawing C-100.

3.2 Waste Data

The Site receives on average approximately 17,000 tonnes of waste and recyclable materials per year. The tonnage of waste accepted and landfilled at Site have been split into three main waste streams: municipal (MSW), commercial and industrial (C&I), and construction and demolition (C&D).

The waste volumes landfill at the Site from 2013-14 through to 2018-19 are presented in Table 3-1.

Table 3-1: Annual Waste Tonnages Landfilled

Financial Year	MSW	C&I	C&D	Total
2012/2013	3,704	6,824	312	**10,839**
2013/2014	5,464	8,895	410	**14,769**
2014/2015	6,378	6,076	181	**12,636**
2015/2016	4,178	7,029	2,085	**13,292**
2016/2017	5,104	1,064	281	**6,449**
2017/2018	6,160	7,038	1,469	**14,668**
2018/2019	4,793	6,696	349	**11,837**
Average*	5,113	7,093	801	**13,007**

**The data from the 2016/2017 financial year is not included in the average since it is a significant outlier.*

With the exception of 2016/2017, which saw a significant drop in C&I waste, the amount of waste landfilled each financial year ranges from about 10,000t to 15,000t with an average of approximately 13,000t per annum (tpa).

3.3 Filling History

Historically, waste has been disposed of below ground in engineered trenches in accordance with DA 76/94. The waste is tipped in compacted clay lined trenches, orientated north to south, measuring approximately 30m wide, 5m deep and 200m long. Therefore, each trench provides up to 30,000m^3 of void capacity.

As of 2020, a total of four trenches have been filled and temporarily capped in the Active Landfill Stage 1. There is one trench currently active with another trench currently under construction.

Following the completion of all proposed landfill trenches in the Active Landfill Stage 1, the Council is seeking to change the Site's landfill methodology from landfill trenching to a more modern practice, above ground operation, creating a landfill formation with a maximum height of 162mAHD, approximately 15m above existing ground level. This will look to maximise the void gain and also minimise the footprint requirements and ground disturbance for future cells.

3.4 Waste Generation Projections

Given the correlation between the volume of waste generated in a community and its population, an annual population growth rate can be applied to determine what future volumes should be catered for at the Site. Therefore, annual population growth rates combined with historical waste generation rates have been utilised for modelling the waste projections.

The process for adopting an annual population growth rate requires a review of the historical population growth rates and what is forecasted for the Council. The NSW Department of Planning, Industry and Environment has developed a profile for the Leeton Shire Council as part of its 2019 NSW Population Projections. The average annual growth rate for the Council across a 25-year period (2016-2041) has been estimated as 0.4%. This 0.4% growth rate was utilised to calculate the waste projections by applying it to the average waste tonnages of 13,007tpa to calculate the potential waste tonnages at the Site projected across the anticipated life of the new Site landfill.

Utilising the adopted growth rate, a summary of the waste projections over a 100-year period is outlined in Table 3-2 for waste landfilled.

Table 3-2: Summary of Waste Generation Projections in Tonnes for Waste Landfilled

Waste Stream	2022/23 Year 1	2041/42 Year 20	2061/62 Year 40	2081/82 Year 60	2101/02 Year 80	2122/23 Year 100
MSW	5,195	5,604	6,070	6,575	7,121	7,713
C&I	7,207	7,775	8,421	9,121	9,880	10,701
C&D	814	878	951	1,030	1,116	1,208
Total	**13,216**	**14,258**	**15,443**	**16,726**	**18,116**	**19,622**

4 Rehabilitation Design

The NSW Landfill Guidelines have been adopted and supported by the Council for the landfill design, operation and rehabilitation of the Site. In accordance with the NSW Landfill Guideline, the Site can be classified as a small, low-risk rural landfill; however, the engineering design of rehabilitation measures must still include the following:

- A restoration profile which will incorporate a low permeability capping layer to restrict the infiltration of rainwater into the waste mass and minimise the production of leachate;
- A restoration profile which will optimise the landfill capacity within the proposed landfill footprint and minimise aesthetic impact;
- A system of surface water management to positively deal with any accumulation of rainwater, and reduce suspended sediment and contaminated runoff; and
- A gas management regime to control the generation of landfill gases and reduce any significant risk of gas adversely impacting the surrounding environment.

The following sections provide details of the formulation of the required rehabilitation design for the Active Landfill Stage 1 and the Future Landfill Stage 2.

4.1 Active Landfill Stage 1

4.1.1 Proposed Trench Development

A total of twelve (No. 12) landfill trenches will be constructed and filled within the Active Landfill Stage 1. There are six (No. 6) proposed trenches that have yet to be constructed as shown in Drawing C-101. The trenches are typically separated by 5-7m. Each trench will be constructed and filled in the order determined by the Council and based on operations at the time.

A bund formed from site-won soils is typically constructed around the perimeter of each active landfill trench for edge protection, trench delineation and to prevent any ingress of surface water runoff into the trench.

The design of the base of each engineered trench incorporates a 1000mm compacted clay attenuation layer with a 2% lime stabilisation within the top 100mm and associated leachate extraction infrastructure in accordance with its Site licence and existing Landfill Environmental Management Plan, February 2002 (LEMP).

Each trench is graded to a low point where there is an aggregate filled sump, at least 2m deep, 2.5m wide and 5m long, to facilitate leachate extraction. Any free leachate percolates through the waste to the base of the trench and is directed to the low point. A 200mm diameter PVC riser is installed from the sump to the surface of the trench. Levels within the sump are monitored and if required, pumped out and either reinjected into the active trench or transferred to the Site's existing leachate pond.

Several drawings have been included in Appendix A to illustrate the typical details for landfill trench development and construction.

4.1.2 Filling Rate

All putrescible waste is retained within the working trench and each historical trench has been operational for approximately 2 to 2.5 years, depending on annual waste inputs. Therefore, it is estimated that the waste is compacted to an approximate density of 950 kilograms per cubic metre through the use of an onsite compactor. The waste is covered with Site won material that is at least 150 millimetres thick.

The historical waste data for the Site provided in Table 3-1 indicated that on average 13,007tpa of waste is landfilled. The waste projections estimate the waste inputs will range from 13,007tpa to 19,622tpa over a 100-year period. The calculated compacted density is 950 kilograms per cubic metres (kg/m^3). At this rate, the rate of landfill void space consumption is approximately between 14,452m^3 and 21,802m^3 per annum (exclusive of cover material). For the purposes of determining the filling rate, it is assumed that the cover soils will consume an additional 5% of the landfill void space consumption (1,445-2,180m^3 per annum). The detailed calculations are provided in Appendix B.

4.1.3 Proposed Future Use

No infrastructure will be placed on the landfill trench area and it will be rehabilitated with grasses and potentially returned to agricultural grazing lands, similar to the surrounding areas. Agricultural grazing could provide a source of revenue for the Council and could offset the costs associated with the required post-closure management and monitoring program as discussed in Section 11.

4.1.4 Proposed Final Profile

It is proposed to cap the Active Landfill Stage 1 at the end of its operational lifespan, and it will comply with the objectives and requirements set out in the NSW Landfill Guidelines and the Site's LEMP. To guide these works, the key objectives adopted for the closure designs include the following:

- Ensuring that all waste materials are covered to mitigate long-term environmental impacts;
- Final fill profile and slopes that:
  - Ensure the long-term stability and integrity of the capping material and containment layer;
  - Promote natural surface water run-off;
  - Provide an aesthetically acceptable landform; and
  - Minimise long-term maintenance requirements; an
- Incorporate appropriate environmental management systems including landfill gas and surface water.

A key factor for determining the final fill profile of each trench is understanding how the waste mass will settle over time. Historically, settlement in above ground landfills range from 1% to 20% of the final waste height. This level of settlement is manageable for an above ground landfill due to its overall shape. For a typical trench with a waste height of 6m, the settlement could range from 100mm to 1200mm. These are sizeable height differences in a landfill trench, which will have a significant impact on the trench's permanent capping system, creating surface depressions and potentially compromising the capping system's sealing layer.

Calculating settlement rates is difficult and is dependent on a variety of factors, including but not limited to waste composition and moisture. Therefore, it is recommended that the Council develops a monitoring program and database to determine the approximate settlement rates within the existing trenches, which can further guide the detailed design of the capping system.

For the purposes of all design modelling works, a conservative average settlement rate of 600mm has been assumed. Therefore, the final fill profile for each proposed trench will be set at 600mm above existing ground levels, which is approximately 147-148mAHD.

4.1.5 Void Space Modelling

Void Space modelling has been undertaken to determine the available filling capacity for the Site's Active Landfill Stage 1 using the calculated waste projections (Section 3.4). This will give the Council a greater understanding of the remaining lifespan within the Active Landfill Stage 1 and the timeframe available to obtain all environmental approvals for the construction and operation of the Future Landfill Stage 2.

For the purposes of this modelling, the worst-case scenario must be considered where there is no introduction of significant waste diversion programs such as, food organics and greenwaste organics (FOGO) recycling, that would diminish the tonnages delivered to Site for disposal. In addition, the density of waste after placement is assumed to be 950kg/m^3 and the cover material requirements is assumed to be 5% of the total available void space volume. Both these values are within the commonly used industry standards.

Assuming that each trench is filled up to 600mm above existing ground levels (refer to Section 4.1.4), the estimated lifespan for the Active Landfill Stage 1 is presented in Table 4-2. For modelling purposes, it is assumed that there are seven trenches that have yet to be filled and the first of these trenches will begin accepting waste at the start of the 2021/22 financial year. The assumed financial year (FY) in which the remaining landfill trenches will begin and cease landfill operations are also provided.

Table 4-1: Estimated Void Space for Active Landfill Stage 1

	Approx. Void Space (m^3)	Void Space ex 10% Cover (m^3)	Landfill Life (years)*	Assumed Start FY	Assumed Completion FY
All Remaining Trenches (7 Trenches)	232,400	220,780	16	2021/22	2035/36

**Based on waste projections as discussed in Section 3.4 and assuming landfill operations within first proposed trench begin in 2021/22 FY.*

It is estimated that there is approximately 232,400m^3 of void space within the Active Landfill Stage 1. With the relatively small waste input volumes, it is estimated there is approximately another ten years of landfill void space within this area of the Site. The landfill trench's actual annual consumption rate would fluctuate based on generation rates and the introduction of any new recycling and landfill diversion initiatives (i.e. FOGO recycling). Therefore, these calculations should be updated regularly to better understand the future demand for the landfill and plan the key capital expenditure works accordingly.

4.1.6 Capping Works

The Council proposes to permanently cap all landfill trenches as one event after landfill operations cease within the Active Landfill Stage 1. Therefore, as per the void space calculation in Section 4.15, capping works will be undertaken within the 2036/37 financial year.

The schedule for the capping works is heavily dependent on the rate of waste intake within each proposed trench. Therefore, these estimates should be updated regularly to better plan the key capital works and expenditure accordingly.

4.2 Future Landfill Stage 2

4.2.1 Proposed Landfill Development

After all landfill trenches have been filled and capped within the Site's south-eastern section, the Council proposes to undertake future above-ground landfill operations within a newly designed landfill located in the western section of the Site.

A topographic survey was completed at the Site on 30 April 2020, which is provided in Drawing C-100. Utilising this topographical survey and the Site's groundwater depth information, the Future Landfill Stage 2 has been split into several cells in accordance with best practice landfill standards. The landfill footprint maximises the available land while also allowing for the surface water management system and access track around the landfill perimeter. Due to the limited groundwater data available, the maximum depth of each cell is approximately 6m, assuming a minimum 2m separation distance from underlying groundwater is maintained. These groundwater levels will be confirmed with further hydrogeological investigations to feed into the detailed design. The maximum landfill height will be 163mAHD, which is approximately 15m in height above the existing ground at 148mAHD.

The southern section of the landfill will have seven (7) cells that are approximately 210m long by 63m wide, while the northern section of the landfill will have six (6) cells that are approximately 175m long by 71m wide. As shown in Drawing C-102, all landfill cells are orientated north to south and each cell will be accessed from its northern boundary. The internal cell slopes are designed at 1:2 (V:H) and the cell floors have a 1% grade towards a 5m x 2.5m x 0.5m (L X W X H) leachate sump for leachate extraction. Two new leachate evaporation ponds are proposed for the Site located adjacent to each other along the Site's northern boundary. All leachate generated in the southern section of the Future Landfill Stage 2 will be extracted and evaporated in a new designated leachate pond. Similarly, all leachate generated in the northern section of the Future Landfill Stage 2 will be transferred to its own designated new leachate evaporation pond.

The northern and southern landfill cells are separated by a 1m high inter-cell bund. The cells within each section are separated by a tapered inter-cell bund that increases in height from 1m to a maximum 1.5m at the lowest point in the cells to contain any leachate generated within a cell.

The design of each engineered cell will incorporate a compacted clay attenuation layer, leachate collection layer, and associated leachate extraction infrastructure in accordance with its Site licence and existing Landfill Environmental Management Plan, February 2002 (LEMP). A typical section through a cell in the southern section of the landfill is provided in Drawing C-304.

A set of drawings have been developed to assist the Council with the proposed landfill development and are included in Appendix A.

4.2.2 Filling Rate

The outer slopes of the landfill should not be steeper than the gradients specified within the NSW Landfill Guidelines, which is 1:5 (V:H) on the lower slopes and 1:20 (V:H) on the upper/crown slopes. These design profiles can be achieved during placement of sequential 2m lifts of waste.

As per the Site LEMP, all waste will be compacted and covered. Cover thickness will be at least 150 millimetres and cover material will be compacted to a density readily achieved by onsite equipment. Therefore, it is assumed that the filling rate within the Future Landfill Stage 2 will be similar to the current filling rate in the Active Landfill Stage 1 as discussed in Section 4.1.2. The detailed calculations are provided in Appendix B.

4.2.3 Proposed Future Use

The post-closure use of the Site is to continue the operation of the Site as a waste facility including the operation of the CRC. In the future, further material processing and recovery infrastructure may be established at the Site. However, no infrastructure will be placed on the landfill and it will be rehabilitated with natural vegetation or return to agricultural grazing lands, which could provide a source of revenue for the Council, offsetting the costs for the required post-closure management and monitoring program as discussed in Section 11.

4.2.4 Proposed Final Profile

It is proposed to cap the Site in a phased approach that will comply with the objectives and requirements set out in the NSW Landfill Guidelines. To guide these works, key objectives adopted for the closure designs include the following:

- Ensuring that all waste materials are covered to mitigate long-term environmental impacts;
- Final fill profile and slopes that are greater than 1V:20H and less than 1V:5H to:
  - Ensure the long-term stability and integrity of the capping material and containment layer;
  - Promote natural surface water run-off;
  - Provide an aesthetically acceptable landform; and
  - Minimise long-term maintenance requirements;
- Incorporate appropriate environmental management systems including landfill gas and surface water; and
- Facilitate phased capping of the landfill.

Drawing C-103 shows the final fill profile for the Future Landfill Stage 2 that complies with the NSW Landfill Guidelines and will have a maximum height of 163mAHD, or 15m above existing ground level.

4.2.5 Void Space Modelling

Void Space modelling has been undertaken to determine the available filling capacity for the Site's Future Landfill Stage 2 using the calculated waste projections (Section 3.4). This will ensure that the Site can cater for future long-term waste management demands, and the results can be used to project key capital works over the various financial years going forward. This will assist the Council with future budgeting works and ensure continued operations at the Site to cater for the communities' disposal requirements.

As with the Active Landfill Stage 1, the assumed density of waste after placement is 950kg/m^3 and the assumed cover material requirements is 5% of the total available void space volume in line with commonly used industry standards.

Based on the final fill profile, the void space for the Future Landfill Stage 2 and its estimated lifespan is presented in Table 4-2. The assumed financial year (FY) in which the landfill section will begin and cease landfill operations are also provided. The landfill has been split between its southern and northern sections since it is proposed to develop the southern section of the landfill until further groundwater information is available.

Table 4-2: Estimated Void Space for Future Landfill Stage 2

	Approx. Void Space (m^3)	Void Space ex 10% Cover	Landfill Life (years)*	Assumed Start FY	Assumed Completion FY
Southern Section	1,141,595	1,027,435	63	2036/37	2098/99
Northern Section	1,057,263	951,537	+23	2099/2100	**
Total	**2,198,858**	**1,978,972**	**+86**		

**Based on waste projections as discussed in Section 3.4 and assuming landfill operations within Cell 1 begin in 2036/37 FY.*
***Waste projections are up to 100 years only; therefore the assumed completion FY cannot be provided as it is beyond the calculated waste projections.*

It is estimated that there is approximately 2,198,858m^3 of void space within the Future Landfill Stage 2. With the relatively small waste input volumes, there is a substantial landfill lifespan, potentially up to +86 years if landfill operations begin in the 2036/2037 FY. The landfill's actual annual consumption rate would fluctuate based on generation rates and the introduction of any new recycling and landfill diversion initiatives (i.e. FOGO recycling). Therefore, these calculations should be updated regularly to better understand the future demand for the landfill and plan the key capital expenditure works accordingly.

4.2.6 Phasing of the Capping Works

It is proposed to progressively cap the landfill to minimise the potential impacts of landfill operations and allow for appropriate financial planning for the required capital works. As shown in Drawing C-105, the capping works will be divided into six (6) phases. The volumes and potential scheduling required for the phased capping works is shown in Table 4-3.

Table 4-3: Closure Plan Phasing and Estimated Remaining Air Space

Landfill Section	Final Capping	Landfill Cells	Void Space (m^3)	Void Space ex. 10% Cover Soils (m^3)	Landfill Lifespan (yrs)*	Assumed Closure FY*
South	Phase 1	1, 2, 3	434,779	391,301	26	2062/63
	Phase 2	4, 5	357,753	321,977	20	2082/83
	Phase 3	6, 7	349,063	314,157	17	2099/2100
North	Phase 4	8, 9	265,473	238,925	13	2112/13
	Phase 5	10, 11	434,303	390,873	+10	**
	Phase 6	12, 13	357,488	321,739	**	**
		Total	**2,198,858**	**1,978,972**	**+86**	

**Based on waste projections discussed in Section 3.4 and assuming landfill operations within Cell 1 begin in 2036/37 FY.*
***Waste projections are up to 100 years only; therefore these values cannot be provided as it is beyond the calculated waste projections.*

It is estimated that Phase 1 would be filled to the final fill profile and ready for capping by 2062/63 FY, providing the most landfill capacity out all the phases with 26 years. The landfill capacity of each phase steadily decreases due the positive growth scenario assumed for the waste projections discussed in Section 3.4.

The schedule for the phasing of the works is heavily dependent on the rate of waste intake between the phases to ensure the next phased area is ready for capping works. Therefore, these estimates should be updated regularly to better plan the key capital works and expenditure accordingly.

5 Filling Plan

To develop a waste filling sequence for the Future Landfill Stage 2, the phases must be divided into filling stages. Each of the waste stages shall be filled using the methodology as detailed in Drawing C-308. Placement of 2m thick layers (lifts) of compacted waste will be covered with a 150mm thick layer of cover soils. The filling stages contain more than one lift of waste and allow for the landfill operations to efficiently achieve the final fill profile. Any temporary waste slopes will be constructed at 1:3 (V:H).

Due to the substantial landfill lifespan, the filling stages have been modelled for Phase 1 only as it is anticipated that the void space within Phase 1 will provide almost 26 years of landfill capacity as shown in the Table 5-1. These filling stages are further illustrated in Drawing C-106 and Drawing C-202 in Appendix A.

Table 5-1: Filling Stages for Phase 1

Filling Stage	Void Space (m^3)	Void Space ex. 10% Cover Soils (m^3)	Approx. Landfill Capacity (years)*
Stage 1.1	100,324	90,291	7
Stage 2.1	125,481	112,933	7
Stage 3.1	129,788	116,809	8
Stage 2.2	33,749	30,374	2
Stage 3.2	45,437	40,894	2
Total	**434,779**	**391,301**	**26**

**Based on waste projections discussed in Section 3.4 and assuming landfill operations within Stage 1.1 begin in 2036/37 FY.*

The phasing and filling plan allows for the progressive restoration and capping of the landfill. The following sections detail the preferred waste placement methods for above and below ground cells.

5.1 Below Ground Filling Plan

The access road and first layer of waste will be placed using the method described in Section 5.4 and illustrated in Drawing C-308. As the first lift of waste is placed and compacted to approximately 2m depth, a 150mm layer of cover soils will be placed over the waste. Once the first lift is completed, the same procedure will be repeated for the second and third lifts, starting again at the entrance ramp into the cell. As with the first platform, each subsequent lift will require 150mm layer of cover soils. Due to the slope of the cell floor, waste lifts will vary slightly in thickness. Upon completion of the third lift, the waste, including its cover soils, should be level with surrounding ground levels at 147mAHD. When completed, the top of Lift 3 will provide a level surface for the proceeding above ground lifts.

Once the below ground landfill void has been completed within Phase 1 footprint, landfilling will continue above ground in accordance with the filling plan.

5.2 Above Ground Filling Plan

To complete the first filling stages within Phase 1 (Stage 1.1 – 3.1), waste will be placed in three compacted lifts separated by required cover material. To carry out the second stage of filling (Stage

2.2 and Stage 3.2) and thus achieve the final fill profile in Phase 1, waste will be further placed in five compacted lifts separated by required cover material.

During completion of tipping in Phase 1, the final area of waste placement will be the backfilling of the access road as operations work their way out of the cell. If this is not practicable due to trafficability, minor filling works may need to be undertaken in the access road area once the waste levels in adjacent Cell 4 (Phase 2) are filled to the same height. The access roads for Phase 1 and Phase 2 should be located on the boundary between the two phases to facilitate this. The access roads for Phases 1 and 2 are shown on Drawing C-106. Phases 3-6 will be filled in a similar manner.

5.3 Waste Placement Method

The preferred method of waste placement is illustrated in Drawing C-308. The method requires:

- Unloading the waste at the head of respective tipping areas;
- Pushing wastes to the tip face using the compactor;
- Spreading and compacting waste in 500mm lifts to form a 2m deep platform;
- Development of a level platform across the cell until the other side is reached; and
- Repetition of this procedure until the pre-settlement final fill profile of the cell is reached.

Once waste activities are completed for a certain stage, a 150mm layer of cover material is applied to:

- Prevent windblown litter;
- Reduce pests such as rodents and birds; and
- Reduce stormwater ingress into the waste mass.

To maintain vehicular access to the tip-face it is essential that a high waste compaction rate is attained. If sufficient waste compaction is not achieved, it may be necessary to apply additional clean fill (or mulch where appropriate) to allow access to the tip-face for the waste delivery vehicles. Bulky objects which are difficult to bury can be placed at the base of the tip face and then covered from above.

6 Capping System

6.1 Active Landfill Stage 1

The Site's LEMP states that a landfill trench shall have the following capping system from base to top:

- A compacted clay layer at least 500mm thick;
- A subsurface drainage layer of at least 300mm thickness; and
- A revegetation layer suitable for plant growth of at least 1000mm thickness.

The layers of the proposed capping system are shown in Drawing C-302. The restoration profile will consist of slopes that are greater than 1V:20H and less than 1V:5H as per NSW Landfill Guidelines and shown in Drawing C-104. The following sections outlines the approved capping design for the Active Landfill Stage 1.

6.1.1 Compacted Clay Layer

The 500mm thick low permeability layer will comprise compacted clay formed from site-won material from the excavation works during the corresponding trench development. The clay material should be compacted such that the permeability is no greater than 1×10^{-8} m/sec.

6.1.2 Subsurface Drainage Layer

The 300mm thick subsurface drainage layer prevents the risk of rainwater building up on top of the compacted clay layer and would maintain the stability of the overlying subsoils. It is anticipated that this material will be sourced from existing stockpiled material or offsite sources. It must be installed such that the achieved permeability is greater than 1×10^{-5} m/sec.

6.1.3 Revegetation Layer

The 1000mm revegetation layer will mostly consist of site-won material from the excavation works during the corresponding trench development. The upper surface of the revegetation layer will comprise of 200mm topsoil, which could be mixed with compost supplied and placed by the Council if available. The topsoil will promote the growth of the grass or seed mix that is applied to the capping surface, which should be placed as soon as possible to stabilise the restoration profile and to prepare for future use as agricultural grazing lands. If agricultural grazing is not pursued, then the applications of grass/seed mix will be based on species native to the NSW region.

6.1.4 Temporary Capping System

Due to the significant landfill lifespan within the Active Landfill Stage 1, each trench will need to be temporarily capped until the permanent capping works commence. The temporary cap will need to be consistently maintained, particularly after extreme rainfall events, which could result in scouring and erosion. The temporary capping system should consist of 300mm of low permeability compacted clay layer at a minimum and should be formed such that surface water run-off is diverted away the landfill trench and into the Site's existing SWMS.

6.2 Future Landfill Stage 2

For the Future Landfill Stage 2, the NSW Landfill Guidelines provide information on the design requirements for the capping system. The key driver is to install a system which minimises the generation of leachate to the extent that infiltration from the base of the final cap is less than 5% of the annual rainfall.

The final capping system should comprise, from bottom to top:

- Regulating layer consisting of site-won material at least 200mm thick to support the sealing layer;
- Sealing layer, comprising a compacted clay layer at least 600mm thick, with an in situ saturated hydraulic conductivity of less than 1 x 10^{-9}m/s (minimum requirement of NSW Landfill Guidelines);
- Drainage layer comprising a drainage geocomposite (geonet); and
- Revegetation layer at least 1000mm thick, comprising an 800mm thick clean sub-soil layer and a 200mm thick topsoil layer, which can include compost to help with vegetation establishment and growth (minimum requirement of NSW Landfill Guidelines).

The layers of the proposed capping system are shown in Drawing C-305. As the Site does not receive more than 20,000 tonnes of waste per annum, the capping system does not require a geomembrane liner. However, a geomembrane liner may be required regardless if the site-won soil material cannot achieve the required hydraulic conductivity. In its 2000 geotechnical report, Coffey undertook permeability tests of the natural in-situ soils at the Site and found the following:

"From laboratory falling head permeability testing on site soils compacted to 98% of Standard Maximum Dry Density at Standard Optimum Moisture Content, permeabilities and 5.0 x 10^{-10} m/sec (BH3, 1.0m to 4.0m) were measured. Both results were thus well below the required permeability of 1 x 10^{-9} m/sec. It is generally considered that the on-site soils observed in the boreholes are suitable for use as leachate barrier in the proposed landfill cells. The material should be sourced from between 1m and 7m depth below the existing surface levels at the site, as soils above and below these soils may not be suitable for use in the leachate barrier."

Based on these findings, it is anticipated that the required hydraulic conductivity of less than 1 x 10^{-9}m/s can be achieved with sit-won material for use as the 600mm thick sealing layer and therefore, a geomembrane liner would not be necessary that this stage. However, further characterisation testing will be required prior to capping development works.

The design of the low permeability capping layer for the Site is ultimately determined by the potential for the landfill to produce leachate and gas. Based on the annual tonnages received at the landfill it is considered that the landfill will produce insufficient gas to warrant the installation of an active gas extraction system. Further discussion of estimated gas generation rates is contained in Section 8. It is also expected that the leachate generation rates will be low due to the low rainfall and high evaporation climate at the Site and the high absorptive capacity of the deposited waste. Further discussion of estimated leachate generation rates is contained in Section 9.

The following sections outlines the proposed capping approach for the Future Landfill Stage 2. To future proof the capping works, Talis has also assessed a range of alterative design options for the capping system that could be adopted at the Site if constraints arise with the preferred approach. For this Site, the alterative design include:

- a geocomposite (geonet) as a replace for the gas collection layer (refer Section 6.2.1.1); and
- the use of a LLDPE capping liner as a replacement for the clay capping system (Section 6.2.2.1).

6.2.1 Regulating Layer

The preferred design approach for the capping system is the utilisation of a 200mm thick regulating bedding layer will consist of site-won material and should provide a smooth firm subgrade for installation of the compacted clay layer.

The regulating layer should meet the following criteria:

- Free from organic matter, perishable material or other deleterious material;
- Within ±2% of the optimum moisture content for that material;
- Not contain clay with liquid limit >80% and/or plasticity index >55%; and
- Have a maximum particle size >50mm.

The material for the regulating layer will be sourced on site from existing stockpiles of excavated soils created during the development of the cell.

6.2.1.1 Alternative Option - Gas Collection Geocomposite Layer

If suitable granular material cannot be sourced for the regulating layer, a geocomposite gas collection layer (geonet) will be required above the regulation layer. The geocomposite will enable the lateral transmission of landfill gas beneath the low permeability capping system to a network of gas collection pipes for extraction of the gas through the capping system, This layer would form part of an alternative capping system, which is shown in Drawing C-305.

The design of the gas collection layer for the Site is ultimately determined by the potential for the landfill to produce gas. Based on the annual tonnages received at the landfill, it is uncertain if the landfill will produce sufficient gas to warrant the installation of an active gas extraction system. Irrespective of whether an active or passive is selected, a geocomposite gas collection layer would be required for both types of system. Estimated gas generation rates and the decision process for selecting a passive and active system is discussed further in Section 8.

6.2.2 Low Permeability Compacted Clay Layer

The 600mm thick low permeability layer will comprise compacted clay formed from site-won material from the excavation works during the corresponding cell development, existing stockpiled material or offsite sources. In accordance with the NSW Landfill Guidelines, the clay must meet the following specification:

- Minimum compacted thickness of 600mm;
- Free from organic matter and other deleterious material;

- Maximum particle size of 50mm, at least 90% passing through a 19mm sieve, and at least 30% passing through a 0.075mm sieve;
- Plasticity Index (PI) > 20% (in accordance with AS1289);
- Liquid Limit (LL) >35%;
- Cation Exchange Capacity (CEC) > 10mEq/100g;
- Dry density of 95% of the maximum dry density (or 5% air voids) and have a hydraulic conductivity measured in a laboratory triaxial rig of $1x10^{-9}$m/sec; and
- Minimum shear strength 50kPa.

Clays with a high plasticity index and high moisture limit are moisture sensitive and susceptible to desiccation cracking. In-situ moisture conditioning of the surface can be carried out to prevent the liner drying out prior to confirmation of clay depth by topographical survey and subsequent placement of subsoils.

6.2.2.1 Alternative Option - Linear Low Density Polyethylene (LLDPE) Layer

Based on the geotechnical investigations undertaken at the Site to date, Talis anticipated that the clay material will satisfy the NSW Landfill Guidelines requirements as specified within Section 6.2 above. However, if Council cannot secure suitable clay materials on or off site for the capping works, a LLDPE liner could be deployed into the capping system.

A LLDPE will act as the artificial sealing layer and will satisfy the maximum permeability requirements stated in the NSW Landfill Guidelines. The LLDPE layer will comprise of a 1.5mm double textured LLDPE liner, manufactured to meet the following specifications:

- Minimum average thickness 1.425mm;
- Minimum asperity height 0.4mm;
- Density of 0.939g/ml;
- Break strength of 16N/mm and elongation of 250%;
- 2% modulus of 630N/mm;
- Tear resistance of 150N;
- Puncture resistance of 300N;
- Axi-symmetric break resistance strain of 30%;
- Carbon black content between 2.0-3.0%; and
- Minimum Oxidative Induction Time (OIT) of 100 mins and High pressure OIT of 400 mins.

There will be no alteration of the overlying restoration layer, which includes the subsurface drainage layer, the subsoil layer, and the vegetation layer.

6.2.3 Subsurface Drainage Layer (Geonet)

A subsurface drainage layer will be included within the capping design to prevent the risk of rainwater building up on top of the compacted clay layer. This would maintain the stability of the overlying subsoils and further reduce the risk of infiltration through the compacted clay layer by minimising the saturated hydraulic head. To divert the potential build-up of subsurface water the subsurface drainage layer proposed is a geocomposite liner (geonet).

A geonet liner is a 3D plastic composite positioned between two layers of geotextile as shown in Diagram 6-1. The geocomposite permits a planar transmission of water between the two layers of geotextile while the filter geotextiles prevent the channels from being clogged up with silt.

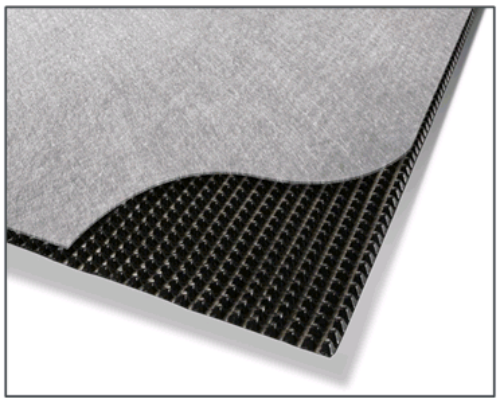


Diagram 6-1: Geonet Liner

The geonet should be installed in accordance with manufacturer's guidelines, noting that its deployment cannot be undertaken using heavy equipment than runs directly on top of the underlying low permeability capping layer as this may impose unacceptable stress and result in damage. Low ground pressure and/or rubber tracked equipment is acceptable.

6.2.4 Subsoil Layer

The 800mm thick subsoil layer will be deployed to protect the low permeability compacted clay layer. This thickness will enable the landform to be trafficked by light 4WD vehicles to undertake site maintenance, as necessary.

It is proposed to use site-won material to install the subsoil layer. If there are insufficient quantities of a suitable material available onsite and then it will be necessary to import soils, or use a borrow pit onsite, to restore the Site. The soils should not contain more than 3% organic content.

The subsoil should not damage the underlying low permeability capping layer. Therefore, the subsoil layer must not contain any elements which could penetrate the low permeability layer during its installation due to the imposed stresses derived from the weight of the overlying materials and the loads generated by a maintenance vehicle.

6.2.5 Revegetation Layer

The upper surface of the restoration layer, or revegetation layer, will comprise of a 200mm depth of topsoil, which could be mixed with compost supplied and placed by the Council if available. The revegetation layer helps to retain the integrity of the subsoil beneath and provides a protection layer for the planting of suitable vegetation which will eventually bind the surface materials together. The objectives for the vegetation layer is to enhance the environmental performance of the built structure and to replicate the appearance of the surrounding landscape.

In accordance with the NSW Landfill Guidelines, the capping system will be revegetated as quickly as possible. Since the landfill capping will be phased, the revegetation works will also take place in stages in conjunction with the capping works.

The selected grass or seed mix that is applied to the capping surface should promote and prepare the final formation for future use as agricultural grazing lands. If agricultural grazing is not pursued, then the applications of grass/seed mix will be based on species native to the NSW region. Supplementary tube stock species could be planted at a later date, following establishment of the hydromulch seeding mix and stabilisation of the restoration profile.

A hydromulch dressing could also be applied on top of the restoration soils if required in order to stabilise the soil surface, prevent dust, suppress weed growth, accelerate the establishment of vegetation and protect vegetation from surface water run-off.

6.2.6 Temporary Capping System

Due to the substantial landfill lifespan and subsequent phased capping, portions of each Phase will need to be temporarily capped until landfill operations begin in the adjoining cell. Once the operations commence in the adjoining cells, the temporary cap can be stripped back and used for cover material or for the permanent capping system at the Council's discretion. The temporary cap will need to be consistently maintained, particularly after extreme rainfall events, which could result in scouring and erosion. The temporary capping system should consist of 300mm of low permeability compacted clay layer at a minimum. To minimise maintenance requirements from scouring and erosion, the Council can apply a further 200mm of protection soils.

The extents of the permanent and temporary capping areas are shown in Drawing C-105.

6.3 Material Balance

Material balance is the calculation of the volume of materials required to carry out engineering, waste cover activities and the final restoration capping works of the landfill and comparing these to the volume of available material retrieved from the Site. Consideration should be given to material balance across the life of the landfill operations during the conceptual design process to ensure that the design optimises available fill. If Material Balance is not achieved over a landfill's lifespan, then the material may need to be imported at a cost to the Council.

The material required throughout the life of the landfill includes cell construction (internal and external bunds), waste cover material and capping material, which is further explained as follows:

- Waste cover material is assumed as 10% of the total landfill void;
- The capping material volume is calculated from the modelled three-dimensional area of the top of waste and an assumed restoration soil layer; and
- All the material available from the excavation performed at the Site is assumed suitable for landfill construction and operating activities.

It is assumed that all site-won material can be used in the proposed capping system, particularly the low permeability compacted clay layer. This is representative of a worst-case scenario as this requires the largest amount of soils.

Table 6-1 and Table 6-2 outlines the approximate material balance calculations for the Active Landfill Stage 1 and the Future Landfill Stage 2. The conceptual design for the future landfill attempts to achieve material balance while providing additional contingency in case any of the site-won materials are considered unsuitable.

Table 6-1: Material Balance Calculations for Active Landfill Stage 1

Description	Total
Trench Development	
Cut from trench development (assuming 7 trenches) [ex. fill to create trenches] (m^3)	+210,140
Daily cover material [10% void space] (m^3) *	-189,000
Capping System	
3D Area @ Restoration Profile (m^2)	100,760
Compacted Clay Layer at 500mm thick (m^3)	-55,418
Drainage Layer at 300mm thick minimum (m^3)	-203,972
Revegetation Layer at 1000mm thick (m^3)	-100,760
Net Total	-135,038

**As per void space calculations from Table 4-1*

Table 6-2: Material Balance Calculations for Future Landfill Stage 2

Description	Southern Section	Northern Section	Landfill Total
Cell Development			
Cut from cell development [inc. fill to create cells & internal bunds] (m^3)	+494,826	+423,885	+918,711
Daily cover material [10% void space] (m^3) *	-114,160	-105,726	-219,886
Capping System			
3D Area @ Restoration Profile (m^2)	84,692	102,242	186,934
Regulation layer at 300mm thick (m^3)	-25,408	-30,673	-56,080
Compacted Clay Layer at 600mm thick (m^3)	-50,815	-61,345	-112,160
Subsoil Layer at 800mm thick (m^3)	-67,754	-81,794	-149,547
Vegetation Layer at 200mm thick (m^3)	-16,938	-20,448	-37,387
Net Total	+157,244	+186,406	+343,650

**As per void space calculations from Table 4-2*

The results of the material balance calculations for the Active Landfill Stage 1 demonstrate that there is a material deficiency of approximately 135,038m^3. Alternatively, the Future Landfill Stage 2 has a potential surplus of material up to 343,650m^3. Therefore, there is a potential to offset the material deficiency for the permanent capping of the Active Landfill Stage 1 with the surplus material from the Future Landfill Stage 2. For the future landfill, there is also sufficient material available to complete all waste covering activities for the lifetime of the landfill and the future capping works and rehabilitation. However, this will need to be closely monitored by the Council as some site-won material may be usable for certain aspects of the permanent capping system without soil characterisation testing.

Undertaking progressive capping of the landfill allows for the Site to receive and stockpile additional clean fill for waste cover or restoration purposes prior to subsequent capping phases, if a material deficiency develops at the Site.

To reduce the risk of material balance deficiency at the Site, it is recommended that the Council:

- Closely monitors material balance at the Site including periodic topographical survey of the landfill footprint and soil stockpile areas;
- Implements material saving measures where possible such as stripping back the temporary capping system in advance of the next lift of waste; and
- Attempts to attract as much clean fill material to the Site that would be suitable for use as waste cover or capping material.

7 Surface Water Management

Environmental risks associated with leachate and surface water will be managed through the development of a Surface Water Management System (SWMS) for the Future Landfill Stage 2. To appropriately manage these risks, a SWMS has been developed for the landfill which achieves two key objectives including minimising leachate generation and proactively managing surface water.

These objectives, and the design features incorporated to achieve these, are shown in Table 7-1.

Table 7-1: Objectives and associated design features of the Surface Water Management Plan

Objective	Design Feature
Minimise leachate generation	Implement a best practice capping and surface water management system over the landfill.
	Phase the construction of the capping and surface water management systems.
	Develop a perimeter drainage system along the toe of the landfill that: • Maintains connectivity with the capping system; and • Includes strategically located discharge points away from the waste mass.
	Locate long-term surface water discharge points.
Proactively manage surface water	Incorporate measures into the capping system to direct surface water from the landfill cap to the discharge points.
	Ensure the surface water management system is appropriately sized to manage a 1 in 20 year Average Recurrence Interval (ARI) storm event and will not result in catastrophic failures during a 1-in-100 year ARI storm event.
	Establish controlled discharge points for surface water.

It is proposed that the Site's existing SWMS, which consists of a series of drains that divert stormwater to one of the Site's three existing surface water ponds, will tie-into the SWMS for the Future Landfill Stage 2. The following sections provide details on the modelling and proposed infrastructure for the Future Landfill Stage 2's SWMS.

7.1 Surface Water Management Infrastructure

The conceptual design for the final capping system of the landfill incorporates detailed surface water management infrastructure to prevent the infiltration of surface water into the waste mass and thereby preventing the production of leachate over time.

As previously stated, a geonet (geosynthetic liner) will be laid between the compacted clay layer and the 800mm thick subsoil layer or above the LLDPE liner if the Council proceeds with the alterative capping system. The purpose of the geonet is to capture and divert subsurface water, which has soaked through the subsoils, away from the compacted clay layer to the base of the slopes. Both surface and subsurface water will be intercepted by the perimeter surface water ditches which will outfall into a surface water pond.

The Site's surface water management infrastructure has been divided into four catchments with each served by a corresponding perimeter drainage swale which will discharge to a designated surface water pond based on the site topography. The catchment areas are illustrated in Diagram 7-1 and detailed in Table 7-2.

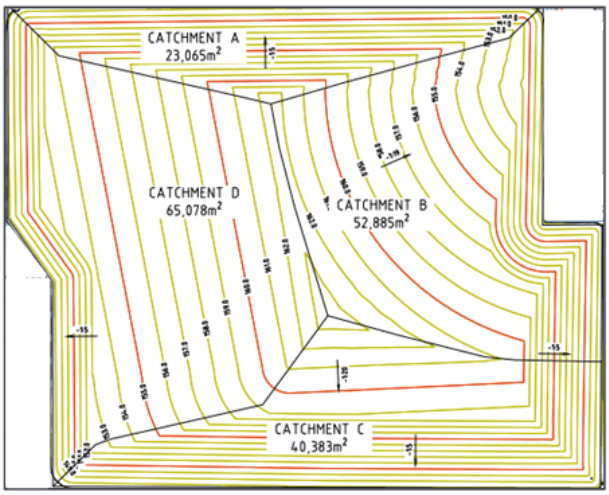


Diagram 7-1: Catchment Overview

The catchment areas were utilised to calculate the capacity of the surface water ponds and the swale system across the Site.

Table 7-2: Summary of Catchment Areas

Catchment	Catchment Area (m^2)
A: North	23,065
B: East	52,885
C: South	40,383
D: West	65,078
Total	**181,411**

7.2 Surface Water Modelling

The NSW Landfill Guidelines state that sediment ponds should be designed to contain surface water runoff from a 90th percentile 5-day rain event in accordance with the *Managing Urban Stormwater – Soils and Construction Volume 1* (4th edition)[1].

In Table 6.3a of the *Managing Urban Stormwater*, the 90th percentile 5-day rain event for the Griffith area is 25.4mm. Although in line with the NSW Landfill Guidelines, it should be noted that the

[1] Landcom. Managing Urban Stormwater – Soils and Construction, Volume 1, 4th Edition. March 2004.

Managing Urban Stormwater is based on construction sediment control generally for land disturbance phases of the development rather than long-term stormwater control due to changes in profile/increased run-off potential of the new landform.

Based on the initial date of publication, *Managing Urban Stormwater* is likely based on the ARR87 Intensity–Frequency–Duration (IFD) from 1987. Updated IFD design rainfalls provided for use in conjunction with the 2016 edition of Australian Rainfall and Runoff (ARR2016) show that for a 5 day (120hr) 1:1 year annual exceedance probability (AEP) return period rainfall is 53.4mm (Table 7-3), two times the directed rainfall event from *Managing Urban Stormwater*.

Managing Urban Stormwater – Soils and Construction Volume 2B: Waste landfills[2] states 'Due to this longer operational life of sediment control measures at landfill sites, higher standards of design and construction should be adopted for water conveyance and storage structures, particularly those that will remain after the operational life of the site.' It is therefore more typical to design stormwater retention at 1-in-20 year AEP to 1-in-100 year AEP dependent on Site sensitivities with 24 hour duration rainfall events, which aligns with the Victoria EPA Best Practice Environmental Management: Siting, design, operation and rehabilitation of landfills (VIC Landfill Guidelines). According to VIC Landfill Guidelines, the surface water management system should be designed to contain and control surface water runoff from a 1-in-20 year storm event for putrescible landfills, at a minimum. However, storm events up to 1-in-100 year recurrence intervals should also be considered to ensure that they do not result in any catastrophic failures such as flooding of the landfill.

Therefore, the design of the surface water management infrastructure at the Site will consider 1-in-20 year storm events with contingencies for 1-in-100 year storm events.

To determine the appropriate design for the proposed surface water management infrastructure, modelling was undertaken utilising a Microsoft Excel surface water pond and drainage swale sizing algorithm based on local climate data including rainfall depth and intensity.

7.2.1 Short Duration Design Rainfall

Rainfall Intensity Frequency Duration (IFD) data for the Site was obtained using the BOM Computerised Design IFD Rainfall System (CDIRS) and the Australian Rainfall and Runoff 2016 database (ARR2016). CDIRS produces a complete set of IFD curves and associated weather data based on user-defined coordinates (http://www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016).

Table 7-3 summarises the Annual Exceedance Probability (AEP) of storms with 1 to 120-hour (hr) durations. AEPs are required to estimate precipitation rates for a range of events.

[2] New South Wales Department of Environment and Climate Change. Managing Urban Stormwater – Soils and Construction, Volume 2B Waste Landfills. June 2008.

Table 7-3: Summary of Annual Exceedance Probabilities for Site (ARR2016)

Storm Duration	1 in 1	1 in 10	1 in 20	1 in 50	1 in 100
	63%	10%	5%	2%	1%
	Rainfall Depth (mm)				
1 hour	14.4	28.7	33.8	40.7	46.1
2 hour	18.1	35.9	42.1	50.4	57
3 hour	20.7	40.5	47.4	56.6	63.9
6 hour	26	49.4	57.4	68.4	77
12 hour	32.4	59.4	68.8	81.7	91.9
24 hour	39.6	70.2	80.9	95.9	108
48 hour	46.5	80.8	92.9	110	123
72 hour	49.9	86.5	99.3	117	132
96 hour	52	90.3	103	122	137
120 hour	53.4	93	106	126	140

At 1-in-20 year AEP and 1-in-100 year AEP with 24 hour duration storm events, the rainfall depth is 81mm and 108mm, respectively. Due to the semi-arid climate, there is no significant difference in rainfall depth between the two storm events.

The highest daily rainfall rate from 2000-2019 was 170mm in March 2012, which is equivalent to a 1:2000 year storm event. The second highest daily rainfall rate was 74mm in February 2003, which is equivalent to a 1:20 year storm event. The landfill's surface water management system will therefore be designed to manage a 1:20 year storm event with contingencies for 1-in-100 year storm events.

7.2.2 Runoff Coefficient

As discussed in Section 2.5.3, the Site geology consists of "unconsolidated to poorly consolidated mottled variegated clay, silty clay" soil horizons with a relatively high clay content. According to *Managing Urban Stormwater – Soils and Construction Volume 2B*, the runoff coefficient can be determined by categorising the site geology into a Soil Hydrologic Group, which can be done with a soil survey or accessing the 'Soil map index layer' in the NSW Office of Environment and Heritage (OEH) eSPADE spatial viewer for soil maps.

However, no data has been recorded that will assist in determining the appropriate Soil Hydrologic Group for the site geology. According to *Managing Urban Stormwater – Soils and Construction Volume 2B*, where the Soil Hydrologic Group is not known, adopting a default runoff coefficient of 0.50 is considered reasonable. Therefore, for the purpose of the calculations the runoff coefficient for the each of the catchments is assumed to be 0.50.

7.2.3 Kerby's Roughness Factor

With regards to Kerby's roughness factor, the description of the area is considered to be smooth bare soil, therefore for the modelling works a roughness factor of 0.10, has been utilised. This is a

conservative value that simulates a worst-case scenario. It essentially means that as the surface water travels across the catchment area to the swale its velocity is not slowed down by the roughness of the surface.

7.2.4 Kerby-Kirpich Method

The swale system was designed using a Microsoft Excel algorithm based on Kerby-Kirpich method to estimate the watershed time of concentration (t_c) for a rainfall event. The method requires adding the overland flow time (Kerby, t_{ov}) to the channel flow time (Kirpich, t_{ch}) in order to obtain the time of concentration.

Once the time of concentration has been determined, then the theoretical peak flow rate through each swale can be calculated and compared to the maximum allowable flow rate through the swale as determined by the design geometry of the swale. If the maximum allowable flow rate is greater than the theoretical peak flow rate, then the design of swale is determined to be suitable.

7.2.5 Surface Water Movements

Drawing C-112 outlines the anticipated surface water movements for the Future Landfill Stage 2. The northern perimeter drain (adjacent to Catchment A) will transfer surface water directly into the existing surface water pond in the Site's northwest corner. The eastern perimeter drain (Catchment B) will feed into the southern perimeter drain (Catchment C) and then a small section of the western drain (Catchment D) before discharging into a new surface water pond along the Site's western boundary. The western perimeter drain (Catchment D) will feed directly into the proposed new surface water pond. These should have an emergency spillway in place to direct surface water offsite into the regional drainage system to cater for extreme rainfall events (1-in-100 year).

7.2.6 Manning's Coefficient

Manning's coefficient describes the roughness of the swale surface, which is determined by the material used to construct the swale. Considering that all swales will be constructed in the same manner, a Manning's coefficient (n) of 0.022 would be considered for the swale system, which corresponds to an unlined earth channel.

A summary of the swale system's design factors is provided in Table 7-4.

Table 7-4: Key Design Considerations for Swale System

Catchment	Manning's Coefficient	Average Gradient
A: North	0.022	0.003
B: East	0.022	0.004
C: South	0.022	0.001
D: West	0.022	0.002

7.2.7 Perimeter Drains

The perimeter drains will be trapezoidal open channel swales and constructed along the lowest boundary of each catchment. Diagram 7-2 provides an illustration of the cross-sectional area of the swale.

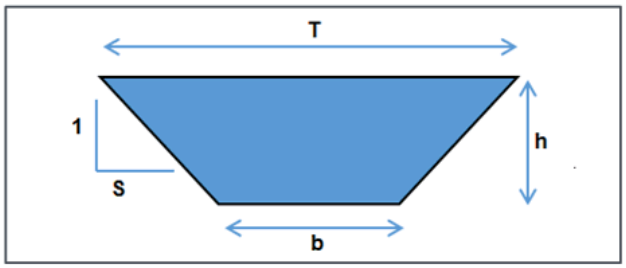


Diagram 7-2: Swale Geometry

Based on the geometry depicted in Diagram 7-2, Table 7-5 provides the corresponding values for each of the different swale designs.

Table 7-5: Key Design Characteristics of the Swale System

Catchment	[1:S] Side Slope (V:H)	[b] Bottom Width (m)	[T] Top Width (m)	[h] Height (m)
A: North	1:3	0.3	4.6	0.7
B: East	1:3	0.3	5.5	0.9
C: South	1:3	0.3	6.5	1.0
D: West	1:3	0.3	5.5	0.9

The height of the water was calculated to be approximately between 0.2m and 0.5m. As a conservative measure, there is a Factor of Safety of 1.2 included within the model and an approximate 0.5m freeboard has been considered.

These swale designs will be required to accommodate flow rates generated in 1-in-100 year storm events. The Microsoft Excel algorithm using the Kerby-Kirpich Method was used to determine whether these are acceptable swale designs.

7.2.8 Design Flow Rates

Table 7-6 outlines the checks performed using the Microsoft Excel algorithm and the Kerby-Kirpich Method to ensure that the swale design is suitable.

Table 7-6: Modelling Results of the Swale System

Catchment	Q_t (m^3/hr)	V (m/s)	Q_a (m^3/hr)	Check $Q_t < Q_a$	Factor of Safety
A: North	398	0.65	496	Pass	1.2

Catchment	Q_t (m^3/hr)	V (m/s)	Q_a (m^3/hr)	Check $Q_t < Q_a$	Factor of Safety
B: East	1,396	0.88	1,637	Pass	1.2
C: South	2,236	0.70	2,598	Pass	1.2
D: West	1,249	0.74	1,521	Pass	1.2

Note: *Q_t is the theoretical peak flow rate that the swale would need to manage.*
V is the maximum velocity of the water through the swale.
Q_a is the maximum allowable flow rate that the swale can manage, excluding the 0.5m freeboard.

For each catchment swale, the theoretical flow rate is less than the actual or designed flow rate that the swale can manage by a Factor of Safety of 1.2. Therefore, all the swale designs are deemed suitable for managing the surface water as it flows through the various sections of the swale system. It is anticipated that there will be minimal scouring or erosion issues due to the minor slope gradients of the swale system. Therefore, all sections of the swale system will be an unlined earth channel.

The layout and details for the swale system are illustrated in Drawing C-112 and Drawing C-305.

7.2.9 Surface Water Ponds

The Site has three existing surface water ponds within its boundary, one of which will be decommissioned. As discussed in Section 7.2.5, the existing surface water pond in the Site's northwest corner will be utilised for managing surface water from the Site's Future Landfill Stage 2. The second pond along the Site's northern boundary can be utilised due to the Site topography; therefore, it is assumed that it will continue to manage surface water run-off from the other waste management activities in the north-eastern section of the Site.

There is a fourth surface water pond that the Site utilises to capture water from swale drains in the Active Landfill Stage 1 and along the southern boundary of the future landfill area. However, this pond will be undersized when development begins in the Future Landfill Stage 2. Therefore, it is proposed to construct a new pond that will eventually manage the surface water run-off from Catchments B, C and D. Surface water modelling found the capacities required to satisfy a 1-in-20 and 1-in-100 year 24 hour storm event as shown in Table 7-7.

Table 7-7: Surface Water Pond Requirements

	Dimensions (m) [L x W x H]	Full Capacity (m^3)	Operational Volume* (m^3)	Required Capacity (m^3) **	Check
Existing Pond	70 x 40 x 1	4,763	2,177		
1:20 year, 24-hr				1,386	Pass
1:100 year, 24-hr				1,850	Pass
Proposed Pond	115 x 30 x 2	10,512	7,277		
1:20 year, 24-hr				6,963	Pass
1:100 year, 24-hr				9,296	Acceptable

Notes: ** The Operational Volume is calculated from the 0.5m freeboard level to the bottom the pond.*
***Includes rainfall into the pond's catchment area.*

The existing northwest surface pond measures approximately 70m by 40m with an unknown depth. Assuming an operating depth of 1m and 1:4 (V:H) side slopes the operational capacity of the pond is approximately 2,177m^3. Therefore, it has sufficient capacity to manage the required volumes generated from the two different rainfall events.

The proposed new surface water pond has been designed with the dimensions of 115m by 30m with a depth of 2m and 1:3 (V:H) and can manage a 1:20 year, 24 hr rainfall event within its operational capacity. For a 1:100 year, 24 hr rainfall event, the proposed pond can manage the generated volume within its full capacity without a risk of overtopping.

The other Site areas will continue to be managed by the existing SWMS, which includes a series of drains and the north-central surface pond that is not be utilised by the Future Landfill Stage 2's SWMS. If the Council requires it at a later stage during the operational life of the Site, then the two systems can be tied into each other to effectively manage surface water at the Site.

8 Landfill Gas Management

8.1 Active Landfill Stage 1

8.1.1 Passive Gas Venting

The NSW Landfill Guidelines do not provide guidance on the gas threshold over which an active gas system may be required. In contrast, the VIC Landfill Guidelines infer that for sites with gas generation rates less than 100 m^3/hr an active system connected to a gas flare is not a viable option.

The anticipated landfill gas production rates are not expected to be high enough to warrant the installation of an active gas extraction system connected to a flare due to the small amount of waste within each isolated landfill trench. Therefore, a simple passive gas vent system is proposed for each trench, which will be installed during the temporary capping works to adequately prevent any gas build up beneath the cap. Adopting this phased approach also promotes the protection of the surrounding environment without excessive expenditure.

8.1.2 Landfill Gas Infrastructure

The passive system in each trench consists of a single 110mm perforated PVC pipe installed approximately 1m within the waste mass from the existing ground levels and backfilled with a coarse aggregate. Each trench will have three vent locations that runs along its longitudinal centreline. At these vent locations, the 110mm perforated horizontal pipes are connected to solid PVC pipes to form the vertical vents through the capping system. The vents are fitted with aspiromatic cowls, which rotate in the wind to encourage evacuation of the landfill gas from underneath the capping layer to the atmosphere. At the interface with the vent, the compacted clay liner is sealed with powdered bentonite. The layout details of the passive gas vent system over the fill profile are shown in Drawing C-113 and Drawing C-303.

8.2 Future Landfill Stage 2

8.2.1 GasSim Landfill Gas Modelling

To determine a suitable gas management design for the Future Landfill Stage 2, a gas production estimate must be calculated. Talis has utilised a landfill gas modelling program called GasSim V1.5 to estimate the current and potential landfill gas production of the waste mass. The gas modelling software has been developed for the use by the Environmental Protection Agency in the UK. The software requires relevant or assumed data to complete the modelling. To this end, the data input utilised in the model is detailed within Table 8-1.

Table 8-1: GasSim - Landfill Input Data

Landfill Details	Table Heading
Year of Opening	Phase 1 (Cells 1-3): 2031 Phase 2 (Cells 4-5): 2049 Phase 3 (Cell 6-7): 2063 Phase 4 (Cells 8-9): 2076

	Phase 5 (Cells 10-11): 2085 Phase 6 (Cells 12-13): 2100
Operating period	Phase 1 (Cells 1-3): 18 years Phase 2 (Cells 4-5): 14 years Phase 3 (Cell 6-7): 13 years Phase 4 (Cells 8-9): 9 years Phase 5 (Cells 10-11): 15 years Phase 6 (Cells 12-13): 11 years
Average Infiltration (mm/yr)	404 mm
Landfill Geometry	
Length (m)	South Section (Cells 1-7): 210 North Section (Cells 8-13): 175
Width (m)	South Section (Cells 1-7): 63 North Section (Cells 8-13): 71
Area (m^2)	South Section (Cells 1-7): 13,230m^2 North Section (Cells 8-13): 12,425m^2
Capping Layers	300mm thick regulation layer 600mm compacted clay layer Drainage geocomposite 1000mm restoration soils
Basal Liner	1000 mm compacted clay layer
Waste Details	
Waste Tonnages (Average)	24,007 tonnes per year (across 82 years)
Waste Stream Breakdown	MSW – 39% C&I – 55% Inert – 6%
Waste Stream Composition	MSW: Data compiled from the RAMROC Regional Waste Strategy 2014-2020 C&I: Data compiled from Appendix E – Review of Waste Strategy ad Policy in New South Wales 2010 C&D: Data compiled from the Construction and Demolition Waste Status Report for the Queensland Department of Environment and Resource Management (October 2011)
Moisture Content	3-5%

Since the GasSim was developed for the UK Environment Agency, the model has been designed to work with ranges for input parameters which are geared towards UK climatic conditions. For example, the typical moisture content of UK waste on an as received basis may be comparable to that in NSW, however, it should be noted that the moisture content of the waste can reduce significantly during filling. The methanogenesis phase of the biodegradation of waste is an anaerobic one, and as such, is significantly influenced by moisture content. High moisture contents can increase the extent of anaerobic conditions in the waste mass, and consequently, increase methane generation. Conversely,

low moisture content waste will yield significantly less methane, simply by virtue of its moisture content.

Due to the semi-arid climate in Leeton, it is expected that the placed waste will dry out in between rainfall events. As such, a moisture content of 3-5% was used in the model and the waste was categorised as 'dry'. While this is considered an acceptable approach, the influence of non-variable default parameters or algorithms within the model is not known. GasSim accepts that the model is set-up for putrescible waste and that it may not be suitable for sites taking unusual waste streams. Consequently, the output values for landfill gas generation rates should be interpreted with caution.

8.2.1.1 Data Limitations

GasSim is a predictive tool and should not be heavily relied upon for an exact landfill gas generation value. The model utilises multiple generic values for criteria and requires assumptions to be made where site-specific data is not available. The following site-specific data limitations must also be noted:

- Waste inputs values were based on the average annual waste tonnage taken from a relatively narrow timeframe, from 2012 and 2018, with future waste inputs projected using a growth rate set a 0.4%;
- Detailed waste composition is unknown and was based on limited historical documentation.

8.2.1.2 Bulk Gas Generation Rates

The results of the gas modelling indicate that the bulk gas production will reach 100 m^3/hr by 2061 and is set to increase to a peak rate of 160m^3/hr by 2112 which coincides with the closure and capping of the final phase, Phase 6. Based on the input data utilised, the anticipated landfill gas generation obtained from the model is shown on Diagram 8-1.

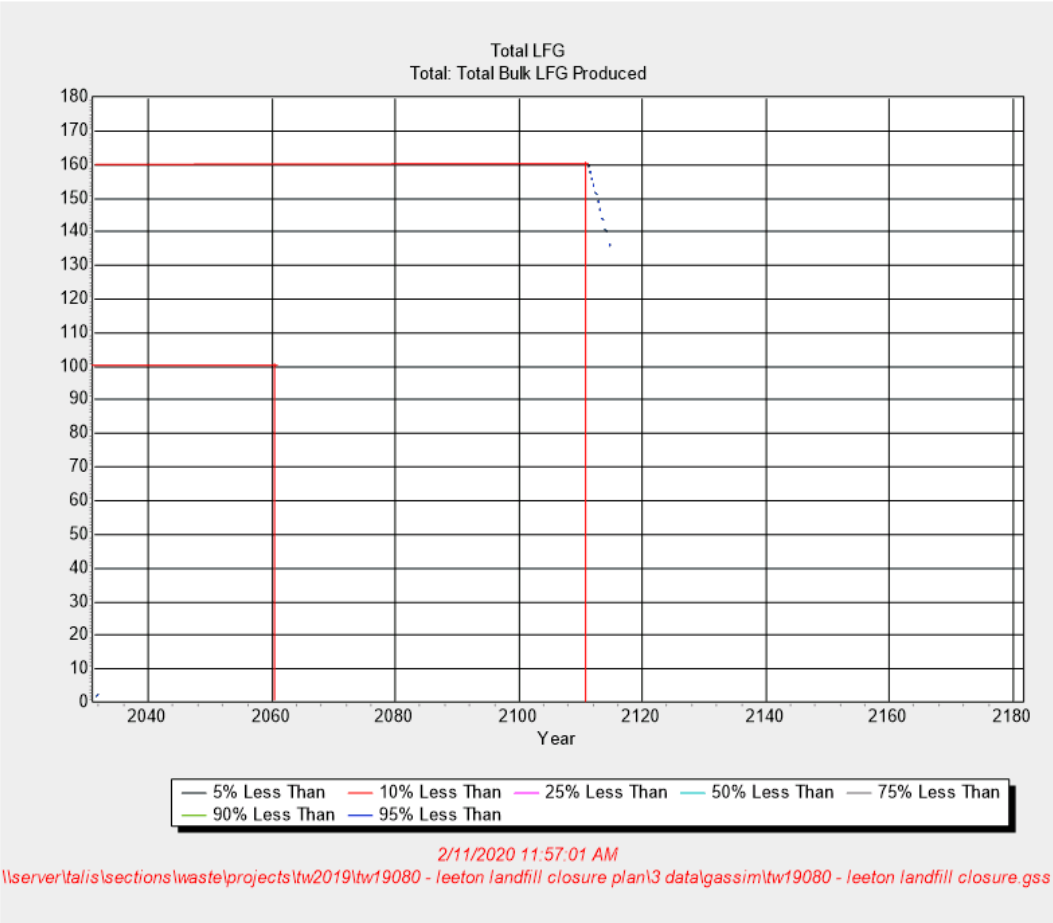


Diagram 8-1: GasSim Bulk Landfill Gas Production

8.2.2 Active and Passive Venting

Since the NSW Landfill Guidelines do not provide guidance on the gas threshold over which an active gas system may be required, the thresholds stated in the VIC Landfill Guidelines have been applied. The thresholds are summarised in Table 8-2.

Table 8-2: Potential landfill gas treatment technologies for a range of generation rates

Landfill gas generation rate (m3/hr)	Potentially suitable landfill gas treatment technologies	
>1000	Combined heat and power Substitute fuel Power generation Intermittent use and off-time flaring High temperature flaring	Active

Landfill gas generation rate (m3/hr)	Potentially suitable landfill gas treatment technologies	
>250 <1000	Power generation Intermittent use and off-time flaring High-temperature flaring Low-calorific flaring	
>100, <250	**Power generation** **High temperature flaring** **Low-calorific flaring** **Other oxidation and discharge (e.g. passive flares, biofilters, biocover)**	
<100	Other oxidation technology and discharge (e.g. passive flares, biofilters, biocover)	Passive

The threshold for when an active system is required is a gas flow rate of 100m^3/hr. The anticipated peak gas generation rate of 160m^3/hr once the landfill is capped in 2112 indicates that an active system may be required for the Site.

Therefore, it is recommended that gas wells are installed once final fill levels have been reached, prior to capping the landfill, and that they are designed as a passive system initially with the capability to be connected to an active system once gas generation rates above the 100m^3/hr threshold have been confirmed through onsite testing. This initial period will allow gas generation rates to be monitored directly to confirm the accuracy of the output from the GasSim model due to the limitations discussed in Section 8.2.1.1. If the results of gas field monitoring determine an active system is required, gas treatment is most likely to be via low-calorific flaring.

To design a flare system requires an in-depth knowledge of the gas concentrations. Traditional flares require consistent flows of gas with Calorific Value (CV) contents greater than 20% and O_2 contents less than 5% to successfully operate without any issues. However, as suction is applied to an active extraction system there is inevitably some degree of air ingress, either into the waste or the extraction pipework. This leads to dilution of the landfill gas by oxygen and nitrogen by the time it reaches the gas flare, rendering traditional flares less effective. Gas concentrations can also be significantly impacted by oxygen ingress from unlined or uncapped areas such as the base of the landfill cell or the temporary waste slope along the southern edge of the landfill.

Capping the landfill, with the installation of passive wells that can be converted to active wells, ensures an optimum and dynamic gas management system can be installed at the Site, so that the surrounding environment can be protected without excessive expenditure.

8.2.3 Landfill Gas Infrastructure

The proposed system consists of a gas field of 75 vertical gas wells as shown in Drawing C-113. The gas wells will be designed to passively vent for an initial monitoring period, to be determined, prior to potential future connection to an active system. Typical details have been provided in Drawing C-307.

During the passive phase, the vents are fitted with aspiromatic cowls, which rotate in the wind to encourage evacuation of the landfill gas from underneath the capping layer to the atmosphere by inducing a light negative pressure. Gas wells will feature a gas sample point. At the interface with the vent and the compacted clay layer, bentonite paste will be placed around the vent to act as a seal. If a LLDPE geomembrane is used as an alternative to the compacted clay layer, then the LLDPE will be sealed with a neoprene collar with steel banding to prevent gas egress on the outside of the vent. The well headworks will protrude above the restoration soils approximately 1m.

During the active phase, the aspiromatic cowls will be removed and replaced with a sealed connection to a landfill gas ring main, which can be installed at the time of capping or during the transition to the active extraction phase for the landfill. The wellhead will feature an access plate and maintain the gas monitoring point and neoprene seal. The wellhead will be connected to the gas main via a UV-resistant flexible hose to account for differential settlement between the well and the main.

Due to the shallow waste deposit and oxygen ingress risk, the vents/wells will not be installed on the steep perimeter side slopes but restricted to the shallower upper slopes of the landfill crown.

The requirements for the future network of horizontal gas mains, condensate traps, manifolds, valves, and flaring equipment, including their proposed locations, will be determined following gas vent monitoring. An indicative location for the flare infrastructure is shown on Drawing C-113, but this should be reviewed at a later stage following gas vent monitoring.

9 Leachate Management

9.1 Leachate Collection and Extraction System

9.1.1 Active Landfill Stage 1

The key elements of the Site's existing leachate collection system for each landfill trench are as follows:

- 150mm diameter perforated/slotted leachate collection pipes;
- 300mm aggregate locally mounded over leachate collection pipework; and
- 200mm diameter solid side slope leachate extraction riser pipe.

The leachate collection pipework directs leachate towards the trench's sump. The sump is at least 2 metres deep, 2.5 metres wide and 5 metres long. The typical construction details for a trench's leachate management system are shown in Drawing C-301 and Drawing C-302.

The leachate that is collected in the trench's sump is either recirculated back into the waste mass, taken offsite for processing, and transferred to the Site's designated leachate pond. The existing leachate pond will be decommissioned following the commencement of the landfill construction works in the Future Landfill Stage 2. However, these additional volumes can be easily transferred to and managed by the leachate evaporation pond system proposed for the Future Landfill Stage 2 which is discussed further in Section 9.3.3.

9.1.2 Future Landfill Stage 2

To protect the surrounding environment and groundwater from contamination, a leachate collection system will be constructed/installed in each new cell within the Future Landfill Stage 2. At this stage, only conceptual design have been completed for this future development. The key elements of the leachate collection system are:

- 300mm thick highly permeable leachate collection layer;
- 225mm diameter perforated primary leachate collection pipes;
- 160mm diameter perforated secondary leachate collection pipes;
- 225mm leachate extraction riser pipes and automatic submersible pump;
- Leachate main for future connection to the proposed leachate evaporation ponds; and
- separation geotextile.

The leachate collection system incorporates an aggregate drainage layer, a network of primary and secondary leachate collection pipes, and leachate collection sump. The 300mm aggregate drainage layer consists of low calcareous aggregate with a hydraulic conductivity of >1 x 10^{-3} m/s.

The pipe network consists of a 225mm outer diameter (OD) HDPE perforated primary pipe connected to 160mm OD HDPE perforated secondary pipes at maximum 25m spacings. The base of the cell has been designed with a 1% crossfall orientated diagonally across the cell base which will direct leachate towards the leachate collection sump located in the south-west corner of each cell in the landfill's southern section and in the north-west corner of each cell in the landfill's northern section.

The leachate collection system design for the Future Landfill Stage 2 is shown in Drawings C-110 and C-301 (Appendix A).

Leachate will be extracted from each cell via a 225mm OD HDPE perimeter side slope riser which can have a permanently installed submersible pump. If these submersible pumps are utilised, then the extraction from the cells would be automated with a pneumatic or electric system dependent on the final design.

The layout of the leachate extraction pipework is shown in Drawing C-110 and the typical details are shown in Drawing C-306.

9.2 Leachate Main

There is no leachate main with the Active Landfill Stage 1.

For the Future Landfill Stage 2, the leachate will be transferred via a solid, butt-fusion welded, 110 mm/63 mm HDPE pipe rising main to the proposed leachate evaporation ponds. Inspection chambers would be installed along the leachate main at each leachate risers and at key junction points. There would be two separate mains, one that services the southern landfill cells and other services the northern cells.

The layout of the leachate mains is shown in Drawing C-111.

9.3 Leachate Evaporation Ponds

It is recommended that all leachate generated at the Site continues to be treated through evaporation as is currently done in the Active Landfill Stage 1. As landfill operations expand, additional management measures and infrastructure will be required. For the Site's Future Landfill Stage 2, a new leachate evaporation pond system is proposed, and its design is discussed in the following sections. As per Section 3.1.10 of the Site's LEMP, a leachate evaporation pond will be shallow and designed to have a surface area and volume sufficient to handle wet weather storage and annual evaporation. To ensure these design objectives, a water balance model for the new Site landfill was prepared.

9.3.1 Leachate Generation

To determine the requirements for the leachate evaporation pond system for the Site's Future Landfill Stage 2, the leachate generation rate is typically estimated using a simulation program such as the Hydrologic Evaluation Landfill Performance (HELP) model, or an equivalent method. According to the NSW Landfill Guidelines, smaller landfill sites can utilise default rainfall infiltration percentages as an alternative. Therefore, the following conservative infiltration percentages will be used to determine the maximum leachate volumes that the Site's leachate management system will need to control:

- 10% to 20% for final capping;
- 50% for intermediate covering; and
- 100% for an active area with daily covering.

The Site's semi-arid climate and strong vegetation growth will minimise the water infiltration through the landfill's final cap; therefore, 10% infiltration will be considered.

The rainfall volumes assumed in the modelling should conservatively incorporate rainfall volumes from historically wetter years (i.e. a 90th percentile rainfall year) at the Site in conjunction with a historical average rainfall year. Table 9-1 outlines the typical leachate generation volumes that will need to be managed at the Site based on each rainfall scenario. The leachate management system requirements will be separated between the northern and southern landfill cells to allow for staged construction of the leachate management infrastructure.

Table 9-1: Estimated Leachate Generation Rates

Infiltration Rates	Cells	Catchment (m^2)	Annual Leachate Volume (m^3)	
			90th Percentile Rainfall	Average Rainfall
Southern Cells				
10%	1, 2, 3, 4, 5	66,150	3,808	2,671
50%	6	23,153	6,664	4,674
100%	7	3,308	1,904	1,335
Total		**92,610**	**12,377**	**8,680**
Northern Cells				
10%	8, 9, 10, 11	49,700	2,861	2,007
50%	12	21,744	6,259	4,390
100%	13	3,106	1,788	1,254
Total		**74,550**	**10,908**	**7,651**

These volumes consider the worst case scenario in which all landfill cells but two are permanentantly capped, one cell is temporarily capped, and the final cell is partially active and the rest of the cell is temporarily capped. The leachate evaporation pond for the southern landfill cells will need to manage approximately 12,377m^3 for a 90th percentile rainfall year and 8,680m^3 for an average rainfall year. The northern landfill cells' evaporation pond will need to manage approximately 10,908m^3 for and 7,651m^3 for a 90th percentile rainfall year and an average rainfall year, respectively.

When the maximum leachate volume is being generated from the landfill's southern section (i.e. Phase 1 and Phase 2 capping is complete, Cell 6 is temporarily capped and Cell 7 is active), the North section's leachate evaporation pond should be constructed in preparation for landfill operations to begin in the corresponding area of the landfill. Therefore, the North leachate evaporation pond can be used as contingency if the South leachate evaporation pond is reaching capacity.

Conversely, when the maximum leachate volume is being generated from the landfill's North section (i.e. Phase 4 and Phase 5 capping is complete, Cell 12 is temporarily capped and Cell 13 is active), the South leachate evaporation pond will have additional capacity since minimal leachate volumes will be generating from this area of the landfill after being permanently capped for 20+ years. Therefore, the

South leachate evaporation pond can be used as contingency if the North leachate evaporation pond is reaching capacity.

The Site monitors on a quarterly basis the volume of leachate extracted from the Site's landfill trenches, which is treated through evaporation within its designated leachate pond. Currently, the annual leachate volume extracted from the existing trenches is less than $6m^3$. It is anticipated that the overall volume of leachate that will be generated from the permanently capped landfill trench area after several years of inactivity will be similarly minimal. Therefore, these additional volumes can be easily transferred to and managed by the leachate evaporation pond system proposed for the Future Landfill Stage 2.

Talis recommends that once the Site's Future Landfill Stage 2 is operational, the volume of leachate that is pumped to the leachate evaporation pond system continues to be monitored to develop a database of Site-specific data which can be utilised to revise the Site's leachate water balance and to accurately determine future management requirements.

9.3.2 Water Balance Assessment

A water balance assessment was utilised to determine the appropriate size of the new leachate evaporation pond system. Using a Microsoft Excel algorithm, the assessment presented a simplified input and output system based on the following:

- Inputs:
  - Leachate
  - Monthly rainfall
- Outputs:
  - Evaporation

The detailed leachate water balance calculations that guided the design of the leachate evaporation pond system have been provided in Appendix D.

9.3.2.1 System Inputs

It is critical that each pond has the capacity to manage the maximum leachate generation rate from its corresponding landfill section. To ensure that there are no legacy issues and sufficient freeboard is maintained, each pond will be designed to manage a wet rainfall year (90^{th} percentile) followed by an average rainfall year when these maximum leachate volumes are being generated.

Therefore, the input volumes within each pond for a given month include

- the remaining leachate from the previous month (if any);
- the leachate input for the month; and
- the rainfall within the pond's catchment area based on the selected rainfall scenario.

9.3.2.2 System Outputs

To assist with accurately modelling the leachate level in each of the ponds, any outputs must also be considered. To quantify the amount of leachate evaporated each year, the following parameters were assumed:

- The freeboard was set at 0.5m to determine the available operational volume of each pond;
- The actual evaporation rate was assumed to be 70% of the potential pan evaporation rate;
- No rainfall within each pond catchment area was lost to run-off/infiltration; and
- The evaporation area was set at half the pond depth at a minimum.

9.3.3 Conceptual Design

To manage leachate from the Site's Future Landfill Stage 2, a system of evaporation ponds will be constructed along the northern boundary of the Site. The design characteristics of the Site's leachate evaporation pond is provided in Table 9-2.

Table 9-2: Design Characteristics for the Leachate Evaporation Pond System

Landfill Section	Dimensions (m) [L X W X D]	Pond Side Slope (V:H)	Catchment Area (m^2)	Operational Volume (m^3)	Full Capacity (m^3)
South	140 x 52 x 2.5	1:2	7,280	12,339	15,883
North	130 x 52 x 2.5	1:2	6,760	11,419	14,708

**Note: The evaporation rate is assumed to be 70% effectiveness. A freeboard of 0.50m is assumed for the Operational Volume.*

Each leachate evaporation pond will be lined with 200mm of compacted in-situ soils, a minimum 700mm thick compacted clay layer, and a 2mm textured HDPE geomembrane. The leachate evaporation pond will be securely fenced to prevent unauthorised access. It is typical to install netting on the interior face of the evaporation pond for occupational health and safety purposes. Each leachate pond should be monitored regularly, and repair/maintenance works to be carried out as necessary.

While it was not considered for the water balance to represent a worst-case scenario, leachate recirculation back into the waste mass can be undertaken as part of the management procedures to aid evaporation and removal of leachate. Recirculation is the process of circulating the leachate from the evaporation pond back into the waste mass and active cells. This process has several advantages including:

- Leachate storage within the waste;
- Increased landfill gas generation rate;
- Increased waste settlement, leading to more efficient use of landfill void space; and
- Accelerated waste degradation and stabilisation.

10 Revegetation

Following completion of the capping system, the landfilled areas across the Site will be rehabilitated using native grass species. The key stages of the rehabilitation works are:

- Drainage works, contour banks, topsoiling and scarifying;
- Direct seeding and tubestock planting (if required);
- Staking and tree guarding (if required);
- Weed control and general maintenance; and
- Revegetation monitoring using permanent transects and quadrants.

Contour banks can be installed using mulch processed from the greenwaste disposed at the landfill. The contour banks minimise erosion, scouring and seed/plant loss. Topsoil blends will be manufactured onsite using by-products from future landfill cell construction works, including clay and compost. Plant species selection on capped landfill cells is specific to shallow rooted, good colonising species that are able to withstand harsh environments and have shallow root systems that will not penetrate the compacted clay layer and establish preferential pathways for water infiltration into the landfill cell and increase leachate volumes.

If agricultural grazing is not pursued, then the seed mixes and tubestock will be selected from a master species list based on species that are endemic to the region and possess the right characteristics for landfill rehabilitation. Otherwise, the selected of grass/seed mixes will be tailored towards agricultural grazing.

It is recommended that the Council develop a Landfill Revegetation Plan for the Site prior to completing any capping works.

11 Post-Closure Management and Monitoring

The NSW Landfill Guidelines state that the typical period for aftercare for a putrescible landfill is approximately 30 years. The following areas relevant to the Site have been considered in planning for the aftercare period:

- Maintenance of landfill cap, in particular to:
  - Prevent/control erosion;
  - Restore depressions, seal and monitor cracks in the cap caused by settlement;
  - Restore/maintain vegetation;
- Maintenance and operation of leachate collection and treatment system;
- Maintenance and operation of landfill gas extraction system;
- Environmental monitoring of:
  - Groundwater;
  - Surface water;
  - Landfill gas;
  - Leachate; and
  - Settlement.

The environmental management measures that will be employed, and associated monitoring works, are described in the following sections.

11.1 Landfill Gas

The monitoring and post-closure management of landfill gas focus on two areas as follows:

- Monitoring of landfill gas within the waste mass; and
- Monitoring of landfill gas migration off site.

The monitoring required for both of these are discussed in the sections below.

11.1.1 Monitoring of Landfill Gas within the Waste Mass

The initial step in the determination of a suitable gas management system for the Future Landfill Stage 2 will be to install landfill gas wells on the waste mass with aspiromatic cowls. As discussed in Section 8, due to the current lack of empirical gas production rates, the proposed approach to landfill gas management cannot be finalised at this point and thus prepares for a number of eventualities. Once the aspiromatic cowls have been installed as part of the first phase of capping works, a gas field analysis can be undertaken coupled with air quality assessment using AERMOD or similar software. Data including methane and carbon dioxide content and atmospheric pressure will be collected from the gas wells using a hand-held gas analyser. The results of this analysis will determine the gas concentrations and the appropriate management measures to mitigate associated risks which may include the installation of a blower and/or a flare. These measures will also include the preparation of a tailored program of landfill gas monitoring for the Future Landfill Stage 2 that will be merged with the established landfill gas monitoring program for the Active Landfill Stage 1. In addition, ongoing

monitoring of the gas wells within the waste mass will continue during the aftercare period for both the Active Landfill Stage 1 and the Future Landfill Stage 2.

11.1.2 Monitoring of Landfill Gas Migration Off Site

In the event of the gas management system not efficiently capturing and venting all the landfill gas generated, there is potential for landfill gas to migrate off site. In order to employ the most effective management measures in the absence of existing relevant landfill gas data, a staged approach is proposed as follows:

- Gas migration monitoring boreholes will be installed as part of the rehabilitation works around the perimeter of the landfill in accordance with the NSW Landfill Guidelines. The proposed location of these boreholes is shown in Drawing C-113. The wells will be installed at 100m centres along the west and south boundary of the Future Landfill Stage 2 and the south and east boundary of the Active Landfill Area as there are no neighbouring developments within 200m of the Site's boundary. The spacing along the north and east boundary of the Future Landfill Stage 2 and the north boundary of the Active Landfill Area will vary between 50m and 100m due to the close proximity of enclosed Site infrastructure (i.e. greenwaste workshop and reuse shop). These wells will be used to determine if there is any lateral migration of gas around the Site; and
- Monitoring of these boreholes will be carried out initially on a monthly basis for the first 6 months following the capping of each phase. If elevated concentrations of landfill gas (CO_2/CH_4) are detected in the perimeter boreholes, a review of the landfill gas management extraction system will be required to determine the source of migrating gas. If gas migration is not identified during the initial 6 months, the monitoring frequency should be reduced to every two months for the following 6 months and biannually thereafter.

The above described phased approach to landfill gas management both on the capped landfill and perimeter gas monitoring wells will ensure that risks can be identified and managed in an effective manner.

11.2 Landfill Leachate

11.2.1 Leachate Head

Leachate levels in each landfill cell and trench will be measured on a quarterly basis to ensure that the extraction system/program is maintaining leachate levels at an acceptable level. Prior to monitoring leachate head in the Future Landfill Stage 2, the pumps should be switched off for several days to allow leachate levels to stabilise.

11.2.2 Leachate Generation Rates

The quantity of leachate extracted from each of the cells and trenches should be monitored via an inline water meter. In the absence of an inline meter, quantities can be estimated based on pumping flow rates and pumping durations. Volumetric leachate generation data can be used to check water balances for the Site and identify potential loss of containment at the landfill disposal areas.

11.2.3 Leachate Composition

Leachate collected will be sampled directly from the leachate risers and from the leachate evaporation ponds to characterise composition and strength. The Site meets several of the criteria for a small, low-risk rural landfill (Section 1.10 of the NSW Landfill Guidelines), including the waste is general solid waste only, the capacity is less than 20,000 tonnes of waste per year, and average annual rainfall is less than 600 millimetres. As such, annual monitoring of leachate composition is considered sufficient. The monitoring frequency may need to alter if impacts to groundwater is detected.

11.3 Surface Water

To ensure that the constructed surface water management system is functioning effectively following the rehabilitation works, samples should be taken at the discharge points to the surface water ponds twice annually and tested for evidence of leachate. Where the results indicate the presence of contaminants, the source of the contamination should be identified, and action taken to remedy any failures in the system. This may require sampling of the individual channels of the surface water management system to assist in the identification of the source. A physical inspection of the surface water management system during sampling rounds should also be carried out to ensure that it is operating effectively.

After the first 5 years following the rehabilitation of a landfill disposal area, monitoring can be carried out at a reduced frequency of once a year and following a heavy rainfall event. After this time, further monitoring may not be required if results indicate that the surface water management system is effective.

11.4 Groundwater

A minimal network of four monitoring wells are currently installed at the Site. An expansion of the monitoring well network is recommended to properly assess the potential for off-site impacts. It is strongly recommended that additional bores are installed at the locations marked on Drawing C-101 to better monitor any groundwater contamination from the landfill. These monitoring wells should be situated a sufficient distance from the landfill mass to adequately measure off-site migration of leachate and its impact on the surrounding environment. It is also critical that Test Well #5 in the Site's northeast corner can be monitored in accordance with the Site Licence. If it is dry for a significant period of time and cannot be monitored, then the Council should consider the reinstalment of the bore at a greater depth to provide the vital baseline chemistry of local groundwater hydraulically up-gradient of the Site.

Groundwater is currently monitored quarterly in accordance with the Site Licence. Following rehabilitation, groundwater will be monitored at the same frequency for the first 5 years, reducing to annually for the remaining 25 years, unless groundwater chemistry indicates impacts from the landfill disposal activities in which case more frequent monitoring may be required.

11.5 Topography

Following rehabilitation, site walkovers to inspect the integrity of the capping system should be conducted twice annually and following severe weather events. It will be important that the proposed topsoil/compost layer remains in place until the surface vegetation has established.

It is expected that a minimal amount of settlement will occur following the installation of the capping system. In general, most of the settlement occurs in landfills in the first two years following rehabilitation.

It is therefore proposed that annual surveys be undertaken at the Site to monitor the settlement rate for the first two years. Following this, surveys will be conducted every two years (up to 15 years post-rehabilitation), unless the settlement rate observed indicates that more frequent surveys are required. After 15 years post-rehabilitation, it is anticipated that settlement will be very minor so surveys of the Site should be undertaken every 5 years, or until the topography of the cell has stabilised.

11.6 Monitoring Program

The proposed Post-Closure Management and Monitoring Program for the Active Landfill Stage 1 and the Future Landfill Stage 2 is presented in Table 11-1.

Table 11-1: Post-Closure Management & Monitoring Program

Aspect	Monitoring Method	Timeframe	Frequency
Topography	Topographic survey	First 2 years	Annually
		Following 13 years	Every 2 years
		Following 15 years	Every 5 years
Landfill Gas	Aspiromatic cowl and gas monitoring borehole sampling. Further measures or the Future Landfill Stage 2 to be confirmed following first phase of monitoring.	First 6 months	Monthly
		Second 6 months	Every 2 months
		29 years	Biannually
		Following 20 years	Annually
Landfill Leachate	Leachate riser and evaporation pond system sampling.	First 5 years	Biannually
		Following 25 years	Annually
Groundwater	Borehole sampling.	Following 5 years	Quarterly
		Following 25 years	Annually
Surface water	Sampling at surface water pond system	First 5 years	Biannually

As the Site is operational, the Active Landfill Stage 1 will be closed as one event, and the Future Landfill Stage 2 will be closed off in phases, the Council needs to consider its current monitoring commitments as specified within its Licence as well as the post-closure monitoring requirements detailed in Table 11-1.

12 Closure Cost Estimates

Talis has prepared indicative cost estimates for the capital works required for the closure of the Active Landfill Stage 1 and the Future Landfill Stage 2. These have been based on the capping design and environmental management systems for landfill gas, leachate and surface water. The cost estimates assume material used in the restoration of these Site areas will be site-won. No allowance has been made for purchasing imported capping and restoration soils. The cost estimates do not include potential maintenance works required during aftercare.

Several provisions have been allowed for local loading, professional services and contingency. Local loading has been set at 8% having regard to regional indices listed within the *Rawlinson's Australian Construction Handbook* (Edition 33, 2015). The indices are a broad indication of the cost variation within NSW and are considered appropriate for this project.

A Professional Services loading of 10% has been applied to cater for consultancy and specialist services required to assist with approvals, design, project management and contract administration activities, site supervision and Construction Quality Assurance. In addition, a contingency of 20% has been incorporated into the capital cost estimate model.

12.1 Active Landfill Stage 1

A summary of the closure cost estimates for the Active Landfill Stage 1 is presented in Table 12-2. A more detailed breakdown of these high-level cost estimates is provided within Appendix E.

Table 12-1: Summary of Cost Estimates for Trench Development & Capping in Active Landfill Stage 1

	Trench Development	Active Landfill Stage 1 Restoration
Year	*	2036/37
Cost (Year 1)	$326,087	$11,156,508
Local Loading (8%)	$26,087	$1,115,651
Professional Services (10%)	$32,609	$892,521
Contingency (20%)	$65,217	$2,231,301
Total Cost	$450,000**	**$15,395,982**

Notes: **Year will vary for Trench Development, with seven trenches proposed for construction and filling*
***Total Cost for Trench Development provided by the Council*

Taking into account the local loading, contingency and professional services factors the overall capital cost estimate for the restoration of the Active Landfill Stage 1 is estimated to be approximately $15.4 million. The cost estimate excluding local loading and contingencies is approximately $11.2 million. As discussed in Section 4.1.6, the closure works for the Active Landfill Stage 1 are scheduled to be undertaken in approximately 10 years, providing the Council a significant amount of time to financially plan and gather the required volumes for the capping materials. The Council can also investigate the potential of undertaking the majority of the earthworks for the capping system in-house, which has the potential to significantly reduce the costings.

12.2 Future Landfill Stage 2

A summary of the closure cost estimates for Phase 1 only is presented in Table 12-2. A more detailed breakdown of the cost estimates for the life of the Future Landfill Stage 2 is contained within Appendix E; however, these costings are high-level and should be refined following the Phase 1 cell development and restoration works.

Table 12-2: Summary of Cost Estimates for Phase 1 Development & Capping in Future Landfill Stage 2

	Cell 1 Development	Cell 2 Development	Cell 3 Development	Phase 1 Restoration
Year	2036	2043	2050	2063
Cost (Year 1)	$1,975,485	$1,263,299	$1,263,053	$4,878,370
Local Loading (8%)	$158,039	$101,064	$101,044	$390,270
Professional Services (10%)	$197,549	$126,330	$126,305	$487,837
Contingency (20%)	$395,097	$252,660	$252,611	$975,674
Sub-Total Cost	**$2,726,169**	**$1,743,353**	**$1,743,013**	**$6,732,151**
Total Cost	**$12,944,686**			

Note: Based on approximately 246,154 tonnes being disposed of during the lifespan of Cells 1-3

Taking into account the local loading, contingency and professional services factors the overall capital cost estimate for Phase 1, including cell development for Cells 1-3 and their subsequent capping, is estimated to be approximately $12.9 million. This includes the cost of developing each proposed cell, the leachate extraction main, the leachate evaporation pond, surface water swale and collection pond, and the capping and restoration costs. The cost estimate excluding local loading and contingencies is approximately $9.4 million. As discussed in Section 4.2.6, the development and closure works for Phase 1 are to be completed over approximately 18 years, over which these costs can be distributed. However, no allowance has been made for additional costs associated with inflation and the costings are exclusive of GST.

12.3 Assumptions

These costs have been based on the following key assumptions:

- The low permeability capping layer is a compacted clay liner; and
- Material for the regulating layer, cohesive material for the compacted clay layer and the restoration soil layers will be sourced from excess cell/trench excavation soils or from clean fill disposed of at the Site.

The detailed cost estimate shows the most expensive element of the rehabilitation works is the construction of the restoration and capping layers. These costs will be heavily dependent on the availability of restoration materials and the plant and methodology which will be employed by the

Contractor undertaking the works. In the event that site-won or clean fill soils are not readily available, and the purchase of capping and restoration soils is required, the cost estimate and potentially the restoration design will need to be revisited.

The capital cost estimate has been prepared for the lifetime of the development and is based on the following assumptions:

- Quantities are based on indicative calculations assuming a final fill profile of 161mAHD for the Future Landfill Stage 2 and at existing surface levels for the Active Landfill Stage 1;
- Rates are based on Talis' experience in the field and rates published in *Rawlinsons Australian Construction Handbook (Edition 33, 2015)* and could change depending on market conditions;
- Talis assumes that sufficient material is available onsite to undertake all construction and capping works;
- No inflation has been accounted for;
- Professional Fees and Services of 10% has been added to the total cost;
- Local loading of 8% has been added to the total cost;
- Contingency of 20% has been added to the total cost; and
- GST is not included in any of the estimates.

Figures

Appendix A: Drawings

Drawing C-100: Existing Topography and Infrastructure

Drawing C-101: Proposed Site Layout

Drawing C-102: Future Landfill Stage 2 - Landfill Cell Layout

Drawing C-103: Future Landfill Stage 2 - Top of Waste Layout

Drawing C-104: Top of Restoration Profile Layout

Drawing C-105: Future Landfill Stage 2 - Phased Capping Layout

Drawing C-106: Phase 1 Top of Waste Stage Development Layout

Drawing C-110: Future Landfill Stage 2 - Leachate Management System Layout

Drawing C-111: Leachate Ponds Layout & Section

Drawing C-112: Surface Water Management System Layout

Drawing C-113: Landfill Gas Management System Layout

Drawing C-201: Future Landfill Stage 2 - Typical Long Sections

Drawing C-202: Phase 1 Staged Development Long Section

Drawing C-301: Active Landfill Stage 1 - Typical Construction Details Sheet 1 of 2

Drawing C-302: Active Landfill Stage 1 - Typical Construction Details Sheet 2 of 2

Drawing C-303: Active Landfill Stage 1 - Typical Gas Management Details

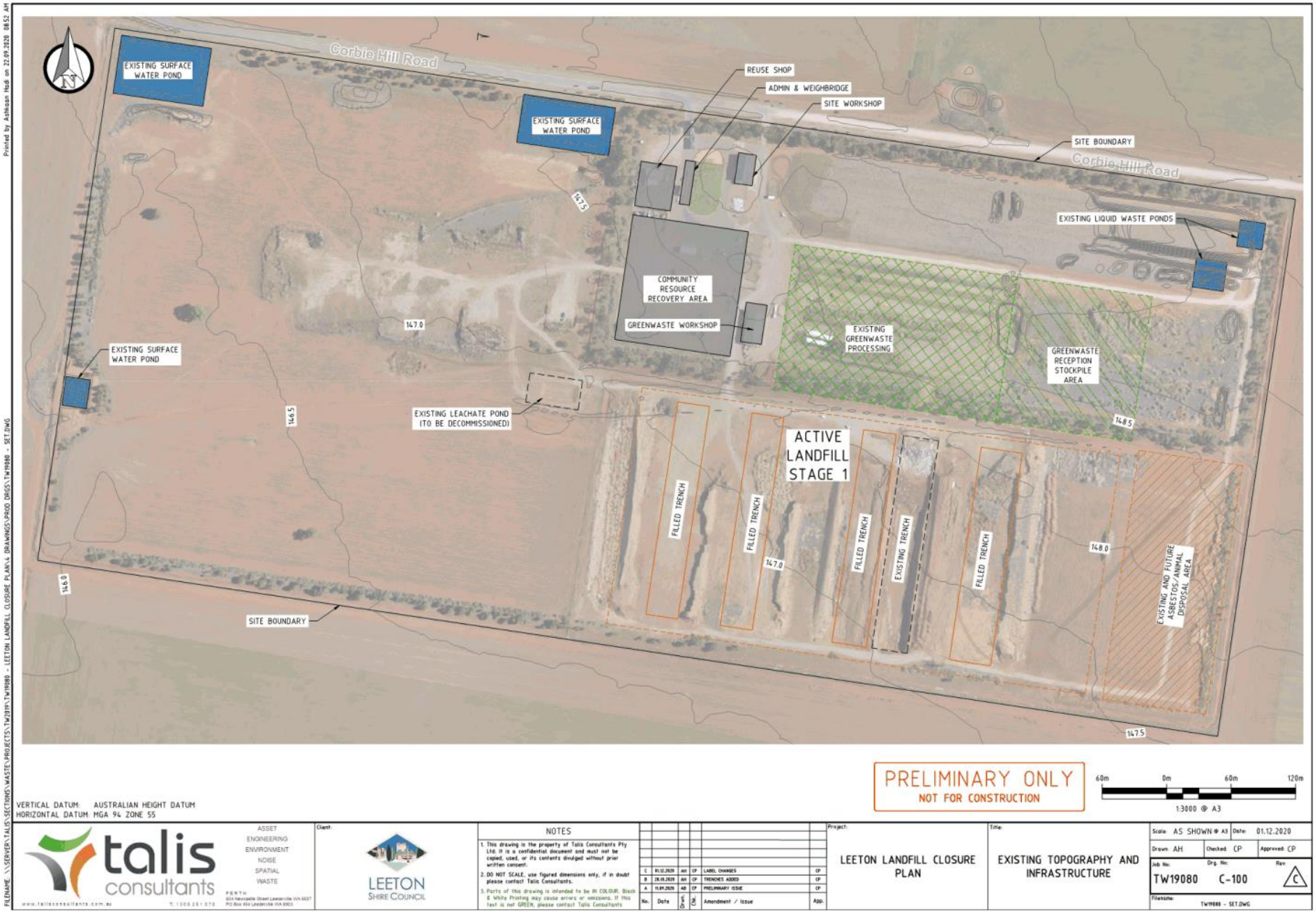
Drawing C-304: Future Landfill Stage 2 - Typical Construction Details Sheet 1 of 3

Drawing C-305: Future Landfill Stage 2 - Typical Construction Details Sheet 2 of 3

Drawing C-306: Future Landfill Stage 2 - Typical Construction Details Sheet 3 of 3

Drawing C-307: Future Landfill Stage 2 - Typical Gas Management Details

Drawing C-308: Future Landfill Stage 2 - Landfill Methodology


Corbie Hill Road
EXISTING SURFACE WATER POND
EXISTING SURFACE WATER POND
EXISTING SURFACE WATER POND
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
SITE BOUNDARY
Corbie Hill Road
EXISTING LIQUID WASTE PONDS
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
GREENWASTE RECEPTION STOCKPILE AREA
EXISTING LEACHATE POND (TO BE DECOMMISSIONED)
ACTIVE LANDFILL STAGE 1
FILLED TRENCH
FILLED TRENCH
FILLED TRENCH
EXISTING TRENCH
FILLED TRENCH
EXISTING AND FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
SITE BOUNDARY
1475
1470
1465
1485
1480
1460
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
60m 0m 60m 120m
1:3000 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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ASSET
ENGINEERING
ENVIRONMENT
NOISE
SPATIAL
WASTE
LEETON SHIRE COUNCIL
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A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drwn Chk Amendment / Issue App.
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Title: EXISTING TOPOGRAPHY AND INFRASTRUCTURE
Scale: AS SHOWN @ A3 Date: 01.12.2020
Drawn: AH Checked: CP Approved: CP
Job No. TW19080 Drg. No. C-100 Rev. C
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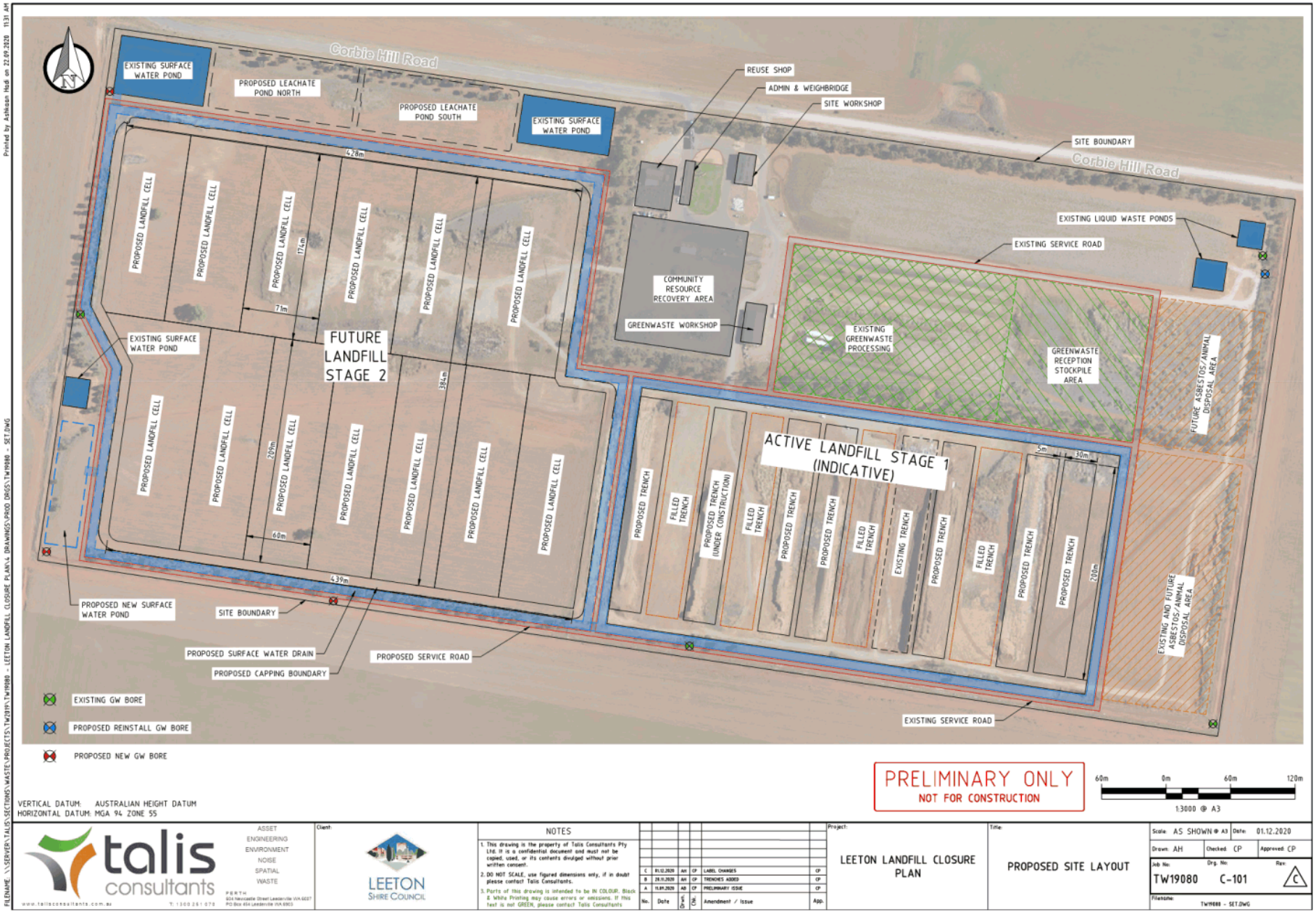
Corbie Hill Road
EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
SITE BOUNDARY
Corbie Hill Road
EXISTING LIQUID WASTE PONDS
EXISTING SERVICE ROAD
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
GREENWASTE RECEPTION STOCKPILE AREA
FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
PROPOSED LANDFILL CELL
FUTURE LANDFILL STAGE 2
EXISTING SURFACE WATER POND
ACTIVE LANDFILL STAGE 1 (INDICATIVE)
PROPOSED TRENCH
FILLED TRENCH
PROPOSED TRENCH (UNDER CONSTRUCTION)
EXISTING TRENCH
EXISTING AND FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
428m
174m
71m
384m
297m
60m
439m
5m
30m
210m
PROPOSED NEW SURFACE WATER POND
SITE BOUNDARY
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
PROPOSED SERVICE ROAD
EXISTING SERVICE ROAD
EXISTING GW BORE
PROPOSED REINSTALL GW BORE
PROPOSED NEW GW BORE
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
60m 0m 60m 120m
1:3000 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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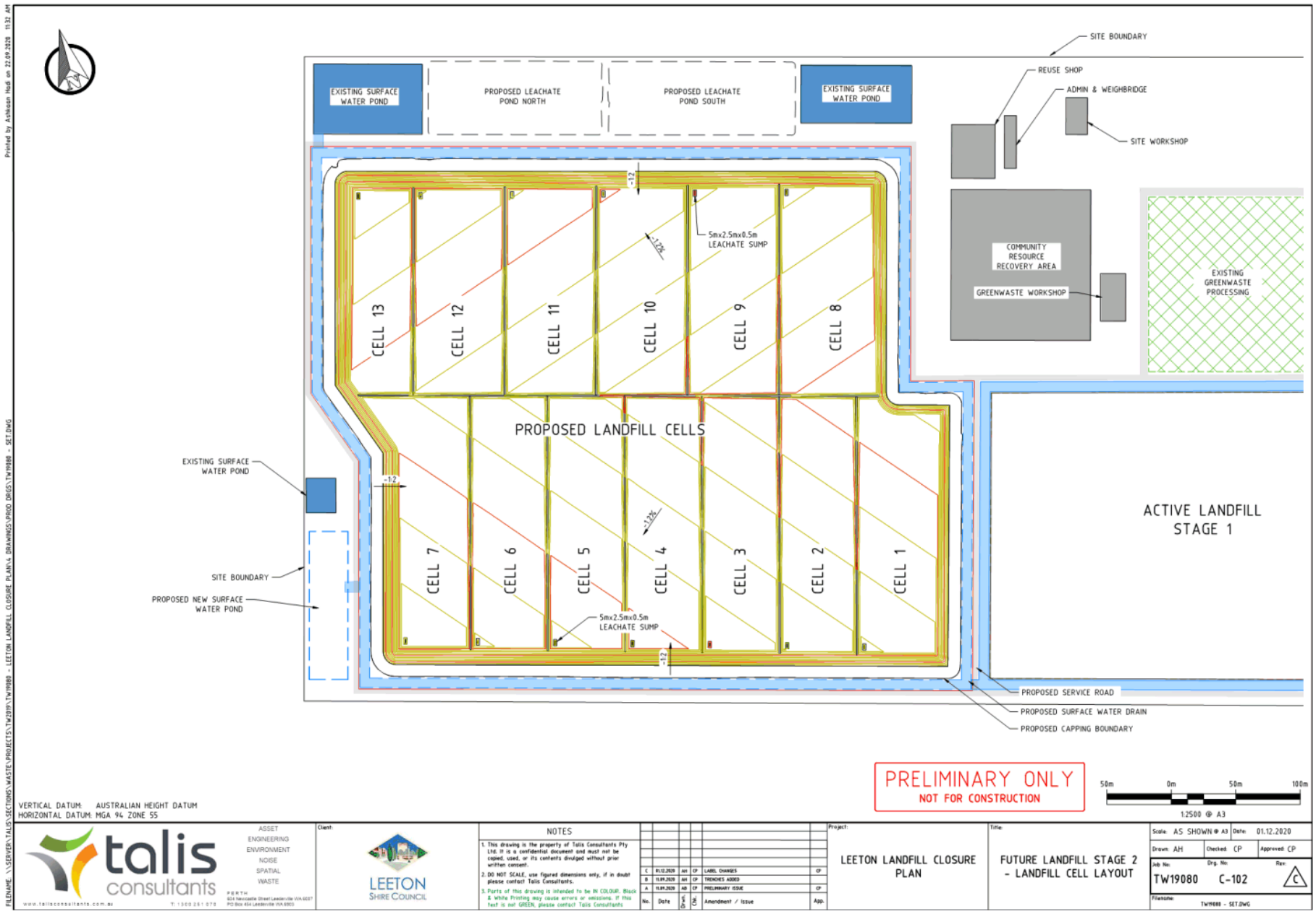
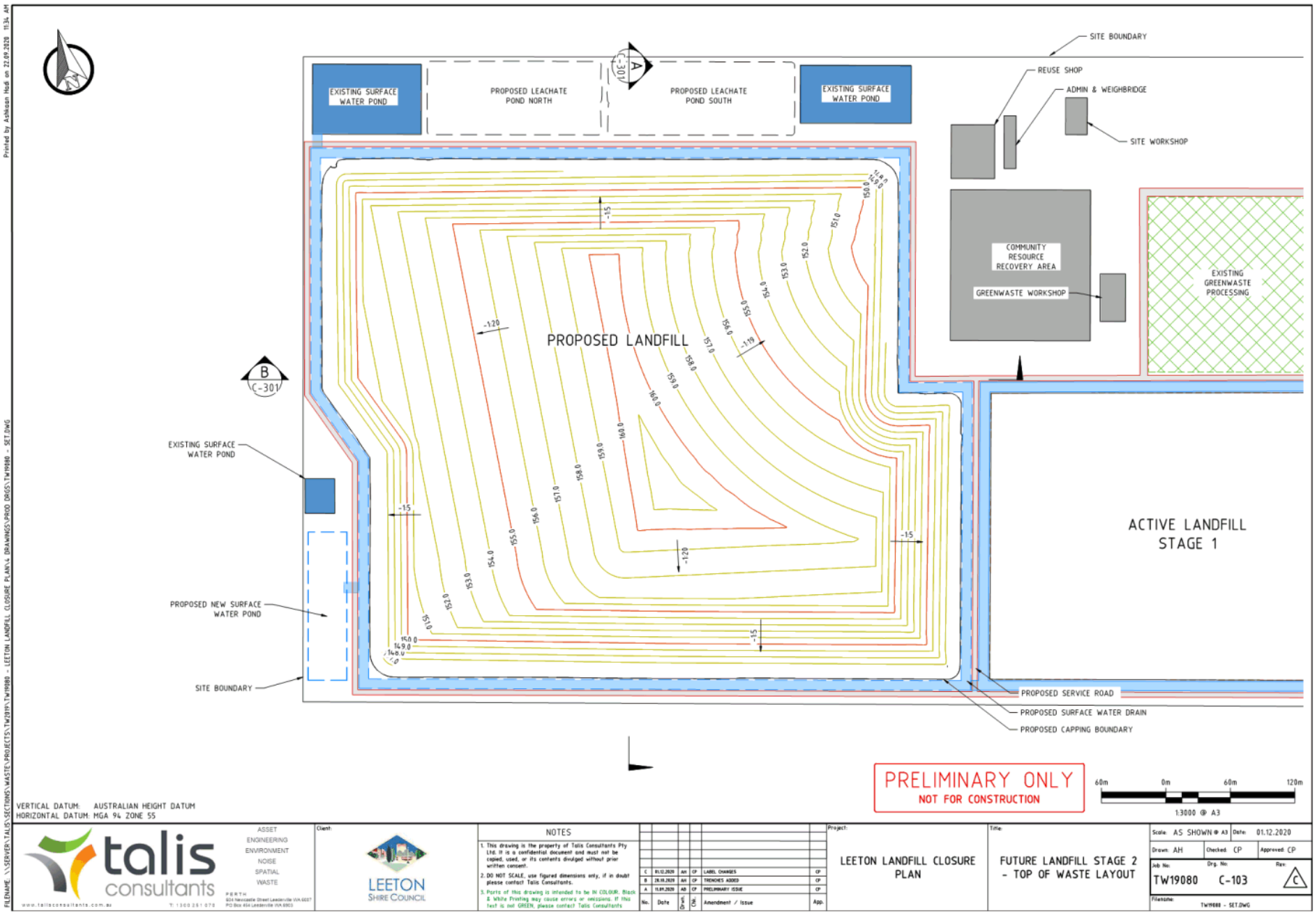
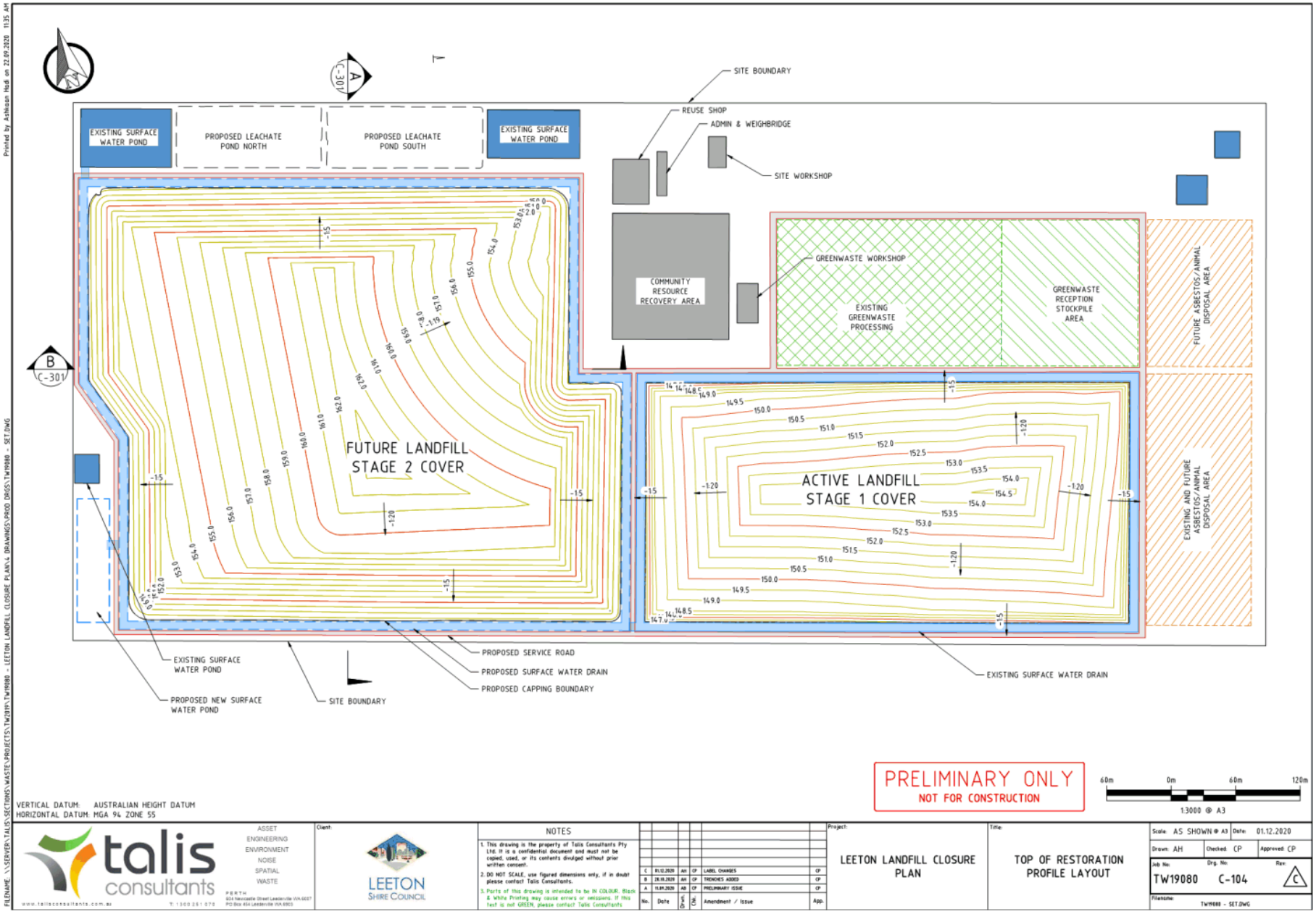
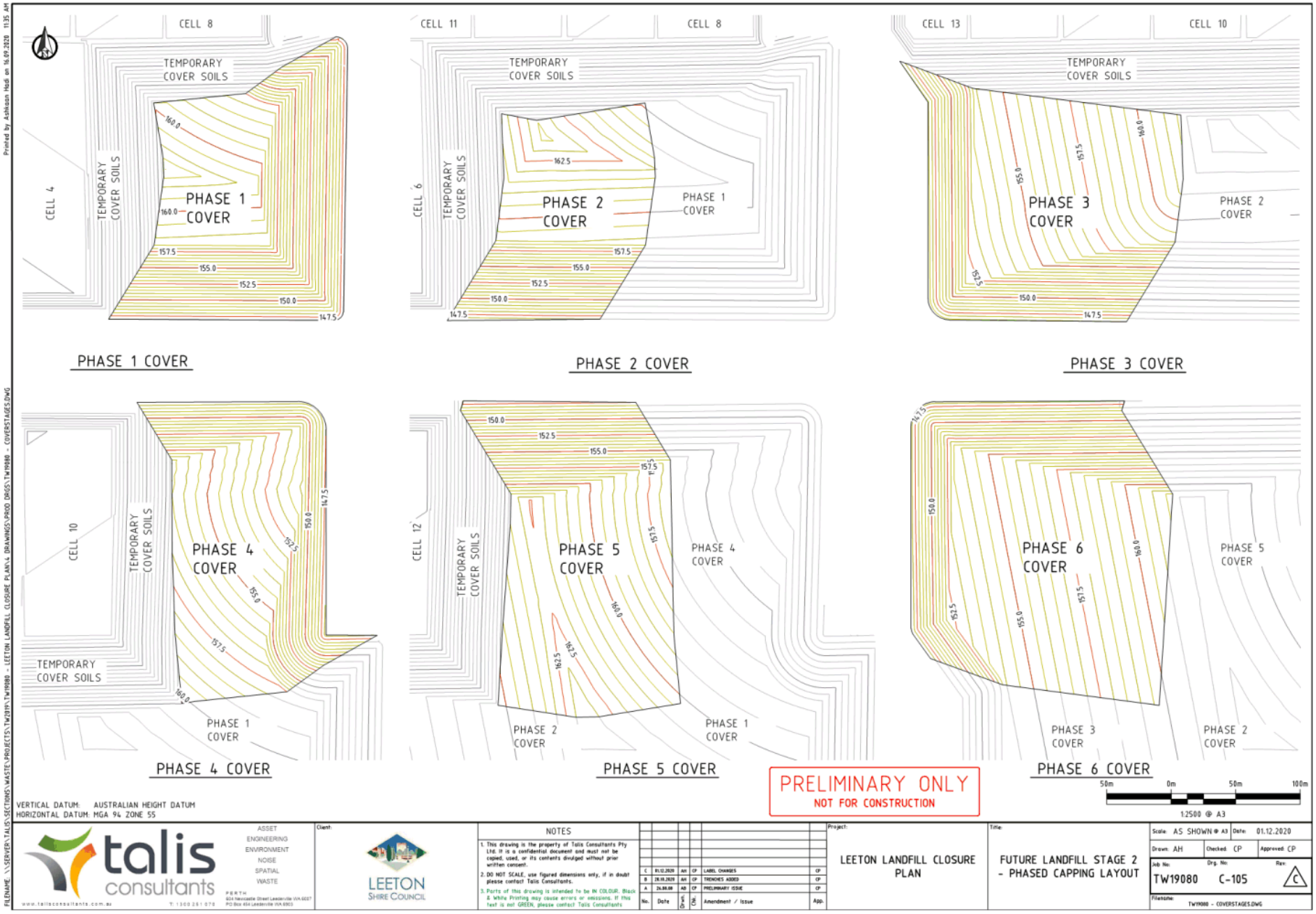
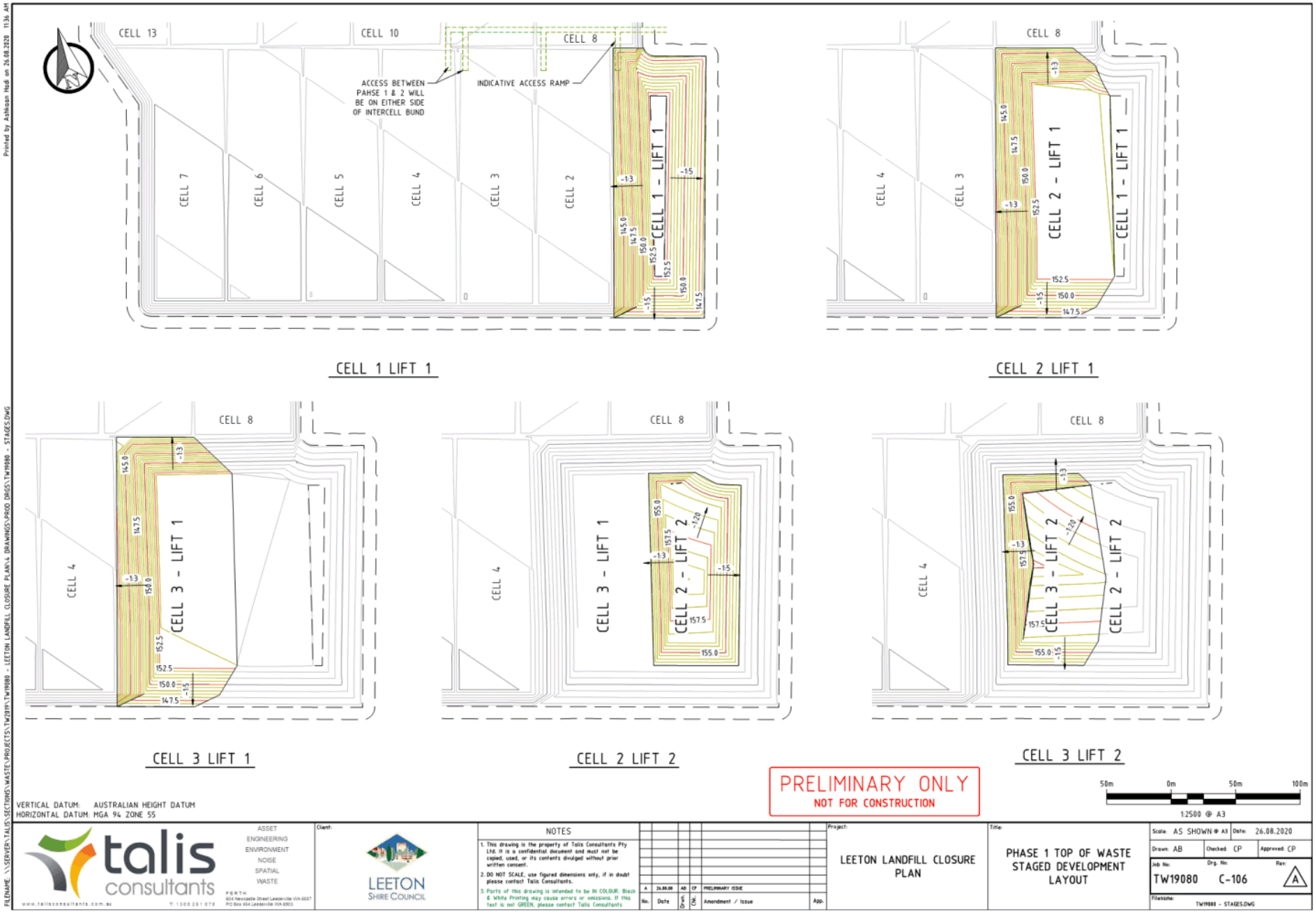
B 28.11.2020 AH CP TRENCHES ADDED CP
A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drwn Chk Amendment / Issue App.
Project: LEETON LANDFILL CLOSURE PLAN
Title: PROPOSED SITE LAYOUT
Scale: AS SHOWN @ A3 Date: 01.12.2020
Drawn: AH Checked: CP Approved: CP
Job No: TW19080 Drg. No: C-101 Rev: C
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DRGS\TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:31 AM

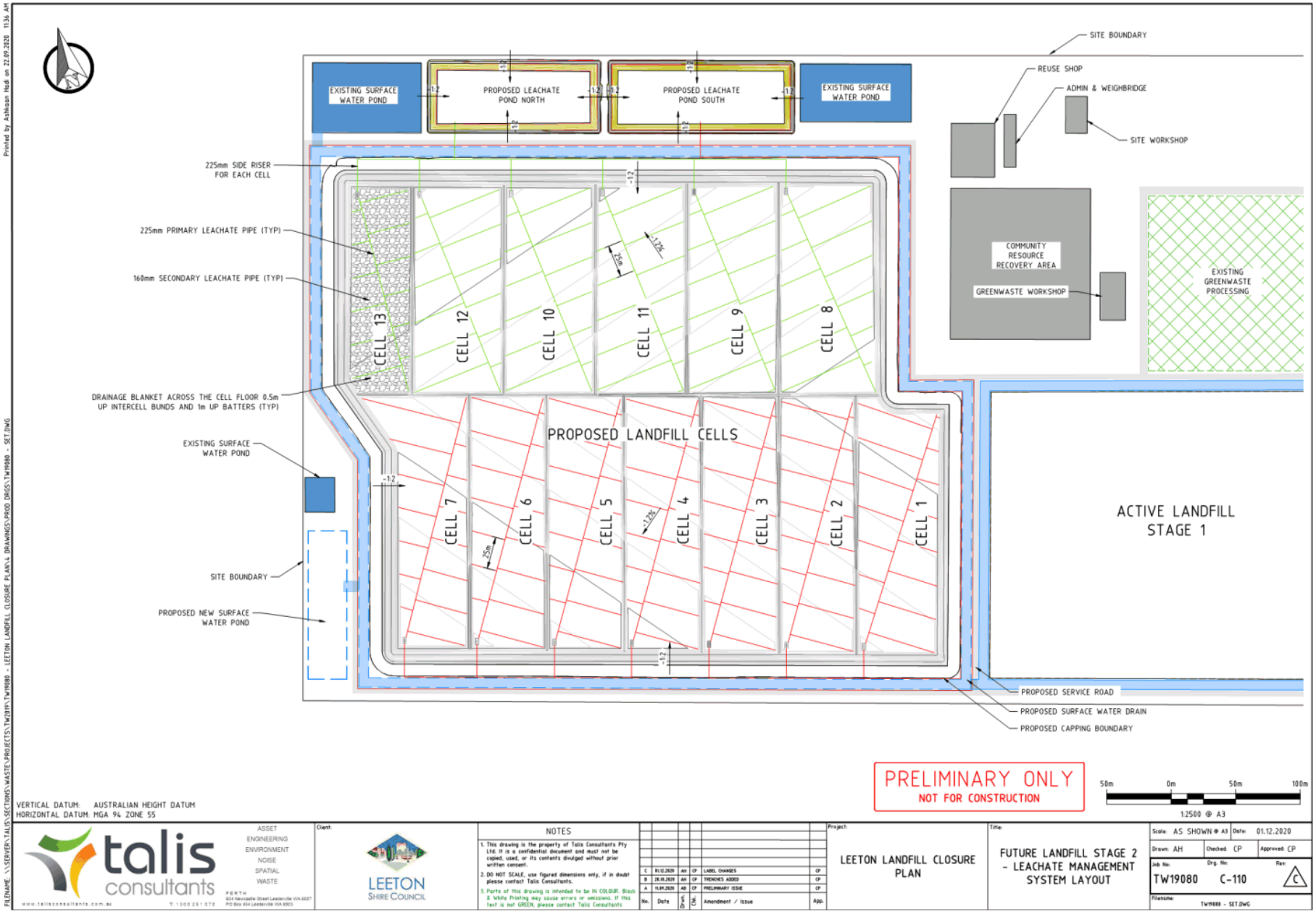

EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
SITE BOUNDARY
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
5mx2.5mx0.5m LEACHATE SUMP
CELL 13
CELL 12
CELL 11
CELL 10
CELL 9
CELL 8
PROPOSED LANDFILL CELLS
CELL 7
CELL 6
CELL 5
CELL 4
CELL 3
CELL 2
CELL 1
ACTIVE LANDFILL STAGE 1
EXISTING SURFACE WATER POND
SITE BOUNDARY
PROPOSED NEW SURFACE WATER POND
PROPOSED SERVICE ROAD
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
1:2500 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
NOTES
LEETON LANDFILL CLOSURE PLAN
FUTURE LANDFILL STAGE 2 - LANDFILL CELL LAYOUT
TW19080 C-102

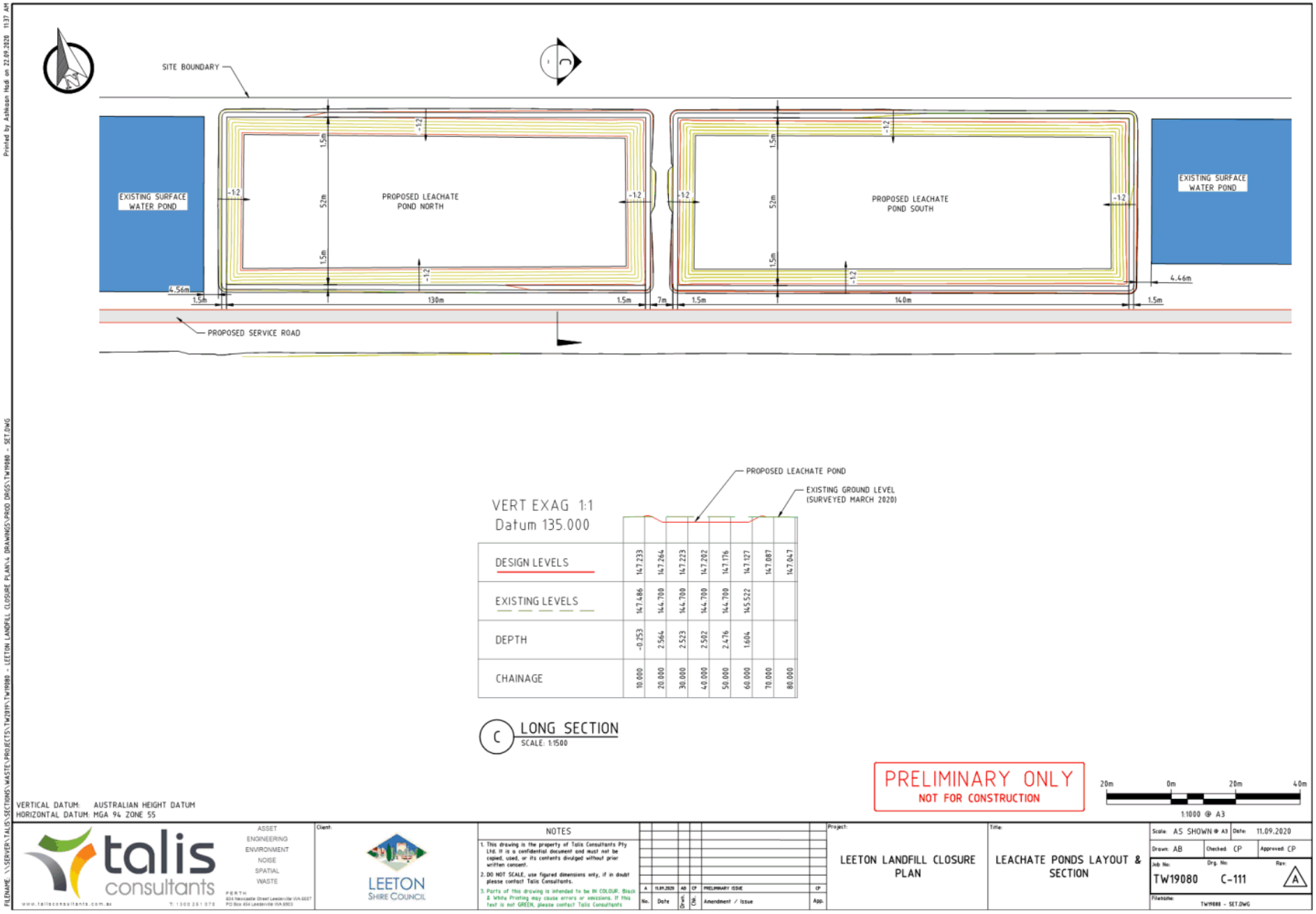

EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
SITE BOUNDARY
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
PROPOSED LANDFILL
ACTIVE LANDFILL STAGE 1
EXISTING SURFACE WATER POND
PROPOSED NEW SURFACE WATER POND
SITE BOUNDARY
PROPOSED SERVICE ROAD
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
1:3000 @ A3
NOTES
LEETON LANDFILL CLOSURE PLAN
FUTURE LANDFILL STAGE 2 - TOP OF WASTE LAYOUT
TW19080 C-103

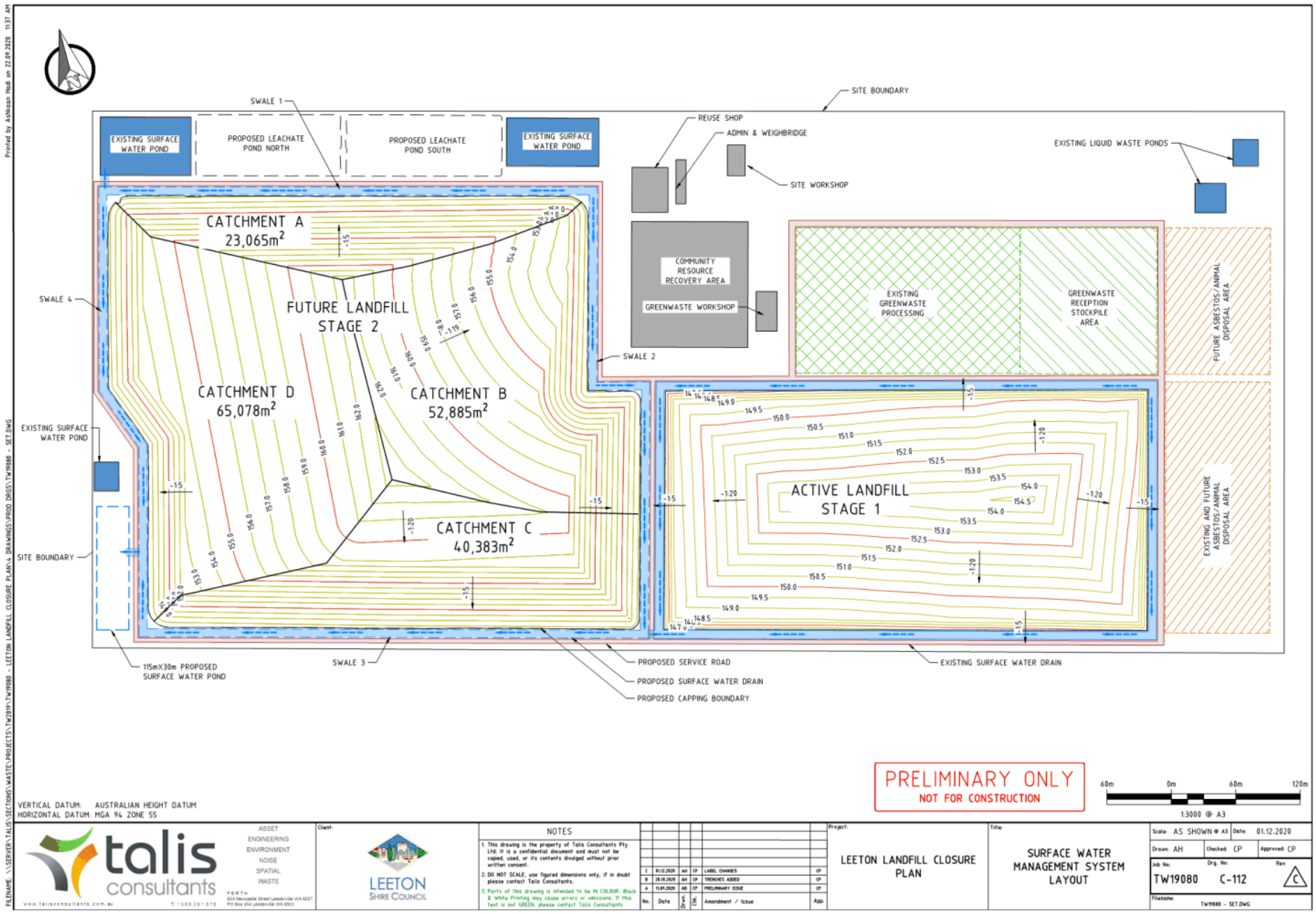

SITE BOUNDARY
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
GREENWASTE RECEPTION STOCKPILE AREA
FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
EXISTING AND FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
FUTURE LANDFILL STAGE 2 COVER
ACTIVE LANDFILL STAGE 1 COVER
EXISTING SURFACE WATER POND
PROPOSED NEW SURFACE WATER POND
SITE BOUNDARY
PROPOSED SERVICE ROAD
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
EXISTING SURFACE WATER DRAIN
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
1:3000 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
LEETON SHIRE COUNCIL
NOTES
LEETON LANDFILL CLOSURE PLAN
TOP OF RESTORATION PROFILE LAYOUT
TW19080 C-104


CELL 8
TEMPORARY COVER SOILS
PHASE 1 COVER
CELL 4
CELL 11
CELL 8
CELL 6
PHASE 2 COVER
PHASE 1 COVER
CELL 13
CELL 10
PHASE 3 COVER
PHASE 2 COVER
CELL 10
PHASE 4 COVER
PHASE 1 COVER
CELL 12
PHASE 5 COVER
PHASE 4 COVER
PHASE 2 COVER
PHASE 1 COVER
PHASE 6 COVER
PHASE 5 COVER
PHASE 3 COVER
PHASE 2 COVER
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
1:2500 @ A3
talis consultants
LEETON SHIRE COUNCIL
NOTES
LEETON LANDFILL CLOSURE PLAN
FUTURE LANDFILL STAGE 2 - PHASED CAPPING LAYOUT
TW19080 C-105
01.12.2020


CELL 13
CELL 10
CELL 8
ACCESS BETWEEN PAHSE 1 & 2 WILL BE ON EITHER SIDE OF INTERCELL BUND
INDICATIVE ACCESS RAMP
CELL 7
CELL 6
CELL 5
CELL 4
CELL 3
CELL 2
CELL 1 - LIFT 1
CELL 1 LIFT 1
CELL 2 - LIFT 1
CELL 2 LIFT 1
CELL 3 - LIFT 1
CELL 3 LIFT 1
CELL 2 - LIFT 2
CELL 2 LIFT 2
CELL 3 - LIFT 2
CELL 3 LIFT 2
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
1:2500 @ A3
talis consultants
LEETON SHIRE COUNCIL
NOTES
LEETON LANDFILL CLOSURE PLAN
PHASE 1 TOP OF WASTE STAGED DEVELOPMENT LAYOUT
TW19080
C-106


EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
SITE BOUNDARY
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
225mm SIDE RISER FOR EACH CELL
225mm PRIMARY LEACHATE PIPE (TYP)
160mm SECONDARY LEACHATE PIPE (TYP)
DRAINAGE BLANKET ACROSS THE CELL FLOOR 0.5m UP INTERCELL BUNDS AND 1m UP BATTERS (TYP)
EXISTING SURFACE WATER POND
SITE BOUNDARY
PROPOSED NEW SURFACE WATER POND
CELL 13
CELL 12
CELL 10
CELL 11
CELL 9
CELL 8
CELL 7
CELL 6
CELL 5
CELL 4
CELL 3
CELL 2
CELL 1
PROPOSED LANDFILL CELLS
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
ACTIVE LANDFILL STAGE 1
PROPOSED SERVICE ROAD
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
1:2500 @ A3
talis consultants
LEETON SHIRE COUNCIL
NOTES
LEETON LANDFILL CLOSURE PLAN
FUTURE LANDFILL STAGE 2 - LEACHATE MANAGEMENT SYSTEM LAYOUT
TW19080
C-110


SITE BOUNDARY
EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
PROPOSED SERVICE ROAD
4.56m
1.5m
130m
7m
140m
4.46m
PROPOSED LEACHATE POND
EXISTING GROUND LEVEL (SURVEYED MARCH 2020)
VERT EXAG 1:1
Datum 135.000
DESIGN LEVELS
EXISTING LEVELS
DEPTH
CHAINAGE
C LONG SECTION
SCALE: 1:500
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
1:1000 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
LEETON SHIRE COUNCIL
NOTES
LEETON LANDFILL CLOSURE PLAN
LEACHATE PONDS LAYOUT & SECTION
TW19080
C-111
A


SWALE 1
SITE BOUNDARY
EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
EXISTING LIQUID WASTE PONDS
CATCHMENT A
23,065m²
SWALE 4
FUTURE LANDFILL STAGE 2
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
GREENWASTE RECEPTION STOCKPILE AREA
FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
SWALE 2
CATCHMENT D
65,078m²
CATCHMENT B
52,885m²
EXISTING SURFACE WATER POND
ACTIVE LANDFILL STAGE 1
CATCHMENT C
40,383m²
SITE BOUNDARY
EXISTING AND FUTURE ASBESTOS/ANIMAL DISPOSAL AREA
115mX30m PROPOSED SURFACE WATER POND
SWALE 3
PROPOSED SERVICE ROAD
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
EXISTING SURFACE WATER DRAIN
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
60m 0m 60m 120m
1:3000 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
ASSET ENGINEERING ENVIRONMENT NOISE SPATIAL WASTE
LEETON SHIRE COUNCIL
NOTES
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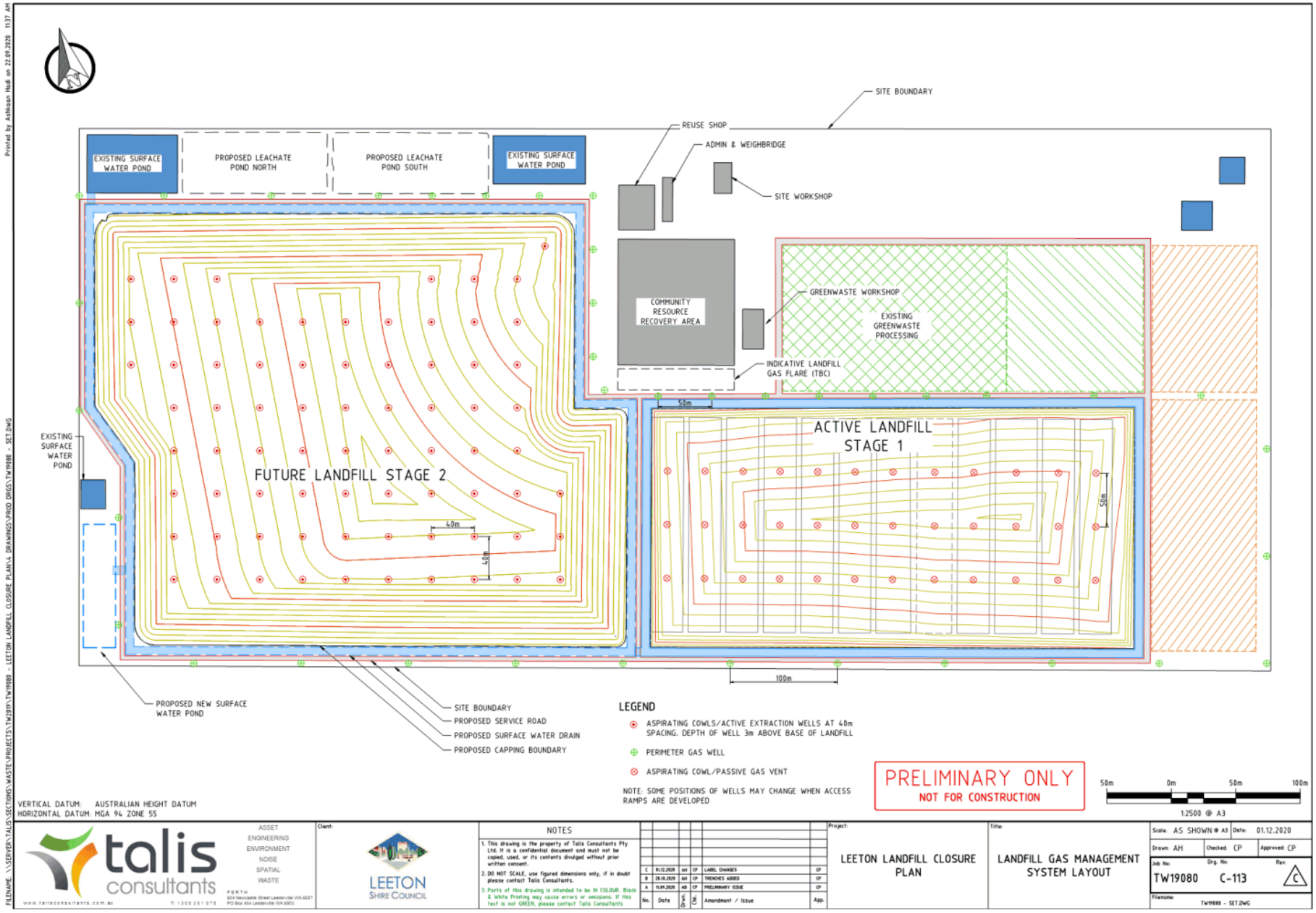
C 01.12.2020 AH CP LABEL CHANGES CP
B 28.10.2020 AH CP TRENCHES ADDED CP
A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drwn Chk Amendment / Issue App.
Project: LEETON LANDFILL CLOSURE PLAN
Title: SURFACE WATER MANAGEMENT SYSTEM LAYOUT
Scale: AS SHOWN @ A3 Date: 01.12.2020
Drawn: AH Checked: CP Approved: CP
Job No: TW19080 Drg. No: C-112 Rev: C
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DRGS\TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:37 AM


SITE BOUNDARY
REUSE SHOP
ADMIN & WEIGHBRIDGE
SITE WORKSHOP
EXISTING SURFACE WATER POND
PROPOSED LEACHATE POND NORTH
PROPOSED LEACHATE POND SOUTH
EXISTING SURFACE WATER POND
COMMUNITY RESOURCE RECOVERY AREA
GREENWASTE WORKSHOP
EXISTING GREENWASTE PROCESSING
INDICATIVE LANDFILL GAS FLARE (TBC)
EXISTING SURFACE WATER POND
FUTURE LANDFILL STAGE 2
ACTIVE LANDFILL STAGE 1
40m
40m
50m
50m
100m
PROPOSED NEW SURFACE WATER POND
SITE BOUNDARY
PROPOSED SERVICE ROAD
PROPOSED SURFACE WATER DRAIN
PROPOSED CAPPING BOUNDARY
LEGEND
ASPIRATING COWLS/ACTIVE EXTRACTION WELLS AT 40m SPACING. DEPTH OF WELL 3m ABOVE BASE OF LANDFILL
PERIMETER GAS WELL
ASPIRATING COWL/PASSIVE GAS VENT
NOTE: SOME POSITIONS OF WELLS MAY CHANGE WHEN ACCESS RAMPS ARE DEVELOPED
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
50m 0m 50m 100m
1:2500 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
ASSET
ENGINEERING
ENVIRONMENT
NOISE
SPATIAL
WASTE
LEETON SHIRE COUNCIL
NOTES
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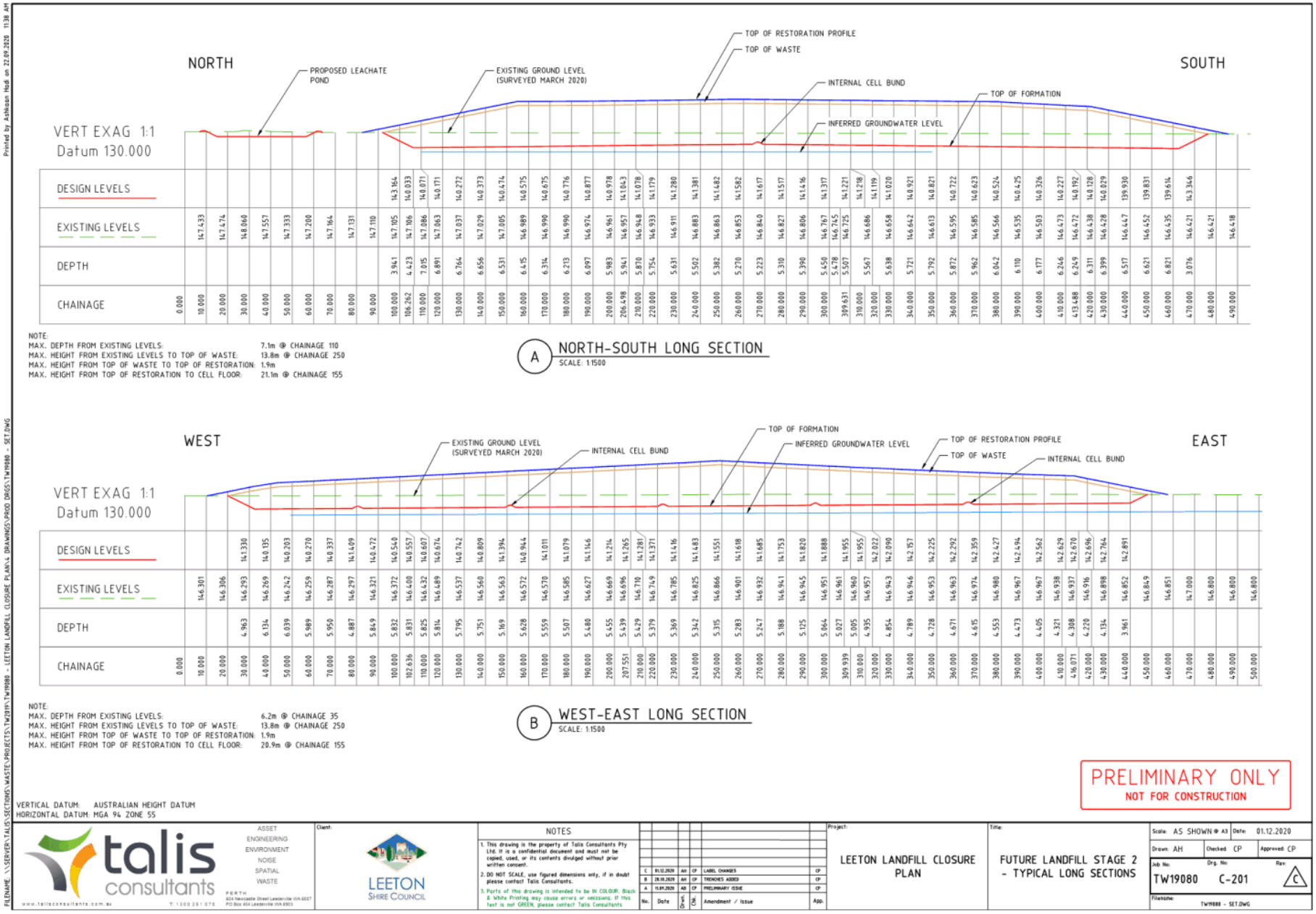
C 01.12.2020 AH CP LABEL CHANGES CP
B 28.10.2020 AH CP TRENCHES ADDED CP
A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drn Chk Amendment / Issue App.
Project: LEETON LANDFILL CLOSURE PLAN
Title: LANDFILL GAS MANAGEMENT SYSTEM LAYOUT
Scale: AS SHOWN @ A3 Date: 01.12.2020
Drawn: AH Checked: CP Approved: CP
Job No: TW19080 Drg. No: C-113 Rev: C
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\Tw2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DRGS\TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:37 AM


NORTH
SOUTH
PROPOSED LEACHATE POND
EXISTING GROUND LEVEL (SURVEYED MARCH 2020)
TOP OF RESTORATION PROFILE
TOP OF WASTE
INTERNAL CELL BUND
TOP OF FORMATION
INFERRED GROUNDWATER LEVEL
VERT EXAG 1:1
Datum 130.000
DESIGN LEVELS
EXISTING LEVELS
DEPTH
CHAINAGE
NOTE:
MAX. DEPTH FROM EXISTING LEVELS: 7.1m @ CHAINAGE 110
MAX. HEIGHT FROM EXISTING LEVELS TO TOP OF WASTE: 13.8m @ CHAINAGE 250
MAX. HEIGHT FROM TOP OF WASTE TO TOP OF RESTORATION: 1.9m
MAX. HEIGHT FROM TOP OF RESTORATION TO CELL FLOOR: 21.1m @ CHAINAGE 155
A NORTH-SOUTH LONG SECTION
SCALE: 1:1500
WEST
EAST
EXISTING GROUND LEVEL (SURVEYED MARCH 2020)
INTERNAL CELL BUND
TOP OF FORMATION
INFERRED GROUNDWATER LEVEL
TOP OF RESTORATION PROFILE
TOP OF WASTE
INTERNAL CELL BUND
VERT EXAG 1:1
Datum 130.000
DESIGN LEVELS
EXISTING LEVELS
DEPTH
CHAINAGE
NOTE:
MAX. DEPTH FROM EXISTING LEVELS: 6.2m @ CHAINAGE 35
MAX. HEIGHT FROM EXISTING LEVELS TO TOP OF WASTE: 13.8m @ CHAINAGE 250
MAX. HEIGHT FROM TOP OF WASTE TO TOP OF RESTORATION: 1.9m
MAX. HEIGHT FROM TOP OF RESTORATION TO CELL FLOOR: 20.9m @ CHAINAGE 155
B WEST-EAST LONG SECTION
SCALE: 1:1500
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
ASSET
ENGINEERING
ENVIRONMENT
NOISE
SPATIAL
WASTE
Client:
LEETON SHIRE COUNCIL
NOTES
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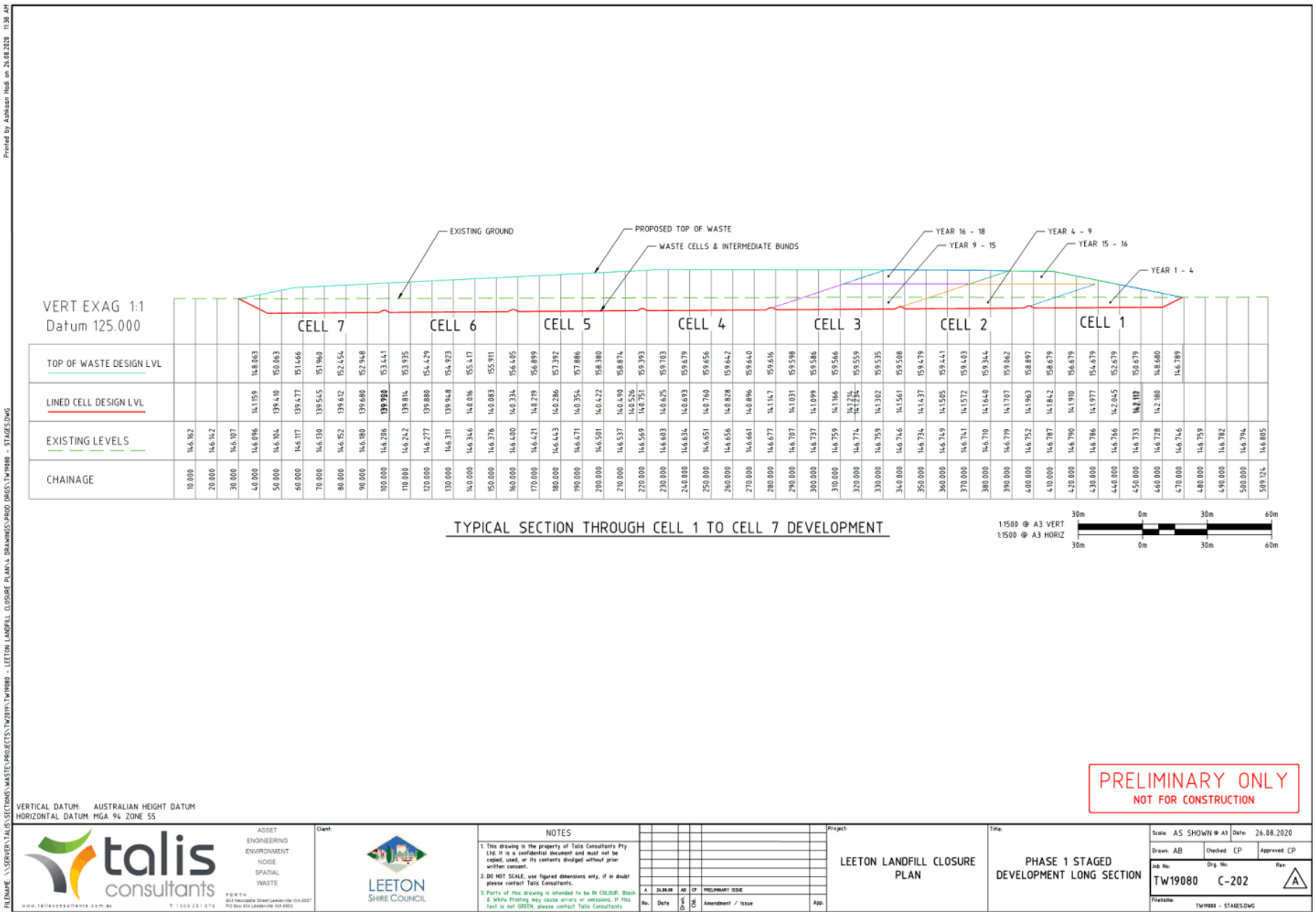
C 01.12.2020 AH CP LABEL CHANGES CP
B 28.10.2020 AH CP TRENCHES ADDED CP
A 15.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drwn Chk Amendment / Issue App.
Project:
LEETON LANDFILL CLOSURE PLAN
Title:
FUTURE LANDFILL STAGE 2 - TYPICAL LONG SECTIONS
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No.: TW19080
Drg. No.: C-201
Rev.: C
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DWGS\TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:38 AM


EXISTING GROUND
PROPOSED TOP OF WASTE
WASTE CELLS & INTERMEDIATE BUNDS
YEAR 16 - 18
YEAR 9 - 15
YEAR 4 - 9
YEAR 15 - 16
YEAR 1 - 4
VERT EXAG 1:1
Datum 125.000
CELL 7
CELL 6
CELL 5
CELL 4
CELL 3
CELL 2
CELL 1
TOP OF WASTE DESIGN LVL
LINED CELL DESIGN LVL
EXISTING LEVELS
CHAINAGE
TYPICAL SECTION THROUGH CELL 1 TO CELL 7 DEVELOPMENT
1:1500 @ A3 VERT
1:1500 @ A3 HORIZ
30m 0m 30m 60m
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
ASSET
ENGINEERING
ENVIRONMENT
NOISE
SPATIAL
WASTE
Client:
LEETON SHIRE COUNCIL
NOTES
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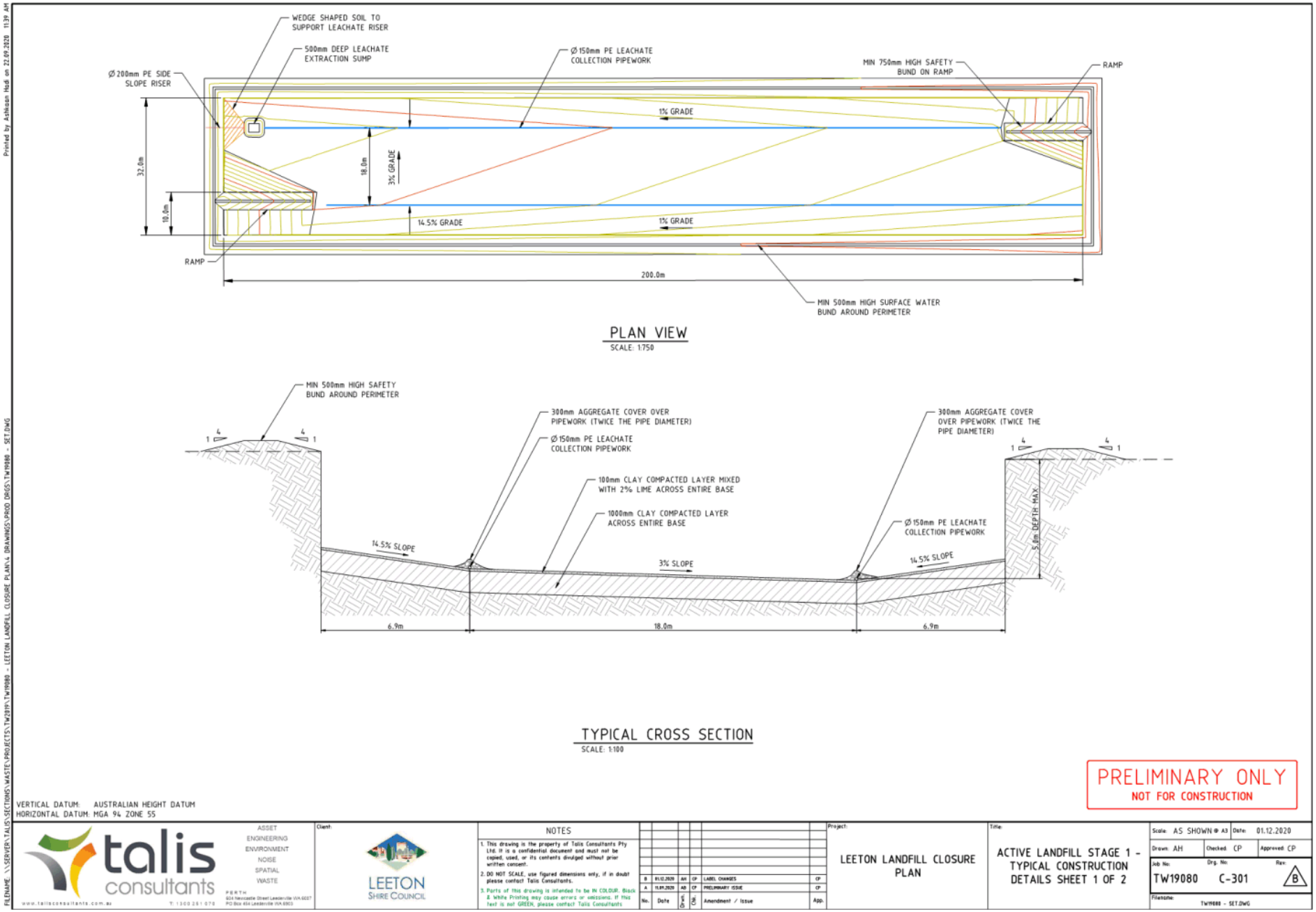
A 26.08.20 AB CP PRELIMINARY ISSUE
No. Date Drwn Chk Amendment / Issue App.
Project:
LEETON LANDFILL CLOSURE PLAN
Title:
PHASE 1 STAGED DEVELOPMENT LONG SECTION
Scale: AS SHOWN @ A3
Date: 26.08.2020
Drawn: AB
Checked: CP
Approved: CP
Job No.: TW19080
Drg. No.: C-202
Rev.: A
Filename: TW19080 - STAGES.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DWGS\TW19080 - STAGES.DWG
Printed by Ashleigh Hall on 26.08.2020 11:38 AM


WEDGE SHAPED SOIL TO SUPPORT LEACHATE RISER
500mm DEEP LEACHATE EXTRACTION SUMP
Ø 150mm PE LEACHATE COLLECTION PIPEWORK
MIN 750mm HIGH SAFETY BUND ON RAMP
RAMP
Ø 200mm PE SIDE SLOPE RISER
1% GRADE
32.0m
18.0m
3% GRADE
10.0m
14.5% GRADE
1% GRADE
RAMP
200.0m
MIN 500mm HIGH SURFACE WATER BUND AROUND PERIMETER
PLAN VIEW
SCALE: 1:750
MIN 500mm HIGH SAFETY BUND AROUND PERIMETER
300mm AGGREGATE COVER OVER PIPEWORK (TWICE THE PIPE DIAMETER)
Ø 150mm PE LEACHATE COLLECTION PIPEWORK
100mm CLAY COMPACTED LAYER MIXED WITH 2% LIME ACROSS ENTIRE BASE
1000mm CLAY COMPACTED LAYER ACROSS ENTIRE BASE
300mm AGGREGATE COVER OVER PIPEWORK (TWICE THE PIPE DIAMETER)
Ø 150mm PE LEACHATE COLLECTION PIPEWORK
5.0m DEPTH MAX
14.5% SLOPE
3% SLOPE
14.5% SLOPE
6.9m
18.0m
6.9m
TYPICAL CROSS SECTION
SCALE: 1:100
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
talis consultants
ASSET
ENGINEERING
ENVIRONMENT
NOISE
SPATIAL
WASTE
LEETON SHIRE COUNCIL
NOTES
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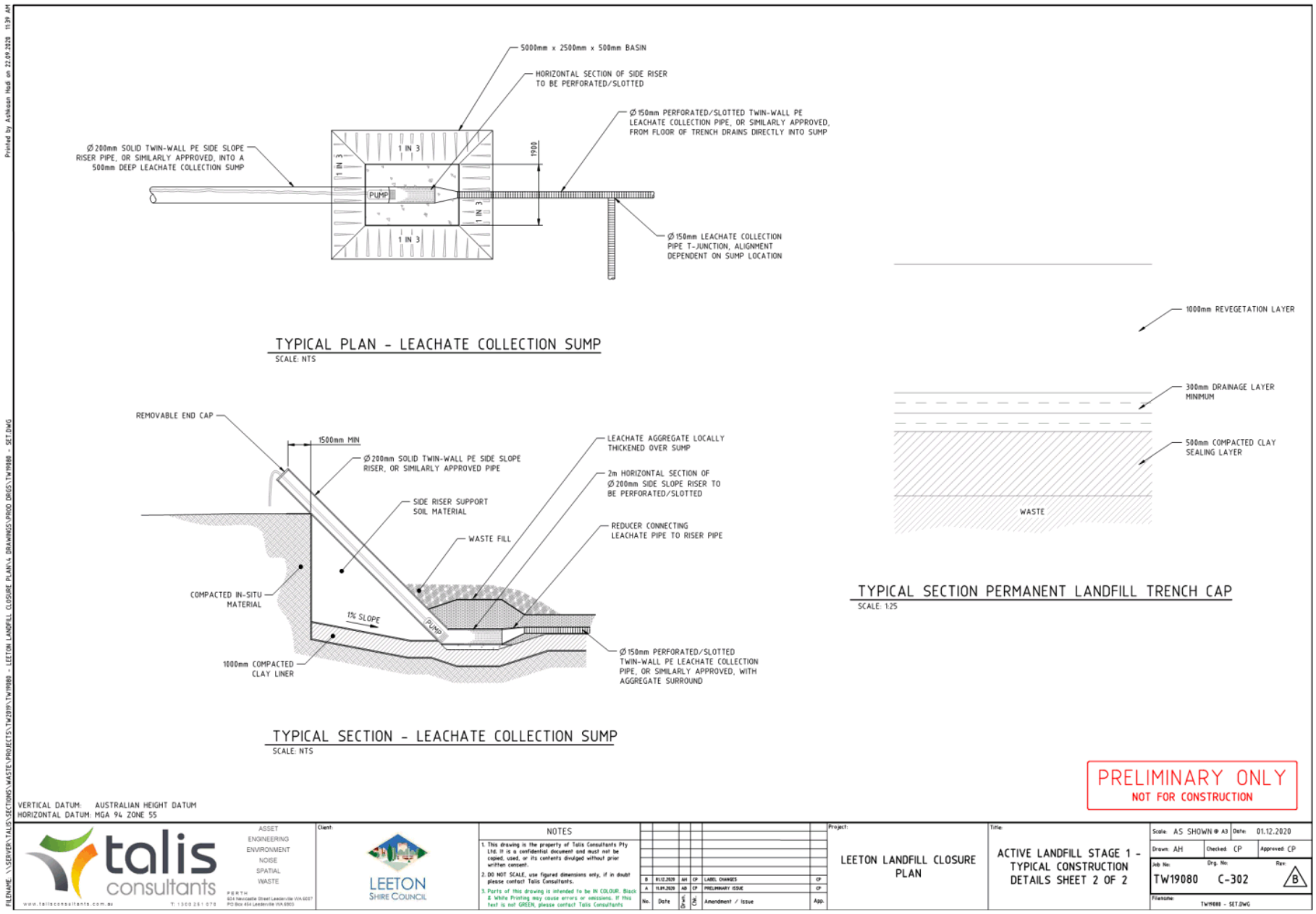
B 01.12.2020 AH CP LABEL CHANGES CP
A 11.09.2020 AH CP PRELIMINARY ISSUE CP
No. Date Dsn Chk Amendment / Issue App.
Project: LEETON LANDFILL CLOSURE PLAN
Title: ACTIVE LANDFILL STAGE 1 - TYPICAL CONSTRUCTION DETAILS SHEET 1 OF 2
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No: TW19080
Drg. No: C-301
Rev: B
Filename: TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:39 AM
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\Tw2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DRGS\TW19080 - SET.DWG


5000mm x 2500mm x 500mm BASIN
HORIZONTAL SECTION OF SIDE RISER TO BE PERFORATED/SLOTTED
Ø150mm PERFORATED/SLOTTED TWIN-WALL PE LEACHATE COLLECTION PIPE, OR SIMILARLY APPROVED, FROM FLOOR OF TRENCH DRAINS DIRECTLY INTO SUMP
Ø200mm SOLID TWIN-WALL PE SIDE SLOPE RISER PIPE, OR SIMILARLY APPROVED, INTO A 500mm DEEP LEACHATE COLLECTION SUMP
1 IN 3
1900
PUMP
Ø150mm LEACHATE COLLECTION PIPE T-JUNCTION, ALIGNMENT DEPENDENT ON SUMP LOCATION
TYPICAL PLAN - LEACHATE COLLECTION SUMP
SCALE: NTS
1000mm REVEGETATION LAYER
300mm DRAINAGE LAYER MINIMUM
500mm COMPACTED CLAY SEALING LAYER
WASTE
TYPICAL SECTION PERMANENT LANDFILL TRENCH CAP
SCALE: 1:25
REMOVABLE END CAP
1500mm MIN
Ø200mm SOLID TWIN-WALL PE SIDE SLOPE RISER, OR SIMILARLY APPROVED PIPE
LEACHATE AGGREGATE LOCALLY THICKENED OVER SUMP
2m HORIZONTAL SECTION OF Ø200mm SIDE SLOPE RISER TO BE PERFORATED/SLOTTED
SIDE RISER SUPPORT SOIL MATERIAL
WASTE FILL
REDUCER CONNECTING LEACHATE PIPE TO RISER PIPE
COMPACTED IN-SITU MATERIAL
1% SLOPE
PUMP
1000mm COMPACTED CLAY LINER
Ø150mm PERFORATED/SLOTTED TWIN-WALL PE LEACHATE COLLECTION PIPE, OR SIMILARLY APPROVED, WITH AGGREGATE SURROUND
TYPICAL SECTION - LEACHATE COLLECTION SUMP
SCALE: NTS
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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NOISE
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WASTE
Client:
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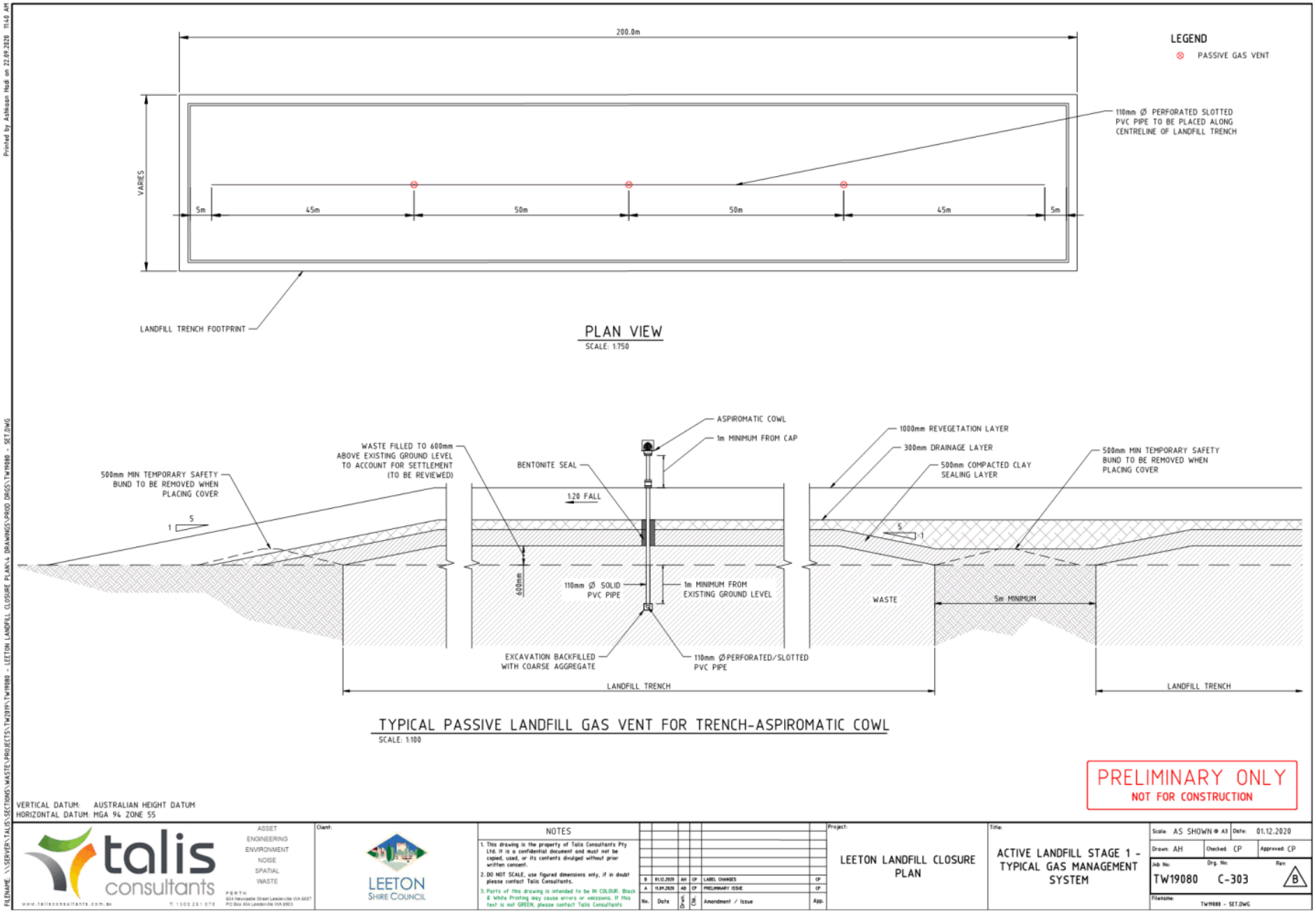
A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drn Chk Amendment / Issue App.
Project:
LEETON LANDFILL CLOSURE PLAN
Title:
ACTIVE LANDFILL STAGE 1 - TYPICAL CONSTRUCTION DETAILS SHEET 2 OF 2
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No: TW19080
Drg. No: C-302
Rev: B
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\Tw2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DWGS\TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:39 AM


200.0m
LEGEND
PASSIVE GAS VENT
110mm Ø PERFORATED SLOTTED PVC PIPE TO BE PLACED ALONG CENTRELINE OF LANDFILL TRENCH
VARIES
5m
45m
50m
50m
45m
5m
LANDFILL TRENCH FOOTPRINT
PLAN VIEW
SCALE: 1:750
ASPIROMATIC COWL
1m MINIMUM FROM CAP
1000mm REVEGETATION LAYER
300mm DRAINAGE LAYER
500mm COMPACTED CLAY SEALING LAYER
500mm MIN TEMPORARY SAFETY BUND TO BE REMOVED WHEN PLACING COVER
WASTE FILLED TO 600mm ABOVE EXISTING GROUND LEVEL TO ACCOUNT FOR SETTLEMENT (TO BE REVIEWED)
BENTONITE SEAL
1:20 FALL
500mm MIN TEMPORARY SAFETY BUND TO BE REMOVED WHEN PLACING COVER
1
5
600mm
110mm Ø SOLID PVC PIPE
1m MINIMUM FROM EXISTING GROUND LEVEL
WASTE
5m MINIMUM
EXCAVATION BACKFILLED WITH COARSE AGGREGATE
110mm Ø PERFORATED/SLOTTED PVC PIPE
LANDFILL TRENCH
LANDFILL TRENCH
TYPICAL PASSIVE LANDFILL GAS VENT FOR TRENCH-ASPIROMATIC COWL
SCALE: 1:100
PRELIMINARY ONLY
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VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date By Chk Amendment / Issue App.
Project:
LEETON LANDFILL CLOSURE PLAN
Title:
ACTIVE LANDFILL STAGE 1 - TYPICAL GAS MANAGEMENT SYSTEM
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No: TW19080
Drg. No: C-303
Rev: B
Filename: TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:40 AM
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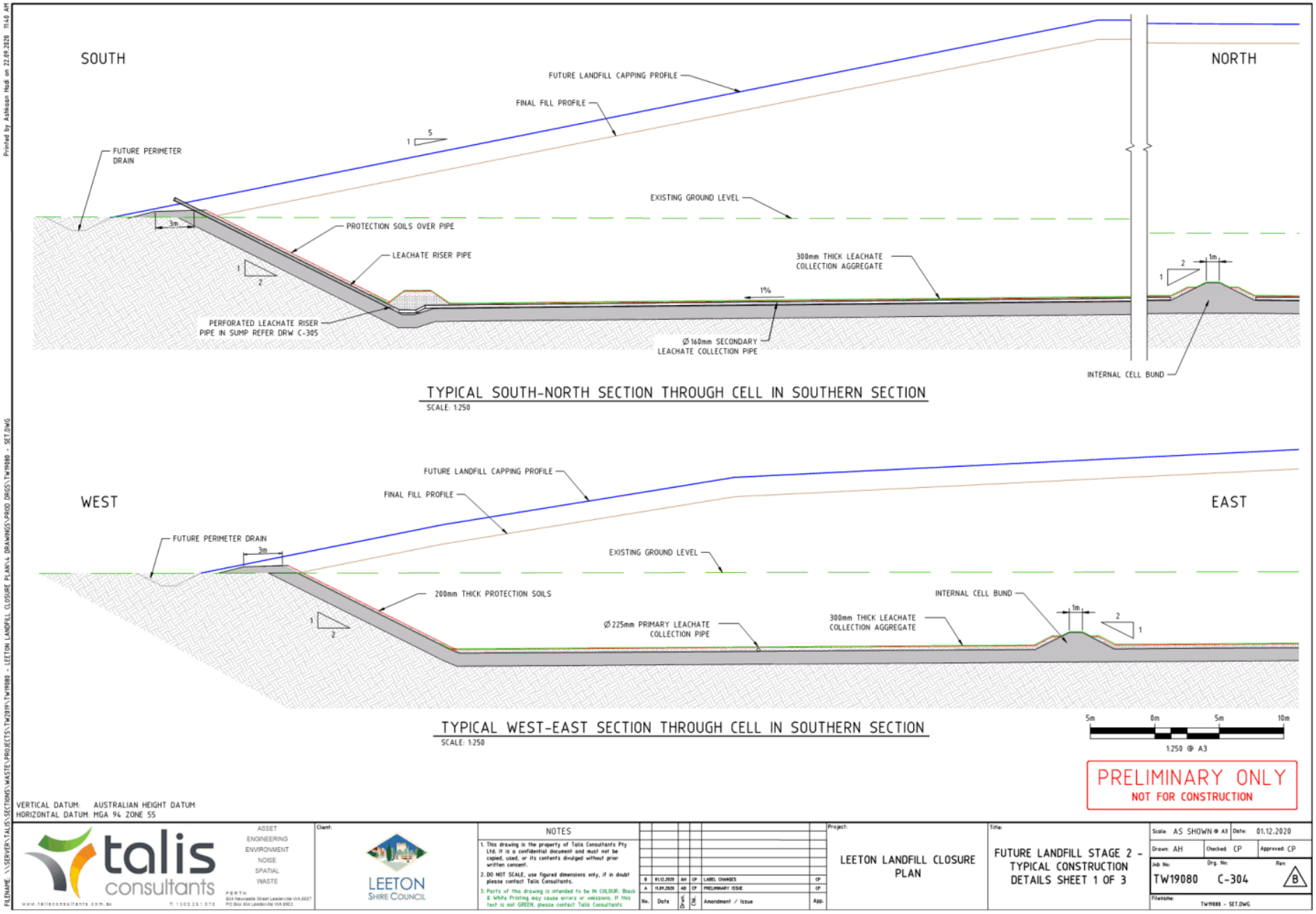
SOUTH
NORTH
FUTURE LANDFILL CAPPING PROFILE
FINAL FILL PROFILE
FUTURE PERIMETER DRAIN
EXISTING GROUND LEVEL
PROTECTION SOILS OVER PIPE
LEACHATE RISER PIPE
300mm THICK LEACHATE COLLECTION AGGREGATE
PERFORATED LEACHATE RISER PIPE IN SUMP REFER DRW C-305
Ø160mm SECONDARY LEACHATE COLLECTION PIPE
INTERNAL CELL BUND
TYPICAL SOUTH-NORTH SECTION THROUGH CELL IN SOUTHERN SECTION
SCALE: 1:250
WEST
EAST
FUTURE LANDFILL CAPPING PROFILE
FINAL FILL PROFILE
FUTURE PERIMETER DRAIN
EXISTING GROUND LEVEL
200mm THICK PROTECTION SOILS
INTERNAL CELL BUND
Ø225mm PRIMARY LEACHATE COLLECTION PIPE
300mm THICK LEACHATE COLLECTION AGGREGATE
TYPICAL WEST-EAST SECTION THROUGH CELL IN SOUTHERN SECTION
SCALE: 1:250
5m 0m 5m 10m
1:250 @ A3
PRELIMINARY ONLY
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VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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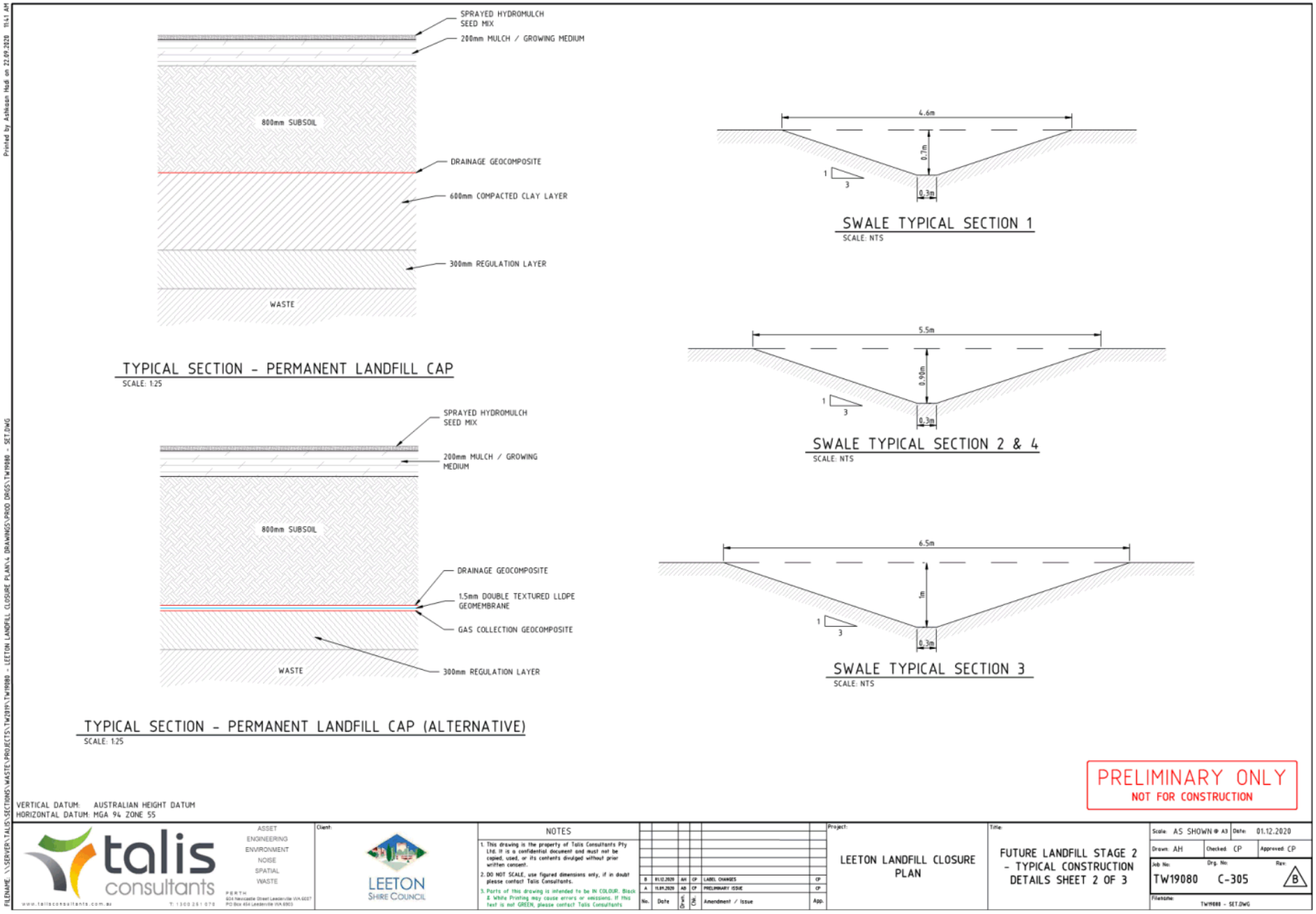
NOTES
LEETON LANDFILL CLOSURE PLAN
FUTURE LANDFILL STAGE 2 - TYPICAL CONSTRUCTION DETAILS SHEET 1 OF 3
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No: TW19080
Drg. No: C-304
Rev: B
Filename: TW19080 - SET.DWG


SPRAYED HYDROMULCH SEED MIX
200mm MULCH / GROWING MEDIUM
800mm SUBSOIL
DRAINAGE GEOCOMPOSITE
600mm COMPACTED CLAY LAYER
300mm REGULATION LAYER
WASTE
TYPICAL SECTION - PERMANENT LANDFILL CAP
SCALE: 1:25
SPRAYED HYDROMULCH SEED MIX
200mm MULCH / GROWING MEDIUM
800mm SUBSOIL
DRAINAGE GEOCOMPOSITE
1.5mm DOUBLE TEXTURED LLDPE GEOMEMBRANE
GAS COLLECTION GEOCOMPOSITE
WASTE
300mm REGULATION LAYER
TYPICAL SECTION - PERMANENT LANDFILL CAP (ALTERNATIVE)
SCALE: 1:25
4.6m
0.7m
1
3
0.3m
SWALE TYPICAL SECTION 1
SCALE: NTS
5.5m
0.98m
1
3
0.3m
SWALE TYPICAL SECTION 2 & 4
SCALE: NTS
6.5m
1m
1
3
0.3m
SWALE TYPICAL SECTION 3
SCALE: NTS
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No. Date Drn Chk Amendment / Issue App.
Project: LEETON LANDFILL CLOSURE PLAN
Title: FUTURE LANDFILL STAGE 2 - TYPICAL CONSTRUCTION DETAILS SHEET 2 OF 3
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
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Approved: CP
Job No: TW19080
Drg. No: C-305
Rev: B
Filename: TW19080 - SET.DWG
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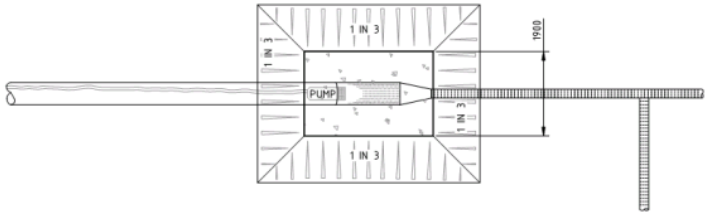
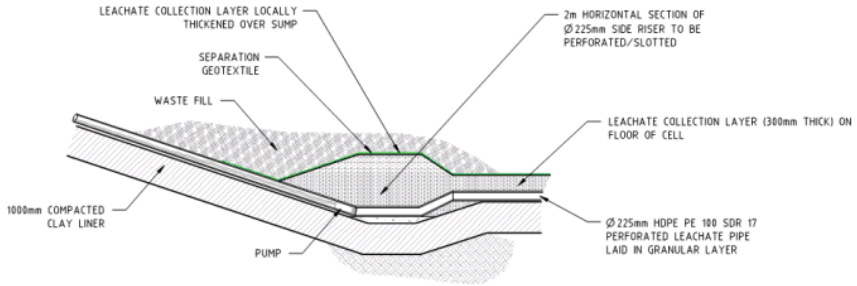


TYPICAL PLAN - LEACHATE COLLECTION SUMP
SCALE: NTS



TYPICAL SECTION - LEACHATE COLLECTION SUMP
SCALE: NTS

PRELIMINARY ONLY
NOT FOR CONSTRUCTION

VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55

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PO Box 454 Leederville WA 6903
www.talisconsultants.com.au T: 1300 251 070

Client: LEETON SHIRE COUNCIL

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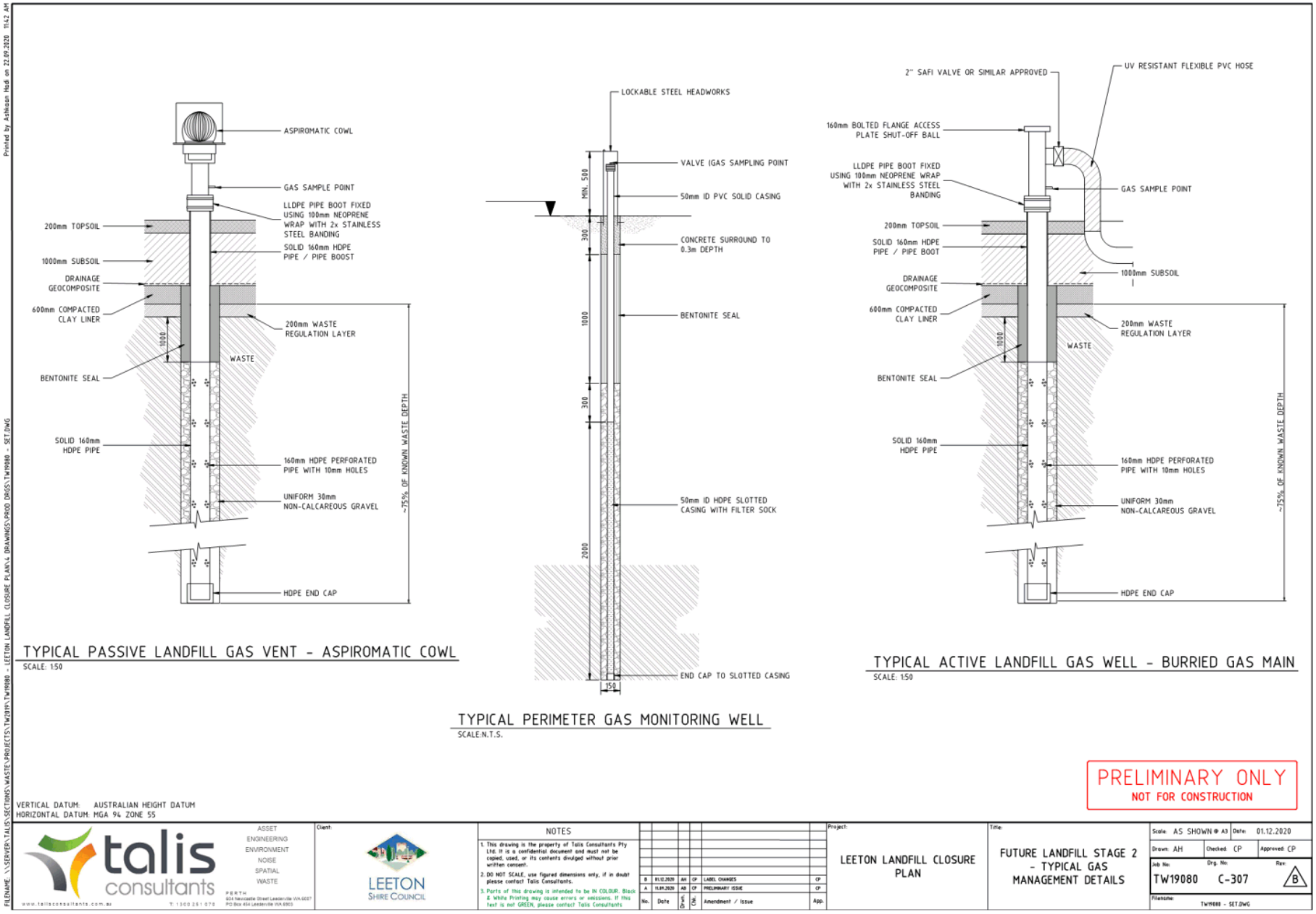
A	11.09.2020	AB	CP	PRELIMINARY ISSUE	CP

Project: LEETON LANDFILL CLOSURE PLAN

Title: FUTURE LANDFILL STAGE 2 - TYPICAL CONSTRUCTION DETAILS SHEET 3 OF 3

Scale: AS SHOWN @ A3 | Date: 01.12.2020
Drawn: AH | Checked: CP | Approved: CP
Job No: TW19080 | Drg. No: C-306 | Rev: B
Filename: TW19080 - SET.DWG

FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DWGS\TW19080 - SET.DWG
Printed by Ashleigh Hall on 22.09.2020 11:41 AM


ASPIROMATIC COWL
GAS SAMPLE POINT
LLDPE PIPE BOOT FIXED USING 100mm NEOPRENE WRAP WITH 2x STAINLESS STEEL BANDING
SOLID 160mm HDPE PIPE / PIPE BOOST
200mm TOPSOIL
1000mm SUBSOIL
DRAINAGE GEOCOMPOSITE
600mm COMPACTED CLAY LINER
200mm WASTE REGULATION LAYER
WASTE
BENTONITE SEAL
SOLID 160mm HDPE PIPE
160mm HDPE PERFORATED PIPE WITH 10mm HOLES
UNIFORM 30mm NON-CALCAREOUS GRAVEL
HDPE END CAP
~75% OF KNOWN WASTE DEPTH
TYPICAL PASSIVE LANDFILL GAS VENT - ASPIROMATIC COWL
SCALE: 1:50
LOCKABLE STEEL HEADWORKS
VALVE (GAS SAMPLING POINT
50mm ID PVC SOLID CASING
CONCRETE SURROUND TO 0.3m DEPTH
BENTONITE SEAL
50mm ID HDPE SLOTTED CASING WITH FILTER SOCK
END CAP TO SLOTTED CASING
MIN. 500
300
1800
300
2000
150
TYPICAL PERIMETER GAS MONITORING WELL
SCALE:N.T.S.
2" SAFI VALVE OR SIMILAR APPROVED
UV RESISTANT FLEXIBLE PVC HOSE
160mm BOLTED FLANGE ACCESS PLATE SHUT-OFF BALL
LLDPE PIPE BOOT FIXED USING 100mm NEOPRENE WRAP WITH 2x STAINLESS STEEL BANDING
GAS SAMPLE POINT
200mm TOPSOIL
SOLID 160mm HDPE PIPE / PIPE BOOT
1000mm SUBSOIL
DRAINAGE GEOCOMPOSITE
600mm COMPACTED CLAY LINER
200mm WASTE REGULATION LAYER
WASTE
BENTONITE SEAL
SOLID 160mm HDPE PIPE
160mm HDPE PERFORATED PIPE WITH 10mm HOLES
UNIFORM 30mm NON-CALCAREOUS GRAVEL
HDPE END CAP
~75% OF KNOWN WASTE DEPTH
TYPICAL ACTIVE LANDFILL GAS WELL - BURRIED GAS MAIN
SCALE: 1:50
PRELIMINARY ONLY
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VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date Drwn Chk Amendment / Issue App.
Project:
LEETON LANDFILL CLOSURE PLAN
Title:
FUTURE LANDFILL STAGE 2 - TYPICAL GAS MANAGEMENT DETAILS
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No: TW19080
Drg. No: C-307
Rev: B
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DRGS\TW19080 - SET.DWG
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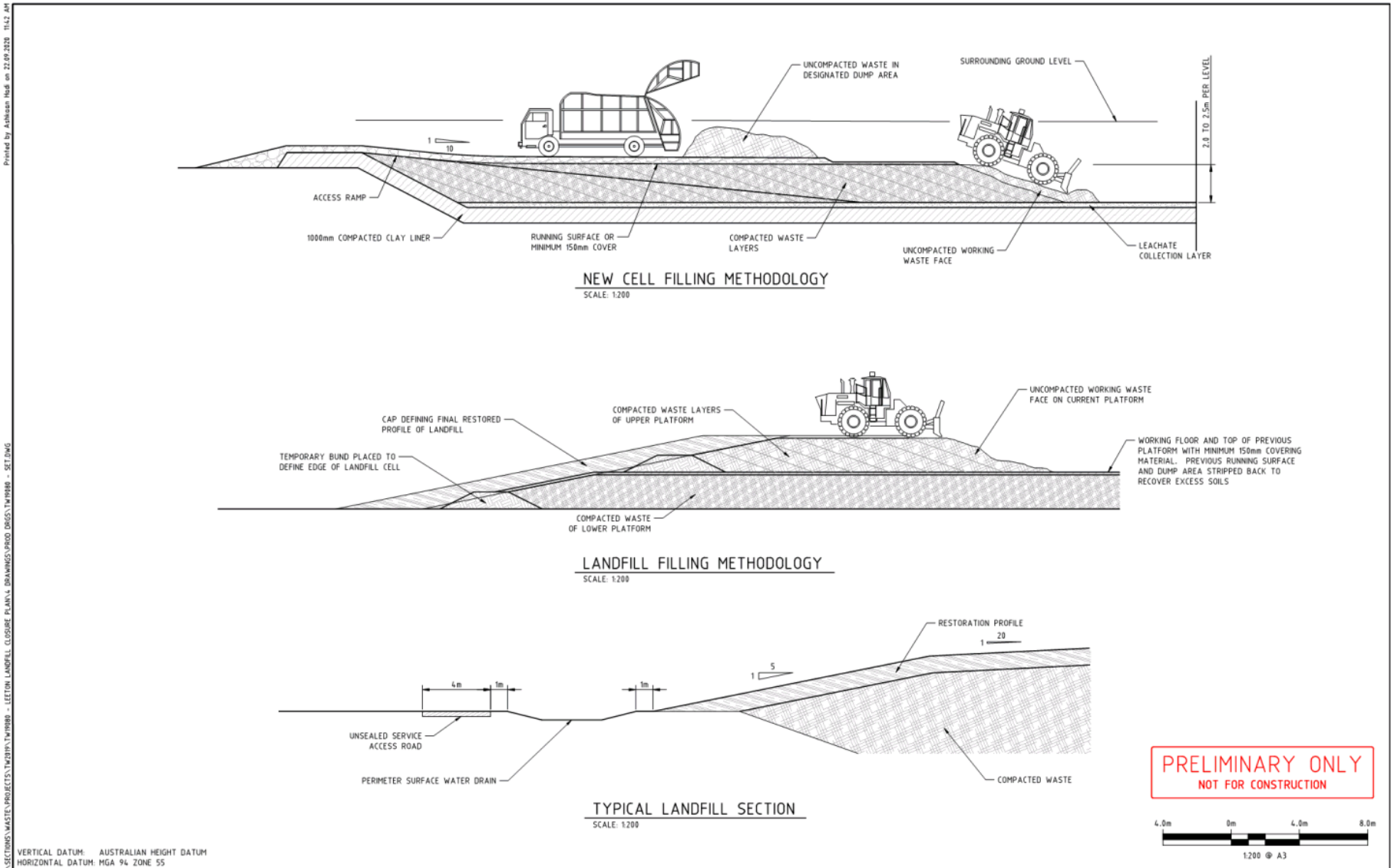
UNCOMPACTED WASTE IN DESIGNATED DUMP AREA
SURROUNDING GROUND LEVEL
2.0 TO 2.5m PER LEVEL
1
10
ACCESS RAMP
1000mm COMPACTED CLAY LINER
RUNNING SURFACE OR MINIMUM 150mm COVER
COMPACTED WASTE LAYERS
UNCOMPACTED WORKING WASTE FACE
LEACHATE COLLECTION LAYER
NEW CELL FILLING METHODOLOGY
SCALE: 1:200
UNCOMPACTED WORKING WASTE FACE ON CURRENT PLATFORM
COMPACTED WASTE LAYERS OF UPPER PLATFORM
CAP DEFINING FINAL RESTORED PROFILE OF LANDFILL
TEMPORARY BUND PLACED TO DEFINE EDGE OF LANDFILL CELL
WORKING FLOOR AND TOP OF PREVIOUS PLATFORM WITH MINIMUM 150mm COVERING MATERIAL. PREVIOUS RUNNING SURFACE AND DUMP AREA STRIPPED BACK TO RECOVER EXCESS SOILS
COMPACTED WASTE OF LOWER PLATFORM
LANDFILL FILLING METHODOLOGY
SCALE: 1:200
RESTORATION PROFILE
1
20
1
5
4m
1m
1m
UNSEALED SERVICE ACCESS ROAD
PERIMETER SURFACE WATER DRAIN
COMPACTED WASTE
TYPICAL LANDFILL SECTION
SCALE: 1:200
PRELIMINARY ONLY
NOT FOR CONSTRUCTION
4.0m
0m
4.0m
8.0m
1:200 @ A3
VERTICAL DATUM: AUSTRALIAN HEIGHT DATUM
HORIZONTAL DATUM: MGA 94 ZONE 55
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Client:
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A 11.09.2020 AB CP PRELIMINARY ISSUE CP
No. Date By Chk Amendment / Issue App.
Project:
LEETON LANDFILL CLOSURE PLAN
Title:
FUTURE LANDFILL STAGE 2 - LANDFILL METHODOLOGY
Scale: AS SHOWN @ A3
Date: 01.12.2020
Drawn: AH
Checked: CP
Approved: CP
Job No: TW19080
Drg. No: C-308
Rev: B
Filename: TW19080 - SET.DWG
FILENAME: \\SERVER\TALIS-SECTIONS\WASTE\PROJECTS\TW2019\TW19080 - LEETON LANDFILL CLOSURE PLAN\4 DRAWINGS\PROD DWGS\TW19080 - SET.DWG
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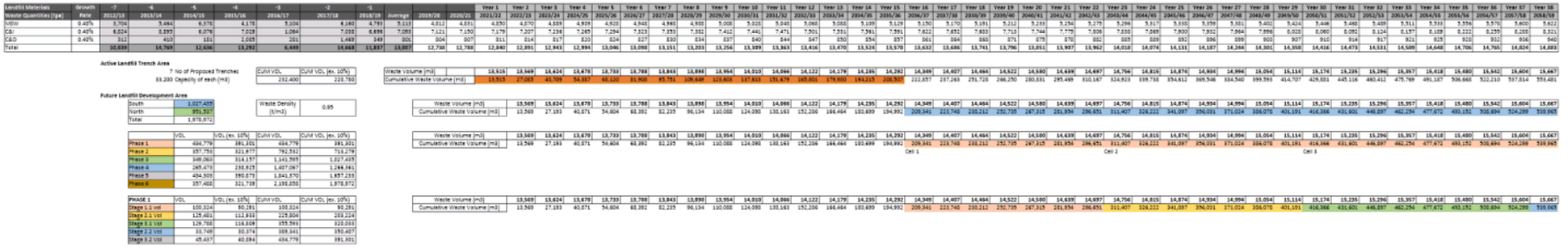
Appendix B: Waste Generation Projections

Leeton Landfill and Recycling Depot
Leeton Shire Council

Waste Projections

July 2021



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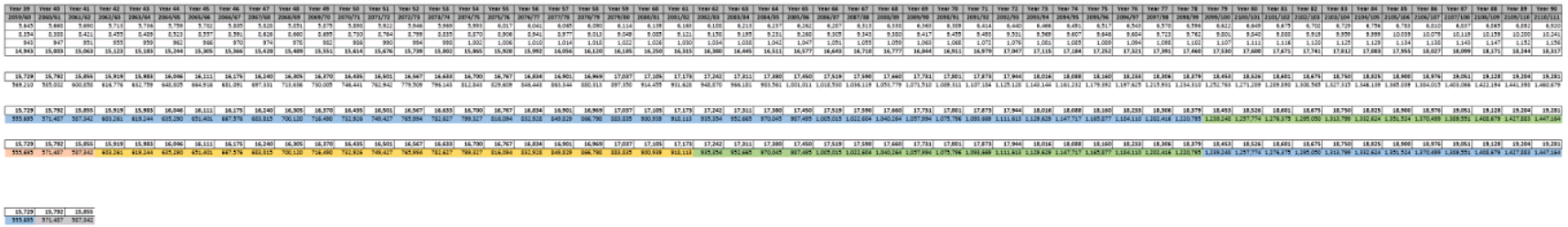
Leeton Landfill and Recycling Depot

Waste Projections

July 2021

Leeton Shire Council



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Appendix C: Surface Water Design

Leeton Landfill and Recycling Depot
Leeton Shire Council

Stormwater Drainage: Inputs

September 2020

Note:		All in yellow fields = Final values

Intensity-Frequency-Duration Data

Location	Corbie Hill, NSW		**Event:**	
Co-ordinates	South	-34.5864	**Location:**	
https://www.google.com.au/maps	East	146.4836		

Annual Exceedance Probability

http://www.bom.gov.au/water/designRainfalls/revised-ifd/?

	Duration		Rainfall (mm)						
			63%	50%	20%	10%	5%	2%	1%
			1:1	1:2	1:5	1:10	1:20	1:50	1:100
0.017	1 min		1.56	1.57	2.23	2.7	3.18	3.83	4.35
0.033	2 min		2.36	2.73	3.92	4.74	5.56	6.65	7.51
0.050	3 min		3.21	3.73	5.31	6.42	7.53	9.01	10.2
0.067	4 min		3.94	4.54	6.48	7.84	9.21	11	12.5
0.083	5 min		4.58	5.27	7.51	9.08	10.7	12.8	14.5
0.167	10 min		6.87	7.89	11.2	13.6	16	19.1	21.6
0.25	15 min		8.39	9.64	13.7	16.6	19.5	23.6	26.9
0.5	30 min		11.2	12.9	18.4	22.3	26.3	31.8	36.1
1	1 hour		14.4	16.6	23.7	28.7	33.8	40.7	46.1
2	2 hour		18.1	20.8	29.7	35.8	42.1	50.4	57
3	3 hour		20.7	23.8	33.6	40.5	47.4	56.6	63.9
6	6 hour		26	29.6	41.3	49.4	57.4	68.4	77
12	12 hour		32.4	36.6	50	59.4	68.8	81.7	91.9
24	24 hour		39.4	44.5	59.5	70.1	80.9	95.9	108
48	48 hour		46.5	51.8	68.8	80.8	92.9	110	123
72	72 hour		48.9	55.6	73.8	86.5	99.3	117	132
96	96 hour		52	57.9	77	90.3	103	122	137
120	120 hour		53.4	59.7	79.4	93	106	126	140
144	144 hour		54.6	61	81.2	95.1	109	128	143
168	168 hour		55.5	62.1	82.6	96.8	110	130	145

AR&R87 IFDs

http://www.bom.gov.au/hydro/has/cdirswebx/cdirswebx.shtml
(Coefficients Tab)

	63.20%	50%le	20%*	10%	5%	2%	1%
C0	3.10E-01	4.50E-01	8.03E-01	9.94E-01	1.16E+00	1.54E+00	1.47E+00
C1	-7.67E-01	-7.94E-01	-8.51E-01	-8.35E-01	-8.28E-01	-8.03E-01	-7.81E-01
C2	7.75E-02	4.57E-02	-6.43E-03	-1.54E-02	-8.40E-03	1.73E-02	4.11E-02
C3	-7.72E-02	-6.21E-02	-3.86E-02	-3.42E-02	-3.50E-02	-4.44E-02	-5.35E-02
C4	1.70E-02	1.40E-02	9.06E-03	7.99E-03	7.91E-03	9.46E-03	1.10E-02
C5	-1.57E-03	-1.29E-03	-8.38E-04	-7.27E-04	-7.04E-04	-8.24E-04	-9.50E-04
C6	5.35E-05	4.33E-05	2.78E-05	2.37E-05	2.26E-05	2.61E-05	3.00E-05

1. Pond Design Inputs

			Unit	Description
Area 1		23.083	m²	**A - North**
Runoff Coefficient 1 =	Clayey Soil, Flat, 0 - 5%	0.5		
Area 2		52.885	m²	**B - East**
Runoff Coefficient 2 =	Clayey Soil, Flat, 0 - 5%	0.5		
Area 3		40.383	m²	**C - South**
Runoff Coefficient 3 =	Clayey Soil, Flat, 0 - 5%	0.5		
Area 4		65.078	m²	**D - West**
Runoff Coefficient 4 =	Clayey Soil, Flat, 0 - 5%	0.5		
Area 5			m²	
Runoff Coefficient 5 =		0		
Area 6			m²	
Runoff Coefficient 6 =		0		
Area 7			m²	
Runoff Coefficient 7 =		0		
Composite Runoff Coefficient, C		**0.50**		

2. Swale Design Inputs — **Equations (reference below)**

http://onlinemanuals.txdot.gov/txdotmanuals/hyd/t

2.1 Swale #1: Catchment A (North)

		Value	Unit	
Overland Flow (over waste mass)				
Flow Length		80.00	m	
ΔRL		16.00	mAHD	
Slope		0.200	m/m	**Slope = ΔRL/ΔFlow Length**
Kerby's Roughness Factor	Poor grass/rough bare soil	0.20		
Time of concentration, **Tc-o**		7.67	min	**Tc-o = K*((L*N)^0.467)*(S^-0.235)**
Channel Flow (through swale)				K=constant: =1.44 for SI
Flow Length		440.00	m	L=flow length (m)
ΔRL		1.45	mAHD	N=Kerby's roughness
Slope		0.003	m/m	
Time of concentration, **Tc-ch**		19.10	min	**Tc-ch = K*((L^0.770)*(S^-0.385)**
Manning's, **n** =	Earth channel - clean	0.022		K=constant: =0.0195 for SI
Total Flow Time, Tc (min)		**26.78**	min	L=flow length (m)
				S=slope (m/m)

2.2 Swale #2: Catchment B (East)

		Value	Unit	
Overland Flow (over waste mass)				
Flow Length		306.00	m	
ΔRL		17.00	mAHD	
Slope		0.056		**Slope = ΔRL/ΔFlow Length**
Kerby's Roughness Factor	Poor grass/rough bare soil	0.20		
Overland Flow, **Tc-o**		19.40	min	**Tc-o = K*((L*N)^0.467)*(S^-0.235)**
Channel Flow (through swale)				K=constant: =1.44 for SI
Flow Length		340.00	m	L=flow length (m)
ΔRL		1.45	mAHD	N=Kerby's roughness
Slope		0.004		
Concentrated Flow, **Tc-c**		14.26	min	**Tc-ch = K*((L^0.770)*(S^-0.385)**
Manning's, **n** =	Earth channel - gravelly	0.025		K=constant: =0.0195 for SI
Total Flow Time, Tc (min)		**33.66**	min	L=flow length (m)
				S=slope (m/m)

2.3 Swale #3: Catchment C (South)

		Value	Unit	
Overland Flow (over waste mass)				
Flow Length		140.00	m	
ΔRL		17.00	mAHD	
Slope		0.121		**Slope = ΔRL/ΔFlow Length**
Kerby's Roughness Factor	Poor grass/rough bare soil	0.20		
Overland Flow, **Tc-o**		11.20	min	**Tc-o = K*((L*N)^0.467)*(S^-0.235)**
Concentrated Flow (through swale)				K=constant: =1.44 for SI
Flow Length		560.00	m	L=flow length (m)
ΔRL		0.72	mAHD	N=Kerby's roughness
Slope		0.001		
Concentrated Flow, **Tc-c**		33.05	min	**Tc-ch = K*((L^0.770)*(S^-0.385)**
Manning's, **n** =	Earth channel - clean	0.022		K=constant: =0.0195 for SI
Total Flow Time, Tc (min)		**44.2**	min	L=flow length (m)
				S=slope (m/m)

2.4 Swale #4: Catchment D (West)

		Value	Unit	
Overland Flow (over waste mass)				
Flow Length		240.00	m	
ΔRL		17.00	mAHD	
Slope		0.071		**Slope = ΔRL/ΔFlow Length**
Kerby's Roughness Factor	Poor grass/rough bare soil	0.20		
Overland Flow, **Tc-o**		16.56	min	**Tc-o = K*((L*N)^0.467)*(S^-0.235)**
Concentrated Flow (through swale)				K=constant: =1.44 for SI
Flow Length		350.00	m	L=flow length (m)
ΔRL		0.75	mAHD	N=Kerby's roughness
Slope		0.001		
Concentrated Flow, **Tc-c**		18.90	min	**Tc-ch = K*((L^0.770)*(S^-0.385)**
Manning's, **n** =	Earth channel - clean	0.022		K=constant: =0.0195 for SI
Total Flow Time, Tc (min)		**35.5**	min	L=flow length (m)
Pipe from NW overflow				
Length of Pipe, **L**			m	
ΔRL			mAHD	
Slope		0.000		

Pipe from E overflow			
Length of Pipe, **L**		m	
ΔRL		mAHD	
Slope	0.000		

Unused Pipe			
Length of Pipe, **L**		m	
ΔRL		mAHD	
Slope	0.000		

Unused Pipe			
Length of Pipe, **L**		m	
ΔRL		mAHD	
Slope	0.000		

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Leeton Landfill and Recycling Depot
Leeton Shire Council

Stormwater Drainage: Pond Design

September 2020

Scenario 1 = 1:20 Year 24 hour Storm

Rainfall Data	
Design Period	1:20
Storm Duration (hrs):	24 hour
Total Rainfall (mm)	80.9

Volume per Catchment						
Northwest Pond		**West Pond**				
Catchment Area (m²):	23,065	Catchment Area (m²):	158,346	Catchment Area (m²):		Catchment Area (m²):
Runoff Coefficient, **C**:	0.500	Runoff Coefficient, **C**:	0.500	Runoff Coefficient, **C**:	0.500	Runoff Coefficient, **C**:
Rainfall (mm)	80.9	Rainfall (mm)	80.9	Rainfall (mm)	80.9	Rainfall (mm)
Storage Requirement (m³)	**933**	**Storage Requirement (m³)**	**6,405**	**Storage Requirement (m³)**	**0**	**Storage Requirement (m³)**
						Total Storage Required (m³)
Design Volume (m³)	4,763	Design Volume (m³)	10,512	Design Volume (m³)		Design Volume (m³)
Difference (m³)	3,830	**Difference (m³)**	4,107	**Difference (m³)**	0	**Difference (m³)**

Scenario 2 = 1:100 Year 24 hour Storm

Rainfall	
Design Period	1:100
Storm Duration (hrs):	24 hour
Rainfall (mm)	108.0

Volume per Catchment						
Northwest Pond		**West Pond**		**0**		
Catchment Area (m²):	23,065	Catchment Area (m²):	158,346	Catchment Area (m²):	0	Catchment Area (m²):
Runoff Coefficient, **C**:	0.500	Runoff Coefficient, **C**:	0.500	Runoff Coefficient, **C**:	0.500	Runoff Coefficient, **C**:
Rainfall (mm)	108.0	Rainfall (mm)	108.0	Rainfall (mm)	108.0	Rainfall (mm)
Storage Requirement (m³)	**1,246**	**Storage Requirement (m³)**	**8,551**	**Storage Requirement (m³)**	**0**	**Storage Requirement (m³)**
						Total Storage Required (m³)
Design Volume (m³)	4,763	Design Volume (m³)	10,512	Design Volume (m³)	0	Design Volume (m³)
Difference (m³)	3,517	**Difference (m³)**	1,961	**Difference (m³)**	0	**Difference (m³)**

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Leeton Landfill and Recycling Depot
Leeton Shire Council

Stormwater Drainage: Pond Design

September 2020

0
0.500
80.9
0
7,338
0

POND SIZING					
	L	W	h	Pond Side Slope	
Catchment Area	115	30	2	1:	3
Operational Area	112	27			
Evaporation Area	109	24			

a	18
b	103

Catchment Area	6,900	m2		558	6,963
Evaporation Area	5,232	m2	*Assuming average area	745	9,296
Operational Pond Capa	7,277	m3	* Assuming 0.5m freeboard		
Full Pond Capacity	10,512	m3			
Evaporation Depth	1.00	m			

0
0.500
108.0
0
9,796
0

POND SIZING					
	L	W	h	Pond Side Slope	
Catchment Area	70	40	1	1:	4
Operational Area	66	36			
Evaporation Area	66	36			

a	32
b	62

Catchment Area	5,600	m2		453	1,386
Evaporation Area	4,752	m2	*Assuming average area	605	1,850
Operational Pond Capa	2,177	m3	* Assuming 0.5m freeboard		
Full Pond Capacity	4,763	m3			
Evaporation Depth	0.50	m			

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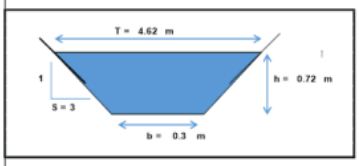
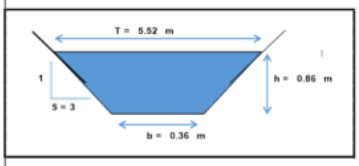
	0.632	50%#	20%*	0.1	0.05	0.02	0.01
C0	3.10E-01	4.50E-01	8.03E-01	9.94E-01	1.16E+00	1.34E+00	1.47E+00
C1	7.67E-01	7.94E-01	8.31E-01	8.35E-01	8.28E-01	8.03E-01	7.81E-01
C2	7.75E-02	4.37E-02	-6.43E-03	-1.34E-02	-8.40E-03	1.73E-02	4.11E-02
C3	-7.72E-02	-6.21E-02	-3.86E-02	-3.42E-02	-3.50E-02	-4.44E-02	-5.35E-02
C4	1.70E-02	1.40E-02	9.06E-03	7.99E-03	7.91E-03	9.46E-03	1.10E-02
C5	-1.57E-03	-1.29E-03	-8.38E-04	-7.27E-04	-7.04E-04	-8.24E-04	-9.50E-04
C6	5.25E-05	4.33E-05	2.78E-05	2.37E-05	2.26E-05	2.61E-05	3.00E-05

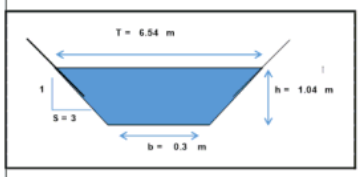
2.1 Swale #1: Catchment A (North)		Comments	Equations (references below)	
			http://onlinemanuals.txdot.gov/txdotmanuals/hyd/rational_method.htm	(1)
			http://www.bom.gov.au/water/designRainfalls/ifd/howtoIFDTool.shtml	(2)
Rainfall Data			http://www.ce.utexas.edu/prof/maidment/CE365KSpr14/Visual/OpenChannels.pdf	(3)
Design Period (yrs):	100		http://www.efm.leeds.ac.uk/CIVE/CIVE2400/OpenChannelHydraulics2.pdf	(4)
Total Concentration Time, Tc (min)	26.78			
Intensity for Tc (mm/h)	34.5			
Peak Flow Rate (m^3/h)	398		Q = ((C*I*(A/10000))/360)*3600 for m3/hr	(1)
			C=runoff coefficient	
			I=rainfall intensity (mm/hr)	
Swale Geometry			A=area(m2)	
Depth of Flow, h (m)	0.72			
Bottom width, b (m)	0.3			
Side slope, S (m)	3			
Top width, T (m)	4.62		T = b + (2*S*h)	(3) pg2
Swale Area, As (m^2)	1.7712		As = (b+S*h)*h	(3)
Wetted Perimeter, Pw (m)	4.85		Pw = b + 2*h*sqrt(1+S^2)	(3)
Hydraulic Radius, Rh (m)	0.365		Rh = As/Pw	(3)
Hydraulic Depth, Dh (m)	0.383		Dh = As/T	(3)
Slope				
Flow Length (m)	440.00			
Total Fall (m)	1.45			
Slope of Swale, Ss	0.003			
Channel Flow				
A - Manning's coefficient, n	0.022			
A - Maximum Velocity, V (m/s)	1.33			
Minimum Flow, Q (m^3/h)	8,496	Pass	21.3	
Froude Number, Fr	0.00	Subcritical	Fr = V/sqrt(g*Dh), where g = gravitational force; = 9.81 m/s2	(3)
Reynolds Number, Re (channel)	-	Laminar	Re = V*(As/Pw)*(1/v) = V*Rh*(1/v), where v is kinematic viscosity (m2/s); = 1.787*10^-6 @ 0°C	(4) pg15



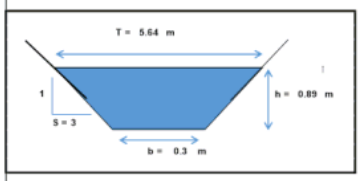
2.2 Swale #2: Catchment B (East)		Comments	Equations (references below)	
			http://onlinemanuals.txdot.gov/txdotmanuals/hyd/rational_method.htm	(1)
			http://www.bom.gov.au/water/designRainfalls/ifd/howtoIFDTool.shtml	(2)
Rainfall Data			http://www.ce.utexas.edu/prof/maidment/CE365KSpr14/Visual/OpenChannels.pdf	(3)
Design Period (yrs):	100		http://www.efm.leeds.ac.uk/CIVE/CIVE2400/OpenChannelHydraulics2.pdf	(4)
Total Concentration Time, Tc (min)	33.66			
Intensity for Tc (mm/h)	37.7			
Peak Flow Rate (m^3/h)	1,396		Q = ((C*I*(A/10000))/360)*3600 for m3/hr	(1)
			C=runoff coefficient	
			I=rainfall intensity (mm/hr)	
Swale Geometry			A=area(m2)	
Depth of Flow, h (m)	0.86			
Bottom width, b (m)	0.36			
Side slope, S (m)	3			
Top width, T (m)	5.52		T = b + (2*S*h)	(3) pg2
Swale Area, As (m^2)	2.6284		As = (b+S*h)*h	(3)
Wetted Perimeter, Pw (m)	5.80		Pw = b + 2*h*sqrt(1+S^2)	(3)
Hydraulic Radius, Rh (m)	0.436		Rh = As/Pw	(3)
Hydraulic Depth, Dh (m)	0.458		Dh = As/T	(3)
Slope				
Flow Length (m)	340.00			
Total Fall (m)	1.43			
Slope of Swale, Ss	0.004			
Flow				
A - Manning's coefficient, n	0.025			
A - Maximum Velocity, V (m/s)	1.492			
Minimum Flow, Q (m^3/h)	13,577	Pass	9.7	
Froude Number, Fr	0.00	Subcritical	Fr = V/sqrt(g*Dh), where g = gravitational force; = 9.81 m/s2	(3)
Reynolds Number, Re (channel)	0	Laminar	Re = V*(As/Pw)*(1/v) = V*Rh*(1/v), where v is kinematic viscosity (m2/s); = 1.787*10^-6 @ 0°C	(4) pg15



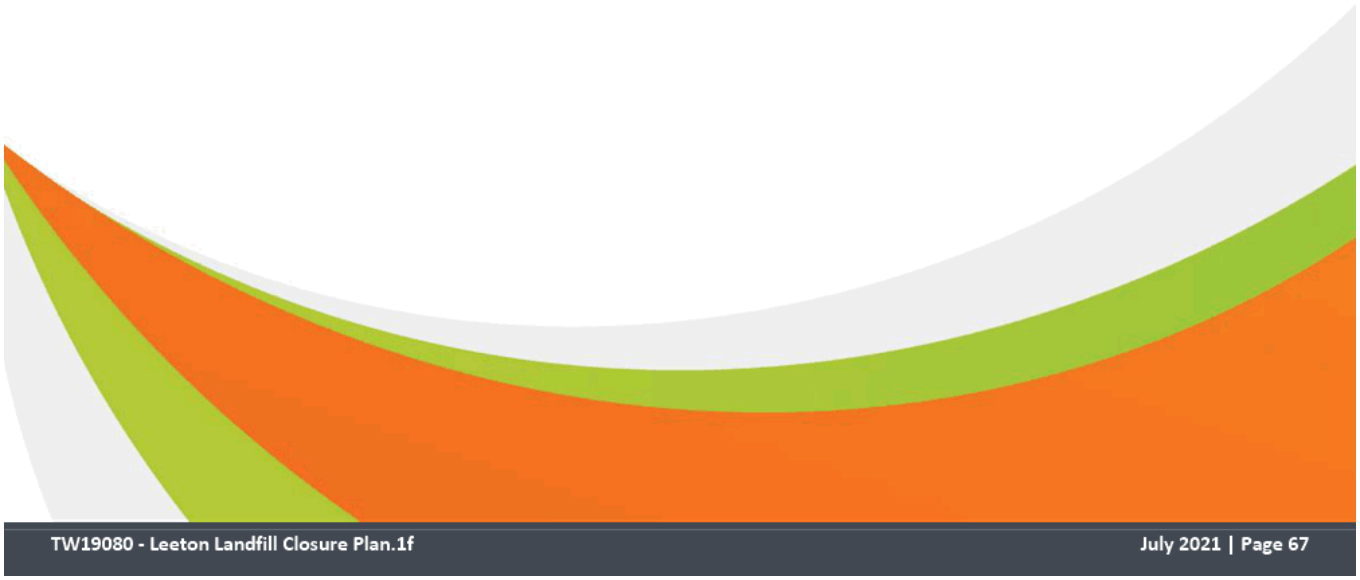
2.3 Swale #3: Catchment C (South)		Comments	Equations (references below)	
			http://onlinemanuals.txdot.gov/txdotmanuals/hyd/rational_method.htm	(1)
			http://www.bom.gov.au/water/designRainfalls/ifd/howtoIFDTool.shtml	(2)
Rainfall Data			http://www.ce.utexas.edu/prof/maidment/CE365KSpr14/Visual/OpenChannels.pdf	(3)
Design Period (yrs):	100		http://www.efm.leeds.ac.uk/CIVE/CIVE2400/OpenChannelHydraulics2.pdf	(4)
Total Concentration Time, Tc (min)	44.25			
Intensity for Tc (mm/h)	41.6			
Peak Flow Rate (m^3/h) + EAST	2,236		Q = ((C*I*(A/10000))/360)*3600 for m3/hr	(1)
			C=runoff coefficient	
			I=rainfall intensity (mm/hr)	
			A=area(m2)	
Swale Geometry				
Depth of Flow, h (m)	1.04			
Bottom width, b (m)	0.3			
Side slope, S (m)	3			
Top width, T (m)	6.54		T = b + (2*S*h)	(3) pg2
Swale Area, As (m^2)	3.5568		As = (b+S*h)*h	(3)
Wetted Perimeter, Pw (m)	6.88		Pw = b + 2*h*sqrt(1+S^2)	(3)
Hydraulic Radius, Rh (m)	0.517		Rh = As/Pw	(3)
Hydraulic Depth, Dh (m)	0.544		Dh = As/T	(3)
Slope				
Flow Length (m)	580.00			
Total Fall (m)	0.7200			
Slope of Swale, Ss	0.0013		Slope = ΔRL/ΔFlow Length	
Flow				
Manning's coefficient, n	0.022			
Maximum Velocity, V (m/s)	1.05		V = (1/n)*(Rh^(2/3))*(Ss^1/2)	(3)
Minimum Flow, Q (m^3/s)	3.74		Q = V*As	(3)
Minimum Flow, Q (m^3/h)	13,446	Pass	6.0	
Froude Number, Fr	0.45	Subcritical	Fr = V/sqrt(g*Dh), where g = gravitational force; = 9.81 m/s2	(3)
Reynolds Number, Re (channel)	303,904	Turbulent	Re = V*(As/Pw)*(1/v) = V*Rh*(1/v), where v is kinematic viscosity (m2/s); = 1.787*10^-6 @ 0°C	(4) pg15



2.4 Swale #4: Catchment D (West)		Comments	Equations (references below)	
			http://onlinemanuals.txdot.gov/txdotmanuals/hyd/rational_method.htm	(1)
			http://www.bom.gov.au/water/designRainfalls/ifd/howtoIFDTool.shtml	(2)
Rainfall Data			http://www.ce.utexas.edu/prof/maidment/CE365KSpr14/Visual/OpenChannels.pdf	(3)
Design Period (yrs):	100		http://www.efm.leeds.ac.uk/CIVE/CIVE2400/OpenChannelHydraulics2.pdf	(4)
Total Concentration Time, Tc (min)	35.26			
Intensity for Tc (mm/h)	38.4			
Peak Flow Rate (m^3/h)	1,249		Q = ((C*I*(A/10000))/360)*3600 for m3/hr	(1)
			C=runoff coefficient	
			I=rainfall intensity (mm/hr)	
			A=area(m2)	
Swale Geometry				
Depth of Flow, h (m)	0.89			
Bottom width, b (m)	0.3			
Side slope, S (m)	3			
Top width, T (m)	5.64		T = b + (2*S*h)	(3) pg2
Swale Area, As (m^2)	2.6433		As = (b+S*h)*h	(3)
Wetted Perimeter, Pw (m)	5.93		Pw = b + 2*h*sqrt(1+S^2)	(3)
Hydraulic Radius, Rh (m)	0.446		Rh = As/Pw	(3)
Hydraulic Depth, Dh (m)	0.469		Dh = As/T	(3)
Slope				
Flow Length (m)	350.00			
Total Fall (m)	0.75			
Slope of Swale, Ss	0.0021		Slope = ΔRL/ΔFlow Length	
Flow				
Manning's coefficient, n	0.022			
Maximum Velocity, V (m/s)	1.23		V = (1/n)*(Rh^(2/3))*(Ss^1/2)	(3)
Minimum Flow, Q (m^3/s)	3.25		Q = V*As	(3)
Minimum Flow, Q (m^3/h)	11,685	Pass	9.4	
Froude Number, Fr	0.57	Subcritical	Fr = V/sqrt(g*Dh), where g = gravitational force; = 9.81 m/s2	(3)
Reynolds Number, Re (channel)	306,367	Turbulent	Re = V*(As/Pw)*(1/v) = V*Rh*(1/v), where v is kinematic viscosity (m2/s); = 1.787*10^-6 @ 0°C	(4) pg15



Appendix D: Leachate Water Balance



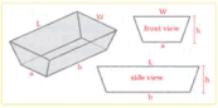
Leeton Landfill and Recycling Depot
Leeton Shire Council

Water Balance Model

September 2020

Name:	C. Panizza
Company:	Talis Consultants Pty Ltd
Project:	Leeton Landfill Leachate Water Balance
Date:	19/08/2020
Project Code:	TW19080
File No:	TW9080 - Water Balance Model 0a

Water Balance Legend	
	= Input values to be completed
	= Evaporation>Rainfall
	= Rainfall>Evaporation
	= Pond is Above Capacity
	= Pond is within Operational Capacity



The volume formula in terms of W, L, a, b, and H is:

$V = H[ab + 0.5(W-a)b + 0.5(L-b)a + (1/3)((W-a)(L-b))]$
$= (H/6)[3ab + 3Wb - 3ab + 3La - 3ba + 2WL + 2ab - 2Wb - 2aL]$
$= (H/6)[2WL + Wb + La + 2ab]$
$= (H/6)[W(L + (W+a)(L+b) + ab]$

Rainfall	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
90th Percentile	70	66	247	12	20	17	39	27	6	8	45	20	576	mm
	0.07	0.07	0.25	0.01	0.02	0.02	0.04	0.03	0.01	0.01	0.05	0.02	0.58	m

Rainfall	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
Average Monthly Rainfall	24	42	36	22	29	43	35	37	34	30	41	34	404	mm
	0.02	0.04	0.04	0.02	0.03	0.04	0.03	0.04	0.03	0.03	0.04	0.03	0.40	m

Pan Evaporation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	
Leeton	310	234	194	114	64	40	43	66	109	173	226	283	1853	mm
	0.31	0.23	0.19	0.11	0.06	0.04	0.04	0.07	0.11	0.17	0.23	0.28	1.85	m

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total (m3)
Leachate Inputs into System													-
Pond #1 (South) 90th	1,507	1,415	5,304	254	430	355	838	585	125	168	976	421	12,377
Pond #1 (South) Average	506	894	772	479	630	915	744	787	721	637	875	721	8,680
Pond #2 (North) 90th	1,328	1,247	4,675	224	379	313	739	515	110	148	860	371	10,908
Pond #2 (North) Average	446	788	680	422	556	806	656	694	635	561	771	636	7,651
Maximum Outputs from System													

Key Parameters					
Runoff Coefficient				1	
Evaporation Coefficient				0.7	
Total Operational Capacity				23,757	m3

Pond #1 (South)

	L	W	h	Pond Side Slope	
Catchment Area	140	52	2.5	1:	2
Operational Area	138	50			
Evaporation Area	135	47			

a	42	
b	130	

Catchment Area	7,280	m2	
Evaporation Area	6,345	m2	*Assuming average area
Operational Pond Capacity	12,339	m3	* Assuming 0.5m freeboard
Full Pond Capacity	15,883	m3	
Evaporation Depth	1.25	m	

Pond #2 (North)

	L	W	h	Pond Side Slope	
Catchment Area	130	52	2.5	1:	2
Operational Area	128	50			
Evaporation Area	125	47			

a	42
b	120

Catchment Area	6,760	m2	
Evaporation Area	5,875	m2	*Assuming average area
Operational Pond Capacity	11,419	m3	* Assuming 0.5m freeboard
Full Pond Capacity	14,708	m3	
Evaporation Depth	1.25	m	

Pond #1 (South) 90th
Remaining Volumes at End of Month Post Evaporation & Irrigation

	Date		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cumulative Residual Volumes	Year 1	2020	641	1,496	7,733	7,568	7,862	8,160	9,092	9,583	9,266	8,723	9,027	8,336
	Year 2	2021	7,636	7,794	7,965	8,102	8,663	9,711	10,517	11,279	11,759	11,845	12,013	11,723

Within Operational Capacity | Above Capacity - Potential Breach

Pond #2 (North)
Remaining Volumes Post Evaporation

	Date		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cumulative Residual Volumes	Year 1	2020	528	1,258	6,801	6,637	6,890	7,151	7,977	8,406	8,107	7,598	7,836	7,178
	Year 2	2021	6,508	6,615	6,739	6,845	7,338	8,268	8,982	9,653	10,066	10,117	10,235	9,935

Within Operational Capacity | Above Capacity - Potential Breach

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Appendix E: Closure Cost Estimates

Leeton Landfill and Recycling Depot
Leeton Shire Council

Active Landfill Trench Area
Capping Cost Estimates

May 2021

No	Item	Unit	Rate	Total		Active Landfill Trench Area	
				Quantity	Amount	Quantity	Amount
1	**Site Development**						
2	**Cell Development - Earthworks**						
3	**Cell Development - Basal Liner System**						
4	**Cell Development - Leachate Management System**						
5	**Cell Development - Surface Water Management**						
6	**Capping - Earthworks & Lining**						
	Supply and install 500mm thick compacted clay layer	m^3	$ 20.00	55,418.00	$ 1,108,360.00	55,418	$ 1,108,360.00
	Supply and install 1000mm thick subsoil layer	m^3	$ 30.00	100,760.00	$ 3,022,800.00	100,760	$ 3,022,800.00
	Supply and install 300mm drainage aggregate	m^3	$ 30.00	203,972.00	$ 6,119,160.00	203,972	$ 6,119,160.00
	Sub-Total				**$ 10,250,320.00**		**$ 10,250,320.00**
7	**Capping - Restoration**						
	Revegetation	m^2	$ 5.00	100,760.00	$ 503,800.00	100,760.00	$ 503,800.00
	Sub-Total				**$ 503,800.00**		**$ 503,800.00**
8	**Capping - Surface Water Management**						
9	**Capping - Landfill Gas Management System**						
	Installation/Replacement of gas monitoring bores	Per Bore	$ 3,000.00	17.00	$ 51,000.00	17.00	$ 51,000.00
	Passive Vent pipe 160mm HDPE with aspirating cowl and fittings	Unit	$ 200.00	36.00	$ 7,200.00	36.00	$ 7,200.00
	Install subsurface pipe in waste layer	m	$ 150.00	2,280.00	$ 342,000.00	2,280.00	$ 342,000.00
	Cut trenches into waste mass	m^3	$ 2.00	1,094.40	$ 2,188.80	1,094.40	$ 2,188.80
	Sub-Total				$ 402,388.80		$ 402,388.80
	Works Sub-Total						
	Site Development				$ -		$ -
	Cell Development				$ -		$ -
	Capping				$ 11,156,508.80		$ 11,156,509
	Total				$ 11,156,508.80		$ 11,156,508.80
	Contingency and Local Loading						
	Professional Fees and Services		10%		$ 1,115,650.88		$ 1,115,651
	Local Loading		8%		$ 892,520.70		$ 892,521
	Contingency		20%		$ 2,231,301.76		$ 2,231,302
	Total Cost				**$ 15,395,982.14**		**$ 15,395,982.14**

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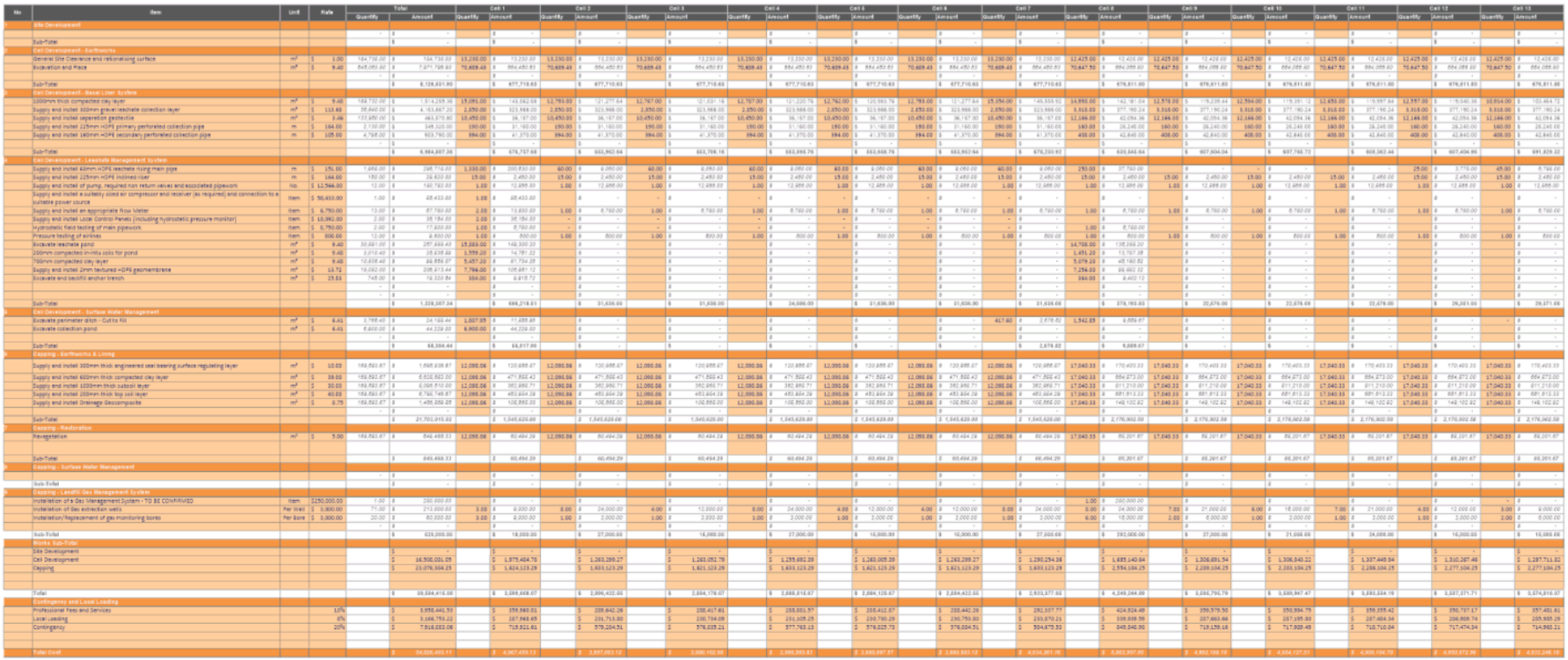
Leeton Landfill and Recycling Depot
Leeton Shire Council

Cell Development and Capping Cost Estimates

September 2020



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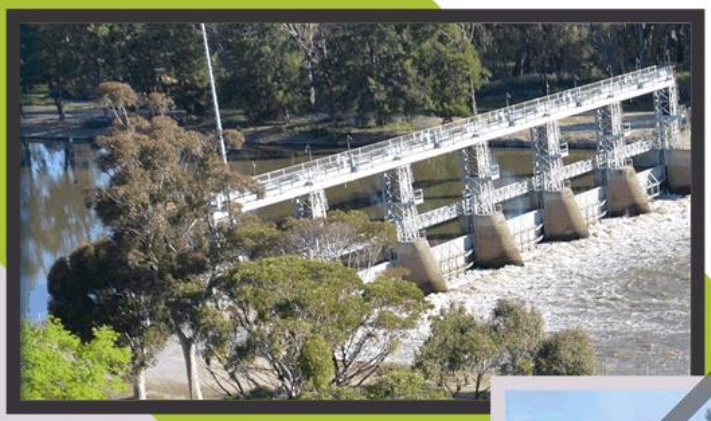
Draft Master Plan

for

Gogeldrie Weir Recreation Reserve



for

Leeton Shire Council

Adopted by Leeton Shire Council
on

INTEGRATED Site Design
PLANNING • DESIGN • MARKETING • MANAGEMENT

DRAFT MASTER PLAN

for

GOGELDRIE WEIR RECREATION RESERVE

prepared by

Integrated Site Design Pty Ltd
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JULY 2021

EXECUTIVE SUMMARY

Gogeldrie Weir Recreation Reserve is located approximately 24 kilometres west of the township of Leeton. The recreation reserve occupies an area of approximately 3.6 hectares on the banks of the Murrumbidgee River, east of the Gogeldrie Weir structure. The recreation reserve is separated from an adjacent holiday park by a 10-metre-wide easement providing WaterNSW with maintenance access to the weir structure. The recreation reserve is located on the eastern side of the easement, and the holiday park is located to the west. The recreation reserve has frontage to the river above the weir, and the holiday park has frontage to the river below the weir. The reserve is a popular riverside recreation area for the local community. The eastern part of the recreation reserve is located in the Murrumbidgee Valley National Park and includes a public boat ramp that provides water access into the Sturt Canal.

Leeton Shire Council, although not previously the owner of the site, had (informally) managed the Gogeldrie Weir Recreational Facility for many years, firstly as a primitive camping ground and more recently (in 2014) as a caravan park. Council acquired the site from Government Property NSW in December 2015. It was a condition of the purchase that the property be classified as Community land, and that if the land was not classified as Community land, it was to be transferred back to Government Property NSW for the same sum that it was purchased, plus costs.

Tourism Research

Gogeldrie Weir is located in the Riverina region of New South Wales. The Riverina is regional New South Wales' number 10 region for domestic overnight visitors and expenditure, and number 9 for nights. Tourism research and planning for the Riverina region is undertaken by Destination NSW.

Under Destination NSW, Gogeldrie Weir forms part of the Destination Riverina Murray (DRM) Destination Network. In 2018, the Riverina Murray Destination Management Plan (DMP) was prepared to guide and assist DRM to stimulate growth in the region's visitor economy in partnership with Destination NSW, Murray Regional Tourism (MRT), Thrive Riverina, NSW National Parks and Wildlife Service (NPWS), local governments and the tourism industry.

The DMP breaks down the region into subregions. Gogeldrie Weir (as part of Leeton Shire Council) forms part of the Western Riverina subregion, which also includes the Shires of Carrathool, Griffith, Murrumbidgee and Narrandera. Included in the Tier 1 priority projects for this subregion is the Gogeldrie Weir Precinct Development including the installation of new boat ramps, greater mix of accommodation and the expansion of recreational activities.

Based on modelled growth scenarios, the Riverina Murray is expected to grow from 6.5 million visitor nights in 2017, to approximately 8.5 million by 2031, an additional two million visitor nights representing 31% growth.

The redevelopment of Gogeldrie Weir Recreation Reserve will provide a facility which caters for the local community and for increasing visitor numbers to the region.

Design Principles

The broad design principles used to guide the preparation of the Proposed Master Plan are set out below:

- Establish clear separation between the holiday park and the recreation reserve.
- Provide unrestricted public access to the weir structure and recreation reserve.
- Establish continuous public access along the entire river frontage – both above and below the weir.
- Retain maintenance access to the weir structure for WaterNSW.
- Remove perimeter fencing in the recreation reserve and provide a diverse range of recreation facilities to enhance general community use of the reserve.

- Provide separate toilet facilities for the recreation reserve.
- Provide interpretive signage for the weir and local cultural heritage.
- Provide for future access to the Murrumbidgee Irrigation Area 2 across the Sturt Canal.
- Retain existing quality vegetation, where possible.

Design Features and Proposed Staging

The Proposed Master Plan for Gogeldrie Recreation Reserve contains the following design features:

- Removal of existing fences, providing unrestricted public access to the reserve and foreshore.
- Clearly defined access to the recreation reserve with appropriate signage and car parking.
- Public promenade leading to Gogeldrie Weir, with interpretive signage.
- Upgraded access road to the boat ramp with additional car parking in the recreation reserve.
- Public toilet facility servicing the recreation reserve and boat ramp.
- Upgraded boat ramp, car/trailer parking and adjacent pontoon.
- Open space for community events/activities.
- Establishment of a public beach and pontoons for safe water access and swimming.
- A water park/splash park for general community use.
- Pavilion and stage for events and special uses.
- Public walkways with cultural heritage interpretive signage along the entire riverbank.
- Weir viewing platforms, both above and below the weir.
- Upgraded picnic and barbecue facilities throughout the recreation reserve.
- Establishment of informal BMX trails.
- Suspension bridge over the Sturt Canal connecting to trails in the Murrumbidgee Valley National Park.

The proposed development will provide the following benefits to the local community and region and visitors to the Gogeldrie Weir area generally:

- Improved facilities for the local community.
- Greater access to the Murrumbidgee River and foreshore.
- Links to the adjacent National Park.
- A tourist attraction to encourage increased visitation.
- Improved access for tourists.

Cost Estimates and Staging

Gogeldrie Weir Recreation Reserve upgrade staging plan

Project	Unit	Rate	Qty	Total
PRIMARY UPGRADE WORKS				
Detailed Design				
Detail survey of recreation reserve				$7,500
Civil design for recreation reserve development (roads, car parking, stormwater, irrigation)				$20,000
Detailed design for boat ramp extension and pontoon				$20,000
Detailed design for public toilet building				$15,000
Preparation of REF and Part 5 assessment including heritage, cultural heritage and bushfire studies				$30,000
Subtotal for Recreation Reserve Design				**$92,500**
Construction				
Construct weir promenade with car parking and turnaround area (decomposed granite)	m^2	$100	800	$80,000
Install interpretive signage along weir promenade	ea	$4,000	8	$32,000
Construct new car park at recreation reserve entrance (2-coat seal, no kerbs)	m^2	$50	800	$40,000
Install recreation reserve entry signs	ea	$2,000	2	$4,000
Construct access road, car and trailer parking to boat ramp (2-coat seal, no kerbs)	m^2	$30	3,200	$96,000
Install new public toilet and waste compound	ea	$200,000	1	$200,000
Install irrigation and establish turf cover for entire recreation reserve (1.8 hectares)	site	$50,000	1	$50,000
Install new quad barbecue shelters	ea	$40,000	4	$160,000
Install new picnic tables and shelters	ea	$5,000	13	$65,000
Clean up understory beneath existing tree canopy	ea	$30,000	1	$30,000
Construct two weir viewing platforms	ea	$40,000	2	$80,000
Install new fish cleaning facilities	ea	$10,000	1	$10,000
Install fencing along recreation reserve riverfront area	lm	$150	150	$22,500
Construct walking tracks along river foreshore (decomposed granite)	lm	$50	1,000	$50,000
Provide cultural heritage interpretive signage along riverside walk	ea	$5,000	6	$30,000
Landscaping and tree planting to entire recreation reserve	ea	$50,000	1	$50,000
Subtotal for Recreation Reserve Construction				**$999,500**

Project	Unit	Rate	Qty	Total
Subtotal for Primary Upgrade Works				**$1,092,000**
Project management @ 5%				$54,600
Contingency allowance @ 10%				$109,200
TOTAL FOR PRIMARY UPGRADE WORKS				**$1,255,800**
POTENTIAL FUTURE ADDITIONS				
Construction and Design				
Upgrade existing boat ramp and install pontoon	ea	$300,000	1	$300,000
Establish beach area and construct two enclosing platforms	ea	$150,000	1	$150,000
Design and construct water park in recreation reserve	ea	$600,000	1	$600,000
Detailed design for pavilion building				$30,000
Construct new pavilion in recreation reserve	ea	$400,000	1	$400,000
Subtotal for Potential Future Additions				**$1,480,000**
Project management @ 5%				$74,000
Contingency allowance @ 10%				$148,000
TOTAL FOR POTENTIAL FUTURE ADDITIONS				**$1,702,000**
TOTAL RECREATION RESERVE DEVELOPMENT				**$2,957,800**

Economic Benefit

Economic impact modelling enables Leeton Shire to explore how change in employment or output (sales) in one sector of the local economy will impact on all other sectors of the economy, by modelling the flow-on effects across different industries.

Using an economic impact model, Council has measured the flow-on impacts to the local economy resulting from the proposed upgrades to the recreation reserve.

Major highlights include the following:

- The combination of all direct, industrial and consumption effects would result in a total estimated rise in output of $4 million in the Leeton Shire economy, representing a type 2 output multiplier of 1.43.
- The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be $7.02 million added to Australia's output.
- The combination of all direct, industrial and consumption effects would result in a total estimated increase of 31 jobs located in Leeton Shire. This represents a type 2 employment multiplier of 1.25.
- The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be an addition of 42 jobs.
- The combination of all direct, industrial and consumption effects would result in an estimated addition in value added of $1.29 million in the Leeton Shire economy, representing a type 2 value-added multiplier of 1.56.
- The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be $2.56 million added to Australia's value added.

CONTENTS

1 INTRODUCTION

1.1 Project Overview

The Gogeldrie Weir Recreation Reserve project is a master planning process to identify and explore the potential of the area to deliver sustainable design solutions that meet the local community's passive recreation desires and stimulate increased visitation to the region.

Key deliverables of the master plan for the recreation reserve are:

- To guide the future use, development and ongoing management of the recreation reserve.
- An attractive and better-defined community recreation area that is complementary to the natural environment.
- A safe community recreation area with the necessary amenities required by day users, including but not limited to grassed areas, fully accessible toilets, barbecues and shade areas.
- A welcoming and fun space for young people and children, including suitable play activities.
- A mix of water-based recreational opportunities, including appropriate and safe boat launching and fish cleaning facilities.
- Facilities that are sympathetic to the environment, multi-use where possible, sustainable, affordable, and robust, requiring minimal servicing.
- An improved interface with the river.
- To undertake comprehensive stakeholder engagement and consultation to inform key design elements.
- To prepare a detailed master plan (report and drawings) detailing all aspects of the proposed master plan and providing a framework for decision making in the ongoing development and improvement of the recreation reserve.
- To present details outlining the benefits to be realised from the redevelopment of the recreation reserve, including financial, amenity and regional growth through tourism or other economic impacts of the proposed plan.

1.2 Project Methodology

Project methodology for the preparation of the master plan is provided below:

a) Site inspection and project inception meeting

Review study areas and all related projects, review outcomes of Council's consultation process, assess site constraints, identify development opportunities and discussion with the Council Committee and Council staff. Meet with National Parks, WaterNSW, current holiday park/recreation reserve management and other stakeholders as necessary. Discuss previous proposals, community attitudes/issues and obtain input on Council ideas for consideration as part of the project.

b) Planning framework review

Review state, regional and local planning legislation, constraints and identify issues for inclusion in the master plan report. Identify any planning pathways required to authorise the proposed development.

c) Detailed site analysis

Using all available information and initial site visit, prepare a detailed site analysis and identify specific design constraints, considerations and opportunities.

d) Tourism research

Undertake detailed research of current visitation to the local area and region. Review regional tourism studies to identify key projects and forecast for future tourism growth.

e) Design options and cost analysis

Develop design options for the recreation reserve. Prepare cost estimates for implementation of the proposed capital upgrades. Identify ongoing operational costs for the redeveloped recreation reserve.

f) Prepare draft master plan report

Present design options with supporting documentation including research, consultation, cost estimates and options for management of the facility.

Plans to include:

i) Overall master plan;

ii) Primary upgrade works; and

iii) Potential implementation.

g) Council review/public exhibition

Council to review the draft master plan report and undertake public exhibition (subject to Council determination). Submissions to be collated and included in the final master plan document identifying any changes to the draft plan resulting from the consultation process.

h) Adoption of the final plan

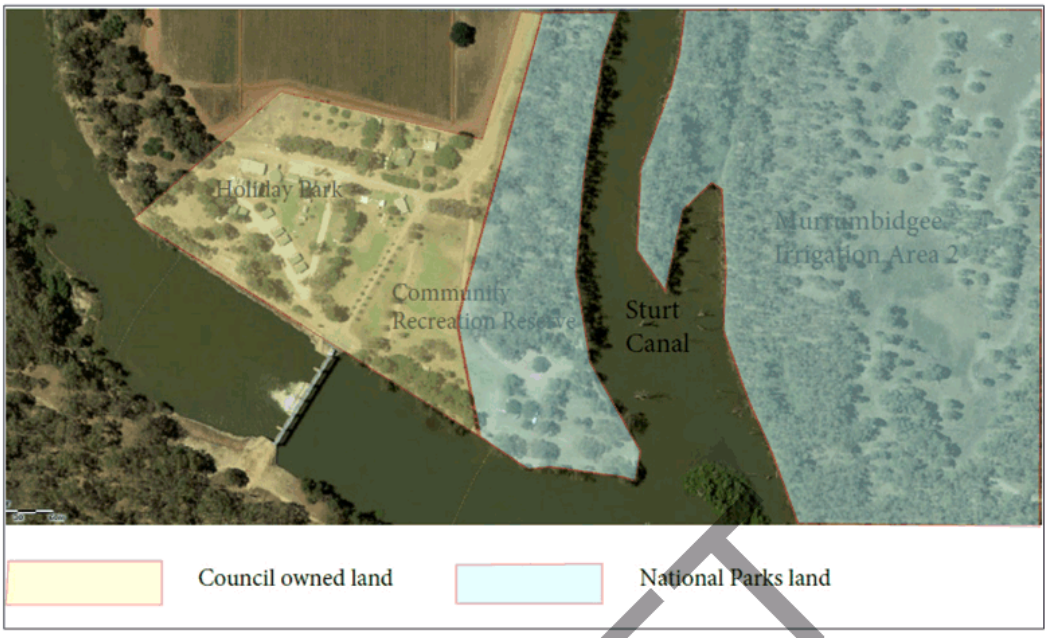
Prepare the final master plan report incorporating changes from Council review and public exhibition.

1.3 Study Areas

Figure 1 illustrates the area relating to the master plan which is partially owned by Council and National Parks. The land (both Council and National Parks) on the western side of the Sturt Canal represents the area of the master plan. The area on the eastern side of the Sturt Canal forms part of the Murrumbidgee Irrigation Area 2, as identified by National Parks.

While the focus of the master plan is on the area west of the Sturt Canal, a footbridge joining the two sides of the canal is included to provide linkages to walkways and cycle tracks in the Murrumbidgee Irrigation Area 2.

Figure 1: Study areas of the master plan identifying land ownership (boundaries are approximate)



2 PLANNING FRAMEWORK

2.1 Introduction

A range of state, regional and local planning controls impact the management and administration of the subject land. Although known locally as the Gogeldrie Weir Community Recreation Area it also includes the Gogeldrie Weir Holiday Park and camping ground. A ***recreation area*** is a defined use in Leeton Local Environmental Plan 2014 (LEP 2014) but it is not clear that it has ever been approved as a use for this purpose. The site has been approved as a Caravan Park and Camping Ground.

2.2 Subject Land

The holiday park and recreation reserve are located on Lots 2 and 4 DP 1184875, which are owned by Council (Figure 2). The land is classified as Community land and while a plan of management for the land was prepared, there is no evidence to demonstrate that it has been adopted.

Figure 2: Lots 2 and 4 DP 1184875 and surrounding land

Source: SIX Maps (note that the cadastral boundary lines are not aligned with the image)

Council has provided copies of the deposited plan associated with the land parcels (Annexure 1). The deposited plans identify registered easements over both land parcels. The easements are in favour of the State Water Corporation and Water Administration Ministerial Corporation for the purpose of access and underground infrastructure.

2.3 State and Regional Planning Controls

2.3.1 Environmental Planning and Assessment Act 1979

This Act sets the overall framework for strategic planning, zoning of land, land use, environmental assessment and development control. Understanding how the Act applies to particular development can be a complex task. At the outset, it is important to determine the specific applicable planning controls and whether development consent is required for the proposed works.

There are a number of State Environmental Planning Policies (SEPPs) prepared under this Act, and a few have particular relevance to improvements in Gogeldrie Weir Recreation Reserve. Similarly, Leeton Shire Council's local planning controls also have relevance for the future development of the recreation reserve.

2.3.2 State Environmental Planning Policy (Koala Habitat Protection) 2021

This SEPP aims to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline.

This SEPP applies to the Leeton LGA. If a development application is lodged for works then the SEPP will be triggered as a consideration if the land:

(a) has an area of at least 1 hectare (including adjoining land within the same ownership), and

(b) does not have an approved koala plan of management applying to the land.

If the SEPP is triggered then:

Before a council may grant consent to a development application for consent to carry out development on the land, the council must assess whether the development is likely to have any impact on koalas or koala habitat.

If the council is satisfied that the development is likely to have low or no impact on koalas or koala habitat, the council may grant consent to the development application.

If the council is satisfied that the development is likely to have a higher level of impact on koalas or koala habitat, the council must, in deciding whether to grant consent to the development application, take into account a koala assessment report for the development.

However, the council may grant development consent if the applicant provides to the council—

(a) information, prepared by a suitably qualified and experienced person, the council is satisfied demonstrates that the land subject of the development application—

(i) does not include any trees belonging to the koala use tree species listed in Schedule 2 for the relevant koala management area, or

(ii) is not core koala habitat, or

(b) information the council is satisfied demonstrates that the land subject of the development application—

(i) does not include any trees with a diameter at breast height over bark of more than 10 centimetres, or

(ii) includes only horticultural or agricultural plantations.

2.3.3 State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017

This state policy requires consent for vegetation clearing in non-rural areas where it is not otherwise protected by the provisions of an LEP or another SEPP. The SEPP references the Biodiversity Offsets Scheme Threshold, which is a test used to determine when it is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (the BAM) to assess the impacts of a proposal.

It is used for local developments (development applications submitted to councils) and clearing in urban areas and areas zoned for environmental conservation. The RE1 zone is regarded as an urban zone.

It does not apply to activities by a public authority that are subject to Part 5 of the EP&A Act 1979.

The *Biodiversity Conservation Regulation 2017* sets out threshold levels for when the Biodiversity Offsets Scheme will be triggered. The threshold has two elements:

- Whether the amount of native vegetation being cleared exceeds a threshold area set out below.
- Whether the impacts occur on an area mapped on the Biodiversity Values Map published by the Minister for the Environment.

If clearing and other impacts exceed either trigger, the Biodiversity Offsets Scheme applies to the proposed development, including biodiversity impacts prescribed by clause 6.1 of the *Biodiversity Conservation Regulation 2017*.

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and Biodiversity Offsets Scheme apply
Less than 1 hectare	0.25 hectares or more
1 hectare to less than 40 hectares	0.5 hectares or more
40 hectares to less than 1,000 hectares	1 hectare or more
1,000 hectares or more	2 hectares or more

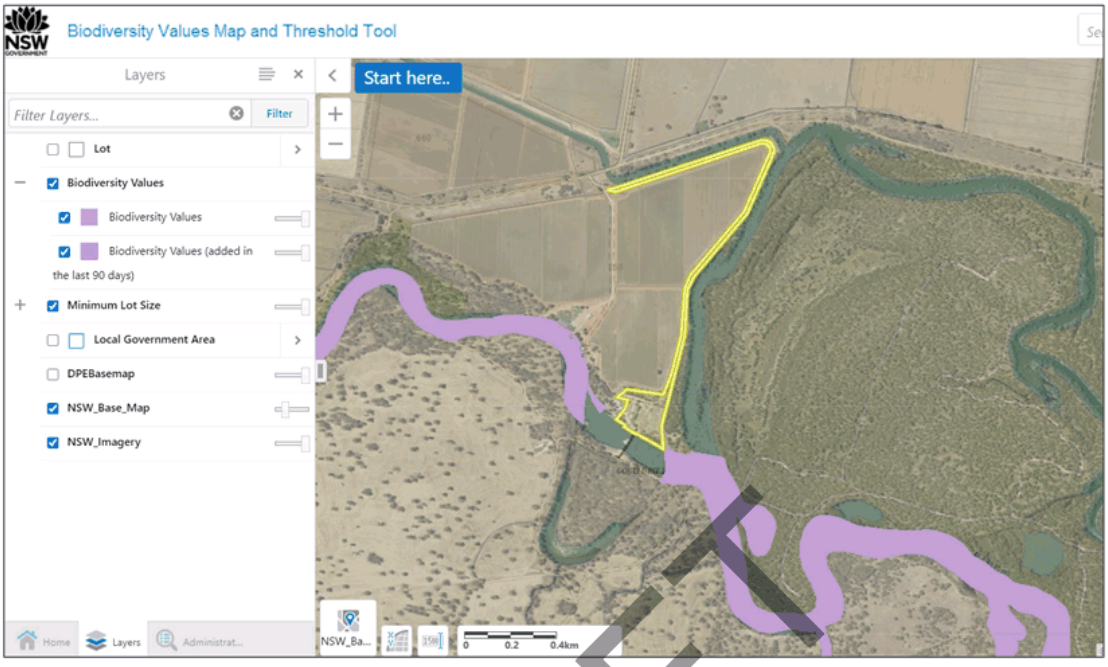
The subject land does not have a minimum lot size. The OEH website advises that in this circumstance: "Where there is no minimum lot size the clearing threshold will be based on the smallest actual lot size associated with the development." Given that the smallest lot is Lot 4 and it has an area of approximately 0.7 hectares then the clearing threshold will be 0.25 hectares.

In this case, if the vegetation clearing is associated with a future development application then it will be ancillary to that approval and will be assessed on merit as part of any approval. If vegetation clearing is associated with an activity under Part 5 then it will be assessed in a Review of Environmental Factors.

It is anticipated that any tree clearing on this site will be minor and it should be kept to less than 0.25 hectares.

The subject land does not contain any areas identified on the NSW Biodiversity Values Map (Figure 3).

Figure 3: Biodiversity Values Map and Threshold Tool



Source: NSW Government

2.3.4 State Environmental Planning Policy (Infrastructure) 2007

Clause 65(3) of SEPP (Infrastructure) 2007 states that:

> *Any of the following development may be carried out by or on behalf of a council without consent on a public reserve under the control of or vested in the council:*
>
> *(a) development for any of the following purposes:*
>
> *(i) roads, pedestrian pathways, cycleways, single storey car parks, ticketing facilities, viewing platforms and pedestrian bridges,*
>
> *(ii) recreation areas and recreation facilities (outdoor), but not including grandstands,*
>
> *(iii) visitor information centres, information boards and other information facilities,*
>
> *(iv) lighting, if light spill and artificial sky glow is minimised in accordance with the Lighting for Roads and Public Spaces Standard,*
>
> *(v) landscaping, including landscape structures or features (such as art work) and irrigation systems,*
>
> *(vi) amenities for people using the reserve, including toilets and change rooms,*
>
> *(vii) food preparation and related facilities for people using the reserve,*
>
> *(viii) maintenance depots,*
>
> *(ix) portable lifeguard towers,*
>
> *(b) environmental management works,*

(c) *demolition of buildings (other than any building that is, or is part of, a State or local heritage item or is within a heritage conservation area).*

Note—

*The term **building** is defined in the Environmental Planning and Assessment Act 1979 as including any structure.* (However, it does not include a manufactured home.)

In this case, if all works are being carried out by or on behalf of the Council on a public reserve under the control of the Council then this SEPP may apply.

SEPP (Infrastructure) 2007 prevails over *Leeton Local Environmental Plan 2014*, but any works that are undertaken without development consent will be subject to a Review of Environmental Factors (REF) prepared under Part 5 of the EP&A Act 1979.

2.3.5 The Riverina Murray Regional Plan 2036

This plan identifies the Riverina Murray region as a leading and highly diversified economy with growing local job opportunities and sustainable communities. Gogeldrie Weir Recreation Reserve (in the Leeton LGA) is centrally located in the heart of the Riverina on the Murrumbidgee River. Leeton's economy is primarily driven by agriculture, with citrus, rice, grapes and wheat important commodities. The Shire is home to the Sunrice Headquarters, Berri Juices, Swift Beef Cattle Feedlot, Freedom Foods and Murrumbidgee Irrigation, and is an important education centre for the Riverina Murray region. The plan states that a key priority for the LGA is to "Create a diversity of jobs by promoting tourism opportunities."

A master plan for Gogeldrie Weir Recreation Reserve that supports the local community and boosts tourism while ensuring no negative impacts on the Murrumbidgee River would be consistent with the Riverina Murray Regional Plan.

2.4 Local Planning Context

Leeton Local Environmental Plan 2014 (LEP 2014) applies to the development, improvement and management of Gogeldrie Weir Recreation Reserve. Under the provisions of LEP 2014, the recreation reserve is within the RE1 Public Recreation zone (Figure 4).

Zone RE1 Public Recreation

1 Objectives of zone

- *To enable land to be used for public open space or recreational purposes.*
- *To provide a range of recreational settings and activities and compatible land uses.*
- *To protect and enhance the natural environment for recreational purposes.*
- *To encourage the development of public open spaces in a way that addresses the community's diverse recreation needs.*

2 Permitted without consent

Environmental protection works; Roads; Water reticulation systems

3 Permitted with consent

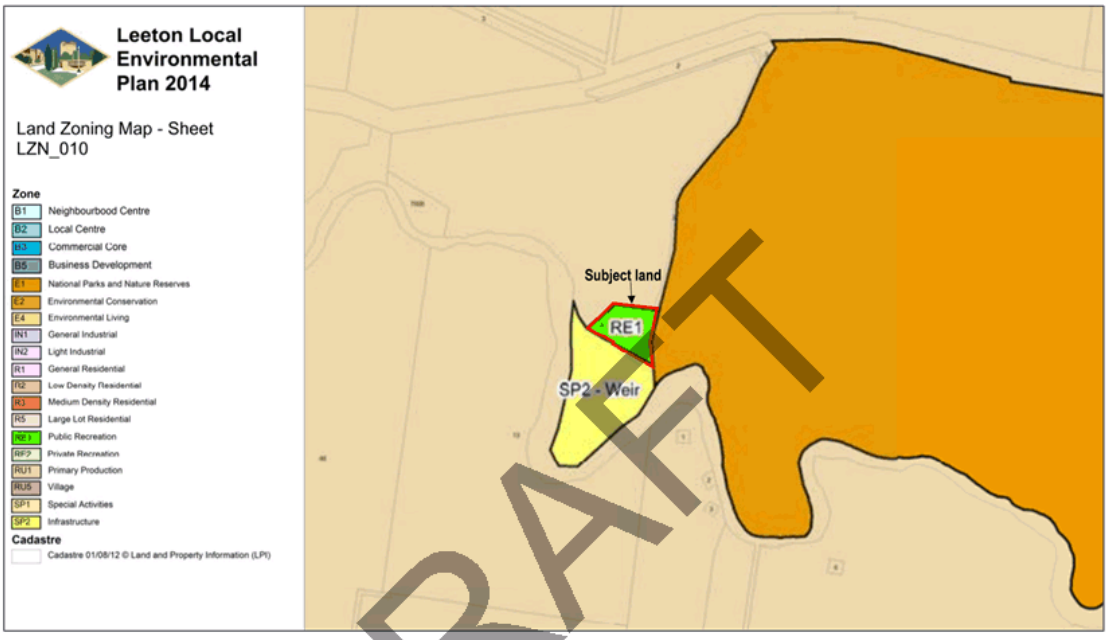
Advertising structures; Aquaculture; Boat launching ramps; Boat sheds; Building identification signs; Business identification signs; Centre-based child care facilities; Charter and tourism boating facilities; Community facilities; Entertainment facilities; Environmental facilities; Flood mitigation works; Food and drink premises; Function centres; Information and education facilities; Kiosks; Markets; Recreation areas;

Recreation facilities (indoor); Recreation facilities (major); Recreation facilities (outdoor); Respite day care centres; Water recreation structures; Water recycling facilities; Water supply systems

4 Prohibited

Pubs; Take away food and drink premises; Water treatment facilities; Any other development not specified in item 2 or 3

Figure 4: Land use zones



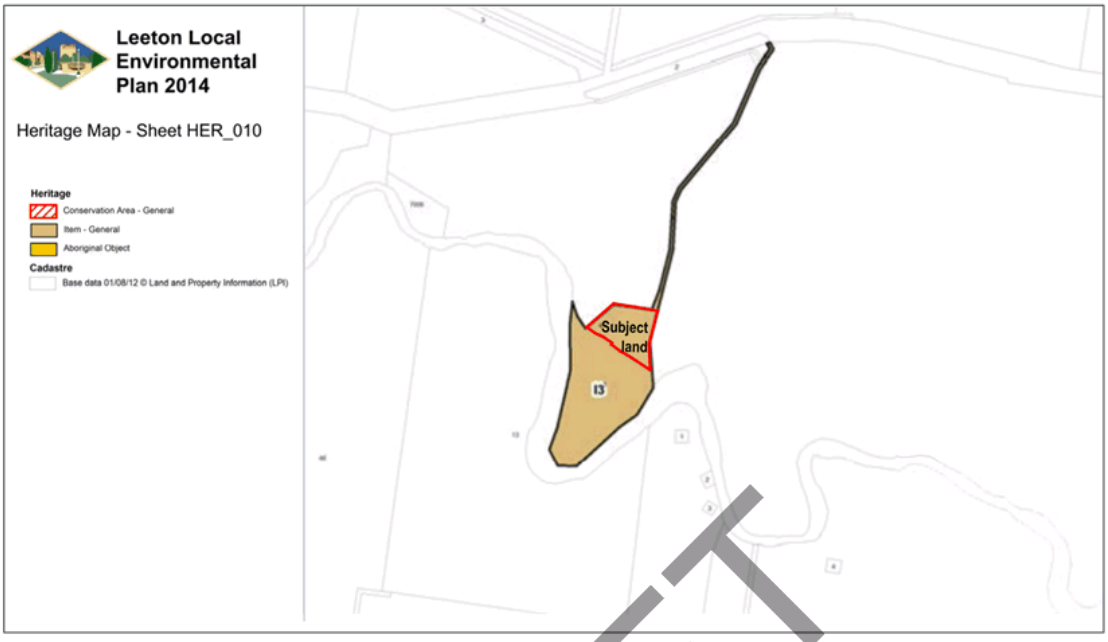
Source: Leeton LEP 2014

2.4.1 Planning Issues

Heritage

Gogeldrie Weir is listed in Leeton LEP 2014 as a state significant heritage item (Figure 5). The listing specifically includes the two lots on which the recreation reserve is located.

Figure 5: Heritage area



Source: Leeton LEP 2014

NSW OEH listing states the following:

> *Gogeldrie Weir is associated with the Coleambally Irrigation Area and also part of the Murrumbidgee Irrigation Area. It was completed in 1959. It is a major component in the Coleambally Irrigation Scheme being the diversion weir that controls and diverts water from the Murrumbidgee River to the Coleambally area. The weir is a landmark in the region. (DLWC S170 Register). The Gogeldrie Weir is one of seven major weirs on the Murrumbidgee River. It is approximately 63 kilometres downstream of Narrandera. The weir is 85.34m (280') between abutments. The weir structure comprises concrete sill floor reinforced with steel sheet piling cut-off walls, the floor is surmounted by concrete piers and steel superstructure providing supports for the steel sluice gates. There are six gates each measuring 6.1m (20') high and 12.2m (40') wide, weighing 24 tonnes. The gates are opened individually by electric motors placed centrally between piers. The gates move vertically and the counterweights drop into the counterweight wells allowed for in each of the concrete piers. The original gate control meter has been replaced by computerised meter in 1996. The weir provides a pool level suitable for the diversion of water from the Murrumbidgee River into Coleambally Canal supplying the Coleambally Irrigation Area, and via Coononcoocabil Lagoon into the Stuart Canal to supply part of the Murrumbidgee Irrigation Areas and associated irrigation districts.*

Consideration would have to be given to any development in proximity to the item. Leeton LEP 2014 clause 5.10 would need to be addressed.

> ***5.10 Heritage conservation***
>
> *(1)* ***Objectives*** *The objectives of this clause are as follows—*
>
> *(a) to conserve the environmental heritage of Leeton,*
>
> *(b) to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views,*

(c) *to conserve archaeological sites,*

(d) *to conserve Aboriginal objects and Aboriginal places of heritage significance.*

(2) ***Requirement for consent*** *Development consent is required for any of the following—*

(a) *demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance)—*

(i) *a heritage item,*

(ii) *an Aboriginal object,*

(iii) *a building, work, relic or tree within a heritage conservation area,*

(b) *altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,*

(c) *disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,*

(d) *disturbing or excavating an Aboriginal place of heritage significance,*

(e) *erecting a building on land—*

(i) *on which a heritage item is located or that is within a heritage conservation area, or*

(ii) *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,*

(f) *subdividing land—*

(i) *on which a heritage item is located or that is within a heritage conservation area, or*

(ii) *on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.*

(3) ***When consent not required*** *However, development consent under this clause is not required if—*

(a) *the applicant has notified the consent authority of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development—*

(i) *is of a minor nature or is for the maintenance of the heritage item, Aboriginal object, Aboriginal place of heritage significance or archaeological site or a building, work, relic, tree or place within the heritage conservation area, and*

(ii) *would not adversely affect the heritage significance of the heritage item, Aboriginal object, Aboriginal place, archaeological site or heritage conservation area, or*

(b) *the development is in a cemetery or burial ground and the proposed development—*

(i) *is the creation of a new grave or monument, or excavation or disturbance of land for the purpose of conserving or repairing monuments or grave markers, and*

(ii) would not cause disturbance to human remains, relics, Aboriginal objects in the form of grave goods, or to an Aboriginal place of heritage significance, or

(c) the development is limited to the removal of a tree or other vegetation that the Council is satisfied is a risk to human life or property, or

(d) the development is exempt development.

(4) ***Effect of proposed development on heritage significance*** The consent authority must, before granting consent under this clause in respect of a heritage item or heritage conservation area, consider the effect of the proposed development on the heritage significance of the item or area concerned. This subclause applies regardless of whether a heritage management document is prepared under subclause (5) or a heritage conservation management plan is submitted under subclause (6).

(5) ***Heritage assessment*** The consent authority may, before granting consent to any development—

(a) on land on which a heritage item is located, or

(b) on land that is within a heritage conservation area, or

(c) on land that is within the vicinity of land referred to in paragraph (a) or (b),

require a heritage management document to be prepared that assesses the extent to which the carrying out of the proposed development would affect the heritage significance of the heritage item or heritage conservation area concerned.

(6) ***Heritage conservation management plans*** The consent authority may require, after considering the heritage significance of a heritage item and the extent of change proposed to it, the submission of a heritage conservation management plan before granting consent under this clause.

(7) ***Archaeological sites*** The consent authority must, before granting consent under this clause to the carrying out of development on an archaeological site (other than land listed on the State Heritage Register or to which an interim heritage order under the Heritage Act 1977 applies)—

(a) notify the Heritage Council of its intention to grant consent, and

(b) take into consideration any response received from the Heritage Council within 28 days after the notice is sent.

(8) ***Aboriginal places of heritage significance*** The consent authority must, before granting consent under this clause to the carrying out of development in an Aboriginal place of heritage significance—

(a) consider the effect of the proposed development on the heritage significance of the place and any Aboriginal object known or reasonably likely to be located at the place by means of an adequate investigation and assessment (which may involve consideration of a heritage impact statement), and

(b) notify the local Aboriginal communities, in writing or in such other manner as may be appropriate, about the application and take into consideration any response received within 28 days after the notice is sent.

(9) ***Demolition of nominated State heritage items*** The consent authority must, before granting consent under this clause for the demolition of a nominated State heritage item—

(a) notify the Heritage Council about the application, and

(b) take into consideration any response received from the Heritage Council within 28 days after the notice is sent.

*(10) **Conservation incentives** The consent authority may grant consent to development for any purpose of a building that is a heritage item or of the land on which such a building is erected, or for any purpose on an Aboriginal place of heritage significance, even though development for that purpose would otherwise not be allowed by this Plan, if the consent authority is satisfied that—*

(a) the conservation of the heritage item or Aboriginal place of heritage significance is facilitated by the granting of consent, and

(b) the proposed development is in accordance with a heritage management document that has been approved by the consent authority, and

(c) the consent to the proposed development would require that all necessary conservation work identified in the heritage management document is carried out, and

(d) the proposed development would not adversely affect the heritage significance of the heritage item, including its setting, or the heritage significance of the Aboriginal place of heritage significance, and

(e) the proposed development would not have any significant adverse effect on the amenity of the surrounding area.

Aboriginal Cultural Heritage

The land is not listed in the NSW AHIMS register as containing an Aboriginal heritage site. A search using a 200-metre buffer was undertaken for Lots 2 and 4 DP 1184875 and these are included at Annexure 2.

Any application that disturbs the ground or mature vegetation will need to be mindful of the possibility of disturbing Aboriginal sites. If sites or objects are present or found at any time in the future, they are protected under the *National Parks and Wildlife Act 1974*, even if they are not recorded on AHIMS. The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Due Diligence Code of Practice) can be used by individuals or organisations who intend to undertake activities that could harm Aboriginal objects.

Other clauses in Leeton LEP 2014 that would need to be addressed if a development application for improvements to the recreation reserve were permitted on the subject land are as follows:

Clause 6.1 Earthworks

(1) The objective of this clause is to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.

(2) Development consent is required for earthworks unless—

(a) the earthworks are exempt development under this Plan or another applicable environmental planning instrument, or

(b) the earthworks are ancillary to development that is permitted without consent under this Plan or to development for which development consent has been given.

(3) *Before granting development consent for earthworks (or for development involving ancillary earthworks), the consent authority must consider the following matters—*

(a) *the likely disruption of, or any detrimental effect on, drainage patterns and soil stability in the locality of the development,*

(b) *the effect of the development on the likely future use or redevelopment of the land,*

(c) *the quality of the fill or the soil to be excavated, or both,*

(d) *the effect of the development on the existing and likely amenity of adjoining properties,*

(e) *the source of any fill material and the destination of any excavated material,*

(f) *the likelihood of disturbing relics,*

(g) *the proximity to, and potential for adverse impacts on, any waterway, drinking water catchment or environmentally sensitive area,*

(h) *any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.*

Note—

The National Parks and Wildlife Act 1974, particularly section 86, deals with harming Aboriginal objects.

Clause 6.2 Flood planning

(1) *The objectives of this clause are as follows—*

(a) *to minimise the flood risk to life and property associated with the use of land,*

(b) *to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change,*

(c) *to avoid significant adverse impacts on flood behaviour and the environment.*

(2) *This clause applies to—*

(a) *land identified as "Flood planning area" on the Flood Planning Map, and*

(b) *other land at or below the flood planning level.*

(3) *Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that the development—*

(a) *is compatible with the flood hazard of the land, and*

(b) *will not significantly adversely affect flood behaviour resulting in detrimental increases in the potential flood affectation of other development or properties, and*

(c) *incorporates appropriate measures to manage risk to life from flood, and*

(d) *will not significantly adversely affect the environment or cause avoidable erosion, siltation, destruction of riparian vegetation or a reduction in the stability of river banks or watercourses, and*

(e) *is not likely to result in unsustainable social and economic costs to the community as a consequence of flooding.*

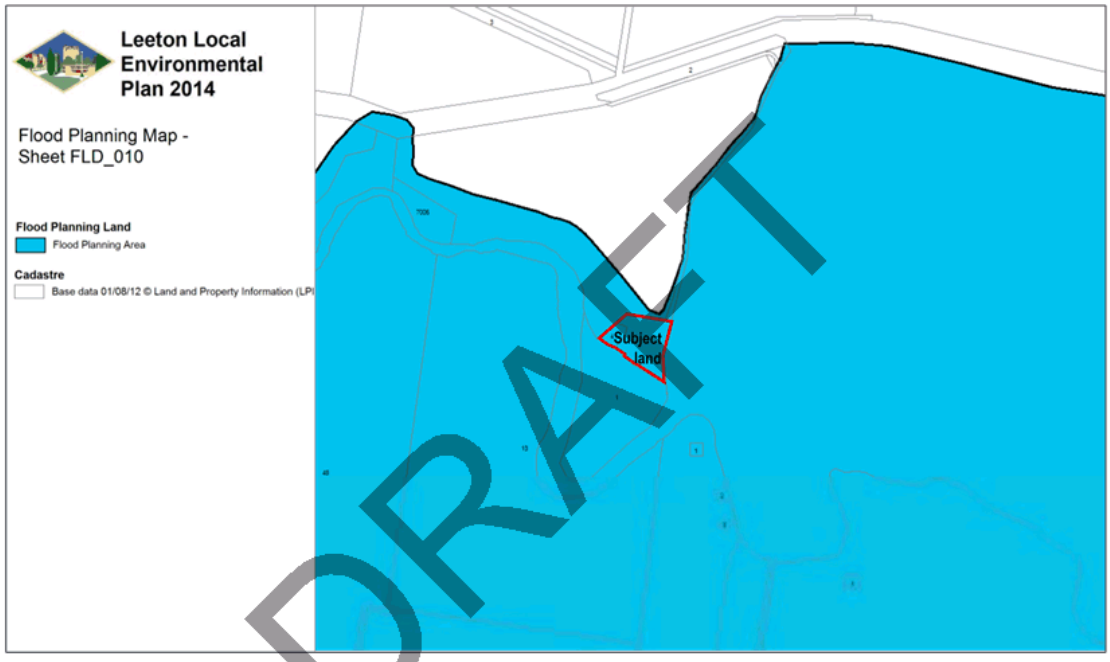
(4) *A word or expression used in this clause has the same meaning as it has in the Floodplain Development Manual (ISBN 0 7347 5476 0) published by the NSW Government in April 2005, unless it is otherwise defined in this clause.*

(5) *In this clause—*

***Land at or below the flood planning level** means the level of a 1:100 ARI (average recurrent interval) flood event plus 0.5 metre freeboard.*

Figure 6 illustrates that the whole site is identified as flood prone. Specialist advice will be required to enable a design response to the flood heights, hazard rating and flood velocity for any proposed development of the recreation reserve.

Figure 6: Flood planning area



Source: Leeton LEP 2014

Clause 6.3 Terrestrial biodiversity

(1) *The objective of this clause is to maintain terrestrial biodiversity by—*

(a) *protecting native fauna and flora, and*

(b) *protecting the ecological processes necessary for their continued existence, and*

(c) *encouraging the conservation and recovery of native fauna and flora and their habitats.*

(2) *This clause applies to land identified as "Biodiversity" on the Terrestrial Biodiversity Map.*

(3) In deciding whether to grant development consent for development on land to which this clause applies, the consent authority must consider—

(a) whether the development is likely to have—

(i) any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and

(ii) any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and

(iii) any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and

(iv) any adverse impact on the habitat elements providing connectivity on the land, and

(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

The western edge of Lot 4 is impacted by this clause (Figure 7).

Figure 7: Land identified as "Biodiversity" on the Terrestrial Biodiversity Map

Source: Leeton LEP 2014

Clause 6.4 Groundwater vulnerability

(1) The objectives of this clause are as follows—

(a) to maintain the hydrological functions of key groundwater systems,

(b) to protect vulnerable groundwater resources from depletion and contamination as a result of development.

(2) This clause applies to land identified as "Groundwater vulnerable" on the Groundwater Vulnerability Map.

(3) In deciding whether to grant development consent for development on land to which this clause applies, the consent authority must consider the following—

(a) the likelihood of groundwater contamination from the development (including from any on-site storage or disposal of solid or liquid waste and chemicals),

(b) any adverse impacts the development may have on groundwater dependent ecosystems,

(c) the cumulative impact the development may have on groundwater (including impacts on nearby groundwater extraction for a potable water supply or stock water supply),

(d) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.

(4) Development consent must not be granted to development on land to which this clause applies unless the consent authority is satisfied that—

(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or

(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or

(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.

The whole site is impacted by this clause (Figure 8).

Figure 8: Land identified as "vulnerable" on the Groundwater Vulnerability Map

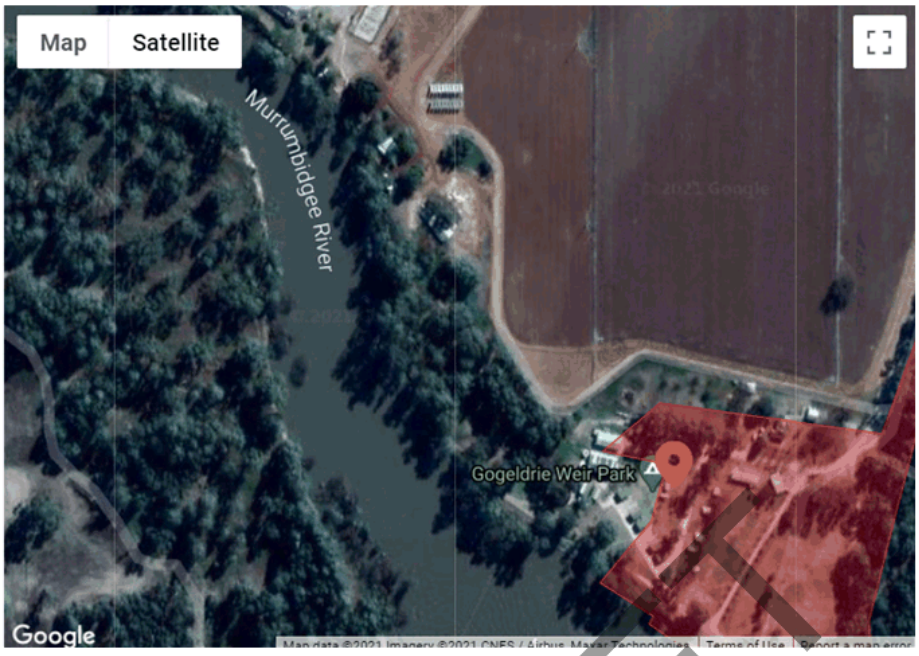
Source: Leeton LEP 2014

2.4.2 Bushfire

Council does not have bushfire mapping for the area. However, a search of the NSW Rural Fire Service website identifies that the subject land is within a designated bushfire prone area (Figure 9). Any development application for the development of the recreation reserve may be referred to the bushfire authority (RFS) as integrated development. In order to proceed, a *bush fire safety authority* is required to authorise development for a purpose referred to in subsection (1) to the extent that it complies with standards regarding setbacks, provision of water supply and other matters considered by the Commissioner to be necessary to protect persons, property or the environment from danger that may arise from a bushfire.

A specialist report from a qualified bushfire consultant would be required to support the application. Should future development be assessed under Part 5 of the EP&A Act, consideration of the impacts of bushfire would form part of the Review of Environmental Factors (REF).

Figure 9: Bushfire mapping (Crown and Council land)



Source: NSW Rural Fire Service (note that the cadastral boundaries are not aligned with the image)

2.4.3 Leeton Development Control Plan

There is currently no development control plan for Leeton Shire Council.

2.5 Summary

The proposed redevelopment of Gogeldrie Weir Recreation Reserve is subject to a number of statutory controls.

The site is significantly impacted by both flooding and bushfire, and is heritage listed; therefore, specialist reports will be required to determine and support the design footprint and intensity of development.

Future redevelopment to implement a master plan may trigger the requirement for a development application or it may be able to be dealt with as an activity pursuant to SEPP (Infrastructure) under Part 5 of the EP&A Act 1979. It is a fundamental requirement that prior to undertaking work in the recreation reserve, a Review of Environment Factors or Statement of Environment Effects is prepared. The path to be taken will depend on the type and extent of works involved.

3 BUSINESS CONTEXT

3.1 Introduction

Tourism 2020 is a whole-of-government and industry long-term strategy to build the resilience and competitiveness of Australia's tourism industry and grow its economic contribution.

The *Tourism 2020* goal was to achieve more than $115 billion in overnight spend by 2020 (up from $70 billion in 2009). At 30 June 2019, overnight visitor expenditure was on target to reach $134 billion by 2020, and work had commenced on the Tourism 2030 Strategy.[1]

Then the COVID-19 pandemic took hold. Within months international borders closed, airlines grounded passenger fleets, businesses collapsed and hotels went into hibernation. Demand slumped in lockstep as travellers cut short their trips to seek sanctuary in their home countries.

Following a long period of uncertainty and the commencement of vaccinations, expectations are for a strong domestic recovery, in particular; while overseas travel undertakes a lengthy recovery. The International Air Transport Association reports that air passenger numbers will not return to 2019 levels until 2023–24. However, there still remains the threat of future waves of infections, which brings uncertainty to forecasting future tourism growth and domestic travel.

When analysing who spends what and where in Australian tourism, two key facts stand out from the 2019 data. Firstly, Australians travelling internationally spent $26 billion more overseas than overseas visitors spent in Australia. Secondly, domestic travellers already outspend international visitors in Australia by a ratio of more than 2:1.

While the future behaviour of those travellers who would have otherwise holidayed overseas is unknown, the level of expenditure in previous years demonstrates the capacity for some of this expenditure to prop up the domestic tourism market.[2]

3.2 NSW Tourism

To avoid the inconsistencies on tourism performance produced by COVID-19, the focus of data in this section of the report relates to 2019.

In the twelve months to December 2019, total travel expenditure in New South Wales (NSW) reached $43.3 billion, an increase of 11.3% from December 2018. Domestic overnight tourism experienced strong growth compared to year ending December 2018, with total expenditure increasing by 12.8%, reaching $23.8 billion in year ending December 2019.[3]

When compared to other Australian states, NSW continued to attract the highest number of domestic overnight visitors, receiving 33.2% of national market share, equating to 39 million domestic visitors in the year to December 2019. Regional NSW had the lion share of all visitors to NSW (63%), while Sydney had higher shares of visitor nights and expenditure in NSW (53% and 53%, respectively).

Some key statistics regarding NSW visitors include:

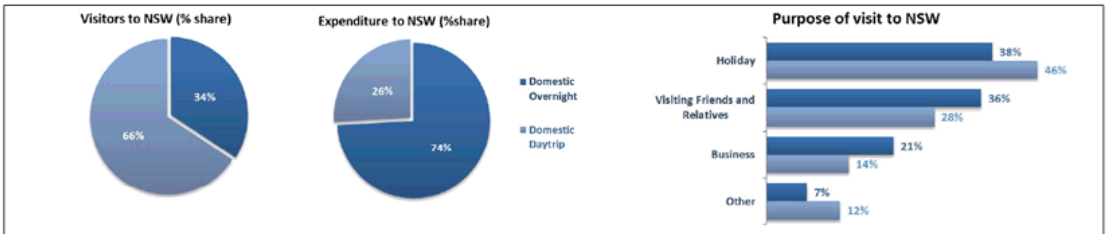
- The average length of stay in NSW was 3.1 nights and average spend per night was $193.
- 'Holiday' was the largest purpose of visit to NSW (38%), followed by 'Visiting Friends and Relatives' (36%) and 'Business' (21%).
- 22% of the domestic overnight visitors were aged 15–29 years, followed by 50–59 years old (18%) and 30–39 years old (17%).

[1] State of the Industry 2018–19, Tourism Research Australia, Canberra.
[2] Moving Forward: The Role of Domestic Travel in Australia's Tourism Recovery, Tourism Research Australia.
[3] The NSW Visitor: Combined Results (International, Domestic Overnight and Daytrip), Year Ending December 2019, Destination NSW.

- 'Unaccompanied Traveller' (34%) was the most common travel party among visitors to NSW, followed by 'Adult Couple' (25%) then 'Friends and Relatives Travelling Together' (20%) and 'Family Groups with Children' (15%).

From YE December 2014 to YE December 2019, domestic overnight visitors, nights and expenditure in NSW recorded the following changes: up 47.1%, up 43.2% and up 58.1%, respectively.[4]

Figure 10: Visitation, purpose of visit and destination of domestic visitors to NSW for YE December 2019



Destination	TOTAL DOMESTIC		DOMESTIC OVERNIGHT						DOMESTIC DAYTRIP		
	Visitors (000)	Expenditure ($million)	Visitors (000)	Nights (million)	Expenditure ($million)	ALOS	Spend per night ($)	Spend per visitor ($)	Visitors (000)	Expenditure ($million)	Spend per visitor ($)
Sydney	40,764	$12,461	12,655	35.0	$9,392	2.8	$268	$742	28,109	$3,069	$109
Regional NSW	74,203	$19,458	27,213	87.6	$14,272	3.2	$163	$524	46,990	$5,185	$110
North Coast NSW	*14,912*	*$4,909*	*6,402*	*24.3*	*$3,948*	*3.8*	*$163*	*$617*	*8,510*	*$961*	*$113*
Hunter	*13,056*	*$2,963*	*4,621*	*12.3*	*$2,104*	*2.7*	*$171*	*$455*	*8,435*	*$859*	*$102*
South Coast	*12,609*	*$2,993*	*4,563*	*15.3*	*$2,192*	*3.3*	*$144*	*$480*	*8,046*	*$800*	*$99*
Central Coast	*6,927*	*$1,067*	*1,939*	*5.0*	*$692*	*2.6*	*$137*	*$357*	*4,987*	*$375*	*$75*
Central NSW	*6,602*	*$1,925*	*2,831*	*7.2*	*$1,290*	*2.5*	*$180*	*$456*	*3,771*	*$635*	*$169*
Capital Country	*5,406*	*$948*	*1,734*	*3.8*	*$634*	*2.2*	*$167*	*$366*	*3,672*	*$314*	*$86*
Blue Mountains	*4,518*	*$737*	*1,318*	*2.9*	*$444*	*2.2*	*$151*	*$337*	*3,200*	*$293*	*$92*
New England North West	*4,029*	*$1,055*	*1,744*	*4.7*	*$719*	*2.7*	*$152*	*$412*	*2,286*	*$336*	*$147*
The Murray	*2,796*	*$843*	*1,361*	*3.7*	*$592*	*2.7*	*$160*	*$435*	*1,435*	*$252*	*$175*
Riverina	*2,789*	*$687*	*1,231*	*3.0*	*$455*	*2.4*	*$154*	*$370*	*1,558*	*$232*	*$149*
Snowy Mountains	*1,652*	*$781*	*960*	*2.9*	*$706*	*3.0*	*$246*	*$736*	*692*	*$75*	*$108*
Outback NSW	*1,042*	*$443*	*662*	*2.1*	*$390*	*3.1*	*$189*	*$590*	*np*	*np*	-
NSW Total	114,067	$31,918	38,968	122.6	$23,654	3.1	$193	$607	75,099	$8,254	$110

ALOS - average length of stay

np = data not publishable

Source: Domestic Travel to NSW Snapshot, year ending December 2019, Destination NSW

The visitor economy supply chain generates added economic multipliers, which means every dollar spent on tourism generates an additional 87 cents in other parts of the economy. At 1.87, tourism's multiplier is greater than retail trade (1.77) and mining (1.7).[5]

The Australian Accommodation Monitor for 2018–19, produced by STR Global and published by Destination NSW, reports a room occupancy rate of 78% for accommodation properties in New South Wales with ten or more rooms.[6] The rate for the Riverina region was 68.1% and for holiday parks 52.4%. The snapshot also provides information on average daily room rates (revenue per occupied room) and the revenue per available room. Respective data for each quarter is provided in Figure 11 and Figure 12.

[4] NSW Visitation International, Domestic Overnight and Daytrip, Year Ending December 2019, Destination NSW.
[5] State of the Industry, June 2016, Tourism Research Australia.
[6] Australian Accommodation Monitor 2018–2019, Destination NSW.

Figure 11: Supply, demand and revenue for establishments with 10 or more rooms by region

		SUPPLY			DEMAND		REVENUE		
	YE	Establish-ments	Rooms	Room nights available (000)	Room nights occupied (000)	Room occupancy rate	Takings from accommo-dation	Average daily rate	Revenue per available room[3]
		no.	no.	no.	no.	%	$ millions	$	$
NSW	2018–19	1,793	89,289	32,425	25,298	78.0%	5,383	212.8	166.0
	% ch	0.5%	1.5%	2.3%	1.0%	-1 ppts	-0.9%	-4.1	-5.4
Sydney	2018–19	411	43,835	15,913	13,270	83.4%	2,958	222.9	185.9
	% ch	1.2%	2.0%	3.9%	2.1%	-1.5 ppts	-0.7%	-6.2	-8.6
Blue Mountains	2018–19	33	1,427	522	320	61.3%	95	297.7	182.5
	% ch	0.0%	-0.3%	-0.1%	-0.5%	-0.2 ppts	4.9%	15.4	8.8
Capital Country	2018–19	62	2,111	769	421	54.7%	66	155.9	85.3
	% ch	0.0%	0.2%	1.4%	1.2%	-0.1 ppts	4.5%	5.0	2.6
Central Coast	2018–19	49	2,074	759	502	66.1%	98	195.8	129.5
	% ch	0.0%	-0.5%	-0.2%	-2.3%	-1.4 ppts	-2.6%	-0.5	-3.2
Central NSW	2018–19	154	4,613	1,672	1,060	63.4%	153	144.4	91.5
	% ch	0.0%	1.5%	0.9%	1.4%	0.3 ppts	4.6%	4.4	3.2
Hunter	2018–19	167	7,063	2,525	1,696	67.2%	317	187.1	125.7
	% ch	1.8%	4.8%	2.3%	1.1%	-0.8 ppts	2.7%	2.9	0.6
New England North West	2018–19	131	3,401	1,241	691	55.7%	103	149.5	83.2
	% ch	0.0%	0.0%	0.0%	1.1%	0.6 ppts	2.2%	1.6	1.8
North Coast NSW	2018–19	323	10,255	3,740	2,457	65.7%	444	180.7	118.7
	% ch	0.0%	0.3%	-0.1%	5.1%	3.2 ppts	12.5%	12.0	13.3
Outback NSW	2018–19	22	663	np	np	np	np	np	np
	% ch	0.0%	0.0%	-	-	-	-	-	-
Riverina	2018–19	68	2,229	813	554	68.1%	78	140.6	95.8
	% ch	0.0%	0.1%	0.1%	1.1%	0.7 ppts	2.7%	2.1	2.4
Snowy Mountains	2018–19	69	2,480	894	367	41.1%	72	195.8	80.4
	% ch	0.0%	0.5%	0.5%	-5.4%	-2.6 ppts	-6.4%	-2.1	-6.0
South Coast	2018–19	191	5,525	2,015	1,332	66.1%	238	178.3	117.9
	% ch	0.5%	0.3%	0.2%	-0.8%	-0.7 ppts	0.3%	2.1	0.1
The Murray	2018–19	113	3,613	1,318	758	57.5%	101	133.9	77.0
	% ch	0.0%	0.5%	4.0%	1.4%	-1.5 ppts	-1.1%	-3.3	-4.0

Source: Australian Accommodation Monitor 2018–19, Destination NSW

Figure 12: Supply, demand and revenue for establishments with 10 or more rooms by category

NSW	YE	SUPPLY			DEMAND		REVENUE		
		Establish-ments	Rooms	Room nights available (000)	Room nights occupied (000)	Room occupancy rate	Takings from accommo-dation	Average daily rate	Revenue per available room[3]
		no.	no.	no.	no.		$ millions	$	$
TOTAL	2018–19	1,793	89,289	32,425	25,298	78.0%	5,383	212.8	166.0
	% ch	3.0%	2.8%	2.3%	1.0%	-1 ppts	-0.9%	-4.1	-5.4
Hotels & Resorts	2018–19	524	44,655	16,152	12,886	79.8%	2,845	220.8	176.2
	% ch	2.5%	3.9%	3.6%	2.3%	-1 ppts	0.6%	-3.8	-5.3
Motels/Private Hotels/Guest Houses	2018–19	907	24,940	9,104	6,205	68.2%	978	157.6	107.4
	% ch	2.4%	0.5%	0.2%	-3.3%	-2.5 ppts	-3.6%	-0.4	-4.2
Serviced Apartments	2018–19	202	14,561	5,304	4,314	81.3%	917	212.7	173.0
	% ch	3.6%	0.3%	2.1%	0.7%	-1.2 ppts	-3.0%	-8.1	-9.2
Holiday Parks	2018–19	160	5,133	1,865	972	52.1%	155	159.1	82.9
	% ch	8.1%	12.7%	2.1%	4.2%	1.1 ppts	9.9%	8.2	5.9
Luxury & Upper Upscale Classes	2018–19	152	19,377	7,017	5,950	84.8%	1,693	284.6	241.3
	% ch	-3.2%	-1.7%	3.6%	3.4%	-0.2 ppts	0.8%	-7.4	-6.8
Hotels & Resorts	2018–19	86	13,246	4,793	4,045	84.4%	1,221	301.9	254.8
	% ch	-1.1%	0.4%	4.1%	4.2%	0.1 ppts	2.4%	-5.3	-4.2
Motels/Private Hotels/Guest Houses	2018–19	20	332	np	np	np	np	np	np
	% ch	-9.1%	-31.5%	-	-	-	-	-	-
Serviced Apartments	2018–19	43	5,668	2,058	1,774	86.2%	440	247.9	213.7
	% ch	-4.4%	-4.5%	2.2%	1.4%	-0.7 ppts	-3.4%	-12.2	-12.4
Holiday Parks	2018–19	3	131	np	np	np	np	np	np
	% ch	0.0%	17.0%	-	-	-	-	-	-
Upscale and Upper Middle Classes	2018–19	492	32,801	11,897	9,129	76.7%	1,677	183.7	141.0
	% ch	3.8%	4.4%	3.4%	1.7%	-1.2 ppts	0.2%	-2.8	-4.4
Hotels & Resorts	2018–19	184	18,522	6,691	5,271	78.8%	992	188.2	148.3
	% ch	5.1%	6.6%	4.9%	3.4%	-1.1 ppts	1.5%	-3.5	-4.9
Motels/Private Hotels/Guest Houses	2018–19	129	4,982	1,818	1,338	73.6%	225	168.3	123.8
	% ch	-0.8%	-4.7%	0.4%	-3.1%	-2.7 ppts	-3.7%	-1.0	-5.2
Serviced Apartments	2018–19	116	7,691	2,807	2,161	77.0%	391	180.9	139.3
	% ch	7.4%	4.6%	2.4%	0.5%	-1.5 ppts	-1.5%	-3.6	-5.6
Holiday Parks	2018–19	63	1,606	581	294	50.7%	48	162.4	82.3
	% ch	3.3%	10.7%	1.2%	5.6%	2.1 ppts	11.8%	9.1	7.9
Midscale and Economy Classes	2018–19	1,149	37,111	13,510	9,350	69.2%	1,280	136.9	94.7
	% ch	3.6%	3.8%	0.8%	-1.9%	-1.9 ppts	-3.5%	-2.2	-4.1
Hotels & Resorts	2018–19	254	12,887	4,668	3,449	73.9%	464	134.5	99.4
	% ch	2.0%	3.7%	1.5%	-2.1%	-2.7 ppts	-4.5%	-3.4	-6.2
Motels/Private Hotels/Guest Houses	2018–19	758	19,626	7,168	4,116	57.4%	509	123.7	71.0
	% ch	3.3%	2.8%	0.0%	-2.4%	-1.4 ppts	-2.2%	0.2	-1.6
Serviced Apartments	2018–19	43	1,202	np	np	np	np	np	np
	% ch	2.4%	-1.4%	-	-	-	-	-	-
Holiday Parks	2018–19	94	3,396	1,236	648	52.4%	96	$148.7	$77.9
	% ch	11.9%	13.5%	2.6%	3.8%	0.6 ppts	9.3%	7.5	4.8

Source: Australian Accommodation Monitor 2018–19, Destination NSW

3.3 The Riverina Tourism Region

Data and planning for the Riverina tourism region is undertaken through Destination NSW.

In New South Wales, performance and trending of key statistics is produced using Tourism Research Australia data. The Riverina tourism region includes the towns of Griffith, Gundagai, Hay, Leeton, Temora and Wagga Wagga. Planning for the region is performed under the Riverina Murray Destination Management Plan.

Figure 13: Travel to Riverina historical trends

Travel to Riverina Tourism Region
Year ended December 2019

Source: National and International Visitor Surveys, TRA.

OVERVIEW

GRAND TOTAL - overnight & daytrip	YE Dec 2010	YE Dec 2011	YE Dec 2012	YE Dec 2013	YE Dec 2014	YE Dec 2015	YE Dec 2016	YE Dec 2017	YE Dec 2018	YE Dec 2019	% change YE Dec19 vs. YE Dec18
Visitors ('000)	2,186	2,165	2,204	2,446	2,286	2,324	2,549	2,634	2,914	2,813	-3.5%
Nights ('000)	2,581	2,718	2,462	3,098	3,253	3,228	3,830	3,145	3,879	3,502	-9.7%
Expenditure ($ million)*	$494	$586	$532	$613	$603	$623	$694	$565	$805	$709	-12.0%
Overnight - Int'l & domestic											
Visitors ('000)	922	829	848	933	987	1,080	1,103	1,016	1,279	1,256	-1.8%
Nights ('000)	2,581	2,718	2,462	3,098	3,253	3,228	3,830	3,145	3,879	3,502	-9.7%
Expenditure ($ million)*	$323	$395	$336	$312	$395	$414	$441	$361	$542	$477	-11.9%
Domestic - overnight & daytrip											
Visitors ('000)	2,164	2,145	2,180	2,424	2,268	2,301	2,522	2,604	2,891	2,789	-3.5%
Nights ('000)	2,191	1,997	1,830	2,523	2,672	2,623	3,211	2,267	3,158	2,951	-6.6%
Expenditure ($ million)*	$475	$554	$503	$595	$582	$586	$669	$521	$776	$687	-11.5%

Source: Travel to Riverina Tourism Region, YE December 2019, Destination NSW

These statistics alone highlight the need for tourism investment in the Riverina region complemented with a strong marketing strategy.

3.3.1 Riverina Murray Destination Management Plan

Destination Riverina Murray (DRM) is one of six Destination Networks established by the NSW Government. The networks are responsible for driving the growth of the visitor economy in each respective region to help achieve the NSW Government's overnight visitor expenditure goal for 2020. The Destination Networks facilitate growth in the visitor economy at a local level by representing and coordinating the region's tourism industry.

In 2018, the Riverina Murray Destination Management Plan (DMP) was prepared to guide and assist DRM to stimulate growth in the region's visitor economy in partnership with Destination NSW, Murray Regional Tourism (MRT), Thrive Riverina, NSW National Parks and Wildlife Service (NPWS), local governments and the tourism industry. The plan projections show that the Riverina Murray region domestic visitor market is expected to grow by at least two million visitor nights to 2030, the majority of which will be absorbed in the primary destinations of Albury Wodonga, Wagga Wagga and Griffith. These destinations are identified as the key population and accommodation nodes, and include major regional airports. Nine Strategic Development Themes were developed to respond to the issues and opportunities for the region:

Theme 1: Major Centre Development	Develop the major regional centres to support a diverse visitor economy and projected visitor growth.
Theme 2: Nature-Based Tourism	Utilise the region's natural assets to develop nature-based and recreational tourism experiences.
Theme 3: Rivers and Waterways	Improve visitor access and experience to major rivers and lakes to increase water-based activities.
Theme 4: Food and Agritourism	Leverage the region's agricultural strengths by encouraging the development of contemporary food experiences.

Theme 5: Major Touring Routes	Harness the region's major transport corridors to develop easy to navigate touring routes.
Theme 6: Sport and Recreation	Unlock the strong sporting culture and infrastructure of the region to develop recreational experiences and attract major sporting events and carnivals.
Theme 7: Festivals and Events	Develop a coordinated approach to festivals and events with a focus on increasing the business event and conference market.
Theme 8: Accommodation	Improve and diversify the range of accommodation in the region to align with contemporary market demands.
Theme 9: Infrastructure and Servicing	Ensure that investment in key infrastructure and visitor servicing keeps pace with visitor growth and expectations, including online marketing.

The projects aligned to the themes that closely relate to, and potentially impact Gogeldrie Weir Recreation Reserve are set out below:

Theme	Projects aligned
Theme 1: Major Centre Development	• **Developing the night-time economy to keep visitors in the region longer and convert daytrips to overnight stays.** • **Developing new leisure products and experiences to increase yield from visitors and meet the needs of growing communities (particularly young families).** • **Building the accommodation base to cater for the growing visitor economy and major events (particularly reinvestment in existing motel stock).** • **Improving the hospitality offering and providing opportunities for new food experiences which showcase the surrounding agricultural regions.**
Theme 2: Nature-Based Tourism	• **Investment in park infrastructure such as roads, picnic areas, camping site and toilets.** • **Investment in trails including walking and cycling trails.** • **Cultural heritage interpretation.** • Educational tours and operators. • Eco and adventure tour operators.
Theme 3: Rivers and Waterways	**Riverfront precinct master plans** ♦ **Commercial activation of riverfronts** ♦ **Riverfront parkland enhancements** ♦ **Boat ramps** ♦ **Wharfs and jetties** ♦ Water-based tour operators ♦ Other water-based experiences ♦ Projects and measures that ensure the sustainability of the region's rivers and waterways over the long term.

Theme	Projects aligned
Theme 5: Major Touring Routes	Rationalisation of existing touring routes to identify 'hero' routes for targeted investment and promotion ♦ Touring route marketing and branding collateral ♦ Major highway and road upgrades ♦ Improved and consistent signage. **Kidman Way – Jerilderie, Coleambally, Darlington Point, Griffith, Goolgowi, Hillston** **Murrumbidgee River Run – Gundagai, Narrandera, Darlington Point, Carrathool, Hay**
Theme 7: Festivals and Events	• Business event venues. • Marketing of business events in the region. • Utilising existing assets for business events. • **Events and festivals facilities and infrastructure**. • Development of new and existing food and wine related festivals and events. • Development of events focused on arts and culture.

The DMP breaks down the region into subregions. Gogeldrie Weir (as part of Leeton Shire Council) forms part of the Western Riverina subregion, which also includes the Shires of Carrathool, Griffith, Murrumbidgee and Narrandera. Included in the Tier 1 priority projects for this subregion is the Gogeldrie Weir Precinct Development. A description of the Gogeldrie Weir project and other projects that will influence visitors to the recreation reserve is included below:

Gogeldrie Weir Precinct Development

The Gogeldrie Weir Precinct Development includes the installation of new boat ramps, greater mix of accommodation and the expansion of recreational activities. The upgrades would attract special user groups seeking the space and facilities for fitness activities, bushwalking, birdwatching and family entertainment. This area also has historical significance being a major part of the irrigation system in the Shire.

Altina Wildlife Park Visitor Centre

The Altina Wildlife Park is also a Tier 1 project identified in the DMP. Located within 40 minutes' drive to Gogeldrie Weir, the continued development of the wildlife park will attract greater visitors to the area looking for other attractions and nearby accommodation. The Altina Wildlife Park in Darlington Point provides an up-close and educational experience with a range of exotic and domestic animals. The wildlife park has experienced increasing visitor numbers in recent years and is currently planning for future expansion. This will include an improved educational and interpretive centre, new exhibition space, and a self-guided experience.

The Tier 2 major projects include:

- Activation NSW National Parks: Establish a close working relationship with NSW National Parks with the aim of working towards enhancing the visitor experience and exploring river frontage product development opportunities between Leeton and Narrandera.
- Roxy Theatre Upgrade: An iconic 1930s theatre from the art deco period has potential to be refurbished and activated through a program of events that would attract visitors to Leeton for arts and cultural purposes. Leeton currently hosts over 5,000 eisteddfod participants per annum from across the wider

region, as well as the Leeton Outback Band Spectacular which draws bands from rural, regional and metropolitan (Sydney and Canberra) – this event has room to grow.

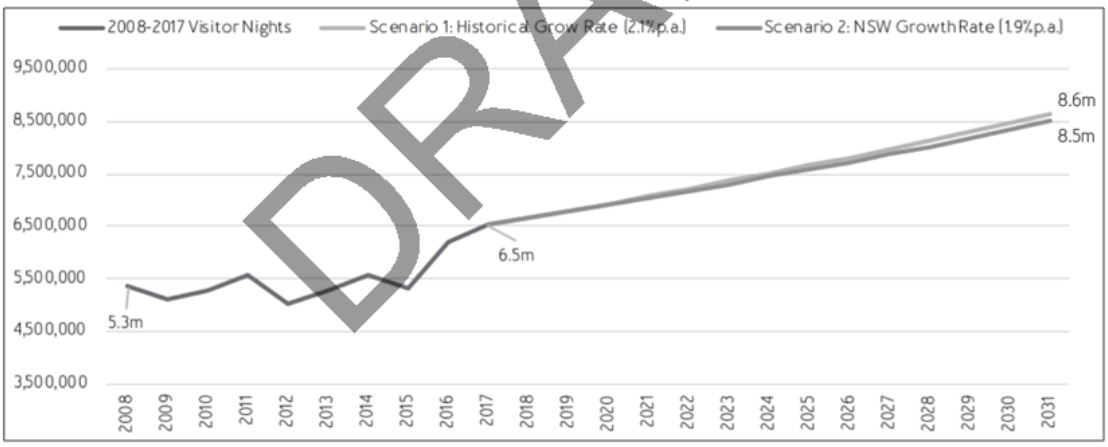
- Fivebough Wetlands Infrastructure: Infrastructure development surrounding enhancing the visitor experience at Fivebough Wetlands. Potential to be linked to nature-based/birding trails.
- Leeton Swimming Pool Upgrade: This project to upgrade the Leeton Swimming Pool facility has been through concept planning and design. Currently applying for relevant and available funding opportunities to make it a reality.
- Leeton Art Deco Festival Relaunch: Relaunch of the Leeton Art Deco Festival in 2019 – funding options currently being investigated.
- New 4-star Motel for Leeton: Leeton has a gap in quality hotel/motel accommodation (at least 4-star). Given that a significant percentage (approximately 60%) of our visitors are business travellers, this offers great potential for a private investor.

The above major projects will drive increased visitation to the local area and improve patronage at the redeveloped recreation reserve. The inclusion of these projects, in particular the Tier 1 priority projects, in the regional strategy is a key requirement for attracting grant funding for future works.

3.3.2 Domestic Visitor Projections

Based on modelled growth scenarios, the Riverina Murray is expected to grow from 6.5 million visitor nights in 2017, to approximately 8.5 million by 2031, an additional two million visitor nights.

Figure 14: Riverina Murray visitor nights projection (domestic visitors)



Source: TRA NVS & IVS Visitation 2007–2017 YE June, TRA State and Territory Tourism Forecasts 2017

The Riverina Murray Destination Management Plan is a positive response to drive increased tourism to the region. Gogeldrie Weir Recreation Reserve has an opportunity to capitalise on the increased growth by providing a modern reserve with facilities that meet market expectations.

4 CONSULTATION

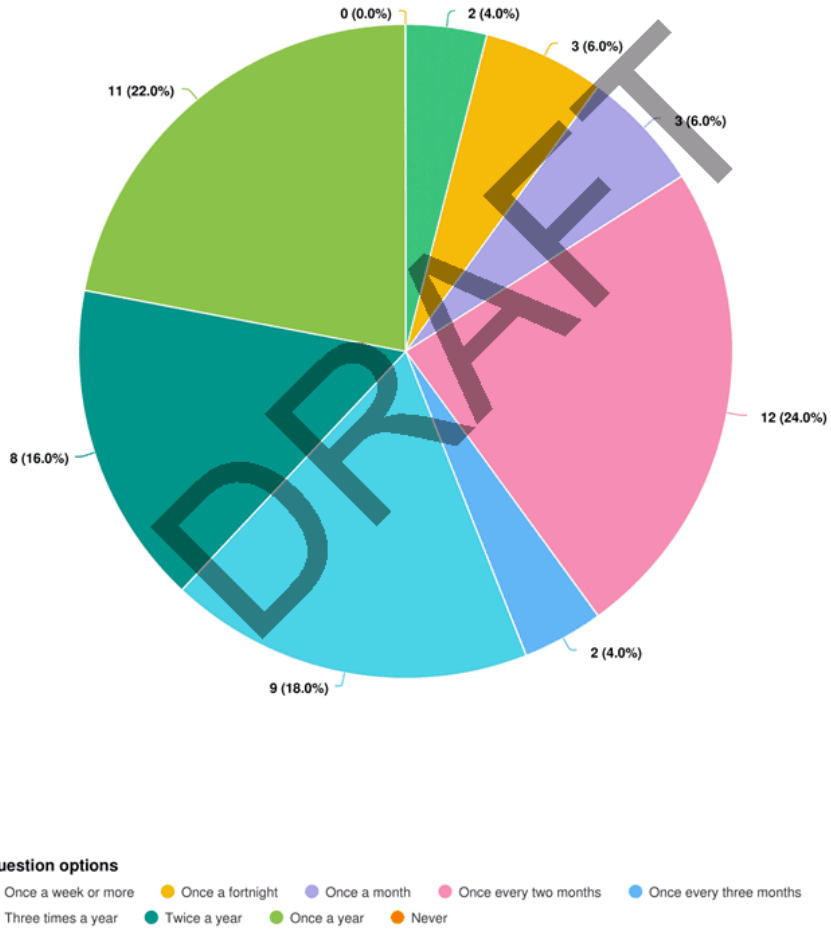
Consultation with key stakeholders is a key component of informing the recommended outcomes of the master plan. Consultation involves a three-stage process.

4.1 Stage 1 – Community Survey

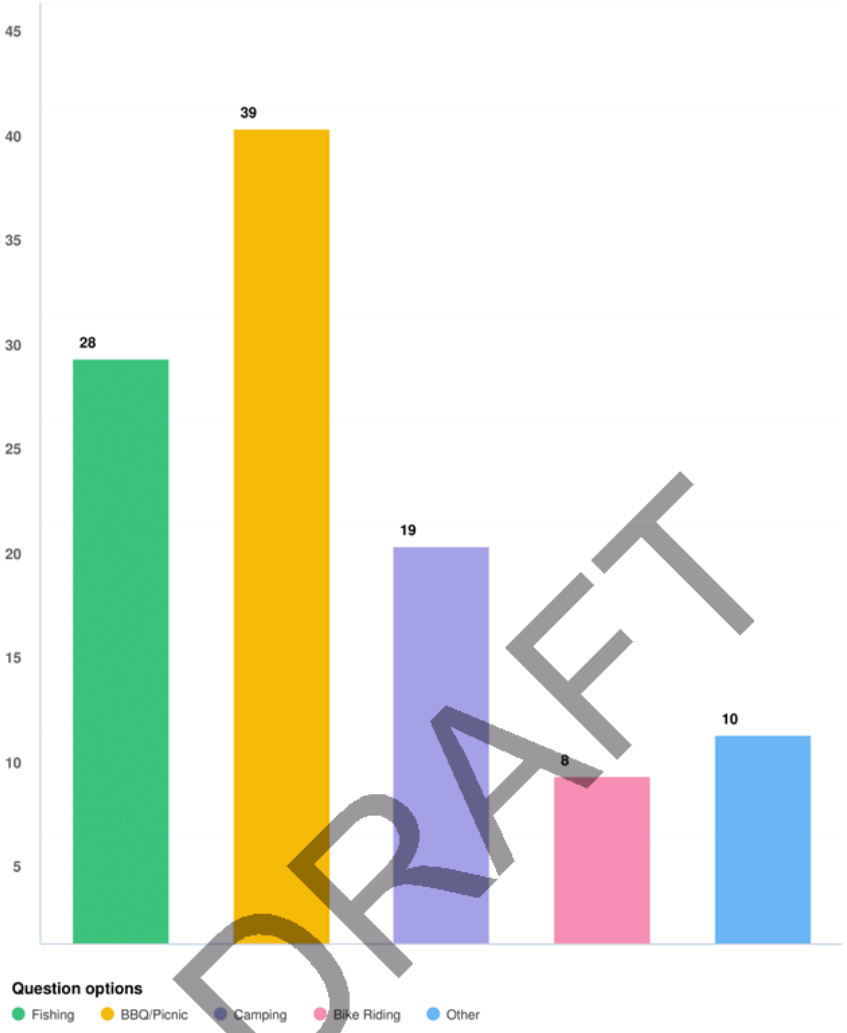
The Gogeldrie Weir Management Committee undertook a community survey using "Have Your Say" to gain initial ideas on the future public recreation and commercial use of the site. There were 51 respondents.

The following questions and summary of responses has been extracted from the results of the survey.

Q1 How often do you attend the weir on average?



2 What activities do you go to the weir for?



3 If you answered "Other" in question 2, please provide details of why you visit the weir

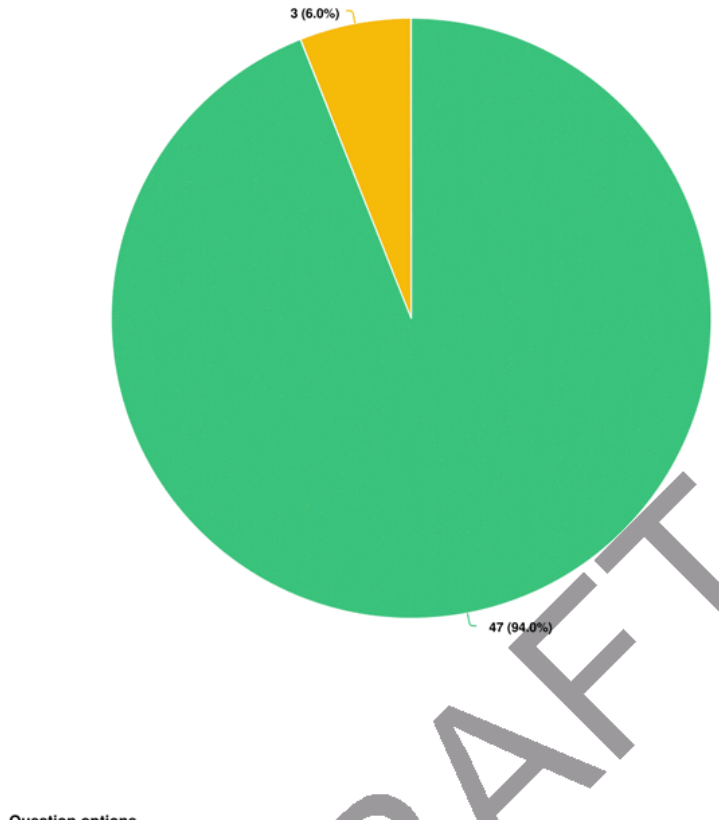
Responses included fishing, kayaking, exercise (walking), water skiing and taking visitors.

4 What do you enjoy best about the weir and its facilities?

Responses included:

- Camping
- Fishing
- Boat ramp
- Good holiday park amenities and facilities
- Relaxing
- Peace and tranquillity
- Kayaking
- Proximity to town
- Park-like setting – open space
- Barbecues
- Cabins
- Safe
- Great family area

5 Do you think anything needs to be improved at the weir?



6 If you answered "Yes" to question 5, please share your thoughts on what can be improved

Responses included:

- Children's play area
- Additional seating
- Improved access and amenities
- Walking trails with interpretive signage
- Removal of barriers to entry – fencing
- Splash pad
- Swimming spot at the river
- Extended opening hours
- Parking
- Upgraded barbecue areas
- Coffee shop
- Conference centre
- Improved boat ramp
- Amenities
- More welcoming
- More cabins in holiday park
- Better quality cabins
- Walking tracks along the river
- Picnic areas
- More powered sites
- Upgraded entrance
- Upgraded function area
- Cultural signage
- Needs to be a community asset

7 If you have any other comments to add, please let us know

Answers to this question reflected the same responses as question 6.

4.2 Stage 2 – Stakeholder Consultation

As part of the initial site visit, consultation was undertaken with the following key stakeholders:

- Gogeldrie Weir Management Committee
- Leeton and District Local Aboriginal Land Council
- Council management and staff
- National Parks
- WaterNSW
- Destination Riverina Murray
- Current holiday park and recreation reserve caretaker – licensee
- CEO Whitton Malt House

The objective of this consultation was to identify the considerations of all parties in the proposed design, highlight any site constraints and listen to the views of each in relation to opportunities at the site.

Most of the consultation meetings were held on site to provide context to the aims of the master plan and the process to be undertaken. The general consensus of all meetings was the wonderful location and the potential of the site to increase local patronage and attract increased tourism to the area.

Of great importance was the support of WaterNSW and National Parks, as the key government bodies impacted by the proposed development. Both bodies were provided with an initial draft of the master plan to identify the linkages with their respective operations.

Figure 15: Meeting with WaterNSW representatives on site

WaterNSW focused on the ability to maintain unimpeded access to the weir for the operation and maintenance of its assets. Modifications to the original draft have been made and form part of the documents placed on exhibition.

National Parks provided maps of the national parks; in particular, the Murrumbidgee Irrigation Area 2 (MIA2) adjacent to the recreation reserve, across the Sturt Canal. The preliminary draft plan illustrates the use of National Parks' land on which the recreation reserve and boat ramp are currently located. National Parks' representatives indicated support for the continued use of the land and the possibility of creating a link to the MIA2 land by way of a footbridge (possibly suspension) to allow access to the walking and bike trails.

The CEO of Whitton Malt House highlighted the strong demand for quality accommodation since the opening of their operation. Weekends are booked well in advance, with strong occupancy rates for most weekdays. This demonstrates that there is demand for quality facilities providing an alternative regional attraction for visitors.

4.3 Stage 3 – Community Consultation

Following finalisation of the draft master plan, it is proposed that the document will be placed on public exhibition seeking feedback from the community and other stakeholders. The outcome of this consultation will form part of a report to Council to consider changes resulting from the feedback. A final plan will be produced highlighting changes to the draft plan resulting from this consultation phase. The final master plan will then be presented to Council for adoption.

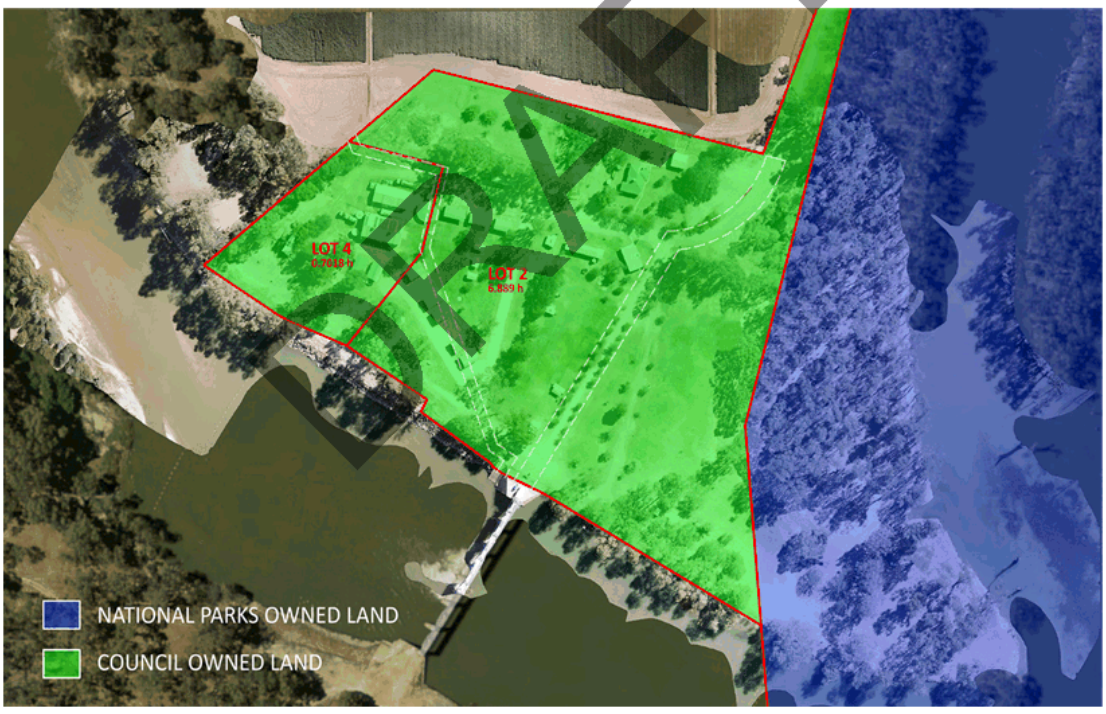
5 SITE ANALYSIS

5.1 Overview

Gogeldrie Weir Recreation Reserve is located approximately 24 kilometres west of the township of Leeton. The recreation reserve occupies an area of approximately 3.6 hectares on the banks of the Murrumbidgee River, east of the Gogeldrie Weir structure. The recreation reserve and holiday park are divided by a 10-metre-wide easement providing WaterNSW with maintenance access to the weir structure. The recreation reserve is located on the eastern side of the easement, and the holiday park is located to the west. The recreation reserve has frontage to the river above the weir, and the holiday park has frontage to the river below the weir. The reserve is a popular riverside recreation area for the local community. The eastern part of the recreation reserve is located in the Murrumbidgee Valley National Park and includes a public boat ramp that provides water access into the Sturt Canal.

Leeton Shire Council, although not previously the owner of the site, had (informally) managed the Gogeldrie Weir Recreational Facility for many years, firstly as a primitive camping ground and more recently (in 2014) as a caravan park. Council acquired the site from Government Property NSW in December 2015. It was a condition of the purchase that the property be classified as Community land, and that if the land was not classified as Community land, it was to be transferred back to Government Property NSW for the same sum that it was purchased, plus costs.

Figure 16: Aerial view of Gogeldrie Weir Recreation Reserve and Holiday Park



5.2 Gogeldrie Weir Recreation Reserve

Most of the recreation reserve is an open, grassed area containing older picnic and barbecue facilities with established trees providing valuable shade. The area is currently maintained by the caretaker who is also the manager of the holiday park. Irrigation ensures a healthy grass cover for most of the recreation reserve. The area is currently fenced off, denying general community access other than through the holiday park, where an entry fee applies.

There is a 10-metre-wide easement providing WaterNSW with access to the weir for maintenance. This has a formed gravel road and Chinese Elm trees planted on either side. It forms a logical separation between the holiday park and the recreation reserve. It also provides a direct connection for visitors wishing to view the weir structure. WaterNSW requires ongoing access along this easement for maintenance.

An unsealed road leads to a boat ramp which provides water access into the Sturt Canal. A turnaround area and limited parking for cars and boat trailers are provided adjacent to the ramp. This road and boat ramp are located in the Murrumbidgee Valley National Park, with the area to the south incorporated into the recreation reserve, and the area to the north (along the Sturt Canal) heavily vegetated. There are currently no public toilet facilities servicing the recreation reserve.

Several issues need to be addressed as part of the redevelopment of Gogeldrie Weir Recreation Reserve:

- Provision of unrestricted public access to the recreation reserve (removal of the fence).
- Provision of separate public toilet facilities for the recreation reserve.
- Provision of improved recreation facilities within the recreation reserve.
- Improved access to the river.

Figure 17: WaterNSW access to the weir

Figure 18: Fenced recreation reserve restricting public access

Figure 19: Picnic and barbecue shelters require replacement

Figure 20: Grassed area of the recreation reserve with established trees

Figure 21: Fencing preventing access to water edge

Figure 22: Public boat ramp

5.3 SWOT Analysis of the Recreation Reserve

A SWOT analysis identified the following strengths, weaknesses, opportunities and threats for the recreation reserve:

Strengths:

- The recreation reserve has direct frontage and access to the Murrumbidgee River.
- The site is accessible from the regional centres of Wagga Wagga, Griffith and Leeton.
- Gogeldrie Weir is an imposing engineering structure of regional significance.
- The water storage upstream of the weir caters for a wide range of water-based recreational activities.
- The site is adjacent to the Murrumbidgee Valley National Park.
- There are significant established trees throughout the recreation reserve.

Weaknesses:

- The site lies within the Murrumbidgee River flood zone.
- The recreation reserve is fenced and not available for unrestricted public use.
- Recreation facilities in the recreation reserve are in poor condition and require replacement.
- Pathway connections along the river foreshore have not been developed.
- There are no designated public toilets for the recreation reserve.
- There are no facilities for people with disabilities.

Opportunities:

- Establish clear separation between the holiday park and the recreation reserve.
- Provide unrestricted public access to the weir structure and recreation reserve.
- Establish continuous public access along the entire river frontage – both above and below the weir.
- Provide separate toilet facilities for the recreation reserve.
- Remove perimeter fencing in the recreation reserve and provide a diverse range of recreation facilities to enhance general community use of the recreation reserve.
- Provide additional car parking for increased use of the recreation reserve.
- Provide interpretive signage for the weir and local cultural heritage.
- Provide a connection to trails in the Murrumbidgee Valley National Park.
- Retain maintenance access to the weir structure for WaterNSW.
- Retain existing quality vegetation, where possible.

Threats:

- Impact of flood events.
- Potential impacts from bushfire hazard assessment.
- Lack of funding for the redevelopment.

6 DESIGN RESPONSE

6.1 Introduction

The tourism data in this report signals a positive outlook for tourist growth in Leeton and the Riverina region generally. This is supported by destination management planning, which has identified significant tourism investment for the region. The potential to provide for the family holiday market and to develop a strong environmental focus adjacent to the river and the Murrumbidgee Valley National Park also create opportunities for future tourism growth. The value of the Australian dollar and uncertainty overseas following recent world events are making overseas travel for locals less attractive. The combination of these factors will result in growing demand for tourism and accommodation options within the Riverina region.

The following drawings are included in this report:

Drawing GW–01:	Proposed Master Plan
Drawing GW–02:	Primary Upgrade Works
Drawing GW–03:	Potential Future Additions
Drawing GW–04:	Gogeldrie Weir Recreation Reserve connection to the Murrumbidgee Valley National Park

Information from the following sources has been used to develop the Proposed Master Plan for Gogeldrie Weir Recreation Reserve:

- Tourism data included earlier in this report.
- Information provided by Leeton Shire Council councillors and staff.
- Stakeholder consultation.
- SWOT analysis for the recreation reserve.
- Detailed site analysis of the recreation reserve.
- Industry experience and expertise of Integrated Site Design management and staff.

The broad design principles used to guide the preparation of the Proposed Master Plan are set out below:

- Establish clear separation between the holiday park and the recreation reserve.
- Provide unrestricted public access to the weir structure and recreation reserve.
- Establish continuous public access along the entire river frontage – both above and below the weir.
- Retain maintenance access to the weir structure for WaterNSW.
- Remove perimeter fencing in the recreation reserve and provide a diverse range of recreation facilities to enhance general community use of the reserve.
- Provide separate toilet facilities for the recreation reserve.
- Provide interpretive signage for the weir and local cultural heritage.
- Provide for future access to the Murrumbidgee Irrigation Area 2 across the Sturt Canal.
- Retain existing quality vegetation, where possible.

The following tables identify how the Proposed Master Plan responds specifically to current tourism industry trends, the SWOT analysis, environmental constraints and preliminary consultation.

6.2 Design Response to Tourism Industry Trends

Industry Trend	Design Response
There is a growing expectation for high quality facilities as an essential part of the holiday experience. Facilities that are in demand include: • Access to water for water-based activities • Playgrounds and children's activities • Clean amenities • Barbecue facilities	Visitors to the recreation reserve will have access to a range of recreation facilities, including: • Boat ramp • Beach and swimming area • Pavilion • Water park • Picnic and barbecue facilities • Pathways along the river foreshore • Tracks throughout the Murrumbidgee Valley National Park
Increased demand for the provision of activities, programs and events as part of the holiday experience.	A range of guest experiences and activities should be offered. A wide range of water-based activities can be offered from the recreation reserve. The pavilion in the recreation reserve will also provide a space for large groups and events.

6.3 Design Response to SWOT Analysis

Strengths	Design Response
The recreation reserve has direct frontage and access to the Murrumbidgee River.	Use of the river frontage has been optimised with continuous public pathways and two river viewing decks provided along the foreshore of the recreation reserve. The beach and boat ramp also leverage the river frontage. Future marketing and branding for the area can draw heavily on the weir structure and riverfront location.
The site is accessible from the regional centres of Wagga Wagga, Griffith and Leeton.	The recreation reserve will provide for the locals and visitors to the region with the redevelopment designed to optimise the riverside setting. Regional attractions such as Gogeldrie Weir, Altina Wildlife Park and Whitton Malt House will also play a large part in marketing and promotion strategies.
Gogeldrie Weir is an imposing engineering structure of regional significance.	The weir is a significant attraction for the recreation reserve. Some interpretive signage developed in consultation with WaterNSW will also add to the appeal.
The water storage upstream of the weir caters for a wide range of water-based recreational activities.	A wide range of water-based recreation facilities have been incorporated into the recreation reserve master plan including upgrade of the boat ramp, establishment of the swimming beach, and provision of pontoons and canoe launching facilities. Toilet facilities and new park furniture will allow people to spend more time in the recreation reserve. Water-based recreation will be a large part of marketing and promotion strategies.

Strengths	Design Response
The site is adjacent to the Murrumbidgee Valley National Park.	The plan provides for a suspension bridge across the Sturt Canal connecting to established walking and cycling trails in the Murrumbidgee Valley National Park.
There are significant established trees throughout the recreation reserve.	The strong natural character of the riverside location will be maintained and enhanced. Existing vegetation that is in good condition will be retained wherever possible, and additional landscaping with locally occurring native species will further enhance the overall landscape amenity.

Weaknesses	Design Response
The site lies within the Murrumbidgee River flood zone.	The public toilets in the recreation reserve will be designed to withstand minor flooding, and the pavilion will be installed above the flood level. Floor levels for all new structures will be determined by more detailed flood information.
The recreation reserve is fenced and not available for unrestricted public use.	The existing fence around the recreation reserve will be removed providing unrestricted public access to the recreation reserve and foreshore. Additional parking is proposed in the recreation reserve, and new facilities will encourage much wider community use. Public access to Gogeldrie Weir will be the centrepiece of the redevelopment.
Recreation facilities in the recreation reserve are in poor condition and require replacement.	Existing picnic and barbecue facilities will be replaced and complemented by the new pavilion and toilet buildings. The new water park, viewing decks and pontoons will also add quality recreation facilities.
Pathway connections along the river foreshore have not been developed.	The master plan provides for continuous public access along the foreshore with two river viewing decks. The pathways also connect to corridors along Sturt Canal to the north, and a suspension bridge across the Sturt Canal connecting to established walking and cycling trails in the Murrumbidgee Valley National Park.
There are no designated public toilets for the recreation reserve.	A separate public toilet building, including accessible toilets, is proposed for the recreation reserve.
There are no facilities for people with disabilities.	All communal buildings in the recreation reserve will be accessible. A public toilet and pavilion will be provided in the recreation reserve. All will be accessible.

Opportunities	Design Response
Establish clear separation between the holiday park and the recreation reserve.	The proposed weir promenade provides a logical and unambiguous separation between the holiday park and the recreation reserve. This allows for unrestricted public access to the weir and recreation reserve, while providing a viable footprint for the holiday park which can be securely fenced and independently operated. The weir promenade will be the centrepiece of the redevelopment.
Provide unrestricted public access to the weir structure and recreation reserve.	The master plan provides unrestricted public access to the recreation reserve and Gogeldrie Weir.

Opportunities	Design Response
Establish continuous public access along the entire river frontage – both above and below the weir.	The master plan provides continuous public access along the entire river frontage – both above and below the weir, with two river viewing platforms.
Provide separate toilet facilities for the recreation reserve.	A separate public toilet building, including accessible toilets, is proposed for the recreation reserve.
Remove perimeter fencing in the recreation reserve and provide a diverse range of recreation facilities to enhance general community use of the recreation reserve.	The perimeter fence in the recreation reserve will be removed, providing full access to the riverfront. New recreation facilities will be provided including upgraded boat ramp and pontoon, swimming beach and pontoons, canoe launching area, water park, pavilion, new picnic and barbecue shelters, and walking tracks.
Provide additional car parking for increased use of the recreation reserve.	Substantial additional car parking will be provided to match the level of new facilities.
Provide interpretive signage for the weir and local cultural heritage.	Interpretive signage is proposed for the weir promenade and foreshore walking tracks.
Provide a connection to trails in the Murrumbidgee Valley National Park.	The plan provides for a suspension bridge across the Sturt Canal connecting to established walking and cycling trails in the Murrumbidgee Valley National Park.
Retain maintenance access to the weir structure for WaterNSW.	The weir promenade is a multi-purpose corridor providing access for WaterNSW to the weir structure, car parking and turnaround area for maintenance vehicles, and public disability access from the recreation reserve car park to the weir structure. An alternative access to the weir for large maintenance vehicles has also been provided through the recreation reserve.
Retain existing quality vegetation, where possible.	The strong natural character of the riverside location will be maintained and enhanced. Existing vegetation that is in good condition will be retained wherever possible, and additional landscaping with locally occurring native species will further enhance the overall landscape amenity.

Threats	Design Response
Impact of flood events.	The public toilets in the recreation reserve will be designed to withstand minor flooding, and the pavilion will be installed above the flood level. Floor levels for all new structures will be determined by more detailed flood information.
Potential impacts from bushfire hazard assessment.	A review of bushfire threat may impact the type and placement of new structures. A bushfire report will be required to assess the proposed development.
Lack of funding for the redevelopment.	Estimates of capital expenditure highlight the significant investment required, which highlights the need for grant funding. The development is proposed in stages to spread the cost over an extended period.

6.4 Design Response to Environmental Issues

The key environmental considerations of the Proposed Master Plan are addressed below.

Environmental Issues	Design Response
Flood inundation	The public toilets in the recreation reserve will be designed to withstand minor flooding, and the pavilion will be installed above the flood level. Floor levels for all new structures will be determined by more detailed flood information.
Energy efficiency	Energy use will be minimised wherever possible. Use of solar energy wherever feasible, high efficiency hot water systems, solar lighting and LED light fittings will be utilised, where possible.
Vegetation management	The existing vegetation will be retained wherever possible. A landscape master plan will be informed by existing vegetation assessments to use locally occurring native species that will enhance existing biodiversity values. Native plant species will be used in landscaping throughout all areas of the recreation reserve to improve amenity. Weed control programs will be implemented to manage invasive species.

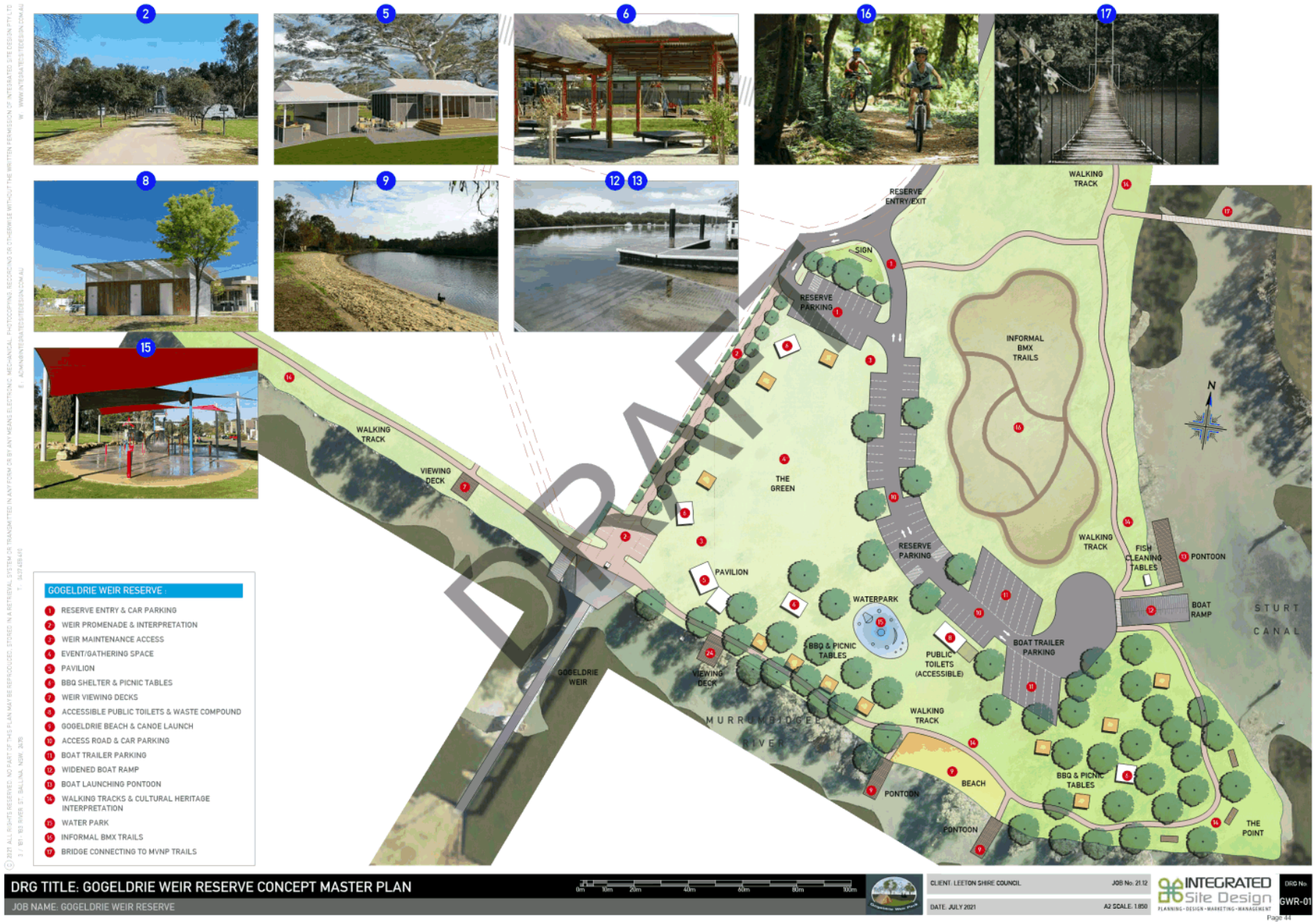
7 PROPOSED MASTER PLAN

7.1 Design Features

The Proposed Master Plan for Gogeldrie Recreation Reserve contains the following design features:

- Removal of existing fences, providing unrestricted public access to the reserve and foreshore.
- Clearly defined access to the recreation reserve with appropriate signage and car parking.
- Public promenade leading to Gogeldrie Weir, with interpretive signage.
- Upgraded access road to the boat ramp with additional car parking in the recreation reserve.
- Public toilet facility servicing the recreation reserve and boat ramp.
- Upgraded boat ramp, car/trailer parking and adjacent pontoon.
- Open space for community events/activities.
- Establishment of a public beach and pontoons for safe water access and swimming.
- A water park/splash park for general community use.
- Pavilion and stage for events and special uses.
- Public walkways with cultural heritage interpretive signage along the entire riverbank.
- Weir viewing platforms, both above and below the weir.
- Upgraded picnic and barbecue facilities throughout the recreation reserve.
- Establishment of informal BMX trails.
- Suspension bridge over the Sturt Canal connecting to trails in the Murrumbidgee Valley National Park.

Figure 23: Change in reserve fencing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DRAFT
GOGELDRIE WEIR RESERVE :
1 RESERVE ENTRY & CAR PARKING
2 WEIR PROMENADE & INTERPRETATION
3 WEIR MAINTENANCE ACCESS
4 EVENT/GATHERING SPACE
5 PAVILION
6 BBQ SHELTER & PICNIC TABLES
7 WEIR VIEWING DECKS
8 ACCESSIBLE PUBLIC TOILETS & WASTE COMPOUND
9 GOGELDRIE BEACH & CANOE LAUNCH
10 ACCESS ROAD & CAR PARKING
11 BOAT TRAILER PARKING
12 WIDENED BOAT RAMP
13 BOAT LAUNCHING PONTOON
14 WALKING TRACKS & CULTURAL HERITAGE INTERPRETATION
15 WATER PARK
16 INFORMAL BMX TRAILS
17 BRIDGE CONNECTING TO MVNP TRAILS
RESERVE ENTRY/EXIT
SIGN
RESERVE PARKING
WALKING TRACK
INFORMAL BMX TRAILS
THE GREEN
VIEWING DECK
PAVILION
WATERPARK
BBQ & PICNIC TABLES
PUBLIC TOILETS (ACCESSIBLE)
BOAT TRAILER PARKING
FISH CLEANING TABLES
PONTOON
BOAT RAMP
STURT CANAL
GOGELDRIE WEIR
MURRUMBIDGEE RIVER
BEACH
THE POINT
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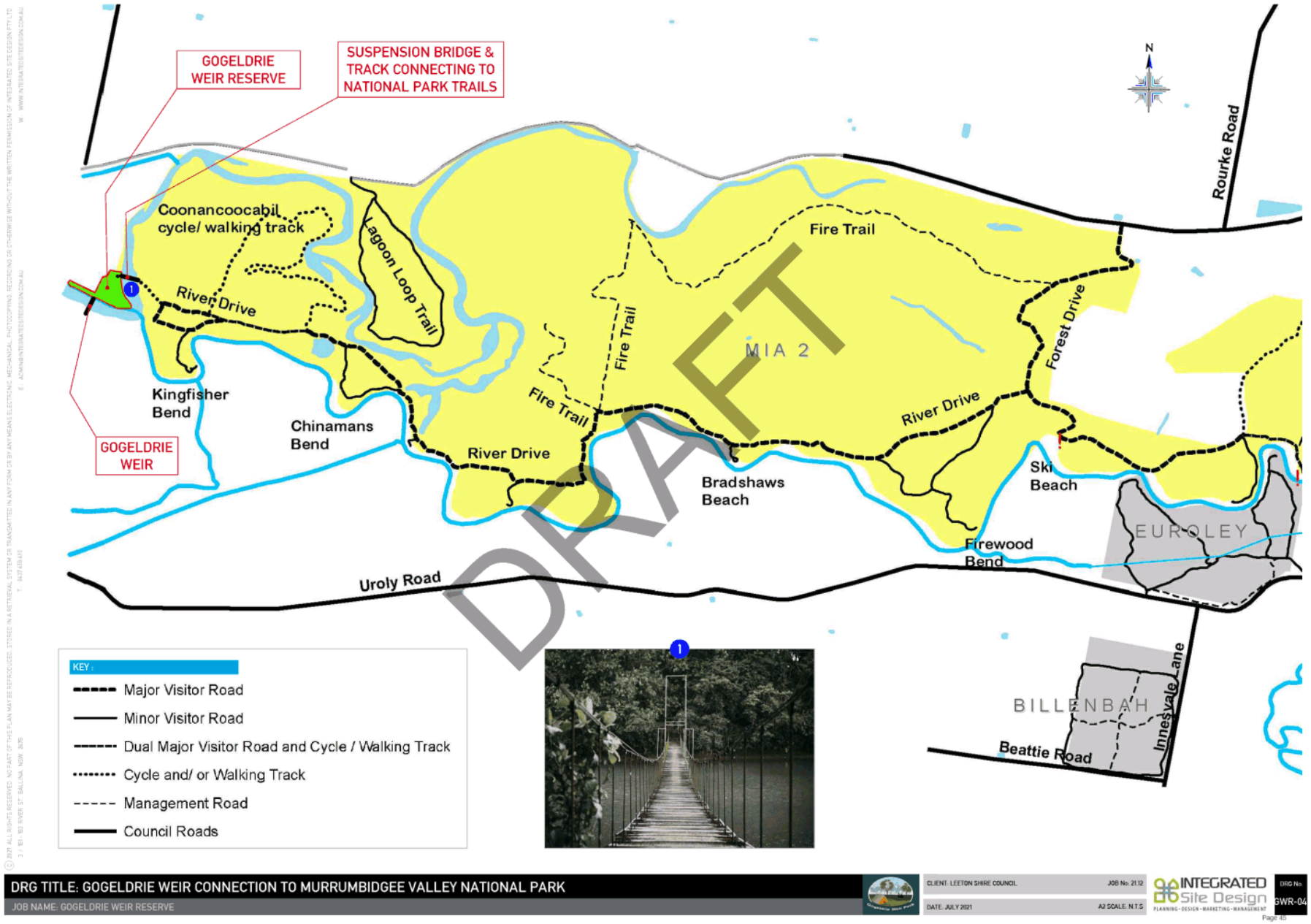
DRG TITLE: GOGELDRIE WEIR RESERVE CONCEPT MASTER PLAN
JOB NAME: GOGELDRIE WEIR RESERVE
CLIENT: LEETON SHIRE COUNCIL
JOB No: 21.12
DATE: JULY 2021
A2 SCALE: 1:850
INTEGRATED Site Design
DRG No: GWR-01


GOGELDRIE WEIR RESERVE
SUSPENSION BRIDGE & TRACK CONNECTING TO NATIONAL PARK TRAILS
GOGELDRIE WEIR
Coonancoocabil cycle/ walking track
Lagoon Loop Trail
River Drive
Kingfisher Bend
Chinamans Bend
Fire Trail
Fire Trail
River Drive
MIA 2
Bradshaws Beach
Fire Trail
River Drive
Forest Drive
Rourke Road
Ski Beach
EUROLEY
Firewood Bend
Uroly Road
BILLENBAH
Innesvale Lane
Beattie Road
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KEY :
Major Visitor Road
Minor Visitor Road
Dual Major Visitor Road and Cycle / Walking Track
Cycle and/ or Walking Track
Management Road
Council Roads
DRG TITLE: GOGELDRIE WEIR CONNECTION TO MURRUMBIDGEE VALLEY NATIONAL PARK
JOB NAME: GOGELDRIE WEIR RESERVE
CLIENT: LEETON SHIRE COUNCIL
JOB No: 21.12
DATE: JULY 2021
A2 SCALE: N.T.S
INTEGRATED Site Design
DRG No. GWR-04

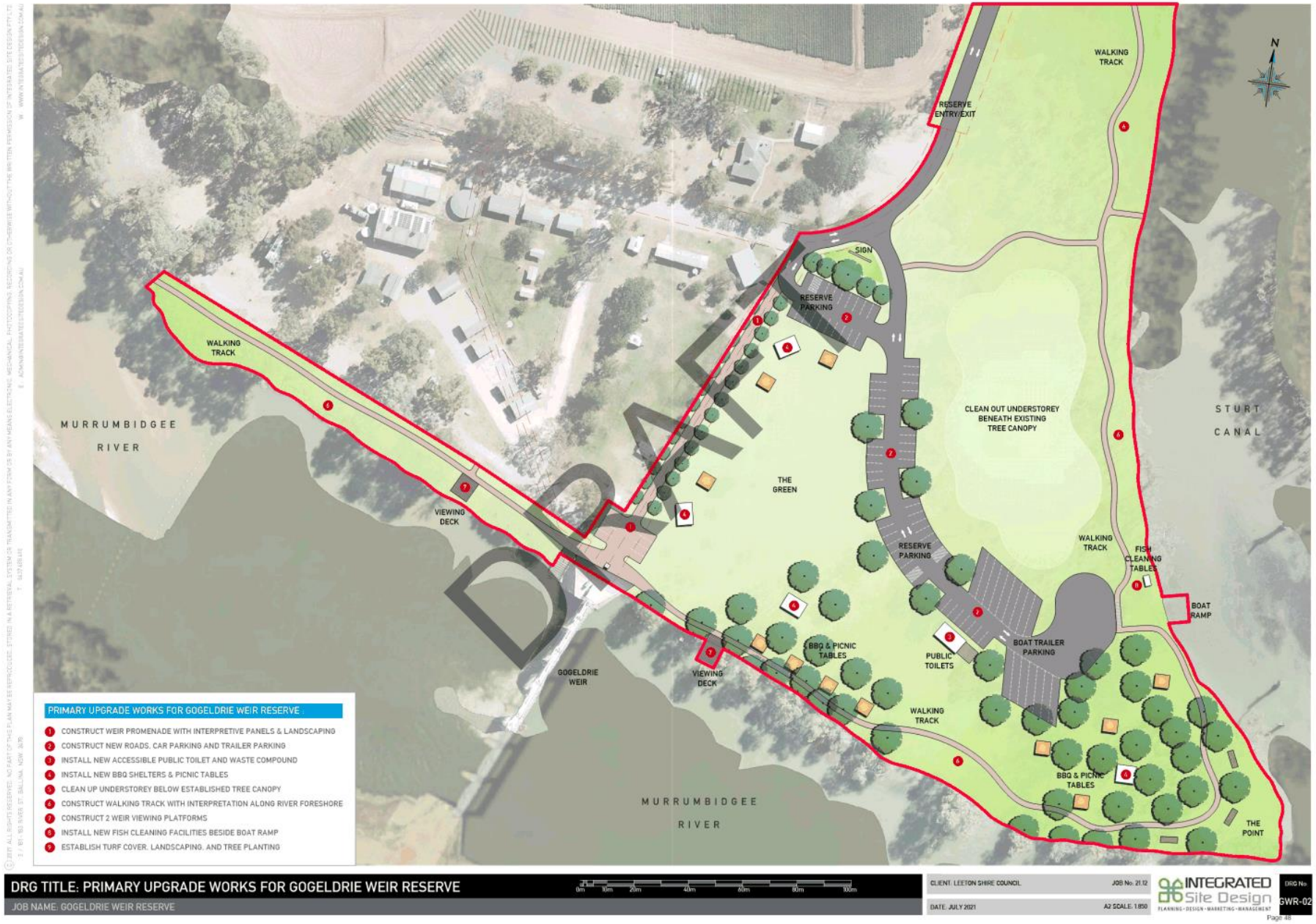
7.2 Detailed Cost Estimates and Staging

Table 1 provides estimates of cost for the upgrade of Gogeldrie Weir Recreation Reserve, highlighting costs for design, primary upgrade works and potential future additions.

Table 1: Gogeldrie Weir Recreation Reserve capital works program

Project	Unit	Rate	Qty	Total
PRIMARY UPGRADE WORKS				
Detailed Design				
Detail survey of recreation reserve				$7,500
Civil design for recreation reserve development (roads, car parking, stormwater, irrigation)				$20,000
Detailed design for boat ramp extension and pontoon				$20,000
Detailed design for public toilet building				$15,000
Preparation of REF and Part 5 assessment including heritage, cultural heritage and bushfire studies				$30,000
Subtotal for Recreation Reserve Design				**$92,500**
Construction				
Construct weir promenade with car parking and turnaround area (decomposed granite)	m^2	$100	800	$80,000
Install interpretive signage along weir promenade	ea	$4,000	8	$32,000
Construct new car park at recreation reserve entrance (2-coat seal, no kerbs)	m^2	$50	800	$40,000
Install recreation reserve entry signs	ea	$2,000	2	$4,000
Construct access road, car and trailer parking to boat ramp (2-coat seal, no kerbs)	m^2	$30	3,200	$96,000
Install new public toilet and waste compound	ea	$200,000	1	$200,000
Install irrigation and establish turf cover for entire recreation reserve (1.8 hectares)	site	$50,000	1	$50,000
Install new quad barbecue shelters	ea	$40,000	4	$160,000
Install new picnic tables and shelters	ea	$5,000	13	$65,000
Clean up understory beneath existing tree canopy	ea	$30,000	1	$30,000
Construct two weir viewing platforms	ea	$40,000	2	$80,000
Install new fish cleaning facilities	ea	$10,000	1	$10,000
Install fencing along recreation reserve riverfront area	lm	$150	150	$22,500
Construct walking tracks along river foreshore (decomposed granite)	lm	$50	1,000	$50,000
Provide cultural heritage interpretive signage along riverside walk	ea	$5,000	6	$30,000
Landscaping and tree planting to entire recreation reserve	ea	$50,000	1	$50,000
Subtotal for Recreation Reserve Construction				**$999,500**

Project	Unit	Rate	Qty	Total
Subtotal for Primary Upgrade Works				**$1,092,000**
Project management @ 5%				$54,600
Contingency allowance @ 10%				$109,200
TOTAL FOR PRIMARY UPGRADE WORKS				**$1,255,800**
POTENTIAL FUTURE ADDITIONS				
Construction and Design				
Upgrade existing boat ramp and install pontoon	ea	$300,000	1	$300,000
Establish beach area and construct two enclosing platforms	ea	$150,000	1	$150,000
Design and construct water park in recreation reserve	ea	$600,000	1	$600,000
Detailed design for pavilion building				$30,000
Construct new pavilion in recreation reserve	ea	$400,000	1	$400,000
Subtotal for Potential Future Additions				**$1,480,000**
Project management @ 5%				$74,000
Contingency allowance @ 10%				$148,000
TOTAL FOR POTENTIAL FUTURE ADDITIONS				**$1,702,000**
TOTAL RECREATION RESERVE DEVELOPMENT				**$2,957,800**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WALKING TRACK
RESERVE ENTRY/EXIT
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RESERVE PARKING
WALKING TRACK
MURRUMBIDGEE RIVER
CLEAN OUT UNDERSTOREY BENEATH EXISTING TREE CANOPY
STURT CANAL
THE GREEN
VIEWING DECK
RESERVE PARKING
WALKING TRACK
FISH CLEANING TABLES
BOAT RAMP
BBQ & PICNIC TABLES
PUBLIC TOILETS
BOAT TRAILER PARKING
GOGELDRIE WEIR
VIEWING DECK
WALKING TRACK
BBQ & PICNIC TABLES
MURRUMBIDGEE RIVER
THE POINT
PRIMARY UPGRADE WORKS FOR GOGELDRIE WEIR RESERVE :
1 CONSTRUCT WEIR PROMENADE WITH INTERPRETIVE PANELS & LANDSCAPING
2 CONSTRUCT NEW ROADS. CAR PARKING AND TRAILER PARKING
3 INSTALL NEW ACCESSIBLE PUBLIC TOILET AND WASTE COMPOUND
4 INSTALL NEW BBQ SHELTERS & PICNIC TABLES
5 CLEAN UP UNDERSTOREY BELOW ESTABLISHED TREE CANOPY
6 CONSTRUCT WALKING TRACK WITH INTERPRETATION ALONG RIVER FORESHORE
7 CONSTRUCT 2 WEIR VIEWING PLATFORMS
8 INSTALL NEW FISH CLEANING FACILITIES BESIDE BOAT RAMP
9 ESTABLISH TURF COVER. LANDSCAPING. AND TREE PLANTING
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JOB NAME: GOGELDRIE WEIR RESERVE
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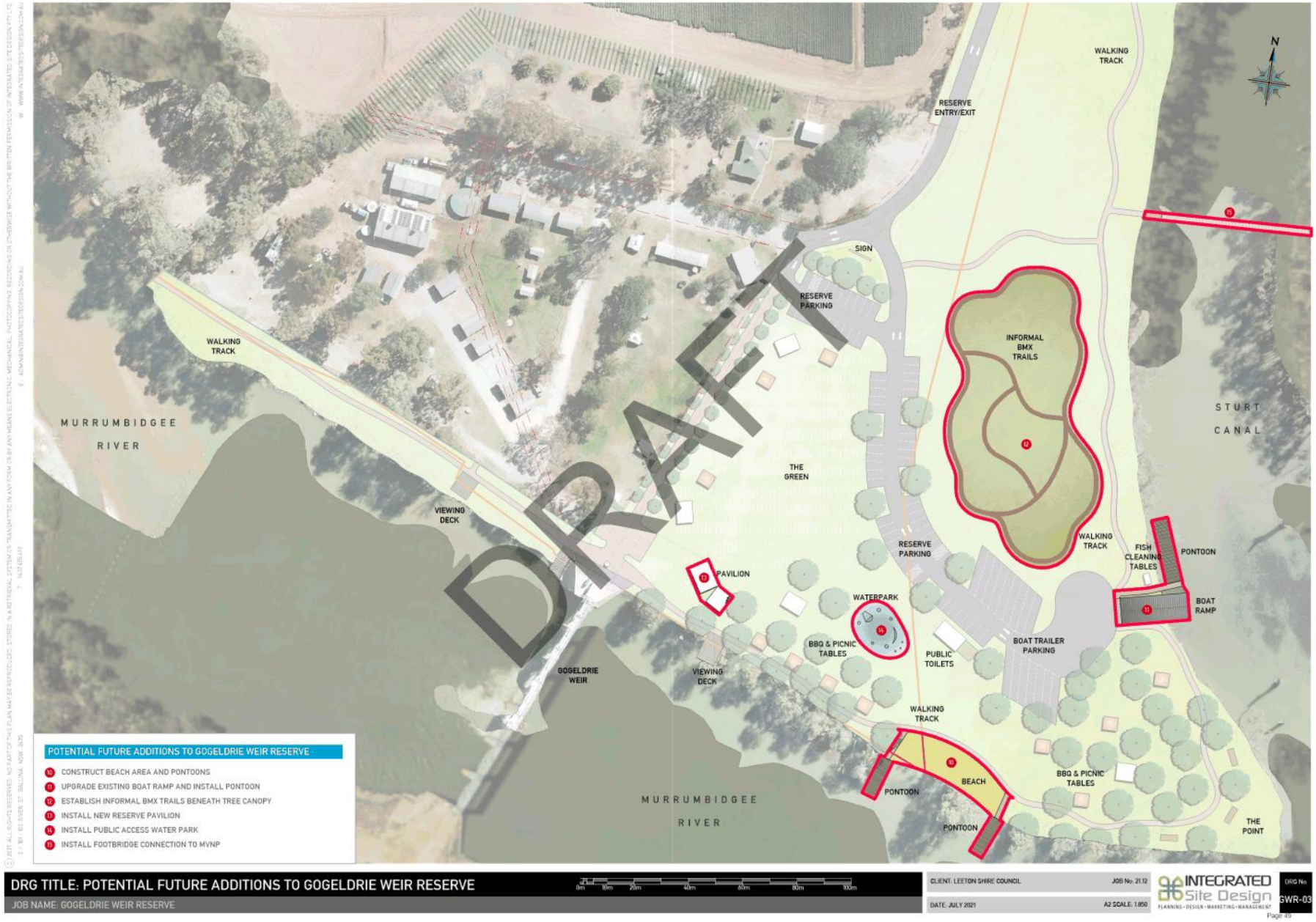
CLIENT: LEETON SHIRE COUNCIL
JOB No. 21.12
DATE: JULY 2021
A2 SCALE: 1:850
INTEGRATED Site Design
PLANNING · DESIGN · MARKETING · MANAGEMENT
DRG No. GWR-02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WALKING TRACK
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WALKING TRACK
MURRUMBIDGEE RIVER
STURT CANAL
THE GREEN
VIEWING DECK
RESERVE PARKING
WALKING TRACK
FISH CLEANING TABLES
PONTOON
PAVILION
WATERPARK
BOAT RAMP
BBQ & PICNIC TABLES
PUBLIC TOILETS
BOAT TRAILER PARKING
GOGELDRIE WEIR
VIEWING DECK
WALKING TRACK
BEACH
BBQ & PICNIC TABLES
PONTOON
PONTOON
MURRUMBIDGEE RIVER
THE POINT
N
POTENTIAL FUTURE ADDITIONS TO GOGELDRIE WEIR RESERVE
CONSTRUCT BEACH AREA AND PONTOONS
UPGRADE EXISTING BOAT RAMP AND INSTALL PONTOON
ESTABLISH INFORMAL BMX TRAILS BENEATH TREE CANOPY
INSTALL NEW RESERVE PAVILION
INSTALL PUBLIC ACCESS WATER PARK
INSTALL FOOTBRIDGE CONNECTION TO MVNP
DRG TITLE: POTENTIAL FUTURE ADDITIONS TO GOGELDRIE WEIR RESERVE
JOB NAME: GOGELDRIE WEIR RESERVE
0m 10m 20m 40m 60m 80m 100m
CLIENT: LEETON SHIRE COUNCIL
JOB No: 21.12
DATE: JULY 2021
A2 SCALE: 1:850
INTEGRATED Site Design
PLANNING • DESIGN • MARKETING • MANAGEMENT
DRG No: GWR-03

8 FINANCIAL PERFORMANCE AND FORECAST

The following tables demonstrate the projected cash flows for the redevelopment and operation of the recreation reserve. It is assumed that the redevelopment will be funded by loans, or a combination of loans and grants.

The revenue included for the recreation reserve includes licence fees for the exclusive use of the reserve, eg fishing competitions.

Operating expenses include asset maintenance (see Table 2 below) and operational costs including labour for grounds maintenance (lawns, tree maintenance and irrigation). The costs below reflect the operation costs for both the primary upgrade works and the future potential additions.

Table 2: Annual asset maintenance estimates

Pavilion	$2,000
Amenities	$12,000*
Grounds	$7,500
Viewing decks	$1,000
Barbecue/Picnic shelters	$4,000
Water park	$5,000
Jetties/Pontoons	$1,500
Irrigation	$1,000
Fencing	$1,000
Roads	$1,000

* Includes septic pump out

Table 3 illustrates the cash flows in the event that no grant funding is received, with the capital expenditure funded entirely by loans.

Table 3: Forecast cash flows – Nil grant funding

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
OPERATING REVENUES	0	5,000	5,100	5,222	5,348	5,476	5,608	5,742	5,880	6,021	6,166
OPERATING EXPENSES	0	48,787	67,263	70,377	88,066	94,180	96,440	98,754	101,125	103,552	106,037
Operating Result EBITDA– Surplus/(Deficit)	**0**	**(43,787)**	**(62,163)**	**(65,155)**	**(82,718)**	**(88,704)**	**(90,832)**	**(93,012)**	**(95,245)**	**(97,531)**	**(99,871)**
Other operational cash movements											
Less interest on loans		3,191	37,555	51,675	70,349	82,327	78,833	75,234	71,526	67,708	63,775
Cash result before capital movements		**(46,978)**	**(99,718)**	**(116,829)**	**(153,067)**	**(171,031)**	**(169,665)**	**(168,246)**	**(166,771)**	**(165,238)**	**(163,646)**
Capital movements											
Less loan principal repayments		3,959	46,854	67,519	95,223	116,483	119,978	123,577	127,284	131,103	135,036
Less Recreation Reserve capital works	106,375	1,149,425	517,500	690,000	494,500	0	0	0	0	0	0
Capital grant funding		0	0	0	0	0	0	0	0	0	0
Add loan funding	106,375	1,149,425	517,500	690,000	494,500	0	0	0	0	0	0
Cash result after capital movements – Recreation Reserve	**0**	**(50,937)**	**(146,572)**	**(184,348)**	**(248,291)**	**(287,514)**	**(289,643)**	**(291,823)**	**(294,055)**	**(296,341)**	**(298,682)**
Accumulated cash result – Recreation Reserve	**0**	**(50,937)**	**(197,509)**	**(381,857)**	**(630,148)**	**(917,662)**	**(1,207,305)**	**(1,499,128)**	**(1,793,184)**	**(2,089,525)**	**(2,388,207)**

With the inclusion of debt servicing, the average annual cash outflows are in excess of $230,000 per annum. Table 4 illustrates the impact with grant funding of $1.5 million, approximately 50% of the capital estimate.

Table 4: Forecast cash flow – $1.5 million grant funding

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
OPERATING REVENUES	0	5,000	5,100	5,222	5,348	5,476	5,608	5,742	5,880	6,021	6,166
OPERATING EXPENSES	0	48,787	67,263	70,377	88,066	94,180	96,440	98,754	101,125	103,552	106,037
Operating Result EBITDA– Surplus/(Deficit)	**0**	(43,787)	(62,163)	(65,155)	(82,718)	(88,704)	(90,832)	(93,012)	(95,245)	(97,531)	(99,871)
Other operational cash movements											
Less interest on loans		0	0	8,199	28,594	42,344	40,675	38,956	37,185	35,361	33,482
Cash result before capital movements		(43,787)	(62,163)	(73,354)	(111,312)	(131,048)	(131,507)	(131,968)	(132,429)	(132,891)	(133,353)
Capital movements											
Less loan principal repayments		0	0	10,171	36,155	55,643	57,312	59,031	60,802	62,627	64,505
Less Recreation Reserve capital works	106,375	1,149,425	517,500	690,000	494,500	0	0	0	0	0	0
Capital grant funding	106,375	1,149,425	244,200	0	0	0	0	0	0	0	0
Add loan funding	0	0	273,300	690,000	494,500	0	0	0	0	0	0
Cash result after capital movements – Recreation Reserve	**0**	(43,787)	(62,163)	(83,525)	(147,467)	(186,691)	(188,819)	(190,999)	(193,232)	(195,518)	(197,858)
Accumulated cash result – Recreation Reserve	**0**	(43,787)	(105,950)	(189,474)	(336,941)	(523,632)	(712,452)	(903,451)	(1,096,683)	(1,292,200)	(1,490,059)

Table 4 illustrates that attaining grant funding of $1.5 million significantly reduces the debt servicing costs and subsequent annual cash outlays for the recreation reserve.

9 FACILITIES MANAGEMENT

A facilities management plan will ensure that the responsibilities for the management, operation, maintenance and funding of the holiday park and recreation reserve are clearly identified.

Council has several alternatives for the management of the holiday park and recreation reserve:

1 Direct employment of Council resources.
2 Long-term lease of the holiday park and/or recreation reserve.
3 Contract management of the holiday park and/or recreation reserve.

The advantages and disadvantages of each option are provided below:

1 Direct employment of Council resources

Advantages	Disadvantages
Stronger governance with all aspects operating under Council's internal controls	Not a typical local government business
Can control fees and charges for the use of the holiday park	Lack of specialist skills to operate and maximise business returns for the holiday park
Assets maintained and replaced as required	Greater exposure to fluctuations in financial performance
	More expensive labour costs
	Higher administrations costs
	Elected officials find it difficult to separate business and community roles

2 Long-term lease of the holiday park and/or recreation reserve

Advantages	Disadvantages
Lower Council administration costs	Council will need significant capital grants to offer a viable lease package
Clearly identified long-term financial return and risk	Difficulty in attracting more recognised operators to country area
	Long-term leases often lead to lower levels of asset maintenance and replacement
	Lack of control over level of service and presentation of the holiday park and recreation reserve
	Elected officials find it difficult to separate business and community roles
	Major emphasis of lessee will be to the business outcomes of the holiday park rather than the local community

3 Contract management of the holiday park and/or recreation reserve

Advantages	Disadvantages
Council administration costs lower than employee option	Contract administration costs higher than lease
Enables strong partnership between operator and Council	Contractor may focus on holiday park over recreation reserve
Management and maintenance of Council assets	
Financial risk shared by contractor and Council	
Profit share arrangement to motivate contractor and Council	

It is our experience that the engagement of contract managers provides the greater balance of control, asset protection and business performance. The inclusion of performance plans for various components of the contract deliverables combined with accountable key performance indicators ensures the clear delineation of responsibilities between the Council and the contractor. A key focus of the management contract is to ensure that the level of maintenance and presentation of the recreation reserve is consistent with that provided for guests staying at the holiday park.

10 ECONOMIC BENEFIT

10.1 Economic Benefit of the Recreation Reserve Redevelopment

Economic impact modelling enables Leeton Shire to explore how change in employment or output (sales) in one sector of the local economy will impact on all other sectors of the economy, by modelling the flow-on effects across different industries.

Using an economic impact model, Council has measured the flow-on impacts to the local economy resulting from the proposed upgrades to the recreation reserve.

A full report is included at Annexure 3. Major highlights include the following:

- The combination of all direct, industrial and consumption effects would result in a total estimated rise in output of $4 million in the Leeton Shire economy, representing a type 2 output multiplier of 1.43.
- The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be $7.02 million added to Australia's output.
- The combination of all direct, industrial and consumption effects would result in a total estimated increase of 31 jobs located in Leeton Shire. This represents a type 2 employment multiplier of 1.25.
- The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be an addition of 42 jobs.
- The combination of all direct, industrial and consumption effects would result in an estimated addition in value added of $1.29 million in the Leeton Shire economy, representing a type 2 value-added multiplier of 1.56.
- The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be $2.56 million added to Australia's value added.

Annexure 1

Instrument setting out terms of Easements or Profits a Prendre intended to be created or released and of Restrictions on the Use of Land or Positive Covenants intended to be created pursuant to Section 88A and Section 88B Conveyancing Act 1919.

(Sheet 1 of 2 Sheets)

DP1184875 B

Plan of Subdivision of Lot 1 DP 32714 and Lot 1 DP 218155 and Easements for Access 10, 15.09 and Variable Widths, Easement for Underground Power 5 Wide and Easement for Underground Data Cable 2 and Variable Width
Subdivision Certicate No 13/2007
5 May 2008

Full name and address of the owner of the land:

Water Administration Ministerial Corporation
Level 10, 10 Valentine Ave
Parramatta NSW 2150

Part 1 (Creation)

Number of items shown in the intention panel on the plan	Identity of easement, profit a prendre, restriction or positive covenant to be created and referred to in the plan	Burdened lots(s) or parcel(s)	Benefited lot(s), road(s), bodies or Prescribed Authorities:
1	Easement for Access 10 metres wide	Lot 2	State Water Corporation
2	Easement for Access 15.09 metres and variable width	Lot 2	State Water Corporation
3	Easement for Underground Power 5 metres wide	Lots 2 and 4	State Water Corporation
4	Easement for Underground Data Cable 2 metres and Variable Width	Lots 2 and 4	Water Administration Ministerial Corporation and State Water Corporation

Part 2 (Terms)

Terms of easement numbered 1-3 in the plan.

Right for State Water Corporation by its employees or agents to enter with any necessary tools or equipment the servient land for the purpose of excavating, laying, installing, using, repairing, maintaining, renewing and relaying or removing any pipes, wires, cables, channels and any necessary or related media or facility, the person exercising the right to cause as little damage and inconvenience as is reasonably practicable in so doing and to make good any damage caused to the servient land.

DP1184875

(Sheet 2 of 2 Sheets)

Terms of easement numbered 4 in the plan.

Right for Water Administration Ministerial Corporation and State Water Corporation by its employees or agents to enter with any necessary tools or equipment the servient land for the purpose of excavating, laying, installing, using, repairing, maintaining, renewing and relaying or removing any pipes, wires, cables, channels and any necessary or related media or facility, the person exercising the right to cause as little damage and inconvenience as is reasonably practicable in so doing and to make good any damage caused to the servient land

Name of person in power to release, vary or modify restrictions numbered 1 in the plan.

Item	Name of person in power
1-3	State Water Corporation 7 Commercial Ave Blueridge Business Park, Mitchell Highway Dubbo NSW 2830
4	Each of Water Administration Ministerial Corporation and State Water Corporation in relation to its interest. Water Administration Ministerial Corporation – Level 10, 10 Valentine Ave Parramatta NSW 2150 State Water Corporation 7 Commercial Ave Blueridge Business Park, Mitchell Highway Dubbo NSW 2830

I certify that the person(s) signing opposite, with whom I am personally acquainted or as to whose identity I am otherwise satisfied, signed this Instrument in my presence.

Signature of Witness: .....

Name of Witness: STEPHEN MARTIN

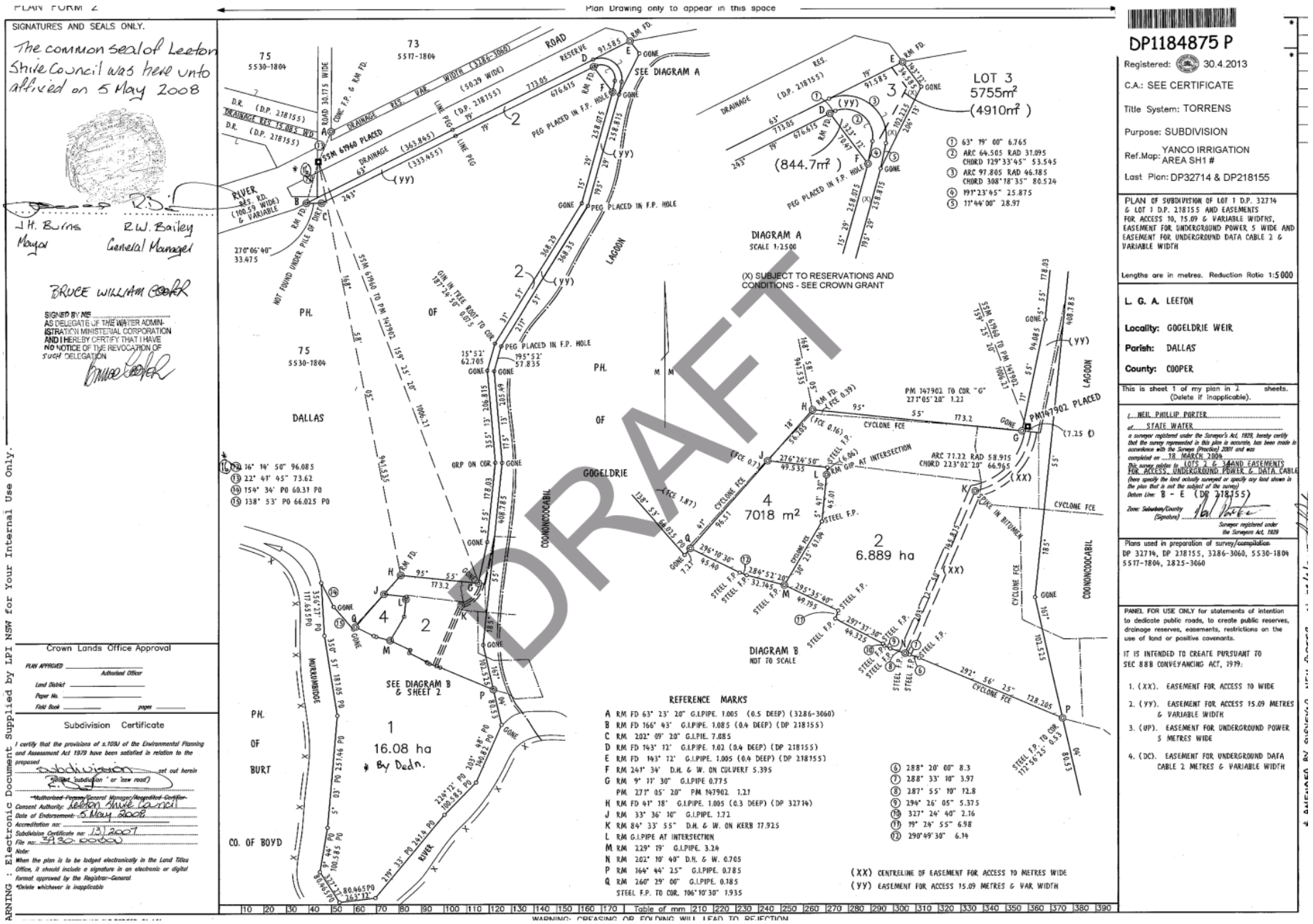
Address of Witness: 10 VALENTINE AVENUE PARRAMATTA NSW 2150

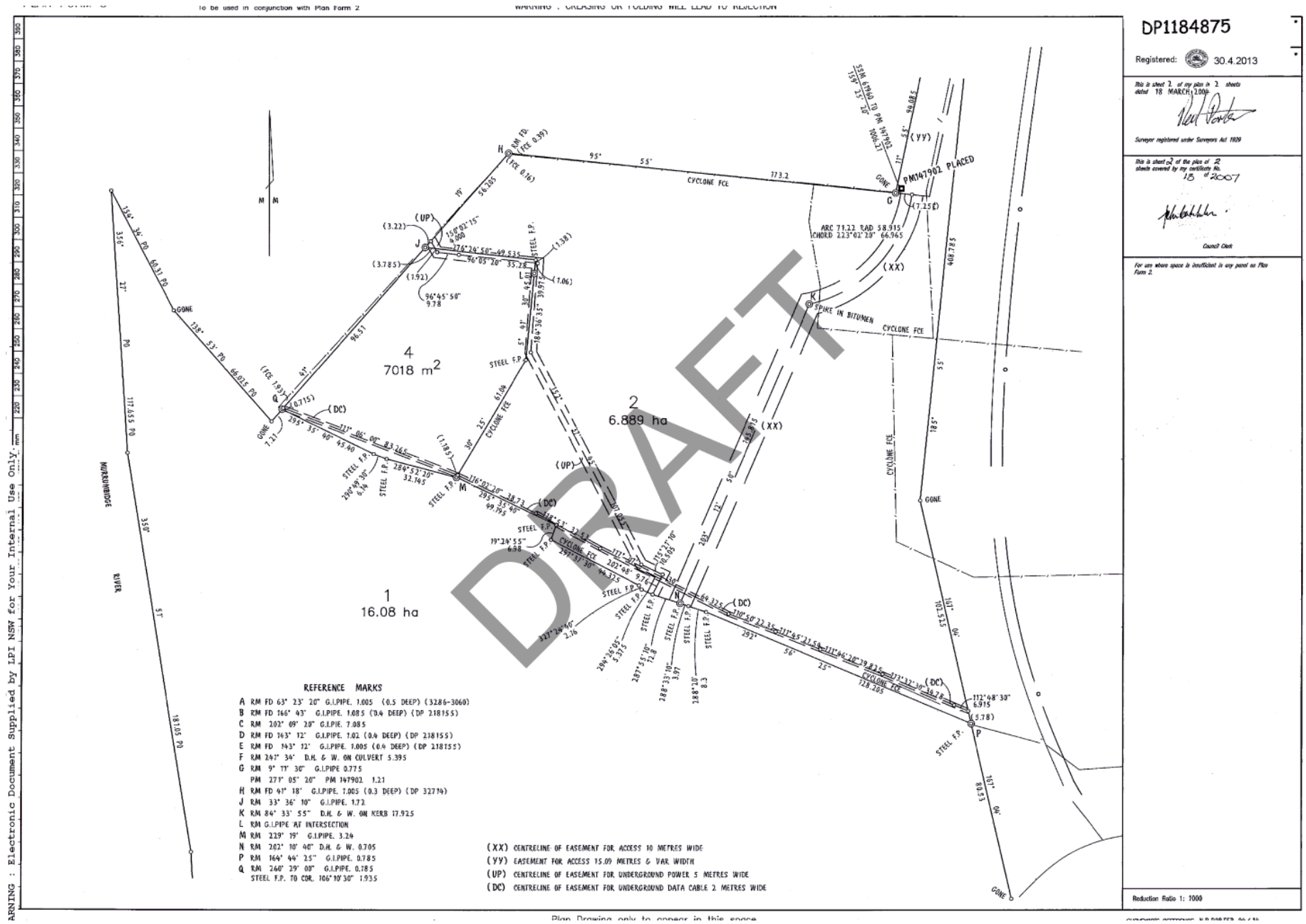
Certified correct for the purposes of the Real Property Act 1900 by the owner.

Signature of Owner: BRUCE WILLIAM COOPER .....

SIGNED BY ME.....
AS DELEGATE OF THE WATER ADMINISTRATION MINISTERIAL CORPORATION AND I HEREBY CERTIFY THAT I HAVE NO NOTICE OF THE REVOCATION OF SUCH DELEGATION

REGISTERED 30.4.2013


PLAN FORM 2
Plan Drawing only to appear in this space
SIGNATURES AND SEALS ONLY.
The common seal of Leeton Shire Council was here unto affixed on 5 May 2008
J.H. Burns Mayor
R.W. Bailey General Manager
BRUCE WILLIAM COOPER
SIGNED BY ME
AS DELEGATE OF THE WATER ADMINISTRATION MINISTERIAL CORPORATION AND I HEREBY CERTIFY THAT I HAVE NO NOTICE OF THE REVOCATION OF SUCH DELEGATION
Crown Lands Office Approval
PLAN APPROVED
Authorised Officer
Land District
Paper No.
Field Book
pages
Subdivision Certificate
I certify that the provisions of s.109J of the Environmental Planning and Assessment Act 1979 have been satisfied in relation to the proposed subdivision set out herein
(Insert 'subdivision' or 'new road')
*Authorised Person/General Manager/Accredited Certifier
Consent Authority: Leeton Shire Council
Date of Endorsement: 5 May 2008
Accreditation no:
Subdivision Certificate no: 13/2007
File no: 5130.00030
Note:
When the plan is to be lodged electronically in the Land Titles Office, it should include a signature in an electronic or digital format approved by the Registrar-General
*Delete whichever is inapplicable
WARNING : Electronic Document Supplied by LPI NSW for Your Internal Use Only.
DP1184875 P
Registered: 30.4.2013
C.A.: SEE CERTIFICATE
Title System: TORRENS
Purpose: SUBDIVISION
Ref.Map: YANCO IRRIGATION AREA SH1 #
Last Plan: DP32714 & DP218155
PLAN OF SUBDIVISION OF LOT 1 D.P. 32714 & LOT 1 D.P. 218155 AND EASEMENTS FOR ACCESS 10, 15.09 & VARIABLE WIDTHS, EASEMENT FOR UNDERGROUND POWER 5 WIDE AND EASEMENT FOR UNDERGROUND DATA CABLE 2 & VARIABLE WIDTH
Lengths are in metres. Reduction Ratio 1:5000
L. G. A. LEETON
Locality: GOGELDRIE WEIR
Parish: DALLAS
County: COOPER
This is sheet 1 of my plan in 2 sheets. (Delete if inapplicable).
I, NEIL PHILLIP PORTER
of STATE WATER
a surveyor registered under the Surveyors Act, 1929, hereby certify that the survey represented in this plan is accurate, has been made in accordance with the Surveys (Practice) 2007 and was completed on 18 MARCH 2008
This survey applies to LOTS 2 & 3 AND EASEMENTS FOR ACCESS, UNDERGROUND POWER & DATA CABLE (here specify the land actually surveyed or specify any land shown in the plan that is not the subject of the survey)
Datum Line: B - E (DP 218155)
Zone: Suburban/County
(Signature)
Surveyor registered under the Surveyors Act, 1929
Plans used in preparation of survey/compilation
DP 32714, DP 218155, 3286-3060, 5530-1804 5517-1804, 2825-3060
PANEL FOR USE ONLY for statements of intention to dedicate public roads, to create public reserves, drainage reserves, easements, restrictions on the use of land or positive covenants.
IT IS INTENDED TO CREATE PURSUANT TO SEC 88B CONVEYANCING ACT, 1919:
1. (XX). EASEMENT FOR ACCESS 10 WIDE
2. (YY). EASEMENT FOR ACCESS 15.09 METRES & VARIABLE WIDTH
3. (UP). EASEMENT FOR UNDERGROUND POWER 5 METRES WIDE
4. (DC). EASEMENT FOR UNDERGROUND DATA CABLE 2 METRES & VARIABLE WIDTH
DIAGRAM A
SCALE 1:2500
DIAGRAM B
NOT TO SCALE
SEE DIAGRAM A
SEE DIAGRAM B & SHEET 2
LOT 3
5755m²
(4910m²)
(844.7m²)
4
7018 m²
2
6.889 ha
1
16.08 ha
* By Dedn.
(X) SUBJECT TO RESERVATIONS AND CONDITIONS - SEE CROWN GRANT
REFERENCE MARKS
A RM FD 63° 23' 20" G.I.PIPE. 1.005 (0.5 DEEP) (3286-3060)
B RM FD 166° 43' G.I.PIPE. 1.085 (0.4 DEEP) (DP 218155)
C RM 202° 09' 20" G.I.PIE. 7.085
D RM FD 143° 12' G.I.PIPE. 1.02 (0.4 DEEP) (DP 218155)
E RM FD 143° 12' G.I.PIPE. 1.005 (0.4 DEEP) (DP 218155)
F RM 241° 34' D.H. & W. ON CULVERT 5.395
G RM 9° 17' 30" G.I.PIPE 0.775
PM 271° 05' 20" PM 147902. 1.21
H RM FD 41° 18' G.I.PIPE. 1.005 (0.3 DEEP) (DP 32714)
J RM 33° 36' 10" G.I.PIPE. 1.72
K RM 84° 33' 55" D.H. & W. ON KERB 17.925
L RM G.I.PIPE AT INTERSECTION
M RM 229° 19' G.I.PIPE. 3.24
N RM 202° 10' 40" D.H. & W. 0.705
P RM 164° 44' 25" G.I.PIPE. 0.785
Q RM 260° 29' 00" G.I.PIPE. 0.785
STEEL F.P. TO COR. 106° 10' 30" 1.935
(XX) CENTRELINE OF EASEMENT FOR ACCESS 10 METRES WIDE
(yy) EASEMENT FOR ACCESS 15.09 METRES & VAR WIDTH
DRAFT
Table of mm
WARNING: CREASING OR FOLDING WILL LEAD TO REJECTION


DP1184875
Registered: 30.4.2013
This is sheet 2 of my plan in 2 sheets dated 18 MARCH 2008
Surveyor registered under Surveyors Act 1929
This is sheet 2 of the plan of 2 sheets covered by my certificate No. 18 of 2007
Council Clerk
For use where space is insufficient in any panel on Plan Form 2.
Reduction Ratio 1: 1000
DRAFT
4
7018 m2
2
6.889 ha
1
16.08 ha
REFERENCE MARKS
A RM FD 63° 23' 20" G.I.PIPE. 1.005 (0.5 DEEP) (3286-3060)
B RM FD 166° 43' G.I.PIPE. 1.085 (0.4 DEEP) (DP 218155)
C RM 202° 09' 20" G.I.PIE. 1.085
D RM FD 143° 12' G.I.PIPE. 1.02 (0.4 DEEP) (DP 218155)
E RM FD 143° 12' G.I.PIPE. 1.005 (0.4 DEEP) (DP 218155)
F RM 241° 34' D.H. & W. ON CULVERT 5.395
G RM 9° 11' 30" G.I.PIPE 0.775
PM 271° 05' 20" PM 147902 1.21
H RM FD 41° 18' G.I.PIPE. 1.005 (0.3 DEEP) (DP 32714)
J RM 33° 36' 10" G.I.PIPE. 1.72
K RM 84° 33' 55" D.H. & W. ON KERB 17.925
L RM G.I.PIPE AT INTERSECTION
M RM 229° 19' G.I.PIPE. 3.24
N RM 202° 10' 40" D.H. & W. 0.705
P RM 164° 44' 25" G.I.PIPE. 0.785
Q RM 260° 29' 00" G.I.PIPE. 0.185
STEEL F.P. TO COR. 106° 10' 30" 1.935
(XX) CENTRELINE OF EASEMENT FOR ACCESS 10 METRES WIDE
(YY) EASEMENT FOR ACCESS 15.09 METRES & VAR WIDTH
(UP) CENTRELINE OF EASEMENT FOR UNDERGROUND POWER 5 METRES WIDE
(DC) CENTRELINE OF EASEMENT FOR UNDERGROUND DATA CABLE 2 METRES WIDE
CYCLONE FCE
STEEL F.P.
SPIKE IN BITUMEN
PM147902 PLACED
GONE
WARRAWIDGE
RIVER

Annexure 2

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : ISD039

Client Service ID : 577673

James Bolger

Date: 21 March 2021

19 Fern St
Lennox Head New South Wales 2478

Attention: James Bolger

Email: jimb@i-site.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 2, DP:DP1184875 with a Buffer of 200 meters, conducted by James Bolger on 21 March 2021.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Page 59

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : ISD039

Client Service ID : 577674

James Bolger

Date: 21 March 2021

19 Fern St
Lennox Head New South Wales 2478

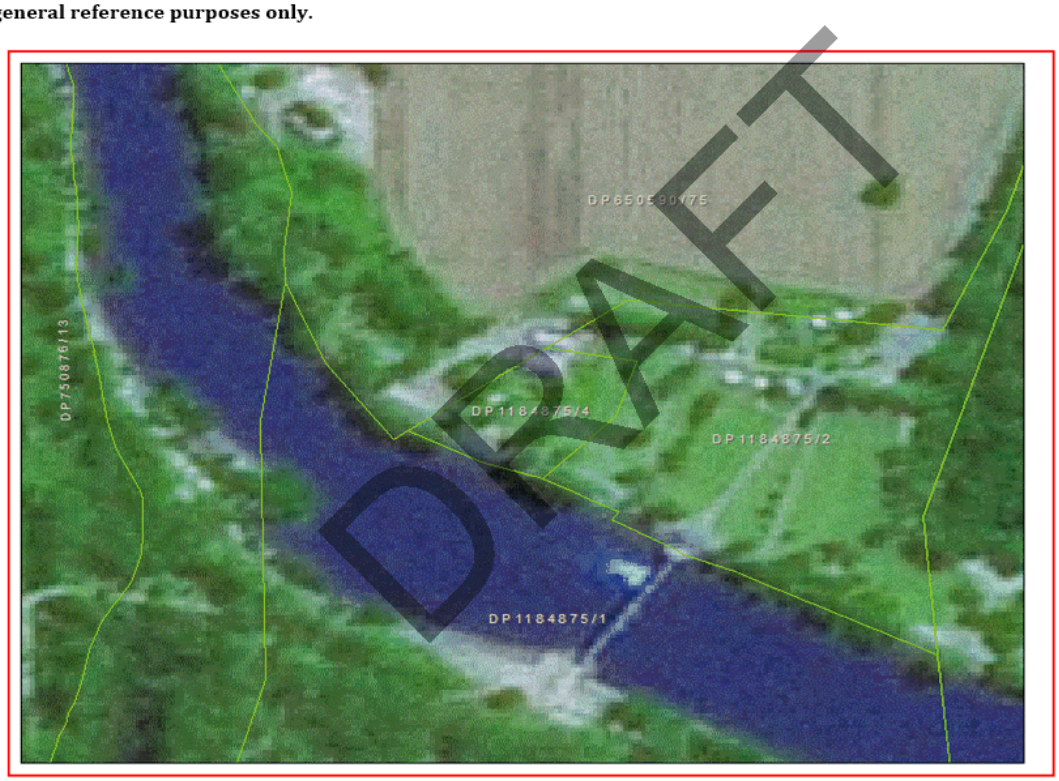
Attention: James Bolger

Email: jimb@i-site.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 4, DP:DP1184875 with a Buffer of 200 meters, conducted by James Bolger on 21 March 2021.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Page 61

If your search shows Aboriginal sites or places what should you do?

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- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

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- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

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ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

Annexure 3

Leeton Shire
Economic impact model

Economic impact modelling enables Leeton Shire to explore how change in employment or output(sales) in one sector of the local economy will impact on all other sectors of the economy, by modelling the flow-on effects across different industries.
This provides Leeton Shire with powerful evidence to advocate against industrial closures or strategically target new industry sectors which are likely to have the greatest positive economic impact.
Different industries will have different flow on effects. Adding jobs in a particular sector will not only add to the value of that sector, but also to other industries related to the supply chain (eg. suppliers, wholesalers) and service industries (retail, food services, administration) which will expand to service the additional workforce. Jobs in associated industries may be added in the local area or outside it, based on journey to work information.
The economic impacts are calculated using an input-output model which is derived from the local economy microsimulation model by National Economics (NIEIR).
To use the model, simply input the number of jobs (per year) to be added to (+) or removed (-) from the economy in a particular industry sector. The results show the theoretical addition (or loss) to the local economy of jobs and value added by industry sector. It also shows the proportion of the new employment that would occur inside and outside Leeton Shire.
To model construction impacts related to a project, input the total cost of construction or direct jobs created. The results shown will represent total direct and indirect impacts over the life of the construction period. To estimate annual impacts, simply divide the total impacts by the estimated life of the project in years (e.g. divide results by 3 if the project will take 3 years to build, or 1.5 for 18 months).

Industry: Sports and Recreation Activities
Impact modelled: ADDITION of $2.8 million sales
Company name: Gogeldrie

Impact Summary

Leeton Shire - Modelling the effect of adding $2.8m sales in Sports and Recreation Activities - Inflation adjusted

Summary	Output ($m)	Value-added ($m)	Local jobs	Residents jobs
Starting position Leeton Shire (year ended June 2020)	--	--	--	--
Sports and Recreation Activities	1.82	0.54	16	19
All industries	1,540.88	567.08	4,872	5,152
Impacts on Leeton Shire economy	--	--	--	--
Direct impact on Sports and Recreation Activities sector	2.80	0.83	24	--
Industrial impact	0.86	0.31	4	--
Consumption impact	0.33	0.15	2	--
Total impact on Leeton Shire economy	**4.00**	**1.29**	**31**	**30**
▪ Type 1 multiplier (direct & industrial)	1.31	1.38	1.17	--
▪ Type 2 multiplier (direct, industrial & consumption)	1.43	1.56	1.25	--
Impact on New South Wales economy	--	--	--	--
Total impact - New South Wales outside Leeton Shire	1.18	0.51	4	4
Total impact New South Wales economy	5.18	1.79	35	34
Impact on Australian economy	--	--	--	--
Total impact outside New South Wales economy	1.84	0.77	7	7
Total impact on Australian economy	**7.02**	**2.56**	**42**	**42**

Source: National Institute of Economic and Industry Research (NIEIR) ©2021. Compiled and presented in economy.id by .id (informed decisions).

Note: All $ values are expressed in 2018/19 base year dollar terms.

Impact on Output

The direct addition of $2.8 million annual output in the Sports and Recreation Activities sector of Leeton Shire economy would lead to an increase in indirect demand for intermediate goods and services across related industry sectors. These indirect industrial impacts (Type 1) are estimated to be an additional $0.86m in Output, representing a Type 1 Output multiplier of 1.31.

There would be an additional contribution to Leeton Shire economy through consumption effects as correspondingly more wages and salaries are spent in the local economy. It is estimated that this would result in a further increase in Output of $0.33m.

The combination of all direct, industrial and consumption effects would result in total estimated rise in Output of $4.00m in Leeton Shire economy, representing a Type 2 Output multiplier of 1.43.

These impacts would not be limited to the local economy. Industrial and consumption effects would flow outside the region to the wider Australian economy to the tune of $3.02m in Output.

The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be $7.02m added to Australia's Output.

Impact on Local Employment (jobs)

The direct addition of $2.8 million annual output in the Sports and Recreation Activities sector of Leeton Shire economy is estimated to lead to a corresponding direct addition of 24 jobs in the local Sports and Recreation Activities sector. From this direct expansion in the economy it is anticipated that there would be flow on effects into other related intermediate industries, creating an additional 4 jobs. This represents a Type 1 Employment multiplier of 1.17.

This addition of jobs in the local economy would lead to a corresponding increase in wages and salaries, a proportion of which would be spent on local goods and services, creating a further 2 jobs through consumption impacts.

The combination of all direct, industrial and consumption effects would result in a total estimated increase of 31 jobs located in Leeton Shire. This represents a Type 2 Employment multiplier of 1.25.

Employment impacts would not be limited to the local economy. Industrial and consumption effects would flow outside the region to the wider Australian economy creating a further 11 jobs.

The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be an addition of 42 jobs.

Impact on value added

The direct addition of $2.8 million annual output in the Sports and Recreation Activities sector of Leeton Shire economy would lead to a corresponding direct increase in value added of $0.83m. A further $0.31m in value added would be generated from related intermediate industries. These indirect industrial impacts represent a Type 1 value added multiplier of 1.38.

There would be an additional contribution to Leeton Shire economy through consumption effects as correspondingly more wages and salaries are spent in the local economy. It is estimated that this would result in a further increase in value added of $0.15m.

The combination of all direct, industrial and consumption effects would result in an estimated addition in value added of $1.29m in Leeton Shire economy, representing a Type 2 value added multiplier of 1.56.

These impacts would not be limited to the local economy. Industrial and consumption effects would flow outside the region to the wider Australian economy to the tune of $1.28m in value added.

The combined effect of economic multipliers in Leeton Shire and the wider Australian economy is estimated to be $2.56m added to Australia's value added.

Impact on GRP

Value added by industry represents the industry component of Gross Regional Product (GRP). The impact on Leeton Shire's GRP as a result of this change to the economy is directly equivalent to the change in value added outlined in the section above.

In summary, GRP in Leeton Shire is estimated to increase by $1.29m.

The effect on the Australian economy (including Leeton Shire) is estimated to be a growth in Gross Domestic Product (GDP) of $2.56m.

Impact on employment by industry sector

This table shows a detailed breakdown of how employment will be affected by the addition of $2.8 million annual output in the Sports and Recreation Activities sector of Leeton Shire economy. This includes both the direct industrial impact (Type 1) and ongoing consumption impact (Type 2).

Employment by industry sector

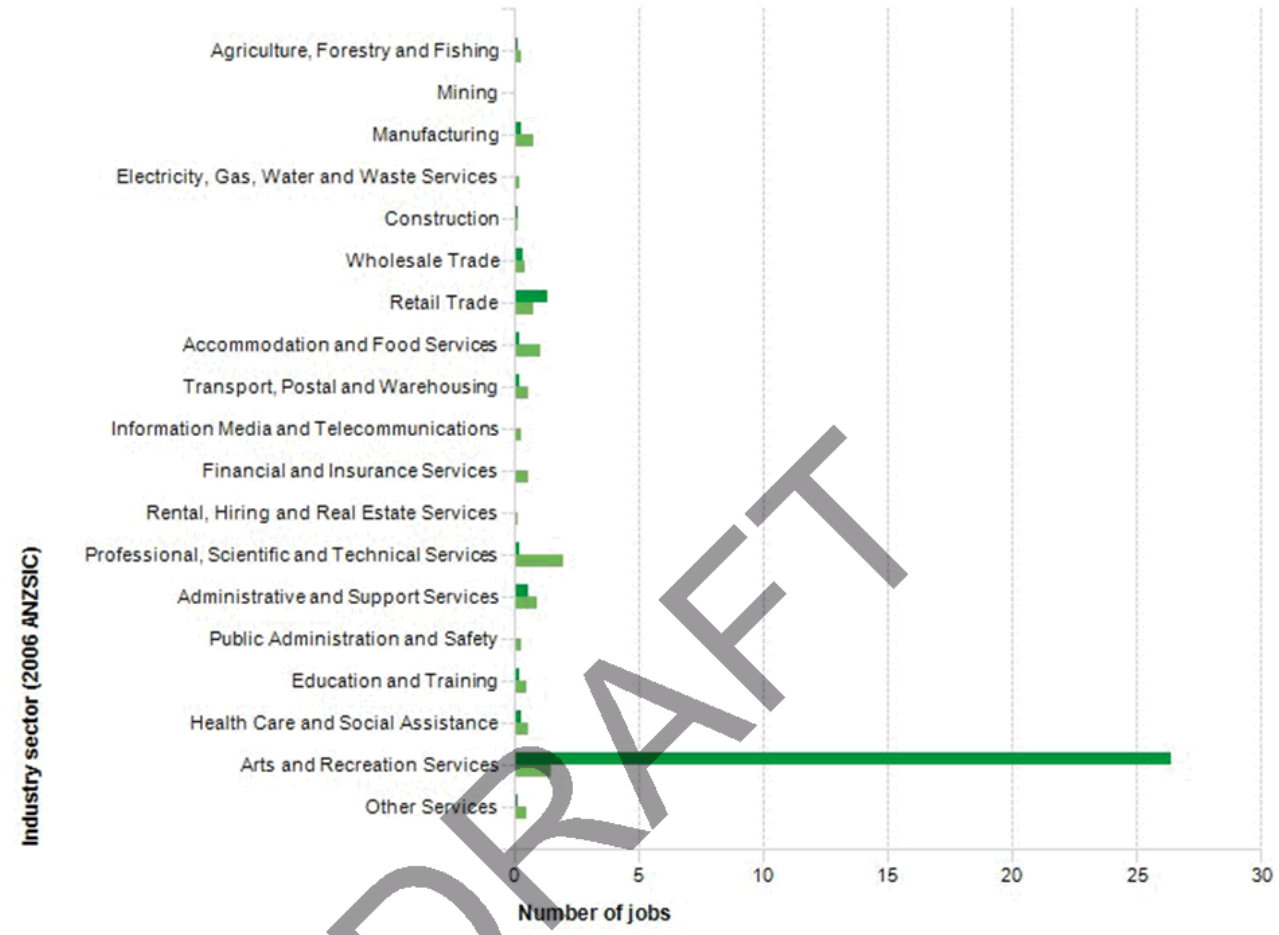
Leeton Shire - Impact of $2.8 million new sales in 'Sports and Recreation Activities' output (Type 1 & 2 combined impact)

Industry sectors (1-digit ANSIC)	Employment impacts			
	Existing jobs in Leeton Shire*	Jobs created in Leeton Shire	Jobs created outside of Leeton Shire	Jobs created for Leeton Shire residents
Agriculture, Forestry and Fishing	544	0	0	0
Mining	42	0	0	0
Manufacturing	970	0	1	0
Electricity, Gas, Water and Waste Services	250	0	0	0
Construction	406	0	0	0
Wholesale Trade	116	0	0	0
Retail Trade	385	1	1	1
Accommodation and Food Services	234	0	1	0
Transport, Postal and Warehousing	200	0	1	0
Information Media and Telecommunications	14	0	0	0
Financial and Insurance Services	43	0	1	0
Rental, Hiring and Real Estate Services	35	0	0	0
Professional, Scientific and Technical Services	145	0	2	0
Administrative and Support Services	111	1	1	1
Public Administration and Safety	243	0	0	0
Education and Training	540	0	1	0
Health Care and Social Assistance	416	0	1	0
Arts and Recreation Services	16	26	1	26
Other Services	161	0	1	0
Total Industries	4,872	31	11	30

Source: National Institute of Economic and Industry Research (NIEIR) ©2021. Compiled and presented in economy.id by .id informed decisions

Employment by industry sector

Impact of $2.8 million new sales in Sports and Recreation Activities sector



Source: National Institute of Economic and Industry Research (NIEIR) ©2021
Compiled and presented in economy.id by .id the population experts

Resident employment impacts

The combination of all direct, industrial and consumption effects of adding $2.8 million annual output to the Sports and Recreation Activities sector of Leeton Shire economy would be an estimated increase of 30 jobs located in Leeton Shire and 12 jobs located outside Leeton Shire – a total of 42 jobs.

As some of Leeton Shire's residents leave the area to work and residents of other areas enter Leeton Shire to work, not all of these jobs will be filled by Leeton Shire residents. It is estimated that of the 42 jobs created, 30 or 71.8% would be expected to be filled by Leeton Shire residents.

Industry employment impacts

The combination of all direct, industrial and consumption effects of adding $2.8 million annual output to the Sports and Recreation Activities sector of Leeton Shire economy would result in an estimated increase of 31 jobs located in Leeton Shire.
Of the 31 jobs created within Leeton Shire, 26, or 86.3% would be added within Arts and Recreation Services the sector. This includes the direct jobs created in the sector, and the effect of flow-on jobs within the same sector.
The largest increase in jobs outside Arts and Recreation Services would be in Retail Trade (1), Administrative and Support Services (1) and Wholesale Trade (0).
A total of 11 jobs are estimated to be created outside Leeton Shire, with the largest number being in Professional, Scientific and Technical Services (2) Accommodation and Food Services (1) and Administrative and Support Services (1).

Impact on value added by industry sector

This table shows a detailed breakdown of how adding $2.8 million annual output in the Sports and Recreation Activities sector of Leeton Shire economy will impact on the value added of each industry sector. This highlights the relationships between industry. This includes both the direct industrial impact (Type 1) and ongoing consumption impact (Type 2).

Value-added by industry

Leeton Shire - Impact of $2.8 million new sales in 'Sports and Recreation Activities' output (Type 1 & 2 combined impact)

Value added 2018-19 ($m constant prices)

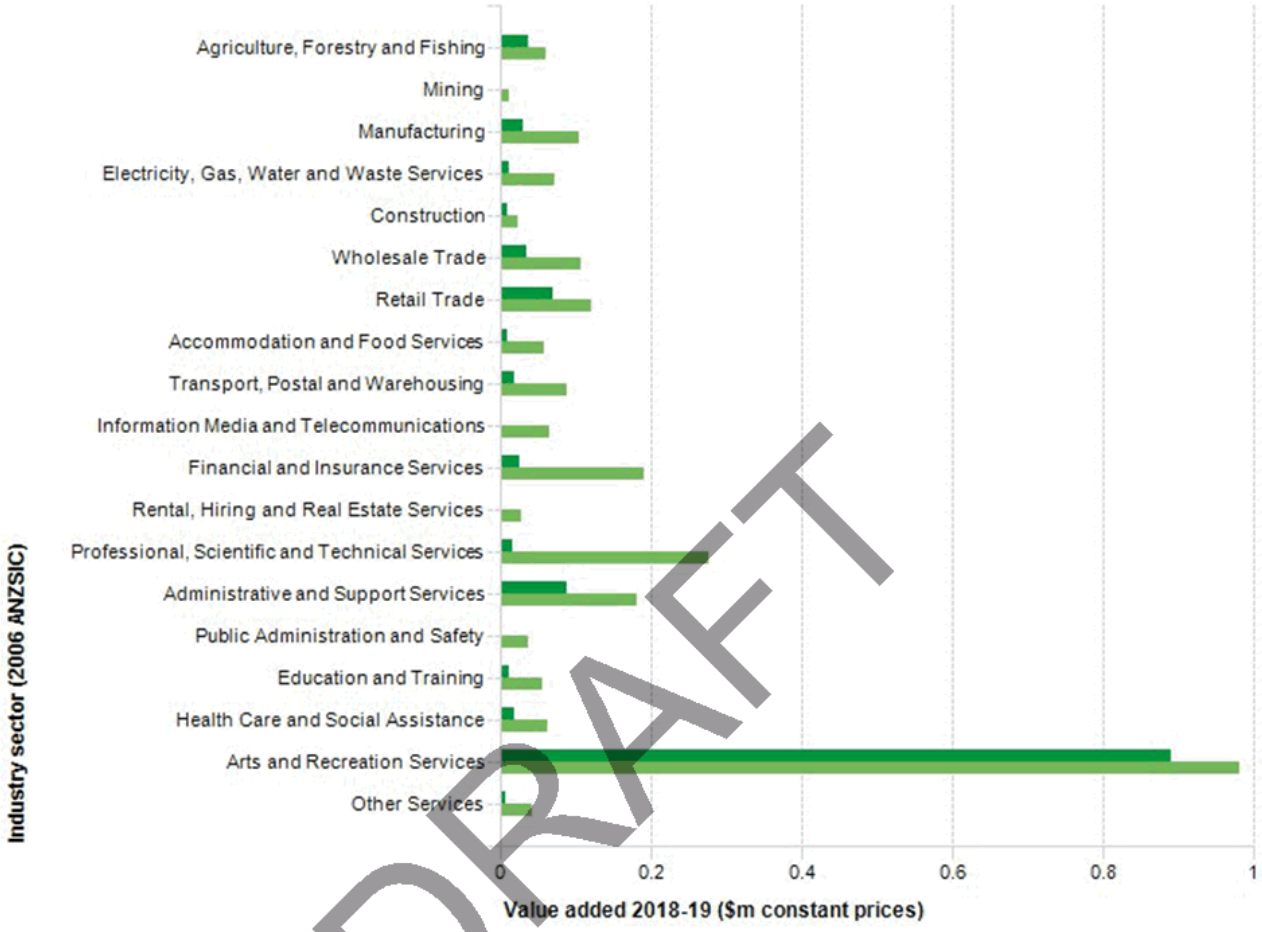
Industry sectors (1-digit ANSIC)	Current local value-added*	Value-added to Leeton Shire	Percentage change	Value-added to Australian economy
Agriculture, Forestry and Fishing	$149.53	$0.04	0.0%	$0.06
Mining	$12.33	$0.00	0.0%	$0.01
Manufacturing	$101.30	$0.03	0.0%	$0.11
Electricity, Gas, Water and Waste Services	$71.81	$0.01	0.0%	$0.07
Construction	$28.22	$0.01	0.0%	$0.02
Wholesale Trade	$12.39	$0.04	0.3%	$0.11
Retail Trade	$20.82	$0.07	0.3%	$0.12
Accommodation and Food Services	$9.93	$0.01	0.1%	$0.06
Transport, Postal and Warehousing	$19.69	$0.02	0.1%	$0.09
Information Media and Telecommunications	$1.05	$0.00	0.2%	$0.07
Financial and Insurance Services	$9.50	$0.02	0.3%	$0.19
Rental, Hiring and Real Estate Services	$4.75	$0.00	0.0%	$0.03
Professional, Scientific and Technical Services	$12.73	$0.02	0.1%	$0.28
Administrative and Support Services	$7.32	$0.09	1.2%	$0.18
Public Administration and Safety	$19.22	$0.00	0.0%	$0.04
Education and Training	$50.35	$0.01	0.0%	$0.06
Health Care and Social Assistance	$28.01	$0.02	0.1%	$0.06
Arts and Recreation Services	$0.54	$0.89	166.3%	$0.98
Other Services	$7.59	$0.01	0.1%	$0.04
Total Industries	$567.08	$1.29	0.2%	$2.56

Source: National Institute of Economic and Industry Research (NIEIR) ©2021. Compiled and presented in economy.id by .id informed decisions

Value-added by industry

Impact of $2.8 million new sales in Sports and Recreation Activities sector

Value-added to Local GRP (industry) Value-added to total Australian economy



Source: National Institute of Economic and Industry Research (NIEIR) ©2021
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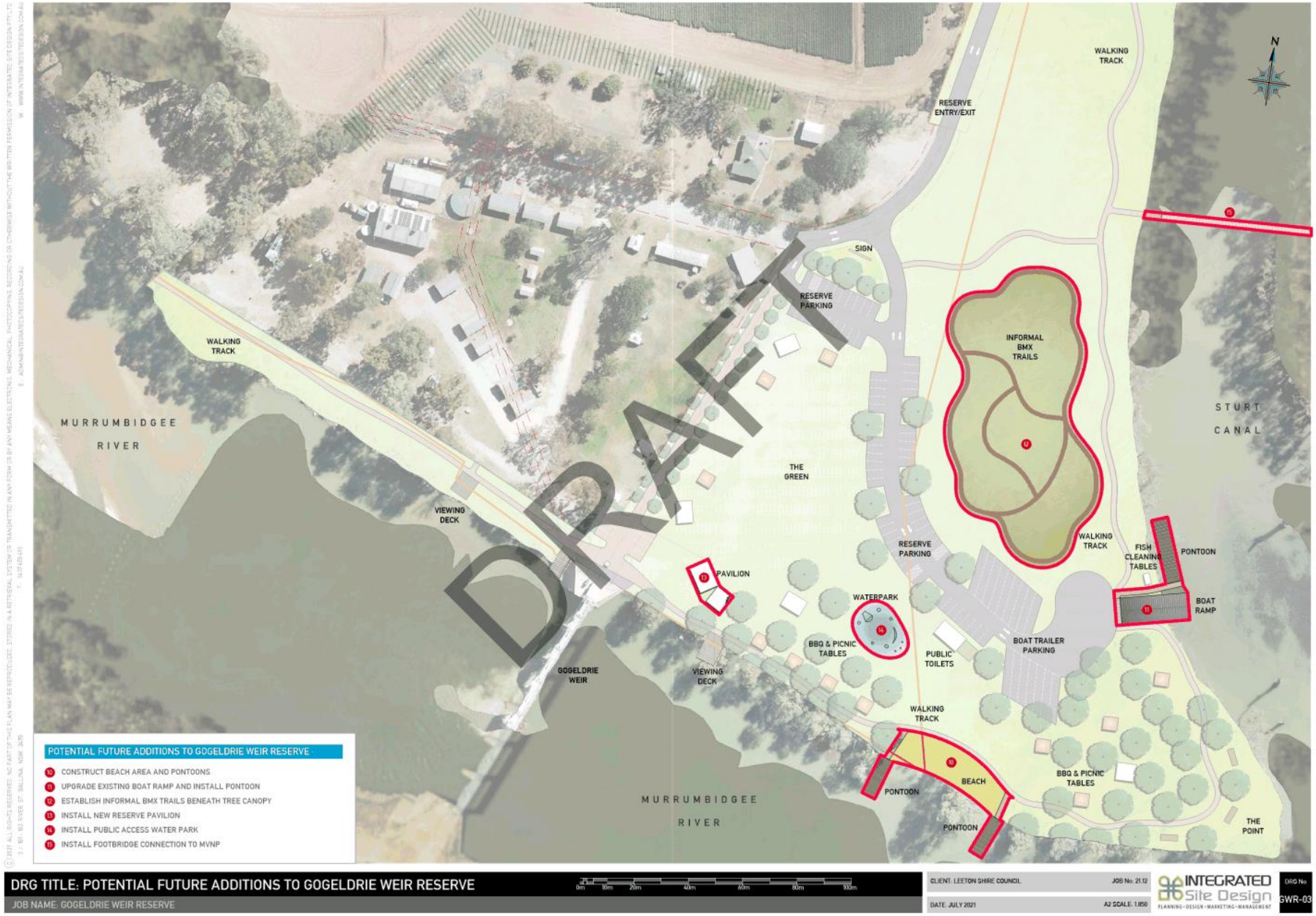
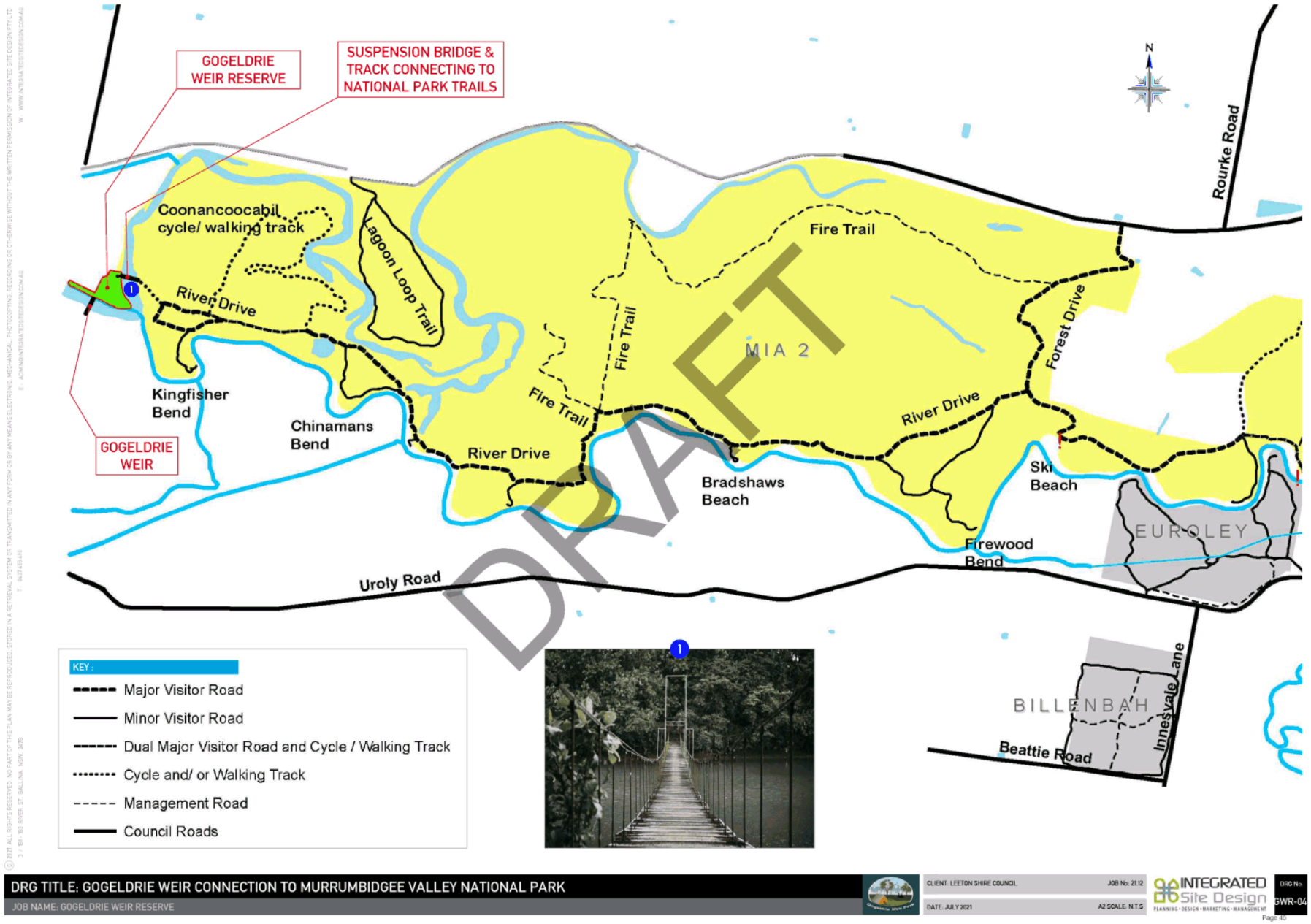
The combination of all direct, industrial and consumption effects of adding $2.8 million annual output to the Sports and Recreation Activities sector of Leeton Shire economy would result in an estimated increase in value added of $1.29m in Leeton Shire economy.
The Arts and Recreation Services sector of the economy is estimated to increase in value added by 166.3%, with the total Leeton Shire economy estimated to grow by 0.2%.
The main impacts in value added within Leeton Shire, outside of Arts and Recreation Services, are in Administrative and Support Services (0.09m), Retail Trade (0.07m) and Agriculture, Forestry and Fishing (0.04m).


2
5
6
16
17
8
9
12 13
15
GOGELDRIE WEIR RESERVE :
1 RESERVE ENTRY & CAR PARKING
2 WEIR PROMENADE & INTERPRETATION
3 WEIR MAINTENANCE ACCESS
4 EVENT/GATHERING SPACE
5 PAVILION
6 BBQ SHELTER & PICNIC TABLES
7 WEIR VIEWING DECKS
8 ACCESSIBLE PUBLIC TOILETS & WASTE COMPOUND
9 GOGELDRIE BEACH & CANOE LAUNCH
10 ACCESS ROAD & CAR PARKING
11 BOAT TRAILER PARKING
12 WIDENED BOAT RAMP
13 BOAT LAUNCHING PONTOON
14 WALKING TRACKS & CULTURAL HERITAGE INTERPRETATION
15 WATER PARK
16 INFORMAL BMX TRAILS
17 BRIDGE CONNECTING TO MVNP TRAILS
RESERVE ENTRY/EXIT
SIGN
RESERVE PARKING
WALKING TRACK
INFORMAL BMX TRAILS
THE GREEN
VIEWING DECK
PAVILION
WATERPARK
BBQ & PICNIC TABLES
PUBLIC TOILETS (ACCESSIBLE)
BOAT TRAILER PARKING
FISH CLEANING TABLES
PONTOON
BOAT RAMP
STURT CANAL
GOGELDRIE WEIR
MURRUMBIDGEE RIVER
BEACH
THE POINT
N
DRAFT
DRG TITLE: GOGELDRIE WEIR RESERVE CONCEPT MASTER PLAN
JOB NAME: GOGELDRIE WEIR RESERVE
CLIENT: LEETON SHIRE COUNCIL
JOB No: 21.12
DATE: JULY 2021
A2 SCALE: 1:850
INTEGRATED Site Design
DRG No: GWR-01


DRAFT
WALKING TRACK
RESERVE ENTRY/EXIT
SIGN
RESERVE PARKING
WALKING TRACK
MURRUMBIDGEE RIVER
CLEAN OUT UNDERSTOREY BENEATH EXISTING TREE CANOPY
STURT CANAL
THE GREEN
VIEWING DECK
RESERVE PARKING
WALKING TRACK
FISH CLEANING TABLES
BOAT RAMP
BBQ & PICNIC TABLES
PUBLIC TOILETS
BOAT TRAILER PARKING
GOGELDRIE WEIR
VIEWING DECK
WALKING TRACK
BBQ & PICNIC TABLES
MURRUMBIDGEE RIVER
THE POINT
N
PRIMARY UPGRADE WORKS FOR GOGELDRIE WEIR RESERVE :
1 CONSTRUCT WEIR PROMENADE WITH INTERPRETIVE PANELS & LANDSCAPING
2 CONSTRUCT NEW ROADS. CAR PARKING AND TRAILER PARKING
3 INSTALL NEW ACCESSIBLE PUBLIC TOILET AND WASTE COMPOUND
4 INSTALL NEW BBQ SHELTERS & PICNIC TABLES
5 CLEAN UP UNDERSTOREY BELOW ESTABLISHED TREE CANOPY
6 CONSTRUCT WALKING TRACK WITH INTERPRETATION ALONG RIVER FORESHORE
7 CONSTRUCT 2 WEIR VIEWING PLATFORMS
8 INSTALL NEW FISH CLEANING FACILITIES BESIDE BOAT RAMP
9 ESTABLISH TURF COVER. LANDSCAPING. AND TREE PLANTING
DRG TITLE: PRIMARY UPGRADE WORKS FOR GOGELDRIE WEIR RESERVE
JOB NAME: GOGELDRIE WEIR RESERVE
0m 10m 20m 40m 60m 80m 100m
CLIENT: LEETON SHIRE COUNCIL
JOB No. 21.12
DATE: JULY 2021
A2 SCALE: 1:850
INTEGRATED Site Design
PLANNING · DESIGN · MARKETING · MANAGEMENT
DRG No.
GWR-02


DRAFT
WALKING TRACK
RESERVE ENTRY/EXIT
N
SIGN
RESERVE PARKING
INFORMAL BMX TRAILS
WALKING TRACK
MURRUMBIDGEE RIVER
STURT CANAL
THE GREEN
VIEWING DECK
RESERVE PARKING
WALKING TRACK
FISH CLEANING TABLES
PONTOON
PAVILION
WATERPARK
BOAT RAMP
BBQ & PICNIC TABLES
PUBLIC TOILETS
BOAT TRAILER PARKING
GOGELDRIE WEIR
VIEWING DECK
WALKING TRACK
BEACH
BBQ & PICNIC TABLES
PONTOON
PONTOON
MURRUMBIDGEE RIVER
THE POINT
POTENTIAL FUTURE ADDITIONS TO GOGELDRIE WEIR RESERVE
CONSTRUCT BEACH AREA AND PONTOONS
UPGRADE EXISTING BOAT RAMP AND INSTALL PONTOON
ESTABLISH INFORMAL BMX TRAILS BENEATH TREE CANOPY
INSTALL NEW RESERVE PAVILION
INSTALL PUBLIC ACCESS WATER PARK
INSTALL FOOTBRIDGE CONNECTION TO MVNP
DRG TITLE: POTENTIAL FUTURE ADDITIONS TO GOGELDRIE WEIR RESERVE
JOB NAME: GOGELDRIE WEIR RESERVE
0m 10m 20m 40m 60m 80m 100m
CLIENT: LEETON SHIRE COUNCIL
JOB No: 21.12
DATE: JULY 2021
A2 SCALE: 1:850
INTEGRATED Site Design
PLANNING • DESIGN • MARKETING • MANAGEMENT
DRG No
GWR-03


GOGELDRIE WEIR RESERVE
SUSPENSION BRIDGE & TRACK CONNECTING TO NATIONAL PARK TRAILS
GOGELDRIE WEIR
Coonancoocabil cycle/ walking track
Lagoon Loop Trail
River Drive
Kingfisher Bend
Chinamans Bend
Fire Trail
Fire Trail
River Drive
MIA 2
Bradshaws Beach
Fire Trail
River Drive
Forest Drive
Rourke Road
Ski Beach
EUROLEY
Firewood Bend
Uroly Road
BILLENBAH
Innesvale Lane
Beattie Road
N
DRAFT
KEY :
Major Visitor Road
Minor Visitor Road
Dual Major Visitor Road and Cycle / Walking Track
Cycle and/ or Walking Track
Management Road
Council Roads
DRG TITLE: GOGELDRIE WEIR CONNECTION TO MURRUMBIDGEE VALLEY NATIONAL PARK
JOB NAME: GOGELDRIE WEIR RESERVE
CLIENT: LEETON SHIRE COUNCIL
JOB No: 21.12
DATE: JULY 2021
A2 SCALE: N.T.S
INTEGRATED Site Design
DRG No. GWR-04

CONTACT US

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admin@integratedsitedesign.com.au
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DRAFT

Gateway Planning Proposal:

Rezoning and reclassification Lot 49 DP1114977 – 26 Lake Paddock Drive Leeton

October 2019

Prepared by:

Building and Environmental Services Today
26 Goulburn Street
JUNEE NSW 2663

Project Name: **Rezoning and reclassification Lot 49 DP1114977 – 26 Lake Paddock Drive Leeton**

Document Ref No.: **Leeton PP 2019**

Version Control Table:

Version	Date	Comments	Prepared	Reviewed	Authorised
1	29/01/19	Draft issue only for comment	DO/IG	IG	
2	28/06/19	Final	DO	IG	NS
3	11/10/19	Final issue to Council			

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ABN 11 489 259 978

Table of Contents

1. Introduction

Building Environment Services Today (BEST) has been engaged by Leeton Shire Council to assist with the preparation of a Gateway Planning Proposal for an amendment to the *Leeton Local Environmental Plan 2014*. This amendment rezones and reclassifies Council owned land, as operational, being Lot 49 DP 1114977 Lake Paddock Drive Leeton.

2. Background

This Gateway Planning Proposal has been prepared in accordance with:

- *Planning Circular PS 16-005 dated 30 August 2016*
- *A Guide to Preparing Planning Proposals dated August 2016*
- *Planning Circular PN 16-001 Classification and reclassification of public land through a local environmental plan dated 5 October 2016*

Section 1.3 of '*A Guide to Preparing a Planning Proposal dated August 2016'* states:

> *'A planning proposal which is submitted for a Gateway determination must provide enough information to determine whether there is merit in the proposed amendment proceeding to the next stage of the plan making process. The level of detail required in a planning proposal should be proportionate to the complexity of the proposed amendment.*
>
> *The planning proposal should contain enough information to identify relevant environmental, social, economic and other site-specific considerations. The scope for investigating any key issues should be identified in the initial planning proposal that is submitted for a Gateway determination. This would include listing what additional studies the RPA considers necessary to justify the suitability of the proposed LEP amendment. The actual information/investigation may be undertaken after a Gateway determination has been issued and if required by the Gateway determination.'*

This proposal has also been prepared having regard to current updated planning practice associated with the development of the Local Environmental Plan (LEP) Standard Instrument. This Gateway Planning Proposal provides sufficient information to support the proposed amendment to the *Leeton Local Environmental Plan 2014*.

All planning proposals classifying or reclassifying public land must address the matters contained in *Planning Circular PN 16-001 Classification and reclassification of public land through a local environmental plan dated 5 October 2016 - Attachment 1 Checklist for proposals to classify or reclassify public land through an LEP* for Gateway consideration.

The following table highlights where these matters are addressed within this report.

Table 1 – Matters for consideration reclassification of Lot 49

Matter for Consideration	*Response*
the current and proposed classification of the land	**See Section 3**
whether the land is a 'public reserve' (defined in the LG Act)	**See Section 3**
the strategic and site specific merits of the reclassification and evidence to support this	**See Section 3**
whether the planning proposal is the result of a strategic study or report	**See Section 6**
whether the planning proposal is consistent with council's community plan or other local strategic plan	**See Section 6**
a summary of council's interests in the land, including: • how and when the land was first acquired (e.g. was it dedicated, donated, provided as part of a subdivision for public open space or other purpose, or a developer contribution) • if council does not own the land, the land owner's consent • the nature of any trusts, dedications etc	**See Section 3**
whether an interest in land is proposed to be discharged, and if so, an explanation of the reasons why	**See Section 3**
the effect of the reclassification (including, the loss of public open space, the land ceases to be a public reserve or particular interests will be discharged)	**See Section 3**
evidence of public reserve status or relevant interests, or lack thereof applying to the land (e.g. electronic title searches, notice in a Government Gazette, trust documents)	**See Attachment 1**
current use(s) of the land, and whether uses are authorised or unauthorised	**See Section 3**
current or proposed lease or agreements applying to the land, together with their duration, terms and controls	**See Section 3**
current or proposed business dealings (e.g. agreement for the sale or lease of the land, the basic details of any such agreement and if relevant, when council intends to realise its asset, either immediately after rezoning/reclassification or at a later time)	**See Section 3**
any rezoning associated with the reclassification (if yes, need to demonstrate consistency with an endorsed Plan of Management or strategy)	**See Section 3**
how council may or will benefit financially, and how these funds will be used	**See Section 3**
how council will ensure funds remain available to fund proposed open space sites or improvements referred to in justifying the reclassification, if relevant to the proposal	**See Section 3**
a Land Reclassification (part lots) Map, in accordance with any standard technical requirements for spatial datasets and maps, if land to be reclassified does not apply to the whole lot	**N/A**
Preliminary comments by a relevant government agency, including an agency that dedicated the land to council, if applicable.	**N/A**

3. Planning Proposal Context

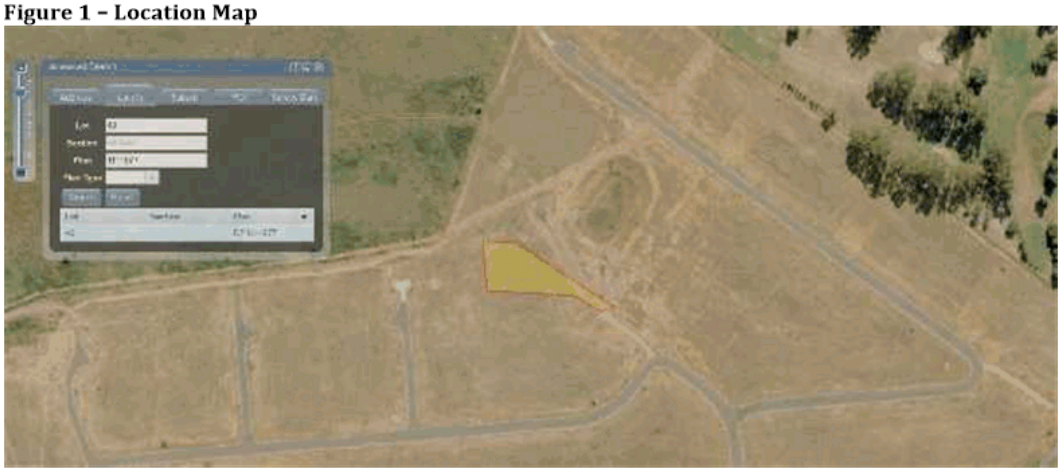
The objective of the planning proposal is to rezone Lot 49 DP 1114977 from RE1 Public Recreation to Zone R2 Low Density Residential and reclassify the land from Community Land to Operational Land.

The reclassification of Lot 49 will also remove the public reserve status applying to the land.

3.1 Site location

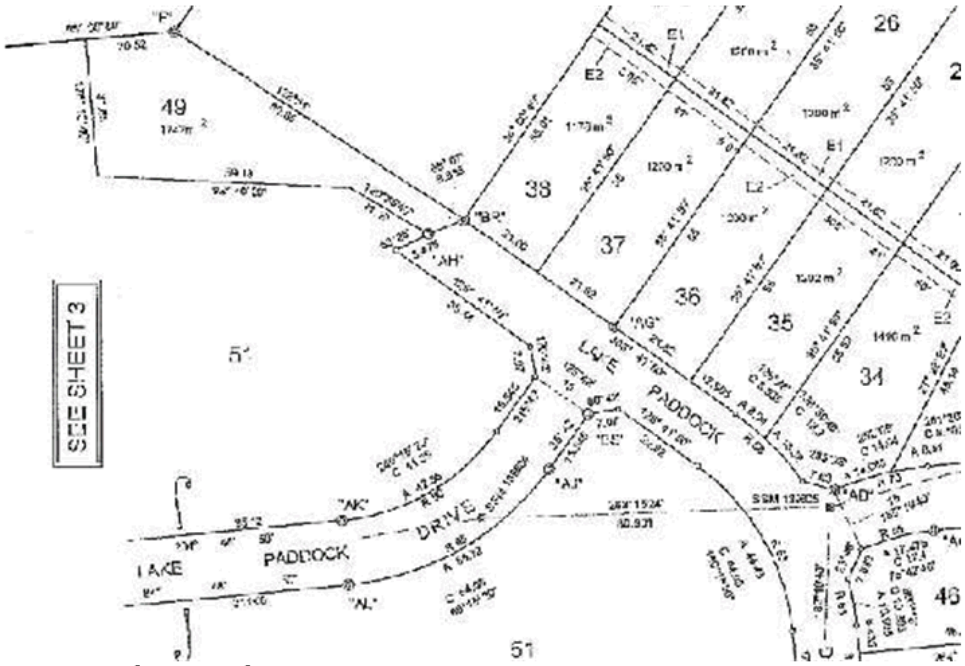
Lot 49 DP 1114977 is located at the north-western end of Lake Paddock Drive to the south of Leeton Township. Lot 49 DP 1114977 was dedicated to Council as public reserve as part of a residential subdivision approved by Council in 2007. Lot 49 has an area of 1742m2. A copy of a Title Search for Lot 49 DP 1114977 is included in **Attachment 1.**

Figure 1 – Location Map



Source: SIX maps 2018

Figure 2 – Extract of Subdivision Plan DP 1114977



Source: Leeton Shire Council 2018

3.2 Site context

Lot 49 DP 1114977 is currently vacant land and has been undeveloped for any public open space purposes. The land is located behind residential development. The general arrangement and features of the land are evident in the following site photos.

Photo 1 – View north east from Lot 49 to existing houses adjoining Golf Club Drive

Photo 2 – View south from Lot 49 to residential development Lake Paddock Drive

Photo 3 – View south from Lot 49 to existing houses on Lake Paddock Drive

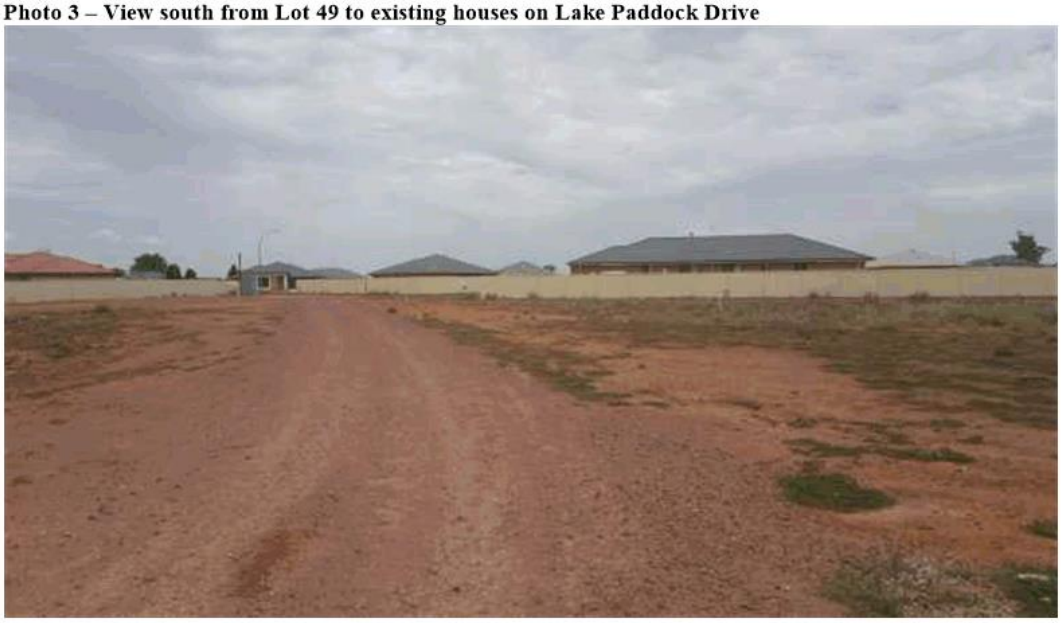


Photo 4 – View south east from Lot 49 to adjoining residential development

Photo 5 – View south east from Lot 49 to adjoining residential development

Photo 6 – View north-west from Lot 49 toward Leeton Township

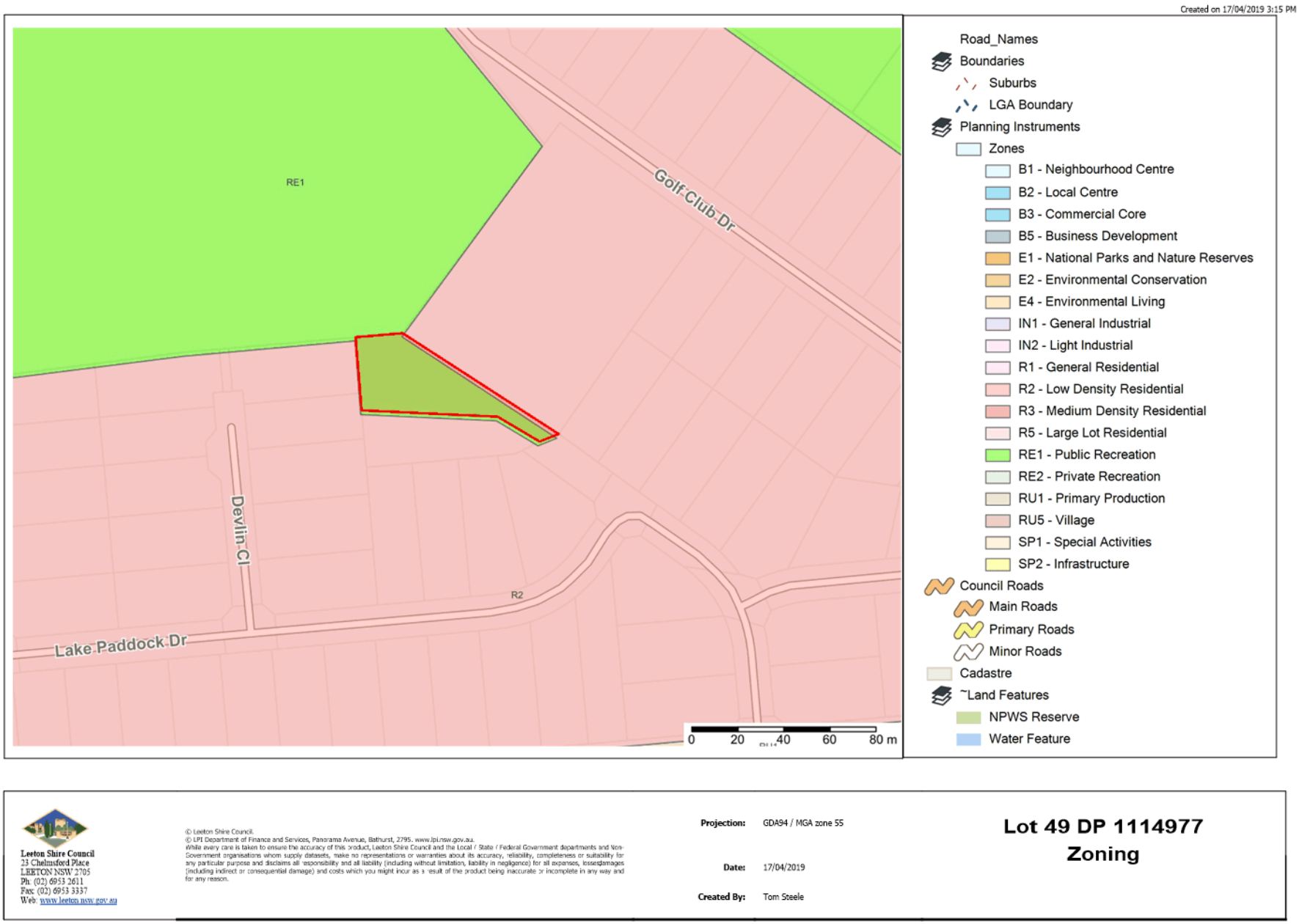
Photo 7 – View west from Lot 49 toward Leeton Township

Photo 8 – View north east from Lot 49 to existing residential development adjoining Golf Club Drive

3.3 Zoning and site constraints

Lot 49 DP 1114977 is zoned RE1 Public Recreation as identified in **Figure 3**.

Figure 3 – Extract of Zoning Map – Lot 49 DP 1114977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RE1
Golf Club Dr
Devlin Cl
R2
Lake Paddock Dr
0 20 40 60 80 m
Road_Names
Boundaries
Suburbs
LGA Boundary
Planning Instruments
Zones
B1 - Neighbourhood Centre
B2 - Local Centre
B3 - Commercial Core
B5 - Business Development
E1 - National Parks and Nature Reserves
E2 - Environmental Conservation
E4 - Environmental Living
IN1 - General Industrial
IN2 - Light Industrial
R1 - General Residential
R2 - Low Density Residential
R3 - Medium Density Residential
R5 - Large Lot Residential
RE1 - Public Recreation
RE2 - Private Recreation
RU1 - Primary Production
RU5 - Village
SP1 - Special Activities
SP2 - Infrastructure
Council Roads
Main Roads
Primary Roads
Minor Roads
Cadastre
~Land Features
NPWS Reserve
Water Feature
Leeton Shire Council
23 Chelmsford Place
LEETON NSW 2705
Ph: (02) 6953 2611
Fax: (02) 6953 3337
Web: www.leeton.nsw.gov.au
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Projection: GDA94 / MGA zone 55
Date: 17/04/2019
Created By: Tom Steele
Lot 49 DP 1114977
Zoning

3.4 Relationship to adjoining land

Lot 49 DP 1114977 is part of an undeveloped open space area that extends from Lake Paddock Drive along Golf Club Drive to Racecourse Road. The Leeton Racecourse and Showground are generally located to the north.

Figure 4 – Locality aerial photograph

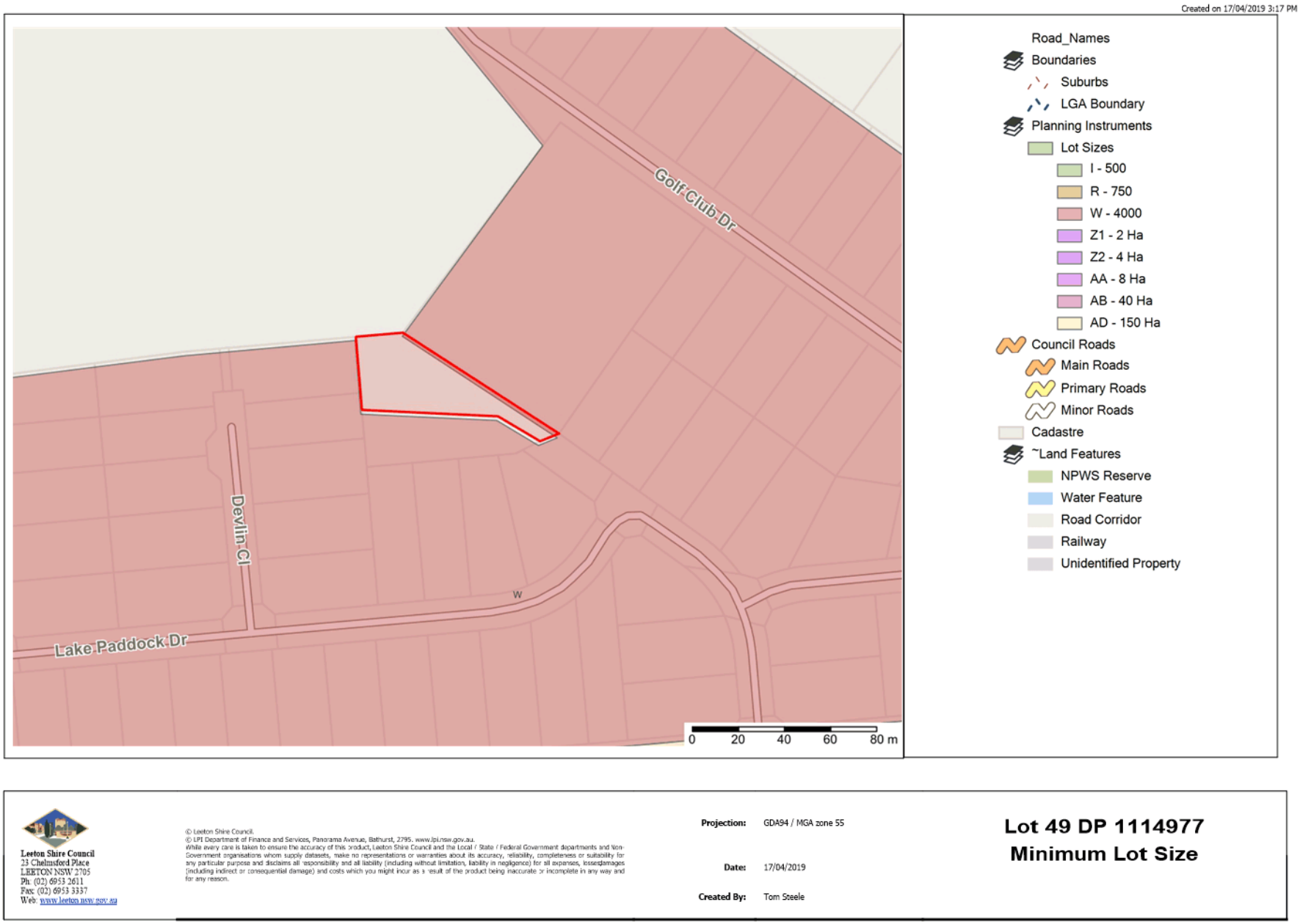
Source – Google Maps 2019

3.5 Development on adjoining land

Lot 49 DP 1114977 forms part of a larger area of zoned open space to the north and is bounded by low density residential development to the east, west and south.

Figure 5, 6 and 7 identify the lot size, height and floor space ratio provisions on adjoining land. These would be applied to Lot 49 as part of the rezoning process to ensure consistency with planning outcomes in the immediate locality.

Figure 5 – Extract of Minimum Lot Size Map – Lot 49 DP 1114977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Golf Club Dr
Devlin Cl
Lake Paddock Dr
W
0 20 40 60 80 m
Road_Names
Boundaries
Suburbs
LGA Boundary
Planning Instruments
Lot Sizes
I - 500
R - 750
W - 4000
Z1 - 2 Ha
Z2 - 4 Ha
AA - 8 Ha
AB - 40 Ha
AD - 150 Ha
Council Roads
Main Roads
Primary Roads
Minor Roads
Cadastre
~Land Features
NPWS Reserve
Water Feature
Road Corridor
Railway
Unidentified Property
Leeton Shire Council
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Fax: (02) 6953 3337
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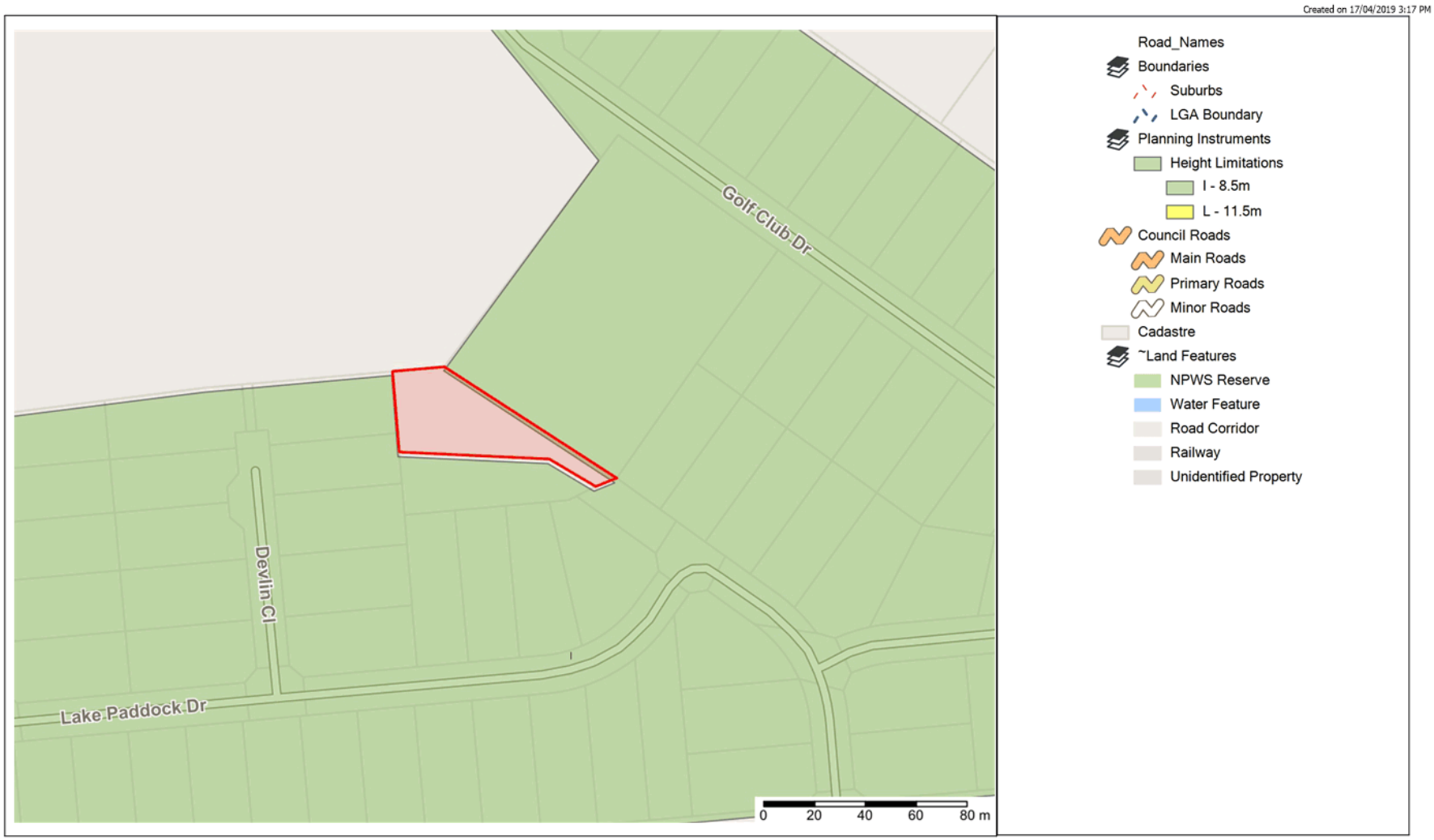
Projection: GDA94 / MGA zone 55
Date: 17/04/2019
Created By: Tom Steele
Lot 49 DP 1114977
Minimum Lot Size

Figure 6 – Extract of Building Heights Map – Lot 49 DP 1114977



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Web: www.leeton.nsw.gov.au

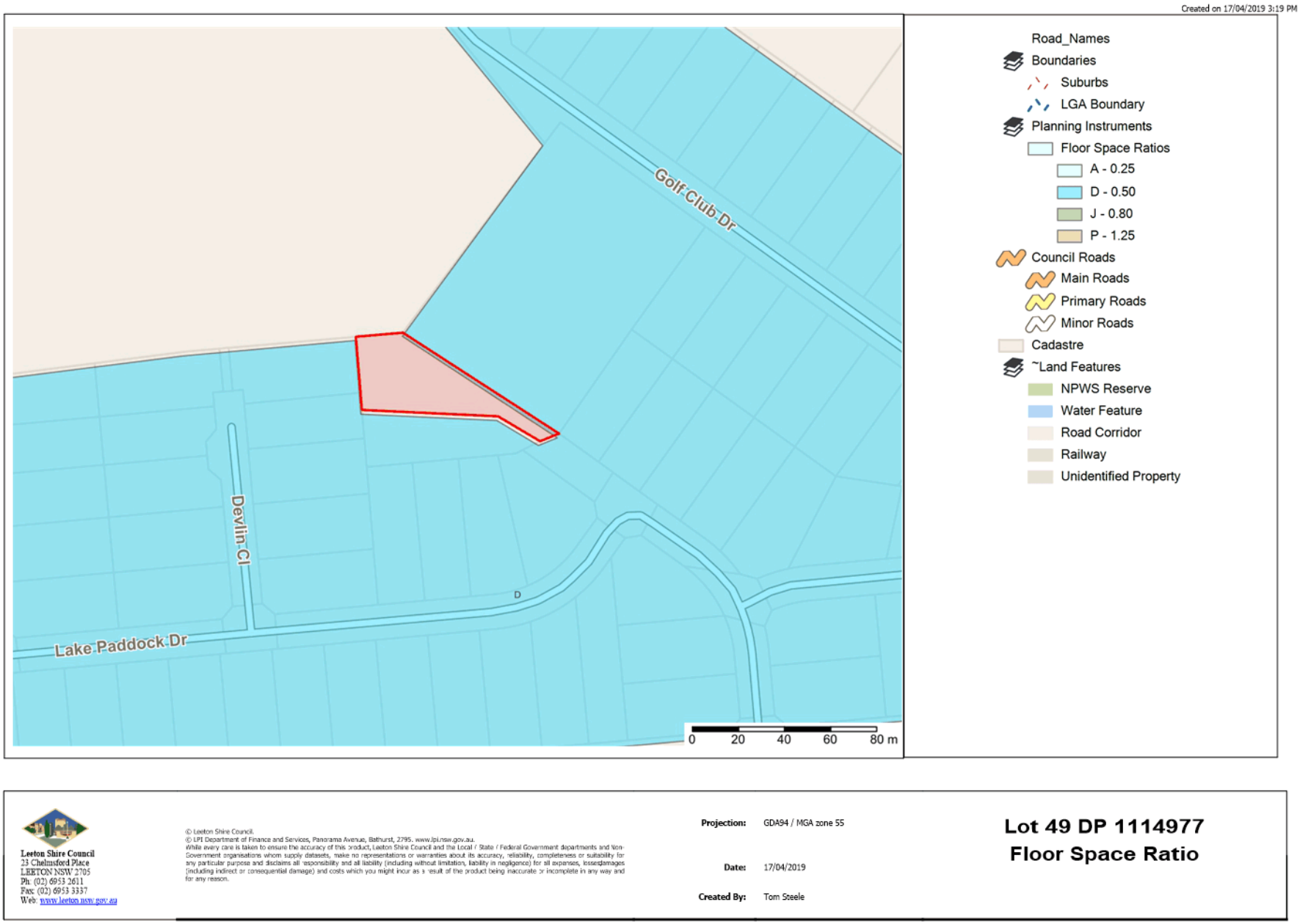
Projection: GDA94 / MGA zone 55

Date: 17/04/2019

Created By: Tom Steele

Lot 49 DP 1114977

Figure 7 – Extract of Floor Space Ratio Map – Lot 49 DP 1114977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Devlin Cl
Lake Paddock Dr
D
0 20 40 60 80 m
Road_Names
Boundaries
Suburbs
LGA Boundary
Planning Instruments
Floor Space Ratios
A - 0.25
D - 0.50
J - 0.80
P - 1.25
Council Roads
Main Roads
Primary Roads
Minor Roads
Cadastre
~Land Features
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Projection: GDA94 / MGA zone 55
Date: 17/04/2019
Created By: Tom Steele
Lot 49 DP 1114977
Floor Space Ratio

3.6 Classification of the land

Lot 49 DP 1114977 is classified as Community Land under the *Local Government Act 1993*.

Under the *Local Government Act 1993 (LG Act)*:

- all land vested in (including land owned in fee simple) or under the control of a council is deemed to be public land (LG Act, Dictionary)
- all public land must be classified as either "Community" or "Operational" land (s25 and s26 LG Act).

The main effect of classification is to restrict the alienation and use of the land.

Classification as "Community" reflects the importance of the land to the community because of its use or special features. Generally, it is land intended for public access and use, or where other restrictions applying to the land create some obligation to maintain public access (such as a trust deed, or dedication under section 94 of the Environmental Planning and Assessment Act 1979). Community land:

- cannot be sold (s45 LG Act)
- cannot be leased, licenced or any other estate granted over the land for more than 21 years (without Ministerial consent) (s47 LG Act)
- must have a plan of management prepared for it (s35 LG Act).

Community land would ordinarily comprise land such as a public park, sportsground or bushland.

In contrast, "Operational" land has no special restrictions other than those that may ordinarily apply to any parcel of land.

Operational land is unfettered land. Operational land would ordinarily comprise land that facilitates the carrying out by a council of its functions or land which may not be open to the general public, such as council offices, a works depot, sewer or water pump station or a council quarry. It also includes land held by Council as a temporary asset or as an investment.

Council resolved on the 22 August 2018 to reclassify Lot 49 as Operational Land.

This reclassification is now to be incorporated into the Planning Proposal to rezone Lot 49.

3.6 Purpose of the reclassification

As identified in the Council report dated 22 August 2018 **(Attachment 2)** the reclassification of the land is to facilitate the rezoning and sale of the land as a residential lot.

3.7 Council interests in the land

Lot 49 is within a residential housing estate that Council granted conditional consent to on 5 February 2002. This approval required the developer to make contributions of $82,943.05 towards the provision of recreation and open space.

Council reviewed this condition upon request from the developer on 26 May 2006 and resolved to *"reduce the recreation and open space contribution to $34,943.05 and accept the dedication of 6,000m^2 of land within the development"*.

As a result of this resolution Lot 49 was dedicated as public reserve land as part of the recreation and open space area within this estate. The land was classified by Council as Community Land.

Council does not have any business dealings with the land.

There are no agreements or leases known to Council that involve or are attached to this land.

3.8 Impacts of the reclassification and rezoning

Council currently owns an adjacent lot (Lot 48) which is 8,828m^2 in area.

In planning the development and provision of the recreation needs of the residential estate Council has determined that Lot 48 has sufficient area to provide the expected facilities and does not now need the further 1,742 m^2 in Lot 49.

The opportunity to develop Lot 48 for open space purposes would be as a direct result of the reclassification and rezoning.

3.9 Financial implications

Council intends to re-allocate the financial resources received from the sale of Lot 49 to development Lot 48 including the purchase of recreational equipment for the development of a playground facility.

4. Part 1- Statement of objectives and intended outcomes

The objective of the planning proposal is to rezone Lot 49 DP 1114977 from Zone RE1 Public Recreation to Zone R2 Low Density Residential. The planning proposal also seeks to reclassify Lot 49 from Community Land to Operational Land under the *Local Government Act 1993.*

5. Part 2- Explanation of provisions

The proposed outcome will be achieved by the following amendments to the *Leeton Local Environmental Plan 2014*:

1. **Amending Map LZN 014F** by altering the zoning applying to Lot 49 from RE1 Public Recreation to Zone R2 Low Density Residential

2. **Amending Map LSZ 014F** and applying a minimum lot size to Lot 49 of 4000m2

3. **Amending Map HOB 014F** and applying a maximum building height to Lot 49 of 8.5m

4. **Amending Map FSR 014F** and applying a maximum floor space ration to Lot 49 of 0.5:1

5. **Inserting into Part 2 of Schedule 4** the real property description of Lot 49 with changes to the vested interests of the land by removing the public reserve status of the land

6. Part 3 - Justification

Section A – Need for the Planning Proposal

Is the planning proposal a result of any strategic study or report?

The following provides strategic context and the rationale associated with the proposed changes under this Planning Proposal.

The Council report and resolution to prepare this Planning Proposal is included in **Attachment 2**.

Draft Open Space for Recreation Guide- Government Architect NSW (2018)

Leeton Shire Council has no formal Council wide open space strategy.

Prepared by Government Architect NSW in 2018, this guide provides a useful tool with benchmarks to assess the suitability of retaining Lot 49 as open space land.

This includes assessing the value of Lot 49 against the performance based approach to open space planning. This performance based approach examines the option for Lot 49 to provide opportunities for outdoor recreation in the relevant urban setting contained in the guide.

Table 2 examines the potential use of Lot 49 against the key performance criteria in the guide for evaluating the suitability of the land for open space and recreation.

Table 2 Performance criteria – using open space for recreation (refer pg 10 Draft Guide)

Performance Criteria	Relevant indicator	Suitability of Lot 49
Accessibility and connectivity Ease of access is critical for the community to enjoy and use public open space and recreation facilities	An integrated network of open-space connections is key: • for a medium- to low-density neighbourhood: 5 minute walk / 400 m walking distance to a local, district, or regional park • 25 minute walk / 2 km proximity to any district park • up to 30 minutes travel time on public transport or by vehicle to regional open space.	Lot 49 forms part of a larger open space network. Other local district and regional parks are within 400m of the existing residential development in this locality
Distribution The ability of residents to gain access to public open space within an easy walk from home, workplaces, and schools is an important factor for quality of life. The geographic distribution of open space is a key access and equity issue for the community.	Distance of open space from houses by size: • Regional open spaces (> 5 ha) 5–10 km • District open spaces (2–5 ha) 2 km • Local open space(0.5–2 ha) 400 m • Distance of open space from workplaces 400 m • Distance of open space from schools 400 m	Lot 49 has an area of 1742m2. This is well below local open space standards. Access to district and regional open space areas are within 400m to 2km from residential areas
Size and shape Size and shape of open space has a direct bearing on the capacity of that open space to meet and accommodate a range of recreation activities and needs.	Desirable minimum size of a local park is 3000 m. Road frontage and visibility are key considerations. Sporting facilities also have specific size and shape requirements that need to be met to provide functional space for their use.	Lot 49 has an area of 1742m2. This is well below local open space standards. Due to the narrow frontage to a public road and narrow access, the land is considered poorly shaped for the purpose of public use
Quantity In high-density areas, good provision of public open space is essential to compensate for the lack of private open space to support active living and contribute to a more liveable	Quantity should be considered in the number of opportunities available. Larger public open space areas mean more opportunities can be provided in one location. Quantity of land available, along with size and shape, are critical in adequately meeting sporting needs. There are minimum areas needed for different sporting outcomes.	There are a number of recreational opportunities in the immediate surrounding area with direct access to the areas of open space to the north of the existing residential precinct

Performance Criteria	Relevant indicator	Suitability of Lot 49
neighbourhood		
Quality The quality of park embellishment and ongoing maintenance and management is critical to attracting use and activation of the open space network.	Key characteristics of open space that influence quality include: • visual and physical access • landscape setting • condition of facilities and equipment • maintenance • number of activations within the space • size, shape, and topography • adjacent land uses • amount of vegetation • biodiversity outcomes.	Lot 49 is undeveloped open space. The land forms part of the existing open space landscape setting visible from Golf Club Drive. The land is visible from the end of Lake Paddock Drive. There are no activations in the immediate area.
Diversity The range of open space setting types within a given area will determine the diversity of recreation opportunity for a community.	Outdoor recreation opportunities are categorised as: • local play for the very young • local children's play • older children's activity space • youth recreation space • local recreation space • active recreation space • large community outdoor recreation area • fitness and exercise space • trail and path-based recreation • organised sport and recreation • off-leash dog exercise area	Lot 49 does not meet the criteria for outdoor recreation opportunities due to location, size and shape.

Is the planning proposal the best means of achieving the objectives or intended outcomes, or is there a better way?

The proposed planning proposal is the best means of achieving the objectives and intended outcomes.

Section B – Relationship to strategic planning framework.

Is the planning proposal consistent with the objectives and actions of the applicable regional, sub-regional or district plan or strategy (including any exhibited draft plans or strategies)?

The Riverina Murray Regional Plan 2036

The *Riverina Murray Regional Plan 2036* is a 20-year blueprint for the future of the Riverina Murray, approved by the Department of Planning and Environment in 2017. The Riverina Murray region consists of 20 local government areas: Albury, Berrigan, Bland, Carrathool, Coolamon, Cootamundra-Gundagai, Edward River, Federation, Greater Hume, Griffith, Hay, Junee, ***Leeton,*** Lockhart, Murray River, Murrumbidgee, Narrandera, Snowy Valleys, Temora and Wagga Wagga.

The *Riverina Murray Regional Plan 2036* identifies that the Riverina Murray region in 2036 will be a diversified economy founded on Australia's food bowl, iconic waterways, a strong network of vibrant and connected communities and with its population expected to increase by 11,150 people.

In terms of Leeton's contribution to this population increase for the Riverina Murray region, the 2016 census shows that Leeton's population to be 11,168, up 1.2% from 11,037 in 2011. Leeton Shire Council's Economic Development, Tourism and Events strategic plan titled *'Envisage 2024, Going for Growth'* indicates the population to reach 12,528 by 2036, an increase of 12.1% from 2016. It also forecasts the age structure in Leeton Shire up until 2026 will see an 11.7% increase in population under the working age and a 26.3% increase in population at retirement age.

The *Riverina Murray Regional Plan 2036* identifies that:

> *'Agriculture is integral to the success of the economy and a major force in the State. The Riverina Murray makes the largest regional contribution to agricultural production in NSW ($1.4 billion). Agricultural productivity, combined with the region's strategic locational advantages and value-added manufacturing capabilities, make for an exciting future for this region.'*

Leeton plays an important role in the regions agricultural economic success. The plan's narrative for the Leeton local government area is as follows:

> *'Leeton's economy is primarily driven by agriculture, with citrus, rice, grapes and wheat important commodities. The shire is home to the Sunrice Headquarters, Berri Juices,*

Swift Beef Cattle Feedlot, Freedom Foods and Murrumbidgee Irrigation, and is an important education centre for the Riverina Murray region.'

The Plan has four (4) main goals for the region:

1. *A growing and diverse economy*
2. *A healthy environment with pristine waterways*
3. *Efficient transport and infrastructure networks*
4. *Strong, connected and healthy communities*

Goal 4. Strong, connected and healthy communities, is directly applicable to this planning proposal. Specifically, within goal 4; the proposal is consistent with the following directions and its applicable actions:

- *Direction 25 – building housing capacity to meet demand,* and
- *Direction 26 – provide greater Housing Choice.*

Direction 25 states:

'Housing in the region has historically been characterised by single detached dwellings, with some larger residential lots and rural lifestyle options. As the population grows and changes, there will be demand for new housing and a greater variety of housing. Making more housing available in existing urban areas will be more sustainable because it takes advantage of existing infrastructure and services.'

Actions from this direction applicable to the proposal are:

25.2 – Facilitate increased housing choice, including townhouses, villas and apartments in regional cities and locations close to existing services and jobs.

Direction 26 states:

'Greater housing choice is needed to cater for changing household size, particularly a rise in the number of single person households and a decrease in the number of occupants in each household, the needs of tourists and an ageing population. More studio, one-and two-bedroom homes, and smaller homes that have good access to infrastructure and services will be needed.'

'The region experiences a large influx of seasonal workers to support agribusiness industries, including wine, orchard fruit (including citrus and nuts) and cotton and berry industries, particularly during harvest periods. An adequate range of accommodation, or capacity within existing options, needs to be provided to meet the future needs of seasonal workers.'

Actions from this direction applicable to the proposal are:

26.7 Promote incentives to encourage greater housing affordability, including a greater mix of housing in new release areas.

This Planning Proposal supports the objectives, actions, desired outcomes, economic drivers and future growth directions detailed in the *Riverina Murray Regional Plan 2036* across the Leeton LGA by:

- increasing the available stock of vacant residential land in an appropriate location; and
- providing greater housing choice within an existing residential area

Is the planning proposal consistent with a council's local strategy or other local strategic plan?

Relevant Local Strategies

Council has prepared a Strategic Community Plan entitled *Leeton on the Go, Our Community Strategic Plan – Toward 2030*.

The current Planning Proposal is consistent with Leeton Shire Community Vision in that Plan being:

> *'To enjoy outstanding lifestyles and prosperous livelihoods within a caring and inclusive community and a healthy environment.'*

Specifically, the Planning Proposal is considered to be consistent with the following key theme of that Plan:

- *Theme 1 - A Healthy and Caring Community* – Specifically its sub-theme *'A community that enjoys good housing.'* This sub-theme addresses the community's aspirations for housing types, availability and affordability and where housing opportunities will be available in ten years' time. The planning proposal is consistent with the 'How can we do this' actions of the theme which are:

  - *By identifying land that might be good for building more houses, including special housing types like elderly, youth, lower income and backpacker places and making sure there is enough transport available for their needs.*
  - *By promoting house builds that foster health and wellbeing and long-term affordability.*
  - *By promoting Leeton as an attractive location for housing development.*

Is the planning proposal consistent with applicable State Environmental Planning Policies?

The Planning Proposal is generally consistent with all applicable SEPPs **(Refer Attachment 3)**.

Is the planning proposal consistent with applicable Ministerial Directions (s.117 directions)?

The Planning Proposal is generally consistent with Ministerial Directions under Section 117(2) **(Refer Attachment 3)** The Planning Proposal does not impact identified flood liable or bushfire prone lands.

Any variations to these Directions **are considered to be of minor significance**.

Section C – Environmental, social and economic impact

Is there any likelihood that critical habitat or threatened species, populations or ecological communities, or their habitats, will be adversely affected as a result of the proposal?

The proposed changes will not impact on critical habitats. The land to which this planning proposal relates is not identified as critical habitat.

Are there any other likely environmental effects as a result of the planning proposal and how are they proposed to be managed?

There are no other likely environmental effects as a result of the Planning Proposal.

Has the planning proposal adequately addressed any social and economic effects?

The planning proposal is considered to have a positive effect on the local community and economy. The social effects of the development of open space land to service the immediate surrounding population will result in a positive outcome.

The planning proposal will:

- facilitate the development and enhancement of open space within an existing residential area
- provide direct social benefits to the local community
- enhance the development of open space land that is currently undeveloped and detracts from the amenity of the surrounding residential area

The planning proposal will indirectly:

- increase the available stock of vacant residential land
- providing greater housing choice within an existing residential area; and
- create opportunities to support the development of a suitable open space network for Leeton

Section D – State and Commonwealth interests

Is there adequate public infrastructure for the planning proposal?

There are no significant public infrastructure impacts associated with the Planning Proposal. Notwithstanding, Council has contribution plan pursuant to the previous section 94A of the *Environmental Planning and Assessment Act 1979* and a contribution plan pursuant to Section 64 of the *Local Government Act 1993* to facilitate the recoupment of cost associated with any public infrastructure works or upgrades which may be required.

The section 94A plan applies across the Leeton local government area and contributions will apply to all developments within Zone R2 Low Density Residential to which this proposal seeks to be permitted which are valued over $100,000.00. The plan assists Council in provision of appropriate public facilities which are required to maintain and enhance amenity and service delivery within the area.

Council's section 64 plan applies across Zone R2 Low Density Residential and enables Council to levy contributions in relation to development proposals where the anticipated development will or is likely to increase the demand for public facilities or infrastructure.

What are the views of State and Commonwealth public authorities consulted in accordance with the Gateway determination?

Relevant State Government agencies will be consulted in accordance with requirements of any future Gateway determination issued by the Department of Planning and Environment. The Department of Planning and Environment were also consulted prior to the preparation of the resolution for Council to proceed with this Planning Proposal.

There are no Commonwealth public authorities considered to be directly impacted by the Planning Proposal.

7. Part 4 – Maps

The planning proposal will require alterations to the *Leeton Local Environmental Plan 2014* maps.

Attachment 4 contains the alterations to mapping from the *Leeton Local Environmental Plan 2014*

8. Part 5 – Community consultation

Wider community consultation will be commenced by giving notice of the public exhibition of the Planning Proposal:

- in a newspaper that circulates in the area affected by the Planning Proposal i.e. The Leeton Irrigator, and
- on the web-site of the Leeton Shire Council

The written notice will:

- give a brief description of the objectives or intended outcomes of the Planning Proposal
- indicate the land affected by the Planning Proposal
- state where and when the Planning Proposal can be inspected
- give the name and address of the RPA for the receipt of submissions
- indicate the closing date for submissions.

During the exhibition period, the following material will be made available for inspection:

- the Planning Proposal, in the form approved for community consultation by the Director General of Planning
- the Gateway Determination
- any studies relied upon by the Planning Proposal.

The initial gateway determination will confirm the public consultation that must be undertaken in relation to the Planning Proposal. If the gateway determination specifies different consultation requirement this part of the proposal will be revised to reflect the terms of the gateway determination.

In the interest of keeping communication open from the outset, key stakeholders will be identified and contacted directly to ensure that they are aware of the Planning Proposal and are given the opportunity to communicate their concerns and ideas in regard to the development.

9. Part 6 – Project Timeline

Table 1: Project Timeline

Task	Anticipated Timeframe
Commencement date (date of Gateway determination)	4 weeks
Completion of required technical information	1 week
Government agency consultation (pre and post exhibition as required by Gateway determination)	3 weeks
Commencement and completion dates for public exhibition period	4 weeks
Dates for public hearing (required)	N/A
Consideration of submissions	2 weeks
Consideration of a proposal post exhibition	2 weeks
Date of submission to the Department to finalise the LEP	1 week
Anticipated date RPA will make the plan (if delegated)	TBD
Anticipated date RPA will forward to the Department for notification.	TBD

Attachment 1 Title search details – Lot 49 DP 1114977

LAND REGISTRY SERVICES **Title Search** InfoTrack

NEW SOUTH WALES LAND REGISTRY SERVICES - TITLE SEARCH

FOLIO: 49/1114977

SEARCH DATE	TIME	EDITION NO	DATE
31/7/2018	4:34 PM	1	20/8/2007

LAND

LOT 49 IN DEPOSITED PLAN 1114977
AT LEETON
LOCAL GOVERNMENT AREA LEETON
PARISH OF YARANGERY COUNTY OF COOPER
TITLE DIAGRAM DP1114977

FIRST SCHEDULE

LEETON SHIRE COUNCIL

SECOND SCHEDULE (4 NOTIFICATIONS)

1 LAND EXCLUDES MINERALS AND IS SUBJECT TO RESERVATIONS AND CONDITIONS IN FAVOUR OF THE CROWN - SEE MEMORANDUM S700000A
2 EASEMENT TO FLOOD AFFECTING THE WHOLE OF THE LAND ABOVE DESRIBED - SEE GOV. GAZ. 23-7-1948 FOL. 1835 & 1836 AND BK.2070 NO.905
3 THE LAND WITHIN DESCRIBED IS PUBLIC RESERVE
4 DP1114977 RESTRICTION(S) ON THE USE OF LAND

NOTATIONS

UNREGISTERED DEALINGS: NIL

*** END OF SEARCH ***

Golf Club Drive PRINTED ON 31/7/2018

Attachment 2 Council report and resolution to prepare Planning Proposal

ITEM 8.11 RECLASSIFICATION OF LAND AS OPERATIONAL - GOLF COURSE ESTATE

RECORD NUMBER	18/334
RELATED FILE NUMBER	EF16/17
AUTHOR/S	Manager Planning, Building and Health
APPROVER/S	Interim Director Environment and Engineering

SUMMARY/PURPOSE

The purpose of this report is to seek a Council resolution to reclassify an area of Council owned land from Community Land to Operational land within the Golf Course Estate.

RECOMMENDATION

THAT Council:

1. Resolves to initiate the process to reclassify Lot 49 in DP 1114977, 26 Lake Paddock Drive, Golf Course Estate, from Community Land to Operational Land under Section 32 of the Local Government Act 1993, as Council is satisfied that this land is unsuitable for the purpose of recreation and open space due to its size and shape.

2. Commence public notice of its intention to reclassify Lot 49 in DP 1114977 from Community Land to Operational Land for a period of 28 days.

3. Consider a further report at the completion of the public notification period seeking a formal resolution to reclassify Lot 49 in DP 1114977 from Community Land to Operational Land under Section 32 of the Local Government Act 1993.

REPORT

(a) Background

On 5 February 2002 Council granted development consent for a 103 lot residential subdivision in McQuillan Road, subject to conditions including the requirement to pay a total of $82,943.05 as a contribution for the provision of Recreation and Open Space.

Upon a request from the developer, Council then reviewed this contribution on 26 May 2004 to *"reduce the Recreation and Open Space Contribution to $34,943.05 for Development Application 192/2001 and accept the dedication of 6,000m² of open space"*.

In effect this resulted in Council having a total area of 10,570m², divided between Lot 48 (detention basin with an area of 8,828m²) and Lot 49 (26 Lake Paddock Drive residential lot with an area of 1,742m²).

(b) Discussion

Council has allocated $25,000 in the current 2018/2019 Operation Plan for preliminary landscaping works in readiness for the establishment of a playground in 2019/2020 as specified in the Playground Strategy.

The initial design considerations for this area have realised that the total combined area of Lots 48 and 49 is excessive to requirements.

It is considered that there is an opportunity to realise the asset value of Lot 49 for resale as a residential allotment with the proceeds being directed to the future development of the playground on Lot 48.

In accordance with Section 32 of the Local Government:

1. *A council may resolve that land dedicated in accordance with a condition imposed under section 94 of the Environmental Planning and Assessment Act 1979 is to be reclassified as operational land.*

2. *A council may make such a resolution only if it is satisfied that the land has been found to be unsuitable for the provision, extension or augmentation of public amenities and public services because of any one or more of the following*

    - *size of the land*
    - *shape of the land*
    - *topography of the land*
    - *location of the land*
    - *difficulty of providing public access to the land.*

3. *The council must specify in the resolution the grounds on which it is satisfied the land is unsuitable.*

4. *Before making the resolution, the council must give public notice of the resolution. The public notice must specify a period of not less than 28 days during which submissions may be made to the council.*

5. *The net proceeds of sale by a council of any land dedicated in accordance with a condition imposed under section 94 of the Environmental Planning and Assessment Act 1979 must be dealt with under that section as if those net proceeds were a monetary contribution paid instead of the dedication.*

In this instance it is considered that the size, shape and location of Lot 49 makes it unsuitable for its development as a recreation or open space facility and should Council resolve to reclassify it to operational, the intention would then be to offer it for sale as a residential allotment and the proceeds be allocated to the establishment of a recreational and open space facility on Lot 48.

(c) Options

Council would have the following options:

1. Resolve not to reclassify Lot 49. This would mean that it would need to continue to maintain the site as it is unsuitable for future development as a recreational and open space site.

2. Resolve to reclassify Lot 49 and use the proceeds of the eventual sale to augment the future development of Lot 48 as a recreational and open space site.

IMPLICATIONS TO BE ADDRESSED

(a) Financial

Should the sale of the land proceed the funds realised would augment the future development of Lot 48 and offset the associated costs such as planning reports and legal and conveyancing costs.

Should Council resolve not to reclassify the land it will continue to accrue costs associated with its ongoing maintenance.

(b) Policy

Nil

(c) Legislative/Statutory

Council will need to comply with section 32 of the Local Government Act 1993.

(d) Risk

Nil

CONSULTATION

(a) External

Nil at this stage. Council will need to consult with the community before formerly resolving the reclassification and sale of Lot 49.

(b) Internal

Manager Open Space & Recreation
Manager Engineering
Manager Planning Building and Health
Contract Property Co-ordinator and Native Title Manager

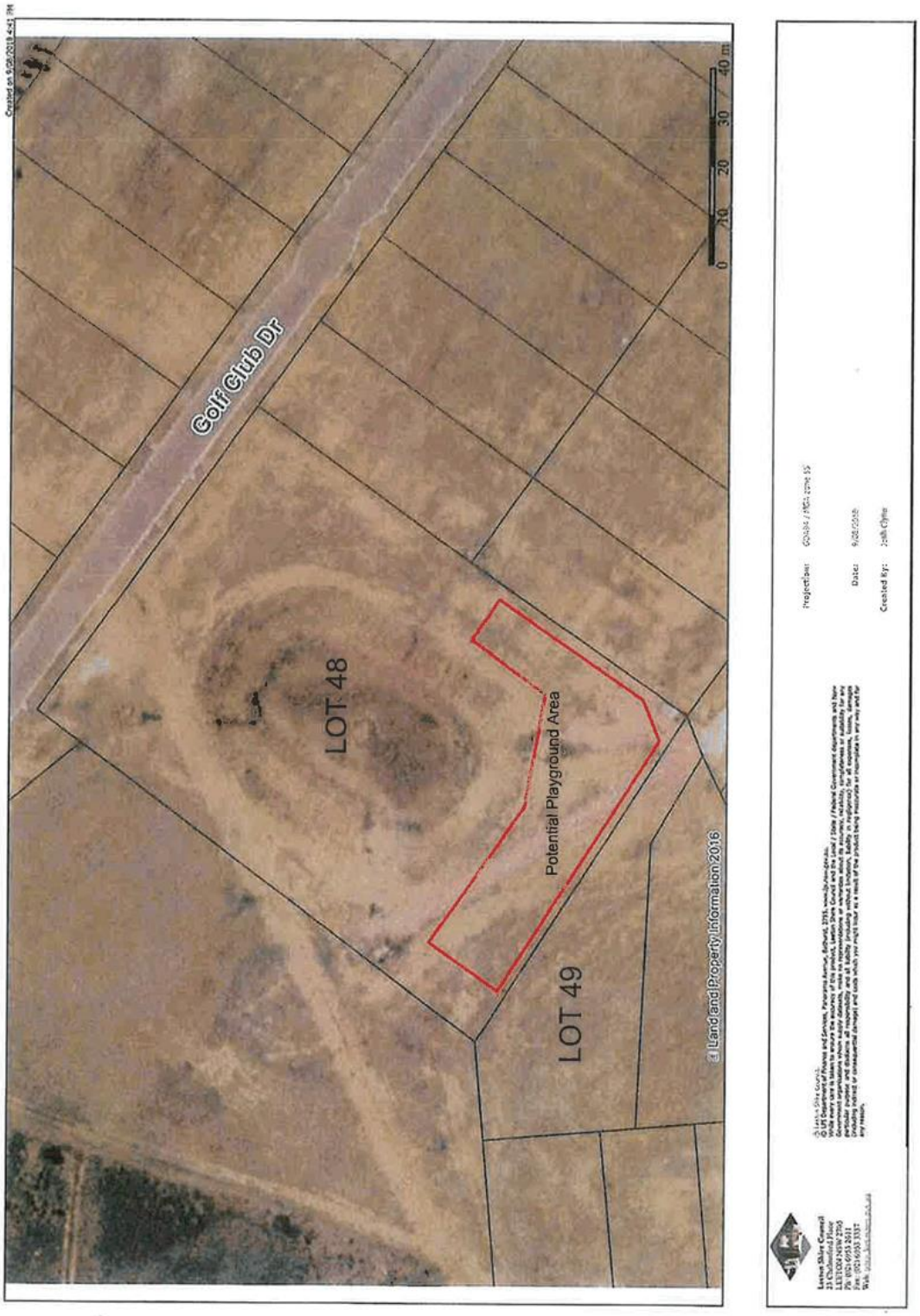
LINK/S TO THE DELIVERY PROGRAM/OPERATIONAL PLAN (DPOP)

Under the Key Priority Area THEME 1 - "A HEALTHY AND CARING COMMUNITY" within Council's adopted Delivery Program/Operational Plan – 05 - A community that enjoys good housing - 5b is to "Expand the range of residential opportunities across the Shire - Consider introduction of mixed zone (commercial and residential) in Leeton CBD".

ATTACHMENTS

1⇩ Site Plan showing Lots 48 & 49

LEETON SHIRE COUNCIL
Ordinary Council Meeting - Wednesday 22 August 2018



Attachment 1 - Site Plan showing Lots 48 & 49

Page 179

Occupation Certificate	$ 34.00
Development Fee	$ 825.00
Principal Certifying Agent Fee	$ 200.00
Section 94A Levy	$ 900.00
Construction Certificate	$ 580.25
TOTAL	**$ 2,539.25**

(Moved Cr Nardi, seconded Cr Smith)

The Mayor Cr Maytom vacated the Chair at 8.15pm and the Deputy Mayor Cr Weston assumed the role of meeting Chair.

Item 8.11 RECLASSIFICATION OF LAND AS OPERATIONAL - GOLF COURSE ESTATE

18/160

Resolved

THAT Council:

1. Resolves to initiate the process to reclassify Lot 49 in DP 1114977, 26 Lake Paddock Drive, Golf Course Estate, from Community Land to Operational Land under Section 32 of the Local Government Act 1993, as Council is satisfied that this land is unsuitable for the purpose of recreation and open space due to its size and shape.

2. Commences public notice of its intention to reclassify Lot 49 in DP 1114977 from Community Land to Operational Land for a period of 28 days.

3. Considers a further report at the completion of the public notification period seeking a formal resolution to reclassify Lot 49 in DP 1114977 from Community Land to Operational Land under Section 32 of the Local Government Act 1993.

(Moved Cr Davidson, seconded Cr Nardi)

9. STATEMENTS BY COUNCILLORS

The Mayor returned to the Chamber at 8.17pm and resumed the Chair.

Councillor Sandra Nardi

Farewell to Roxy Manager – Would like to acknowledge the work that Clay Pasquetti has undertaken at the Roxy Community Theatre. Working along side him for the McLeods Daughters event was appreciated. I would like to wish him all the best.

ITEM 8.13 REZONING OF LAND - 26 LAKE PADDOCK DRIVE AND 98 ACACIA AVENUE EAST

RECORD NUMBER	18/368
RELATED FILE NUMBER	EF11/103
AUTHOR/S	Manager Planning, Building and Health
APPROVER/S	Director Environment and Engineering

SUMMARY/PURPOSE

The purpose of this report is to seek a Council resolution to commence the planning process to rezone the following two separate parcels of Council owned land:

1. Lot 49 in DP 1114977, 26 Lake Paddock Drive, Leeton, from Public Recreation RE1 to Low Density Residential R2.

2. Lot 742 in DP 751745, 98 Acacia Avenue East, Leeton, from Public Recreation RE1 to Commercial Core B3.

RECOMMENDATION

THAT Council resolves to:

1. Rezone Lot 49 in DP 1114977, 26 Lake Paddock Drive, Leeton, from Public Recreation RE1 to Low Density Residential R2.

2. Rezone Lot 742 in DP 751745, Acacia Avenue East, Leeton, from Public Recreation RE1 to Commercial Core B3.

3. Prepare and submit a Planning Proposal to NSW Planning and Environment seeking a Gateway determination to amend the Leeton Local Environmental Plan 2014 by rezoning of 26 Lake Paddock Drive Leeton and 98 Acacia Avenue East Leeton.

4. Request authorisation from NSW Planning and Environment to exercise the functions of the Minister for Planning under section 3.36 of the Environmental Planning & Assessment Act 1979 in relation to the Planning Proposal.

5. Authorise the Mayor and General Manager to sign all necessary documents in relation to this matter.

REPORT

(a) Background

(i) **26 Lake Paddock Drive Leeton**

At the Ordinary Council Meeting held on 22 August 2018, Council discussed a report on the need for this land to be used as a recreational area.

Council determined it was not needed for recreational or any other purpose and resolved to re-classify this land from community to operational land in accordance with the Local Government Act 1993.

It then resolved to sell the land as a residential lot, the proceeds from the sale then being allocated to the development of a new recreational area adjacent to this site.

To permit this proposal to happen the land will also need to be rezoned from RE1 Public Recreation to the adjacent residential zone Low Density Residential R2.

(ii) **98 Acacia Avenue East, Leeton**

This land is the site of the previous Leeton Golf Club Clubhouse facilities.

Council was granted ownership of this site by its previous owner, the Leeton Soldiers Club, following Council's agreement to manage and fund the operation of the golf course.

The clubhouse facilities previously contained a bar, restaurant and function rooms and were demolished several years ago.

The site is currently zoned Public Recreation RE1 which permits the redevelopment as an entertainment facility, food and drink premises, function centre and recreation facility (indoor).

Consideration has recently been given to maximise the future potential of this site should clubhouse facilities again be established by adding flexibility by way of potential other land uses in order to increase the long term sustainability of the golf club and course.

(b) Discussion

The procedure for Council to rezone these two lots is to firstly resolve to support the change to the Leeton Environmental Plan 2014 by rezoning Lots 49 & 742, prepare a Planning Report which is then submitted to NSW Planning & Environment who will provide a gateway determination by either supporting the proposal and or refusing to support the proposal.

If agreeable to the change, the NSW Planning & Environment Department will require Council to undertake public consultation, which may also require a public meeting.

In relation to Lot 49 in DP 1114977, 26 Lake Paddock Drive, Leeton, Council has already supported the reclassification of the site from community to operational land to permit the sale of the lot in order to fund the future development of recreational facilities on the adjoining lot.

In relation to Lot 742 in DP 751745, Acacia Avenue East, Leeton, it is considered that the most beneficial zoning that will permit the widest possible future uses of the site is Commercial Core B3.

The B3 zone extends from Yanco Avenue to the corner of Maiden Avenue and Acacia Avenue East. A B3 zone will permit, amongst other uses, commercial premises, entertainment facilities, function centres, recreational facilities (indoor), registered clubs, hotels, motels and food and drink facilities, as well as residential accommodation such as multi dwelling housing and residential flat buildings.

The land opposite the site in Acacia Avenue East is zoned Medium Density Residential R3 which does not permit entertainment facilities, function centres, recreational facilities (indoor), registered clubs, hotels or motels.

(c) Options

Council would have the following options;

1. In relation to Lot 49 in DP 1114977, 26 Lake Paddock Drive, Leeton, Council's options are probably limited to resolving to rezone the lot, as it has already resolved to reclassify it to operational land so that it may be sold to raise income to undertake the development of a recreational facility on adjoining land. Should the lot not be rezoned it would make the sale of this land impossible as the current zone prohibits the erection of a dwelling.

2. In relation to Lot 742 in DP 751745, 98 Acacia Avenue East, Leeton, could either to resolve to submit a planning proposal to rezone the lot to Commercial Core B3 to increase the range of permissible land uses in order to enhance the future economic sustainability of the golf course or it may choose not to rezone this land and utilise it for a new golf club house only (which is permitted under the current zone).

IMPLICATIONS TO BE ADDRESSED

(a) Financial

The resources required to prepare the planning proposal for the rezoning of Lots 49 and 742 has not been included in Council's 2018/2019 Operational Plan.

It is envisaged that the cost of appointing external planning services to undertake this project could be in the range of $5,000 to $8,000 which will be funded from the Town Planning Budget.

Policy

In accordance with Execution of Documents Matrix.

(b) Legislative/Statutory

The process to rezone Lots 49 and 742 will need to comply with the NSW Planning & Environment guidelines on the preparation of planning proposals.

(c) Risk

It is possible that NSW Planning & Environment may not grant approval to the planning proposal. To minimise this risk, the planning proposal will need to fully demonstrate the strategic merits of the proposed re-zonings.

CONSULTATION

(a) External

Nil at this stage. Council will need to consult with the community before formerly resolving the reclassification and sale of Lot 49.

Council will also be required to consult the community about the planning proposals that are the subject of this report, if the recommendation is adopted.

(b) Internal

Manager Open Space & Recreation
General Manager

LINK/S TO THE DELIVERY PROGRAM/OPERATIONAL PLAN (DPOP)

Under the Key Priority Area THEME 2 - "AN ACTIVE AND ENRICHED COMMUNITY" within Council's adopted Delivery Program/Operational Plan – 06 - A community that participates in sports and active leisure - 6b is to "Support local sport and recreation clubs to remain viable - Respond to local sports and recreation clubs seeking advice and assistance from Council".

Under the Key Priority Area THEME 5 – "A QUALITY BUILT ENVIRONMENT" within Council's adopted Delivery Program/Operational Plan – 17 – A community that enjoys attractive towns and parks – 17a is to "Provide open spaces for active and passive leisure – To have suitably equipped playgrounds that are fun, safe, fit for purpose and cater for diverse needs".

ATTACHMENTS

There are no attachments for this report.

Item 8.13 REZONING OF LAND - 26 LAKE PADDOCK DRIVE AND 98 ACACIA AVENUE EAST

18/179

Resolved

THAT Council resolves to:

1. Rezone Lot 49 in DP 1114977, 26 Lake Paddock Drive, Leeton, from Public Recreation RE1 to Low Density Residential R2.

2. Rezone Lot 742 in DP 751745, Acacia Avenue East, Leeton, from Public Recreation RE1 to Commercial Core B3.

3. Prepare and submit a Planning Proposal to NSW Planning and Environment seeking a Gateway determination to amend the Leeton Local Environmental Plan 2014 by rezoning of 26 Lake Paddock Drive Leeton and 98 Acacia Avenue East Leeton.

4. Request authorisation from NSW Planning and Environment to exercise the functions of the Minister for Planning under section 3.36 of the Environmental Planning & Assessment Act 1979 in relation to the Planning Proposal.

5. Authorise the Mayor and General Manager to sign all necessary documents in relation to this matter.

(Moved Cr Kidd, seconded Cr Smith)

Item 8.14 UPDATE ON LEETON FLOODPLAIN MANAGEMENT COMMITTEE

18/180

Resolved

THAT Council:

1. Notes the information contained within this report.

2. Nominates and endorses Cr Peter Davidson and Cr Mayor Paul Maytom to become members of the Leeton Shire Council Floodplain Management Committee.

3. Notes and endorses community and stakeholder membership of the Leeton Shire Council Floodplain Management Committee.

(Moved Cr Reneker, seconded Cr Smith)

Attachment 3 Consistency with SEPPs and S117 Directions

Attachment 3: Request for initial gateway determination - State Environmental Planning Policy (SEPP) Checklist

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
State Environmental Planning Policy No. 1 – Development Standards	Makes development standards more flexible. It allows councils to approve a development proposal that does not comply with a set standard where this can be shown to be unreasonable or unnecessary.	N/A	N/A
State Environmental Planning Policy No. 14 – Coastal Wetlands	Ensures coastal wetlands are preserved and protected for environmental and economic reasons. The policy applies to local government areas outside the Sydney metropolitan area that front the Pacific Ocean.	N/A	N/A
State Environmental Planning Policy No. 19 – Bushland in Urban Areas	Protects and preserves bushland within certain urban areas, as part of the natural heritage or for recreational, educational and scientific purposes. The policy is designed to protect bushland in public open space zones and reservations, and to ensure that bush preservation is given a high priority when local environmental plans for urban development are prepared.	N/A	N/A
State Environmental Planning Policy No. 24 – Caravan Parks	Ensures that where caravan parks or camping grounds are permitted under an environmental planning instrument, movable	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	dwellings, as defined in the Local Government Act 1993, are also permitted. The specific kinds of movable dwellings allowed under the Local Government Act in caravan parks and camping grounds are subject to the provisions of the Caravan Parks Regulation. The policy ensures that development consent is required for new caravan parks and camping grounds and for additional long-term sites in existing caravan parks. It also enables, with the council's consent, long-term sites in caravan parks to be subdivided by leases of up to 20 years		
State Environmental Planning Policy No. 26 – Littoral Rainforests	Protects littoral rainforests, a distinct type of rainforest well suited to harsh salt-laden and drying coastal winds. The policy requires that the likely effects of proposed development be thoroughly considered in an environmental impact statement.	N/A	N/A
State Environmental Planning Policy No. 29 – Western Sydney Recreation Area	Enables development to be carried out for recreational, sporting and cultural purposes within the Western Sydney Recreation Area, including the development of a recreation area of State significance.	N/A	N/A
State Environmental Planning Policy No. 33 –	Provides new definitions for 'hazardous industry', 'hazardous storage establishment',	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
Hazardous & Offensive Industry	'offensive industry' and 'offensive storage establishment'. The definitions apply to all planning instruments, existing and future. The new definitions enable decisions to approve or refuse a development to be based on the merit of proposal. The policy does not change the role of councils as consent authorities, land zoning, or the designated development provisions of *the Environmental Planning and Assessment Act 1979.*		
State Environmental Planning Policy No. 36 – Manufactured Home Estate	Helps establish well-designed and properly serviced manufactured home estates (MHEs) in suitable locations. Affordability and security of tenure for residents are important aspects. The policy applies to Gosford, Wyong and all local government areas outside the Sydney Region. To enable the immediate development of estates, the policy allows MHEs to be located on certain land where caravan parks are permitted. A section 117 direction issued in conjunction with the policy guides councils in preparing local environmental plans for MHEs, enabling them to be excluded from the policy	N/A	N/A
State Environmental Planning Policy No. 44 –	Encourages the conservation and management of natural vegetation areas that provide habitat	N/A	Whilst not directly applicable to this planning proposal, any future

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
Koala Habitat Protection	for koalas to ensure permanent free-living populations will be maintained over their present range.		development of the site will be assessed on its merits against the provisions of this policy. The planning proposal is subsequently considered to be consistent with the aims and objectives of the SEPP.
State Environmental Planning Policy No. 47 – Moore Park Showground	Enables the redevelopment of the Moore Park Showground for film and television studios and film-related entertainment facilities in a manner that is consistent with the Showground's status as an area important to the State and for regional planning.	N/A	N/A
State Environmental Planning Policy No. 50 – Canal Estate Development	Bans new canal estates from the date of gazettal, to ensure coastal and aquatic environments are not affected by these developments	N/A	N/A
State Environmental Planning Policy No. 55 – Remediation of Land	Introduces state-wide planning controls for the remediation of contaminated land. The policy states that land must not be developed if it is unsuitable for a proposed use because it is contaminated. If the land is unsuitable, remediation must take place before the land is developed. The policy makes remediation permissible across the State, defines when consent is required, requires all remediation to	N/A	Whilst not directly applicable to this planning proposal, any future development proposals for the site will be assessed on its merits against the provisions of this policy. The land use itself is also not considered to be a contaminating use. The planning proposal is subsequently considered to be consistent with the aims and

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	comply with standards, ensures land is investigated if contamination is suspected, and requires councils to be notified of all remediation proposals. To assist councils and developers, the Department, in conjunction with the Environment Protection Authority, has prepared Managing Land Contamination: Planning Guidelines		objectives of the SEPP.
State Environmental Planning Policy No. 64 – Advertising & Signage	Aims to ensure that outdoor advertising is compatible with the desired amenity and visual character of an area, provides effective communication in suitable locations and is of high quality design and finish. The SEPP was amended in August 2007 to permit and regulate outdoor advertising in transport corridors (e.g. freeways, tollways and rail corridors).	N/A	N/A
State Environmental Planning Policy No. 65 – Design Quality of Residential Flat Development	Raises the design quality of residential flat development across the state through the application of a series of design principles. Provides for the establishment of Design Review Panels to provide independent expert advice to Councils on the merit of residential flat development. The accompanying regulation requires the involvement of a	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	qualified designer throughout the design, approval and construction stages		
State Environmental Planning Policy No. 70 – Affordable Housing (Revised Schemes)	Extends the life of affordable housing provisions relating to: Sydney Regional Environmental Plan No. 26 - City West, Willoughby Local Environmental Plan 1995, South Sydney Local Environmental Plan 1998. Schemes such as these are helping to provide affordable housing in areas undergoing significant redevelopment. In February 2019 expanded to include all councils across NSW expediting councils' ability to investigate and develop an affordable housing contributions scheme.	N/A	N/A
State Environmental Planning Policy No 71 – Coastal Protection	The policy has been made to ensure that development in the NSW coastal zone is appropriate and suitably located, to ensure that there is a consistent and strategic approach to coastal planning and management and to ensure there is a clear development assessment framework for the coastal zone.	N/A	N/A
State Environmental Planning Policy (Affordable Rental	Establishes a consistent planning regime for the provision of affordable rental housing. The policy provides incentives for new affordable	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
Housing) 2009	rental housing, facilitates the retention of existing affordable rentals, and expands the role of not-for-profit providers. It also aims to support local centres by providing housing for workers close to places of work, and facilitate development of housing for the homeless and other disadvantaged people.		
State Environmental Planning Policy (Building Sustainability Index: BASIX) 2004	This SEPP operates in conjunction with Environmental Planning and Assessment Amendment (Building Sustainability Index: BASIX) Regulation 2004 to ensure the effective introduction of BASIX in NSW.	Yes	Whilst not directly applicable to this planning proposal, any future development proposals for the site will be assessed on its merits against the provisions of this policy. The planning proposal is subsequently considered to be consistent with the aims and objectives of the SEPP.
State Environmental Planning Policy (Educational Establishments and Childcare Facilities) 2017	State Environmental Planning Policy (Educational Establishments and Child Care Facilities) 2017 contains provisions that make it easier for child-care providers, schools, TAFEs and universities to build new facilities and improve existing ones by streamlining approval processes to save time and money and deliver greater consistency across NSW. The SEPP balances the need to deliver additional educational infrastructure	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	with a focus on good design.		
State Environmental Planning Policy (Exempt & Complying Development Codes) 2008	Streamlines assessment processes for development that complies with specified development standards. The policy provides exempt and complying development codes that have State-wide application, identifying, in the General Exempt Development Code, types of development that are of minimal environmental impact that may be carried out without the need for development consent; and, in the General Housing Code, types of complying development that may be carried out in accordance with a complying development certificate as defined in the *Environmental Planning and Assessment Act 1979*.	Yes	Whilst not directly applicable to this planning proposal, any future development proposals for the site will be assessed on its merits against the provisions of this policy. The planning proposal is subsequently considered to be consistent with the aims and objectives of the SEPP.
State Environmental Planning Policy (Housing for Seniors & People with a Disability) 2004	Encourage the development of high quality accommodation for our ageing population and for people who have disabilities - housing that is in keeping with the local neighbourhood. Note the name of this policy was changed from SEPP (Seniors Living) 2004 to SEPP (Housing for Seniors or People with a Disability) 2004 effective 12.10.07	N/A	N/A
State Environmental	Provides a consistent planning regime for	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
Planning Policy (Infrastructure) 2007	infrastructure and the provision of services across NSW, along with providing for consultation with relevant public authorities during the assessment process. The SEPP supports greater flexibility in the location of infrastructure and service facilities along with improved regulatory certainty and efficiency.		
State Environmental Planning Policy (Integration and Repeals) 2016	This SEPP serves to repeal the following environmental planning instruments: • *Hunter Regional Environmental Plan 1989 (Heritage),* • *Illawarra Regional Environmental Plan No 1,* • *Illawarra Regional Environmental Plan No 2—Jamberoo Valley,* • *Jervis Bay Regional Environmental Plan 1996,* • *Lower South Coast Regional Environmental Plan (No 2),* • *North Coast Regional Environmental Plan,* • *Orana Regional Environmental Plan No 1—Siding Spring,* • *Riverina Regional Environmental Plan No*	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	1, • *State Environmental Planning Policy No 15—Rural Landsharing Communities,* • *State Environmental Planning Policy No 29—Western Sydney Recreation Area,* • *State Environmental Planning Policy No 32—Urban Consolidation (Redevelopment of Urban Land),* • *State Environmental Planning Policy No 39—Spit Island Bird Habitat,* • *State Environmental Planning Policy No 59—Central Western Sydney Regional Open Space and Residential,* • *State Environmental Planning Policy (SEPP 53 Transitional Provisions) 2011,* • *Sydney Regional Environmental Plan No 18—Public Transport Corridors,* • *Sydney Regional Environmental Plan No 19—Rouse Hill Development Area.*		
State Environmental Planning Policy (Kosciuszko National Park – Alpine Resorts)	The aim of this policy is to strengthen the assessment framework for development within the alpine resorts and to reinforce environmentally sustainable development and	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
2007	recreational activities within these resorts. The Policy also facilitates the protection of the natural and cultural setting of the alpine resorts in Kosciuszko National Park		
State Environmental Planning Policy (Kurnell Peninsula) 1989	This Policy applies only to the land within the Shire of Sutherland, known as Kurnell Peninsula, and adjacent waterways.	N/A	N/A
State Environmental Planning Policy (Mining, Petroleum Production & Extractive Industries) 2007	This Policy aims to provide for the proper management and development of mineral, petroleum and extractive material resources for the social and economic welfare of the State. The Policy establishes appropriate planning controls to encourage ecologically sustainable development.	N/A	N/A
State Environmental Planning Policy (Miscellaneous Consent Provisions) 2007	This policy provides that the erection of temporary structures is permissible with consent across the State, whilst also ensuring safety and environmental factors are considered. It also provides that development comprising the subdivision of land, the erection of a building or the demolition of a building, to the extent to which it does not already require development consent under another environmental planning instrument, cannot be	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	carried out except with development consent.		
State Environmental Planning Policy (Penrith Lakes Scheme) 1989	This SEPP provides a development control process that ensures that environmental and technical matters are considered in the implementation of the Penrith Lakes Scheme	N/A	N/A
State Environmental Planning Policy (State and Regional Development) 2011	This SEPP identifies development and infrastructure that is of State significance and also confers functions on joint regional planning panels to determine development applications.	N/A	N/A
State Environmental Planning Policy (State Significant Precincts) 2005	The aims of this SEPP is to facilitate the development, redevelopment or protection of important urban, coastal and regional sites of economic, environmental or social significance to the State.	N/A	N/A
State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011	The aims of this Policy are to • provide for healthy water catchments that will deliver high quality water while permitting development that is compatible with that goal, and • to provide that a consent authority must not grant consent to a proposed development unless it is satisfied that the proposed development will have a neutral	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	or beneficial effect on water quality, and • to support the maintenance or achievement of the water quality objectives for the Sydney drinking water catchment.		
State Environmental Planning Policy (Sydney Region Growth Centres) 2006	Provides for the coordinated release of land for residential, employment and other urban development in the North West and South West growth centres of the Sydney Region (in conjunction with Environmental Planning and Assessment Regulation relating to precinct planning).	N/A	N/A
State Environmental Planning Policy (Three Ports) 2013	This SEPP provides a consistent planning regime for the development and delivery of infrastructure on land in Port Botany, Port Kembla and the Port of Newcastle.	N/A	N/A
State Environmental Planning Policy (Urban Renewal) 2010	The aims of this Policy are as follows: • to establish the process for assessing and identifying sites as urban renewal precincts, • to facilitate the orderly and economic development and redevelopment of sites in and around urban renewal precincts, • to facilitate delivery of the objectives of any	N/A	N/A

SEPP Title	Summary of SEPP	Applicable to Planning Proposal	Consistency
	applicable government State, regional or metropolitan strategies connected with the renewal of urban areas that are accessible by public transport.		
State Environmental Planning Policy (Vegetation in non-rural areas) 2017	This policy applies to non-rural areas of the state. It seeks to to protect the biodiversity values of trees and other vegetation in non-rural areas of the State, along with preserving the amenity of non-rural areas of the State through the preservation of trees and other vegetation.	N/A	N/A
State Environmental Planning Policy (Western Sydney Employment Area) 2009	Promotes economic development and the creation of employment in the Western Sydney Employment Area by providing for development, including major warehousing, distribution, freight transport, industrial, high technology and research facilities. The policy provides for coordinated planning, development and rezoning of land for employment or environmental conservation purposes.	N/A	N/A
State Environmental Planning Policy (Western Sydney Parklands) 2009	The aim of the policy is to put in place planning controls that will enable the Western Sydney Parklands Trust to develop the Western Parklands into multi-use urban parkland for	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	the region of western Sydney.		
State Environmental Planning Policy (Primary Production and Rural Development) 2019	The aims of this Policy are to facilitate the orderly economic use and development of lands for primary production and to encourage sustainable agriculture, including sustainable aquaculture. It also identifies State significant agricultural land and provides a new regulatory framework for development on agricultural lands.	N/A	N/A
Murray REP No. 2 – Riverine Land	Ensures the river and its floodplain are able to support a range of productive land uses. The plan coordinating planning along the Murray River and the implementation of planning-related aspects of the Murray Darling Basin Commission strategies. It simplifies the consultation process between agencies and councils established in REP No. 1. It also promotes consistency between NSW and Victoria planning in relation to the river and its floodplain.	N/A	N/A
Willandra Lakes REP No 1 - World Heritage Property	Applies to the Willandra Lakes Region in the Shires of Wentworth and Balranald. The purpose of the plans is to protect, conserve and manage this World Heritage Property in accordance with any strategic plan of	N/A	N/A

SEPP Title	*Summary of SEPP*	*Applicable to Planning Proposal*	*Consistency*
	management. The plan also aims to provide a process of consultation with stakeholders on development and related decisions.		

Attachment 3: Request for initial gateway determination - s.9.1 Ministerial Directions Checklist

No.	*Title*	*Applicable to Planning Proposal*	*Consistency*
1. Employment and Resources (effective 1 July 2009, except for new Direction 1.2 effective 14 April 2016 and 1.1 effective 1 May 2017)			
1.1	*Business and Industrial Zones* A planning proposal must: • give effect to the objectives of this direction, • retain the areas and locations of existing business and industrial zones, • not reduce the total potential floor space area for employment uses and related public services in business zones, • not reduce the total potential floor space area for industrial uses in industrial zones, and • ensure that proposed new employment areas are in accordance with a strategy that is approved by the Secretary of the Department of Planning and Environment.	N/A	N/A
1.2	*Rural Zones* A planning proposal must:	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	• not rezone land from a rural zone to a residential, business, industrial, village or tourist zone • not contain provisions that will increase the permissible density of land within a rural zone (other than land within an existing town or village).		
1.3	*Mining Petroleum Production and Extractive Industries* This direction applies when a relevant planning authority prepares a planning proposal that would have the effect of: • prohibiting the mining of coal or other minerals, production of petroleum, or winning or obtaining of extractive materials, or • restricting the potential development of resources of coal, other minerals, petroleum or extractive materials which are of State or regional significance by permitting a land use that is likely to be incompatible with such development.	N/A	N/A
1.4	*Oyster Aquaculture* This direction applies when a relevant planning authority prepares any planning proposal that proposes a change in land use which could result in: • adverse impacts on a Priority Oyster Aquaculture Area or a "current oyster aquaculture lease in the national parks estate"; or • incompatible use of land between oyster aquaculture in a Priority Oyster Aquaculture Area or a "current oyster aquaculture lease in the national parks estate" and other land uses.	N/A	N/A

No.	*Title*	*Applicable to Planning Proposal*	*Consistency*
1.5	*Rural Lands* This direction applies when: • a relevant planning authority prepares a planning proposal that will affect land within an existing or proposed rural or environment protection zone (including the alteration of any existing rural or environment protection zone boundary) or • a relevant planning authority prepares a planning proposal that changes the existing minimum lot size on land within a rural or environment protection zone.	N/A	N/A
2. Environment and Heritage (effective 1 July 2009 Except for new Direction 2.5 effective 2 March 2016, Direction 2.1, 2.2 and 2.4 effective 14 April 2016)			
2.1	*Environment Protection Zones* A planning proposal must include provisions that facilitate the protection and conservation of environmentally sensitive areas. A planning proposal that applies to land within an environment protection zone or land otherwise identified for environment protection purposes in a LEP must not reduce the environmental protection standards that apply to the land (including by modifying development standards that apply to the land). This requirement does not apply to a change to a development standard for minimum lot size for a dwelling in accordance with clause (5) of Direction 1.5 "Rural Lands".	N/A	N/A
2.2	*Coastal Protection* A planning proposal must include provisions that give effect to	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	and are consistent with: • the NSW Coastal Policy: A Sustainable Future for the New South Wales Coast 1997, and • the Coastal Design Guidelines 2003, and • the manual relating to the management of the coastline for the purposes of section 733 of the Local Government Act 1993 (the NSW Coastline Management Manual 1990).		
2.3	*Heritage Conservation* A planning proposal must contain provisions that facilitate the conservation of: • items, places, buildings, works, relics, moveable objects or precincts of environmental heritage significance to an area, in relation to the historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic value of the item, area, object or place, identified in a study of the environmental heritage of the area, • Aboriginal objects or Aboriginal places that are protected under the *National Parks and Wildlife Act 1974*, and • Aboriginal areas, Aboriginal objects, Aboriginal places or landscapes identified by an Aboriginal heritage survey prepared by or on behalf of an Aboriginal Land Council, Aboriginal body or public authority and provided to the relevant planning authority, which identifies the area, object, place or landscape as being of heritage significance to Aboriginal culture and people.		
2.4	*Recreation Vehicle Areas* A planning proposal must not enable land to be developed for the	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	purpose of a recreation vehicle area (within the meaning of the Recreation Vehicles Act 1983): • where the land is within an environmental protection zone, • where the land comprises a beach or a dune adjacent to or adjoining a beach, • where the land is not within an area or zone referred to in paragraphs (4)(a) or (4)(b) unless the relevant planning authority has taken into consideration: ➢ the provisions of the guidelines entitled Guidelines for Selection, Establishment and Maintenance of Recreation Vehicle Areas, Soil Conservation Service of New South Wales, September, 1985, and ➢ the provisions of the guidelines entitled Recreation Vehicles Act, 1983, Guidelines for Selection, Design, and Operation of Recreation Vehicle Areas, State Pollution Control Commission, September 1985.		
2.5	*Application of E2 and E3 Zones and Environmental Overlays in Far North Coast LEPs* The objective of this direction is to ensure that a balanced and consistent approach is taken when applying environmental protection zones and overlays to land on the NSW Far North Coast. This direction applies to the local government areas of Ballina, Byron, Kyogle, Lismore and Tweed only.	N/A	N/A
3. Housing Infrastructure and Urban Development (effective 1 July 2009 - except for new Direction 3.6 effective 16 February 2011,			

No.	*Title*	*Applicable to Planning Proposal*	*Consistency*
Direction 3.1, 3.2, 3.4 and 3.5 effective 14 April 2016)			
3.1	*Residential Zones* This direction applies when a relevant planning authority prepares a planning proposal that will affect land within: • an existing or proposed residential zone (including the alteration of any existing residential zone boundary) • any other zone in which significant residential development is permitted or proposed to be permitted. A planning proposal must include provisions that encourage the provision of housing that will: • broaden the choice of building types and locations available in the housing market, and • make more efficient use of existing infrastructure and services, and • reduce the consumption of land for housing and associated urban development on the urban fringe, and • be of good design. A planning proposal must, in relation to land to which this direction applies: • contain a requirement that residential development is not permitted until land is adequately serviced (or arrangements satisfactory to the council, or other appropriate authority, have been made to service it), and • not contain provisions which will reduce the permissible residential density of land.	Yes	Consistent – the Planning proposal includes provisions that encourage additional housing consistent with the immediate locality
3.2	*Caravan Parks and Manufactured Home Estates*	N/A	N/A

No.	*Title*	*Applicable to Planning Proposal*	*Consistency*
	This direction applies when a relevant planning authority prepares a planning proposal. In identifying suitable zones, locations and provisions for caravan parks in a planning proposal, the relevant planning authority must: • retain provisions that permit development for the purposes of a caravan park to be carried out on land, and • retain the zonings of existing caravan parks, or in the case of a new principal LEP zone the land in accordance with an appropriate zone under the Standard Instrument (Local Environmental Plans) Order 2006 that would facilitate the retention of the existing caravan park. In identifying suitable zones, locations and provisions for manufactured home estates (MHEs) in a planning proposal, the relevant planning authority must: • take into account the categories of land set out in Schedule 2 of SEPP 36 as to where MHEs should not be located, • take into account the principles listed in clause 9 of SEPP 36 (which relevant planning authorities are required to consider when assessing and determining the development and subdivision proposals), and • include provisions that the subdivision of MHEs by long term lease of up to 20 years or under the Community Land Development Act 1989 be permissible with consent.		
3.3	*Home Occupations* This direction applies when a relevant planning authority prepares a planning proposal.	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	Planning proposals must permit home occupations to be carried out in dwelling houses without the need for development consent.		
3.4	*Integrating Land Use and Transport* This direction applies when a relevant planning authority prepares a planning proposal that will create, alter or remove a zone or a provision relating to urban land, including land zoned for residential, business, industrial, village or tourist purposes. A planning proposal must locate zones for urban purposes and include provisions that give effect to and are consistent with the aims, objectives and principles of: • Improving Transport Choice – Guidelines for planning and development (DUAP 2001), and • The Right Place for Business and Services – Planning Policy (DUAP 2001).	Yes	Consistent – the Planning proposal identifies additional urban land within close proximity to existing urban settlements and established local transport networks
3.5	*Development Near Licensed Aerodromes* This direction applies when a relevant planning authority prepares a planning proposal that will create, alter or remove a zone or a provision relating to land in the vicinity of a licensed aerodrome.	N/A	N/A
3.6	*Shooting Ranges* This direction applies when a relevant planning authority prepares a planning proposal that will affect, create, alter or remove a zone or a provision relating to land adjacent to and/ or adjoining an existing shooting range. A planning proposal must not seek to rezone land adjacent to and/	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	or adjoining an existing shooting range that has the effect of: • permitting more intensive land uses than those which are permitted under the existing zone; or • permitting land uses that are incompatible with the noise emitted by the existing shooting range.		
3.7	*Reduction in non-hosted short term rental accommodation period* This direction applies to Byron Shire Council. This direction applies when the council prepares a planning proposal to identify or reduce the number of days that non-hosted short-term rental accommodation may be carried out in parts of its local government area.	N/A	N/A
4. Hazard and Risk (effective 1 July 2009 – except for new Direction 4.2 effective 12 April 2016)			
4.1	*Acid Sulfate Soils* This direction applies when a relevant planning authority prepares a planning proposal that will apply to land having a probability of containing acid sulfate soils as shown on the Acid Sulfate Soils Planning Maps.	N/A	N/A
4.2	*Mine Subsidence and Unstable Land* This direction applies to land that is within a Mine Subsidence District proclaimed pursuant to section 15 of the Mine Subsidence Compensation Act 1961, or has been identified as unstable land.	N/A	N/A
4.3	*Flood Prone Land* This direction applies when a relevant planning authority prepares	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	a planning proposal that creates, removes or alters a zone or a provision that affects flood prone land. A planning proposal must include provisions that give effect to and are consistent with the NSW Flood Prone Land Policy and the principles of the Floodplain Development Manual 2005 (including the Guideline on Development Controls on Low Flood Risk Areas). A planning proposal must not rezone land within the flood planning areas from Special Use, Special Purpose, Recreation, Rural or Environmental Protection Zones to a Residential, Business, Industrial, Special Use or Special Purpose Zone. A planning proposal must not contain provisions that apply to the flood planning areas which: • permit development in floodway areas • permit development that will result in significant flood impacts to other properties • permit a significant increase in the development of that land • are likely to result in a substantially increased requirement for government spending on flood mitigation measures, infrastructure or services, or • permit development to be carried out without development consent except for the purposes of agriculture (not including dams, drainage canals, levees, buildings or structures in floodways or high hazard areas), roads or exempt development. A planning proposal must not impose flood related development		

No.	Title	Applicable to Planning Proposal	Consistency
	controls above the residential flood planning level for residential development on land, unless a relevant planning authority provides adequate justification for those controls to the satisfaction of the Director-General (or an officer of the Department nominated by the Director-General). For the purposes of a planning proposal, a relevant planning authority must not determine a flood planning level that is inconsistent with the Floodplain Development Manual 2005 (including the Guideline on Development Controls on Low Flood Risk Areas) unless a relevant planning authority provides adequate justification for the proposed departure from that Manual to the satisfaction of the Director-General (or an officer of the Department nominated by the Director-General).		
4.4	*Planning for Bushfire Protection* This direction applies when a relevant planning authority prepares a planning proposal that will affect, or is in proximity to land mapped as bushfire prone land. In the preparation of a planning proposal the relevant planning authority must consult with the Commissioner of the NSW Rural Fire Service following receipt of a gateway determination under section 56 of the Act, and prior to undertaking community consultation in satisfaction of section 57 of the Act, and take into account any comments so made, A planning proposal must: • have regard to Planning for Bushfire Protection 2006,	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	• introduce controls that avoid placing inappropriate developments in hazardous areas, and • ensure that bushfire hazard reduction is not prohibited within the APZ. • A planning proposal must, where development is proposed, comply with the following provisions, as appropriate: • provide an Asset Protection Zone (APZ) incorporating at a minimum: (i) an Inner Protection Area bounded by a perimeter road or reserve which circumscribes the hazard side of the land intended for development and has a building line consistent with the incorporation of an APZ, within the property, and (ii) an Outer Protection Area managed for hazard reduction and located on the bushland side of the perimeter road, • for infill development (that is development within an already subdivided area), where an appropriate APZ cannot be achieved, provide for an appropriate performance standard, in consultation with the NSW Rural Fire Service. If the provisions of the planning proposal permit Special Fire Protection Purposes (as defined under section 100B of the Rural Fires Act 1997), the APZ provisions must be complied with, • contain provisions for two-way access roads which links to perimeter roads and/or to fire trail networks, • contain provisions for adequate water supply for fire fighting purposes, • minimise the perimeter of the area of land interfacing the		

No.	Title	Applicable to Planning Proposal	Consistency
	hazard which may be developed, • introduce controls on the placement of combustible materials in the Inner Protection Area.		
5. Regional Planning (effective 1 July 2009 - except for new Direction 5.2 effective 3 March 2011, Direction 5.9 effective 30 September 2013, Direction 5.4 effective 21 August 2015, Direction 5.8 and 5.10 effective 14 April 2016, Direction 5.1 and 5.3 effective 1 May 2017)			
5.1	*Implementation of Regional Strategies (Revoked 17 October 2017).*	N/A	N/A
5.2	*Sydney Drinking Water Catchments* This Direction applies to the Sydney drinking water catchment in the following local government areas: • Blue Mountains • Campbelltown • Cooma Monaro • Eurobodalla • Goulburn Mulwaree • Kiama • Lithgow • Oberon • Palerang • Shoalhaven Sutherland • Upper Lachlan • Wingecarribee	N/A	N/A

No.	Title	Applicable to Planning Proposal	Consistency
	• Wollondilly • Wollongong.		
5.3	*Farmland of State and Regional Significance on the NSW Far North Coast* This direction applies to: • Ballina Shire Council, • Byron Shire Council, • Kyogle Shire Council, • Lismore City Council, • Richmond Valley Council, and • Tweed Shire Council	N/A	N/A
5.4	*Commercial and Retail Development along the Pacific Highway, North Coast* This Direction applies to those council areas on the North Coast that the Pacific Highway traverses, being those council areas between Port Stephens Shire Council and Tweed Shire Council, inclusive	N/A	N/A
5.5	*Development in the vicinity of Ellalong, Paxton and Millfield (Cessnock LGA) (Revoked 18 June 2010).*	N/A	N/A
5.6	*Sydney to Canberra Corridor (Revoked 10 July 2008).*	N/A	N/A
5.7	*Central Coast (Revoked 10 July 2008).*	N/A	N/A
5.8	*Second Sydney Airport: Badgerys Creek* This direction applies to land shown within the boundaries of the	N/A	N/A

No.	*Title*	*Applicable to Planning Proposal*	*Consistency*
	proposed airport site and within the 20 ANEF contour as shown on the map entitled "Badgerys Creek–Australian Noise Exposure Forecast–Proposed Alignment–Worst Case Assumptions", this being found in Appendix U of the Second Sydney Airport Site Selection Program Draft Environmental Impact Statement within Fairfield City Council, Liverpool City Council, Penrith City Council and Wollondilly Shire Council local government areas.		
5.9	*North West Rail Link Corridor Strategy* The objectives of this direction are to: • promote transit-oriented development and manage growth around the eight train stations of the North West Rail Link (NWRL) • ensure development within the NWRL corridor is consistent with the proposals set out in the NWRL Corridor Strategy and precinct Structure Plans. This Direction applies to Hornsby Shire Council, The Hills Shire Council and Blacktown City Council only.	N/A	N/A
5.10	*Implementation of Regional Plans* The objective of this direction is to give legal effect to the vision, land use strategy, goals, directions and actions contained in Regional Plans. Planning proposals must be consistent with a Regional Plan released by the Minister for Planning.	Yes	Consistent – planning proposal consistent with the ***Riverina Murray Regional Plan 2036*** See commentary in *'Part 3 Justification, Section B'* of the planning proposal.

No.	*Title*	*Applicable to Planning Proposal*	*Consistency*
6. Local Plan Making (effective 1 July 2009)			
6.1	*Approval and Referral Requirements* This direction applies when a relevant planning authority prepares a planning proposal. A planning proposal must: • minimise the inclusion of provisions that require the concurrence, consultation or referral of development applications to a Minister or public authority, and • not contain provisions requiring concurrence, consultation or referral of a Minister or public authority unless the relevant planning authority has obtained the approval of: (i) the appropriate Minister or public authority, and (ii) the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General), prior to undertaking community consultation in satisfaction of section 57 of the Act, and • not identify development as designated development unless the relevant planning authority: (i) can satisfy the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General) that the class of development is likely to have a significant impact on the environment, and (ii) has obtained the approval of the Director-General of the Department of Planning (or an officer of the Department	Yes	Consistent – no provisions are included in the Planning proposal for approval or referrals.

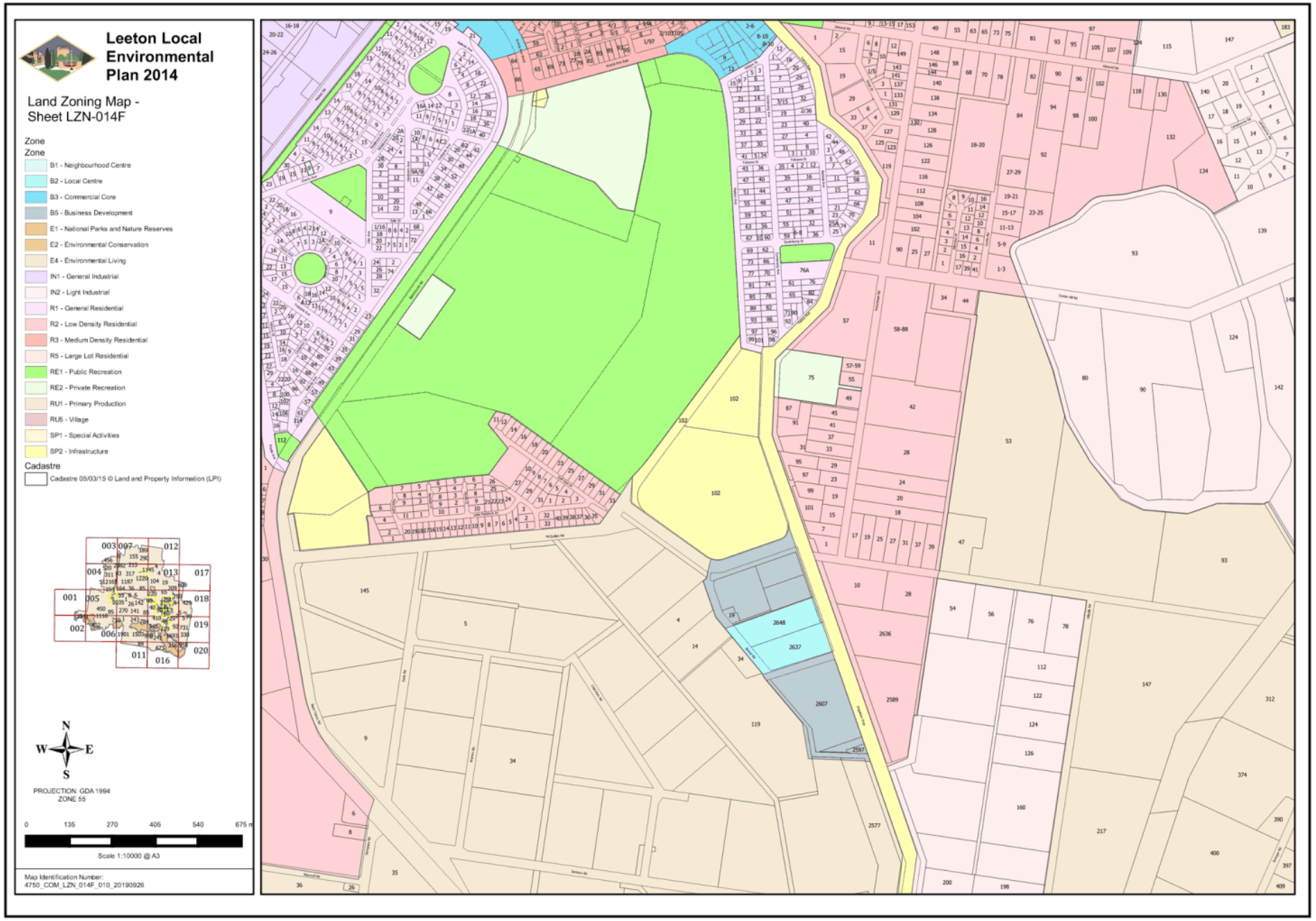
No.	Title	Applicable to Planning Proposal	Consistency
	nominated by the Director-General) prior to undertaking community consultation in satisfaction of section 57 of the Act.		
6.2	*Reserving Land for Public Purposes* This direction applies when a relevant planning authority prepares a planning proposal. A planning proposal must not create, alter or reduce existing zonings or reservations of land for public purposes without the approval of the relevant public authority and the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General). When a Minister or public authority requests a relevant planning authority to reserve land for a public purpose in a planning proposal and the land would be required to be acquired under Division 3 of Part 2 of the Land Acquisition (Just Terms Compensation) Act 1991, the relevant planning authority must: • reserve the land in accordance with the request, and • include the land in a zone appropriate to its intended future use or a zone advised by the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General), and • identify the relevant acquiring authority for the land. When a Minister or public authority requests a relevant planning authority to include provisions in a planning proposal relating to the use of any land reserved for a public purpose before that land is acquired, the relevant planning authority must:	Yes	Consistent See commentary in *'Part 3 Justification, Section B'* of the planning proposal. The land is owned by Council and approval will be sought to seek approval to alter the existing zoning from the Director General.

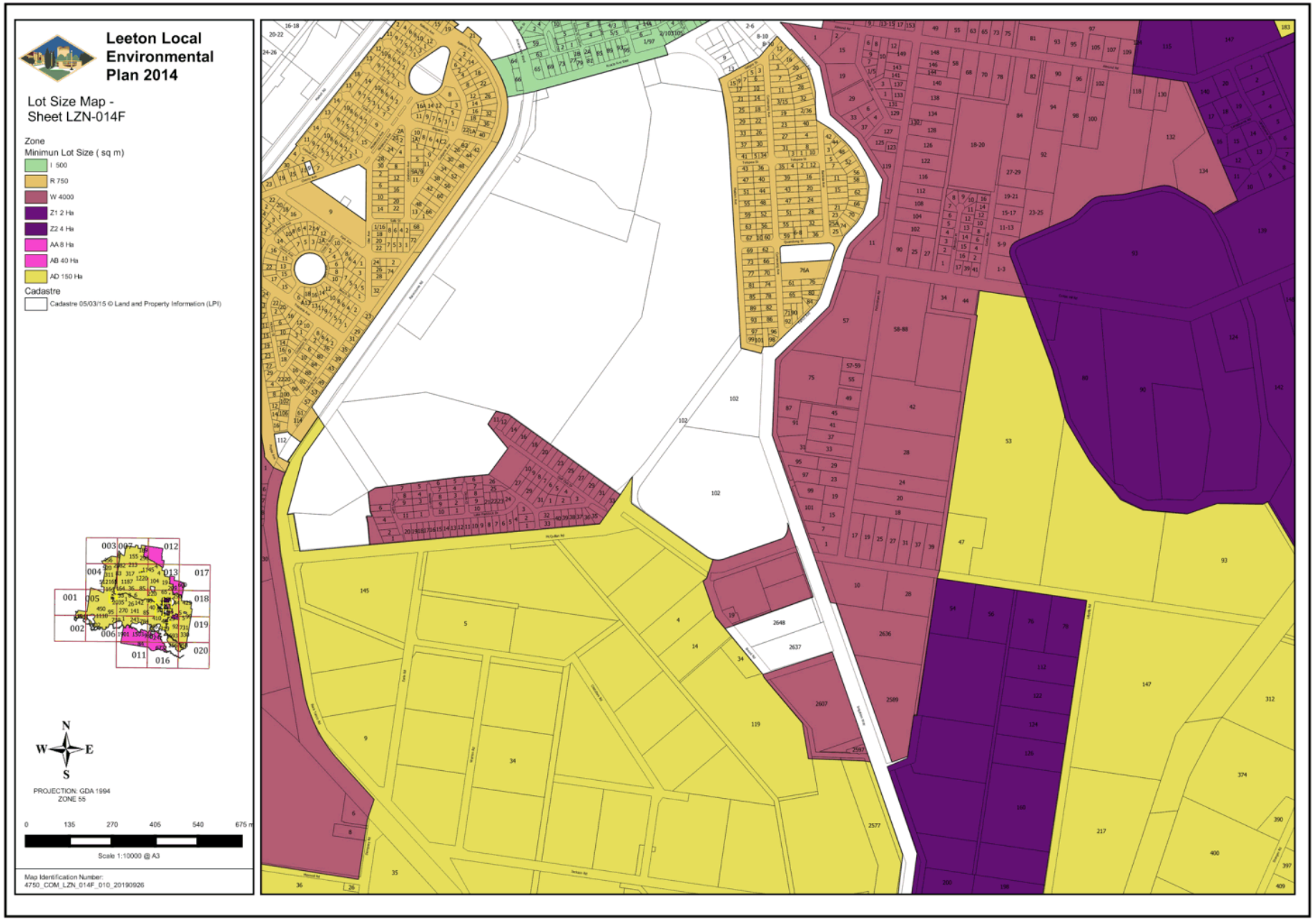
No.	Title	Applicable to Planning Proposal	Consistency
	• include the requested provisions, or • take such other action as advised by the Director-General of the Department of Planning (or an officer of the Department nominated by the Director-General) with respect to the use of the land before it is acquired. When a Minister or public authority requests a relevant planning authority to include provisions in a planning proposal to rezone and/or remove a reservation of any land that is reserved for public purposes because the land is no longer designated by that public authority for acquisition, the relevant planning authority must rezone and/or remove the relevant reservation in accordance with the request.		
6.3	*Site Specific Provisions* This direction applies when a relevant planning authority prepares a planning proposal that will allow a particular development to be carried out. A planning proposal that will amend another environmental planning instrument in order to allow a particular development proposal to be carried out must either: • allow that land use to be carried out in the zone the land is situated on, or • rezone the site to an existing zone already applying in the environmental planning instrument that allows that land use without imposing any development standards or requirements in addition to those already contained in that zone, or • allow that land use on the relevant land without imposing	N/A	N/A

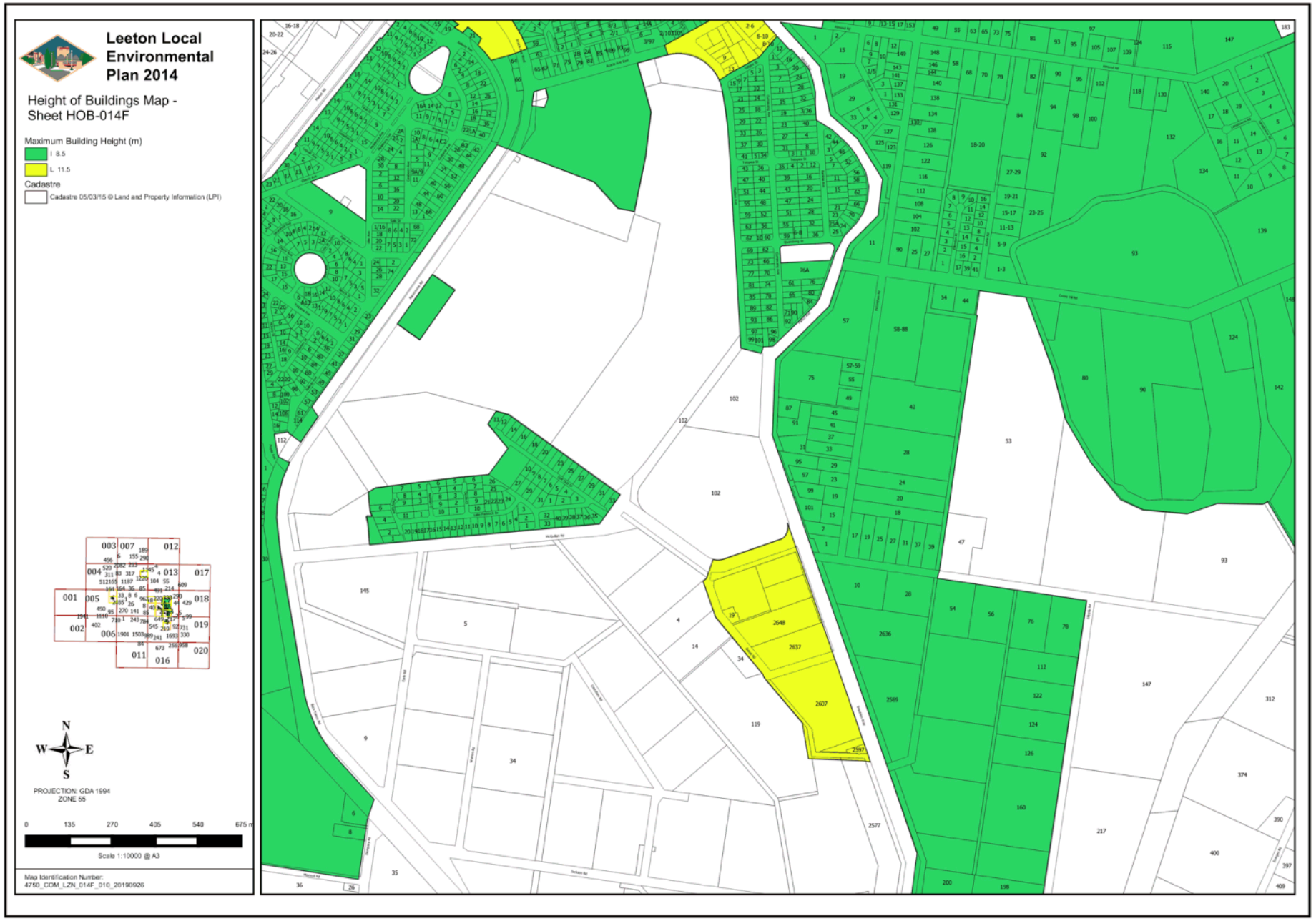
No.	Title	Applicable to Planning Proposal	Consistency
	any development standards or requirements in addition to those already contained in the principal environmental planning instrument being amended. A planning proposal must not contain or refer to drawings that show details of the development proposal.		
7. Metropolitan Planning 14 January 2015 (Except for Direction 7.2 effective 22 September 2015, Direction 7.3 effective 19 December 2016, Direction 7.4 effective 15 May 2017, Direction 7.5 effective 25 July 2017 and Direction 7.6 effective 5 August 2017			
7.1	*Implementation of A Plan for Growing Sydney* The objective of this direction is to give legal effect to the planning principles; directions; and priorities for subregions, strategic centres and transport gateways contained in A Plan for Growing Sydney. It does not apply to the Leeton Shire Council Local Government Area.	N/A	N/A
7.2	*Implementation of Greater Macarthur Land Release Investigation* The objective of this direction is to ensure development within the Greater Macarthur Land Release Investigation Area is consistent with the Greater Macarthur Land Release Preliminary Strategy and Action Plan (the Preliminary Strategy). This direction applies to Campbelltown City Council and Wollondilly Shire Council only.	N/A	N/A
7.3	*Parramatta Road Corridor Urban Transformation Strategy* The objectives of this Direction are to: • facilitate development within the Parramatta Road Corridor that is consistent with the *Parramatta Road Corridor Urban Transformation Strategy (November, 2016)* and the *Parramatta Road Corridor Implementation Tool Kit*, • provide a diversity of jobs and housing to meet the needs of a	N/A	N/A

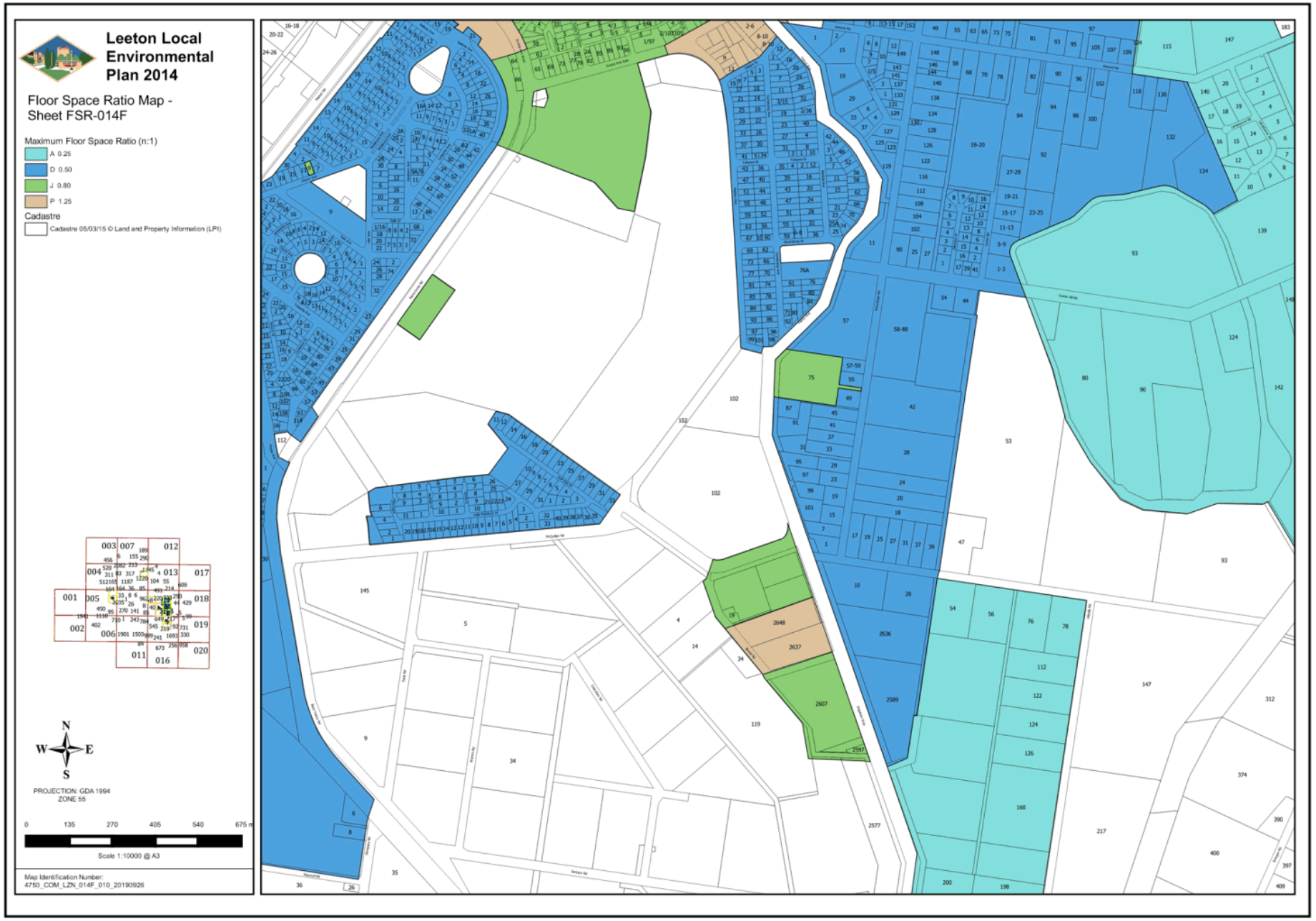
No.	Title	Applicable to Planning Proposal	Consistency
	broad cross-section of the community, and • guide the incremental transformation of the Parramatta Road Corridor in line with the delivery of necessary infrastructure. It does not apply to the Leeton Shire Council Local Government Area.		
7.4	*Implementation of North West Priority Growth Area Land Use and Infrastructure Implementation Plan* The objective of this direction is to ensure development within the North West Priority Growth Area is consistent with the North West Priority Growth Area Land Use and Infrastructure Strategy (the Strategy). It does not apply to the Leeton Shire Council Local Government Area.	N/A	N/A
7.5	*Implementation of Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan* The objective of this direction is to ensure development within the Greater Parramatta Priority Growth Area is consistent with the Greater Parramatta Priority Growth Area Interim Land Use and Infrastructure Implementation Plan dated July 2017 (the interim Plan). It does not apply to the Leeton Shire Council Local Government Area.	N/A	N/A
7.6	*Implementation of Wilton Priority Growth Area Interim Land Use and Infrastructure Implementation Plan* The objective of this direction is to ensure development within the Wilton Priority Growth Area is consistent with the Wilton Interim Land Use and Infrastructure Implementation Plan and Background Analysis. It does not apply to the Leeton Shire Council Local Government Area.	N/A	N/A

Attachment 4 *Leeton Local Environmental Plan 2014* Maps


Leeton Local Environmental Plan 2014
Land Zoning Map - Sheet LZN-014F
Zone
Zone
B1 - Neighbourhood Centre
B2 - Local Centre
B3 - Commercial Core
B5 - Business Development
E1 - National Parks and Nature Reserves
E2 - Environmental Conservation
E4 - Environmental Living
IN1 - General Industrial
IN2 - Light Industrial
R1 - General Residential
R2 - Low Density Residential
R3 - Medium Density Residential
R5 - Large Lot Residential
RE1 - Public Recreation
RE2 - Private Recreation
RU1 - Primary Production
RU5 - Village
SP1 - Special Activities
SP2 - Infrastructure
Cadastre
Cadastre 05/03/15 © Land and Property Information (LPI)
N
W
E
S
PROJECTION: GDA 1994
ZONE 55
0 135 270 405 540 675 m
Scale 1:10000 @ A3
Map Identification Number:
4750_COM_LZN_014F_010_20190926


Leeton Local Environmental Plan 2014
Lot Size Map - Sheet LZN-014F
Zone
Minimun Lot Size (sq m)
I 500
R 750
W 4000
Z1 2 Ha
Z2 4 Ha
AA 8 Ha
AB 40 Ha
AD 150 Ha
Cadastre
Cadastre 05/03/15 © Land and Property Information (LPI)
N
W
E
S
PROJECTION: GDA 1994
ZONE 55
0 135 270 405 540 675 m
Scale 1:10000 @ A3
Map Identification Number:
4750_COM_LZN_014F_010_20190926


Leeton Local Environmental Plan 2014
Height of Buildings Map - Sheet HOB-014F
Maximum Building Height (m)
I 8.5
L 11.5
Cadastre
Cadastre 05/03/15 © Land and Property Information (LPI)
PROJECTION: GDA 1994 ZONE 55
0 135 270 405 540 675 m
Scale 1:10000 @ A3
Map Identification Number: 4750_COM_LZN_014F_010_20190926


Leeton Local Environmental Plan 2014
Floor Space Ratio Map - Sheet FSR-014F
Maximum Floor Space Ratio (n:1)
A 0.25
D 0.50
J 0.80
P 1.25
Cadastre
Cadastre 05/03/15 © Land and Property Information (LPI)
PROJECTION: GDA 1994 ZONE 55
0 135 270 405 540 675 m
Scale 1:10000 @ A3
Map Identification Number: 4750_COM_LZN_014F_010_20190926