



## Application for works approval

### Part V Division 3 of the *Environmental Protection Act 1986*

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<b>Works approval number</b>	W6416/2020/1
<b>Licence holder</b>	Department of Planning, Lands and Heritage
<b>DWER file number</b>	DER2020/000257
<b>Premises</b>	Former Wheal Ellen Mine Site Legal description – Lot 1146 on Deposited Plan 231889 Certificate of Title LR3164/799 and Lot 11448 on Deposited Plan 184560 Certificate of Title LR3075/254
<b>Date of report</b>	4 December 2020
<b>Decision</b>	Works Approval granted

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# 1. Definitions

Key terms relevant to this decision report and their associated definitions are listed in Table 1.

**Table 1: Definitions**

Term	Definition
AACR	Annual Audit Compliance Report
AER	Annual Environment Report
Applicant	Department of Planning, Lands and Heritage
Asbestos	means the asbestiform variety of mineral silicates belonging to the serpentine or amphibole groups of rock-forming minerals and includes actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite and any mixture containing 2 or more of those.
Category/ Categories/ Cat.	categories of Prescribed Premises as set out in Schedule 1 of the EP Regulations
CEO	means Chief Executive Officer. CEO for the purposes of notification means:  Director General Department Administering the <i>Environmental Protection Act 1986</i> Locked Bag 10 JOONDALUP WA 6919 <a href="mailto:info@dwer.wa.gov.au">info@dwer.wa.gov.au</a>
Decision Report	refers to this document
Delegated Officer	an officer under section 20 of the EP Act
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> and designated as responsible for the administration of Part V, Division 3 of the EP Act.
DWER	Department of Water and Environmental Regulation
EP Act	<i>Environmental Protection Act 1986 (WA)</i>
EP Regulations	<i>Environmental Protection Regulations 1987 (WA)</i>
NEPM	<i>National Environment Protection (Ambient Air Quality) Measure</i>
Noise Regulations	<i>Environmental Protection (Noise) Regulations 1997</i>
PCC	Permanent Containment Cell
Prescribed Premises	has the same meaning given to that term under the EP Act.

Premises	refers to the premises to which this Decision Report applies, as specified at the front of this Decision Report.
Risk Event	as described in <i>Guidance Statement: Risk Assessment</i>
TSF	Tailings storage facility

## 2. Purpose and scope of assessment

On 22 June 2020, Department of Planning, Lands and Heritage (the Licence Holder) submitted a works approval application to the Department of Water and Environmental Regulation (DWER). The works approval application is for the construction of a permanent construction cell (PCC) for tailings storage (capacity of 38,780m<sup>3</sup>) and associated clearing of native vegetation.

**Table 2: Classification of premises and proposed design capacity**

Category number	Category description	Design capacity
65	Class IV secure landfill site: premises (other than clean fill premises) on which waste of a type permitted for disposal for this category of prescribed premises in accordance with the Landfill Waste Classification and Waste Definitions 1996, is accepted for burial.	Maximum capacity of 38,780m <sup>3</sup>

This Decision Report is an assessment of the foreseeable Risk Events that have the potential to impact public health, public amenity and the environment, arising from the Primary Activities associated with the construction and operation of the proposed containment cell. The Delegated Officer has determined that the amendment will be granted.

### 2.1 Exclusions

This Decision Report assesses both construction and operation of the PCC however only construction and time limited operations to allow the initial movement of waste will be authorised under the Works Approval. Further operations and management of the PCC will require an amendment to the operating licence. It is anticipated that the applicant will apply for an amendment to the operating licence at around the time of the submission of the stage 1 compliance documentation.

The application includes reference to the removal of asbestos material at the premises to facilitate the works. The removal of asbestos from the premises, and the required methods in doing so, are appropriately authorised and addressed within the current licence for the premises (L9074/2017/1) and are therefore not discussed as part of this Works Approval.

## 3. Application details

Table 3 lists the documents submitted during the assessment process.

**Table 3: Application documents**

Document description	Date received
Application Form, including attached supporting documentation: <ul style="list-style-type: none"><li>Containment Cell design report - Att 3B(1) Northampton Lead Tailings Containment Cell – 100% Design Report</li><li>Works requirements and specifications – Att 3B(2) Northampton Lead Containment Cell – Specification 1 Preliminaries (including design drawings)</li><li>Rehabilitation Plan – Att 3B(3) Northampton Lead Tailings Containment Cell – Rehabilitation Plan</li><li>Geotechnical Factual Report – Att 3B(4) Northampton Lead Containment Cell – Geotechnical Investigation – Factual Report</li><li>Slope Stability Report – Att 3B(5) Memorandum – Northampton Containment Cell Slope Stability</li><li>Flora and Fauna Survey – Att 3D Wheal Ellen: Flora and Fauna Reconnaissance</li></ul>	22/06/2020

Document description	Date received
Survey	
<ul style="list-style-type: none"> <li>Northampton Lead Tailings Specification for Tender</li> <li>Northampton Lead Tailings CQA Plan</li> <li>Letter – I. Watkins to DPLH re Cap Specification Change dated 7 Sept 2020</li> </ul>	10/09/2020
<ul style="list-style-type: none"> <li>Email – AECOM Response to Design and Specification Amendments query</li> </ul>	14/09/2020
<ul style="list-style-type: none"> <li>Northampton Lead Tailings Specification for Tender Rev 1 (including CQA requirements)</li> </ul>	30/09/2020
<ul style="list-style-type: none"> <li>Northampton Containment Cell Cover Slope Stability Rev 1</li> </ul>	02/10/2020
<ul style="list-style-type: none"> <li>Updated Drawings and Design Specifications</li> </ul>	26/10/2020

## 4. Description of proposed activities

### 4.1 Current operations

The Premises is currently licenced as a solid waste depot (licence number L9074/2017/1) under the *Environmental Protection Act 1986* for the storage of lead tailings within a temporary tailings storage facility (TSF) prior to the construction of the permanent PCC. The temporary TSF was constructed under works approval W6068/2017/1. The tailings have been characterised in accordance with Department of Environment Regulation (DER) (2009) Landfill Waste Classification and Waste Definitions to be a Class IV material, due to leachable lead concentrations exceeding the concentration limit for Class II waste (1 mg/L). The current temporary TSF is constructed from in-situ clay. Following stage 1 construction of the PCC, the Applicant will need to seek an amendment to L9074/2017/1 for the further operation and management of the PCC.

### 4.2 Construction summary

The Applicant is proposing to construct the PCC in stages as follows:

- Stage 1A: preparation works and construction of a partial cell adjacent to the south of the existing TSF;
- Stage 1B: relocation of lead tailings and impacted materials from the temporary TSF into the southern portion of the PCC;
- Stage 2: construction of the northern portion of the PCC where the former TSF footprint was located. This portion of the PCC will be used to store tailings and tailings impacted material from the historic stockpiles located within an adjacent lot. Stage 2 also includes construction of the capping layer.

The PCC has been designed to store approximately 38,780 m<sup>3</sup>, based on an estimated volume of 31,700 m<sup>3</sup> of tailings and tailings impacted soil plus an allowance of 7,080 m<sup>3</sup> as a contingency. The PCC is proposed to be single-lined on the basis that the tailings material is inert unless there is water flow, which a lined and capped cell is designed to prevent.

Figure 1 shows the existing premises layout, and Figure 2 demonstrates the proposed construction staging.



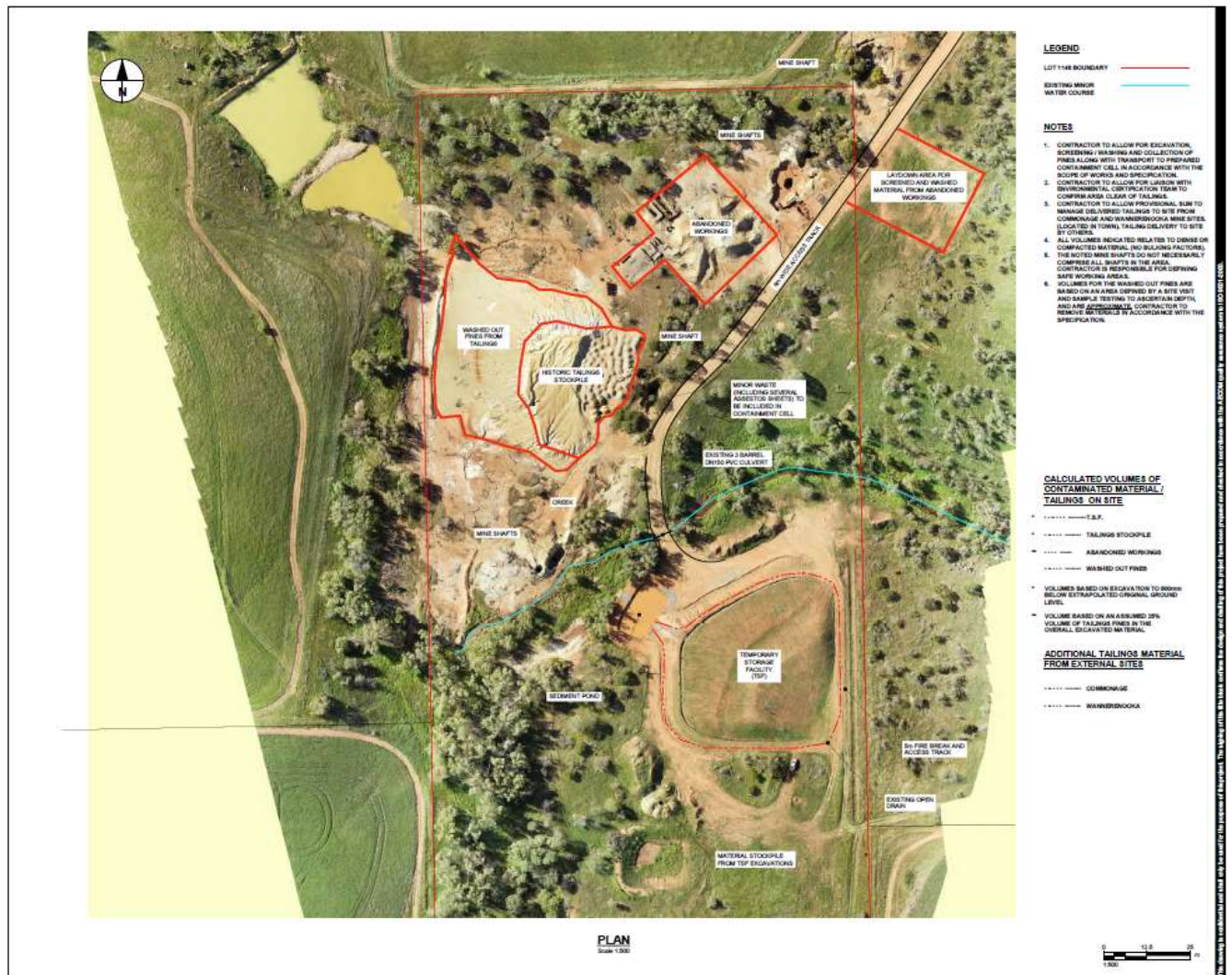


Figure 1: Current Site Layout



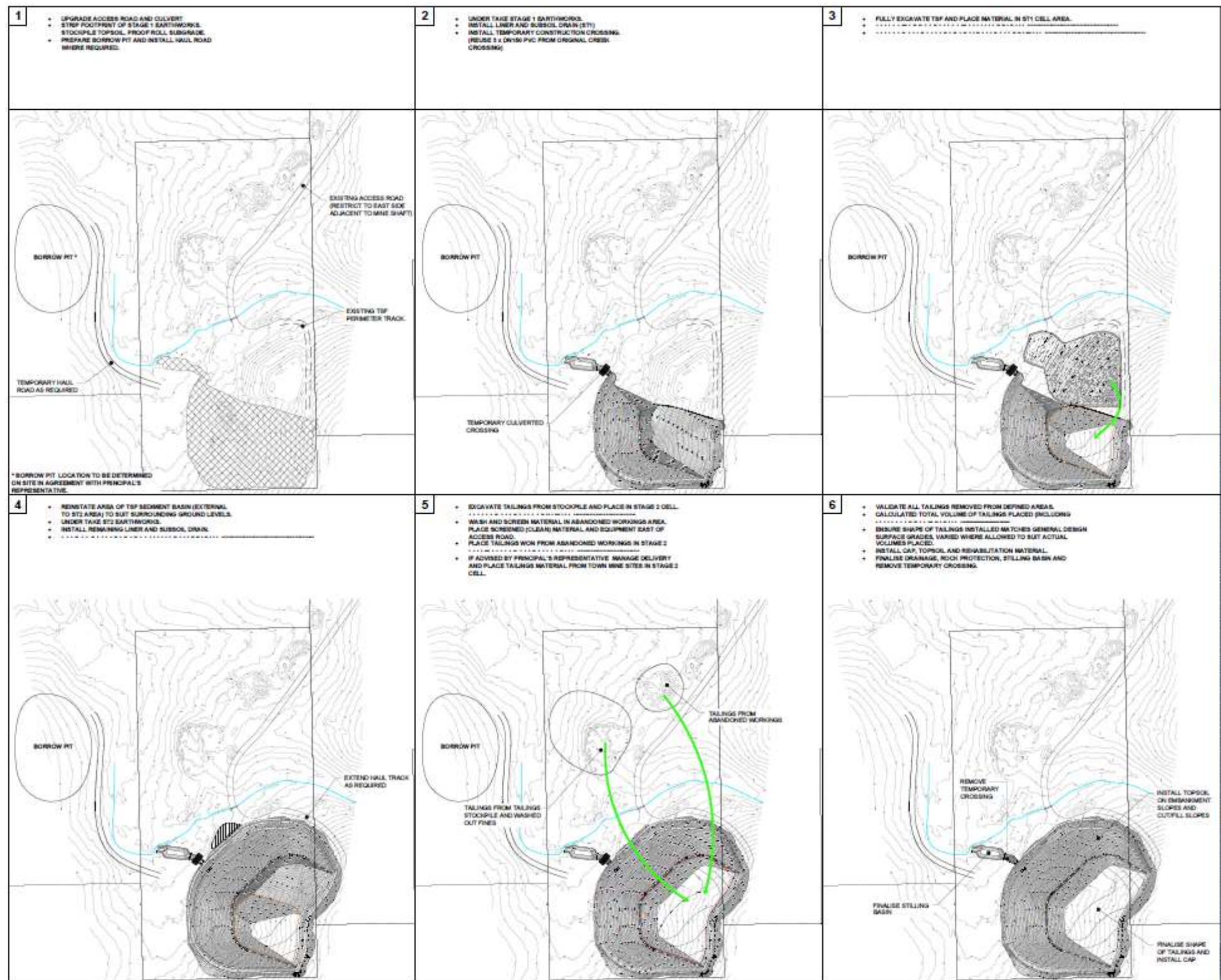


Figure 2: Proposed construction staging

### 4.3 Operations summary

Following construction and filling of the PCC there will be no on-going acceptance or disposal of waste at the premises. Operations will be limited to the maintenance of the PCC and ongoing monitoring. As mentioned previously, ongoing management of the premises is not assessed as part of this works approval.

## 5. Legislative context and other approvals

### 5.1 Occupancy

Lots 1146 and 11448 are crown land, with the Department of Planning, Lands and Heritage listed as the responsible agency on the certificates of title. Therefore, the Applicant is deemed to have occupational control of the premises.

### 5.2 Planning

The Shire of Northampton issued planning approval for the proposal on the 17 August 2020. The planning approval is subject to submission of a management plan detailing how risks of wind and/or water borne erosion and sedimentation will be minimized during the works, to the satisfaction of the Shire. Where works have not substantially commenced within two years, the approval will lapse.

### 5.3 Contaminated Sites Act 2003

The site has been classified under the *Contaminated Sites Act 2003* as 'contaminated – remediation required' due to the historical use as a mining site and as it contains significant stockpiles of unmanaged tailings. Stockpile erosion may lead to contaminated material entering adjacent creek lines and down-stream stock dams. The construction of the PCC is part of the remediation works for the Premises.

### 5.4 Clearing

The application includes a request to clear 0.66 hectares of native vegetation. Clearing has been assessed as part of this works approval application, and the clearing assessment report is provided in Appendix 2.

## 6. Location and siting

### 6.1 Environmental Siting

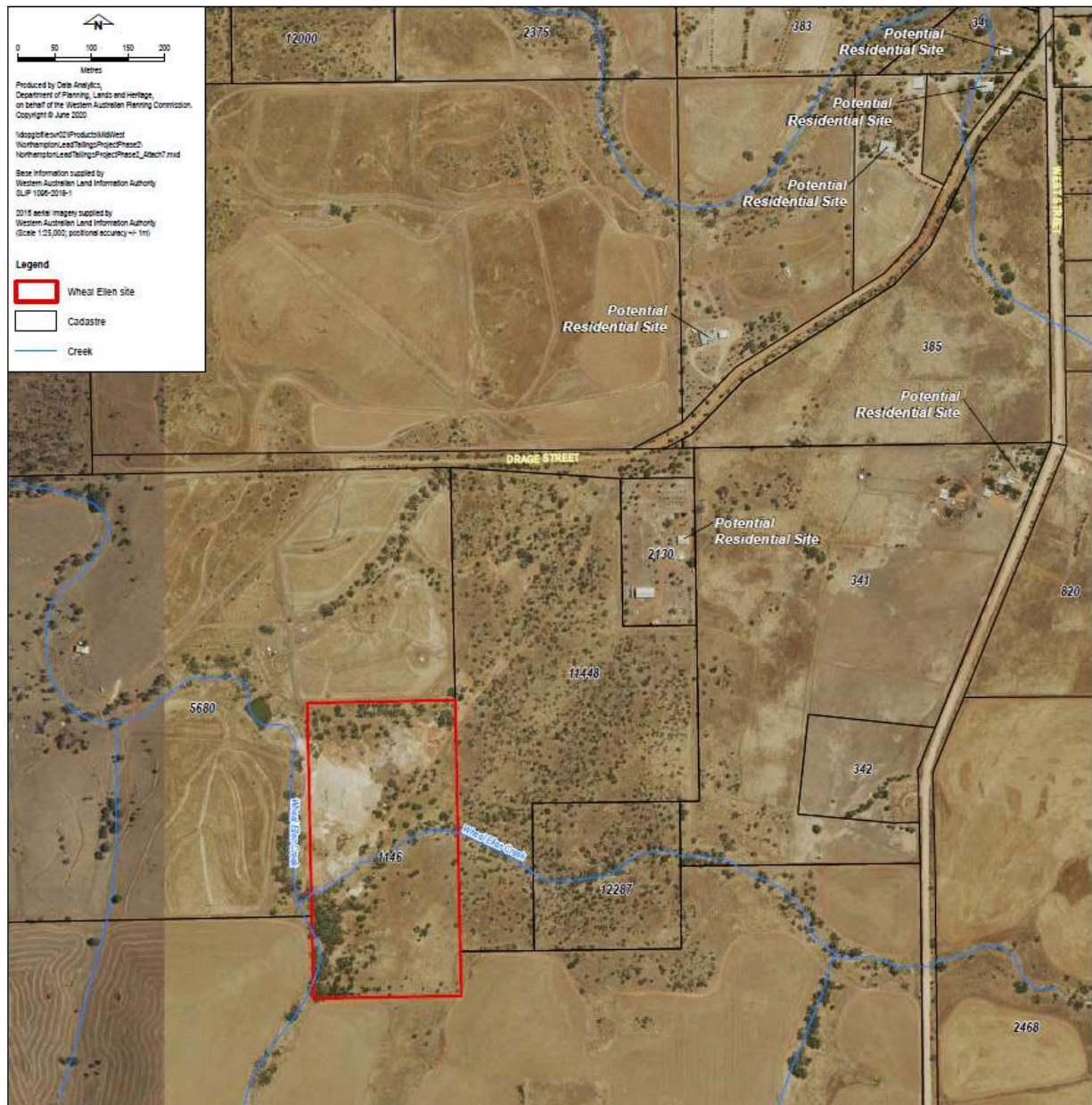
#### 6.1.1 Potential receptors and environmental aspects

Table 7 and Figure 3 provides a summary of human and environmental receptors in proximity to the premises which have a potential to be impacted from site activities, and the risk assessment in Section 7 considers these receptors in the context of emissions and potential pathways.

**Table 7: Distance to receptors**

<b>Human receptors</b>	<b>Distance from prescribed premises</b>
Homestead	Approximately 370 m east north-east of the north-eastern corner of the Premises
Homestead	Approximately 580 m north-east of the north-eastern corner of the Premises
Homestead	Approximately 791 m east north-east of the north-eastern corner of the Premises
Homestead	Approximately 930 m west of the western boundary of the Premises
Homestead	Approximately 1300 m east of the eastern boundary of the Premises
<b>Environmental receptors</b>	<b>Distance from prescribed premises</b>
Wheal Ellen Creek north (ephemeral)	The creeks are located within the Premises, the north creek running through the Premises from east to west and the south creek running through only the south-western corner of the Premises.  The creeks merge and discharge to Nokanena Brook approximately 1 km downstream of the western Premises boundary.
Wheal Ellen Creek south (ephemeral)	
Underlying groundwater (non-potable purposes)	Gascoyne Groundwater Area  Data from monitoring bores within the Premises indicate groundwater at depths ranging between 1.1 m and 11.1 mbgl.
Aboriginal and other heritage sites	Within the Premises





**Figure 3: Distance to residential and surface water receptors**

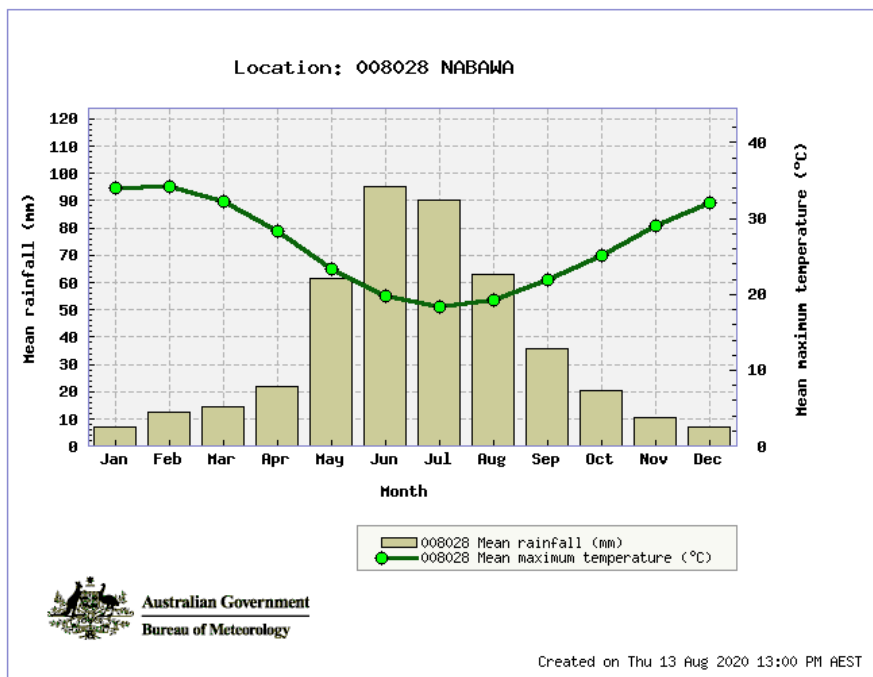
## 6.2 Climate

### 6.2.1 Rainfall and temperature

The nearest Bureau of Meteorology (BoM) station with rainfall and temperature data is Nabawa (station number 008028) located approximately 22 km from the Premises.

As shown in Figure 4, the BoM data for the Nabawa station shows that the area in the vicinity of the Premises has an annual average of 439.7 mm (based on data between 1905 to 2020), with the majority of rainfall received between May to August.

Temperatures average around 18-20 degrees Celsius in winter months, and up to 34 degrees Celsius in summer months, for an average annual temperature of 26.5 degrees Celsius.



Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean rainfall (mm) for years 1905 to 2020	7.2	12.7	14.7	21.9	61.5	95.2	90.3	63.2	35.7	20.3	10.3	7.0	439.7	115
Statistics	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Years
Mean maximum temperature (°C) for years 1912 to 1973	34.1	34.2	32.3	28.3	23.4	19.7	18.4	19.3	22.0	25.1	29.1	32.1	26.5	61

12.3 = Not quality controlled

Figure 4: Nabawa station data

## 6.2.2 Wind direction and strength

The nearest BoM station with wind data is Geraldton Town (station number 008050) located approximately 47 km from the Premises.

Based on the climate data for the Bunbury station the prevailing wind directions are morning easterlies and afternoon southerlies. This is depicted in the wind roses shown in Figure 5.



### **Figure 5: Geraldton Town 9 am and 3 pm wind direction and strength**

It is important to note that these wind roses show historical wind speed and wind direction data for the Geraldton Town weather station and should not be used to predict future data.

#### **6.2.1 Topography**

The applicant has provided the following information regarding the premises topography.

The elevation of the land surface on and in the immediate vicinity of the premises ranges between 105 m and 140 m Australian Height Datum (AHD). The site's maximum elevation is in the southeast corner. The site's surface slopes down from the southeast corner to the west and north towards the Wheal Ellen Creek South and Wheal Ellen Creek East, respectively. The PCC will be constructed to blend into the natural topography of the hillside located within Lot 1146.

#### **6.2.2 Geology**

The applicant has provided the following information regarding the premises geology.

Northampton and immediate surrounds are located on the Northampton Block (GSWA, 1971), which comprises Precambrian metasediments in form of granulite, gneiss, feldspathic quartzite, and pegmatite intruded by steeply dipping dolerite dykes estimated to be up Upper Proterozoic age. The dominate rock types mapped in proximity to the site is Garnet Graulite. Thin colluvial and alluvial sediments derived from these rocks are likely to be spread across the site with possible thicker deposits in and along drainage lines.

Mineralisation of the Northampton Block in the vicinity of the site is related to the movement of fluids along margins of swarms of dolerite dykes. Copper and lead mineralisation is understood to be the result of structurally controlled instruction of metal bearing fluids. The origin of the fluids is not conclusive however it appears that given the apparent spatial differences in copper and lead enriched areas that there were multiple fluids and mineralisation events. The dolerite dykes in the vicinity of Northampton are orientated with a northeast-southwest trend; with one such dyke transecting the premises. Mining activities have been undertaken along those dykes, including at the site.

Mining activities conducted at the site are understood to have included surface mining and the hand excavation of shafts to access and remove ore from below ground using manual and possibly some rudimentary mechanical methods.

#### **6.2.3 Hydrogeology**

The applicant has provided the following information regarding the premises hydrogeology.

Groundwater beneath Northampton and its surrounds is understood to be hosted within fractured and weathered bedrock. Groundwater is inferred to be recharged through general vertical infiltration through the surface soils and also from the natural drainage network in the greater Northampton area including the Wheal Ellen Creek East and Wheal Ellen Creek South which traverse the Site. Depth to groundwater from the existing groundwater monitoring wells installed around the TSF ranged between 1.1 m and 11.1 m below ground level with differences in topography resulting in the variances.

Groundwater was previously used for the town water supply with nine production bores located near margins of dolerite dykes generally within 3 km of the town. None of these are located on the Site, with the closest >500 m south east of the premises. Drinking water is now supplied with scheme water from the Allanooka Facility south of Geraldton. It is also understood that groundwater is currently abstracted by the Shire of Northampton for irrigation in the town however this is sourced from locations away from the site. There are currently no known groundwater abstraction bores at, or in proximity to, the site.

## 7. Proposed landfill engineering and design

The following sections provide a summary of the proposed PCC construction specifications and incorporate the Delegated Officer's key findings relevant to the assessment of risks related to potential emissions and discharges from the proposal.

### 7.1 Summary

The key aspects of the PCC are summarised in Table 8, and cross sections of the landfill design are shown in Figures 5 and 6.

**Table 8: Proposed PCC Design**

PCC design aspect	Description
Footprint	2.62 ha
Capacity	Total capacity – 38,780 m <sup>3</sup> excluding cover material
Groundwater separation distance	greater than or equal to 3 metres
Cell lifespan	Immediate placement of tailings and closure, no on-going operation.
Side slopes	1V:5H and 1V:2H
Basal gradient	1 in 5 to 1 in 6 (average 1 in 5.5)
Final slope profile	No steeper than 1V:3.5H
Maximum height	132 AHD (including capping)
Containment system	Basal liner system and capping system

### 7.2 Landfill liner system and performance

#### 7.2.1 Landfill liner design

The Licence Holder has proposed a landfill liner design consisting of;

- 200 mm thick protective layer of locally-sourced sand over the prepared subgrade,
- 2.00 mm textured HDPE liner
- a cushion geotextile liner,
- a minimum 300 mm sand protection layer (excluding the cell side batters)

The HDPE liner will continue on the surface of the embankment slope, however there will be no sand layer due to the slope of 1V:2H, and so instead there will be a cushion geotextile installed on either side of the liner.

#### 7.2.2 Landfill liner performance



The Applicant has not conducted a seepage assessment within the application, however the tailings are not expected to generate leachate during the life of the PCC.

The Applicant has assessed the expected liner performance, taking into account available soil temperature data for the Geraldton Airport, and water temperature data from the Premises. The Applicant considers that the estimated service life of the liner will likely be 400-500 years.

Internal expert advice from DWER's Contaminated Sites area confirmed that the general design of the PCC is suitable for receiving the stockpiled lead tailings

**Key Findings:**

The Delegated Officer notes advice received by the Department that confirms that it can approve landfill cell designs which vary from those outlined in the Landfill Waste Classification and Waste Definitions 1996.

The Delegated Officer has considered expert advice from DWER's Contaminated Sites area and has determined that the proposed design for construction of the PCC incorporates a composite liner system which is suitable for receiving the stockpiled lead tailings meeting a Class IV waste classification.

### 7.3 Separation distance to groundwater

The lowest point of the PCC will be 118.981m AHD, while the highest recorded groundwater level in the area was measured at 111.591m AHD. This provides for a measured separation distance of 7m, which the Applicant has determined provides a minimum 3m separation when variations in topography are considered.

### 7.4 Leachate collection and storage

The tailings waste is not putrescible, and therefore it is not expected that leachate will be generated during the life of the PCC. However, during construction there is potential for stormwater ingress resulting in a small volume of leachate during this phase. Control measures proposed to limit the volume of stormwater entering the cell include undertaking the works during the dry season and covering the works as needed, and the ability to pump collected water during tailings placement via the Megaflo and monitoring point.

The Megaflo system will be installed along the lowest point of the PCC base, and drain to a collection sump. Access to the sump will provide the ability to monitor leachate and pump as necessary.

**Key Findings:**

The Delegated Officer has determined that due to the limited ability for the lead tailings to generate leachate, and the immediate capping of the PCC;

- a) the proposed leachate control measures are suitable for the PCC;
- b) detailed water balance modelling is not necessary for this application; and
- c) a seepage assessment is not necessary for this application.

The Delegated Officer notes that preventing the ingress of water during the construction phase is the most relevant control in minimising any leachate generation. Additionally, ensuring a high quality of liner construction will minimise seepage, if any.

## 7.5 Stormwater and sediment management

Specific stormwater management measures are yet to be developed, with the applicant requiring their contractor submit an Erosion and Sedimentation Control Plan (ESCP) seven days prior to the commencement of work in each catchment area of the premises. The key minimum requirements of an ESCP are outlined by the applicant as follows:

- Prompt completion of drainage works to minimises exposure of disturbed areas
- Diversion of uncontaminated stormwater from outside of the premises prior to any adjacent ground disturbances
- Uncontaminated water must pass through the premises without mixing with contaminated waters at the premises
- Use of sediment filtering or sediment traps in advance of and in conjunction with earthworks operations to prevent contaminated water leaving the premises
- Daily inspection and maintenance of drainage infrastructure
- Limiting the areas of erodible material being worked on at any one time.
- Minimising the loss of sediment during construction of embankments
- Maintaining a 5 m buffer zone between stockpiles and any stream/flow path
- Access and exit areas to include shake-down or other methods for the removal of soil materials from vehicles

Permanent stormwater management for the final landform of the capped PCC will be managed through three catchment areas which direct flow to an open drain which directs stormwater to a stilling basin to allow sediments to be settled before discharge to the creek line. Figure 5 shows the catchment areas and drainage infrastructure

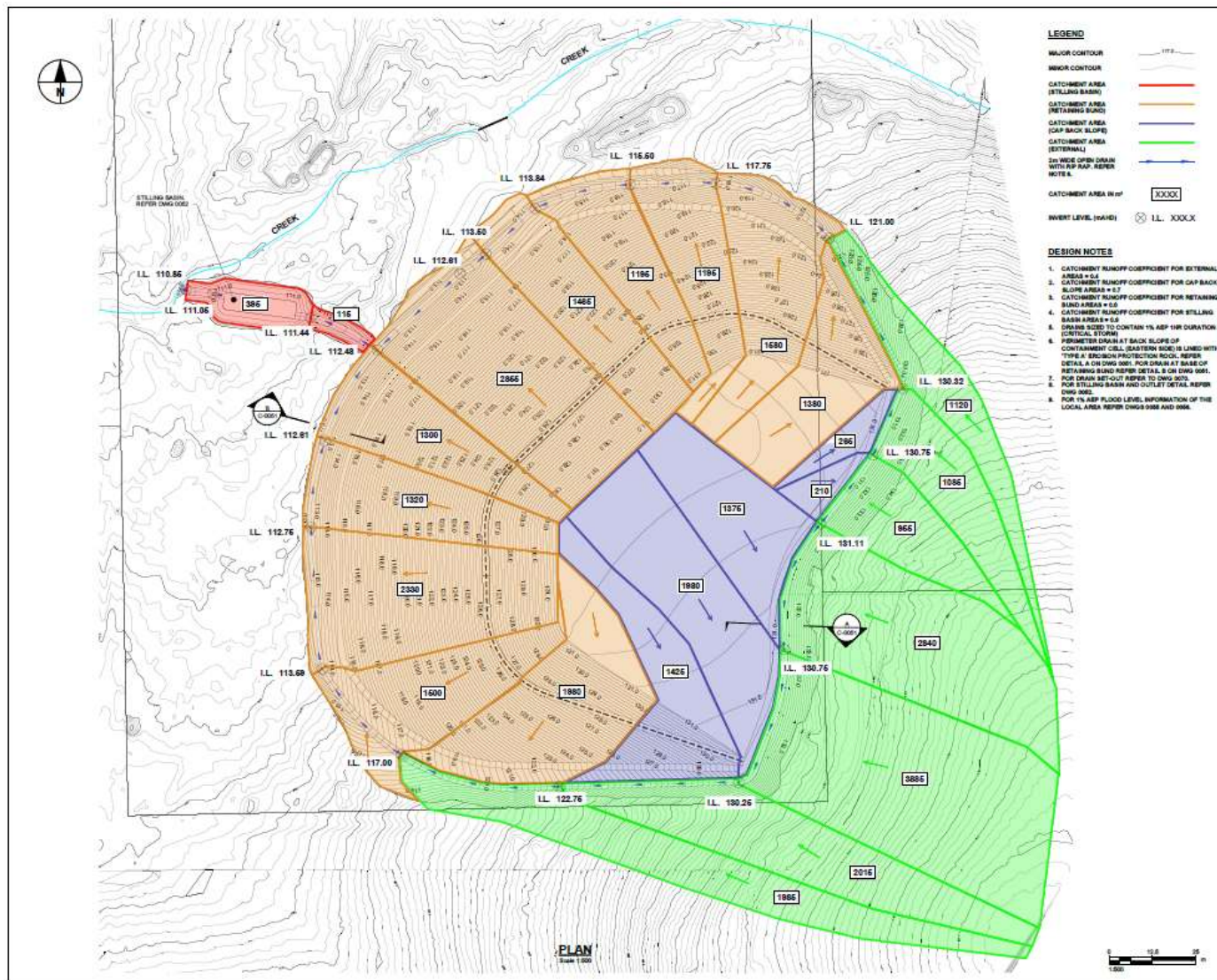


Figure 5: PCC stormwater drainage infrastructure

## 7.6 Capping system

The applicant has proposed a capping layer consisting of a 2 mm HDPE double-textured liner, a 300 mm sand layer and a 500 mm rehabilitation layer. The rehabilitation layer will be placed in a single layer, in a matter to avoid significant compaction to enable rapid vegetation growth.

## 7.7 Landfill gas infrastructure

The tailings waste is not putrescible, and therefore it is not expected that landfill gas will be generated. No landfill gas infrastructure is proposed.

## 7.8 Stability assessment

Stability of a landfill is important to ensure the landfill will maintain integrity over the entire lifecycle of the landfill. Instability of the landfill has the potential to result in liner system failure which may result in emissions to land and groundwater. A slope stability analysis should demonstrate that there are adequate safety factors for all relevant potential failure mechanisms, both at the proposed final landform and at interim stages during construction.

The applicant has provided a stability analysis of the PCC which was undertaken using SLOPE/W slope stability software using optimised failure search routine (covering both circular and planar failure slip surfaces). The geotechnical design strengths for the materials was provided, and lower estimate values were adopted.

The assessment used 10 different scenarios to model activities including full storage capacity, static and seismic events, and construction activities. All 10 scenarios met or exceeded the target factors of safety as developed from ANCOLD for design of tailings dams.

Non-circular failure assessment was used in order to target the strength along interfaces as these are the limiting condition for stability. As the assessment was carried out on lower estimate strengths, a sensitivity analysis was not provided as any sensitivity would produce higher factors of safety.

The proposed cell cover was also analysed for its ability to remain stable following construction. Based on a minimum design friction angle, factors of safety for a dry slope, half-saturated and even fully saturated sand layer will satisfy or exceed the minimum factor of safety.

### Key Findings:

The Delegated Officer considers the type of modelling and factors of safety utilised are acceptable, and the outcomes of the analysis demonstrate that appropriate factors of safety are likely to be met.

## 7.9 Construction Quality Assurance

A construction quality assurance plan for the construction of the PCC was provided with the application (*Northampton Lead Tailings Project Phase 2 Part B, Construction of Permanent Containment Cell, Issue for Tender – Specification, Rev 1, 29 Sept 2020*) which along with the design drawings in the application documentation provide detail on the material and construction specifications, quality assurance testing methods and procedures required for the proposal.

# 8. Facility operations and management

## 8.1 Operational Controls

The Applicant will require the construction contractor to develop a Construction Environmental

Management Plan, and Dust Management Plan, which must include the controls detailed in Table 9 as a minimum. The premises is currently subject to a number of control measures within the current licence L9074/2017/1, which are also detailed in Table 9.

**Table 9 Proposed Controls**

Potential Emission	Proposed Controls	Current controls conditioned in L9074/2017/1
Dust (including lead contaminated dust) and windblown waste	<ul style="list-style-type: none"> <li>• The use of a dust suppression water cart and surface sealant, minimising handling of the material, avoiding transport in inclement weather, installed tailings to be covered daily at cessation of works.</li> <li>• Frequent watering of areas disturbed by the Contractor.</li> <li>• Use of wind fencing.</li> <li>• Staging, site clearing and replacing of topsoil to minimise the length of time disturbed areas are left exposed.</li> <li>• Operations with dust creating potential not to be carried out when wind velocities create a nuisance.</li> <li>• The timely stabilisation of completed earth worked areas.</li> <li>• Compacted tailings are to be either covered or treated with a suitable polymer or alternative method to prevent water erosion or dust blow before the end of each working day.</li> <li>• Operations will comply with “A Guideline for Managing the Impacts of Dust and Associated Contaminants from Land Development Sites, Contaminated Sites, Remediation and Other Related Activities”, Department of Environment and Conservation, March 2011.</li> </ul>	<ul style="list-style-type: none"> <li>• No operation of equipment during high wind conditions</li> <li>• All vehicle tyres to be free of dirt before exiting the premises.</li> <li>• Low speed signage (<math>\leq 10</math> km/hr) within the premises boundary</li> <li>• Internal roads and trafficable areas to be kept damp at all times during operation</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Works at the premises are required to comply with the <i>Environmental Protection (Noise) Regulations 1997</i>.</li> </ul>	<ul style="list-style-type: none"> <li>• All vehicles/equipment to be fitted with noise mitigation and minimisation equipment.</li> </ul>



	<ul style="list-style-type: none"> <li>• Earthmoving machinery should be maintained in good working order with effective silencers where applicable.</li> <li>• Works will only occur during hours approved by the Shire of Northampton.</li> </ul>	
Stormwater contaminated with sediments and/or lead tailings	<ul style="list-style-type: none"> <li>• Construction is proposed to begin during summer months to avoid excessive rainfall.</li> <li>• Construction specifications include erosion and sediment control.</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of operational areas such that uncontaminated stormwater is directed away from operational areas.</li> <li>• Groundwater monitoring</li> </ul>
Leachates high in lead compounds	<ul style="list-style-type: none"> <li>• Construction is proposed to begin during summer months to avoid excessive rainfall.</li> <li>• Construction specifications designed to capture and prevent seepage of any leachate.</li> </ul>	N/A

Additional controls within the current licence L9074/2017/1 include:

- Maintenance of secure fencing around the perimeter of the premises with access to the facility through a lockable, gated entry/exit point.
- A 1.8 m high chain wire security fence across the entry section on Drage Street
- Signage at entry points identifying waste types for acceptance with emergency phone numbers.
- Premises to be locked when not manned.

#### Key Findings:

1. The Delegated Officer notes that while management plans are yet to be developed, DWER's risk assessment will consider the above minimum proposed controls as outlined in the application documentation.
2. As the premises is currently subject to licence conditions under L9074/2017/1 these control measures will be considered part of the risk assessment for this works approval.

## 8.2 Environmental monitoring and sampling

Following completion of the PCC the Applicant is proposing to undertake groundwater monitoring. The current licence conditions require groundwater monitoring, and will provide baseline data to compare future monitoring to. The timing and groundwater parameters for ongoing monitoring are yet to be determined, however they are likely to consist of quarterly monitoring events over the first 2 years, which will inform requirements for ongoing monitoring over the life of the PCC.

**Key Findings:**

1. The Delegated Officer considers that groundwater monitoring is the main mechanism by which the ongoing effectiveness and integrity of the PCC as piece of critical containment infrastructure can be observed.
2. The Delegated officer notes that groundwater timing and parameters are yet to be determined, and considers that the specifics can be determined during the licence amendment stage.

## 9. Risk assessment

The identification of the sources, pathways and receptors to determine Risk Events are set out in Tables 10 and 11 below, consistent with the *Guidance Statement: Risk Assessments*. Risk ratings have been assessed for each key emission source and take into account potential source-pathway-receptor linkages. The mitigation measures / controls proposed by the Applicant have been considered in determining the risk rating. Emissions during construction and operation have been assessed separately to allow clear delineation of activity phases.

The works approval that accompanies this report authorises construction only. A licence is required to operate the premises.

The conditions in the issued Works Approval, as outlined in Table 10 and 11, have been determined in accordance with the *Guidance Statement: Setting Conditions*.



## 9.1 Risk assessment – construction

**Table 10: Identification of emissions, pathway and receptors during construction**

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
<b>Site preparations</b> <b>Staged construction of permanent containment cell and drainage infrastructure</b> <b>Vehicle movements</b>	Dust	Human receptors (Nearest residence is approximately 370 m east north-east).	Air/windborne pathway	Impacts to health and amenity	Yes	See section 9.4
	Noise				Yes	See section 9.5
	Stormwater contaminated with lead tailings or sediments	Wheal Ellen Creek located within the Premises	Overland flow	Ecosystem disturbance or impacts to surface water quality.	Yes	See section 9.6

## 8.2 Risk assessment – operation

**Table 11: Identification of emissions, pathway and receptors**

Risk Events					Continue to detailed risk assessment	Reasoning
Sources/Activities	Potential emissions	Potential receptors	Potential pathway	Potential adverse impacts		
Relocation of tailings from the temporary TSF and other stockpiles, into the PCC	Dust	Human receptors (Nearest residence is approximately 370 m east north-east).	Air/windborne pathway	Impacts to health and amenity	Yes	See section 9.4
	Noise				Yes	See section 9.5
	Stormwater contaminated with lead tailings or sediments	Wheal Ellen Creek located within the Premises	Overland flow	Ecosystem disturbance or impacts to surface water quality.	Yes	See section 9.6
Ongoing storage of tailings in the PCC	Dust	Human receptors (Nearest residence is approximately 370 m east north-east).	Air/windborne pathway	Impacts to health and amenity	No	Following the placement of tailings into the PCC, the PCC will be capped and no waste will be accepted at the premises. Therefore there is unlikely to be any dust or noise generated from the ongoing tailings storage.
	Noise					
	Leachate high in lead compounds	Groundwater	Seepage	impacts to groundwater quality	Yes	See section 9.6
	Sediment laden stormwater	Wheal Ellen Creek located within the Premises	Overland flow	Ecosystem disturbance or impacts to surface water quality.	Yes	See section 9.7

## 9.2 Consequence and likelihood of risk events

A risk rating will be determined for risk events in accordance with the risk rating matrix set out in Table 14 below.

**Table 4: Risk rating matrix**

Likelihood	Consequence				
	Slight	Minor	Moderate	Major	Severe
Almost certain	Medium	High	High	Extreme	Extreme
Likely	Medium	Medium	High	High	Extreme
Possible	Low	Medium	Medium	High	Extreme
Unlikely	Low	Medium	Medium	Medium	High
Rare	Low	Low	Medium	Medium	High

DWER will undertake an assessment of the consequence and likelihood of the Risk Event in accordance with Table 15 below.

**Table 5: Risk criteria table**

Likelihood		Consequence		
The following criteria has been used to determine the likelihood of the Risk Event occurring.		The following criteria has been used to determine the consequences of a Risk Event occurring:		
			Environment	Public health* and amenity (such as air and water quality, noise, and odour)
Almost Certain	The risk event is expected to occur in most circumstances	Severe	<ul style="list-style-type: none"> <li>onsite impacts: catastrophic</li> <li>offsite impacts local scale: high level or above</li> <li>offsite impacts wider scale: mid-level or above</li> <li>Mid to long-term or permanent impact to an area of high conservation value or special significance<sup>^</sup></li> <li>Specific Consequence Criteria (for environment) are significantly exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Loss of life</li> <li>Adverse health effects: high level or ongoing medical treatment</li> <li>Specific Consequence Criteria (for public health) are significantly exceeded</li> <li>Local scale impacts: permanent loss of amenity</li> </ul>
Likely	The risk event will probably occur in most circumstances	Major	<ul style="list-style-type: none"> <li>onsite impacts: high level</li> <li>offsite impacts local scale: mid-level</li> <li>offsite impacts wider scale: low level</li> <li>Short-term impact to an area of high conservation value or special significance<sup>^</sup></li> <li>Specific Consequence Criteria (for environment) are exceeded</li> </ul>	<ul style="list-style-type: none"> <li>Adverse health effects: mid-level or frequent medical treatment</li> <li>Specific Consequence Criteria (for public health) are exceeded</li> <li>Local scale impacts: high level impact to amenity</li> </ul>
Possible	The risk event could occur at some time	Moderate	<ul style="list-style-type: none"> <li>onsite impacts: mid-level</li> <li>offsite impacts local scale: low level</li> <li>offsite impacts wider scale: minimal</li> <li>Specific Consequence Criteria (for environment) are at risk of not being met</li> </ul>	<ul style="list-style-type: none"> <li>Adverse health effects: low level or occasional medical treatment</li> <li>Specific Consequence Criteria (for public health) are at risk of not being met</li> <li>Local scale impacts: mid-level impact to amenity</li> </ul>
Unlikely	The risk event will probably not occur in most circumstances	Minor	<ul style="list-style-type: none"> <li>onsite impacts: low level</li> <li>offsite impacts local scale: minimal</li> <li>offsite impacts wider scale: not detectable</li> <li>Specific Consequence Criteria (for environment) likely to be met</li> </ul>	<ul style="list-style-type: none"> <li>Specific Consequence Criteria (for public health) are likely to be met</li> <li>Local scale impacts: low level impact to amenity</li> </ul>
Rare	The risk event may only occur in exceptional circumstances	Slight	<ul style="list-style-type: none"> <li>onsite impact: minimal</li> <li>Specific Consequence Criteria (for environment) met</li> </ul>	<ul style="list-style-type: none"> <li>Local scale: minimal to amenity</li> <li>Specific Consequence Criteria (for public health) met</li> </ul>

<sup>^</sup> Determination of areas of high conservation value or special significance should be informed by the *Guidance Statement: Environmental Siting*.

\* In applying public health criteria, DWER may have regard to the Department of Health's *Health Risk Assessment (Scoping) Guidelines*.

“onsite” means within the Prescribed Premises boundary.

### 9.3 Acceptability and treatment of Risk Event

DWER will determine the acceptability and treatment of Risk Events in accordance with the Risk treatment table 16 below:

**Table 6: Risk treatment table**

Rating of Risk Event	Acceptability	Treatment
<b>Extreme</b>	Unacceptable.	Risk Event will not be tolerated. DWER may refuse application.
<b>High</b>	May be acceptable. Subject to multiple regulatory controls.	Risk Event may be tolerated and may be subject to multiple regulatory controls. This may include both outcome-based and management conditions.
<b>Medium</b>	Acceptable, generally subject to regulatory controls.	Risk Event is tolerable and is likely to be subject to some regulatory controls. A preference for outcome-based conditions where practical and appropriate will be applied.
<b>Low</b>	Acceptable, generally not controlled.	Risk Event is acceptable and will generally not be subject to regulatory controls.

### 9.4 Risk Assessment – Dust Impacts

#### 9.4.1 Hazard characterisation and impact

Dust may be generated during construction activities from vehicle movement on unsealed access roads, earthworks and stockpiling of material. Construction is expected to be limited to a short term period. Sources of dust during time limited operations include vehicle movements and placement of tailings.

Dust may cause reduced local air quality and nuisance impacts and may also cause public health impacts if particulate matter is inhaled. During time limited operations and the movement of tailings material, there is potential for some of the dust generated to contain lead tailings which may cause additional health impacts if inhaled. Wind direction and strength may impact the intensity and direction of dust impacts. The residential premises within the vicinity of the premises are considered to be the most affected by potential dust emissions.

#### 9.4.2 Criteria for assessment

The relevant criteria for assessment of dust emissions as PM<sub>10</sub> is 50 µg/m<sup>3</sup> over 24 hours as specified in the *National Environment Protection (Ambient Air Quality) Measure* (NEPM). The NEPM is the relevant criteria for assessment in relation to human health and wellbeing.

Amenity impacts can also be assessed against the general provisions of the EP Act, specifically whether fugitive dust unreasonable interferes with the health, welfare, convenience, or comfort of any person.

#### 9.4.3 Applicant controls

Refer to section 8.

#### 9.4.4 Consequence

##### **Construction**

Based upon the sensitivity of the most affected receptor (residential premises) the Delegated Officer has determined that the impact of dust emissions during construction may be minimal impacts to amenity. Therefore the Delegated Officer considers the consequence to be Slight.

##### **Time Limited Operations**

Based upon the sensitivity of the most affected receptor (residential premises) and the potential for dust during time limited operations to contain lead tailings the Delegated Officer has determined that the impact of dust emissions during time limited operations will be Moderate.

#### 9.4.5 Likelihood of Risk Event

##### **Construction**

Based upon the applicant's controls and the duration of construction activity the Delegated Officer has determined that slight dust impacts during construction will probably not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be Unlikely.

##### **Time Limited Operations**

Based upon the applicant's controls and the duration of time limited operations the Delegated Officer has determined that moderate impacts during time limited operations will probably not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be Unlikely.

#### 9.4.6 Overall rating

##### **Construction**

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of dust impacts on receptors during construction is Low.

##### **Time Limited Operations**

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of dust impacts on receptors during time limited operations is Medium.

#### 9.4.7 Acceptability of Risk Event

##### **Construction**

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and will generally not be subject to regulatory controls

##### **Time Limited Operations**

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and may be subject to regulatory controls.

#### 9.4.8 Regulatory Controls for dust emissions

The Delegated Officer considers that the applicant's proposed controls are likely to be sufficient in managing potential dust emissions during both construction and time limited operations. Conditions reflecting the applicant's proposed controls will be placed on the works approval in relation to controlling dust emissions during the placement of tailings during time

limited operations.

## 9.5 Risk Assessment – Noise Impacts

### 9.5.1 Hazard characterisation and impact

During construction, noise emissions may occur from vehicle movement, excavation of soil, placement of the liner and general earthworks. Construction is expected to be limited to a short time period.

During time limited operations, noise emissions may occur from vehicle movement and placement of waste.

Noise emissions may cause amenity impacts. The residential premises within the vicinity of the premises are considered to be the most affected by potential noise emissions.

### 9.5.2 Criteria for assessment

The criteria for assessment of noise emissions is the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations) and the premises activities will be subject to these regulations.

### 9.5.3 Applicant controls

Refer to section 8.

### 9.5.4 Consequence

#### Construction

Based upon the sensitivity of the most affected receptor (residential premises) the Delegated Officer has determined that the impact of noise emissions during construction will be minimal impacts to amenity. Therefore the Delegated Officer considers the consequence to be Slight.

#### Time Limited Operations

Based upon the sensitivity of the most affected receptor (residential premises) the Delegated Officer has determined that the impact of noise emissions during time limited operations will be minimal impacts to amenity. Therefore the Delegated Officer considers the consequence to be Slight.

### 9.5.5 Likelihood of Risk Event

#### Construction

Based upon the applicant's controls and the duration of construction activity the Delegated Officer has determined that slight noise impacts during construction will probably not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be Unlikely.

#### Time Limited Operations

Based upon the applicant's controls and the duration of time limited operations the Delegated Officer has determined that slight impacts during time limited operations will probably not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be Unlikely.

### 9.5.6 Overall rating

#### Construction

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of noise impacts on receptors during construction is Low.

#### **Time Limited Operations**

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of noise impacts on receptors during time limited operations is Low.

### **9.5.7 Acceptability of Risk Event**

#### **Construction**

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and will generally not be subject to regulatory controls

#### **Time Limited Operations**

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and will generally not be subject to regulatory controls

### **9.5.8 Regulatory Controls for dust emissions**

The Delegated Officer considers that the applicant's proposed controls are likely to be sufficient in managing potential noise emissions during both construction and time limited operations, and no additional controls will be placed on the works approval.

## **9.6 Risk Assessment – Contaminated Stormwater Impacts**

### **9.6.1 Hazard characterisation and impact**

During construction and time limited operations, stormwater may become contaminated with sediments and lead tailings which may then be transported via overland run-off to the Wheal Ellen Creek which is located on the premises.

During ongoing storage of tailings in the capped PCC, stormwater may also transport sediments via overland run-off to the Wheal Ellen Creek, however once the PCC is capped stormwater is unlikely to be contaminated with lead tailings.

Stormwater contaminated with sediments may cause impacts to surface water quality of the Wheal Ellen Creek and surface waters downstream. Stormwater that contains lead tailings sediments may also cause impacts to surface water quality as well as contaminate soils in surrounding land.

### **9.6.2 Criteria for assessment**

Guidelines which are considered relevant for surface water quality at this premises include *Water Quality Protection Guidelines No. 2 (2000) Tailings Facilities*, and *Department of Water (DoW) Water Notes 17, Sediment in Streams*.

### **9.6.3 Applicant controls**

Refer to section 8.

### **9.6.4 Consequence**

#### **Construction**



Based upon the sensitivity of the most affected receptor (Wheal Ellen Creek) the Delegated Officer has determined that the impact of contaminated stormwater emissions during construction could be low level off-site impacts. Therefore the Delegated Officer considers the consequence to be Moderate.

#### **Time Limited Operations**

Based upon the sensitivity of the most affected receptor (Wheal Ellen Creek) the Delegated Officer has determined that the impact of contaminated stormwater emissions during time limited operations could be low level off-site impacts. Therefore the Delegated Officer considers the consequence to be Moderate.

### **9.6.5 Likelihood of Risk Event**

#### **Construction**

Based upon the applicant's controls and the duration of construction activity the Delegated Officer has determined that moderate impacts during construction will probably not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be Unlikely.

#### **Time Limited Operations**

Based upon the applicant's controls and the duration of time limited operations the Delegated Officer has determined that moderate impacts during time limited operations will probably not occur in most circumstances. Therefore, the Delegated Officer considers the consequence to be Unlikely.

### **9.6.6 Overall rating**

#### **Construction**

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of contaminated stormwater impacts on receptors during construction is Medium.

#### **Time Limited Operations**

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of contaminated stormwater impacts on receptors during time limited operations is Medium.

### **9.6.7 Acceptability of Risk Event**

#### **Construction**

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and may be subject to regulatory controls.

#### **Time Limited Operations**

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and may be subject to regulatory controls.

### **9.6.8 Regulatory Controls for stormwater emissions**

The Delegated Officer considers that the applicant's proposed controls are likely to be sufficient in managing potential stormwater emissions during both construction and time limited operations. Conditions reflecting the applicant's proposed controls will be placed on the works approval in relation to controlling dust emissions during the placement of tailings during time limited operations.

## 9.7 Risk Assessment – Leachate Impacts

### 9.7.1 Hazard characterisation and impact

Leachate seepage to groundwater from landfilling operations may arise if defects occur during placement and/or over time in the liner or leachate management system. Defects may occur due to manufacturing faults, poor installation, failure to conduct adequate Control Quality Assurance (CQA) checks and instability of subbase or internal waste. Landfill liner systems cannot be made completely impermeable and all liners will therefore experience a certain level of leachate seepage over time. Adequate capping of a landfill cell at closure is required to reduce ingress of stormwater and reduce the potential for leachate generation over the long term. Emissions may also occur if stormwater is not appropriately managed during the placement of waste within the PCC.

The lead tailings material to be placed within the PCC has shown through testing that leachable lead concentrations exceed 1mg/L and therefore any leachate from the PCC is likely to contain similar levels of lead compounds.

The groundwater directly below the premises is considered to be the most affected receptor. Any seepage of leachate from the PCC is likely to impact groundwater quality.

### 9.7.2 Criteria for assessment

Groundwater in the vicinity of the premises is used for non-potable uses. Therefore guidelines which are considered appropriate for the known and potential beneficial uses of groundwater in the vicinity of the premises include *Contaminated Sites Ground and Surface Water Chemical Screening Guidelines*, Department of Health (DOH 2014) for non-potable uses and *Long Term Irrigation Water ANZECC & ARMCANZ* (2000) for irrigation.

### 9.7.3 Applicant/Licence Holder controls

Refer to section 8.

The Delegated Officer notes that the current licence for the premises requires groundwater monitoring, however long-term groundwater monitoring parameters are yet to be developed and these will be assessed and considered as part of a future licence amendment application.

### 9.7.4 Consequence

Based upon the sensitivity of the most affected receptor (groundwater) the Delegated Officer has determined that the impact of leachate emissions during operations may be low level off-site impacts. Therefore the Delegated Officer considers the consequence to be Moderate.

### 9.7.5 Likelihood of Risk Event

Based upon the applicant's controls including groundwater separation distance, the Delegated Officer has determined that moderate impacts would probably not occur in most circumstances, and would only be expected to occur where there was a failure in control infrastructure, or during CQA. Therefore, the Delegated Officer considers the consequence to be Unlikely.

### 9.7.6 Overall rating

The Delegated Officer has compared the consequence and likelihood rating described above for the Risk Criteria and determined that the overall rating for the risk of leachate impacts on receptors is Medium.

### 9.7.7 Acceptability of Risk Event

As per DWER's acceptability and treatment of Risk Events the Delegated Officer has determined that the risk event is acceptable and may be subject to regulatory controls.

### 9.7.8 Regulatory Controls for dust emissions

The Delegated Officer considers that the applicant's proposed controls including construction specifications and CQA requirements are likely to be sufficient in managing potential leachate emissions. Conditions reflecting the applicant's proposed controls including specific construction requirements and CQA specifications will be placed on the works approval. Reporting requirements relating to the submission of critical containment infrastructure reports prior to the commencement of waste placement are also included on the works approval.

## 10. Consultation

**Table : Summary of consultation**

Method	Comments received	DWER response
Application advertised on DWER website (30/07/2020)	No comments.	Noted.
Local Government Authority advised of proposal (30/07/2020)	No comments received. Planning approval provided.	Noted.
Department of Mines, Industry Regulation and Safety advised of application (30/07/2020) and advise requested (6/10/2020)	No comments when advised of application, advise provided regarding stability assessment.	Noted and incorporated in risk assessment.
Yamtji Marlpa Aboriginal Corporation advised of application (30/07/2020)	No comments.	Noted.
Surrounding properties advised of application (30/07/2020)	One comment received in support of the application, however noting concerns regarding potential dust emissions.	Noted, dust emissions and potential impacts to receptors has been noted in this assessment.
Applicant referred draft documents (13/11/2020)	Additional information provided.	Noted and included in documents.

## 11. Conclusion

Based on the assessment in this decision report, the Delegated Officer has determined that a works approval will be granted, subject to conditions commensurate with the determined

controls and necessary for administration and reporting requirements.

**Steve Checker**  
**MANAGER WASTE INDUSTRIES**  
**REGULATORY SERVICES**

*An officer delegated by the CEO under section 20 of the EP Act*

## Appendix 1: Key documents

Document title	Availability
Current licence L9074/2017/1	accessed at <a href="http://www.dwer.wa.gov.au">www.dwer.wa.gov.au</a>
DER, July 2015. <i>Guidance Statement: Regulatory principles</i> . Department of Environment Regulation, Perth.	
DER, October 2015. <i>Guidance Statement: Setting conditions</i> . Department of Environment Regulation, Perth.	
DER, August 2016. <i>Guidance Statement: Licence duration</i> . Department of Environment Regulation, Perth.	
DER, February 2017 <i>Guidance Statement: Risk Assessments</i> . Department of Environment Regulation, Perth.	
DWER, June 2019. <i>Guideline: Decision Making</i> . Department of Water and Environmental Regulation, Perth.	
DWER, June 2019. <i>Guideline: Industry Regulation Guide to Licensing</i> . Department of Water and Environmental Regulation, Perth.	

## Appendix 2: Clearing Assessment



Government of Western Australia  
Department of Water and Environmental Regulation

### Clearing Assessment Report

#### 1. Application details

##### 1.1. Application details

CPS No: 8976/1  
Approval type: Works Approval / Licence Assessment

##### 1.2. Applicant details

Applicant's name: Department of Planning, Lands and Heritage (DPLH)  
Application received date: 23 October 2018

##### 1.3. Property details

Property: Lot 1146 on Deposited Plan 231889 and Lot 11448 on Deposited Plan 184560  
Local Government Authority: Shire of Northampton  
Localities: Sandy Gully

##### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
0.66		Mechanical Removal	Waste disposal/management

#### 2. Site Information

**Clearing Description:** The application is to clear 0.66 hectares of native vegetation within Lot 1146 on Deposited Plan 231889 and Lot 11448 on Deposited Plan 184560, Sandy Gully. The larger project is for the construction of a permanent containment cell for the Northampton Lead Tailings Project at the Wheal Ellen mine site, which also includes a temporary contractor's site office, workshops, laydown area and vehicle parking area.

A portion of the proposed works, including the primary containment cell, and site offices etc. are likely to be exempt from the requirement for a clearing permit under Regulation 5, Item 1 (clearing for a building or structure) of the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Therefore, this clearing assessment is specific to non exempt purposes, including the proposed laydown area and sediment basin. The application area is shown in Figure 1.

**Vegetation Description:** The application area has been subject to a flora and fauna reconnaissance survey (the Survey) undertaken by MWH Australia Pty Ltd (MWH Australia) (2017), which identified three vegetation types (where \* denotes an exotic species):

- *Hakea preissii*, *Acacia acuminata* and *Acacia tetragonophylla* tall to mid shrubland to open shrubland over \**Avena barbata* with mixed dead tussock grasses and dead annual herbs on upper hill slopes and crests.
- *Acacia acuminata* and *Acacia tetragonophylla* tall to mid shrubland to open shrubland over \**Avena barbata* with mixed dead tussock grasses and dead annual herbs on lower hillslopes and plains.
- *Eucalyptus camaldulensis* subsp. *obtusata* woodland over *Cyperus gymnocaulos* and *Cyperus vaginatus* with mixed dead tussock grasses and annual herbs in drainage lines. This vegetation type comprises a small portion of the proposed clearing area.

Broad scale vegetation mapping undertaken over the state of Western Australia historically mapped the application area as Beard Vegetation Association (BVA) 35, described as wattle with York gum, casuarina, with *Eucalyptus loxophleba*, *Allocasuarina* species and *Acacia aneura* (Shepherd et al., 2001).

**Vegetation Condition:** The Survey notes the vegetation within the application area has been subject to extensive historical grazing and is in the following condition (MWH Australia, 2017):

- Completely Degraded: the structure of the vegetation is no longer intact and the area is completely or almost completely without native species (Keighery 1994) to
- Degraded; Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

Disclaimer: This document is DWER's preliminary assessment based on information available as at 8 September 2020. This document is not a final report and does not constitute a decision on the application to clear native vegetation.

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<b>Soil/Landform Type:</b>	<p>The application area is mapped within the Northampton 1 Subsystem which is described as narrow valleys with gently undulating to rolling rises and low hills with an integrated drainage system (Schoknecht et al., 2004).</p> <p>The Survey identified the soils within the application area as orange brown skeletal sandy clay loams, with loam and loamy sands along the ephemeral drainage line (Wheal Ellen Creek) which intersects a small portion of the application area (MWH Australia, 2017).</p>
<b>Comments:</b>	The local area considered in the assessment of this application is defined as a 10 kilometre radius around the perimeter of the application area.



Figure 1. Application Area hatched yellow

### 3. Minimisation and mitigation measures

The applicant advised that a comprehensive Construction Environmental Management Plan (CEMP) for the works will be undertaken prior to clearing. The applicant notes that the CEMP will set out clear actions on how environmental impacts will be avoided/minimised and managed. The applicant advised that the CEMP would require review and approval by the Shire of Northampton prior to the start of works (AECOM, 2020a).

The applicant advised that the laydown area and any other disturbed areas of the site will be rehabilitated following construction of the permanent containment cell. The applicant advised that full details of the rehabilitation works will be planned, reviewed, and approved in a detailed Rehabilitation Plan by a specialist Rehabilitation Consultant to be engaged by the contractor. The detailed Rehabilitation Plan will be provided to DWER for review once developed (AECOM, 2020b).

### 4. Assessment of application against clearing principles

According to available databases, two threatened flora species and 17 priority flora species have been recorded within the local area. None of these species have been recorded within the application area.

Disclaimer: This document is DWER's preliminary assessment based on information available as at 6 September 2020. This document is not a final report and does not constitute a decision on the application to clear native vegetation.

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The application area was subject to a reconnaissance survey (the Survey) on 11 and 12 April 2017. The Survey incorporated six relevés (floristic sampling sites) to characterise vegetation types and condition and included active searches for threatened and priority flora species known from the local area (MWH Australia, 2017).

The Survey identified 52 flora taxa from a larger survey area encompassing the application area, of which 21 were introduced (weed) taxa. The Survey did not identify any threatened or priority flora species (MWH Australia, 2017).

The Survey was undertaken at a suboptimal time of year to accurately identify flowering flora taxa. However noting the degraded to completely degraded (Keighery, 1994) condition of the application area, there is a low risk of threatened or priority flora occurring in the application area, and the proposed clearing is not likely to impact on any such species.

There are no threatened or priority ecological communities mapped within the local area, and the vegetation types recorded in the application area are not representative of any known threatened or priority ecological communities.

The Survey identified two broad fauna habitats within the application area (MWH Australia, 2017):

- Mixed Shrublands - consisted of a mid shrubland dominated by *Acacia acuminata*, *Acacia tetragonophylla* and *Hakea preissii* (dominant habitat type)
- Drainage Line - consisted of a woodland with an upper stratum dominated by *Eucalyptus camaldulensis* subsp. *obtusata*.

Both fauna habitats lacked large hollow bearing trees or a native understorey (MWH Australia, 2017).

There are records of four conservation significant fauna species within the local area. The Survey notes that the application area provides suitable habitat for three of these species (MWH Australia, 2017), being:

- Carnaby's cockatoo (*Calyptorhynchus latirostris*)
- Peregrine falcon (*Falco peregrinus*)
- Fork-tailed swift (*Apus pacificus*)

The Survey did not identify any conservation significant fauna species utilising the application area (MWH Australia, 2017).

The fork-tailed swift and peregrine falcon may transiently forage in the application area. Given the lack of suitable breeding habitat within the application for either species, and that they are highly mobile avian fauna with large home ranges, the proposed clearing is not likely to impact on significant habitat for these species.

The application area is at the northern limit of Carnaby's cockatoo distribution. The application area does not contain a high density of preferred foraging habitat or suitable roosting or breeding habitat for Carnaby's cockatoo, and is not likely to provide significant habitat for this species.

Noting that the application area is in a degraded to completely degraded (Keighery, 1994) condition and is unlikely to contain any conservation significant flora, fauna or ecological communities, it is unlikely to comprise a high level of biological diversity.

The national objectives and targets for biodiversity conservation in Australia has a target to prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001).

The application area is within the Geraldton Sandplains Interim Biogeographic Regionalisation of Australia bioregion, which retains approximately 45 per cent of its pre-European extent of native vegetation (Government of Western Australia, 2019). The mapped Beard Vegetation Association (BVA) 35 retains approximately 16 per cent (around 30,087 hectares) of its pre-European extent (Government of Western Australia, 2019). The local area retains around 12 per cent remnant vegetation (around 4000 hectares). Based on these figures, the application area is within a highly cleared landscape.

While the application area is within a highly cleared landscape, it is not considered a significant remnant given the extensive grazing that has historically occurred within the site leaving it in a degraded to completely degraded (Keighery, 1994) condition with limited biological diversity (MWH Australia, 2017).

The application area intersects Wheal Ellen Creek. The proposed clearing will involve the removal of 0.041 hectares of riparian vegetation (comprising the *Eucalyptus camaldulensis* subsp. *obtusata* woodland vegetation type) for a sediment basin. The sediment basin is to prevent sedimentation of the creek caused by stormwater runoff from the permanent containment cell (AECOM, 2020a). Noting the minimal extent of clearing proposed within Wheal Ellen

Creek, it is unlikely to significantly impact on the greater extent of riparian vegetation growing in association with this creek or on riparian habitats in the local area.

The proposed clearing for the sediment basin may initially lead to increased sedimentation of Wheal Ellen Creek (noting its long term goal is to reduce sedimentation), however this impact is likely to be short term and localised noting the minimal extent of clearing within the vicinity of the creek. The proposed clearing is not likely to result in land degradation or flooding noting the small size of the application area and its completely degraded to degraded (Keighery, 1994) condition.

There are no conservation areas within the local area, and the application area does not provide any ecological linkage values between areas of conservation estate.

One Weed of National Significance, *Opuntia stricta*, was recorded within the application area and the proposed clearing may increase the risk of weeds spreading into adjacent native vegetation. Weed management measures will assist in minimising this risk.

The assessment has found that the proposed clearing is at variance to Principle (f), may be at variance to Principle (i) and is not likely to be at variance to the remaining clearing principles.

#### **Planning instruments and other relevant matters**

No Aboriginal sites of significance have been mapped within the application area.

A historical clearing assessment (CPS 7670/1) was undertaken by DWER for an adjacent area that was the subject of a concurrent works approval application for a temporary tailings storage facility. DWER granted the Works Approval associated with 7670/1 subject to conditions, expiring July 2019 (Works Approval W6068/2017/1).

The applicant has advised that a Development Approval application has been submitted to the Shire of Northampton for this project. The applicant advised that the Shire is on the Project Steering Committee for the Northampton Lead Tailings Project and was involved with the site selection process. The applicant notes that the Shire has been kept up to date on all proposed activities at the Wheal Ellen site (DPLH, 2020).

The applicant has advised that surface water drainage will be installed to ensure that stormwater during and post-construction is diverted to the sediment basin and not in contact with tailings. The applicant notes that works will be timed to occur in the drier summer months and tailings material will be covered should rainfall occur (AECOM, 2020a).

#### **5. Recommendations**

An assessment of the environmental impacts of the proposed clearing has been undertaken in accordance with DWER's Regulatory Principles, taking into consideration the clearing principles contained in Schedule 5 of the *Environmental Protection Act 1986* (EP Act). Noting the assessment against the clearing principles above, the proposed clearing is at variance with principle (f), may be at variance with Principle (i) and is not likely to be at variance with the remaining principles. Section 62(1) of the EP Act provides for conditions to be placed on a works approval to prevent, control, abate or mitigate pollution or environmental harm. Recommended conditions are as follows:

##### **1. Clearing authorised**

The Works Approval holder shall not clear more than 0.66 hectares of native vegetation within the areas cross-hatched yellow on attached Plan 8976/1 under this Works Approval.

##### **2. Avoid, minimise and reduce the impacts and extent of clearing**

In determining the amount of native vegetation to be cleared authorised under this Works Approval, the Works Approval Holder must have regard to the following principles, set out in order of preference:

- (a) Avoid the clearing of native vegetation.
- (b) Minimise the amount of native vegetation to be cleared.
- (c) Reduce the impact of clearing on any environmental value.

##### **3. Weed control:**

When undertaking any clearing or other activity authorised under this Works Approval, the Works Approval Holder must take the following steps to minimise the risk of the introduction and spread of weeds:

- (a) Clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared.
- (b) Ensure that no weed-affected soil, mulch, fill or other material is brought into the area to be cleared.
- (c) Restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

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#### 4. Revegetation and Rehabilitation

- (a) The Works Approval Holder must *revegetate* and *rehabilitate* areas cleared for *temporary works* under this Works Approval within six months of the area no longer being required for the purpose for which it was cleared.
- (b) The Works Approval Holder is not required to *revegetate* and *rehabilitate* an area specified in condition 4(a) of this Works Approval if the Works Approval Holder intends to use that cleared area for another purpose within 24 months of that area no longer being required for the purpose that it was cleared under this Works Approval.

#### 5. Records to be kept

The Works Approval Holder must maintain the following records for activities done pursuant to this Works Approval:

- (a) In relation to the clearing of native vegetation authorised under this Works Approval:
  - (i) The location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees.
  - (ii) The date that the area was cleared.
  - (iii) The size of the area cleared (in hectares).
  - (iv) Actions taken to avoid, minimise and reduce the impacts and the extent of clearing in accordance with condition 2 of this Works Approval.
  - (v) Actions taken to minimise the introduction and spread of *weeds* in accordance with condition 3 of this Works Approval.
- (b) In relation to the *revegetation* and *rehabilitation* of areas pursuant to condition 4 of this Works Approval:
  - (i) The size of the area *revegetated* and *rehabilitated* (in hectares).
  - (ii) The date(s) on which the area *revegetated* and *rehabilitated* was undertaken.
  - (iii) The boundaries of the area *revegetated* and *rehabilitated* recorded as a shapefile.

#### 6. Reporting

The Works Approval Holder must provide to the CEO the records required under Condition 5 of this Works Approval, when requested by the CEO.

#### Definitions

The following meanings are given to terms used in this Works Approval:

- **CEO** means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;
- **fill** means material used to increase the ground level, or fill a hollow;
- **mulch** means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;
- **rehabilitate/ed/ion** means actively managing an area containing native vegetation in order to improve the ecological function of that area;
- **revegetate/ed/ion** means the re-establishment of a cover of local provenance native vegetation in an area using methods such as natural regeneration, direct seeding and/or planting, so that the species composition, structure and density is similar to pre-clearing vegetation types in that area;
- **temporary works** means access tracks, spoil areas, side tracks, site offices, storage areas, laydown areas, extraction sites, camps, project surveys, pre-construction activities and similar works associated with a project activity that are temporary in nature;
- **weed/s** means any plant –
  - (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*;
  - (b) published in a Department of Biodiversity, Conservation and Attractions Regional Weed Rankings Summary, regardless of ranking; or not indigenous to the area concerned.
  - (c) not indigenous to the area concerned.



Meenu Vitarana  
A/MANAGER  
NATIVE VEGETATION REGULATION

Officer delegated under Section 20 of the  
Environmental Protection Act 1986

8 September 2020

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## 6. References

- AECOM (2020a) Northampton Lead Tailings Containment Cell. Design Report. DWER Ref A1917862.
- AECOM (2020b) Northampton Lead Tailings Containment Cell. Rehabilitation Plan. DWER Ref A1917865.
- Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.
- Department of Planning, Lands and Heritage (DPLH) (2020) Works Approval Application. DWER Ref A1922330.
- Government of Western Australia. (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2018. WA Department of Biodiversity, Conservation and Attractions. Available from: <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- MWH Australia Pty Ltd (2017) Wheel Ellen: Flora and Fauna Reconnaissance Survey. Prepared for JBS&G. DWER Ref A1917869.
- Schoknecht, N., Tille, P. and Purdie, B. (2004) Soil-landscape mapping in South-Western Australia – Overview of Methodology and outputs' Resource Management Technical Report No. 280. Department of Agriculture.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

### GIS Databases:

- Aboriginal Sites of Significance
- DBCA Managed Estate
- Directory of Important Wetlands
- Geomorphic Wetlands
- Groundwater salinity
- Hydrography, hierarchy
- Hydrography, linear
- Soil Landscape Mapping – Subsystems
- SAC Bio Datasets
- Topographic contours
- Beard Vegetation Associations