



## Application for Licence Amendment

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

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<b>Licence Number</b>	L8918/2015/1
<b>Applicant</b>	Keysbrook Leucoxene Pty Ltd
<b>ACN</b>	137 091 297
<b>File number</b>	DER2015/001866
<b>Premises</b>	Keysbrook Mineral Sands Mine 1391 Hopeland Road North Dandalup WA 6207  Lots 101, 103, 104 & 105 on Diagram 92169, lot 300 on plan 31012, Lots 31, 32, 33 & 34 on Plan 408493, lots 56, 57, 59 & 63 on Plan 739.
<b>Date of report</b>	31 July 2024
<b>Decision</b>	Licence granted

Manager, Resource Industries

INDUSTRY REGULATION (STATE-WIDE DELIVERY)

an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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## 1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the operation of the premises. As a result of this assessment, amended licence L8918/2015/1 has been granted.

## 2. Scope of assessment

### 2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at <https://dwer.wa.gov.au/regulatory-documents>.

### 2.2 Overview of premises

#### 2.2.1 Overview of the operation

Licence L8918/2015/1 is held by Keysbrook Leucoxene Pty Ltd (licence holder) for the Keysbrook Mineral Sands Mine (the premises). The premises is located near the town of Keysbrook, in the shire of Serpentine Jarrahdale, approximately 65km south-east of Perth. The premises is regulated under Part V, Division 3 of the *Environmental Protection Act 1986* (EP Act) licence L8918/2015/1 and Part IV of the EP Act, Ministerial Statement (MS) 810 approved by the Environmental Protection Authority (EPA) in 2009. MS 984 and 1089 published in 2014 and 2019 respectively, also apply and outline some amendments to MS 810 conditions. Several expansions to the mining footprint have been approved by the EPA under section 45C of the EP Act. The mining area now extends to approximately 1700 hectares. Ownership of the premises includes several freehold lots on pre-1899 land titles therefore the *Mining Act 1978* does not apply.

The licence holder uses dry mining techniques to extract mineral ore from open pits. The ore is then placed into a hopper and wet screened on the pit floor. Here the washed ore is separated, with particles sized over two millimetres (mm) being deposited back into the pit. Ore particles sized between two mm and forty-five micrometres ( $\mu\text{m}$ ) are pumped to the wet concentrator plant (WCP) located on Lot 62. The sand is separated from the (thickened) clay component in the slurry and a heavy mineral concentrate (HMC) is extracted. The HMC is stockpiled to be transported to the Picton Mineral Separation Plant where further processing occurs. The thickened clay component is disposed of into mining voids. Supernatant water from tailings is decanted and recycled through the northern return settling pond and the process water pond(s) before being reused at the plant. Tailings from the Picton mineral separation plant are accepted at the premises, blended with sand tailings and slimes to reduce the radiation level and disposed of in the mining voids.

Water demands at the premises are met through two onsite production bores drawing from the Leederville Aquifer, the recycling of tailings supernatant water and captured stormwater. Groundwater, decant return water, contaminated stormwater and dewatering effluent are collected into a northern return water settling pond and recirculated to the WCP via the process water pond. The process water pond is located on Lot 62 and has an overall capacity of 74,000 kilolitres (kL). It comprises three dams connected by an overflow channel intended to maximise the settlement of sediments. Only the third of the three dams is lined. An overflow point from the process water pond discharges into Balgobin Brook South. The northern return water settling pond is unlined and its location varies according to the location of the mining activities. When volumes of effluent at the premises exceed demand a controlled discharge of process water occurs into the Nambelup Brook North through six discharge points (Figure 1). The total

discharge volume permitted under the licence is set for 250,000 tonnes per annual period.

All sources of water in the northern return water settling pond and process water pond and the associated potential risks of each effluent type are listed in Table 1. Discharge from the northern return water settling pond is currently pumped to the Nambeelup Brook North via discharge points W2.5 and W2.1. Discharge from the process water pond occurs via a lined spillway into Balgobin Brook South (discharge point W1).

Historical water quality monitoring data of the discharges to Balgobin Brook South (via discharge point W1) indicate that process water with low pH (acidic) has been discharged to surface water in the past. Low pH was recorded in the 2017, 2018 and 2023 discharged effluent with pH values below 5.5 and as low as 4.6. More recent monitoring data from 2021 and 2022 were incomplete for pH sampling.

Low pH (i.e., below 5.5) was recorded on surface water monitoring sites on Nambeelup Brook North in 2017. While discharge on the Nambeelup Brook North had not yet begun under this licence, the acidic conditions are not reflective of the natural conditions of the stream.

**Table 1. Sources of effluent discharge at the Northern return water settling and process water ponds and associated potential contaminants**

Sources of water	Associated potential water quality risks
Stormwater	<ul style="list-style-type: none"> <li>Increased sediments causing turbidity</li> <li>Risk of hydrocarbon contamination</li> <li>Increased level of nutrients if passing through a rehabilitated area</li> </ul>
Dewatering effluent	<ul style="list-style-type: none"> <li>Increased level of salinity</li> <li>Increased level of acidity</li> </ul>
Groundwater	<ul style="list-style-type: none"> <li>Increased level of salinity</li> <li>Increased level of acidity</li> </ul>
Tailings decant water	<ul style="list-style-type: none"> <li>Increased levels of metalloids</li> <li>Natural occurring radiological material (NORMs)</li> <li>Increased level of salinity</li> <li>Increased level of acidity</li> </ul>

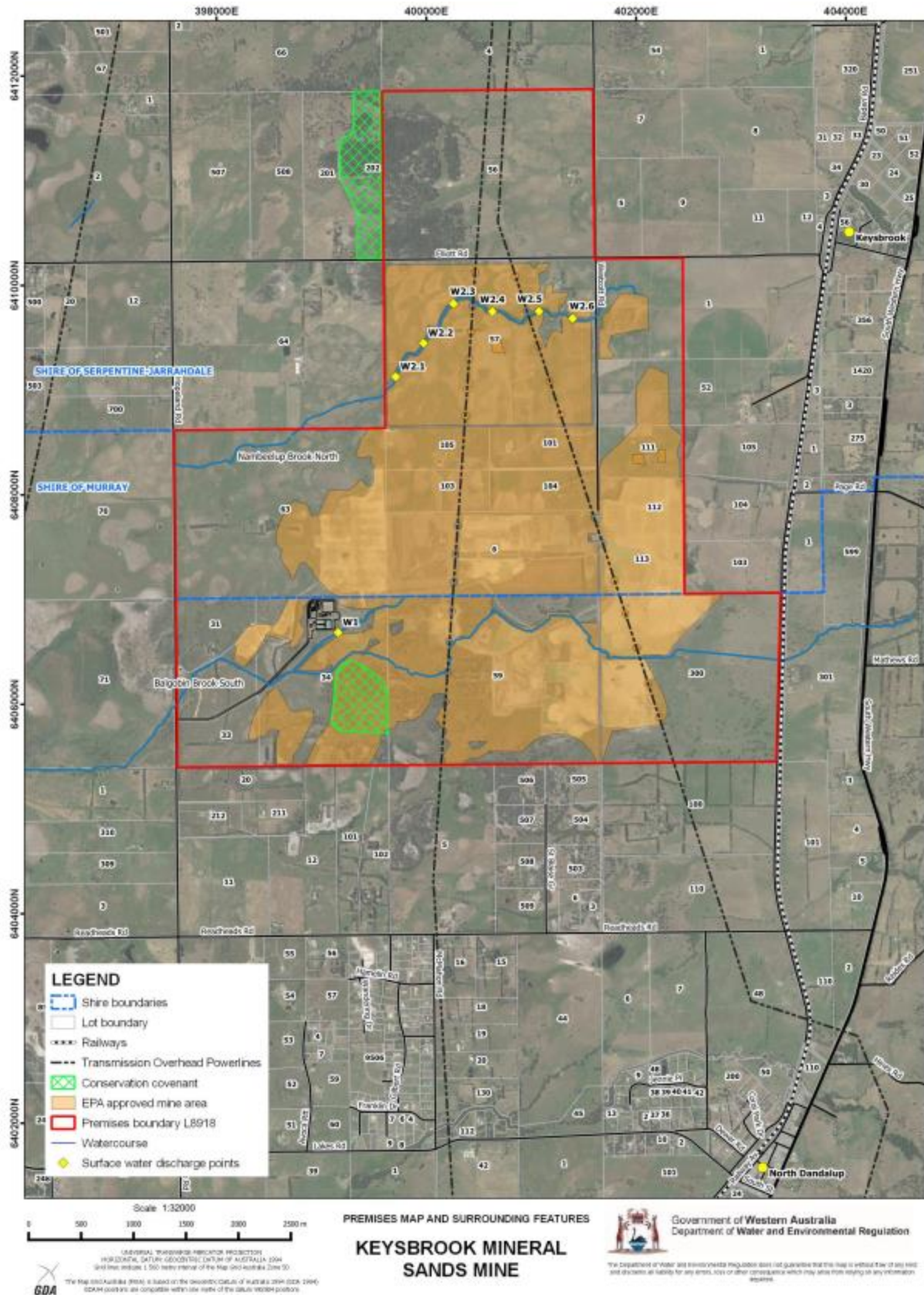


Figure 1. Discharge points on the Nambeelup Brook North (W2.1 – W2.6) and Balgobin Brook South (W1) under the current licence.

## 2.2.2 Overview of the local environment

### Acid Sulfate Soils

The premises is situated on the Swan Coastal Plain, within a geological formation known as the Bassendean Dune System. The Bassendean Dune System is known to contain a type of acid sulfate soils (ASS) characterised by the presence of the sulfide mineral pyrite. Pyrite is small grained and has a high surface area making it highly reactive. The presence of pyrite in the soil coupled with the poor buffering capacity characteristic of the Bassendean Sands Dune system make the soil prone to acidification when exposed to oxidising conditions. If undisturbed, soils of these characteristics pose very little environmental risk, however, activities such as dewatering and mining excavation can lead to the release of acid when exposed to air. Oxidation of these soils may lead to increased acidity in groundwater through seepage, and the consequent mobilisation of heavy metals and metalloids. Potential Acid sulfate soils (PASS) necessitate selective handling and/or neutralisation. The risk of PASS was identified through the Part IV assessment process. The licence holder proposed Acid Sulfate Soils Management Plan (ASSMP) was approved under MS 810. The ASSMP outlines how the licence holder identifies and manages ASS that are encountered during mining operations.

### Surface water

The premises sits within the Serpentine Groundwater Area and the Serpentine River System, both proclaimed under the *Rights in Water and Irrigation Act, 1914* (RIWI Act). A P2 drinking water source protection plan applies to the premises as it is located within the Karnup-Dandalup Underground Water Pollution Control Area (MBS Environmental, 2015). The P2 plan is designed to prevent an increased risk of contamination of the local water sources. It generally applies to an area where activities such as a pasture and dry land cropping occur (Department of Water, 2009). Groundwater quality varies widely in the area particularly with parameters such as colour, turbidity and iron content. Salinity ranges from 200 to 1,000 milligram per litre, making the aquifer a good source of water for agriculture and livestock. Several watercourses cross the premises (Figure 2) and most form part of the Nambelup Brook catchment draining into Black Lake and in turn into Goegrup Lake (one of the Serpentine Lakes). Black Lake has high conservation significance under the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* (Department of Water, 2015).

MBS Environmental (2015) classified the water courses under three major categories: major, medium and minor based on peak flow. The Dirk Brook Tributary crossing the northern part of the premises is a medium-sized watercourse within a well-defined channel and has a peak flow of one to two cubic metres per second. It forms part of the Dirk Brook sub-catchment flowing into the Serpentine River, Goegrup Lake and the Peel Inlet. The Dirk Brook Tributary flows into two conservation category dampland wetlands and an area of Resources Enhancement wetland. The Nambelup Brook North, crossing lot 57 and 63, is another medium-sized watercourse with similar characteristics. Discharge of mine effluent has been occurring to a section of this watercourse during the winter months since 2022. Balgobin Brook South crosses lot 62 and is another medium watercourse with a similar peak flow and characteristics to the Nambelup Brook North.

Several unnamed tributaries also cross the premises. These were classified by MBS Environmental (2015) as minor streams and have a peak flow of one to two cubic meters per second. Their channel is shallow and poorly defined. On lot 63, south of the Nambelup Brook North, the unnamed tributary flows into a conservation category wetland. The Nambelup Brook North flows into a further three conservation category wetlands located approximately 500m, 2,000 and 2,500 metres and from the lot 63 boundary. The conservation category wetlands are associated with the palusplain flats of the Nambelup Brook North.

Another unnamed tributary is located on lot 56 and flows in a north-westerly direction into the

Nambeelup Brook ultimately discharging into the Serpentine River Catchment (MBS Environmental 2015). All water courses at the premises ultimately flow into the Peel–Harvey estuary, a listed wetland and ecosystem of international significance under the Ramsar Convention.

Surface water testing conducted downstream of the mine in 2015 (MBS Environmental) showed that water in the area has a neutral pH, a high concentration of phosphorus and nitrogen and high turbidity, likely affected by the surrounding agricultural and farming activities. Salinity was above the values recommended by the ANZECC guideline (2000) for rivers but within a normal range for wetlands. Ecoedge (2023) states that the state of wetlands at the premises including those of conservation category are degraded with some having been cleared.

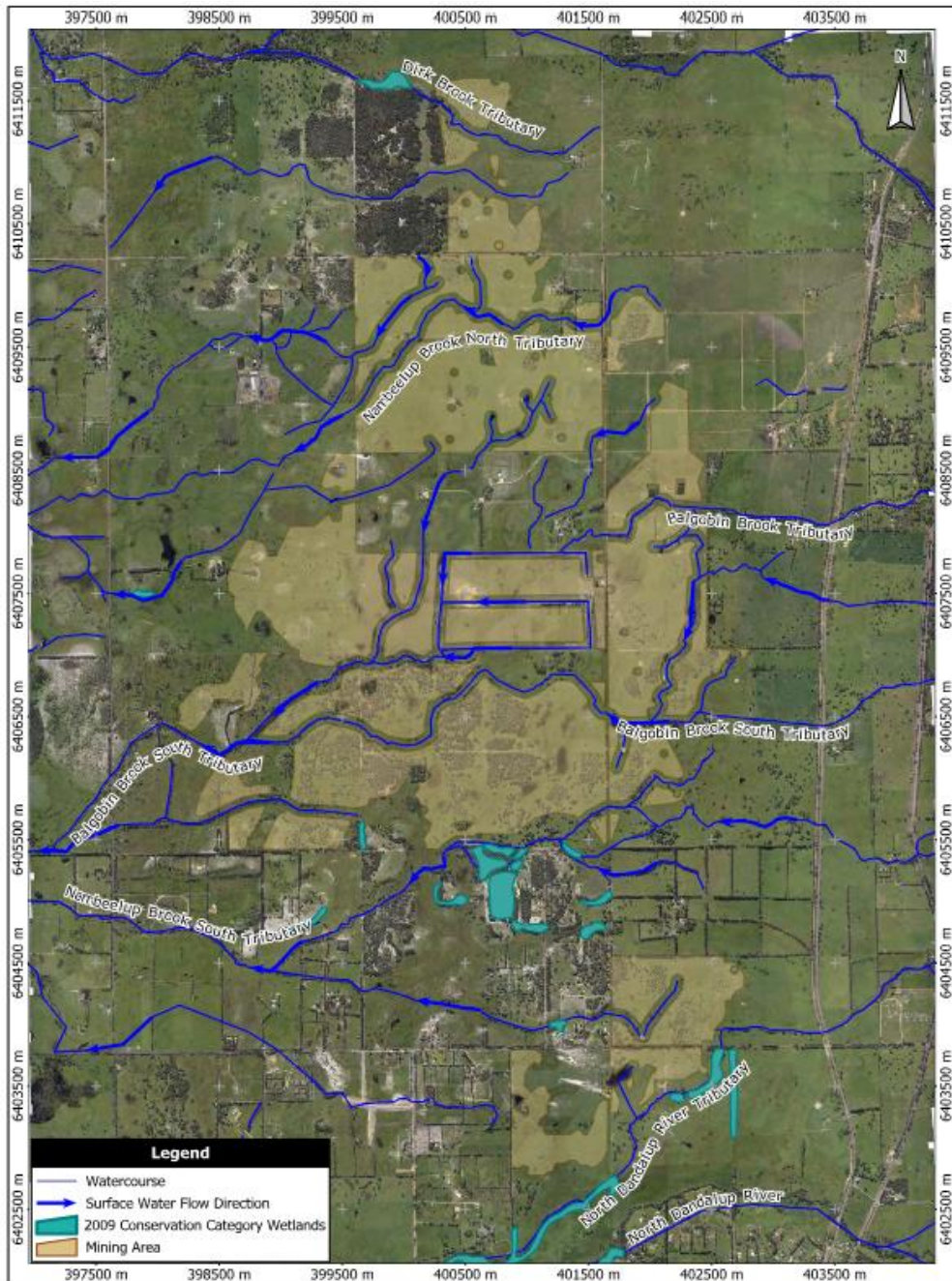


Figure 2. Conservation category wetlands within the mining area (MBS Environmental 2015)

## Vegetation

The licence holder did not undertake a vegetation assessment as part of the proposed amendment application as no direct impacts to vegetation are expected. However, as changes to quality and quantity of ground and surface water may impact vegetation, a brief overview of the vegetation at the premises has been provided.

A vegetation and fauna assessment were conducted in 2004 (MBS Environmental) and submitted as part of the MS 810. The vegetation and flora assessment included the northern part of the premises. Since then, clearing of up to 182 hectares of native vegetation was approved under MS 810, specifically the vegetation subject of over grazing and devoid of any understory. A further five detailed reconnaissance and targeted flora and vegetation surveys were conducted with the last ones being conducted by Ecoedge (2022, 2023) and submitted in 2023 as part of a proposed amendment to MS 810 to further extend the mining footprint. Two of the surveys are relevant to this amendment and include lots 56, 62 and 63. The latest MS proposed amendment is still undergoing consideration by the EPA.

The 2004 flora assessment (MBS Environmental) classified vegetation within and surrounding the premises as either part of the Guilford or the Bassendean Central and South Complexes (MBS Environmental 2004). The Guilford complex is generally made of a mix of open forest and fringing woodland. Common species include the *Marri*, *Wandoo*, *Jarrah*, *Eucalyptus Rudis*, *Banksia grandis* and *Xanthorrhoea preissii*. Vegetation of the Bassendean Central and South complex include woodlands of *Jarrah*, *Casuarina* and *Banksia* on sand dunes, low woodland of *Melaleuca* and sedge lands. The 2022 and 2023 flora assessments also refer to the Southern River complex generally characterised by open woodland of *Corymbia calophylla*, *Eucalyptus marginata*, and *Banksia spp.* on the elevated areas and fringing woodland of *Eucalyptus rudis* and *Melaleuca rhapsiophylla* along streams.

A summary of the three flora (and fauna) assessments are below.

### *MBS Environmental vegetation and fauna assessment (2004)*

- A large part of the vegetation at the premises has been cleared, however pockets of remnant vegetation remain.
- The premises has approximately 72 hectares (ha) of *Banksia attenuata* woodland and marry/jarrah woodland (lot 56). Some of the vegetation is in excellent condition, habitats are of a wide range and represent some of the best preserved in the region.
- 1 ha of *Regelia* and *Melaleuca* species and sedges is located within the premises.
- 7 ha of *Kunzea thicket* are located within the premises.
- 11 hectares of *Banksia* open woodland with limited understorey are located within the premises.
- Conservation significance species including aquatic perennials (*Aponogeton hexatepalus*), shrubs *Calothamnus graniticus*, perennial herb, *Drakea elastica* (Glossy leaved Hammer-orchid) are considered as moderately and highly likely to occur.
- Potentially threaten ecological communities including *Banksia attenuata* and *Eucalyptus marginata* and *Corymbia calophylla* of the Swan Coastal Plan (SCP) are likely to occur.

Figure 3 highlights the different pockets of remnant vegetation at the premises in 2004, including that of lot 56.

### *Reconnaissance and targeted flora and vegetation survey (Ecoedge, 2022) – includes lot 56*

- The vegetation complexes found within the survey area the Bassendean Complex (Central and South), the Guilford Complex and the Southern River complex. The extent within the SCP is below the 30% retention target established by the Commonwealth of Australia, for all the main vegetation complexes.
- Five vegetation units were recognised within the survey area, with one of the units found



to be very similar to the *Banksia Woodland* of the SCP threatened ecological community, however it was not classified so due to its degraded state.

- A total of 34.4 ha of *Corymbia calophylla* – *Xanthorrhoea preissii* woodlands and shrublands of the SCP, listed as Endangered under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and Critically Endangered under the BC Act were found in the survey area. Condition varied between degraded or better. Twenty species of conservation status were possible to occur within lot 56.
- A large part of the native of vegetation overall was in a degraded or completed degraded condition, with only 10% being in good condition.
- The survey area serves as an ecological corridor.

Figures 4 and 5 provide an overview of lot 56 2022 detailed vegetation condition including that of the threatened communities.

*Reconnaissance and targeted flora and vegetation survey (Ecoedge, 2023) (includes lot 62 and 63)*

- Vegetation units recognised were Marri and Jarrah-Sheoak open forest or woodland, Low woodland of *Melaleuca preissiana* or *M. raphiophylla* and Sedgeland of *Juncus pallidus*
- No threatened species were found
- Vegetation complexes found were the Bassendean Complex (Central and South), the Guilford Complex and the Southern River complex. All complexes are below the 30% retention target established by the Commonwealth of Australia
- Several conservation category wetlands occur within and surrounding the boundaries of lot 62 and 63, two are environmental sensitive areas. The wetlands status including those within the Resource Enhancement areas are degraded.
- The closest Bush Forever site is between 2 and 3km from the premises boundary.

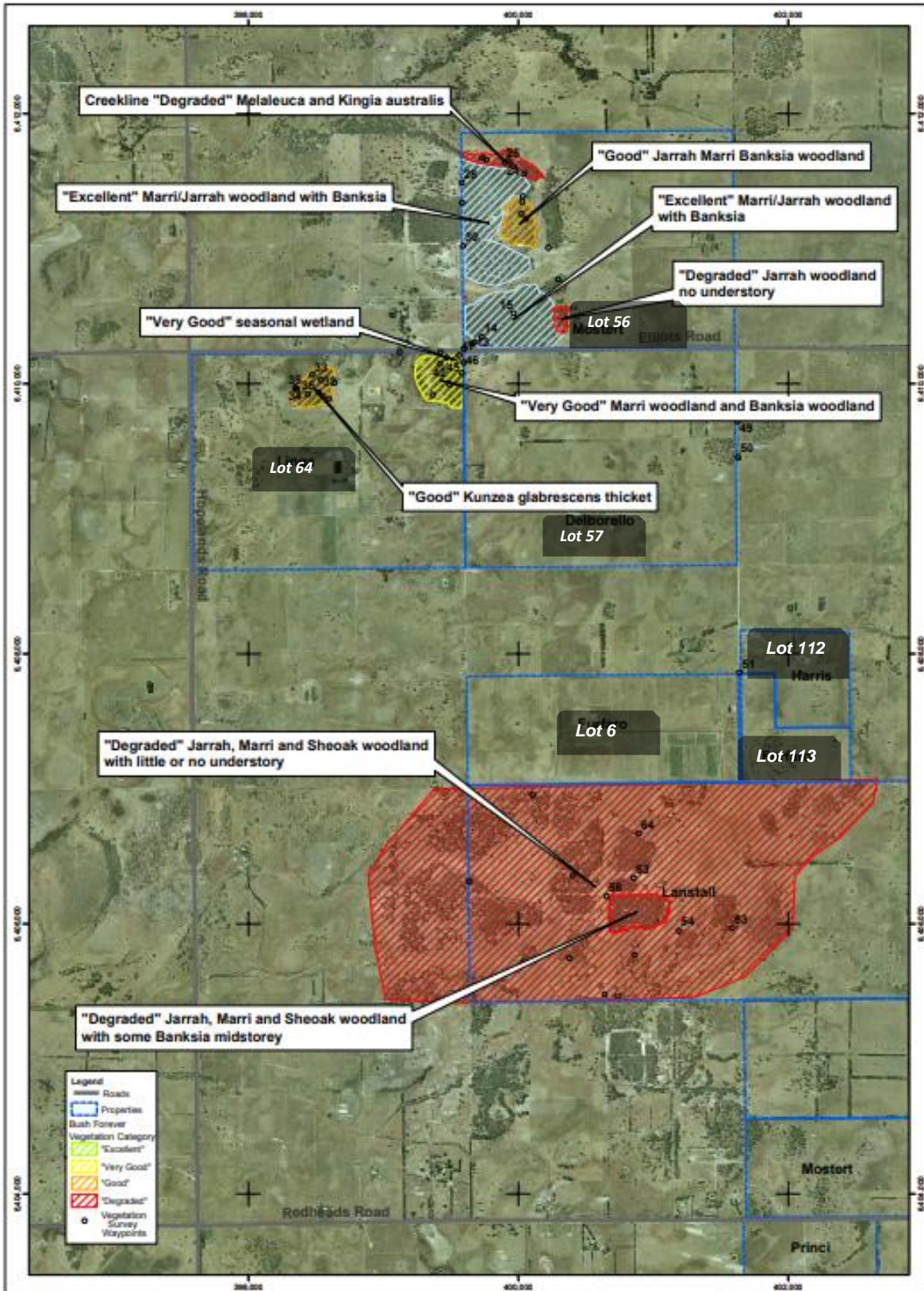


Figure 3. Outline of vegetation type and state at the premises as at 2004 (MBS Environmental, 2004)

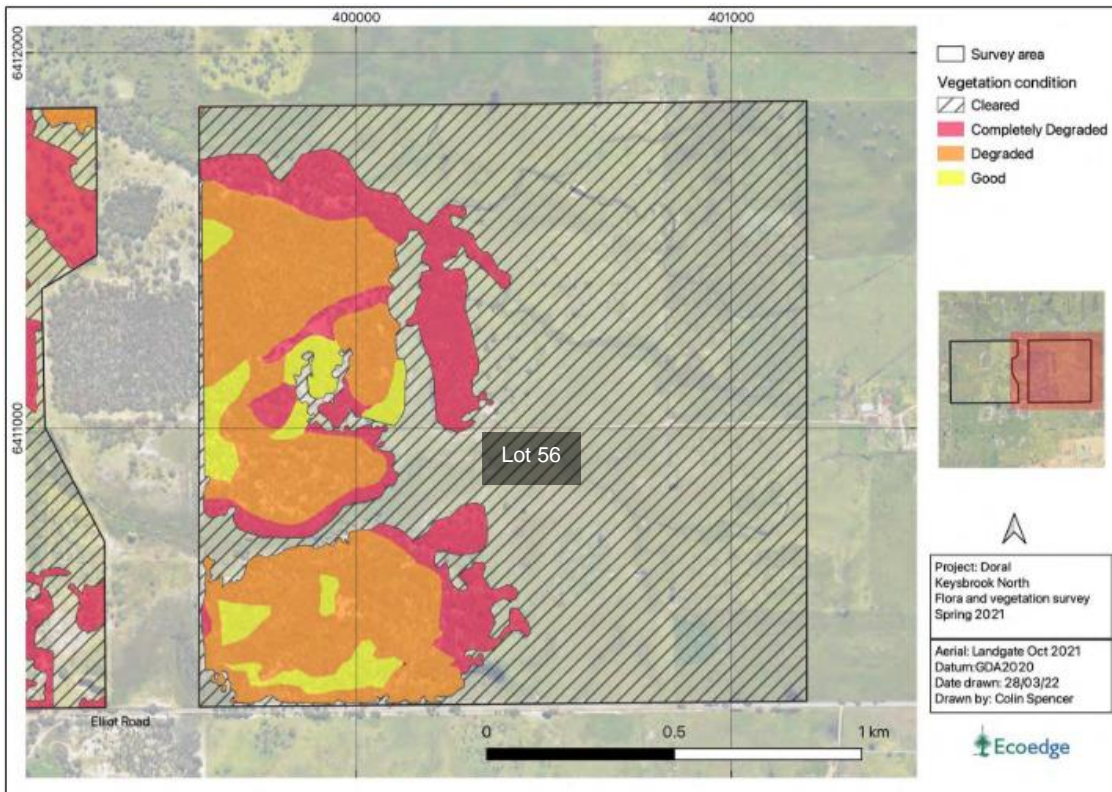


Figure 4. 2021 vegetation condition of lot 56 (Ecoedge, 2022)

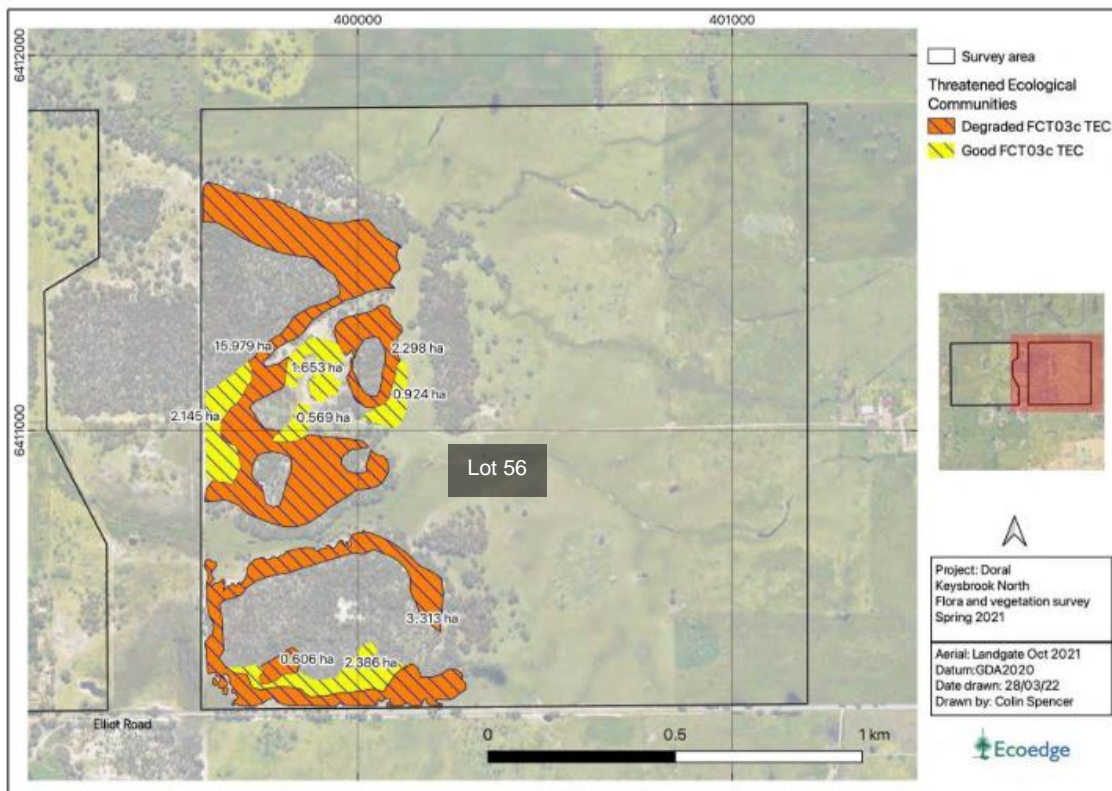
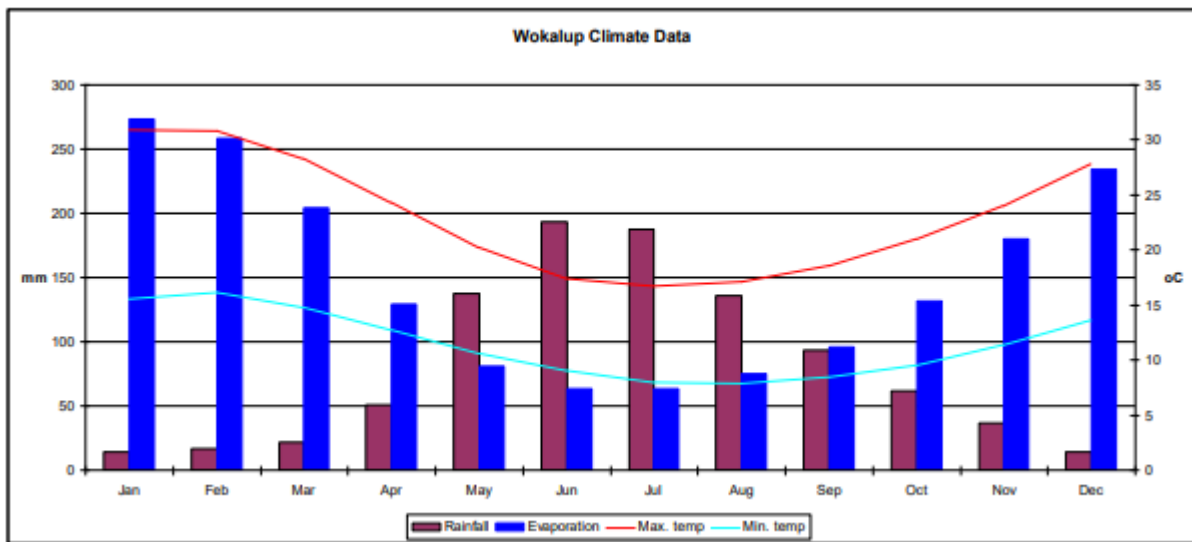


Figure 5. Vegetation condition of the threatened ecological communities of lot 56 (Ecoedge, 2022)

## Climate

The Keysbrook area is situated in the SCP. It is characterised by a mediterranean climate with cool wet winters and hot dry summers. The nearest meteorological station that closely matches the rainfall at Keysbrook is that of Wokalup, approximately 100km away (MBS Environmental, 2015). Annual rainfall is approximately 964 millimeters with an average annual evaporation of 1,800 millimeters. Most of the rainfall occurs generally between June and July (up to 200 millimeters), with only around 10 millimeters during January, February and December.



**Figure 6. Wokalup meteorological station average climate data (MBS Environmental, 2015)**

## Land use

The main land use prior to the mining activities starting at the premises was agriculture. Agriculture is one of the top three economic activities in the Peel Harvey Catchment. Intensive agriculture in the Swan Coastal Plain, and the production of cereal, dairy and beef farming in the Hortham -Williams region are most common. The Peel-Harvey represents approximately 33% of the Western Australia's sow herd and 10% of glasshouse and nursery production. Forestry and fishery are also important. Approximately half of the region is owned by a farming community who rely on ground and surface water to sustains agriculture and livestock (Peel-Harvey Catchment Council, 2022).

## 2.3 Application summary

After an amendment to MS 810 was obtained from the EPA for the extension of the premises mining footprint, on 18 December 2023, the licence holder applied for a licence amendment under section 57 of the EP Act. Details of the proposed amendments are outlined below:

- Addition of four emergency discharge points on lot 63, two discharging on the Nambeelup Brook North (W2.7 and 2.8) two discharging on the Nambeelup Brook North unnamed tributary (W2.9 and W2.10).
- Addition of two emergency discharge points on lot 56 one discharging on the Dirk Brook Tributary and one on the unnamed tributary.
- Addition of ambient surface water monitoring points WQ6 to WQ10 upstream and downstream of the proposed discharge points.
- Removal of monitoring bores KS1 to KS7, KS15, KS 20 to KS22 and KS26.

- Addition of groundwater quality monitoring bores KS27, KS31, KS35 and KS39.
- Update Schedule 1 Map to include the expansion of the approved mining footprint in accordance with Ministerial Statement 810.

The Licence Holder has undertaken studies of the impacts of increasing the volume of storm water discharged to the brooks. Potential impacts to the stream ecology associated with changes to water quality were not investigated by the licence holder as part of this application.

### 2.3.1 Amendment to discharge points

#### **Nambeelup Brook North discharge**

As mining activities move in a westerly direction on lot 63 and rehabilitation of lot 57 gradually occurs, discharge sites on the Nambeelup Brook North, (W2.1 – W2.6) are becoming increasingly impractical. The licence holder proposes two additional discharge points further downstream (W2.7 and 2.8) and two on its tributary to the south (W2.9 and W2.10) (Figure 7). Discharge upstream has been occurring at two of the six discharge points (W2.1 and W2.5) since 2022. The Delegated Officer notes that a 20-metre buffer zone is required by MS 810 for all medium sized streams within the premises boundary in which no vegetation may be cleared or mining activities undertaken.

Two additional discharge points are also proposed on the unnamed Nambeelup Brook North tributary within lot 63. The proposal includes a diversion of the unnamed tributary to avoid the water quality being impacted by the upstream mining activities. Diversion impacts on minor streams were considered and approved under Bulletin 1260 (EPA, 2007) as part of the original MS. The discharge to the unnamed tributary would be contingent upon the stage of diversion.

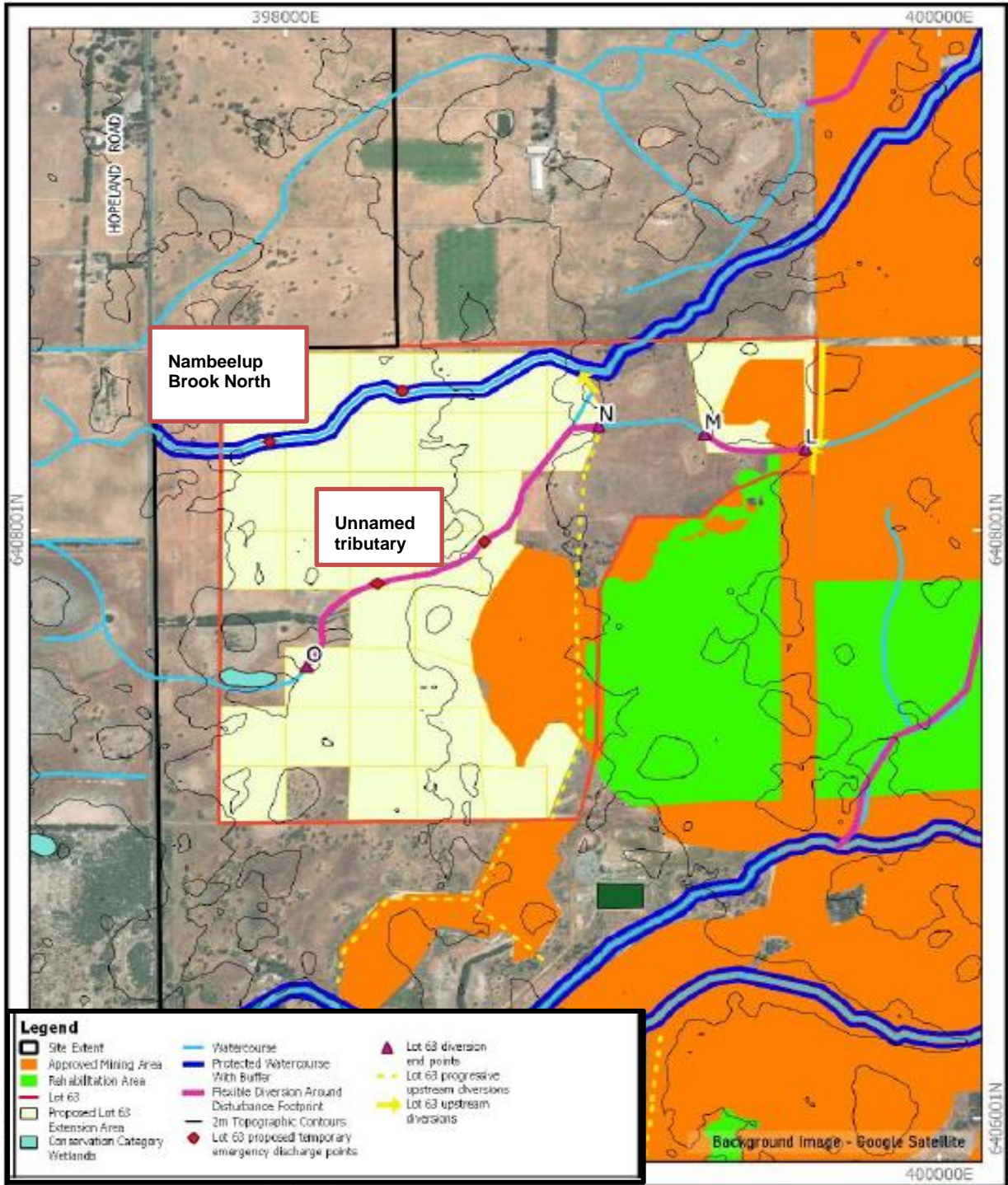
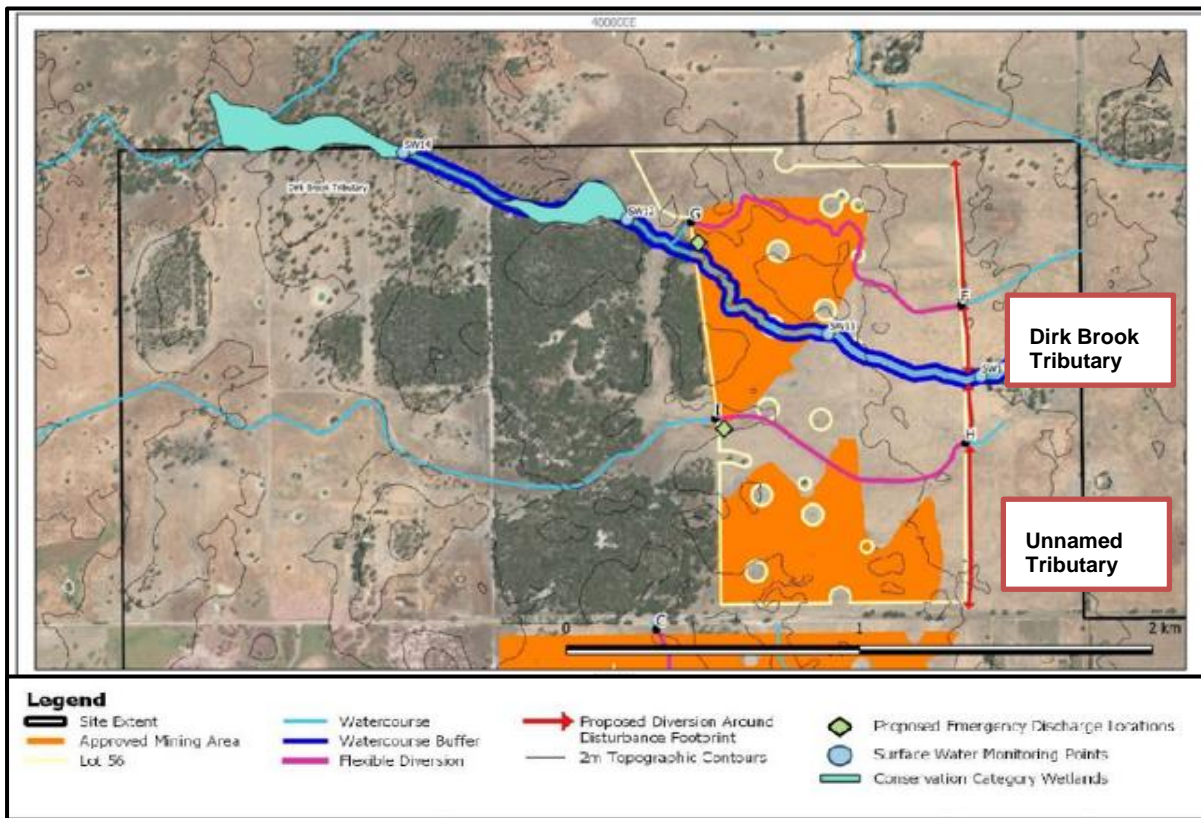


Figure 7. Proposed discharge points on the Nambelup Brook North its unnamed tributary on lot 63 (red diamond)

## Dirk Brook Tributary and Unnamed Tributary discharge

Expansion of mining activities is also occurring northwards into lot 56, therefore the licence holder proposes an additional discharge point on the Dirk Brook Tributary (W2.11) and one on the unnamed tributary, south of the Dirk Brook Tributary (W2.12) (Figure 8). The Delegated Officer notes that under condition 7-2 of MS 810 *'the proponent shall not undertake mining activities within 100m of the boundary of a conservation category wetland'* and *'[...] vegetation along the watercourse[s] should be enhanced consistent with the Watercourse Rehabilitation Plan'* (EPA, 2009).

Analogously to lot 63, the licence holder proposes to divert the unnamed tributary to ensure that surface water quality is not unnecessarily impacted by the mining activities. Discharge to the tributary would therefore be contingent upon the stage of diversion.



**Figure 8. Proposed discharge points (green diamond) on the Nambeelup Brook Tributary and the unnamed tributary on lot 56.**

### 2.3.2 Amendment to surface monitoring sites

In line with the amendments to the discharge points, the licence holder is proposing to add surface monitoring sites upstream and downstream of the new discharge points on the Nambeelup Brook North and on the Dirk Brook Tributary. Surface monitoring points previously agreed with the department will be maintained in place as the discharge locations previously granted under the licence may still be used. The licence holder proposes two additional monitoring points (WQ6 and 7) on the Nambeelup Brook North, one (WQ8) on the Nambeelup Brook North Tributary and two on the on the Dirk Brook Tributary (WQ9 and WQ10).

### 2.3.3 Expansion of the mining area and groundwater monitoring requirements

#### Proposed addition of monitoring bores

Groundwater monitoring under the current licence occurs at set monitoring locations (KS1 – KS26) quarterly, 6 monthly and annually depending on the parameter being measured (Figure

9). In line with the expansion of the mining activities, the licence holder proposes to add five groundwater monitoring locations (KS27 to KS31) to monitor groundwater on lot 56 and five (KS35 to KS39) to monitor groundwater when mining on lot 63. All bores aside KS27 and KS28 were constructed by the licence holder when the premises was initially established and bore logs were reviewed by the department as part of this application. KS27 and KS28 were existing bores and bore logs could not be found, however the licence holder is confident that specifications and bore construction would be similar to those constructed by Keysbrook. The Licence holder states that the bores have been monitored since inception to establish baseline data.

### **Proposed removal of monitoring bores**

As part of the amendment, the licence holder proposed to remove monitoring requirements for several bores, specifically KS1 to KS7, KS15 and KS20 to KS22 and KS26 for the following reasons:

- KS1 to KS3, KS 20 to KS22: land access is no longer available.
- KS4 to KS7: the bores are outside the active mining zone and have been for two years, additionally KS6 has been damaged by root growth and this prevents monitoring.
- KS15 is no longer available as it has been incorporated into the mining area.
- KS26 is out of service

KS1 to KS7, KS20 and KS22 are all located on the eastern side of the premises. Annual reporting requirements regulated under the licence require the licence holder to submit monitoring data on all groundwater bores unless a licence amendment is sought. The licence holder stopped monitoring bores KS1, KS2, KS3, KS6, KS19, KS20, KS21, KS22, KS26 at different points during the duration of the licence due to lack of access.



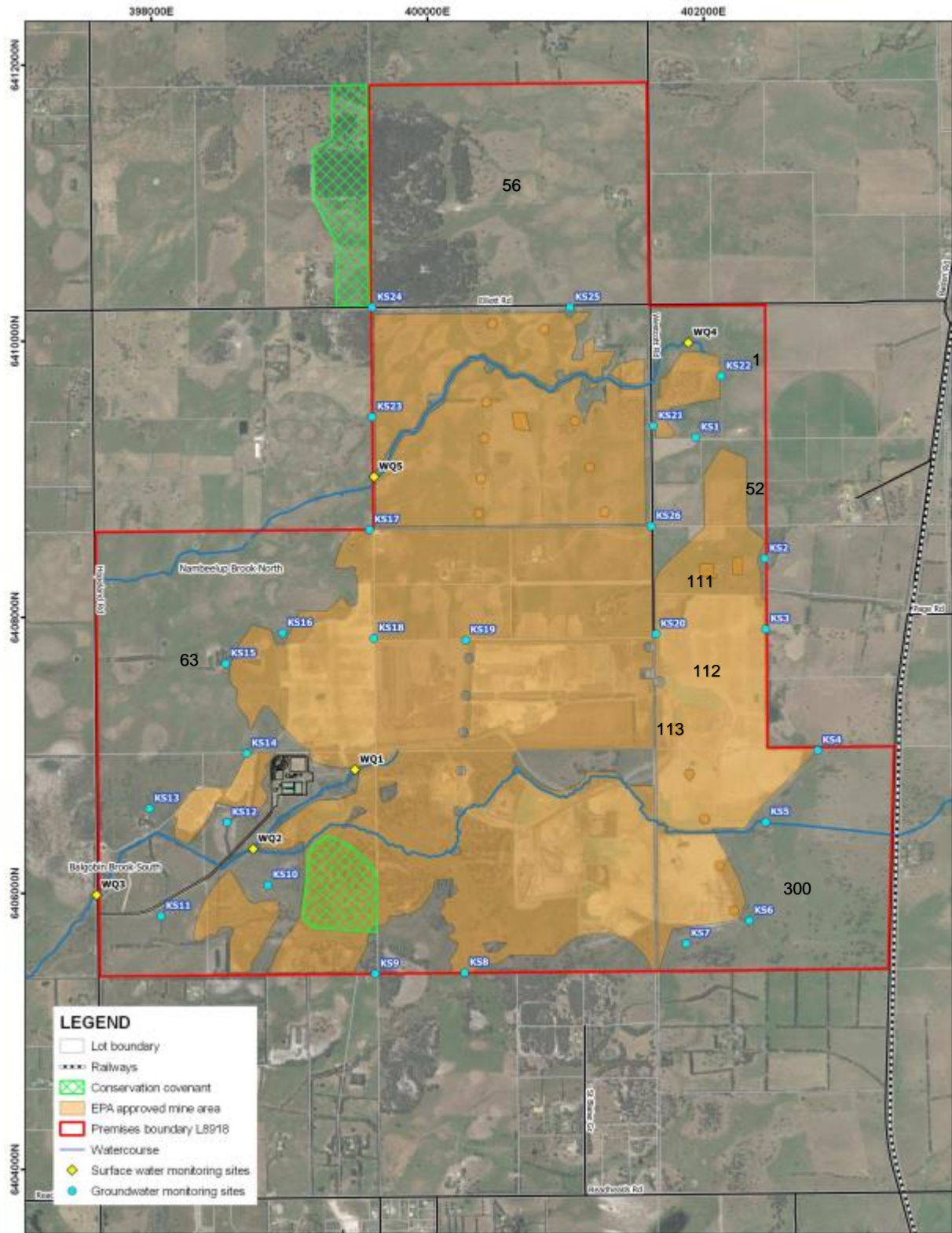


Figure 9. Current location of surface and groundwater monitoring location within the premises boundary.

### Summary of groundwater quality at the premises

A review of groundwater data submitted by the licence holder as part of the annual reporting requirements, showed that several groundwater monitoring bores had a low pH value at different points since 2015 (Figure 9). KS1 pH was approximately 5 in 2017 and 5.5 in 2020 and 2021. KS5 appears to undergo a downward trend from 2022 to the beginning of 2023. KS17's pH value was 3.46 in 2022. KS23 pH dropped below 4 twice in 2020 and again in 2022. KS24, directly north of both KS17 and KS23 also appeared to show a decreasing trend between 2020 and 2023 with values being around 4 in June 2023 (Figure 9).

Total Titratable Acidity (TTA), indicative of the quantity of acid the water can release, was also shown to be elevated in some of the shallow bores, including KS8 in 2017, 2020 and 2022, KS10 in 2021, KS12 in 2019 and 2021 and KS15 most years since 2015. Furthermore, high levels of total titratable acidity were found intermittently in KS16, 17, 20 and 23 (Figure 10). DWER guidance document *Treatment and management of soil and water in acid sulfate soil landscapes (2015)* recommends that groundwater with a TTA greater than 40mg/L should be neutralized before being discharged to the environment to reduce potential risks of acidification.

Several bores also showed sustained elevated values of total dissolved solids (Figure 11). KS3 despite high variability shows a concentration of total dissolved solids value of 9000 mg / L in 2019, with a value above 1500 mg/L most years since 2015. KS9 and KS10, K11, KS13, KS14 and KS16 albeit with slightly lower values also display consistent high concentrations of total dissolved solids.

Overall, the data indicates that there are currently pockets of poor quality groundwater at the premises with high levels of acidity and salinity. Expansion of the footprint will bring with it additional tailings deposition and disturbance to PASS. Monitoring bores allow for the detection of groundwater impacts, reducing the likelihood of groundwater contamination.

### Technical Review

Technical advice was sought from the Department's contaminated sites branch on the impact of removing all monitoring bores as proposed by the licence holder. The contaminated sites branch recommended that monitoring of bores on the eastern side of the premises should continue, as water quality changes assessed on the shallow groundwater bores at premises is consistent with the oxidation of pyrite within PASS. A continued monitoring regime ensures that the licence holder and the department remain informed on whether any further degradation of the water quality is occurring at the premises. The technical advice also recommended to include titratable alkalinity within the groundwater parameters to be monitored as it provides an additional indication of whether groundwater is acidifying even in the presence of a relatively stable pH.

### Amended Proposal

After several informal discussions with the licence holder, the initial proposal to remove monitoring bores KS1 to KS7, KS15, KS20 to KS22 and KS26 was amended. The licence holder proposes to remove monitoring bores KS22, 21, 1, 2, 3, 20 19, 6 and continue with the monitoring of KS26, 4, 5 and 7. The removal of the monitoring bores is consistent with the inability of the licence holder to gain entry to the privately owned lots 1, 52, 111, 112 113 and 6 included within the premises boundaries.

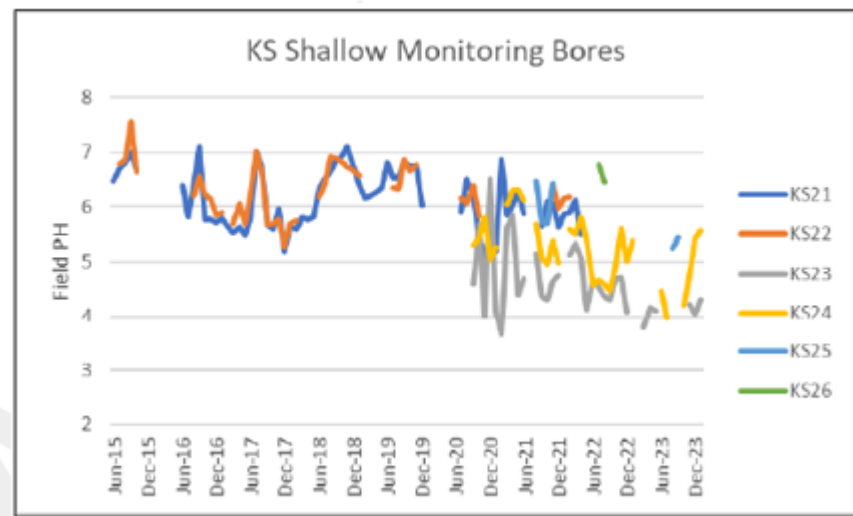
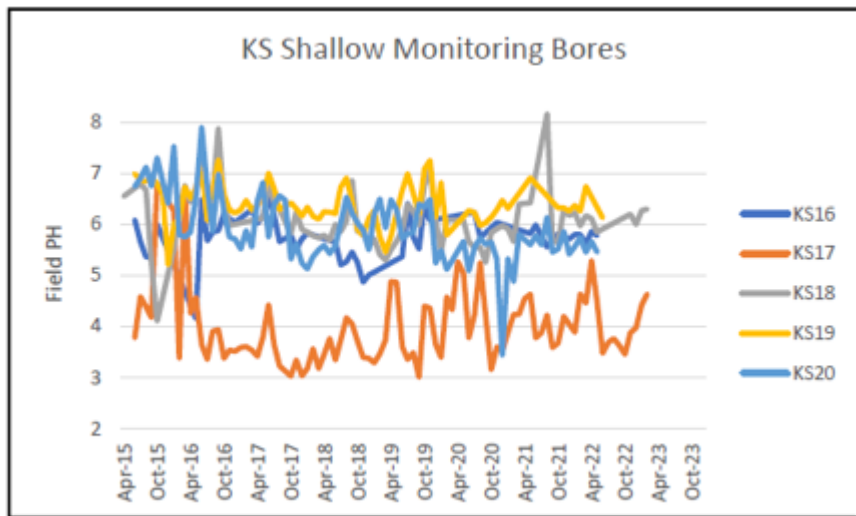
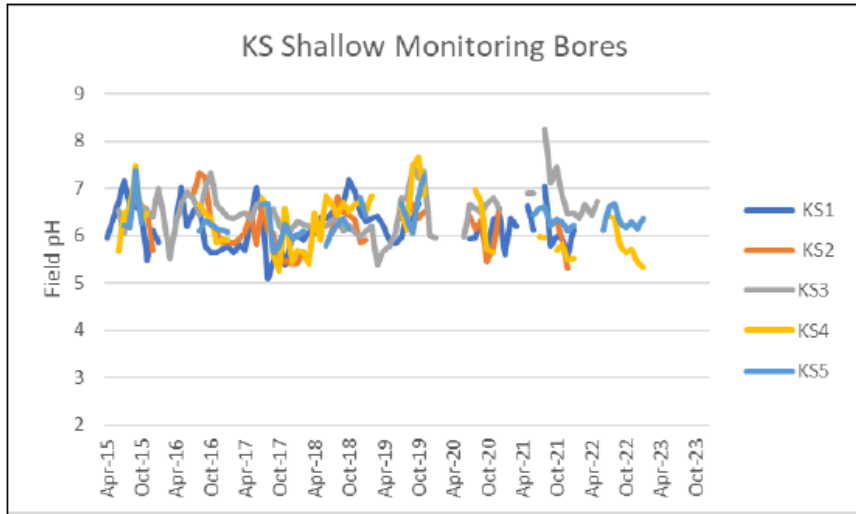


Figure 9. PH monitoring data on bores KS1 to KS5 and KS16 to KS26 between April 2015 and December 2023.

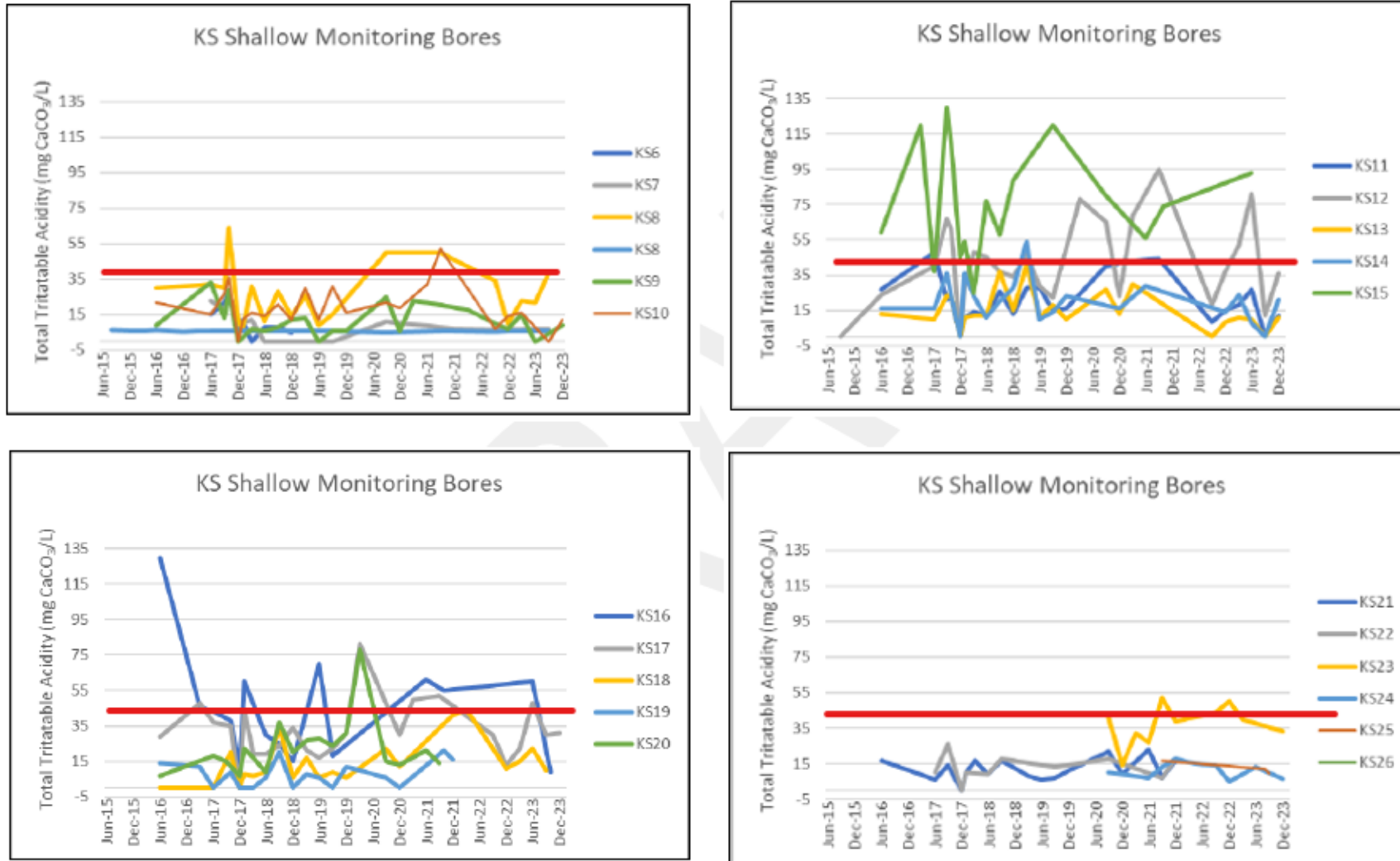


Figure 10. Total Titratable acidity in mg/L between June 2015 and December 2023 at bore KS11 to KSS26

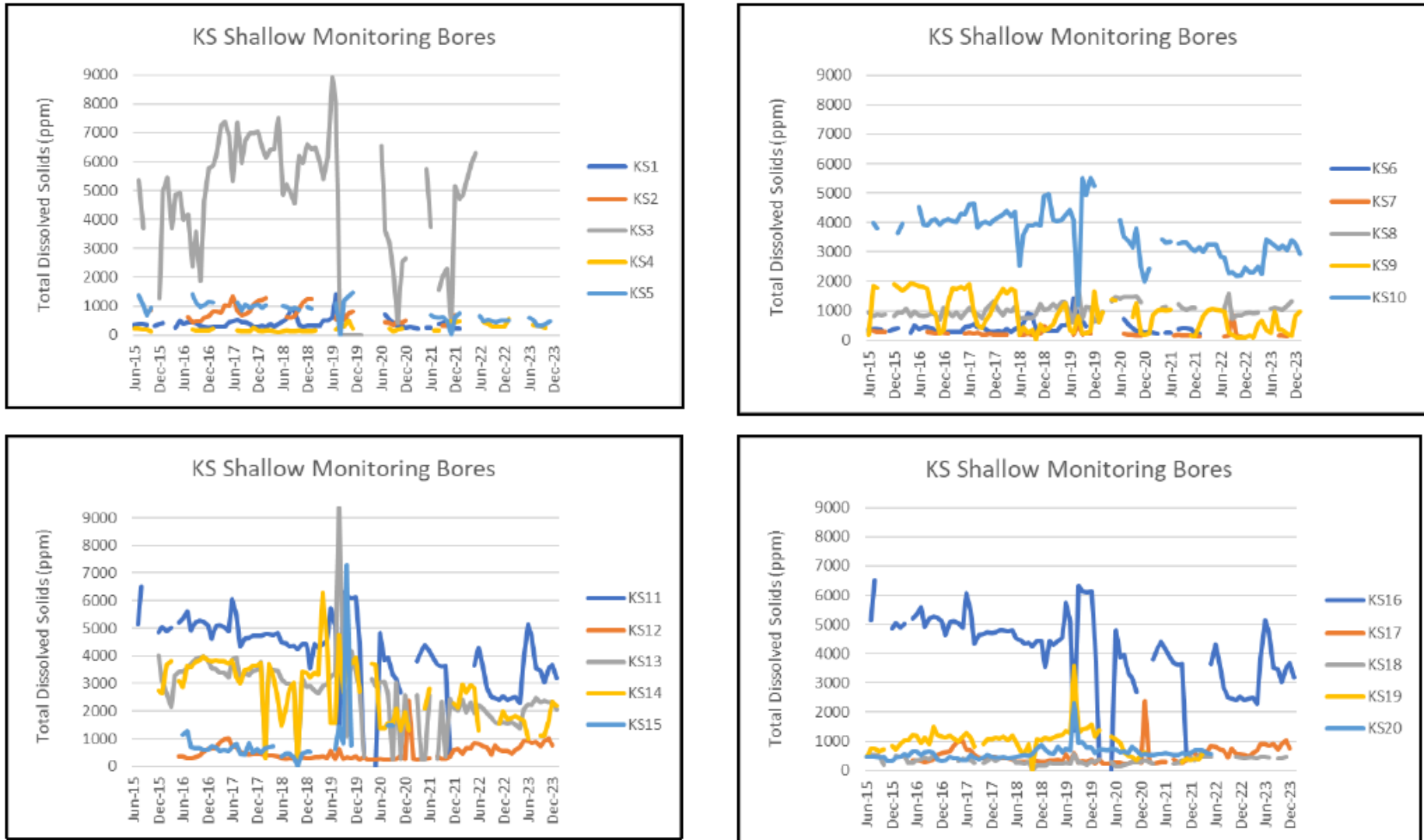


Figure 11. Total dissolved solids values on bore KS1 to KS20 (ppm) from June 2015 to June 2023

## 2.4 DWER initiated amendments

Further to a review of the information provided by the licence holder and historical information provided on the discharge, the Delegated Officer has determined that a DWER initiated amendment will also be undertaken. The DWER initiated amendment includes:

- A review of the risk rating associated with the year-round discharge from the process water pond on Balgobin Brook South (discharge point W1).
- A review of the premises boundaries.  
The licence holder stated that access to some of the privately owned lots is no longer permitted. The review includes ensuring that all licence agreements for the lots not currently owned by Doral Pty Ltd are valid and current. Those lots no longer accessible by a valid licence agreement will be removed from the licence.

## 2.5 Part IV of the EP Act

MS810, MS 984 and 1089 regulate the premises under part IV of the EP Act. Details of the notice of decisions can be found on the EPA website.

The original MS considered the following:

- Clearing of native vegetation under condition 6
- Protection of watercourses and wetlands under condition 7
- Rehabilitation plan under condition 8
- Weed and Dieback management under condition 9
- Nutrient mobilisation under condition 10
- Water management under condition 11
- Acid Sulphate soils management under condition 12
- Noise management and monitoring under condition 14
- Air quality and dust regulation under condition 15

Subsequent amendments under section 46C of the EP Act were granted by the EPA to:

- expand the approved mining area and update figures
- increase the Life of Mine
- increase productivity
- amend some of the wording in the MS.

The expansion of the mining footprint was assessed under MS810 and approved under section 45C of the EP Act. Dust and noise emissions are usually regulated under Part V, however as these have already been considered and regulated under the MS, are therefore not within the scope of this amendment. Direct impacts to flora and fauna (such as clearing) have also been regulated under MS 810, however, indirect impacts to wetland vegetation, aquatic biota and other flora and fauna receptors from discharges and emissions proposed as part of this amendment will form part of this assessment.

The Delegated Officer acknowledges that the broad aspects of water management at the premises are primarily regulated through MS 810 and the approved Water Management Plan. However, the detailed assessment of the specific discharge points is regulated under the licence, and any additional conditions on the licence will be included to complement regulation under Part IV of the EP Act.

### 3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

#### 3.1 Source-pathways and receptors

##### 3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises operation which have been considered in this decision report are detailed in Table 2 below.

**Table 2: Proposed applicant controls**

Emission	Sources	Potential pathways	Proposed controls
<b>Operation</b>			
Mine effluent including catchment runoff, dewatering effluent, groundwater and recovered process water from the northern water settling pond (refer to Table 1 for more information)	Discharge of process water through the new discharge points on lot 56 and lot 63.	Direct discharge	The licence holder proposes to maintain the <b>operational controls</b> as per the existing licence and add <b>monitoring locations</b> . Current Operational controls: <ul style="list-style-type: none"> <li>• Flow meter device installed on the pump discharging the effluent from the northern return water settling pond (condition 3)</li> <li>• Combined (between the ponds) discharge limit of 250,000 tonnes per annual period (condition 8) (condition 3)</li> <li>• Discharge to be conducted in accordance with condition 8 discharge points, sources of discharge and a discharge limit of 250,000 tonnes per annual period.</li> </ul> Current Monitoring: <ul style="list-style-type: none"> <li>• Emissions monitoring program at the northern return water settling pond (conditions 9, 10, 11 and 12)</li> <li>• Ambient environmental monitoring (condition 14)</li> </ul> Additional monitoring proposed: <ul style="list-style-type: none"> <li>• Addition of ambient surface water monitoring sites WQ6 and WQ7 (Nambeelup Brook North)</li> <li>• Addition of ambient surface water monitoring site WQ8 (Nambeelup</li> </ul>

Emission	Sources	Potential pathways	Proposed controls
			<p>Brook North Tributary)</p> <ul style="list-style-type: none"> <li>• Addition of ambient surface water monitoring sites WQ9 and WQ10 on the Dirk Brook Tributary</li> </ul>
Acidified seepage from mining/disturbance of PASS	Expansion of mining activities into lot 63 and lot 56	Seepage Groundwater drawdown	<p>Acid Sulfate Soil management plan (ASSMP) approved under MS 810 applies.</p> <p>Only Monitoring controls apply to the current licence. The licence holder proposes to maintain the current monitoring and add additional monitoring locations</p> <p>Current Monitoring:</p> <ul style="list-style-type: none"> <li>• Ambient groundwater monitoring of bores KS1 – KS26 (conditions 9, 10, 11 and 15)</li> </ul> <p>Additional monitoring proposed:</p> <ul style="list-style-type: none"> <li>• Addition of a total of 10 monitoring bores surrounding mining activities on lot 56 and 63</li> </ul>
Potentially contaminated seepage from tailings deposition		Infiltration and horizontal migration	<p>The licence holder proposes to maintain the <b>operational controls</b> as per the existing licence and add <b>monitoring locations</b>.</p> <p>Controls on the licence consist of:</p> <ul style="list-style-type: none"> <li>• Supernatant water to be collected and pumped to process water pond(s)</li> <li>• Water levels to be maintained at least below 500mm below the top of the wall; and</li> <li>• A safety bund to be maintained around active pits (condition 3)</li> </ul> <p>Current Monitoring:</p> <ul style="list-style-type: none"> <li>• Ambient groundwater monitoring of bores KS1 – KS26 (conditions 9, 10, 11 and 15)</li> </ul> <p>Additional monitoring proposed:</p> <ul style="list-style-type: none"> <li>• Addition of a total of 10 monitoring bores surrounding mining activities on lot 56 and 63</li> </ul>
Sediment contaminated Runoff		Disturbance of surface water streams	<p><b>The licence holder proposes to maintain current operational controls and extend them</b> to the minor streams on lot 56 and 63.</p> <p>Controls on the licence consist of:</p> <ul style="list-style-type: none"> <li>• diversion channels and drains to divert all stormwater runoff from disturbed areas within the Premises to allow for collection and reuse in</li> </ul>



Emission	Sources	Potential pathways	Proposed controls
			processing (condition 3)

### 3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the applicant’s employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies and is provided for under other state legislation.

Table 3 provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

**Table 3: Sensitive human and environmental receptors and distance from prescribed activity**

Human receptors	Distance from prescribed activity
<p>While the prescribed premises is surrounded by residential premises with the closest being approximately 670 m from lot 63 and 400m from lot 56, the human receptors have not been considered as part of this amendment as already managed under part IV of the EP Act (MS810).</p>	
Environmental receptors	Distance from prescribed activity
<p><u>Surface water</u></p>	
<p>Several watercourses flow through the extended footprint of the project:</p> <ul style="list-style-type: none"> <li>• Nambeelup Book North</li> <li>• The Dirk Brook Tributary</li> <li>• Four conservation category wetlands (ID: 14870, 14802, 14803, 14831)</li> <li>• Two conservation category wetlands</li> <li>• Black Lake Of conservation significance under The <i>Environmental Protection (Swan Coastal Plain Lakes) Policy 1992</i> list</li> <li>• Serpentine River System Proclaimed under the <i>Rights in Water and Irrigation Act, 1914</i> (RIWI Act).</li> </ul>	<p>Flows south-west through the centre of the project and across the north of lot 63.</p> <p>Flows north-west across the northern part of lot 56</p> <p>Located within the extension of the mining footprint on lot 63 and 2.2, 2.52, 0.5 km respectively, west of lot 63 boundary.</p> <p>Located on lot 56, directly downstream of the Dirk Brook Tributary</p> <p>Approximately 12 km from lot 63 boundary. The Nambeelup Brook catchment flows into Black Lake.</p> <p>The premises sits within this river system</p>
<p><u>Groundwater</u></p>	
<ul style="list-style-type: none"> <li>• Serpentine Groundwater Area Proclaimed under the <i>Rights in Water and Irrigation Act, 1914</i> (RIWI Act).</li> <li>• Karnup-Dandalup Underground Water Pollution control area (P2 plan applies)</li> </ul>	<p>Underlying</p>
<p><u>Flora</u></p>	
<p>Threatened and Priority ecological communities: Banksia Woodland of the Swan coastal Plain and <i>Corymbia calophylla</i>.</p> <p>Remnant vegetation of lot 56 is:</p> <ul style="list-style-type: none"> <li>• poorly represented on the eastern side of the Swan Coastal Plain;</li> <li>• in Good to Very Good condition, in an extensively cleared area; and</li> </ul>	<p>Along the western boundary and immediately downstream of lot 56 as well as to the west and southern boundary of lot 63.</p>

<ul style="list-style-type: none"> <li>comprises of habitat for native fauna conservation significance</li> </ul>	
<p><i>Fauna</i></p> <p><i>Terrestrial</i></p> <ul style="list-style-type: none"> <li><i>Calyptorhynchus banksia naso</i> (Red tailed black cockatoo) - Vulnerable</li> <li><i>Zanda latirostris</i> (Carnaby's black Cockatoo) - Endangered</li> </ul> <p><i>Aquatic</i></p> <ul style="list-style-type: none"> <li>The Nambeelup Brook provides habitat for several native species of estuarine and estuarine – freshwater fish and crustaceans including <i>Bostockia porosa</i> (nightfish), <i>Galaxias occidentalis</i> (western minnow) and <i>Cherax quinquecarinatus</i> (gilgie)</li> </ul>	<p>Within and in the area surrounding lot 56 and 63.</p> <p>Downstream of lot 63.</p>

## 3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the licence as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

Licence L8918/2015/1 that accompanies this decision report authorises emissions associated with the operation of the premises.

The conditions in the issued licence, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

**Table 4: Risk assessment of potential emissions and discharges from the premises during operation**

Risk events					Risk rating <sup>1</sup>	Applicant controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
<b>Operation</b>								
Discharge of process water from the northern return water settling pond through additional emergency discharge points on the Nambeelup Brook North (W2.7, W2.8)	Mine process water including catchment runoff, dewatering effluent, groundwater and recovered process water	<b>Pathway:</b> Direct discharge  <b>Impact:</b> Erosion, with subsequent increase sediments entering the stream.	Surface water, aquatic fauna	No additional controls proposed	C = Minor L = Unlikely <b>Medium Risk</b>	N	<b><u>Condition 5</u></b>	Condition 5 has been updated to require the licence holder to inspect the points of discharge to surface water regularly to assess whether erosion is occurring and implement prevention measures if necessary.  Applicant's controls have been conditioned within the works approval in accordance with DWER <i>Guideline: Risk Assessments</i>
		<b>Pathway:</b> Direct discharge  <b>Impact:</b> Changes to volume of streamflow with a potential impact to stream ecology	Surface water, native aquatic fauna, stream dependent native vegetation	Refer to section 3.1	C = Moderate L = Unlikely <b>Medium Risk</b>	N	Condition 3 <b><u>Condition 8</u></b> Condition 13 Condition 15	Additional regulatory controls have been applied, please refer to the detailed risk assessment (section 3.3) for risk rating details and additional controls. The risk rating on this table reflects the rating after the additional controls have been applied.  The proposed surface monitoring locations WQ6, WQ7 are deemed acceptable.  Applicant's controls have been conditioned within the works approval in accordance with DWER <i>Guideline: Risk Assessments</i>
		<b>Pathway:</b> Direct	Surface Water and	Refer to	C = Moderate	N	<b><u>Condition 8</u></b>	Additional discharge points to this medium-flow stream are considered an acceptable risk if the

Risk events					Risk rating <sup>1</sup> C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		discharge  <b>Impact:</b> Deterioration of Surface Water quality from discharge of acidic process water	overall ecology of the stream, including riparian vegetation and downstream threatened and priority 3 ecological communities	section 3.1	L = Possible <b>Medium Risk</b>		<b>Conditions 9</b> Condition 13 Condition 15	discharged water meets suitable water quality standards and is undertaken during the winter months when it more closely matches the natural stream flow. Discharge water quality limits have been conditioned on the licence. The risk rating on this table reflects the risk rating after the additional controls have been applied.  Refer to the detailed risk assessment (section 3.3).
Discharge of process water from the northern return water settling pond through additional discharge points on the Nambeelup Brook North Unnamed Tributary: W2.9 and W2.10	Mine effluent including catchment runoff, dewatering effluent, groundwater and recovered process water	<b>Pathway:</b> Direct discharge  <b>Impact:</b> Changes to volume of streamflow	Conservation category wetlands downstream and within lot 63 and aquatic species	Refer to section 3.1	C = Major L = Likely <b>High Risk</b>	N	-	The risk of the deterioration of the water quality in these 'minor' low flow, sensitive waterways is particularly elevated by the naturally low flow of the stream, reducing amelioration by dilution and increasing impacts from changing flow regimes. The risks associated with discharging water to this location is deemed unacceptable and will not be authorised. Alternative discharge locations that present a lower risk to the environment are available for use.  Refer to the detailed risk assessment (section 3.3) for risk rating details.
		<b>Pathway:</b> Direct discharge  <b>Impact:</b> Deterioration of Surface Water quality from discharge of acidic process water	Conservation category wetlands downstream and within lot 63 and aquatic species	Refer to section 3.1	C = Major L = Likely <b>High Risk</b>	N	-	

Risk events					Risk rating <sup>1</sup>	Applicant controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Discharge of process water from the northern return water settling pond through additional discharge point on the Dirk Brook Tributary - W2.11 (renamed to W2.9)	Mine effluent including catchment runoff, dewatering effluent, groundwater and recovered process water	<b>Pathway:</b> Direct discharge  <b>Impact:</b> Erosion, with subsequent increase of nutrients and sediments entering the stream.	Surface water, including conservation category wetland threatened and native vegetation and threatened fauna	Refer to section 3.1	C = Minor L = Unlikely <b>Medium Risk</b>	N	<b><u>Condition 5</u></b>	A condition has been added to inspect the points of discharge regularly to assess whether erosion is occurring and implement prevention measures if necessary.  Applicant's controls have been conditioned within the works approval in accordance with DWER <i>Guideline: Risk Assessments</i>
		<b>Pathway:</b> Direct discharge  <b>Impact:</b> Changes to volume of streamflow	Native aquatic fauna, conservation category wetlands, threatened and priority 3 ecological communities	Refer to section 3.1	C = Moderate L = Unlikely <b>Medium Risk</b>	N	Condition 3 <b><u>Condition 8</u></b> Condition 13 Condition 15	Additional regulatory controls have been applied, please refer to the detailed risk assessment (section 3.3) for risk rating details and additional controls. The risk rating on this table reflects the rating after the additional controls have been applied.  The proposed surface monitoring locations WQ9, WQ10 are deemed acceptable.  Applicant's controls have been conditioned within the works approval in accordance with DWER <i>Guideline: Risk Assessments</i>
		<b>Pathway:</b> Direct discharge  <b>Impact:</b> Deterioration of Surface Water	Surface Water including conservation category wetlands, native and priority 3	Refer to section 3.1	C = Moderate L = Possible <b>Medium Risk</b>	N	<b><u>Condition 8</u></b> <b><u>Condition 9</u></b> Condition 13 Condition 15	A discharge points to this medium-flow stream are considered an acceptable risk if the discharged water meets suitable water quality standards. Discharge water quality limits have been conditioned on the licence.  Refer to section 3.3 for detailed risk assessment.

Risk events					Risk rating <sup>1</sup> C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
		quality from discharge of acidic process water	ecological communities, threatened fauna species and aquatic fauna					
Discharge of process water from the northern return water settling pond through additional discharge point on the unnamed tributary on lot 56: W2.12	Mine effluent including catchment runoff, dewatering effluent, groundwater and recovered process water	<b>Pathway:</b> Direct discharge  <b>Impact:</b> Changes to volume of streamflow	Surface water and aquatic species	Refer to section 3.1	C = Major L = Likely <b>High Risk</b>	N	-	The risk of the deterioration of the water quality in these 'minor' low-flow sensitive waterways is particularly elevated by the naturally low flow of the stream, reducing amelioration by dilution and increasing impacts from changing flow regimes. The risks associated with discharging water to this location is deemed unacceptable and will not be authorised. Alternative discharge locations that present a lower risk to the environment are available for use.  Refer to the detailed risk assessment (section 3.3) for risk rating details.
		<b>Pathway:</b> Direct discharge  <b>Impact:</b> Deterioration of Surface Water quality from discharge of acidic process water from	Surface water and aquatic species	Refer to section 3.1	C = Major L = Likely <b>High Risk</b>	N	-	



Risk events					Risk rating <sup>1</sup>	Applicant controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Discharge of process water from the northern return water settling pond through the existing discharge point (W1) outside of the winter months.	Mine effluent including catchment runoff, dewatering effluent, groundwater and recovered process water	<p><b>Pathway:</b> Direct discharge</p> <p><b>Impact:</b> Changes to volume of streamflow</p>	Surface water and aquatic species	Refer to section 3.1	C = Moderate L = Possible <b>Medium Risk</b>	N	Condition 3 <b>Condition 8.</b> Condition 13 Condition 15	<p>Previously, this discharge was assessed as an intermittent emergency discharge during high and prolonged rainfall events. This has been reassessed as historical monitoring data show the discharge now occurs year-round. Discharge to this location is considered an acceptable risk if the discharged water meets suitable water quality standards and only occurs during the winter period only. Discharge water quality limits have been conditioned on the licence.</p> <p>Refer to the detailed risk assessment (section 3.3) for risk rating details and additional controls.</p>
		<p><b>Pathway:</b> Direct discharge</p> <p><b>Impact:</b> Deterioration of Surface Water quality from discharge of acidic process water</p>						
Expansion of mining footprint to lot 56 and lot 63 with increased disposal of sand tailings within the mining voids	<p>Metal content, saline effluent, NORMs</p> <p>Acidity from disturbance of PASS</p>	<p><b>Pathway:</b> Seepage</p> <p><b>Impact:</b> Deterioration of soils health and groundwater quality</p>	Soil and groundwater	Refer to section 3.1	C = Moderate L = Possible <b>Medium Risk</b>	Y	Condition 16	<p>The proposed locations of the 10 additional groundwater monitoring bores around the expanded mine footprint are considered reasonable to identify any potential changes to groundwater quality.</p> <p>The licence holder's proposal to remove groundwater monitoring bores KS22, KS21, KS1, KS2, KS3, KS20, KS19 and KS 6 on the centre and eastern side of the premises and continue with the monitoring of KS26, KS4, KS5, KS7 is considered acceptable to determine whether any further degradation of groundwater quality is</p>

Risk events					Risk rating <sup>1</sup> C = consequence L = likelihood	Applicant controls sufficient?	Conditions <sup>2</sup> of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
								<p>occurring at the premises.</p> <p>The Delegated Officer notes that the bores the licence holder wishes to remove are required to be monitored under the EPA approved groundwater management plan (MS 810). Furthermore, Keysbrook proposed amendment under part IV of the EP Act to expand the western boundary of the premises does not include any changes to the current groundwater monitoring regime.</p> <p>Applicant's controls have been conditioned within the works approval in accordance with DWER <i>Guideline: Risk Assessments</i></p>
Expansion of mining activities into lot 56 and 63	Sediment contaminated runoff	Disturbance of surface water streams	Surface water	Refer to section 3.1	C = Minor L = Unlikely <b>Medium Risk</b>	Y	Condition 3	Applicant's controls have been conditioned within the works approval in accordance with DWER <i>Guideline: Risk Assessments</i>

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

### 3.3 Detailed risk assessment - Discharge of process water to proposed surface water discharge points

The discharge of process water into a stream may affect stream ecology from changes in stream flow and water quality. Stream flow changes are directly related to both the volume and velocity of the water in the stream. Changes in volume affect the ability of the stream to deal with pollutants and nutrients as the level of dilution changes. Small and medium-sized intermittent streams as those considered in the proposed amendment are particularly prone to any impacts from changes of volume as flow is lower than large sized streams and varies widely between the winter and summer season. Changes in velocity can affect turbidity (as sediments remain suspended in the in the water column for longer); dissolved oxygen and salinity in the stream (Patil *et al.*, 2022). Section 2.3.1 of this report outlines the locations of the proposed discharge points and section 2.2.2 (*Surface water*) provides the characteristics of each stream where discharge is proposed.

Localised impacts of changes to streamflow can affect aquatic fauna lifecycle, particularly those reliant on the seasonal changes, and riparian vegetation relying on the presence of water at different times of the year for survival. On a broader scale, the impacts of changed to streamflow can affect downstream wetlands and lakes as well as threatened and priority ecological communities who rely on the presence of water for survival. Changes to water quality may lead to the death of sensitive species, and the proliferation of invasive species. This in turn affects native vegetation, including threatened or priority ecological communities and the aquatic flora and fauna. Additionally, surface water in and surrounding the premises is also used for agriculture and livestock therefore any adverse effects may impact the local industry.

The detailed risk assessment will consider the two risk events (i.e., changes to streamflow and water quality) separately for practical reasons, however as mentioned above, it should be noted that the streamflow water quality is directly linked to streamflow natural patterns and volumes. Therefore, in considering the risk rating the Delegated Officer has also recognised how potential impacts to the ecology and water users from changes in water quality may be compounded by alterations in stream flow patterns.

#### 3.3.1 Assessment of impacts on stream ecology from changes in streamflow

##### Technical Advice

Technical advice was sought from the Environmental Water Planning branch on the potential impact of the discharge volume on the Nambeelup Brook North, Nambeelup Brook North Unnamed Tributary, Dirk Brook and unnamed tributary on lot 56. Key points of the advice and recommendation are summarised below:

- Based on the information provided, changes to the streamflow are unlikely to have a significant impact if discharges occur during periods when discharge volume matches natural streamflow
- The information supplied is not sufficient to understand the broader impact on a local and regional scale
- Discharge should be made at volumes and times that most closely match natural streamflow
- Discharge should occur at lower volumes over extended periods to minimise the risks to the environment
- Daily discharge events should not be significantly higher than natural flow events at the discharge points or cumulatively at downstream locations, particularly on high value locations such as conservation value wetlands

- Stream erosion at the point of discharge must be managed by the licence holder.

## Risk Assessment

The Delegated Officer acknowledges that the extent of the risk to the stream ecology from the volume of discharge is not fully understood. The streamflow data provided by the licence holder is limited to one large sized stream (i.e., peak flow 10 - 15m<sup>3</sup> /sec) (MBS Environmental, 2015) which is not representative of the streams where the new discharge locations will occur. Secondly, while the streamflow data was collected downstream of the mine, it is not directly on the same stream where the discharges will occur.

The proposed discharge points are on different streams with varying sensitive receptors, so different risk ratings have been assigned to the different discharge points. These have been assessed individually below.

### 1. Nambeelup Brook North discharge (proposed discharge points W.2.7, W2.8)

The Nambeelup Brook North is a medium sized stream (MBS Environmental, 2015). Annual data provided by the licence holder show that discharge volumes since 2022 when discharge began, were on average low and undertaken between July and September when streamflow is at its peak. As the other discharge points become redundant, the additional discharge points on the Nambeelup Brook North are unlikely to increase the level of risk, provided that discharge continues to occur during periods of high streamflow (i.e., winter period). Discharge during periods of low stream flow increases contaminants loads excessively therefore restricting the discharge to a seasonal basis decreases the risk. With these additional conditions, the consequence rating is reduced to moderate while the likelihood rating is unlikely. The risk event rating is therefore found to be medium.

#### *Additional controls*

The Delegated Officer finds that to minimise the impact of discharge on streamflow, the discharge on the Nambeelup Brook North may continue but should be restricted to the winter/spring months only when the streamflow is likely to be high/medium due to elevated rainfall.

### 2. Nambeelup Brook North unnamed tributary discharge (proposed discharge points W.2.9, 2.10)

Impacts on streamflow from the discharge increases in the smaller streams where the discharged effluent is a higher proportion of the streamflow which results in contaminant loads being proportionally higher. Located directly downstream of the unnamed tributary is a conservation category wetland. Discharge to the unnamed tributary may significantly impact the flow regime of the stream and by extension the adjacent conservation category wetland and any sensitive aquatic organisms. Given the environmental value of the wetland, the consequence of impact to the stream ecology from changes in streamflow has been found to be major, and the likelihood as likely, making the risk event rating high.

#### *Additional controls*

When considering the risk associated with the discharge to a small low flow stream, and the risk to the downstream conservation category wetland, the Delegated Officer finds that the precautionary principle should apply therefore a determination has been made that these discharge points will not be authorised. Noting that the licence holder has proposed to retain the previously granted discharge locations (W2.1- W2.6) the Delegated Officer finds the licence holder has sufficient flexibility to allow discharge associated with the movement of mining activities into lot 63 without needing the additional discharge locations on the Nambeelup Brook North unnamed tributary.

### 3. Dirk Brook discharge (proposed discharge point W2.11(renamed to W2.9))

Changes in streamflow of the Dirk Brook Tributary may directly impact the stream ecology, the conservation category wetlands and the fauna and flora (including the threatened species) dependent on it for survival. The consequence of the risk event is therefore considered major, with a likelihood of unlikely provided that specific controls specified are maintained. Discharge during periods of low stream flow increases contaminants loads excessively therefore restricting the discharge to a seasonal basis decreases the risk. The risk rating is therefore reduced to medium.

#### *Additional controls*

The Delegated Officer finds that to minimise the impact of discharge on streamflow, the discharge on the Nambeelup Brook North may continue but should be restricted to the winter/spring months only when the streamflow is likely to be high due to elevated rainfall.

### 4. Unnamed Tributary on lot 56 (proposed discharge point, W.2.12)

A low streamflow increases the likelihood that the volume of effluent discharged albeit minor, may disproportionately impact the ecology of the stream from changes to volume and velocity, and the associated contaminant loading. Consequence of the risk event has been found to be major with a likelihood of likely. The risk event has therefore been deemed as high.

#### *Additional controls*

When considering the risk associated with the discharge to a small low flow stream, the Delegated Officer finds other available alternatives (discharge points W2.7 and W2.8 and W2.11(renamed to W2.9) present a lower risk of environmental impact due to the higher natural flows at these locations. Noting that the licence holder has proposed other more suitable discharge locations the Delegated Officer finds existing discharge locations provide sufficient operational alternatives. Therefore, this discharge location will not be authorised at this time.

### 3.3.2 Impacts on stream ecology from changes in water quality

Effluent quality, if unchecked could have a harmful effect on the stream ecology. Discharge of low quality water from dewatering and bore abstraction has the potential to remove the organic matter from the water column and increase photooxidation (Burton & Allan, 1986) and deteriorate water quality further through additional releases of heavy metals. This may result in a wide range of stream impacts which could include fish kill and loss of biodiversity (DER, 2015).

#### **Risk Assessment**

Groundwater at the premises has been shown in some circumstances to have elevated acidity and salinity, with several groundwater bores displaying low pH, high total titratable acidity and sustained elevated values of total dissolved solids (section 2.3.3, Figures 9,10,11). The expansion of mining activities, which includes further deposition of tailings within mining voids and additional disturbance to PASS, will bring additional risk to the groundwater quality. Groundwater is one of the sources of water used at the premises and together with stormwater, dewatering effluent, and tailings decant water is stored in the process water pond and the Northern return settling pond. If this water is discharged to the stream, it may have a negative impact on the stream ecology and other water users including those using the water for livestock and agriculture. Historical data on discharge effluent quality has shown that, on occasion, acidic water and effluent with a high concentration of total dissolved solids have been discharged into Balgobin Brook South. Without the additional controls, the Delegated Officer has found that the likelihood of the risk event occurring is deemed as likely with a moderate consequence, making the risk event rating high. Additional controls however (section below), will reduce the likelihood

to possible thus reducing the risk rating to medium.

#### *Additional Controls*

The risk of poor quality water impacting the stream can be easily mitigated by ensuring that the effluent meets an acceptable water quality criterion prior to discharging. The Delegated Officer finds that a limit for pH and total titratable acidity (TTA) measured in the field will be adequate to minimise impacts to sensitive receptors from the discharge. The pH and total titratable acidity are important indicators to determine the acidity in (process) water, both in the form of hydrogen ion at any given time (pH) and the total acidity stored (TTA) which provides an indication of the potential acidity in the future.

Total suspended solids and electrical conductivity (at 25 degrees Celsius) limits will also be introduced to ensure that salinity levels are low and sufficient settlement has occurred before the water is discharged. This will assist in reducing the possible sediment load and turbidity in the stream.

Most limit levels are based on the Department of Environment Regulation Guideline on Treatment and management of soil in water acid sulfate soil landscapes (2015). These parameters will not require a NATA accredited analysis but can be tested in the field, with results available immediately.

The Delegated Officer finds that water quality sampling must occur regularly to inform the licence holder on whether the water quality is suitable for discharge. If the licence holder finds that the water quality does not meet the discharge criteria, they will have the option to treat the water or retain the water within the site. Ongoing water quality sampling must therefore occur in the Northern Water Settling Pond (not just during discharge events).

### **3.3.3 DWER Initiated Amendment – discharge on Balgobin Brook South (existing discharge point W1)**

#### **Background**

Discharge of process water on Balgobin Brook south was incorporated into the 2015 initial licence issue. The discharge through discharge point W1 currently occurs via a lined spillway from the process water pond(s). The risk evaluation under the original licence assessed the discharge as low risk as the expected discharge volume was low and was to occur only during high rainfall in winter (i.e. approximately over a three-month period). Four amendments were granted under Part V of the EP Act since 2015 which included, in 2020, the addition of six discharge points on the Nambeelup Brook North and an increase in the overall discharge volume. The premise of the risk rating in increasing the discharge volume and adding discharge points remained the same. The discharge was assessed as medium risk, as it was only expected to occur when a rainfall sequence caused an exceedance of water demand during the four wettest months in winter.

#### **Risk assessment**

Discharge on Balgobin Brook South has been occurring since 2017. Balgobin Brook south is an ephemeral medium sized stream (MBS Environmental, 2015). Annual data provided by the licence holder shows that discharge has occurred through discharge point W1 throughout the year, including in the summer months when the stream bed is dry or has low stream flow. Discharge during drier periods, when rainfall is low and evaporation high, has the potential to alter the stream flow significantly even when the volume discharged is low. This in turn affects water quality, directly linked to streamflow natural patterns and volumes. The consequence rating of the discharge on the stream ecology outside the winter period is considered to be moderate while the likelihood rating is possible. Both risk events have therefore, been rated as medium risk.

*Additional controls*

Similarly to the other medium- sized streams the Delegated Officer finds that to minimise the possible impact on the stream ecology from changes in streamflow, discharge must aim at not exceeding the natural streamflow. As for all ephemeral streams at the premises, streamflow gradually decreases from spring when rainfall starts to decrease (Figure 5 for climate data) with streamflow reduced to nil in summer when evaporation by far exceeds rainfall. The Delegated Officer has conditioned the licence to allow discharge to occur during the winter/sping period only. The winter/spring period for the purpose of this licence will be from 1 May to 31 October each year when high rainfall events still occur.

To remain consistent with the proposed discharge points on the medium sized streams, a requirement for a discharge water quality criterion to be met prior to discharge at W1 will also be introduced in this amendment. A limit for pH and total titratable acidity will be adequate to minimise impacts to sensitive receptors from acidic discharge. Total suspended solids and Electrical conductivity (at 25 degrees Celsius) limits will also be introduced to ensure that sufficient settlement has occurred before the water is discharged. This will assist in reducing the possible sediment load and turbidity in the stream.

Most limit levels are based on the Department of Environment Regulation Guideline on Treatment and management of soil in water acid sulfate soil landscapes (2015). These parameters will not require a NATA accredited analysis but will be tested in the field, with results available immediately.

The Delegated Officer finds that water quality sampling must also occur regularly to inform the licence holder on whether the water quality is suitable for discharge. If the licence holder finds that the water quality does not meet the discharge criteria they will have the option to treat the water or retain the water within the site. Ongoing water quality sampling must therefore occur at the third dam of the process water pond (not just during discharge events).

## 4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

**Table 5: Consultation**

Consultation method	Comments received	Department response
Local Government Authority advised of proposal on 08 February 2023.	The Shire of Serpentine Jarrahdale responded on 20/02/2024 confirming that a development approval and an extractive industry licence had recently been issued by the Local Government for the expansion of the operations consistent with the proposed licence amendment. The approval was issues on 20 November 2023 subject to conditions. A copy of the Notice of Determination on Application for Development Approval was provided.	Noted

Consultation method	Comments received	Department response
Applicant was provided with draft documents on 24 June 2024	Refer to comments in Appendix 1 of this decision report.	Refer to department response in Appendix 1 of this decision report.

## 5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a revised licence will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

### 5.1 Summary of amendments

Table 1 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised works approval as part of the amendment process.

**Table 1: Summary of works approval amendments**

Condition no.	Proposed amendments
N/A	Premises legal description updated to remove lot 1 on Diagram 8916, Lots 111, 112 and 113 on Diagram 94183, part of Lot 52 of Plan 739 and Lot 6 on Diagram 52395 as access agreements are no longer held by the licence holder.
N/A Licence history	Added summary of changes relevant to this amendment.
-	Conditions and Tables renumbered where required for coherence.
5	Added condition to include a visual inspection of the Process water discharge points for erosion in accordance with this report.
8	<i>mine</i> replaced with <i>process</i> for accuracy.
8. Table 5	<p>Removed the word <i>table</i> from the table description as it is redundant.</p> <p>Replaced the word <i>Emission</i> with <i>Discharge</i> on the table heading in line with current standards and completed the word <i>reference</i> for clarity.</p> <p>Added <i>during the winter/spring period</i> to the description column of the process water pond(s) discharge in line with this DWER initiated amendment.</p> <p>Removed W2.1-W2.6 as requested by licence holder and added W2.7 and W2.8 in the Discharge point reference.</p> <p>Removed the words <i>staged emergency</i> and <i>locations</i> on the Discharge point reference column and replaced with discharge points for consistency.</p> <p>Added <i>W2.11 (renamed to W2.9)- discharge point on the Dirk Brook Tributary</i> on the Discharge point reference column in accordance with this amendment.</p> <p>Added <i>or Dirk Brook Tributary during the winter period</i> on the description column for the Northern return water settling pond discharge in accordance with this DWER initiated amendment.</p> <p>Note 1 added</p>



Condition no.	Proposed amendments
9 (new)	Added Condition 9 and Table 6 – process water discharge limits
13. Table 7 (Previously 12. Table 6)	<p>Table Description amended to <i>Process water discharge monitoring</i> for accuracy.</p> <p>Removed <i>SW1</i> and <i>SW2</i> from monitoring point column as requested by the licence holder at the 08 July 2024 meeting, to avoid confusion with discharge point references.</p> <p>Replaced <i>overflow point</i> with <i>third dam</i> for clarity and accuracy.</p> <p>Added map reference to the process water pond(s) and (<i>may be relocated in line with mining activities</i>) to the Northern return water settling pond for clarity.</p> <p>Added <i>Electrical conductivity @25C<sup>1</sup></i> and corresponding to unit to the parameter and units columns respectively for consistency with other conditions.</p> <p>Added an '<i>Averaging period</i>' column and '<i>Spot sample</i>' to this column for precision.</p> <p>Frequencies amended to <i>Weekly; or within 24 hours of discharge occurring then three times a week during discharge</i> for pH, Electrical conductivity @25C<sup>1</sup>, Total titratable acidity and Total suspended solids and total dissolved solids. Frequency amended to '<i>monthly</i>' for sulfate and the metal suite.</p>
15. Table 9 (Previously 14. Table 8)	<p>Added (<i>as depicted in Schedule 1, Figure 1</i>) for clarity.</p> <p>Added additional surface monitoring points references in accordance with this amendment.</p> <p>Added additional parameters <i>Total Titratable acidity, Total alkalinity</i> to the monthly parameters and added the <i>Metal suite</i> as a Quarterly parameter for a better understanding of groundwater conditions.</p> <p><i>Notes 2-6</i> below table and at the corresponding monitoring points removed as now redundant.</p>
16 Table 10 (Previously 15. Table 9)	<p>Groundwater monitoring points references amended to include the new monitoring bores and remove redundant ones consistent with this amendment.</p> <p>Parameter <i>Titratable alkalinity</i> added in accordance with the technical advice received from the Contaminates Sites branch.</p> <p><i>Total recoverable hydrocarbons</i> and <i>ammonium</i> removed as redundant.</p> <p>Note 3 added in relation to monitoring bore KS18 in accordance with the licence holder request.</p>
17 (previously 16)	Renumbered the condition references for coherence.
21 (previously 20)	Renumbered the condition references for coherence.
23 (new)	Condition 23 added consistent with the limits introduced in condition 9. This was discussed with the licence holder on the 08 July 2024.
N/A Table 11 (previously 10) Definitions	<i>Winter/spring period</i> definition added.
Schedule 1: Maps	Replaced as applicable.

## References

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2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Environment Regulation, 2015, Treatment and management of soil and water in acid sulfate soil landscapes, Perth, Western Australia.
4. Department of Water 2016, *Peel-Harvey catchment Nutrient Report*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. Ecoedge 2022. Detailed, Reconnaissance and Targeted flora and Vegetation Survey Llot 507, 508, 201 Ellito Road and Part Lot 56 Wescott Road Keysbrook, Western Australia, Perth, Western Australia.
8. Ecoedge 2023. Reconnaissance and Targeted flora and Vegetation Survey Western Extension, Perth, Western Australia.
9. Environmental Protection Authority (EPA) 2007, *Keysbrook Mineral Sands Mine: Olympia Resources Limited, Report and recommendations of the Environmental Protection Authority*, Perth, Western Australia.
10. Keysbrook Leucoxene Pty Ltd, 2022, *Licence L8918/2015/1: Annual Environmental Report 2021*. North Dandalup. Western Australia.
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12. Keysbrook Leucoxene Pty Ltd, 2024, *Licence L8918/2015/1: Annual Environmental Report 2023*. North Dandalup. Western Australia.
13. MBS Environmental 2004, Vegetation and Fauna Assessment of exploration Licence 70/2407, Keysbrook, West Perth, Western Australia.
14. MBS Environmental 2015, *Water Management Plan Keysbrook Mineral Sands Project*, West Perth, Western Australia.
15. Patil, P., Yongping W., Pullar D. & Shulmeister J., 2022, Effects of change in streamflow patterns on water quality. *Journal of Environmental Management*. **302**, Part A. <https://doi.org/10.1016/j.jenvman.2021.113991>

## Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
9 – Table 6	<p><i>The pH limit range is narrow. Can the pH range limit be extended to a pH range of 5.5 to 8.5 considering that:</i></p> <ol style="list-style-type: none"> <li data-bbox="584 520 1245 576">I. <i>pH at WQ1 (upstream of the process water pond) has a recorded pH of 5.3 – 8.8.</i></li> <li data-bbox="584 592 1317 699">II. <i>Downstream of W1, values of surface water monitoring pH at WQ2 are relatively neutral (5.8- 7.8) and often &gt;6.5. This demonstrates Doral's activities have only limited impact on the environment.</i></li> <li data-bbox="584 715 1312 821">III. <i>Page 2 of the report shows low pH of W2.5 in 2017, however, this is unlikely to have been caused by Doral's activities as discharge on the Nambelup Brook North was not undertaken prior to 2017.</i></li> <li data-bbox="584 837 1301 928">IV. <i>While low pH was recorded in 2023 for emergency discharge WQ2.1(4.97 and 5.5) laboratory testing of the same samples show a pH of 6 to 6.6. In most cases pH is neutral.</i></li> </ol>	<p>The pH limit range in condition 9 has been amended to a 5.5 - 8.5 range. Given that discharge will now only occur during the winter/spring period (i.e.1 May to 31 October each year), the Delegated Officer finds that some dilution is likely which therefore reduces the risk from low pH on the streams. Background monitoring data from surface water monitoring points upstream of the discharge points also indicate periods of time where pH ranged between 5.3-6. Taking into account upstream water quality and limiting discharges when the streams are flowing (winter/spring) the delegated officer finds it acceptable for the pH limit range to be amended to 5.5-8.5.</p>
8 – Table 5	<p><i>Whilst discharge has been recorded at times during summer, it should be noted that WQ2 has remained dry during summer indicating that flow infiltrated without creating flow downstream. Large volumes of rainfall which must be captured on disturbed ground are often received in September and October. It will be impractical not to discharge during these times. Could discharge limits be extended to include winter and spring for W1 given upstream flows at WQ1 are still occurring throughout spring?</i></p>	<p>The discharge of process water into a dry stream bed has the potential to adversely impact the overall stream ecology, soils, or groundwater. Discharging during the winter months when the stream flow is high reduces the risk as contaminants in the process water are diluted.</p> <p>It is acknowledged that September and October can at times experience rainfall events. Stream flow data for the Nambelup Brook shows medium average flows in September and low flows in October (not no flow). This data is likely to be comparable to the Dirk Brook Tributary as they are comparable in size. As the stream is likely to still have a medium flow in September and still flowing in October (albeit low flow) the Delegated Officer considers the extension to the discharge period to be reasonable and has amended condition 8. Condition 8 has been amended to: <i>during the winter/spring</i></p>

Condition	Summary of applicant's comment	Department's response
		<p><i>period</i>. The definitions table (11) of the licence defines this term as <i>the period from 1 May to 31 October each year</i>.</p> <p>The Delegated Officer notes that if the licence holder has a consistent excess water at the premises, alternative storage solutions for the process water should be considered.</p>
8 – Table 5	<p><i>Doral would like to propose an overflow device for emergency discharge rather than pumping. The proposed wording was included in the amendment application but may have been missed. Pumping relies on humans to turn a pump on and off and also discharges large volumes all at once, under force which could potentially erode stream banks. The proposed overflow (v-notch) would be set up high in the profile of a void to ensure water is only discharged when water holding capacity is at a maximum and pumping back to the PWD is not sufficient to maintain levels. Water would be discharged at a slower rate than pumping using the v-notch method and would occur in times of consistent rainfall. The discharge point would be monitored daily for volume and water quality undertaken as per Table 7.</i></p>	<p>The proposed amendment is inconsistent with the information provided on the surface water assessment submitted in support of the application. The department discussed the proposed amendment in a meeting with the licence holder on 8 July 2024 and sought clarifications on the structure of the weir and embankments.</p> <p>Due to the possible risk of overtopping and the inconsistency with the requirement of a 20m buffer between mining activities and medium sized streams (required under condition 7-1 of Ministerial Statement 810), the discharge will need to continue to be required to be pumped to the stream.</p>
13 – Table 7	<p><i>Daily water quality monitoring for pH and EC when discharging can be achieved with the installed in-situ pH/EC meter however, TDS and TSS is not practical on weekends as environmental staff do not work weekends. Is it possible to undertake a field pH, EC, TDS and TSS weekly. TSS is an external lab test and water quality is unlikely to change dramatically daily.</i></p> <p><i>Physical sampling immediately prior to discharge may not be possible for all analytes requested, as W1 overflows when it reaches capacity with no way to prevent overflow. Overflow could occur on the weekend/overnight. Would sampling as suggested in the point above be sufficient?</i></p>	<p>The Delegated Officer has taken into consideration the licence holder's comments. Monitoring frequency of Total Titratable acidity, pH, Electrical conductivity and Total suspended solids and TDS have been maintained as weekly when not discharging but has been modified from daily during discharge to only requiring monitoring three times a week during discharge to accommodate not having environmental personal available on weekends. These parameters can all be easily sampled in the field.</p> <p>Condition 9 has been amended to include a limit for Electrical conductivity (2,500 µS/cm) and to exclude a limit for Total Dissolved Solids.</p> <p>The Delegated Officer has considered the Licence holder comments. The wording <i>Immediately prior to discharge</i> has been rephrased to <i>Within 24 hours of discharge occurring</i>.</p> <p>The Delegated Officer notes that the licence holder must actively manage the process water at the premises. Tracking process water volumes and quality is an integral part of this management. While the dam overflow cannot be stopped, it can be predicted through appropriate monitoring. When</p>

Condition	Summary of applicant's comment	Department's response
		anticipating discharge, monitoring in accordance with condition 13 should be undertaken and measures to ensure limits within condition 9 are met, should be taken.
12 – Table 6  23	<p>During the 8 July 2024 meeting the licence holder also stated that:</p> <ul style="list-style-type: none"> <li>I. Monitoring references SW1 and SW2 should be removed from the licence as they create confusion.</li> <li>II. Clarity should be introduced on the licence to inform the licence holder what the reporting expectation is when a condition is not complied with.</li> <li>III. Note 2 of Table 10 was unclear.</li> </ul>	<ul style="list-style-type: none"> <li>I. The Delegated Officer has noted the comment and removed SW1 and SW2 from condition 12, Table 6.</li> <li>II. Condition 23 has been added to the licence to ensure breaches, failures, malfunctions and incidents are reported on the appropriate form.</li> <li>III. Note 2 of Table 10 has been clarified to define that a maximum of 1 reading per year is expected on the gross alpha and beta activity.</li> </ul>
16 – Table 10	On 08 July 2024, the licence holder wrote to the Department and stated that bore KS18 was inaccessible due to mining activities surrounding the bore. Access to KS18 is expected to be re-established by July 2025. The licence holder requested to remove the bore from the licence or delay monitoring until the access is re-established.	Groundwater quality and levels surrounding the mining footprint should be monitored to ensure that any groundwater changes don't go undetected. KS18 is required to be monitored under condition 16 of the licence and should continue to be monitored when access is re-established. Therefore, a note has been added to table 10 to allow monitoring to cease for now and to resume after July 2025.
<b>Additional comments provided on 29/07/2024</b>		
8 , 9	W2.1 – W.2.6 can be removed from the licence as rehabilitation activities are well underway and no emergency discharge will be undertaken from these locations. We could therefore retain W2.7 and W2.8 and rename W2.11 to W2.9 as W2.9 and W2.0 were omitted from the licence amendment during review.	This has been accepted.