



Application for Licence

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

Licence Number	L8306/2008/3
Applicant	Newmont Boddington Gold Pty Ltd
ACN	101 199 731
File number	2013/002375-2
Premises	Boddington Gold Mine Gold Mine Road, BODDINGTON WA 6390 Legal description – As defined by the premises map attached to the issued licence.
Date of report	26 April 2023
Decision	Licence granted

A/MANAGER, RESOURCE INDUSTRIES REGULATORY SERVICES

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 Newmont Boddington Gold Mine (the premises). As a result of this assessment, renewed licence L8306/2008/3 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 Application summary

On 31 January 2023, Newmont Boddington Gold Pty Ltd (the applicant) submitted an application for a licence renewal to the department under section 57 of the *Environmental Protection Act 1986* (EP Act). The application is to renew licence L8306/2008/2 for the Newmont Boddington Gold Mine. In addition to renewing the licence, the applicant has also requested some additional amendments, as outlined in Section 2.4.

The premises relates to the categories and assessed production capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations), which are defined in licence L8306/2008/3 and summarised in Table 1. No change to the categories and assessed production capacities have been requested by the applicant.

The infrastructure and equipment relating to the premises category and any associated activities which the department have been previously assessed to be in line with *Guideline: Risk Assessments* (DWER 2020b).

In accordance with the department's internal *Work Instruction: Industry Regulation Licensing position – COVID-19 response* (DWER 2022a), this application to renew an existing licence will be processed and granted as an administrative renewal only, as the licence is due to expire on or before 30 June 2023 (i.e., the expiry date for licence L8306/2008/2 is 30 April 2023).

Therefore, the Delegated Officer:

- will extend the duration of the licence period for up to 20 years, in accordance with the *Guideline: Licence Duration* (DER 2016);
- will not include any further environmental assessment, other than those requested by the applicant (refer to Section 2.4); and
- may include any administrative changes deemed appropriate by the Delegated Officer (refer to Section 2.5).

The department acknowledges the need for a full review to be undertaken for the Premises and intends to undertake a formal licence review following the granting of renewed licence L8306/2008/3. This is further discussed in Section 5.

2.3 Overview of premises

The Newmont Boddington Gold Mine (the premises) is a gold mining operation combining ore extraction, crushing and processing to produce gold and copper products (Figure 1). The premises encompasses both privately owned land and State Forest, approximately 3.2 km south-east of the Boddington township. The premises is located within the Thirty-Four Mile

Brook catchment, which is linked to the Hotham River, a tributary of the Murray River connected to the Peel Inlet.

Mining at the premises commenced in 1987 and continued until 2001, when it was placed under care and maintenance. Operations at the premises recommenced in 2009 and have continued to the time of this assessment.

Table 1: Prescribed activities at the premises

Category number	Description of category	Approved production capacity
5	Processing or beneficiation of metallic or non-metallic ore	45,000,000 tonnes per annual period
6	Mine dewatering	4,000,000 tonnes per annual period
33	Chemical blending or mixing	35,000 tonnes per annual period
54	Sewage facility	270 m ³ per day
57	Used tyre storage (general)	100 tyres
63	Class I inert landfill site	2,000 tonnes per annual period
73	Bulk storage of chemicals, etc	6,000 m ³ (in aggregate)

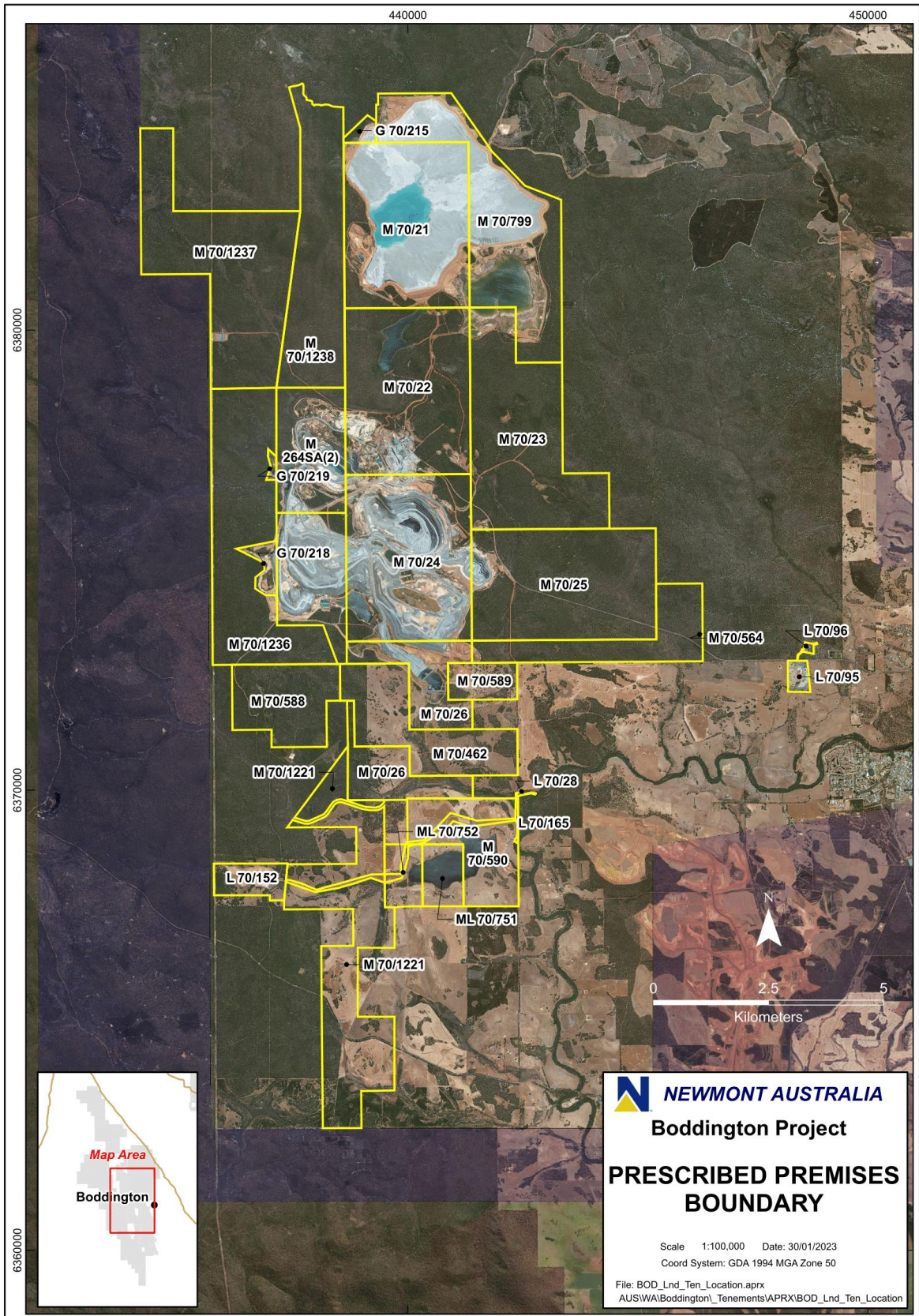


Figure 1: Premises boundary and tenements

2.4 Licence holder requested amendments to the licence

In addition to the renewal of licence L8306/2008/2, the applicant has also requested changes to some aspects of the licence. These proposed amendments are summarised in Table 2. A risk assessment is undertaken as part of this renewal application for these proposed changes, where relevant.

Table 2: Proposed changes to licence L8306/2008/3 by the applicant

Proposed change	Rationale	Notes
Increase authorised operational height of F1 Residual Disposal Area (RDA)to 361.0 mRL (Stage 18).	Construction of raises to F1 RDA saddle dams have been approved under licence L8306/2008/2 up to Stage 18 (361.0 mRL).	F1 RDA is currently approved to operate up to Stage 16 (355.5 mRL). Construction of Stage 16 is currently underway, with Stage 17 construction intended to commence in June 2023. Operation of Stage 17 and 18 has been approved under Mining Proposal Reg ID 48325.
Addition of Thirty-Four Mile Brook Diversion Pond as an authorised discharge location for mine dewatering.	The existing containment infrastructure for mine dewatering (North Clear Water Pond) is scheduled to be decommissioned as part of the N05 (North Pit) cutback mine expansion. As such, the adjacent Thirty-Four Mile Brook Diversion Pond is proposed as the replacement containment infrastructure for mine dewatering.	Thirty-Four Mile Brook Diversion Pond was constructed in 2007 and commissioned in 2009. Construction of a spillway at Thirty-Four Mile Brook Diversion Pond is required to direct excess water back to the North Wandoo Pit.
Removal of Improvement Reference (IR) 2 in condition 4.1.2.	The requirements of IR2 have been met. The condition should either be removed or updated to reflect the further works undertaken since then.	In addition to IR2, the applicant has also undertaken additional investigations. An Environmental Risk Assessment for R4 RDA was submitted to the department in February 2023.
Update the premises boundary to include ML70/751, ML70/752, M70/590 and M70/1221.	The amended premises boundary would include the D6 Dam to represent the Boddington Gold premises more accurately.	The D6 Dam stores water abstracted from the Hotham River. No process water is stored in this dam. Addition of these mining tenements do not alter the emissions and discharges from the premises.

2.4.1 F1 Residue Disposal Area

The F1 RDA has been operational since 2009 and is the current discharge location for tailings produced from the processing circuit (Figure 2). The RDA facility was constructed over natural ground (i.e., F1 area) and existing oxide tailings (i.e., within F3 RDA, which was operated prior to care and maintenance). The RDA is confined by nine constructed embankments/saddle dams along its northern, eastern and southern perimeters and natural topography along its western extent.

Tailings are deposited into the F1/F3 RDA by sub-aerial deposition. Slurry is delivered at slurry densities ranging between 50% to 65% solids (by weight). The delivery system consists of three separate distribution pipelines around the perimeter embankment to provide a flexible discharge sequence, allowing for the ongoing deposition of tailings with construction of embankment raises.

The raising of the F1/F3 RDA saddle dams have been undertaken using a combination of downstream, centreline and upstream construction methods to achieve optimal geotechnical stability. Buttressing of several of the saddle dams may be required to provide additional geotechnical support.

Licence L8306/2008/2 currently authorises maximum operating height of 355.5 mRL (Stage 16), with an authorised construction height of 361.0 mRL (Stage 18). Through this licence renewal, the applicant has also proposed to increase the operating height of F1/F3 RDA to align with the authorised construction height (i.e., 361.0 mRL at Stage 18).

2.4.2 Thirty-Four Mile Brook Diversion Pond and Dewatering at North Wandoo Pit

Active mine dewatering occurs in two locations at the premises: North Wandoo Pit and South Wandoo Pit. Currently, mine dewater from the North Wandoo Pit is extracted and stored at the North Clear Water Pond (Figure 2). The majority of the mine dewater stored will be pumped and reused in the processing circuit and for dust suppression.

The North Clear Water Pond contains a storage capacity of approximately 130 megalitres (ML). The pond is linked with an upstream Thirty-Four Mile Brook Diversion Pond through a spillway, which provides a cumulative storage capacity of 470 ML. However, this volume is considered inadequate for containing a 1-in-100 year, 72-hour storm event, which was estimated to require approximately 1,400 ML (Galt 2021), resulting in an estimated overflow of approximately 800 ML. To manage the risk of overtopping, the North Clear Water Pond is also equipped with an emergency spillway that flows back into the North Wandoo Pit through the N05 roadside drain.

The proposed N05 cutback mine expansion would require the decommissioning of the North Clear Water Pond. As such, the Thirty-Four Mile Brook Diversion Pond was proposed as the replacement discharge location for mine dewater from the North Wandoo Pit. The Thirty-Four Mile Brook Diversion Pond was constructed and commissioned in 2007 and 2009, respectively (Figure 2). The pond was designed as a storm surge facility and currently receives only raw water and catchment runoff.

To address similar issues with risk of overtopping, a spillway will be constructed from the Thirty-Four Mile Brook Diversion Pond to the North Wandoo Pit. The risks of overtopping are unlikely to change significantly, given the relatively low storage capacity of the to-be decommissioned North Clear Water Pond.

Water balance modelling indicated that the decommissioning of the North Clear Water Pond would slightly increase the risk of the North Wandoo Pit overtopping, which would now receive approximately 1,200 ML of overflow, instead of 800 ML, if a 1-in-100 year, 72-hour storm event (GRM 2021) was to occur.

The applicant is exploring options to raise the embankment of Thirty-Four Mile Brook Diversion Pond to increase the storage capacity, including raising the embankment and spillway elevation (Galt 2021). However, written correspondence with the applicant has indicated that this will not be considered in immediate future (i.e., 2023-2024 annual periods) and was not requested as part of this application. The applicant considers the discharge of pond overflow to the North Wandoo Pit to be an adequate water management control until 2033, when mining below the pit lake level is required.

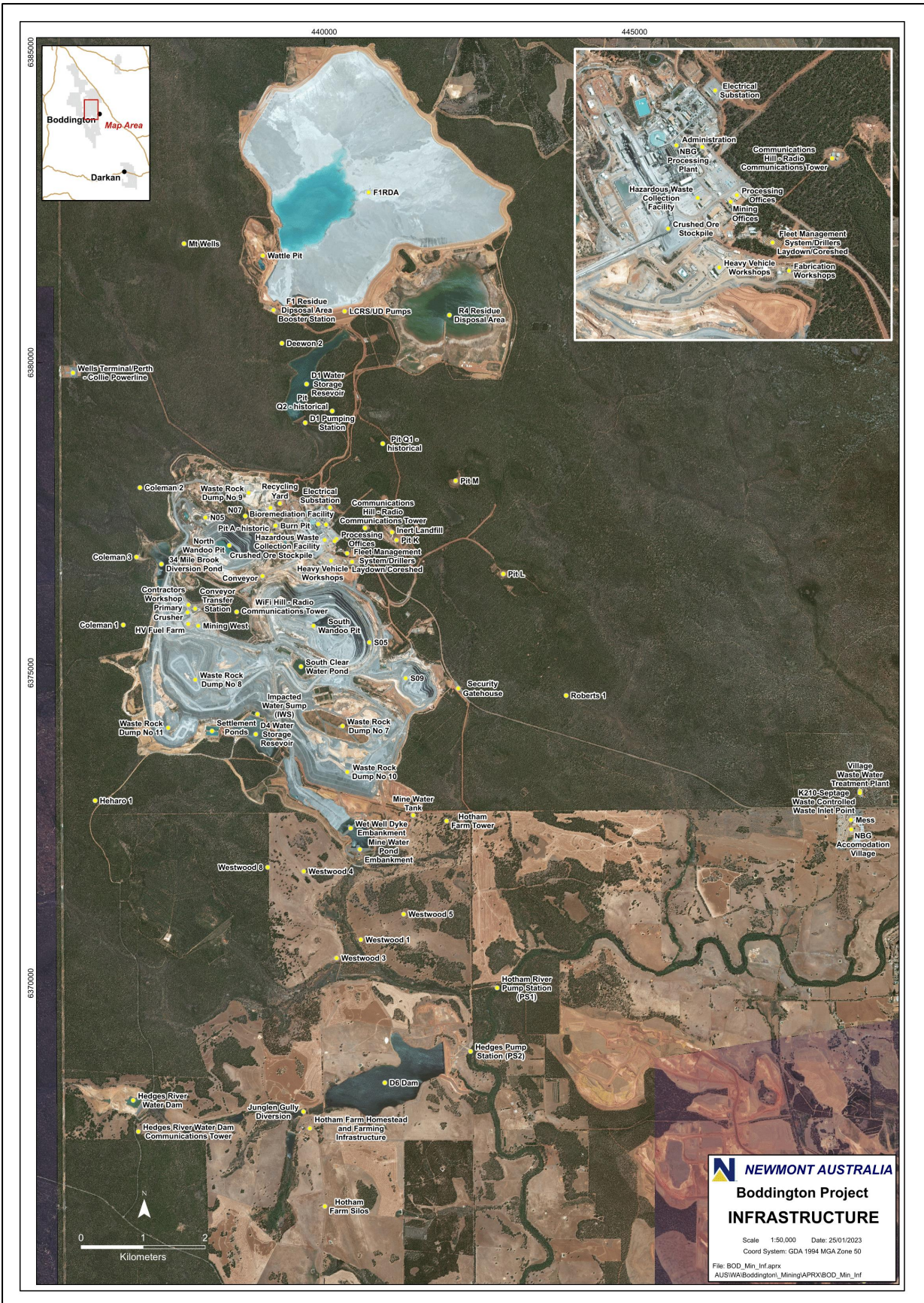


Figure 2: Site infrastructure, including F1 RDA and Thirty-Four Mile Brook Diversion Pond

2.5 Department-initiated administrative amendments

As part of this renewal, the Delegated Officer has made the following general administrative changes to the licence:

1. Revised the licence condition numbers to reflect updated licence formatting;
2. Corrected clerical mistakes, unintentional errors and modified the wording of conditions and tables to better represent the purpose and outcome of the condition; and
3. Modified table formats to improve readability.

In addition, the Delegated Officer has also made changes to specific conditions. In reviewing recent reports provided by the applicant and required under licence L8306/2008/2, the department has made the following observations:

1. Quarterly reporting presents a significant administrative burden on both the department and applicant. Nevertheless, the information provided in the quarterly environmental reports were useful in informing environmental performance at the premises;
2. The Annual Environmental Reports (AER) contain information not necessary to demonstrate compliance with licence L8306/2082, which makes it challenging for the department to assess these reports for compliance against the licence conditions. The high volume of data provided in the AERs to demonstrate compliance is presented in a way that makes interpretation or verification of these data challenging. With the exception of water monitoring data, there is generally a lack of discussion and interpretation provided in relation to recent monitoring data obtained. This is likely due to the lack of such requirements in condition 33 of the licence.

To address these issues, the Delegated Officer has made appropriate amendments to the licence and provided rationale for doing so, as detailed in Table 3.

Table 3: Department-initiated amendments to licence

Department-initiated amendments	Rationale
Removal of conditions 1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.1, 1.2.2, 1.2.3, 1.2.4, 1.2.5, 2.1.1, 5.1.2 and 5.1.5.	These conditions were considered redundant and/or unenforceable.
Replacing Ecological Investigation Limit (EIL) with Ecological Screening Levels (ESL) in Table 7.	The relevant guideline values for total recoverable hydrocarbons (TRH) are presented as ESLs in the National Environmental Protection (Assessment of Site Contamination) Measures. The EILs provide guideline values for other chemical parameters, such as metals and metalloids.
Addition of electrical conductivity (EC) and total iron (Fe) in the parameters required in Table 14.	The requirements to monitor for EC and total iron at the F1 RDA and Compliance Sites monitoring locations (respectively) were unintentionally left out of Table 14. These parameters were added to the table. The department noted that the omission of these parameters was identified by Big Dog Hydrogeology (2022) and were monitored nonetheless.
Addition of dissolved tungsten (W) in the parameters required in Table 15.	The requirements to monitor dissolved tungsten at the Compliance Sites monitoring locations unintentionally left out of Table 15. These parameters were added to the table. The department noted that the omission of these parameters was identified by Big Dog Hydrogeology (2022) but were

Department-initiated amendments	Rationale
	monitored nonetheless.
Addition to Note 5 to Table 14 for the monitoring of SD8SU-D1	The department understands that perimeter sump SD8SU-D1 was intended to replace sump SD8SU-D. As SD8SU-D remains operational, and SD8SU-D1 has not been constructed, the department added Note 5 to the table such that only one of these sumps would require sampling during a monitoring event.
Reduction to submission timeframe for AER from 6 months to 90 calendar days	The department has reduced the reporting timeframe for the AER of this licence to be consistent with reporting timeframes required by licences with similar prescribed activities.
Removal of quarterly reporting requirements with details to be contained with the AER (Condition 33)	<p>The department has removed condition 5.2.2 requiring quarterly reporting of the F1 RDA water balance and surface water and groundwater monitoring results. This aims to reduce administrative burden on both the applicant and the department.</p> <p>The information is required to be submitted to the department in the AER on an annual basis. The applicant must maintain (or improve) the level of detail and quality of the information provided. Only the reporting frequency has changed (i.e., quarterly to annually).</p>
Addition of requirements for trend analysis and comparative assessment to historical data for air/stack monitoring and water monitoring	<p>The department requires the applicant to provide interpretation and assessment of data, particularly in relation to historical data. In the absence of applicable targets and limits for the majority of monitoring parameters, observation of upward trends in contaminant parameters would provide an indication of potential environmental issues.</p> <p>The department understands that this is already reported for surface water and groundwater monitoring results, but not air/stack monitoring results.</p>
Requirement for monitoring data to be presented in tabulated, graphical, and editable formats	Monitoring data should be presented in formats that facilitate the interpretation and assessment of the data, and also in formats that can be verified by the department.

While no conditions are included in licence L8306/2008/3 for enforcing this, the applicant is encouraged to submit the AER to DWER separately to DMIRS. This is currently done for annual compliance reports required under EPBC 2011/6192, EPBC 2012/637, Ministerial Statement 971 and Licence to Take Water SWL60668(7).

No additional risk assessment of the premises was undertaken in relation to these changes.

2.6 Part IV of the EP Act

The Minister for Environment granted Ministerial Statement (MS) 971 for the Newmont Boddington Gold Mine under Part IV of the EP Act on 12 June 2014 to extend the operating life of the premises.

The Environmental Protection Authority (EPA) Report 1506 identified and assessed five key environmental factors relevant to the proposal:

1. *Flora and vegetation* – Clearing of up to 3,120 hectares (ha) of vegetation, of which 1,7555 ha would consist of native vegetation;

2. *Terrestrial fauna* – While direct impacts to conservation significant fauna was considered unlikely, there would remain a significant residual impact due to the loss of habitat as a result of clearing;
3. *Hydrological processes* – Potential reduction in groundwater available to Groundwater-Dependent Ecosystems (GDE), including several swamps and potentially riparian vegetation associated with Hotham River;
4. *Amenity* – Diversion of Bibbulmun Track, a nationally significant recreational trail; and
5. *Offsets (integrating factor)*.

The following key environmental factors were assessed to not be a key environmental factor due to adequate regulation under Part V of the EP Act to meet relevant the EPA's objectives:

1. *Inland waters* – Surface water runoff, discharge from RDA, waste rock dumps and other infrastructure, impacts to groundwater as a result of seepage from the RDAs;
2. *Air quality* – Dust and chemical compounds from point source emissions, air quality associated with existing operations (where no different or significantly greater impacts to air quality were anticipated as a result of proposal implementation).

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 2020b).

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 4 below. Table 4 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 4: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction (Category 6)			
Dust	Construction of spillway at Thirty-Four Mile Brook Diversion Pond	Air/ windborne pathway	None.
Sediment laden stormwater		Overland runoff	None.
Operation (Category 5)			
Seepage water	Operation of F1 RDA at increased embankment height (Stages 17 & 18)	Vertical infiltration and lateral migration	<ul style="list-style-type: none"> • Implementation of RDA Operation Manual and associated Trigger Action Response Plan. • Pond area are lined with synthetic liner with a permeability of 1×10^{-13} m/s. Areas outside of the supernatant pond are clay lined with a seepage containment system. • Minimisation of decant pond area. • Prioritisation of F1 RDA water usage within the process plant. • Operation of F1 RDA drainage design – leakage collection and recovery system (LCRS), underdrainage, beach drains, perimeter sumps. • Maintenance of perimeter sumps for seepage interception. • Groundwater monitoring around the perimeter of the F1 RDA, as well as background sites. • Piezometers installed on dam walls. • Annual dam audit completed by external auditor.
Tailings and decant pond water		Overtopping	<ul style="list-style-type: none"> • Twice daily inspections of RDA perimeter. • Freeboard to be maintained at minimum 500mm.
Operation (Category 6)			
Mine dewater	Discharge of mine dewatering at Thirty-Four Mile Brook Diversion Pond	Vertical infiltration and lateral migration	<ul style="list-style-type: none"> • Monthly monitoring of process water dam water quality. • Diversion Pond is clay-lined. • Dam audit completed by external auditor.
		Overtopping	<ul style="list-style-type: none"> • Daily inspections of process water dams. • Monitoring using level indicators and telemetry. • Monthly dam safety inspections. • Water will be extracted for reuse in processing circuit and dust suppression. • Spillway will be constructed to direct excess flow to the North Wandoo Pit, which is the source of the mine dewater.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020b), 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 5 and Figure 3 below 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 2020a)).

Table 5: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Township	<p>The Boddington township is located approximately 3.2 km south-east of the premises boundary. The township is located approximately 8.5 km and 10.7 km south-east of the premises operational footprint and F1 RDA, respectively.</p> <p>This receptor was not considered in the risk assessment in Section 3.2 due to the absence of a complete source-pathway-receptor linkage.</p>
Rural premises	<p>There are several rural residential and commercial premises located east of the premises.</p> <p>The closest rural premises is located 2 km south-east of the premises boundary and is owned by a business entity.</p> <p>The closest rural premises to the F1 RDA is located approximately 7 km north-east of the F1 RDA and is likely used for residential purposes.</p> <p>This receptor was not considered in the risk assessment in Section 3.2 due to the absence of a complete source-pathway-receptor linkage.</p>
Environmental receptors	Distance from prescribed activity
Native vegetation	<p>The premises is located within an area characterised by jarrah-marri medium-open woodland. Native vegetation is present within the premises boundary, especially in the northern half of the premises.</p>
Conservation areas	<p>The Dwellingup State Forest is present to the west of the premises, encroaching into the western portion of the premises. The state forest abuts the operational areas (e.g., RDA, mine pit etc.) within the premises</p>
Conservation significant flora	<p>A number of priority flora have been sighted within the premises, with the Priority 3 sighting located approximately 1.3 km west of the F1 RDA.</p>
Surface water bodies	<p>The premises is located within the Murray River System, a proclaimed surface water area under the <i>Rights in Water and Irrigation Act 1914</i>.</p> <p>Thirty-Four Mile Brook is located within the premises, flowing southwards and converges with the Hotham River south of the premises. Drainage lines within the premises have been modified due to mining activities.</p> <p>The premises' northern boundary also overlaps with the South Dandalup Dam Catchment Area (Figure 3), a Priority 1 Drinking Water Source Area (PWDSA), proclaimed under the <i>Metropolitan Water Supply, Sewerage and Drainage Act 1909</i>. The PWDSA encompasses the catchment of the surface water source and recharge areas of groundwater sources. The objective of the Priority 1 South Dandalup Dam Catchment Area is to avoid unnecessary water quality contamination risks.</p>
Groundwater aquifer	<p>Groundwater at the premises is contained within four aquifer systems, comprising (1) ephemeral isolated lenses of groundwater at shallow depths, followed by (2) an oxide unit that acts as an aquitard, (3) a weathered and</p>

	<p>fractured bedrock zone, which is thought to be the major groundwater system at Boddington, and (4) in some locations, a deep groundwater system comprising discrete fracture zones in deep unweathered bedrock.</p> <p>Hydrogeology throughout the premises is not well understood, with the exception of the F1 RDA area, where extensive investigations have been undertaken to better understand the impacts of seepage from the RDA on the groundwater system. Impacts from seepage resulted in an increase in standing water level, sulfate and salinity in nearby monitoring bores.</p>
Cultural receptors	Distance from prescribed activity
Aboriginal heritage sites	<p>There are up to 56 Aboriginal Heritage sites within the premises. The registered Aboriginal heritage sites located near the F1 RDA, including:</p> <ul style="list-style-type: none"> •Hotham River (Place ID 27935; mythological) is located approximately 1 km south-west of F1 RDA. Another tributary of the river is also located directly south of the RDA, though it is likely to have been modified by historical mining activities; •Boddington Forest 43 (Place ID 4237; artefacts/scatter, quarry) is located approximately 2 km south-west of F1 RDA, intersecting with the Hotham River; and •Boddington Forest 36 (Place ID 4230, artefacts/scatter) is located approximately 3.1 km south of the F1 RDA.

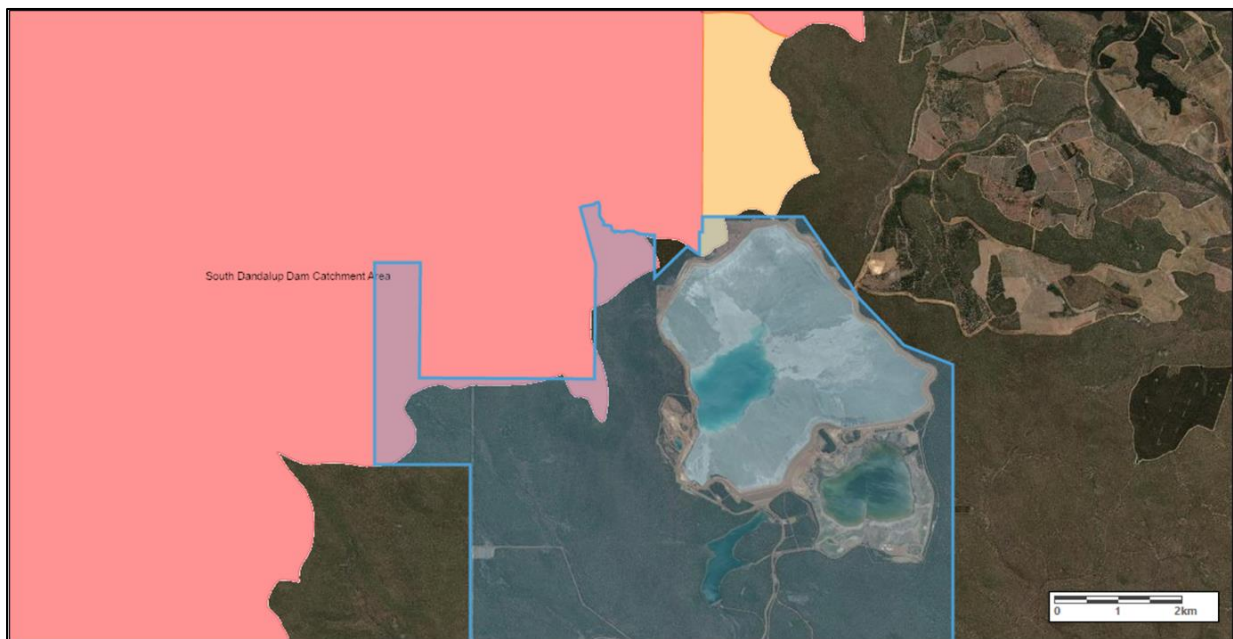


Figure 3: Distance of South Dandalup Dam Catchment Public Drinking Water Source Area – Priority 1 (red) and Priority 2 (orange) from the prescribed premises boundary (blue)

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020b) 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 6.

Licence L8306/2008/3 that accompanies this decision report authorises emissions associated with the operation of the premises i.e., tailings deposition, mine dewatering discharge and storage etc.

The conditions in the issued licence, as outlined in Table 6 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

Table 6: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating ¹	Applicant controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls	C = consequence L = likelihood			
Construction								
Construction of spillway between Thirty-Four Mile Brook Diversion Pond and North Wandoo Pit	Dust	Pathway: Air/ windborne pathway Impact: Impact to ecological health and amenity	Native vegetation, including conservation area	Refer to Section 3.1	C = Slight L = Unlikely Low Risk	Y	None	N/A
	Sediment laden stormwater	Pathway: Overland runoff during storm events Impact: Discharge to land, resulting in impact to ecological health and amenity				Y		
Operation								
Tailings deposition into F1 RDA (Stage 17 and 18)	Tailings slurry	Pathway: Overtopping of RDA, resulting in loss of containment and discharge of tailing slurry to land Impact: Impact to ecological health	Native vegetation, including conservation area and conservation significant flora Surface water bodies Aboriginal heritage sites	Refer to Section 3.1	C = Moderate L = Unlikely Medium risk	Y	Condition 5 Condition 10 Condition 11	N/A
	Tailings seepage	Pathway: Vertical infiltration and lateral migration Impact: Mounding of local water table and potential surface expression of groundwater, resulting in impacts to ecological health	Native vegetation, including conservation areas Surface water bodies, including Aboriginal	Refer to Section 3.1	C = Moderate L = Possible Medium risk Refer to Section 3.3	Y	Condition 4 Condition 11 Condition 25 Condition 27 Condition 28	Based on the detailed risk assessment in Section 3.3, the Delegated Officer considers the existing controls adequate for managing impact of tailings seepage on sensitive receptor. No additional regulatory controls were considered to be necessary at this point in time.

Risk events					Risk rating ¹ C = consequence L = likelihood	Applicant controls sufficient?	Conditions ² of licence	Justification for additional regulatory controls
Sources / activities	Potential emission	Potential pathways and impact	Receptors	Applicant controls				
			heritage sites Groundwater aquifer					
Storage of mine dewater at Thirty-Four Mile Brook Diversion Pond	Mine dewater	Pathway: Overtopping of pond, resulting in loss of containment and discharge of mine dewater to land Impact: Impact to ecological health	Native vegetation, including conservation area	Refer to Section 3.1	C = Minor L = Unlikely Medium risk	Y	Condition 4 Condition 15	N/A
		Pathway: Vertical infiltration and lateral migration Impact: Mounding of local water table and potential surface expression of groundwater, resulting in impacts to ecological health	Native vegetation, including conservation areas Groundwater aquifer	Refer to Section 3.1	C = Moderate L = Unlikely Medium risk	Y	Condition 4	N/A
		Pathway: Overflow from pond via spillway, resulting in a discharge back into the North Wandoo Pit Impact: Mounding of local water table	Groundwater aquifer	None	C = Slight L = Possible Low risk	Y	Condition 4	N/A

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

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 of seepage impacts from F1 RDA to neighbouring PWDSA

3.3.1 Background

The deposition of tailings slurry into the F1 RDA (also known as the F1/F3 RDA) at the premises is a key prescribed activity that requires a detailed risk assessment. The primary source-pathway-receptor linkage of concern is the seepage of contaminated water from the F1 RDA to the surrounding groundwater aquifer. Specifically, the facility is located along the northern boundary of the premises and abuts the Priority 1 South Dandalup Dam Catchment Area.

Routine surface water and groundwater monitoring has been undertaken by the applicant to assess the impacts of the F1 RDA and its tailings seepage on the local hydrogeological regime. A hydrogeological review undertaken of historical water quality data suggested that the most diagnostic indicator of seepage influence was groundwater elevation (i.e., mounding of the local water table) (Big Dog Hydrogeology 2019). Key chemical indicators of seepage influences at the premises are sulfate concentration, which also affects total dissolved solids (TDS) and electrical conductivity (EC) (Big Dog Hydrogeology 2019). More recently, dissolved cobalt (Co) and weak acid dissociable cyanide (WAD CN) have also been identified as potential chemical indicators, particularly for monitoring locations close to the F1 RDA embankment toe (Big Dog Hydrogeology 2022).

3.3.2 Surface water monitoring

The following observations were made from the surface water monitoring results during the 2021 annual period (Big Dog Hydrogeology 2022):

- Average sulfate and TDS concentrations were highest at the F1 RDA decant pond, followed by the perimeter sumps (Table 7). Concentrations of these parameters in the background monitoring sites were significantly lower compared to both the decant pond and sumps.
- Field EC, TDS and sulfate concentrations demonstrated similar trends, driven by seasonal influences, primarily precipitation during winter months and evapo-concentration during summer months. This was observed in both the F1 RDA decant pond and the perimeter sumps.
- Perimeter sump SD8SU-A1 contained the highest sulfate concentrations compared to the other sumps. The concentrations detected were similar to those in the decant pond. This is likely due to the contribution of water intercepted by the beach drainage at F1 RDA.
- Total cobalt and WAD CN concentrations were elevated in the F1 RDA decant pond, but lower in the perimeter sumps, and typically not detected in background monitoring locations (Table 7).
- The occasional presence of heavy metals detected at background monitoring locations (e.g., arsenic, cobalt, copper, nickel, zinc) was inferred to reflect the geochemistry of upgradient catchments, with no trends attributed to seepage from the F1 RDA entering these surface water environments.

Table 7: Concentration range for surface water and groundwater parameters from 2021 monitoring period

Analyte	Unit	Surface water			Groundwater	
		Decant pond	Perimeter sumps	Background	Monitoring bores	Compliance bores
Standing water level	mBTOC ³	NA	NA	NA	1.5 to 42.68	1.28 to 65.93
Sulphate	mg/L	641 to 2750	15 to 2260	3 to 481	9 to 1080	10 to 818
EC ¹	uS/cm	3440 to 17240	362 to 12140	143.5 to 15430	316 to 12440	459 to 10190
TDS	mg/L	2430 to 12400	172 to 8880	64 to 14000	134 to 9240	214 to 6770
Cobalt ²	mg/L	0.132 to 0.515	<0.001 to 0.324	<0.001 to 0.006	<0.001 to 0.275	<0.001 to 0.093
WAD CN	mg/L	0.601 to 12.2	<0.004 to 0.063	<0.004 to <0.004	<0.004 to 0.009	<0.004 to <0.004

Note 1: Electrical conductivity was measured in the field.

Note 2: Total cobalt concentrations are presented for surface water samples, while dissolved cobalt concentrations are presented for groundwater samples.

Note 3: mBTOC means metres below top of casing.

3.3.3 Groundwater monitoring

Historically, several types of standing water level (SWL) responses were observed at groundwater monitoring bores at the premises in relation to groundwater mounding: (1) rapid, severe mounding, (2) subtle and delayed, but consistent mounding, (3) stabilised SWL after mounding (i.e., ceiling effect) and (4) no mounding.

The following historical trends were noted in this detailed risk assessment (Big Dog Hydrogeology 2022):

- Historically, periods of rapid SWL increases have been observed at several monitoring bores in close proximity to the PWDSA (i.e., F1BR35D, F1BR31S, F1BR31D, F1BR26D) (Figure 4). Groundwater mounding occurred most rapidly at these bores due to their location being immediately adjacent to the F1 RDA embankment toe and away from the HDPE liner (*Response #1*) (Figure 4).
- The largest mounding response occurred at F1BR29D in 2015, where SWL increased by nearly 20 m in the span of one year (*Response #1*) (Figure 5). However, SWL has been stable since (*Response #3*), due to groundwater reaching surface and subsequently being controlled by pumping from adjacent perimeter sumps.

Currently, the following trends were observed (Figure 5):

- The shallowest standing water levels were observed at F1BR26S, F1BR26D, F1BR29S and F1BR29D, which were typically within 3.0 metres below top of casing (mBTOC) (Figure 5). The F1BR26 and F1BR29 series bores are located adjacent to the north-western corner of the F1 RDA embankment toe.
- The highest groundwater elevations were measured at F1BR29S, F1BR29D, F1BR31D, F1BR31S and F1BR34S (in decreasing order). The F1BR31 and F1BR34 series bores are located within the PWDSA.
- A consistent mounding trend have been observed at F1BR34D, F1BR31D, F1BR31S and BUBR6. These bores are located in the northern portion of F1 RDA, with both F1BR31 and F1BR34 series bores located within the PWDSA.

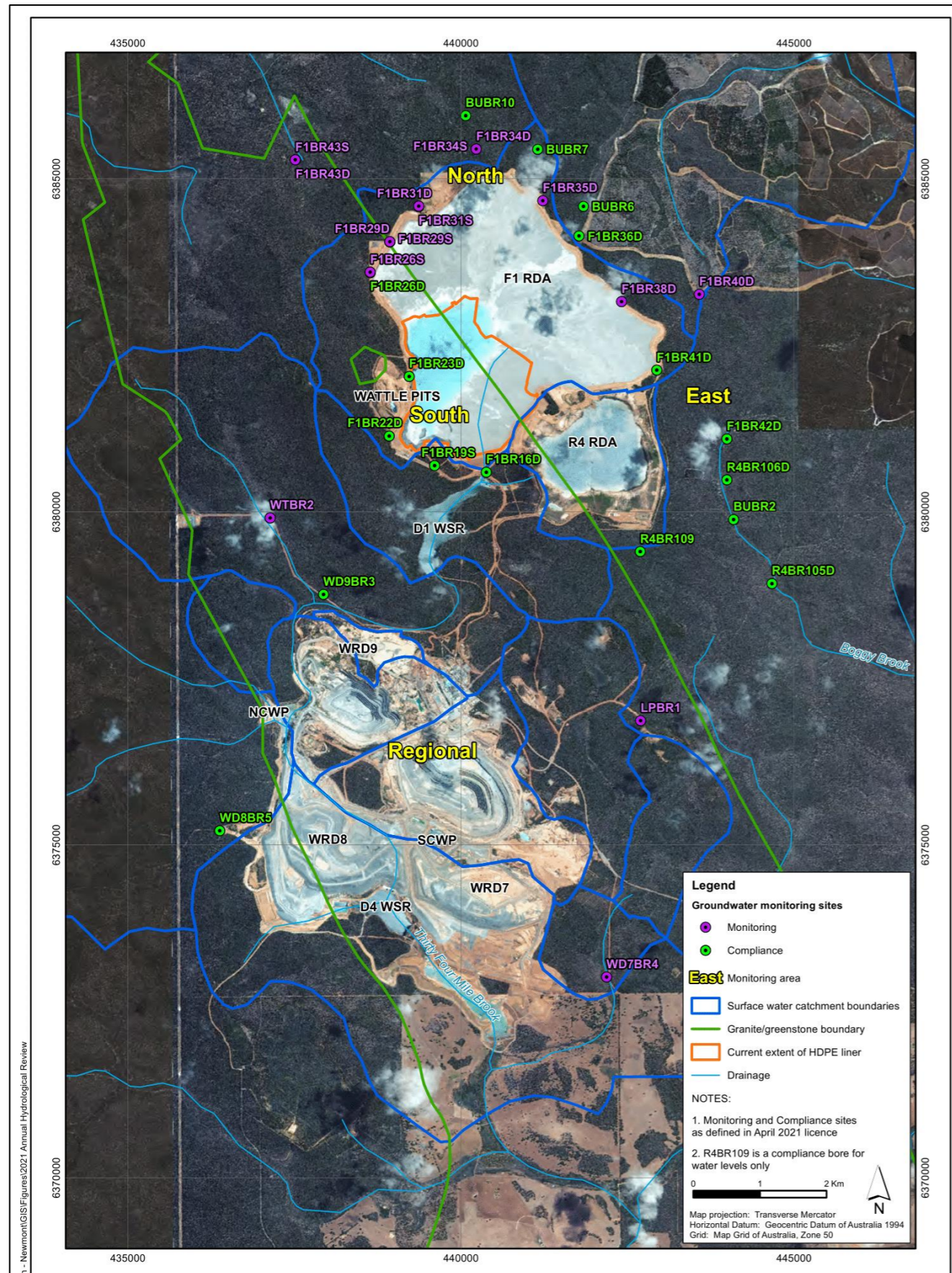


Figure 4: Groundwater monitoring sites and extent of HDPE liner at F1 RDA

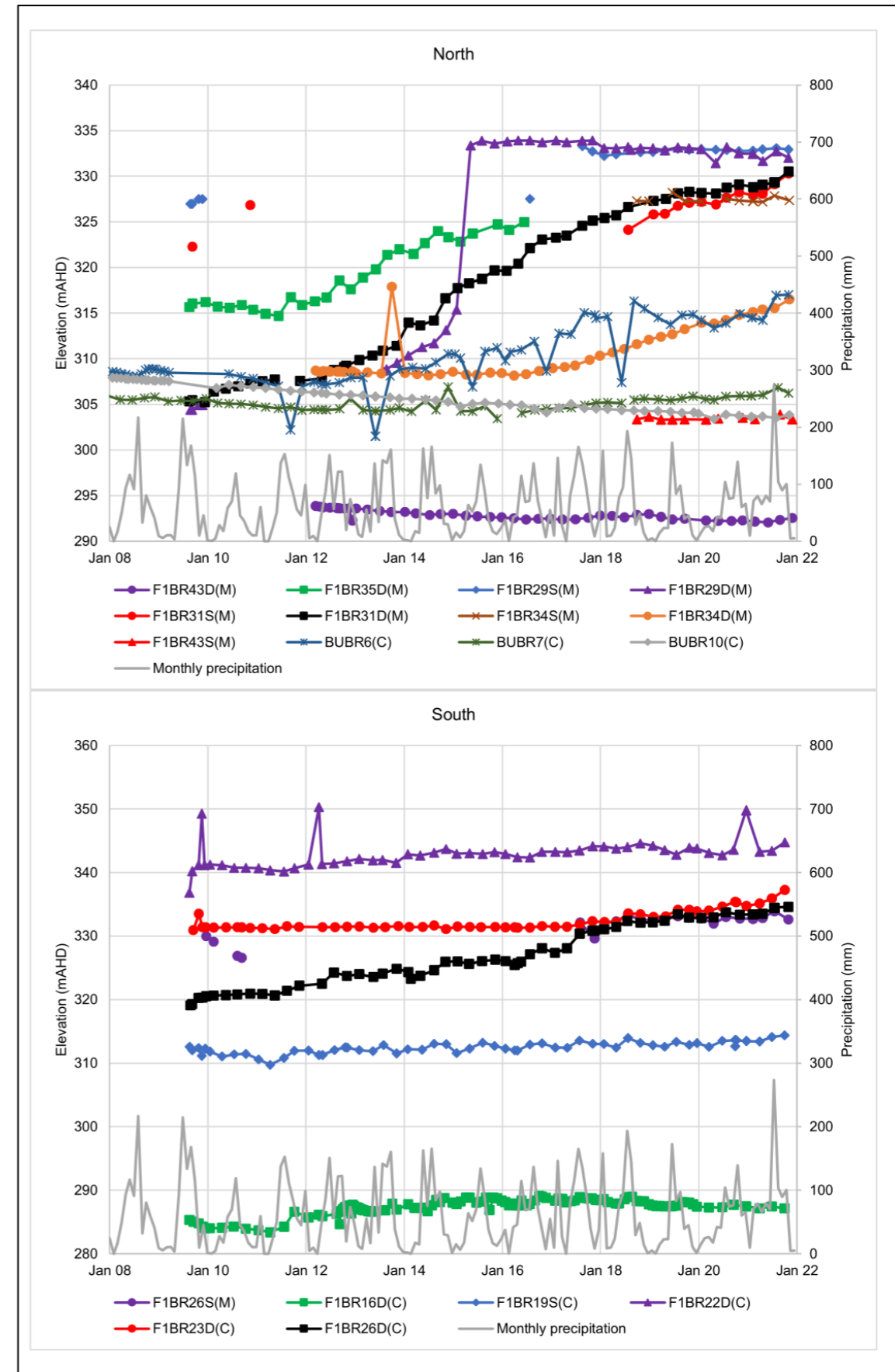


Figure 5: Historical groundwater elevation at the northern and southern portion of F1 RDA

The following observations were made from the groundwater monitoring results during the 2021 annual period (Big Dog Hydrogeology 2022):

- Trends in EC and sulfate concentrations were similar in the monitored groundwater bores. While seasonal variation was evident in most bores, there was no direct correlation between sulfate concentrations and precipitation conditions.
- Long-term sulfate concentration increases were observed at F1BR29S (i.e., from less than 100 mg/L in 2017 to over 1,000 mg/L in 2021). The cause of this trend was interpreted to be due to seepage from F1 RDA, due to the sulfate concentrations at the decant pond ranging between 500 mg/L to 3,000 mg/L.
- Although not clearly defined from sulfate concentrations, changes in field EC also suggests potential seepage influences at F1BR26S and F1BR31D.
- Groundwater monitoring bores that demonstrated signs of groundwater mounding and increasing sulfate concentrations do not demonstrate similar rising trends in certain dissolved heavy metals (i.e., copper, iron, manganese, iron, zinc). This was likely due to geochemical attenuation during transport through the groundwater system.
- While dissolved cobalt concentrations were variable in most bores (i.e., similar to other heavy metals), increasing concentrations were detected in 2020 and 2021 at F1BR26S and F1BR29S, which correlated with an increase in sulfate concentrations. These trends likely reflect the influence of seepage from F1 RDA. The lesser amount of attenuation observed in dissolved cobalt, compared to other heavy metals, is likely attributed to the cobalt being complexed with low concentrations of cyanide, which is also present in the tailings seepage.
- WAD CN concentrations were below the limit of detection in all bores, except at F1BR26S and F1BR29S. Cyanide is strongly attenuated within the groundwater system. The detection of WAD CN at these monitoring bores also correlated with the detection of dissolved cobalt and increasing sulfate concentrations. As such, these observations likely reflect the influence of seepage from F1 RDA.

3.3.4 Seepage management controls

Several infrastructure and controls are currently operational to manage the risk and extent of seepage from F1 RDA:

1. A 1.5 mm high-density polyethylene (HDPE) liner was installed in the southern portion of the F1 RDA, overlying 300 mm of compacted clay (Figure 4). The liner was designed to encompass the entire spatial extent of the decant pond. The northern portion of the RDA was not lined because the underlying oxide unit was determined to be adequate in controlling seepage (Knight Piezold 2008). However, a recent hydrogeological review has determined that most seepage from the RDA likely occurred from the unlined parts of the facility (Big Dog Hydrogeology 2019).
2. An underdrainage layer, comprised of pipes in 50 m spacing in gravel immediately above the HDPE, with drainage reporting to sumps. The underdrainage was intended to reduce the hydraulic head acting on the base of the RDA and reduce potential seepage.
3. A gravel layer below the HDPE liner, with drainage reporting to the Leakage Collection and Recovery System (LCRS). The LCRS was intended to intercept any seepage that had bypassed the liner or any groundwater entering the facility from below.
4. Toe drains located immediately upstream of crucial portions of the embankments, which reports to toe wells. The toe wells were designed to be pumped to reduce hydraulic head at the embankments.
5. Beach drains installed embankment raises, which comprises of V-shaped structure on the beach upstream of a saddle dam and gravity outfall pipes perpendicular to the

embankment. The beach drains were intended to reduce the phreatic level within the RDA.

6. Perimeter sumps were constructed around the outer perimeter of the F1 RDA to intercept seepage and groundwater, as well as capture catchment surface runoff.

Water intercepted by the underdrainage and LCRS are redirected back to be discharged at the F1 RDA decant pond. Water intercepted by the beach drains are directed to sump SD8SU-A1, which is returned to the F1 RDA decant pond as well. Water collected in toe drains are pumped to the perimeter sumps, which is ultimately discharged at the R4 RDA, south of the F1 RDA.

While the amount of intercepted water returned to F1 RDA is minimised to ensure embankment stability and reduce seepage pressures, the fate of the intercepted water is also determined by the water quality, with water that is more likely impacted by tailings seepage (i.e., beach drain, underdrainage) being sent to the decant pond to be reused in the processing circuit.

The applicant has committed to maintaining these controls as part of the operation of the F1 RDA Stage 17 and 18 embankments.

3.3.5 Risk assessment and decision

The monitoring results detailed supports the conceptual site model that water from the F1 RDA contains high concentrations of contaminants, though it attenuates and dilutes in the groundwater, which results in lower concentrations at the perimeter sumps. The attenuation of contaminant concentration in groundwater is also evident through the elevated concentrations observed in sump SD8SU-A1, which contains water intercepted directly from the F1 RDA beach drainage (i.e., not intercepted through the groundwater). Nevertheless, both surface water and groundwater monitoring indicated that seepage impacts to background sites were not evident.

While the SWL trends suggest that mounding is apparent at the F1BR31 and F1BR34 series bores, there is adequate separation distance between the water table and ground surface. Surface expression of groundwater, as well as inundation of root zones of deep-rooted vegetation, is currently considered unlikely at this stage. Further, there is currently limited evidence suggesting that the hydrogeological chemistry have been impacted at these locations.

On the other hand, the more impacted locations appear to be at the F1BR26 and F1BR29 series bores, located further south outside the PWDSA. At these locations, groundwater was observed to be the shallowest (i.e., within 3 m of surface level). The increase in sulfate and TDS strongly indicates seepage influences, which is further supported by the recent detection of dissolved cobalt and WAD CN. Continued monitoring of these parameters is required to further verify the influence of seepage at these groundwater bores as well as those beyond (i.e., closer to the PWDSA).

The long-term increase in average sulfate and TDS concentrations observed at most perimeter sumps was thought to reflect the increasing contribution of seepage water in the sump water balance (Blue Dog Hydrogeology 2022). The operation of the F1 RDA Stage 17 and 18 embankments would likely further increase contaminant loading intercepted by the perimeter sumps. Therefore, the maintenance of these seepage control infrastructure and implementation of a robust surface water and groundwater monitoring programme is required. Greater consideration should be given to the hydrogeological regime at the northern portion of the F1 RDA due to its close proximity to the Priority 1 PWDSA.

The consequence of this risk event is **moderate** due to the contaminant concentration of the tailings seepage (including any attenuation that had occurred prior to mixing with groundwater) and proximity of the F1 RDA to the South Dandalup Dam Catchment Area (Priority 1 PWDSA). Based on the water quality monitoring and trend analysis undertaken by Blue Dog Hydrogeology (2022), the likelihood of this risk event is **possible**. Consequently, the overall risk rating for this risk event is **medium risk**.

The continued operation of the F1 RDA, up to the Stage 18 embankment, is authorised and is

unlikely to pose an unacceptable risk to human health and the environment. However, the department acknowledges that the impacts of seepage from the F1 RDA facility is becoming apparent in the surrounding groundwater aquifer, though it has yet to impact water quality within the PWDSA, based on available data at the time of this assessment.

In light of this, the department intends on initiating a detailed review of the licence following the granting of this licence renewal. A critical component of this review will be to re-evaluate the operation of the F1 RDA and to better understand the risks of its current operations to sensitive receptors (i.e., the South Dandalup Dam PWDSA), as well as any potential risks that may arise from further raises to the embankment of the facility. The department will also seek to identify appropriate targets and limits to condition into the licence to enable more proactive management of the seepage occurring from the RDA.

4. Consultation

Table 8 provides a summary of the consultation undertaken by the department.

Table 8: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 29 March 2022.	No comments received.	N/A
Shire of Boddington advised of proposal on 29 March 2022.	The Shire of Boddington responded on 5 April 2023 with no objections to this application.	Noted.
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal on 29 March 2022.	DMIRS responded on 19 April 2023 outlining they had no concerns or comments.	Noted.
Department of Jobs, Tourism, Science and Innovation (JTSI) advised of proposal on 28 March 2022.	JTSI responded on 12 April 2023 with no comments.	Noted.
Applicant was provided with draft documents on 20 April 2023.	Refer to Appendix 1.	Refer to Appendix 1.

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that the application to renew licence L8306/2008/2 will be granted (as L8306/2008/3), subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements. The expiry of the licence has been extended for an additional 20 years in accordance with *Guideline: Licence Duration* (DER 2016).

The department intends to initiate a review in the immediate future, in accordance with the *Guideline: Industry Regulation licence review* (DWER 2022b). The scope of the licence review would likely include any of the following:

1. Undertake an updated risk assessment of all prescribed activities at the premises, including category 33, 54, 57, 63 and 73. This risk assessment will be informed by recent compliance inspections and reports provided by the applicant.
2. Investigate further the current and future potential impacts of seepage from F1 RDA to the surrounding receptors, including the Priority 1 South Dandalup Dam Catchment Area. The department has identified this to be of particular concern due to proposed plans to further increase the embankment height of F1 RDA.
3. Potentially include new specified action conditions for further investigations and/or regulatory controls related to seepage management at F1 RDA and the impacts of water quality at R4 RDA on visiting transient wildlife.
4. Ensure that prescribed activities and relevant infrastructure are accurately reflected on the licence.
5. Further refine and streamline conditions in licence L8306/2008/3 to improve clarity and enforceability of conditions.

The department understands the applicant intends to apply for authorisation to construct and operate further embankments at the F1 RDA in the near future. Given the scope of the licence review, if an application to amend the licence is received while the licence review is underway, the CEO may decide to amalgamate the amendment into the review process, in accordance with the *Guideline: Industry Regulation licence reviews* (DWER 2022b).

5.1 Summary of amendments

Table 9 provides a summary of the condition numbers that were revised from licence L8306/2008/2 to L8306/2008/3. Table 10 provides a summary of the amendments and will act as a record of implemented changes undertaken as a result of this licence renewal. All proposed changes have been incorporated into the licence L8306/2008/3, as part of the renewal process.

Table 9: Summary of amendments as part of licence renewal

Existing condition	Revised licence condition	Condition summary	Conversion notes
1.1.1	Interpretation section	Interpretation of definitions	Redundant condition. Revised to current licensing format.
1.1.2	Table 18	Definitions	Redundant condition. Revised to current licensing format.
1.1.3	Interpretation section	Australian or other standard	Redundant condition. Revised to current licensing format.
1.1.4	Interpretation section	Reference to code of practice	Redundant condition. Revised to current licensing format.
1.2.1	N/A	Emissions	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from licence
1.2.2	N/A	Pollution control and monitoring equipment	Redundant condition. Adequately covered by alternative existing conditions. Deleted from licence.
1.2.3	N/A	Storage of environmentally hazardous materials	Redundant condition. Adequately regulated by the <i>Dangerous Goods Safety Act 2004</i> . Deleted from licence.

Existing condition	Revised licence condition	Condition summary	Conversion notes
1.2.4	N/A	Recovery and removal of spills	Redundant condition. Adequately covered by <i>Environmental Protection (Unauthorised Discharges) Regulations 2004</i> . Deleted from licence.
1.2.5	N/A	Prevention of contamination and containment of contaminated stormwater	Redundant condition. Adequately covered by s.49 of the EP Act 1986. Deleted from licence.
1.2.6	1	Authorised staged construction and operating heights for F1 RDA	New condition numbering and update to wording format.
1.2.7	14	Construction requirements for F1 RDA embankment raises	New condition numbering.
1.2.8	15	Construction requirements for infrastructure	New condition numbering.
1.3.1	2	Pipeline controls	New condition numbering.
1.3.2	3	Waste disposal at Contaminated Blue Rock Facility	New condition numbering.
1.3.3	4	Containment infrastructure requirements	New condition numbering.
1.3.4	5	Freeboard requirements	New condition numbering.
1.3.5	6	Waste acceptance	New condition numbering.
1.3.6	7	Waste processing	New condition numbering and update to wording format.
1.3.7	8	Landfilling requirements	New condition numbering.
1.3.8	9	Timber burning	New condition numbering.
1.3.9	10	Inspection requirements	New condition numbering and update to wording format.
1.3.10	24	Water balance for F1 RDA	New condition numbering and update to wording format.
1.3.11	11	Authorisation to discharge seepage to R4 RDA	New condition numbering.
1.3.12	12	Waste processing	New condition numbering and update to wording format.
1.3.13	13	Infrastructure requirements (bioremediation facility)	New condition numbering and update to wording format.
2.1.1	N/A	Record and investigate exceedances of limits or targets	Redundant condition. Deleted from licence.
2.2.1	16	Point source air emissions	New condition numbering and update to wording format.

Existing condition	Revised licence condition	Condition summary	Conversion notes
2.3.1	17	Fugitive dust emissions	New condition numbering.
2.4.1	18	Odour emissions	New condition numbering.
3.1.1	19	Standards for monitoring	New condition numbering. Amalgamated conditions 3.1.1 and 3.2.2 and 3.2.3.
3.1.2	20	Monitoring frequency requirement	New condition numbering.
3.1.3	23	Record production or throughput data for non-continuous monitoring	New condition numbering.
3.1.4	21	Monitoring equipment calibration	New condition numbering and update to wording format.
3.1.5	22	Notification requirement for calibration issue	New condition numbering.
3.2.1	26	Point source air quality monitoring	New condition numbering and update to wording format.
3.2.2	19	Standard for air quality monitoring	New condition numbering. Amalgamated conditions 3.1.1 and 3.2.2 and 3.2.3.
3.2.3	19	NATA accreditation for air quality monitoring and analysis	New condition numbering. Amalgamated conditions 3.1.1 and 3.2.2 and 3.2.3.
3.3.1	25	Process monitoring	New condition numbering and update to wording format.
3.4.1	27 28	Surface water and groundwater monitoring	New condition numbering and update to wording format. Separated into conditions 27 and 28 for surface water and groundwater monitoring, respectively.
4.1.1	N/A	Improvement program	Condition met. Redundant condition. Deleted from licence.
4.1.2	N/A	Notification requirement for improvement program.	Condition met. Redundant condition. Deleted from licence.
5.1.1	30 31	Records	New condition numbering and update to wording format.
5.1.2	N/A	Person in charge of premises made aware of licence conditions	Redundant condition. Deleted from licence.
5.1.3	32	Annual Audit Compliance Report	New condition numbering and update to wording format.

Existing condition	Revised licence condition	Condition summary	Conversion notes
5.1.4	29	Complaints	New condition numbering and update to wording format.
5.1.5	N/A	Environmental incident system for spills greater than 250L	Redundant condition. Adequately covered by condition 36. Deleted from licence.
5.2.1	33	Annual Environmental Report	New condition numbering and update to wording format.
5.2.2	N/A	Annual Environmental Report additional reporting requirements	New condition numbering. Amalgamated conditions 5.2.1, 5.2.2 and 5.2.3.
5.2.3	N/A	Non-annual reporting requirements	New condition numbering. Amalgamated conditions 5.2.1, 5.2.2 and 5.2.3.
5.2.4	34	Environmental Compliance Report	New condition numbering.
5.2.5	35	Environmental Compliance Report contents	New condition numbering and update to wording format.
5.3.1	36	Notifications	New condition numbering and update to wording format.
N/A	N/A	Prescribed premises categories (Schedule 2)	Revised to current licensing format. Moved to licence cover page.

Table 10: Summary of amendments as part of licence renewal

Condition no.	Proposed amendments
----	<p>Updated cover page to:</p> <ul style="list-style-type: none"> • update licence number from L8306/2008/2 to L8306/2008/3, with licence duration of 20 years; and • include prescribed premises category description and assessed production / design capacity.
Condition 1	<p>Updated the condition to:</p> <ul style="list-style-type: none"> • authorise operating height of F1 RDA to Stage 18 (361.0 m RL); and • specify requirement to submit the corresponding Environmental Compliance Report (required by condition 34) prior to operating that stage/height.
Condition 4	<p>Included Thirty-Four Mile Brook Diversion Pond as a replacement for North Clear Water Pond for accepting mine dewater from the Wandoo North Pit in Table 2.</p> <p>Included North Wandoo Pit as an emergency discharge location for overflow from Thirty-Four Mile Brook Diversion Pond.</p> <p>Removed North Clear Water Pond from Table 2.</p> <p>Removed mention of grout curtains for F1 RDA in Table 2 (refer to Appendix 1: Summary of applicant's comments on risk assessment and draft conditions).</p>

Condition 10	Updated Table 6 to specify survey for tailings beach to be undertaken monthly, rather than weekly (refer to Appendix 1: Summary of applicant's comments on risk assessment and draft conditions).
Condition 15	Included construction requirements for Thirty-Four Mile Brook Diversion Pond spillway.
Condition 19	Removed standards specification for waste water monitoring, as there are no requirements in the licence for monitoring wastewater.
Condition 20	Removed monitoring frequency requirement for annual monitoring, as there are no requirements in the licence for annual monitoring.
Condition 24	Removed reference to Catch pit 3 and 4 in water balance (refer to Appendix 1: Summary of applicant's comments on risk assessment and draft conditions).
Condition 25	Updated 'Monitoring location' and 'Process description' for clarity. Removed requirement for target from Table 12, as there are no specified targets in Table 12.
Condition 27	Included Note 5 in footnotes of Table 14, such that either SD8SU-D or SD8SU-D1 would need to be monitored during a monitoring event. Included requirement to monitor electrical conductivity at F1 RDA perimeter sumps, and analysis of iron at Compliance Sites.
Condition 28	Included requirement to analyse for tungsten at Compliance Sites.
---	Removed two conditions under the Improvements section, due to the conditions having been met. No additional new conditions were added.
Condition 33	Updated condition to reduce timeframe for submission of Annual Environmental Report from 6 months to 90 calendar days to align with current licensing format. Updated Table 16 to: <ul style="list-style-type: none"> include further requirements for reporting of surface water and groundwater monitoring results and data, in specified formats and forms (previously part of quarterly reporting requirements); and include requirements to submit copies of original monitoring reports provided by third-parties; and include requirements to for monthly water balance of F1 RDA, specified formats and forms (previously part of quarterly reporting requirements).
---	Removed condition for non-annual reporting requirements due to removal of quarterly reporting.
Condition 34	Updated condition to include reporting timeframe for items of infrastructure constructed under condition 15.
Condition 15	Updated condition to include certification requirements for items of infrastructure constructed under condition 15.
---	Updated Table 18 to: <ul style="list-style-type: none"> include terms relevant to the licence (e.g., clean fill, <i>E. coli</i>, ecological screening levels, HDPE, inert waste type 1 and 2, mbgl, NEPM, special waste type 1, suitably qualified engineer, TRH, VOC and WRD); remove terms and definitions that are no longer relevant to the licence (e.g., AS/NZS 5667.10, dangerous goods, environmentally hazardous material); align timeframes defined to align with the annual period of the licence (e.g., six monthly); and

	<ul style="list-style-type: none"> improve clarity of definitions (e.g., fugitive emissions).
---	<p>Updated Schedule 1: Maps to:</p> <ul style="list-style-type: none"> replaced premises boundary figure and mining tenement log to include additional tenements (M70/1221, M70/590, ML70/751 and ML70/752); and remove dead tenement M60/562 from mining tenement log.
---	<p>Removed Schedule 2: Prescribed Premises categories due to inclusion on licence cover page. Schedule 3: Notifications & Forms is now listed as Schedule 2.</p>

References

1. Big Dog Hydrogeology 2019, *Boddington Gold Mine 2019 RDA Groundwater Review*, Western Australia.
2. Big Dog Hydrogeology 2022, *Boddington Gold Mine 2021 Annual Hydrological Review – Rev A (Draft)*, Western Australia.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. DER 2016, *Guidance Statement: Licence Duration*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.
7. DWER 2022a, *Works instruction: Industry Regulation Licensing position – COVID-19 response*, Perth, Western Australia.
8. DWER 2022b, *Guideline: Industry Regulation licence reviews*, Perth, Western Australia.
9. Galt 2021, *Basis of Design – N05 Cutback, 34MB Diversion Pond Modifications, FWD01 Modifications, FWD02-N05, NCWP Infill, WD9 Sediment Pond Modifications, 34MB Diversion Mine Water Drains*, Osborne Park, Western Australia.
10. Groundwater Resource Management Pty Ltd (GRM) 2021, *N05 Layback Hydrological Analysis and Conceptual Drain Designs*, Perth, Western Australia.
11. Knight Plezold 2008, *F1 RDA Groundwater Protection In-Situ Soil Liner Justification*, Western Australia.

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

Condition	Summary of applicant's comment	Department's response
Condition 4	The applicant clarified that F1 RDA does not have grout contains.	The department has removed this control from the infrastructure requirements for the F1 RDA in Table 2. This correction was not considered to have materially changed the outcome of the risk assessment undertaken.
	The applicant responded to the department's query, confirming that the North Clear Water Pond has been decommissioned.	The department has removed North Clear Water Pond from Table 2.
Condition 10	The applicant clarified that the survey of tailings beach is undertaken quarterly, not weekly. Survey of decant pond elevation is undertaken weekly. Based on verbal correspondence, survey of tailings beach is undertaken to determine whether operational freeboard requirements are met. Survey of decant pond elevation is undertaken to determine the area and size of the decant pond and ensure that decant pond formation and water recovery is optimised.	The department has clarified this in Table 6. This correction was not considered to have materially changed the outcome of the risk assessment undertaken.
Condition 24	The applicant clarified that tailings captured in Catch Pits 3 and 4 were deposited into F1 RDA and should not be included in the water balance. Outside emergency situations (e.g., power failure), Catch Pits 3 and 4 act as containment structures along the tailings pipelines that lead from the processing plant thickener to the Caros Acid Plant/Booster station, and are used approximately three times annually during plant shutdown and maintenance. The tailings pipeline is flushed with water, with the resultant slurry directed into these catchpits. The slurry is stored within the catchpits and monitored until WAD CN concentrations were detected at below 50 ppm (as required y International Cyanide Management Code standards). Once compliant, the water from Catch Pit 1 is directed back to the processing plant, while water from Catch Pits 3 and 4 have always been directed to the R4 RDA. The residual tailing solids are excavated into trucks and deposited into F1 RDA. The volume of water pumped out of the catchpits (i.e., back to the processing plant or to R4 RDA) and volume of dried tailings transported to F1 RDA are not	The department has removed reference of Catch Pit 3 and 4 from condition 24(b). This correction was not considered to be a significant component of the water balance.

Condition	Summary of applicant's comment	Department's response
	<p>measured. Historical monitoring indicates typically low WAD CN concentrations. Hence, Catch pit 3 and 4 have limited relevance to water movement at the F1 RDA.</p>	
---	<p>The applicant responded to the department's query, providing descriptions for the new mining tenements added to the prescribed premises through this licence renewal application.</p>	<p>The department has included these descriptions in the mining tenements logs, in Schedule 1: Maps.</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)				
Application type				
Works approval	<input type="checkbox"/>			
Licence	<input type="checkbox"/>	Relevant works approval number:		None <input type="checkbox"/>
		Has the works approval been complied with?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Has time limited operations under the works approval demonstrated acceptable operations?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Date report received:		
Renewal	<input checked="" type="checkbox"/>	Current licence number:	L8306/2008/2	
Amendment to works approval	<input type="checkbox"/>	Current works approval number:		
Amendment to licence	<input type="checkbox"/>	Current licence number:		
		Relevant works approval number:		N/A <input type="checkbox"/>
Registration	<input type="checkbox"/>	Current works approval number:		None <input type="checkbox"/>
Date application received	31 January 2023			
Applicant and premises details				
Applicant name/s (full legal name/s)	Newmont Boddington Gold Pty Ltd			
Premises name	Newmont Boddington Gold Mine			
Premises location	Mining tenements: 1. M70/1221 2. M70/1031 3. M70/1236 4. M70/1237 5. M70/1238 6. M70/21 7. M70/22 8. M70/23 9. M70/24 10. M70/25 11. M70/26 12. M70/462 13. M70/564 14. M70/588 15. M70/589 16. M70/590 17. M70/799		18. M264SA General tenements: 1. G70/215 2. G70/218 3. G70/219 Miscellaneous tenements: 1. L70/28 2. L70/95 3. L70/96 4. L70/152 5. L70/165 Mineral lease: 1. ML70/751 2. ML70/752	

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)		
Local Government Authority	Shire of Boddington	
Application documents		
HPCM file reference number:	2013/002375-2	
Key application documents (additional to application form):	<ul style="list-style-type: none"> • Licence L8306/2008/2 Renewal Attachments • F1 Residue Disposal Area Stage 15 Civil Construction Report (including certificate of completion) • Basis of Design Report for N05 Cutback, 34MB Diversion Pond Modifications, NCWP Infill • Response to Request for Further Information, provided on 10 February 2023 	
Scope of application/assessment		
Summary of proposed activities or changes to existing operations.	<p><u>Licence renewal</u></p> <ul style="list-style-type: none"> • Renewal of licence to continue operating at the prescribed premises; • Authorisation to operate F1 RDA Stage 17 and 18 embankment; • Authorisation to discharge mine dewatering at Thirty-Four Mile Brook Diversion Pond; • Removal of Improvement Reference 2; and • Modification to the premises boundary to better represent the premises. 	
Category number/s (activities that cause the premises to become prescribed premises)		
Table 1: Prescribed premises categories		
Prescribed premises category and description	Assessed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 5: Processing or beneficiation of metallic or non-metallic ore	45,000,000 tonnes per annual period	No change
Category 6: Mine dewatering	4,000,000 tonnes per annual period	No change
Legislative context and other approvals		
Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Ministerial statement No: 971 EPA Report No: 1506
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Mining lease / tenement <input checked="" type="checkbox"/>
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>	N/A
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Licence/permit No: SWL60668(7)
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Name: Murray River System, Dandalup River System Type: Proclaimed Surface Water Area Has Regulatory Services (Water) been consulted? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/> Regional office: South West
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Name: South Dandalup Dam Catchment Area Priority: Priority 1 Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>
Is the Premises subject to any other Acts or subsidiary regulations?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<ul style="list-style-type: none"> • Environmental Protection Act 1986 (Part IV); • Mining Act 1978; • Mines Safety and Inspection Act 1994; and • Dangerous Goods Safety Act 2004.
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

Is the Premises subject to any EPP requirements?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	N/A
Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i> ?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Classification: Possibly contaminated – investigation required (PC–IR) Date of classification: N/A