Andy Well Mine

Works Approval Supporting Information Document

Category 5- Processing or beneficiation of metallic or non-metallic ores

Tenements	**M51/870**
Tenement Holder	**All tenements held by Andy Well Mining Pty Ltd**

28 May 2025

Executive Summary

Meeka Metals Ltd (Meeka) owns the Murchison Gold Project via its subsidiary called Andy Well Mining Pty Ltd and is planning to commence mining and processing operations starting with mining a series of open pits at the Gnaweeda Project. Ore will be trucked from Gnaweeda to the adjacent Andy Well mine where processing will occur.

When processing recommences, the Andy Well site will have limited capacity for tailings storage. There is an existing tails dam that has approximately 6 months of storage left across two cells. The tails within the cells are dry, since no tails have been deposited for the last seven years. The tailings material has been subject to metallurgical test work to confirm the tails are not acid forming and metals within the tails are not leachable. With this being the case, advice from DEMIRS has been that these tails can be treated as inert waste rock and can therefore be removed from the dam for reuse as construction material. The removal of these tails will add further capacity to the exiting TSF, however new long term sustainable tailings storage capacity is required.

As an interim solution Meeka has applied for an in pit TSF within the Suzie Pit. This application has been submitted and is now approved for tails deposition. The Suzie pit will provide for approximately 1 year of further tailings storage.

To provide a full life of mine tailings storage solution, Meeka has developed a plan for an integrated waste rock landform (IWL). The IWL will provide significant tails storage capacity to allow for the mining and processing of further Andy Well ore, as well as Gnaweeda ores, and any further ore acquired by the project. The IWL concept was chosen as this is the current preferred tails manage method in Western Australia, and also because it will make use of existing waste rock dumps and other waste material to reduce the overall footprint of the mine.

The IWL will be constructed with a starter embankment of waste rock and NAF tails and can then be used and grown via embankment rises and backfilling with tailings. This prevents the need to undertake expensive TSF lifts, and makes use of existing waste material, removing these structures from the mine footprint.

The Mine will also require a new landfill site as part of the resumption of operations. There is presently a landfill, however this is located under the footprint of the proposed IWL and will therefore need to be moved to facilitate the expansion of the mine. A major issue encountered during the operation of the landfill has been the hardness of the underlying Wiluna hard pan, which makes excavation of suitable trenches impossible without heavy duty equipment. To solve this issue, Meeka plans to locate the new landfill within the existing TSF. Some tailings from the TSF will be required to build the IWL, but not all, and this will mean there is a landform in place capable of being dug and backfilled easily. The inert nature of the tailings materials, as determined by leach and acid generation testing, ensures the facility is suitable for the landfill. The construction of the TSF will prevent leachates leaving the facility and provide further environmental safeguards surrounding the landfill.

TABLE OF CONTENTS

1 Introduction

1.1 Application Type

This Works Approval application is for the following categories;

Category 5: Processing or beneficiation off metallic or non-metallic ore:

Premises on which:

c) tailings residue from metallic or non-metallic ore is discharged into a containment cell or dam.

1.2 Applicant Details

The Murchison Gold Project (MGP) is located on M51/882, M51/870 and L51/97, held by Andy Well Mining Pty Ltd (ABN 68 158 108 895). Andy Well mining is a fully owned subsidiary of Meeka Metals limited (ABN 23 080 939 135).

All correspondence regarding this application should be forwarded to;

[redacted]

Meeka Metals Limited

[redacted]u

The tenement details are outlined in the table below.

Table 1 Project Tenement

Tenement ID	Tenement Holder	Grant	Expiry	Area (ha)
M51/870	Andy Well Mining Pty Ltd	27/04/2012	26/04/2033	1109.5

2 Premises Details

2.1 Project Description

The MGP is the name allocated to all the mining and exploration areas that form part of the granted tenure owned by Meeka in the Murchison region. Within this broader project description is the existing Andy Well Project (AW) and the new Gnaweeda Project (GP). Within each respective sites exists individual mining areas. This breakdown is shown below:

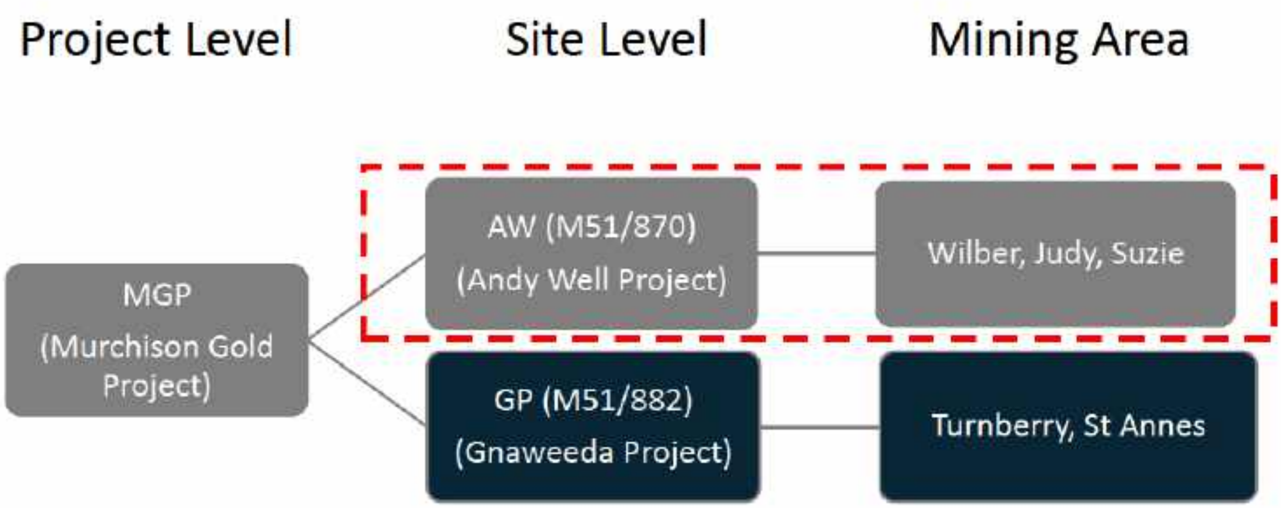

Figure 1 Project Description

2.2 Location

The MGP is located 45 km north of the town of Meekatharra in the Murchison region of Western Australia (WA), adjacent to the Great Northern Highway (Figure 2). The Andy Well mine is entirely located on M51/870. The Project is situated within the registered Native Title area of the Yugunga Nya People. An accommodation camp on M51/870 is proposed which will support activities over the life of the project.

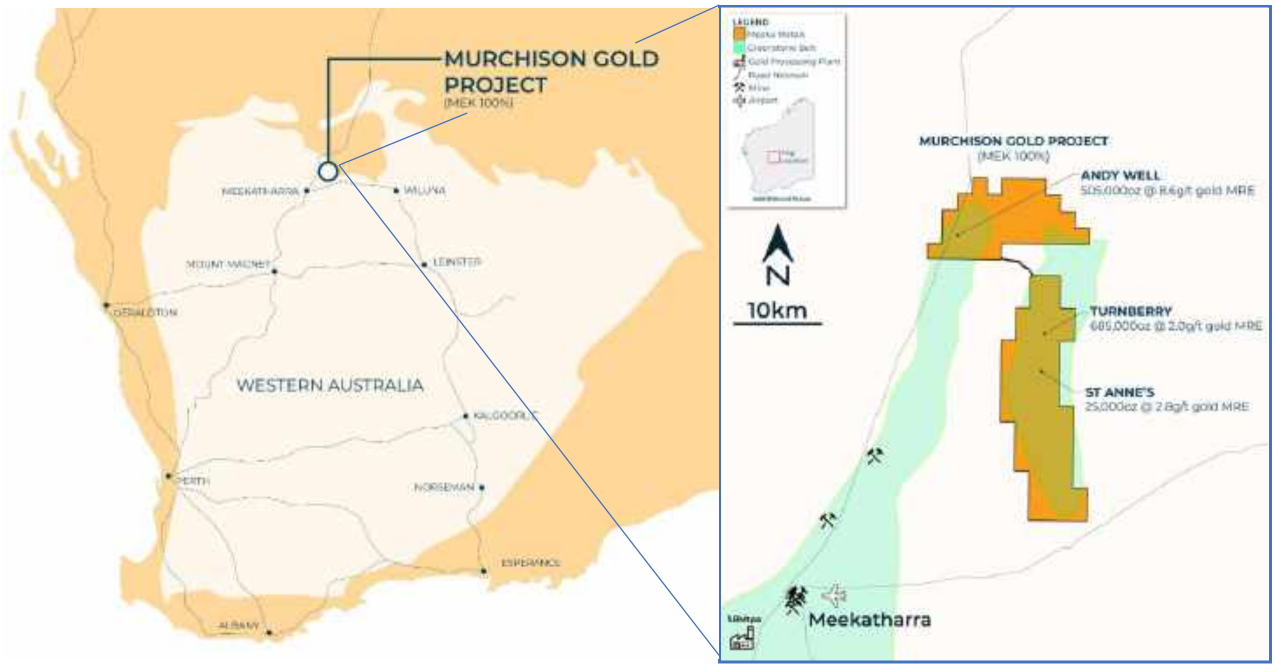

Figure 2 MGP Project location and Tenure

2.3 Site Layout

The Andy Well Mine was in operation between 2012 and 2017. As a result of the operation, the site is well developed and heavily disturbed (Figure 3).

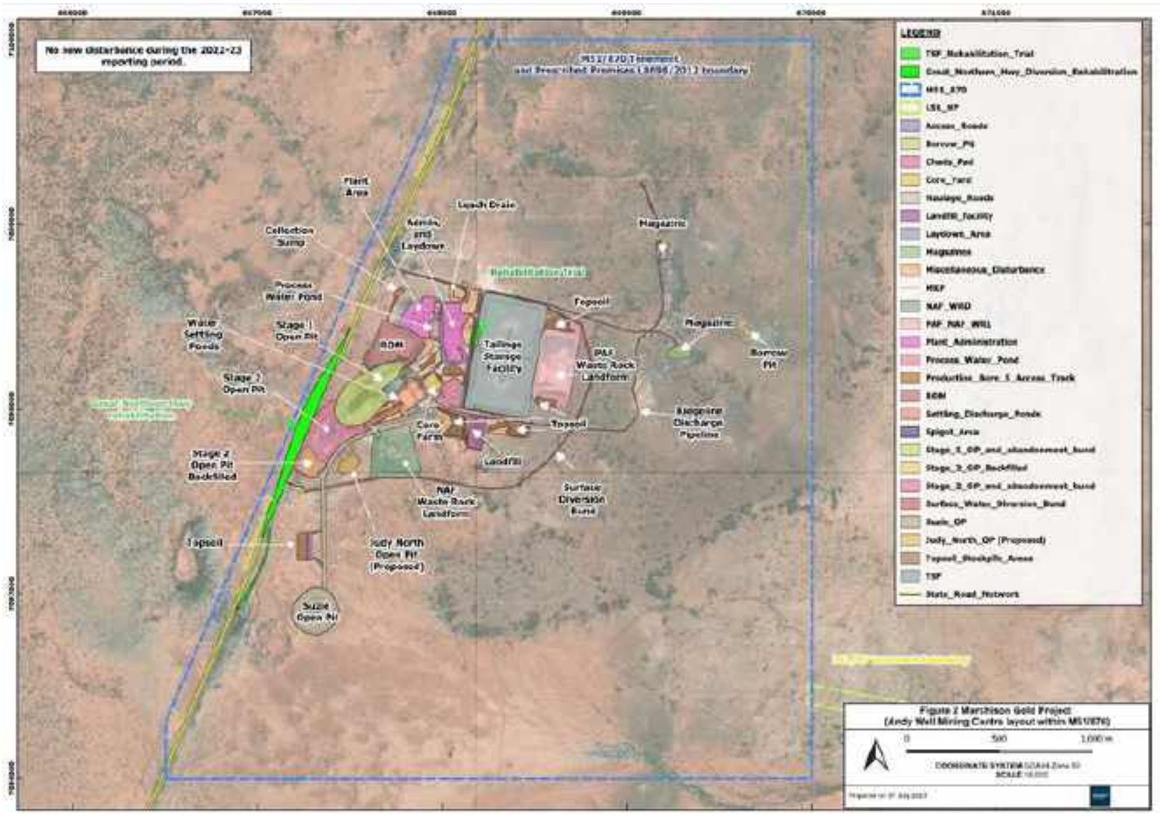

Figure 3 Andy Well Mine Layout

Figure 4 shows the location of the proposed IWL. The facility sits immediately south of the current TSF (Cells 1 and 2), largely located in a heavily disturbed area. The proposed location currently has a topsoil stockpile, waste rock stockpile and the exhausted landfill within it. The topsoil and waste rock will be moved to make way for the IWL. While the landfill will be backfilled, compacted and end up underneath the IWL eventually.

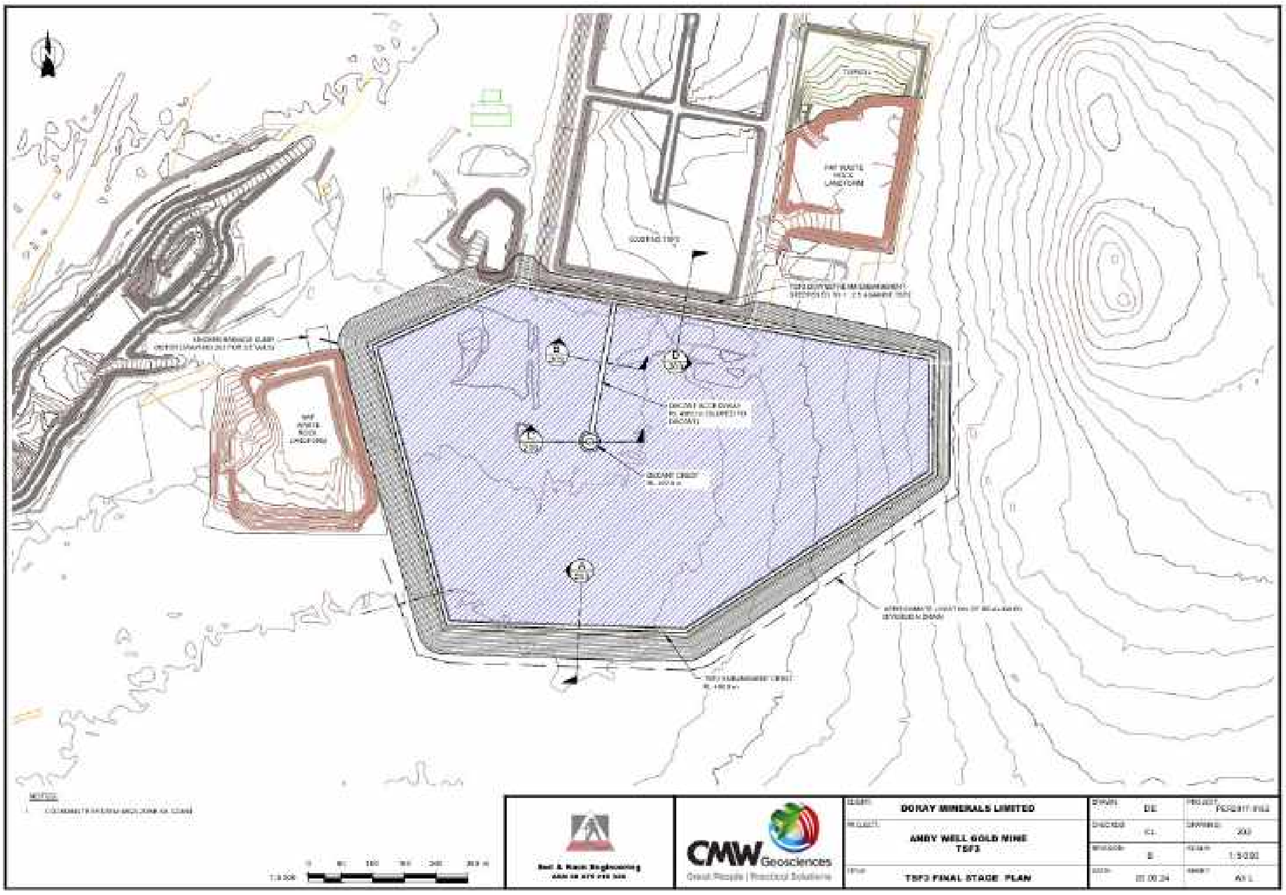

Figure 4 IWL Location and Layout

2.4 Prescribed Premises Boundary

The Andy Well Mine currently has a site licence allowing for the operation of the mine. The Prescribed premises boundary is the tenement boundary and has been supplied as part of licence L8698/2012. There are no proposed changes to the prescribed premises boundary as part of this application.

2.5 Project Description

2.5.1 IWL

The Andy Well Mine was in operation between 2012 to 2017 when it was put in care and maintenance by the previous owner and was later sold. Meeka Metals acquired the mine in 2021 and undertook a period of heavy exploration, focussing on the Turnberry Deposit and the subsequently discovered St Annes deposit. Between Turnberry, St Annes and Andy Well, Meeka has published resources of 12.9Mt of ore containing 1.235moz of gold.

Meeka plans to resume mining and processing at Andy Well, making use of the infrastructure that remains in place, and replacing infrastructure that was removed by the previous mine owners. When the Andy Well mine was in operation, infrastructure, specifically the TSF infrastructure was designed for the Andy Well life of mine, which has now been significantly extended by the addition of the Turnberry and St Annes deposits.

To enable the processing more TSF space is required. there is the approval to undertake an additional lift of TSF cell 2, there is the ability to remove dry tails from these cells and create additional storage space and expand the life of cells 1 and 2 of the TSF. An in pit TSF has also been applied for at the Suzie pit, which adds a further 18 months of capacity.

While the existing TSF and recently applied for Suzie in pit TSF allow for a significant expansion of the tails containment infrastructure, the two facilities are insufficient for the volume of ore to be mined. With the requirement for more tails storage space, Meeka commissioned SRE to undertake a design for a new facility, with the IWL design being the one recommended by SRE.

The IWL physical characteristics are outlined in Table 2 below;

Table 2 Physical Design Characteristics

Usable Storage Volume (Mm^3)	Greatest Depth (m)	Expected Depth of Tailings (m)	Footprint (ha)	Downstream Slopes (H:V)
4.8	16.2	15.5	45.5	3:1

The physical features of the IWL are shown in Table 3.

Table 3 IWL Physical Characteristics

Expected Tailings Surface Area (ha)	Expected Final Height (m)	Tonnes of Tailing to be Stored (1.5t/m3)	Storage Life (months) at 650,000 tpa
35	15.5	6.75	10.39

The TSF will be constructed with a start embankment constructed of NAF mine wase. PAF waste material may be utilised within the embankment, where it will be encapsulated within the centre of the embankment. This will be used to manage any ARD issues that arise with the underground mining of fresh rock, where sulphide material has not been oxidised.

The IWL has been designed with a central decant ring filter with a pontoon mounted pump inside to return water to the process plant. Perimeter monitoring recovery bores are to be along strike to the southwest, adjacent to this facility to supplement the existing monitoring bores installed for TSF Cell1 and TSF Cell 2. These bores can be fitted with pumps, if necessary, in order to return water to the plant. The monitoring/recovery are bores to be located by the project hydrogeologist to ensure they are within the potential flow paths, which are controlled structurally and lithologically by fractured rock beneath the IWL (SRE, 2024).

Geochemical characterisation of the tailings was completed as part of previous studies and the relevant documents are presented in the appendices. The Andy Well tailings samples were classified as Non-Acid Forming (NAF). The results from the multi-elemental analysis of both tailings samples indicate that the following elements may become enriched in Silver (Ag), Arsenic (As), Tellurium (Te) and Titanium (Ti). Silver (Ag) occurs as a native metal or an alloy and is stable in air and water. Titanium (Ti) readily reacts with oxygen to form TiO_2, a stable compound. Tellurium (Te) has a strong affinity to Au and Ag and is often present as gold tellurides. Te exists in the earth's crust as a rare stable element. Arsenic (As) concentration levels are well below Health Investigation

Levels (HIL) classification F – Commercial/industrial sites, and meet HIL classification A – Standard residential, although exceed Ecological Investigation Levels as published by Department of Environment and Conservation (DEC) soil contamination criteria (2010) (SRE,2024).

Geotechnical assessment of the proposed IWL indicates that it can be safely operated as a tailings storage facility, provided it is operated in accordance with the intent of the design and the Operations Manual, with the liberated tailings slurry water removed so that the risk of long-term saturation of the containment embankments, which might result in failures, is reduced. The operation of other similar above-ground TSFs has been safely executed at this site and other sites throughout Western Australia and there was no evidence of distress in the existing embankments of TSF Cell 1 and TSF Cell 2 during the previous operation of these facilities. It can therefore reasonably be expected that, with good operating practice, the risk of containment embankment failure is very low. However, it must be stressed that the safe operation of each tailings storage facility relies upon:

- The execution of all the construction works, in accordance with the Scope of Works, Drawings, Materials Schedule and Earthworks Specification (Appendix 1).

- It being operated in accordance with the Operations Manuals (Appendix 1). These manuals set out the tailings deposition and water recovery procedures as part of the TSF management, to maximise water return and reduce the potential risk for embankment failure, as well as the inspection and maintenance procedures which are part of the TSF management process.

2.5.2 Disturbance

The disturbance associated with the Project is 46.5 ha. This disturbance is comprised of:

Table 4 Project Disturbance

Tenement	Infrastructure	Footprint (Ha)
M51/870	IWL	46.5
	Associated disturbance for access	3.5
Total Disturbance		**50.0**

The IWL has a footprint of 46.5ha at the base and will cover an area of 35.8ha when at capacity. The IWL sits across an area which is currently partially disturbed, with the area containing past waste rock dumps, the exhausted and fill and topsoil stockpiles.

When the construction commences, the existing waste rock will be used to construct the starter embankment for the facility, meaning the structure will be removed. Waste from the existing PAF cell will also be utilised during the construction of the embankment. In this case a layer of NAF waste will be used as a base, with the PAF then being encapsulated within interior of the embankment, leading to the removal of the current PAF waste rock dump, and allowing this to be managed appropriately.

The topsoil stockpiles will be moved to allow these to be reused when required. Topsoils will be added to existing stockpiles outside future disturbance areas.

The landfill site is located in the northern portion of the future IWL. The landfill was used between 2012 and 2017. A series of shallow trenches were installed into the ground and backfilled with waste and covered by waste rock. Given the underlying soil conditions of the Wiluna hard pan, the trenches were less than 1m deep and did not penetrate the hard pan layer. An inspection of the landfill confirmed that the underlying soils and hardpan remain undisturbed and remain suitable to be used as the base for the IWL.

2.5.3 Ore Processing

Ore from both Gnaweeda and Andy Well will be process at the Andy Well mill and tailings will report to the IWL. The tonnages of gold to be processed are shown in the table below. Ore from Gnaweeda will be mixed with Andy Well ore and processed concurrently.

Details of the tails from both Andy Well and Gnaweeda have been provided in separate reports, and the geochemistry is discussed in the Works Approval application as well as section 9.2 of this document.

The tonnages of ore to be processed for the planned resumption of the Andy Well mine and Gnaweeda Deposits are shown in Table 5.

Table 5 Ore Tonnages

Project Year	**Units**	**Total**	**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**	**Year 7**	**Year 8**	**Year 9**
Open Pit Mining												
St Anne's	Kt	**179**	13	165	-	-	-	-	-	-	-	-
	g/t	**3.44**	1.70	3.58	-	-	-	-	-	-	-	-
	Koz	**20**	1	19	-	-	-	-	-	-	-	-
Turnberry	Kt	**474**	-	324	-	-	-	-	-	-	2	148
	g/t	**2.28**	-	2.55	-	-	-	-	-	-	0.70	1.70
	Koz	**35**	-	27	-	-	-	-	-	-	0	8.1
Total	Kt	**653**	13	489	-	-	-	-	-	-	2	148
	g/t	**2.60**	1.70	2.90	-	-	-	-	-	-	0.70	1.70
	Koz	**55**	1	46	-	-	-	-	-	-	0	8.1
Underground Mining												
Andy Well	Kt	**2,737**	-	8	371	433	529	493	431	280	191	-
	g/t	**3.93**	-	1.71	3.10	3.65	3.74	4.02	4.50	4.31	4.66	-
	Koz	**345**	-	1	37	51	64	64	62	39	29	-
Total	Kt	**2,737**	-	8	371	433	529	493	431	280	191	-
	g/t	**3.93**	-	1.71	3.10	3.65	3.74	4.02	4.50	4.31	4.66	-
	Koz	**345**	-	1	37	51	64	64	62	39	29	-
Mining Total												
Tonnes	Kt	**3,390**	13	498	371	434	529	493	431	280	194	148
Grade	g/t	**3.67**	1.70	2.88	3.10	3.65	3.74	4.02	4.50	4.31	4.61	1.70
Ounces	Koz	**400**	1	46	37	51	64	64	62	39	29	8.1
Processing Total												
Tonnes	Kt	**3,390**	-	468	340	340	340	340	340	340	393	489
Grade	g/t	**3.67**	-	2.95	3.23	4.13	4.70	4.91	5.13	3.91	3.32	1.85
Milled Oz	Koz	**400**	-	44	35	45	51	54	56	43	42	29
Recovered Oz	Koz	**390**	-	43	34	44	50	52	55	42	41	28

3 DWER Approvals

Andy Well currently holds a Part V licence to operate the process plant and the existing TSF (L8698/2012/1). The licence permits the following activities at the mine;

- Category 5 Processing or beneficiation of metallic or non-metallic ore. 365,000 tonnes per annual period.
- Category 6 Mine dewatering. 600,000 tonnes per annual period.
- Category 64 Class II putrescible landfill site. 500 tonnes per annual period.

The licence was granted in 2012 and remains in force until 23/12/2031. No further DWER approvals are required to utilise the IWL.

4 Other Approvals and Consultation

4.1 Other Approvals

A Mining Proposal and a Mine Closure plan will be required by DEMIRS to enable the construction of the IWL and landfill site. The site will also require the expired Native Vegetation Clearing Permit to be reapplied for to enable the clearing for the IWL. These approvals are being developed and will be submitted in concurrence with this Works Approval.

4.2 Consultation

The Project has undertaken consultation with all the key stakeholders associated with the Murchison Gold Project. A summary of the consultation is provided in the sections below.

4.2.1 DWER

An initial meeting was held between representatives from Meeka and DWER on October 17, 2023. At the meeting the Project was introduced, and the various items within the remit of DWER were discussed. A further meeting was held with DWER on April 16, 2024, to discuss the tailings management proposals. The meeting discussed the requirements of the in pit TSF as well as this IWL.

4.2.2 DEMIRS

An initial meeting was held between representatives from Meeka and DEMIRS on October 11, 2023. At the meeting the Project was introduced, and the various items within the remit of DMIRS were discussed the two key approvals within the scope of DEMIRS are the Mining Proposal and Mine Closure Plan. DEMIRS were able to explain what they wanted to see in the documents and provided advice for the development of the approvals documents, which was mostly around ensuring all of the development envelope was covered by the various studies and to only include information within the approvals documents that was required for an assessment.

A further meeting was held with DEMIRS on April 16, 2024. DEMIRS and Meeka discussed the interconnected nature of the legacy Andy Well approvals and hot to manage Andy Well and Gnaweeda. It was discussed that these would be kept separate until such time as Meeka brings together the Andy Well Project and the Gnaweeda Project into a single Mining Proposal and Mine Closure Plan. The meeting also touched on the Andy Well approvals and bringing these into the 2020 guidelines format. The timing of this change was left to Meeka, and it is now considered an appropriate time to undertake this process. The Mining Proposal being developed as part of the IWL suite of approvals will be developed to be compliant with the guidelines.

4.2.3 Yugunga-Nya Aboriginal Corporation

An existing Native Title Mining Agreement is in place for the entire Murchison Gold Project. A meeting was held between Meeka representatives and those of the Corporation to discuss the Project. The Corporation was supportive of the Project and expressed an interest in being part of the operation. This would include being invited to tender for work within their skill set and to provide other services as required. Meeka agreed to work with the Corporation where possible and include their feedback and post mining desires for the area into future planning, and approvals.

4.2.4 Munarra Station

Andy Well is situated on Munarra Station. There is regular and ongoing contact between Meeka and the station, and a good relationship has been formed. Munarra station will assist Meeka and be invited to tender for work on the Project.

4.2.5 Meekatharra Shire

The Shires has been contacted and told that the Gnaweeda Project approvals had commenced. The shire is supportive of the Project and wants to find ways for local businesses to become involved where possible.

5 Applicant History

Andy Well Mining Pty Ltd was established to enable the mining of the Andy Well mine located on M51/870. The company currently holds a Part V licence over the mine, L8698/2012/1 which covers the following;

- Category 5 Processing or beneficiation of metallic or non-metallic ore (design capacity of 50,000 tonnes or more per year)
- Category 6 Mine dewatering over 50,000 tonnes per year.
- Category 64 Landfill

This licence remains in force and will be required when the Andy Well site is taken out of care and maintenance as part of the greater Murchison Gold Project.

The Works approval and subsequent licence being sought for the Andy Well Project will enable processing of ore from both Andy Well and Gnaweeda to continue over the life of the mine. The current TSF has approximately 6 months of capacity, and the addition of the Suzie Pit adds a further 15 months. The IWL provides in excess of 10 years further tailings storage.

The approval for the Suzie Pit TSF was submitted on July 4, 2024. It is anticipated that given the low-risk nature of this project, this facility will be approved quickly, allowing DWER to take the time to assess the IWL in depth, given there are more risks associated with the integrated facility.

6 Emissions and Discharges

The emission associated with this application is the discharge of tails to the IWL. The Andy Well mine is currently licenced to discharge up to 365kt of tailings per annum under licence L8698/2012/1. The IWL has been designed for a deposition rate of 650ktpa. This has been done to allow the throughput of the plant to be increased if needed. No increase is proposed as part of this works approval, and any further throughput increases will be approved prior to the change being made.

The landfill site will be designed as per the current site, to accept up to 500t per year. While the site will undertake recycling of bottles and cans, and oils and other hazardous material will be sent off site, during the refurbishment of the process plant and other works required to bring the mine back into a state fit to operate, significant volumes of wastes are expected to be generated. The 500t/pa capacity of the landfill will ensure there is always adequate capacity at the facility to accept the wastes.

7 Overview of the IWL

7.1 General Design

The design objectives for TSF3 were:

Optimising water recovery from this facility for return to the plant for re-use in processing, which will assist in maximising the in-situ dry density of the deposited tailings.

Optimising tailings storage capacity by maximising the deposited tailings density (i.e. undertaking cyclic tailings deposition between groups of spigots) by maximising tailings drying time.

Reducing environmental impact by maximising water recovery and minimising the potential for seepage losses.

The Scope of Works, Drawings, Schedule of Materials and Earthworks Specification for the Construction of the IWL are provided in Appendix 1 (SRE, 2024). The appendix also contains the IWL operations manual and the site water balance.

7.1.1 Risk Based Design

The IWL will be constructed by downstream construction techniques. The structure is robust and the factors of safety in the design well exceed the minimum levels (Appendix 1). An assessment of the potential impacts on sensitive receptors was undertaken by SRE identified the risks associated with a dam wall failure.

This IWL has been assigned a hazard rating of Medium, Category 1, based on classification criteria outlined in accordance with the DEMIRS Code of Practice (2013) (Appendix 1).

A hazard category assessment has also been undertaken for the proposed TSF3 development using the criteria provided in Tables 1 and 2 of ANCOLD (2019) Guidelines on Tailings Dams - Planning, Design, Construction, Operation and Closure (Appendix 1)

The natural topography of the area will lead any flows to run south west in the event of a dam wall failure (Appendix 1). The diversion bunding around the underground workings would prevent this flow from entering the underground operation, allowing it to run to wards the Great Northern Highway. Much of the key project infrastructure is located up gradient of the IWL meaning this will be unimpacted.

The closest residences are the Munarra Homestead and the Andy Well Mine Village. The Mine village is located in the northern portion of M51/870 and is upgradient of the IWL, meaning any dam break will not impact the village. The Munarra homestead is located approximately 6km to the south of the operation. Given the significant distance between the homestead and the operation, and the increased elevation between the homestead and the IWL< there is no risk to the homestead associated with a dam wall failure.

The design of the IWL starter embankments and subsequent additions have all been designed to well exceed the required factors of safety (Appendix 1). In the event of a dam wall failure SRE estimates between 9% and 67% of the contents of the IWL would be lost. Assuming the IWL is managed as per the Operations Manual, the contents were estimated to run between 60m to 110m from the facility (SRE, 2024).

7.2 Embankment Design

The IWL will be a single cell, constructed by downstream raising using mine waste sourced from existing mine waste dumps. The maximum height of the IWL will be 17.5 m after the construction of the Stage 2 embankment. Figure 5 shows the embankment design over the life of the facility.

The embankment of the IWL will be a zoned embankment comprising an upstream zone of low permeability roller-compacted tailings with a downstream zone of traffic-compacted mine waste material. The low permeability materials in the upstream zone will be sourced from the in-situ tailings in TSF 1 and TSF 2.

The embankment incorporates a cut-off trench founded on the hardpan below the surficial soils, approximately 0.5 m below ground level in order to reduce seepage losses. The embankments will be keyed into the existing TSF2 embankment.

The embankments for the IWL have design slopes of 1(V):2(H) upstream and 1(V):3(H) downstream, with a crest width of 4 m on the upstream zone and 4 m on the downstream zone. The upstream embankment crest will have a 2% cross-fall towards the upstream side, with a 0.5 m (min height) windrow at the downstream crest, and above-ground tailings pipeline at the upstream crest. The decant causeway has design slopes of 1:1.5 (V: H) and a nominal 6 m crest width. The crest of the decant causeway will have 0.5 m minimum height windrows on both sides of the accessway. Breaks in the windrow on the low side will allow surface water to run off. There is an upstream toe drain in Stage 1 on the northern, western and southern embankment to assist with the captures and removal of any potential leachate from the IWL.

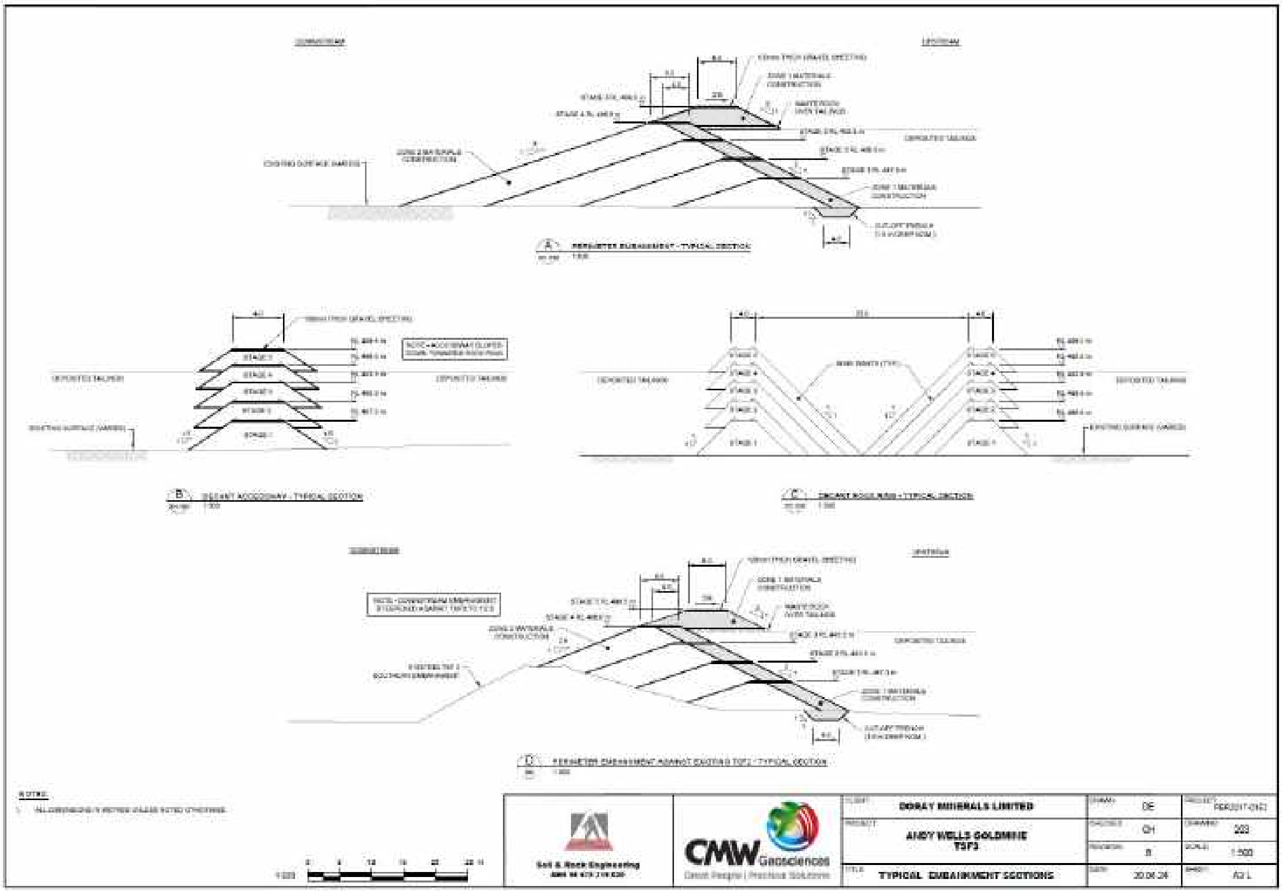

Figure 5 Embankment Design

7.3 Foundation Preparation

The foundation for the TSF will be the Wiluna Hard Pan which has been verified via geotechnical ground works and permeability assessments.

To prepare the foundations for the construction of the TSF, the vegetation and topsoils will be stripped to a depth of 250mm and stockpiled for later use in rehabilitation. Any rubbish exposed during this clearing will be removed and sent to the new landfill (the TSF sits atop the existing landfill). The embankment will then be placed directly onto the hardpan. The hardpan behaves as a weak rock with strength upto 10MPa and can be upto 15m thick.

Upstream of the embankment a low permeability soil liner will be keyed into a trench that will be formed on the exposed hardpan layer. The Wiluna Hardpan possesses sufficient geotechnical shear strength, attributed to its ferruginous/calcareous/siliceous induration, such that the hardpan layer is anticipated to constrain any geotechnical shear failure plane forming within the embankment.

The rigidity of the Wiluna Hardpan for the foundation has been proven in on site testing. Test pits into the hard pan all proved difficult to excavate and refusal occurred at a shallow depth.

TSF3 will be a single cell, constructed by downstream raising using mine waste sourced from existing mine waste dumps. The maximum height of TSF3 will be 17.5 m after the construction of the Stage 2 embankment.

The embankment of TSF3 will be a zoned embankment comprising an upstream zone of low permeability roller-compacted tailings with a downstream zone of traffic-compacted mine waste material. The low permeability materials in the upstream zone will be sourced from the in-situ tailings in TSF 1 and TSF 2.

The embankment incorporates a cut-off trench founded on the hardpan below the surficial soils, approximately 0.5 m below ground level in order to reduce seepage losses. The embankments will be keyed into the existing TSF2 embankment.

The embankments for TSF3 have design slopes of 1(V):2(H) upstream and 1(V):3(H) downstream, with a crest width of 4 m on the upstream zone and 4 m on the downstream zone. The upstream embankment crest will have a 2% cross-fall towards the upstream side, with a 0.5 m (min height) windrow at the downstream crest, and above-ground tailings pipeline at the upstream crest. The decant causeway has design slopes of 1:1.5 (V: H) and a nominal 6 m crest width. The crest of the decant causeway will have 0.5 m minimum height windrows on both sides of the accessway. Breaks in the windrow on the low side will allow surface water to run off. There is an upstream toe drain in Stage 1 on the northern, western and southern embankment to assist with the captures and removal of any potential leachate from TSF3.

The geotechnical evaluation for the IWL comprised a site visit, executed on 8 to 10 May 2024, to visually assess the current conditions at the site proposed for TSF3. The details from the geotechnical assessment are presented in Appendix 2 of the design report (SRE, 2024).

The design concept adopted for TSF3 has been formulated to meet both the general requirements of the mine and the general parameters discussed in the previous sections.

The design is based on the available reports, testing and the experience of the author who has been involved in the development, operation and annual reviews of existing similar, above-ground tailings storage facilities for various gold projects throughout Western Australia.

The key features from the geotechnical assessment of the site and the design of the downstream-raised TSF3 are:

- The TSF is a robust design with significant structural Stability
- Incorporation of an upstream toe drain to mitigate potential seepage losses and enhance stability.
- The rock-ring filter is designed to clarify the supernatant water to enhance the potential for high water recovery and significantly limit the spatial extent of the decant pond, which will not exceed a distance of 12.5m from the outer side of the decant rock ring. This means the total radius of the decant pond is limited to approximately 40m from the centre of the decant rock ring.

Material for the foundations and embankment fill of the TSF will be sourced from the existing TSF from either cell1 or cell 2. This material has been tested and contains no PAF materials or readily leachable metals (Pendragon 2024) the material will be rolled and compacted to prevent

7.4 Water Recovery

Surface water will be removed from TSF3 by a pontoon-mounted decant pump located in a rock-ring-type central decant structure. The water recovered by the decant will be pumped directly to the process plant for reuse. The water recovery system, pumps and pipes must be sized for an operating capacity of not less than 70% of the slurry water volume at the maximum static head (refer to Figure 2.2, Appendix 1).

7.5 Seepage Modelling

A seepage assessment was undertaken by SRE (SRE, 2024). The model was constructed using seepage analysis software assuming a steady state seepage flow. The assessment was undertaken based on the following assumptions:

- The IWL will have an upstream toe drain connected to an external sump at the toe of the northern, western and southern embankments.
- TSF3 west, south and east embankments comprise 4 downstream constructed raises from the natural ground level to an embankment height of up to 15 m (RL 481 m to RL 496 m), followed by a single 2.5 m high upstream raise to RL 498.5 m, Stage 5. The existing ground level for the eastern embankment is approximately RL 490 m, and an initial 1 m high embankment (crest RL 491 m) will be constructed to prevent runoff entering TSF3 from the higher ground to the east. The Stage 4 crest of the embankments have a minimum width of 6 m.
- TSF3 north embankment, southern embankment of TSF2 will, after any loose surface materials have been removed, have a low-permeability soil liner placed on the existing TSF2 embankment, which will be at least 4 m thick (measured along horizontal plane), with this thickness specified based on constructability considerations (layer width is dictated by compaction and earth haulage machinery width) and will be keyed into the southern extremities of the eastern and western embankments of TSF2. This embankment will be raised in stages up to the existing TSF2 embankment crest at RL 489 m. Above this elevation the northern embankment of TSF3 will be founded onto the existing TSF2 crest as well as onto the in-situ tailings within TSF 2 to RL 496 m, followed by the Stage 5 raise, a single 2.5 m high upstream raise to RL 498.5 m.

- TSF3 tailings are to be deposited up to no closer than 1 m below the embankment crest. They is assumed to be fully inundated up to maximum tailings beach surface (i.e. 1 m freeboard below crest).

- In-situ TSF 2 tailings are sufficiently desaturated that a phreatic surface is not present.

- Natural groundwater table within the IWL footprint is RL 457m

- Soil hydraulic conductivity coefficients based on geotechnical interpretive findings presented above and summaries in the table below.

- All soil material (except the tailings impounded within the IWL, which are considered to be fully saturated) is modelled considering saturated/ unsaturated potential, defined by Van Genuchten hydraulic conductivity function, combined with preset volumetric water content functions contained within SEEP/W

Table 6 Hydraulic Conductivity of Construction Materials

Material	Input Hydraulic conductivity coefficient, K (m/s)
Natural foundation (fractured Wiluna Hardpan)	$1x10^{-5}$
Mine waste fill	$1x10^{-6}$
Low-permeability soil liner (tailings fill)	$5x10^{-7}$
Impounded IWL tailings	$5x10^{-7}$

SEEP/W analysis output based on the above assumptions and considerations is presented as an illustration in Figures 4.6 and 4.9 (SRE, 2024). From these figures, the following comments can be made:

- Seepage out of TSF3 is anticipated to preferentially drain to the upstream toe drain, although some vertical drainage down into the groundwater table may occur and is not expected to saturate in-situ TSF2 tailings underlying the proposed TSF3 north wall alignment.

- Seepage drainage through the Wiluna Hardpan, on the basis it is similarly fractured (or contains unsealed sterilisation boreholes), as inferred from the existing TSF VWP response when it was operating (refer findings in Section 4.7.2), is anticipated to be sufficiently fast such that natural foundation soils underlying the TSF3 base are likely to remain relatively dry without a phreatic surface development down to the natural groundwater table.

- Mine-waste fill forming the bulk of the TSF3 embankment body is anticipated to remain dry due to (i) the relative impermeability of the low-permeability tailings soil liner placed on the upstream embankment batter, and (ii) fast seepage drainage through the TSF basin and into the Wiluna Hardpan as discussed above.

7.6 Drainage Diversion

The IWL is a partially side-hill paddock style of TSF. The existing drainage diversion to the east is to be modified and with a new drainage diversion (windrow) constructed adjacent to and along the eastern, southeastern and southern embankment toe of the IWL, to divert runoff away from the embankment.

7.7 Geotechnical Assessment

A geotechnical evaluation for the IWL comprised a site visit by SRE, executed on 8 to 10 May 2024, to visually assess the current conditions at the site. The details from the geotechnical assessment are presented in Appendix 1 of this document.

The design concept adopted for the IWL was designed to meet both the general requirements of the mine and the general parameters discussed in the previous sections of this Works Approval.

The design is based on the available reports, testing and the experience of SRE who have been involved in the development, operation and annual reviews of existing similar, above-ground tailings storage facilities for various gold projects throughout Western Australia.

The key features from the geotechnical assessment of the site and the design of the downstream-raised IWL are:

- The TSF is a robust design with significant structural stability.
- Incorporation of an upstream toe drain to mitigate potential seepage losses and enhance stability.
- The rock-ring filter is designed to clarify the supernatant water to enhance the potential for high water recovery and significantly limit the spatial extend of the decant pond, which should ideally not exceed a distance of 12.5 m from the outer side of the decant rock ring. This means the total radius of the decant pond is limited to approximately 40 m from the centre of the decant rock ring.

7.7.2 Site Geology

The regional geology of the area takes in the northern margin of the Yilgarn Craton. The Yilgarn Craton is composed of Archaean rocks, predominantly granitoids, which are crossed by north-northwest-trending belts of greenstone. Archaean and the overlaying Proterozoic strata of the Yilgarn Craton have been extensively oxidised to depths of up to 120 m, possibly since the pre-Cretaceous, during the formation of the Western Australian Plateau. The Yilgarn Craton comprises elongate, NNW-SSE-striking belts of sedimentary and volcanic rock (i.e., greenstone) that are enclosed by large areas of granite and granitic gneiss. These rocks formed principally between c. 3.05 and 2.62 Ga, with a minor older component (> 3.7 Ga). The Yilgarn is divided into four broad tectonic units: the Narryer Terrane, Youanmi Terrane, South West Terrane and Eastern Goldfields Superterrane.

Superficial cover includes degraded laterite profiles and ferruginised rubble and colluvium over areas of subdued relief. Watercourses are related to north-westerly-flowing tributaries to the Yalgar drainage system.

7.7.3 Subsoil Stratigraphy

Foundation soils (encountered at the time of the 2024 SRE GSI fieldwork) within the proposed IWL development footprint, can generally be characterised as a surficial soil cover (thickness varying between 0.1 m and 1.2 m, averaging 0.5 m) overlying the Wiluna (i.e. Red Brown) Hardpan (SRE, 2024).

The soil cover is composed of a mixture of loose to medium-dense sandy SILT, clayey SAND, sandy CLAY, silty GRAVEL material, where the coarse-grained gravel component is fine to medium grained and fine-grained silt clay and components are of low to nil plasticity, as per classification in general accordance with AS1726:2017. (SRE, 2024).

The underlying Wiluna Hardpan is composed of FERRICRETE and CALCRETE material as per AS1726:2017, however, quartz induration has also been observed in some of the testpits. It should also be noted that topsoil and exposed rubbish (including putrescible landfill) was identified during the GSI and noted to be present in the northern half of the proposed TSF3 footprint, as per satellite imagery illustration (Appendix 1)

7.8 Geology

The regional geology of the area takes in the northern margin of the Yilgarn Craton. The Yilgarn Craton is composed of Archaean rocks, predominantly granitoids, which are crossed by north-northwest-trending belts of greenstone. Archaean and the overlaying Proterozoic strata of the Yilgarn Craton have been extensively oxidised to depths of up to 120 m, possibly since the pre-Cretaceous, during the formation of the Western Australian Plateau. The Yilgarn Craton comprises elongate, NNW-SSE-striking belts of sedimentary and volcanic rock (i.e., greenstone) that are enclosed by large areas of granite and granitic gneiss. These rocks formed principally between c. 3.05 and 2.62 Ga, with a minor older component (> 3.7 Ga). The Yilgarn is divided into four broad tectonic units:

- Narryer Terrane
- Youanmi Terrane
- South West Terrane
- Eastern Goldfields Superterrane (SRE, 2024).

Superficial cover includes degraded laterite profiles and ferruginised rubble and colluvium over areas of subdued relief which grade in to sheetwash deposits 5 to 8 metres thick and alluvium in surrounding watercourses related to north-westerly flowing tributaries to the Yalgar drainage system (SRE, 2024).

7.9 Seismicity

Australia has a low seismicity (or rate of occurrence of earthquakes) when compared to countries located along tectonic plate boundaries such as New Zealand or Indonesia. Seismic risk, however, is the combination of hazard, community exposure and infrastructure vulnerability. According to the Earthquake Hazard Map of Western Australia, Figure 3.2 (C) of AS1170.4-2007, a horizontal Peak Ground Acceleration (PGA) of 0.06 g has a 10% probability of exceedance in 50 years (1:500 AEP).

8 TSF Design and Operation

8.1 Water Balance

A preliminary water balance was developed by SRE as part of the design report of the IWL (Appendix 1). The water balance uses inflows and outflows from the TSF and estimates the balance after the water return has been optimised.

Water inflows to the TSFs consist of rainfall (incident-rainfall on the impoundment area only as the perimeter bunds exclude external runoff) and slurry water from the plant. Water outflows consist of evaporation from the supernatant pond and running beaches, evapo-transpiration from drying beaches, seepage, retention of water within tailings and water returned to the plant.

The following information was used to inform the water balance;

- Average rainfall figures from the Meekatharra BoM site (1944-2023), where the average annual rainfall is 232mm
- The average evaporation from the BoM was used (3504mm per year)

The following assumptions were made for the water balance;

- Annual operation totalling 7900 hours
- Runoff co-efficient of 1.0 from the surface of the tailings
- In-situ dry density of tailings being 1.5t/m^3 and the tailings stack is assumed to be saturated
- A decant pond area of 2000m^2, with a pond radius of 12.5m outside the 25m rock ring filter.
- Wet beach areas are assumed to be 20,200m^2, 4 opened spigots at 25m spacing with wet beach area of 200m^2
- Seepage is assumed to be 1 x 10^{-9}m/sec/m^2

Water recovery was set at 70% (~62.18tph) based on the performance of other similar TSFs within the Goldfields of Western Australia (SRE, 2024).

Using the assumptions above, together with average rainfall and evaporation, the preliminary water balance results for this TSF3 indicate a slight surplus, averaging around 1/m3/annum. Water recovery will be maintained at a minimum of 70% of the inflow slurry water volume to avoid the build-up of excess water on the TSF to avoid exceeding the storage capacity of the TSF.

8.2 Water Recovery

Surface water will be removed from TSF3 by a pontoon-mounted decant pump located in a rock-ring-type central decant structure. The water recovered by the decant will be pumped directly to the process plant for reuse. The water recovery system, pumps and pipes must be sized for an operating capacity of not less than 70% of the slurry water volume at the maximum static head (SRE, 2024).

8.3 Drainage Diversion

The IWL is a partially side-hill paddock style of TSF. The existing drainage diversion to the east is to be modified and with a new drainage diversion (windrow) constructed adjacent to and along the eastern, southeastern and southern embankment toe of TSF3, to divert runoff away from the embankment (SRE, 2024)

8.4 Erosion

The risk of erosion is considered negligible. The construction of the IWL from competent rock material will greatly limit the potential for erosion (SRE, 2024). To further manage potential erosion the IWL will be designed such that spigots are placed correctly (as per Design Report, Appendix 1), erosion protection will be placed under the spigots, and regular inspections during operation will be undertaken.

8.5 Freeboard

The IWL will have a minimum freeboard of 0.7m, to be maintained at all times. The 0.7m figure is developed from;

- 0.182m to store the received rainfall from the 1% annual exceedance probability (AEP) 72-hour storm event.
- 0.2m for the operation of the facility
- 0.3m operational freeboard for tailings deposition

9 Tailings Properties

9.1 Geotechnical Characteristics

Tailings testwork executed by E-Precision Pty Ltd in May 2024 is the most recent work and the results are presented in Appendix 4 of the Design Report (SRE, 2024). The test work was executed in tailings recovered from the existing TSF1 and TSF2. The results of this testing and the implications for the operation of the IWL are summarised as follows:

The results of the Particle Size Distribution (PSD) and Atterberg Limits (AL) executed in the 2024 testing indicate that the tailings can be classified as a low to medium plasticity, sandy silt, according to Table 10, Classification of Fine-Grained Soils in AS 1726:2017, Geotechnical site investigations. Based on the results of the PSD and AL tests, the hydraulic conductivity for the settled, consolidated tailings is estimated to be in the range of 10^{-8} m/s to 10^{-9} m/s. The relevant geotechnical test results (PSD and AL testing) on which the screening for liquefaction is based, include moisture content, particle size distribution, clay content (defined as % passing the 0.005 mm sieve) and Atterberg Limits. The screening implies that there is an overall tendency for the tailings materials tested, which have medium plasticity, not to be susceptible to liquefaction under sufficiently adverse conditions of saturation, in-situ stress, and cyclic loading. However, given that the tailings are stored in a mined-out pit there is no potential for tailings to be released should they liquefy.

The tailings Soil Particle Density (SPD) is in the range of 2.817 to 3.142 t/m^3.

The objective of the Undrained Settling Test (UST) is to monitor the tailings settlement and the development of clear supernatant water in undrained conditions. By monitoring the percentage of supernatant with respect to the initial water volume, an indication of how much water will be available for recovery and the speed at which this water is released can be assessed. The laboratory results in Appendix 1 of the design report show the available supernatant water with respect to the total water discharged to the tailings storage. The points to note from the laboratory results are:

Water available for recovery (approximately 53%) takes 6.75 hours under laboratory conditions.

The objective of the Drained Settling Test (DST), which was top and bottom drained, is to monitor the tailings settlement and the development of clear supernatant water and underdrainage in drained conditions. By monitoring the percentage of supernatant and underdrainage with respect to the initial water volume, an indication of how much water will be available for recovery and the speed at which this water is released can be assessed. The result of this drained settling test is presented in Appendix 1. The points to note from the laboratory results are:

- The total recovery of water is approximately 68.9% of water available with approximately 21.75 hours after tailings deposition.

- The dry density of the tailings is 1.156 t/m3 in the drained settling test.

9.2 Geochemical Properties

Geochemical characterisation of the tailings has been completed as part of previous studies (Soil and Water 2012). The Andy Well tailings samples were classified as Non-Acid Forming (NAF). The results from the multi-elemental analysis of both tailings samples indicate that they may be enriched in Silver (Ag), Arsenic (As), Tellurium (Te) and Titanium (Ti). Silver occurs as a native metal or an alloy and is stable in air and water. Titanium readily reacts with oxygen to form TiO2, a stable compound. Tellurium has a strong affinity to Gold and Silver and is often present as gold tellurides and it exists in the earth's crust as a rare stable element. Arsenic concentration levels are well below Health Investigation Levels (HIL) classification F – Commercial/industrial sites, and meet HIL classification A – Standard residential, although exceed Ecological Investigation Levels as published by Department of Environment and Conservation (DEC) soil contamination criteria (2010).

As tailings will be generated from ores from both Turnberry and St Annes, Pendragon Environmental Solutions undertook a tails characterisation study of those tails to assess their geochemistry and suitability to be deposited in the IWL (Pendragon, 2024).

The Turnberry and St Annes deposits are located within the greenstone belt comprising a succession of metamorphosed mafic to ultramafic, felsic and metasedimentary rocks, with minor felsic to intermediate intrusives. The stratigraphy dips steeply east to sub-vertical with isoclinal folding along a north-north-east axis with a north-north-east trending foliation.

Lithologies at Turnberry are dominated by dolerites with the best mineralisation along a 1.7km northnorth- east trending hosted within a magnetic quartz dolerite. The area is covered with transported colluvium to a depth of ~10m to 25m and is highly weathered with a depth to fresh rock of approximately 100m.

The ALS Metallurgy and Mineral Processing laboratory in Balcatta Perth prepared two composite samples of tailings (1kg each P80: 150µm) representative of the Turnberry and St Annes ore bodies from 15 tailings leach residues from each ore body, each weighing 800g. These composites were engineered to reflect the nature of tailings when mined via open pit and underground methods.

The two composite samples were submitted to ALS Environmental Laboratories, a National Association of Testing Authorities (NATA) accredited laboratory, in Wangara Perth and analysed for the parameters listed in Table 1.

Table 7 Tails Test Work

Analyte	Unit	Limit of reporting
Bulk density	Kg/m^3	1
Emerson Value aggregate test	-	-
pH value (1:5), pH_r, pH_{fox} and GAG-pH (or pH_{ox})	pH Unit	0.1
Electrical conductivity @ 25°C (1:5)	µS/cm	1
Total Sulfur (S), Sulfate-Sulfur (S-SO4), Chromium Reducible Sulphur (CRS), Total Organic Carbon and Total Inorganic Carbon	%	0.005-0.01
Total Metals: Al, As, Ba, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni, Se, U, V and Zn	mg/kg	1-50
Net Acid Generation (NAG at pH4.5 and 7.0)	pH unit	0.01
Net Acid Producing Potential (NAPP)	kgH_2SO_4/t	1
Acid Neutralising Capacity (ANC)	kgH_2SO_4/t	1
Acid Buffering Characterisation Curve	-	-

Exchangeable Cations (Ca, Mg, K, Na), Cation Exchange Capacity CEC) and Exchangeable Sodium Percentage (ESP)	meq/100g and %	0.1
Total Metals: Aluminium, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Thorium, Uranium, Vanadium, Zinc	mg/kg	0.1-50
Leachable Metals (at pH 5, pH 7 and pH 9): Aluminium, Arsenic, Barium, Beryllium, Boron, Cadmium, Chromium, Cobalt, Copper, Iron, Lead, Manganese, Mercury, Nickel, Selenium, Thorium, Uranium, Vanadium, Zinc	mg/kg	0.0005-1

The results of the tailings test work are supplied in the Pendragon report and are summarised herein. The tails contain between 0.02% S (St Annes) and 0.55% S (Turnberry). The potential acid forming ration for both tailings is 5.0 and 7.2. a number greater than two indicates material is unlikely to be acid forming (Pendragon, 2024). **The tailings are considered to be NAF.**

Electrical Conductivity (EC) is a measure of the salinity of a soil or rock. Drainage of water from saline rocks may release water with high salt concentrations (saline drainage) which may impact and deteriorate the ecological function and particularly water quality in the downstream environment.

The Cation Exchange Capacities (CEC's) of the tailings materials vary between 3.0meq/100g (St Annes) and 16.8meq/100g (Turnberry) hence vary between low (<10 indicative of soils prone to leaching and nutrient loss with a low water holding capacity) and medium (10 to 15 which is typical range for loams with a moderate nutrient and water holding capacity).

The exchangeable sodium percentage (ESP) of the tailings vary between 1.7 (Turnberry) and 9.0 (St Annes) hence vary between non sodic and sodic (when the ESP is greater than 6). The Turnberry tailings have an Emerson Class of 4 (no dispersion) whilst the St Annes tailings have an Emerson Class of 2 (some dispersion).

The most dominant metals are Iron, Aluminium and Manganese (Appendix A). Regarding potential contamination from the tailings once deposited in the Suzie Pit, the following are relevant:

- Barium, Beryllium, Boron, Cadmium Mercury and Selenium are absent.
- Chromium, Cobalt, Copper, Lead, Thorium, Uranium, Vanadium and Zinc occur in low concentrations and in all instances below the relevant ASC NEPM Areas of Ecological Significance Investigation Levels.
- Arsenic occurs in concentrations between 61mg/kg (Turnberry) and 854mg/kg (St Annes) exceeding the ASC NEPM Areas of Ecological Significance Investigation Level of 40mg/kg.
- Nickel occurs in concentrations between 39mg/kg (St Annes) and 56mg/kg (Turnberry) exceeding the ASC NEPM Areas of Ecological Significance Investigation Level of 30mg/kg.

A geochemical abundance index (GAI, Förstner *et. al*., 1993) was calculated to assess enrichment of the tailings by metals/metalloids:

GAI = log[(Cn/(1.5*Bn)),2]

where Cn is the measured content of the nth element in the sample and Bn is the average crustal abundance of the element. The Average Crustal Abundance values were sourced from the GARD

Guide, Chapter 5 (INAP, 2009) and where no value was available for a particular element, values were obtained from *Environmental Chemistry of the Elements* (Bowen, 1979).

The GAI is expressed in integer increments from 0 to 6, where a value of 0 indicates that the element is present at a concentration less than, or similar to, the average crustal abundance; and a GAI value of 6 indicates a 96-fold enrichment above the median crustal abundance. Generally, a GAI of 3 or greater signifies enrichment that may warrant further examination; this is particularly the case with some environmentally important *trace* elements, such as arsenic, chromium, cadmium, copper, lead, selenium and zinc, more so than with major rock-forming elements, such as aluminium, calcium, iron, manganese and sodium.

Elements identified as enriched may not necessarily be a concern for revegetation, drainage water quality or public health, but their significance should still be evaluated. Cognisance should be taken of:

- Whilst some element concentrations can be elevated relative to the median crustal abundance, the nature of an ore deposit implies that background levels are generally expected to be elevated.

- If a sample is enriched relative to the average crustal abundance, there is no direct correlation that that sample will also leach metals/metalloids at elevated concentrations. The mobility, bioavailability and toxicity of metals/metalloids are dependent on many factors including mineralogy, adsorption/desorption and the environment in which it occurs.

- Because an element is not enriched does not mean it will never be a concern, because under some conditions (e.g. low pH) the solubilities of common environmentally important elements such as aluminium, copper, cadmium, iron and zinc increase significantly.

The GAI calculations (Appendix A) for tailings materials indicate that only one element, namely Arsenic, is enriched: Turnberry has a GAI of 3 and St Annes 7.

The potential for metalliferous drainage was also assessed, under pH conditions of 5, 7 and 9. The results are presented within Table 2.2 of the Pendragon report. In general, all metals are low with the exception of arsenic, aluminium, iron, and beryllium. It is worth noting that the grind size of the tails is low and test work involved constantly tumbling the sample over a 24 hour period. These conditions are highly unlikely to be encountered within the pit, which would lead to a reduction in the potential for leaching.

Any seepage of metals from the IWL would be limited due to the sealing effects of the fine ground tails, and would only occur for a short period (Pendragon, 2024). To minimise any potential leaching of metals, Meeka will keep the water pool on the tails as low as possible and will undertake rehabilitation of the pit as soon as practically possible. A NAF cover layer will be placed over the tails and will be contoured to promote the shedding of water. With this management, and the proposed monitoring, any potential issues will be identified and managed as they arise.

9.2.1 Acid Mine Drainage

pH characterises the chemical environment and is a measure of the acidity in the tailings materials. The two samples display a dominant neutral to alkaline environment with pH values greater than 6.2 (Pendragon, 2024).

The classification of the analytical data employs primarily three methods, each refining the last:

- A worst-case Total Sulfur based Maximum Potential Acidity (MPA = 30.6 x %S) method.

- An Acid Potential Ratio (APR) which is calculated by dividing the Acid Neutralising Capacity (ANC) of the sample by the Total Sulfur-derived MPA (excluding a reduction for sulfate-sulfur).

- A Net Acid Production Potential (NAPP) value, calculated by subtracting ANC from MPA (excluding a reduction for sulfate-sulfur).

Based on this approach, the tailings were classified as follows:

- Total Sulfur concentrations vary between 0.02%S (St Annes) and 0.55%S (Turnberry).

  The Total Sulfur distribution provides an initial, conservative indication of the potential acidgeneration capacity of a sample/material. The assessment assumes that all sulfur is present asreactive pyrite. It is therefore an inherently conservative assessment as it discounts non-acid forming sulfur species or any inherent neutralising capacity.

- The Acid Potential Ratio (APR = ANC:MPA) vary between 5.0 (Turnberry) and 7.2 (St Annes).

  This ratio is an alternative way of reporting laboratory data to ascertain initial AMD risk and providesan indication of the relative margin of safety (or factor of safety) with respect to the potential for netacid generation (INAP, 2009).

Generally speaking, and depending on the mineralogy, an APR of less than 1 indicates the material is likely to be acid forming (PAF) as it contains more acid generating than acid neutralising minerals. An APR ratio of between 1 and 2 generally indicates an area of uncertainty (UC) that requires additional investigation, while an APR of greater than 2 generally indicates that the material is likely to be self-buffering upon oxidation, again depending on which minerals are present (AMIRA 2002). High ANC:MPA values indicate a high probability that the material may remain circum-neutral in pH and should not be problematic by generating acid rock drainage.

Maximum Potential Acidities (MPAs) vary between 15.1 and 0.3kgH2SO4/t. The same sample (Turnberry) with a Total Sulfur concentration >0.3%S have a MPA above the accepted low capacity value of 10kgH2SO4/t (DITR, 2007). Acid Neutralisation Capacities (ANCs) vary between 75.9 (Turnberry) and 2.2kgH2SO4/t (St Anne).

- Net Acid Producing Potential (NAPP = MPA-ANC) vary between -60.8 (Turnberry) and -1.9kgH2SO4/t (St Annes).

NAPP calculates a theoretical net acid producing (or consuming) value of a sample by subtracting the theoretical Acid Neutralising Capacity (ANC) of a sample from the Maximum Potential Acidity (MPA) of a sample (Total Sulphur in this instance). This calculation identifies the severity and extent of the potential of the materials to produce acid across the site in general.

9.2.2 Saline Drainage

Electrical Conductivity (EC) is a measure of the salinity of a soil or rock. Drainage of water from saline rocks may release water with high salt concentrations (saline drainage) which may impact and deteriorate the ecological function and particularly water quality in the downstream environment (Pendragon, 2024.

The Cation Exchange Capacities (CEC's) of the tailings materials vary between 3.0meq/100g (St Annes) and 16.8meq/100g (Turnberry) hence vary between low (<10 indicative of soils prone to leaching and nutrient loss with a low water holding capacity) and medium (10 to 15 which is typical range for loams with a moderate nutrient and water holding capacity).

The exchangeable sodium percentage (ESP) of the tailings vary between 1.7 (Turnberry) and 9.0 (StAnnes) hence vary between non sodic and sodic (when the ESP is greater than 6). The Turnberry tailings have an Emerson Class of 4 (no dispersion) whilst the St Annes tailings have an Emerson Class of 2 (some dispersion).

9.2.3 Metals and Metalliferous Drainage

Total metals were assessed by Pendragon and reported on in Appendix 2. There are minor elevated metals within the sample which is due to the nature of the orebody.

The leaching of these metals was tested at pHs of 5, 7 and 9. Leaching tests found that under laboratory conditions some leaching was seen, which led to concentrations exceeding either the drinking water guidelines or the livestock drinking water guidelines. When assessing these results it should be remembered that laboratory conditions are seldom met in an operating environment, with samples in mining not being ground as fine, or subject to tumbling leaching tests. Therefore it is unlikely that the levels of leaching seen in the laboratory will be seen in operational conditions (Pendragon, 2024).

9.3 Tailings Consolidation

The consolidation of the tailings was considered by SRE in the Design Report utilising an oedometer consolidation test. The testing concluded that tailings would consolidate under their own weight, at the same rate as deposition (SRE, 2024).

The proposed life of the TSF is approximately nine years for a 15-16m high embankment height. Full consolidation of the tails is expected to be achieved within the lifespan of the facility.

At closure, impounded TSF3 tailings are anticipated to gradually desaturate (due to supernatant recovery, evaporation, and/or seepage through underdrain) and will result in gradual increase in effective self-weight overburden pressure within the in-situ tailings mass over time. The gradual increase in effective self-weight overburden pressure of the in-situ tailings mass is anticipated to also result in on-going primary self-weight consolidation of in-situ tailings, corresponding to tailings surface settlement over time.

10 Environmental Siting and Location

10.1 Climate

The Murchison region is described as an arid climate characterised by summer and winter rainfall with annual totals rarely exceeding 200 millimetres (mm)). The climate is typical of a semi-desert tropical climate characterised by hot summers and relatively warm, dry winters (BoM 2016).

Meekatharra Airport (station number 007045), approximately 40 km south west of the Study Area, is the nearest Bureau of Meteorology (BoM) weather station, which documents long term climate data (BoM 2023). The mean annual rainfall recorded at Meekatharra Airport is 239 mm with the majority received between January and March each year, with a secondary peak between May and July. Peak rainfall is recorded in February with a secondary peak in June (BoM 2023). The hottest maximum temperatures occur between November and March, with the coldest minimums occurring between May and August (BoM 2023).

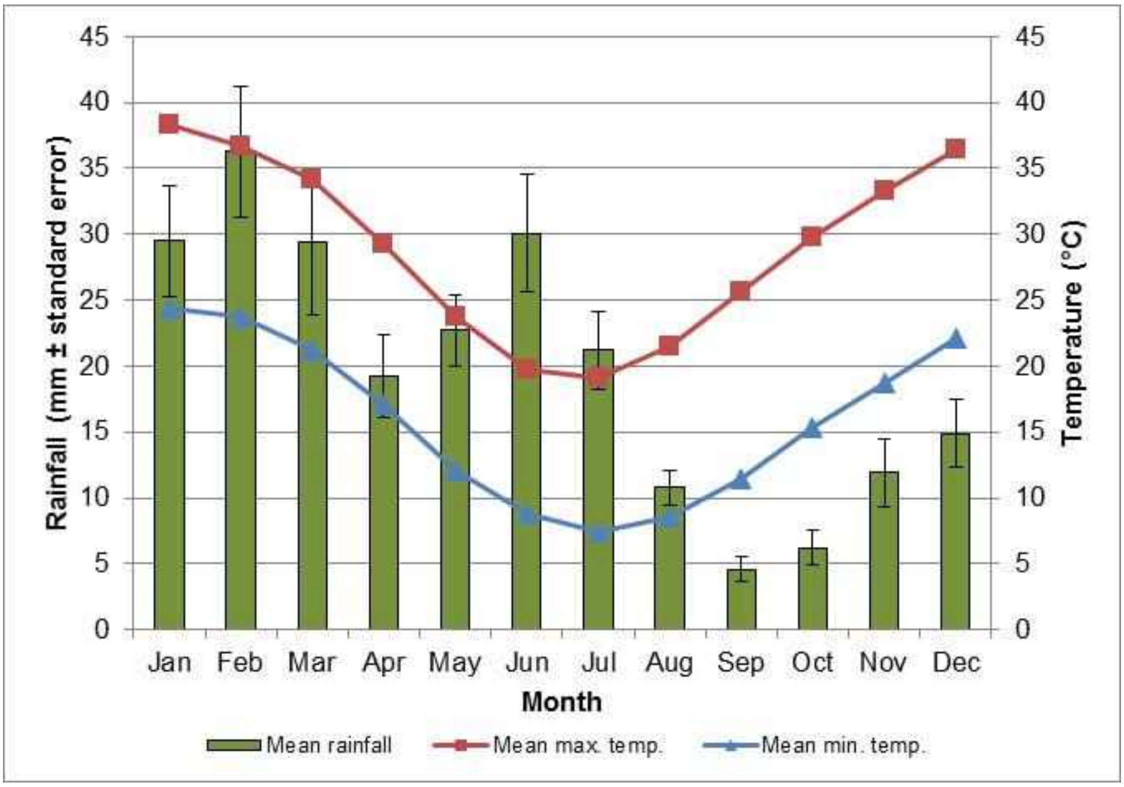

Figure 6 Project Climate Data (BOM, 2023)

10.2 Flora and Vegetation

10.2.1 Regional Vegetation

The Murchison region of the Eremaean Botanical Province (Beard 1976) is typified by plants from the families Fabaceae (*Acacia* spp.), Myrtaceae (*Eucalyptus* spp.), Scrophulariaceae (*Eremophila* spp.), Chenopodiaceae (samphires, bluebushes and saltbushes), Asteraceae (daisies) and Poaceae (grasses). The region is characterised by the widespread presence of mulga (*Acacia aneura*) communities (Beard 1990). *Acacia aneura*, which thrives in harsh environments, is a variable species, forming woodlands on the plains and reducing to scrub on the rises and hills (Beard 1990) (Mattiske Consulting 2011).

The vegetation of the convergence of the West and East Murchison subregions is dominated by Mulga woodland and Mulga shrubland, with *Eremophila* spp being the most abundant species of undershrub (Beard 1990). These woodlands and shrublands are often rich in ephemeral species (plants with short life cycles that are very dependent on favourable conditions such as rainfall) and may also support perennial and annual grasses. Hummock grasslands and chenopod communities associated with salt lake systems are less frequently present (Cowan 2001: Desmond et al. 2001) (Mattiske Consulting 2011).

10.2.2 Local Vegetation

The vegetation of the Project area can be broadly described as “Mulga” (*Acacia aneura* and spp.) or *Acacia* semi-desert scrub, consisting of *Acacia* groves roughly aligned to contours within an otherwise treeless broad, flat hardpan wash plain supporting low open scrub of *Eremophila* spp (SWC, 2012).

Mattiske Consulting conducted a flora and vegetation survey of the Project area from 11th to 14th April 2011. A total of 69 sampling sites were surveyed, covering the greater Andy Well exploration tenement (E15/1217) to include the proposed mining and infrastructure areas within the Mining Lease M51/870 application boundary and land access areas extending the entire EL boundary (see Figure 2). The survey effort after reasonable rains was considered more than adequate to meet the EPA Guidance Statement 51 standards (EPA 2004) (Mattiske Consulting 2011).

Ten plant communities were recorded during the flora and vegetation survey of which the following eight occur within the Project area:

Shrublands

- S1: Open scrub of *Eremophila galeata* and emergent *Acacia aneura* var. *aneura* and *Acacia tetragonophylla* over *Ptilotus obovatus* var. *obovatus* and *Solanum lasiophyllum* over *Aristida contorta*, *Eriachne pulchella* subsp. *dominii* and other grass species on orange clay flats with variable quantities of quartz and other pebbles.

- S2: Open scrub of *Acacia aneura* var. *aneura*, *Acacia pteraneura* and occasional *Acacia tetragonophylla* over mixed *Eremophila* species and *Ptilotus obovatus* var. *obovatus* over *Aristida contorta*, *Eriachne pulchella* subsp. *dominii* and *Dysphania kalpari* on orange sandy/loam to clay/loam flats with occasional coverage of pebbles.

- S3: Tall scrub of *Acacia aneura* var. *aneura*, *Acacia ayersiana* and *Acacia tetragonophylla* over *Eremophila galeata* over *Ptilotus macrocephalus* over *Eragrostis pergracilis*, *Paspalidium basicladum* and other grass species and mixed herbaceous species on orange clay/loam flats and flood plains.

Woodlands

- W1: Woodland of *Acacia aneura* var. *aneura*, *Acacia ayersiana* and *Acacia tetragonophylla* over *Eremophila galeata* over *Ptilotus macrocephalus* over *Eragrostis pergracilis*, *Paspalidium basicladum* and other grass species and mixed herbaceous species on orange clay/loam flats.

- W2: Open woodland of *Acacia aneura* var. *aneura, Acacia ayersiana* and *Acacia tetragonophylla* over *Eremophila galeata* over *Ptilotus macrocephalus* over *Eragrostis pergracilis*, *Paspalidium basicladum* and other grass species and mixed herbaceous species on orange clay/loam flats and flood plains.

- W3: Mosaic of woodland to open woodland of *Acacia aneura* var. *aneura*, *Acacia ayersiana* and *Acacia tetragonophylla* over *Eremophila galeata* over *Ptilotus macrocephalus* over *Eragrostis pergracilis*, *Paspalidium basicladum* and other grass species and mixed herbaceous species and *Eremophila galeata* and emergent *Acacia aneura* var. *aneura* and *Acacia tetragonophylla* over *Ptilotus obovatus* var. *obovatus* and *Solanum lasiophyllum* over *Aristida contorta* and *Eriachne pulchella* subsp. *dominii* on orange clay/loam flats and flood plains.

Flow-lines

- C1: Tall scrub of *Acacia tetragonophylla*, *Acacia fuscaneura*, *Acacia craspedocarpa* and *Grevillea striata* over occasional *Eremophila galeata* over mixed grass and herbaceous species on flowlines with orange loam.

- Other
    - CD: Completely degraded vegetation. Cleared for bitumen roads (Mattiske Consulting 2011).

A total of 172 vascular plant taxa from 77 plant genera and 29 plant families were recorded within the Project area. The majority of taxa were recorded within the Fabaceae (29 taxa), Poaceae (22 taxa), Scrophulariaceae (17 taxa), Chenopodiaceae (16 taxa) and Amaranthaceae (13 taxa) families (Mattiske Consulting 2011).

No Threatened Flora species pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* and as listed by the Department of Environment and Conservation (2011) were recorded within the survey area. No plant species listed under the *Environment Protection Biodiversity Conservation Act 1999* (Department of Sustainability, Environment, Water, Population and Communities (2011) were found within the survey area (Mattiske Consulting 2011).

One potential Priority 1 species*, Euphorbia*? *sarcostemmoides* (P1), was recorded in the survey area, however as the specimen was immature and lacking key diagnostic characteristics the identification was not completed (Mattiske Consulting 2011).

A total of three introduced (exotic) taxa were recorded within the Project area. None of these are Declared Plants species pursuant to section 37 of the *Agricultural and Related Resources Protection Act 1976* according to the Western Australian Department of Agriculture and Food (2008) (Mattiske Consulting 2011).

Ten plant communities were defined and mapped for the Project area. None of the communities defined are listed as Threatened Ecological Communities or Priority Ecological communities under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (Department of Sustainability, Environment, Water, Heritage and the Arts (2011) or the Department of Environment and Conservation (2011) (Mattiske Consulting 2011).

On the basis of the review of the ten clearing principles under the *Environmental Protection Act 1986*, for which native vegetation should not be cleared, there appear to be no impediments from a botanical perspective for the proposed project developments (Mattiske Consulting 2011).

10.3 Terrestrial Fauna

10.3.3 Vertebrate Fauna and Short-Range Endemics (SRE)

Bamford Consulting Ecologists completed a fauna assessment, including desktop view and reconnaissance field survey, of the Mining Lease M51/870 application area encompassing the Project in December 2011.

The desktop survey identified 219 fauna species potentially occurring in the Project area. This comprised six frog, 68 reptile, 117 bird, 18 native mammal and ten introduced mammal species. A total of 72 fauna species were recorded during the field survey. This comprised 55 bird, seven native mammals, four introduced mammals, five reptile and one frog species (Bamford Consulting Ecologists 2012).

A total of 13 conservation significant species are considered likely to occur within the Project area (either as a resident or as a visitor on a seasonal basis). Two conservation significant species were recorded during the field survey (Australian Bustard – CS2 and Woolley's Pseudantechinus – CS3), with evidence of a species considered locally extinct also recorded (Western Pebble-mound Mouse

– CS2). An additional species, the Bush Stone-curlew (CS2), was recorded from Meekatharra and is also likely to occur within the Project area. Targeted searching did not locate any further conservation significant fauna species (Bamford Consulting Ecologists 2012).

The faunal assemblage expected is typical of the Murchison region. Most fauna species occurring or expected to occur in the Project area are widespread but some species may have restricted or habitat limited distributions, and some fauna species expected have declined in the region (Bamford Consulting Ecologists 2012).

Five major vegetation and soil associations (VSAs) were identified; of most significance were the rocky ironstone ridges and drainage lines. These VSAs are restricted in the area and are likely to support conservation significant and specialist species. However they occur mostly outside the proposed area of disturbance, with common and widespread VSAs covering much of the proposed pit and underground waste stockpile areas (Bamford Consulting Ecologists 2012).

Impacts upon fauna values are generally considered to be only minor, even upon the majority of significant species. This is because of the relatively small footprint of the Project which is located within widespread and common habitats, and the expected presence of a limited number of conservation significant species within the Project area. Conservation significant species of most concern, as they are restricted or likely to be impacted by the Project, include:

- Bush Stone-curlew (CS2)
- Grey Honeyeater (CS3)
- Long-tailed Dunnart (CS2)
- Woolley's Pseudantechinus (CS3).

10.3.4 Subterranean Fauna

Bennelongia Environmental Consultants (Bennelongia) was engaged to undertake a subterranean fauna desktop review and field survey to assess whether proposed mining for the Project may pose any conservation threats to subterranean fauna, which is a term used to refer to the invertebrate animals that occur at depth underground and have morphological adaptations to a subterranean life. These species are of conservation concern because many of them have very small ranges. Two types of subterranean fauna are recognised: troglofauna are air-breathing and live in unsaturated habitats at depth while stygofauna are aquatic and live in groundwater (Bennelongia 2011).

Information on subterranean fauna at the Project was compiled, and assessment undertaken, in two stages. The first stage consisted of desktop compilation of existing information on subterranean fauna and local geology, an assessment of the suitability of habitat at the Project for subterranean fauna, a preliminary assessment of the threats to subterranean fauna from mine development, and an evaluation of the need for field survey. The second stage consisted of field surveys to collect subterranean fauna, with a final assessment of the threats to subterranean fauna from mining based on the results of both the desktop work and field surveys (Bennelongia 2011).

The calculated risk to stygofauna from mining at the Project was determined to be moderate according to the desktop analysis. This was primarily attributed to the presence of classic stygofauna habitat within the Project area (aquifers of the Quaternary detritals of Murchison paleochannel) and the relatively small impact footprint of groundwater drawdown (1540 ha) (Bennelongia 2011). The extent of groundwater drawdown from mine dewatering was calculated by RPS Aquaterra during the completion of the dewatering assessment.

A total of 71 stygofauna samples were collected during subsequent field survey. This survey recorded 21 stygofauna species in the Project area; comprising Nematoda, Rotifera, Aphanoneura, Oligochaeta, Ostracoda, Copepoda, Syncarida and Amphipoda. Six of the 21 species were recorded from the impact footprint of the Project (Bennelongia 2011).

In terms of conservation threats, no stygofauna species are restricted to the detrital aquifers of the Project, and the integrity of the Priority 1 ecological communities (PECs) at Karalundi and Killara North calcretes will not be threatened by the proposed mining at the Project due to the relatively small impact footprint of groundwater drawdown (1540 ha) resulting from mine dewatering. Therefore, the proposed mining at the Project will not threaten stygofauna conservation values or the persistence of any stygofauna species (Bennelongia 2011).

The calculated risk to troglofauna from mining at the Project was determined to be low to very low according to the desktop analysis, due to the small impact footprint of the shallow pit excavation (3 ha). This was confirmed by the field survey consisting of 25 samples, during which a depauperate troglofauna community of two species (one isopod and one polyxenid) was collected. Neither species was recorded within the impact footprint and mining activities for the Project will not threaten their persistence (Bennelongia 2011).

10.4 Surface Hydrology

10.4.5 Regional Surface Water Hydrology

The water resources of the region can be described in terms of surface and ground water features. Surface drainage features can be further divided into two broad groups: the external drainage provided by the catchment areas of rivers that flow into the ocean, and the internal drainage of water courses that drain into salt lakes. To the east of a line running generally north to south, located between Meekatharra and Wiluna, lies the area of the internal drainage. Here, creeks and internal rivers drain surface water into numerous salt lakes. External surface water drainage is provided by a number of intermittent rivers (RPS Aquaterra 2011c).

The Project is located within the Murchison River catchment, which is the second longest river in Western Australia. Other major rivers draining this area into the Murchison River include the Yalgar River, Whela Creek and the Sandford and Roderick Rivers (RPS Aquaterra 2011c).

The catchment area of the Murchison River comprises an area of approximately 104,000 km^2 as defined by the Department of Water, but this reduces to an effective catchment of around 89,000 km^2 when the Lake Austin sub-catchment is excluded (inward draining catchment) (RPS Aquaterra 2011c).

The Murchison River extends about 550 km inland onto the Yilgarn Plateau and arises on the southern slopes of the Robinson Ranges, about 75 km north of Meekatharra. From there it flows in a westerly direction for about 130 km to its junction with the Yalgar River, then west for another 100 km before turning south-south-west for 120 km, at which point it is joined by the Roderick River. Another 70 km to the south-south-west it meets its other important tributary, the Sanford River. Over the next 100 km it makes a number of sharp turns, taking it about 70 km to the west. It then flows to the south-west, passing under the North West Coastal Highway at the Galena Bridge. Entering the Kalbarri National Park, it flows first to the north-west and then to the north, flowing through the Murchison Gorge, and passing through a number of tight bends known as the Z Bend and The Loop respectively. It eventually turns to the southwest, passing through one more dogleg before disgorging into the Indian Ocean at Kalbarri, the only settlement at any point along the river (RPS Aquaterra 2011c).

Large river gums exist along the river, although they are only present in the immediate vicinity of the main river channel, and do not generally extend into the flood plain (RPS Aquaterra 2011c).

Rain generally only falls in the upper basin during summer cyclones, so for much of the year, the Murchison River does not flow, having dry sandy river beds with occasional permanent pools. The eastern reaches of the catchment contain large chains of salt lakes, which flow only intermittently. Water quality during floods is fresh, but turbid, while low flows are brackish and saline (RPS Aquaterra 2011c).

Streamflow is directly in response to rainfall and flows are ephemeral. Streamflow in the smaller creeks is typically of short duration, and ceases soon after the rainfall passes. In the larger rivers, which drain the larger catchments, runoff can persist for several weeks and possibly months, following major rainfall events, such as those resulting from tropical cyclones (RPS Aquaterra 2011c).

10.4.6 Local Surface Water Hydrology

The Project area lies within a catchment of approximately 520 km^2 that crosses the Great Northern Highway at a series of floodway/culvert arrangements. Bunds constructed parallel to Great Northern Highway channel local flow towards each respective floodway/culvert. The culverts generally comprise single 400 NB concrete pipes, and as such only have capacity for small flows. Larger flow events cross the road via the floodways. The majority of the catchment flows over the southern series of floodways (RPS Aquaterra 2011c).

The main catchment is around 31 km in length upstream of the mining area, and the main flowpaths have relatively flat average bed gradients of around 0.2%, and drain mainly in a north-westerly direction towards the mining area. The catchment typically has no defined incised creek bed, and as such, flow through the catchment is more likely to be in the form of sheet flow and with flow only during major rainfall events (RPS Aquaterra 2011c).

Once across the Great Northern Highway, the general direction of flow is in a north-westerly direction towards the Yalgar River. The Yalgar River is a 120 km long tributary of the Murchison River. It arises near the Great Northern Highway about 50 km north of Meekatharra, flowing about 80 km westward to a junction with its tributary, the Hope River. From there it flows north-north-westerly for about 40 km, before disgorging itself into the upper reaches of the Murchison River near the Carnarvon Meekatharra Road (RPS Aquaterra 2011c).

10.5 Groundwater

A staged hydrogeological investigation and dewatering assessment of the Project area was undertaken by RPS Aquaterra during 2011 (RPS Aquaterra 2012a). Investigations included an initial desktop review of the local hydrogeology, utilisation of the mineral drilling rig to complete a number of airlift tests across the mine site, packer testing of deeper lithologies and the ore body, and the drilling, construction and testing of a trial dewatering bore and associated monitoring bores.

Following the field investigations, groundwater modelling was undertaken, to assess the dewatering requirements and associated impacts relating to groundwater drawdown over the life of mine. Results from these hydrogeological and dewatering assessments are detailed below.

10.6 Hydrogeology

10.6.7 Regional Hydrogeology

Groundwater is likely to be present in the majority of lithologies in the Project area; however only those formations that contain effective porosity and permeability will yield significant quantities of groundwater. Key aquifer types that are likely to be present in the greater Project area are as follows:

- Shallow Alluvium
- Calcrete Aquifers
- Palaeochannel Sand Aquifers
- Fractured Rock Aquifers.

10.6.7.1 Shallow Alluvium

Alluvial deposits typically occur along the main drainages and are generally between 5 and 20 m thick, dependant on the size of the drainage system. This type of deposit usually consists of silty sand and gravels, and are characterised by ferruginisation and poor sorting of the predominantly quartz and ironstone grains.

Alluvial deposits form the upper portion of the Cainozoic sequence within the regional palaeodrainages. The shallow alluvial aquifers are generally unconfined, with a water table less than 5m below ground level (mbgl) and a saturated thickness typically between 5 and 15 m. The permeability is generally low. Typical yields from alluvium can range from 50 to 500 kL/d depending upon the local permeability.

The alluvial aquifers are generally fresh to brackish (1,000 to 4,000 mg/L TDS) becoming hypersaline (TDS >14,000 mg/L) towards salt lakes and in the lower parts of the regional drainage systems. Recharge to the aquifers is from irregular, episodic rainfall events and is estimated to be approximately 1% of the annual average rainfall (Johnson et al. 1999).

Due to typically low permeability and low bore yields, the alluvial aquifers are generally not directly utilised, other than for stock bores. The large groundwater storage in the aquifers can be utilised through downward leakage to the underlying palaeochannel sand and fractured rock aquifers, during regional aquifer depressurisation as a result of borefield pumping.

10.6.7.2 Calcrete Aquifers

Bodies of calcrete generally occur at the margins of present day salt lakes, and locally in some of the tributaries of the main drainages. The water table is generally shallow, less than 5 mbgl. The saturated thickness is highly variable (up to a maximum of 30 m thick) with an average saturated thickness of between 5 and 10 m. The areal extent of the calcrete aquifers is often limited although several large bodies occur to the north and east of the Project area.

Bore yields are variable depending on the nature and degree of karstic development. However, the calcretes can form locally high yielding aquifers where secondary porosity and high permeability are well developed. Long-term sustainable bore yields from the calcrete aquifers are typically around 500 kL/d although short term yields up to 1500 kL/d have been reported.

The groundwater is commonly brackish to saline (2,000 to 6,000 mg/L TDS), although local areas of fresh groundwater may occur where the calcrete receives enhanced groundwater recharge through direct infiltration from rainfall and surface run-off during intense rainfall events. Salinities in excess of 10,000 mg/L TDS have also been reported in some areas and groundwater may be hypersaline in the vicinity of salt lake systems.

Recharge rates of approximately 0.7% to 0.8% of rainfall have been estimated to the calcrete aquifers near Wiluna. Due to the nature of the calcrete aquifers, with highly transmissive zones generally close to the water table, this type of aquifer is susceptible to dewatering due to over-pumping. Recorded licensed abstractions from calcrete aquifers for mining use in the Goldfields region range from 0.2 to 3GL/year (Johnson et al. 1999).

Significant calcrete deposits have been mapped in the Yalgar River drainage to the north of the Project area.

10.6.7.3 Paleochannel Sand Aquifers

The palaeochannel sands form the most important aquifer in the Northern Goldfields, capable of providing significant groundwater supplies. The aquifers can be up to 1 km wide and 40 m thick in the trunk of major palaeochannels, while widths of several hundred metres may be found in tributaries. The thickness and presence of the palaeochannel sands is related to their origin with the thickest sand sequences occurring within and downstream of granitoid catchments and more clayey and finer sands within and downstream of predominantly greenstone catchments. Palaeochannel sands are usually inferred to be continuous along the main trunk drainages. The palaeochannel sand aquifers can be unconfined to confined below up to 80 m of clay.

Reported permeability ranges from 1 to 40 m/d, with an average of 10 m/d. There is relatively limited storage in the palaeochannel sands; however, long-term pumping induces leakage from the overlying lithologies and surrounding weathered/fractured bedrock. Reported short term yields from the palaeochannel sands are in the range 200 to 1,600 kL/d, as determined from pumping tests (Johnson et.al. 1999).

Groundwater in the main palaeochannels is generally brackish to hypersaline (TDS greater than 14,000 mg/L). However, lower salinity water (fresh to brackish, TDS 1,000 to 3,000 mg/L) can been found in the upper reaches of the palaeodrainages and in some tributaries.

The main drainage catchment of the present-day Yalgar River to the north of the Project, and its tributaries, both east and west of the Project area, have good potential for palaeochannel development.

10.6.7.4 Fractured Rock Aquifers

The fractured rock aquifers comprise greenstones, granitoids and minor intrusive rocks that are characterised by structurally (and weathered) induced secondary porosity and permeability. Groundwater occurs within the weathering profile and fractures in the basement rocks. In general, the greenstone rocks are more prospective for groundwater supplies than the granitoids, which are more homogeneous and less fractured. The greenstones form linear, arcuate belts of interbedded mafic and ultramafic volcanic, felsic volcanic and metasedimentary rocks (including chert and banded-iron formation). Within the weathering profile of greenstones, however, typically high clay contents limit groundwater development potential, whereas the weathering profile in granites is more productive due to high quartz content.

The fractured rock aquifers generally form minor local aquifer with fresh to saline groundwater (1,000 to 14,000 mg/L TDS). Yields from the fractured rock aquifers are highly variable and related to geological structure and rock type. The long-term sustainability of the fractured rock aquifer is constrained by their limited storage and availability of direct recharge. The fractured rock aquifers are recharged infrequently by rainfall and runoff from ephemeral drainages into open fractures and weathered zones.

10.6.8 Local Hydrogeology

The Andy Well ore bodies are hosted in high magnesium basalts that have been locally sheared and altered. Weathering has resulted in a regolith profile consisting of up to 10 m of saprolitic clays grading downward into sap-rock and oxidised meta-basalts. A thin veneer of detrital deposits overlie the saprolite.

A transition zone aquifer exists beneath the detrital cover and saprolitic clays and is represented by fractured and weathered lithologies both within the ore body, host rock and surrounding country rock.

Permeabilities will be enhanced in this zone particularly in the meta-basalt unit and deformed schists in proximity of the main shear and ore body, however some permeability enhancement is also likely in the surrounding granitic country rock. The transition zone aquifer can be further refined into an upper and lower aquifer unit.

Permeability generally decreases with depth below the transition zone and beyond around 100 mbgl the formations are very tight and no significant permeability has been observed.

Depth to water is relatively uniform and has been measured at approximately 5 mbgl across the proposed development area.

Groundwater quality in the Project area is expected to be fresh to slightly brackish. Some brackish groundwater (<4,000 mg/L total dissolved solids) may be expected at depth associated with mineralisation along the ore body; however this has not been indicated from current investigations.

Water samples collected across the ore body area show salinity as total dissolved solids (TDS) ranging between 990 and 1400 mg/L. pH levels for all water samples were slightly alkaline, ranging from 7.9 to 8.1.

The relative concentrations of the major ions for each water sample were found to be very similar in composition. All samples were determined to be of the sodium-chloride water type, typical of endpoint type groundwater with long residence times and little indication of recharge.

Deeper groundwater flow within the basement lithologies will be controlled locally by the dominant north to south trending structures and associated shearing and jointing. Shallower groundwater flow through surperficial sediments and weathering profiles will be influenced by local topography and drainage. Regional groundwater flow is expected be to the west into the Yalgar River and Murchison River drainage systems.

Groundwater recharge generally occurs as infiltration of rainfall and runoff with enhanced recharge occurring in areas of greater permeability such as sands and gravel, calcrete or fractured rock outcrops. Bestow (1992) has estimated rainfall recharge across the Murchison and Goldfields regions of Western Australia using the chloride mass balance method and found that estimates of rainfall recharge as a percentage of average annual rainfall can be correlated with shallow groundwater salinity as shown in Table 5. Based on this method, recharge in the vicinity of the Project is likely to be of the order of 2 mm per year. However, given the lack of outcrop and the presence of the saprolitic clay unit in the vicinity of the ore body, very little of this is expected to reach the local water table.

Table 8 Estimates of Rainfall Recharge (Bestow 1992)

Groundwater Salinity Range (mg/L)	Recharge (%)
<1500	0.9
1500 to 7,000	0.23
7,000 to 14,000	0.09
>14,000	negligible

10.7 Social Heritage

10.7.9 Aboriginal Heritage

The Project area is not identified on the Department of Indigenous Affairs (DIA) Aboriginal Heritage Inquiry System to be located within the boundary of any registered Aboriginal heritage sites.

An Aboriginal Heritage Survey was conducted for WMC over the M51/870 area by Dr Mana Waite in May 1997, the report titled *Report of an ethnographic survey in the Meekatharra area, Western Australia, Number 2*. This Aboriginal Heritage Survey did not identify any major site of cultural significance, although minor artefacts have been found.

The Mining Lease M51/870 tenement is covered by the Yugunga-Nya Native Title Claim Group who is represented by the Yamatji Marlpa Aboriginal Corporation (YMAC).

The relevant Aboriginal communities and stakeholders have been notified of the Project, including the following:

- Yamatji Marlpa Aboriginal Corporation (YMAC)
- Yugunga-Nya Native Title Claim Group
- Munarra Station Pastoral Lease Holder
- Department of Indigenous Affairs (DIA).

A thorough Aboriginal Heritage Survey was undertaken in coordination with YMAC (as the heritage provider and representative body for the Yugunga-Nya Native Title Claim Group) in February 2012 as part of this Native Title negotiation process (Native Title Co-existence Agreement). The Aboriginal Heritage Survey identified four Aboriginal heritage sites within the Project area. Doray has applied for consent from the Minister for Indigenous Affairs to disturb three of these Aboriginal heritage sites under Section 18 of the *Aboriginal Heritage Act 1972*. The other Aboriginal heritage site will be avoided.

10.7.10 European Heritage

The Project will not impact on any European heritage sites, as confirmed by the Australian Heritage Database and Heritage Council of Western Australia (HCWA) Places Database.

The Project area is remote with no existing or pre-existing (historic) human settlement nearby. The Karalundi Aboriginal Education Community is located approximately 10 km to the north of the Project area and the Killara Homestead approximately 25 km south-east, both of which are not registered European heritage sites.

11 Risk

11.1 Risk Procedure

The following tables have been developed for the purpose of risk assessment. The risk ranking process utilises a standard risk ranking table and is based on the perceived likelihood and consequence of an event.

Table 6 and Table 7 provide the definitions of Likelihood and Consequence. Table 8 is the risk ranking matrix. By selecting the appropriate Likelihood and Consequence, the risk ranking is determined from this table.

Risks associated with the Proposal were workshopped based on the work proposed and the various activities that would need to be undertaken to achieve this. The likelihood and consequence for each risk was evaluated without controls and was then revaluated with controls in place. The project aims to manage risk utilising the hierarchy of controls. Risks are evaluated and eliminated where possible, however if not, risks are then managed by substituting the risk, engineering a solution or finally administrative controls to manage the risk.

In undertaking the risk analysis component of the overall assessment, the approach focussed on addressing the 'credible worst-case consequence of the risk and the likelihood of the credible worst-case consequence occurring'. This approach was deemed the most appropriate due to the scale of the project.

Table 9 Risk Likelihood Table

Likelihood	Frequency	Description
Almost Certain	Twice or more per year	Event will occur during the Project
		High number of known incidents
Likely	Once per year	Event is likely to occur during the Project
		Regular incidents known
Possible	Once in 5 years	Event may occur during the life of the Project
		Occasional events known to occur
Unlikely	Once in 10 years	Event is not likely to occur during the Project
		Occurrences of event very unusual
Rare	Once in 20 years	Event will occur in exceptional circumstances
		Very limited or no known occurrences

Table 10 Risk Consequence Table

Factor	Insignificant	Minor	Moderate	Major	Severe/ Catastrophic
Biodiversity	Alteration or disturbance to an isolated area with no effect on habitat or ecosystem. Loss of an individual plant / animal of conservation significance.	Alteration or disturbance to <10% of a habitat or ecosystem resulting in a recoverable impact within 2 years. Loss of multiple plants or animals of conservation significance	Alteration or disturbance to 10- 40% of a habitat or ecosystem resulting in a recoverable impact within 2-5 years. Loss of <50% of known local plant or animal species of conservation significance	Alteration or disturbance to 40- 70% of a habitat or ecosystem resulting in a recoverable impact within 5-15 years. Loss of >50% known local population of plant/animal species with possible loss of entire local population.	Alteration or disturbance to >70% of a habitat or ecosystem resulting in a recoverable impact >15 years. Local loss of conservation significant or listed species. Extinction of a species.
Water Resources	Negligible change to hydrological processes, water availability or water quality.	Short-term modification of hydrological processes, water availability and quality within project tenure, but no change in beneficial use.	Medium-term modification of hydrological processes, water availability and water quality within project tenure, but no change in beneficial use. Short-term modification of hydrological processes, water availability and water quality outside project tenure, but no change in beneficial use.	Long-term modification of hydrological processes, water availability and water quality within project tenure, but no change in beneficial use. Medium-term modification of hydrological processes, water availability and water quality outside project tenure, with change in beneficial use	Long-term or permanent modification of hydrological processes, water availability or water quality outside project tenure, with impacts to a water-dependent environmental value and/or change in beneficial use.
Lands and Soils	Clean-up by site personnel,	Clean-up by site personnel,	Clean-up by site personnel,	Clean-up requiring external	Clean-up requiring external

	rectified immediately. Confined to immediate area around source.	remediation within 1 year. Confined to operational area.	remediation within 1-3 years. Minor impact outside disturbance envelope or minor impact to soil stockpiles.	specialist, remediation within 3-10 years. Impact has migrated outside the disturbance envelope or contamination of soil stockpiles	specialist. Remediation >10 years, or permanent residual impact. Impact outside the tenement boundary.
Rehabilitation and mine Closure	Site is safe, stable a non-polluting. Post mining land use is not adversely affected.	Site is safe, all major landforms are stable, and any stability or pollution issues are contained and require no residual management. Post mining land use is not adversely affected.	Site is safe, and any stability or pollution issues require minor, ongoing maintenance by end land-user. Post mining land use cannot proceed without some management.	Site cannot be considered safe, stable or non-polluting without long-term management or intervention. Post mining land use cannot proceed without ongoing management.	Site is unsafe, unstable and/or causing pollution or contamination that will cause an ongoing residual affect. Post mining land use cannot be achieved.

Table 11 Risk Matrix

Risk Matrix		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
ikelihood	Almost Certain	medium	high	high	extreme	extreme
	Likely	medium	medium	high	high	extreme
	Possible	low	medium	medium	high	high
	Unlikely	low	low	medium	Medium	high
	Rare	low	low	low	medium	medium

11.2 Risk Assessment

Table 12 Project Risk Assessment

Risk number	Factor	Description of impact	Phase	Inherent Risk			Management Practices to be Implemented	Residual Risk		
				Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
1	General Safety	Embankment Wall Failure	Operations	Unlikely	Major	Medium	Embankment to be constructed as per approved design. geotechnical inspection and sign off before commencement of operations. Regular inspections and audits.	Rare	Major	Medium
2		Workforce accessing active tailings disposal area	Operation	Possible	Catastrophic	High	Physical access to tails damn blocked off. Site procedures in place to educate as to the dangers of entering the dam. Site induction	Rare	Catastrophic	Medium
3		Workers entering landfill trench	Operations	Possible	Catastrophic	High	Landfill trench fenced. No access to the trench installed. Recovery tools, such as ladders in place in the event of an accident	Rare	Catastrophic	Medium
4		Landfill trench collapse	Operations	Possible	Catastrophic	High	Operating procedure in place to prevent people standing too close. Trench dug at an angle that prevents collapse. Egress available	Rare	Catastrophic	Medium
5	Lands and Soils	Soils contaminated with tails after embankment breach	Operations	Likely	Moderate	High	Geochemical study of tailings confirms these are not acid forming. Ongoing geochemistry to occur to ensure new tails remain NAF. Regular inspections of the embankment for geotechnical	Rare	Moderate	Low

							stability. Embankment built as per approved design.			
6		Overtopping of pit with water or tailings	Operations	Likely	Moderate	High	Tails not deposited within 2m of pit crest. 0.7m of freeboard maintained at all times- and surveyed. 0.7m mark highly visible on pit wall. Tailings operation manual followed. Regular inspections of freeboard. Pump in the pipe is the correct size to remove water as required.	Rare	Moderate	Low
7		Contamination of lands with ARD and metals after pipeline leak	All	Unlikely	Minor	Low	Geochemical characterisation of tails shows tails in NAF and metals aren't leachable.	Rare	Minor	Low
8		Groundwater mounding causes vegetation deaths	Operations	Unlikely	Minor	Low	Monitoring bores around the pit do not show water outside the abandonment bund within 4m of surface level. Dewatering of active mining area lowers local groundwater levels to further prevent mounding.	Rare	Minor	Low
9		Rupture in return water pipeline leads to contamination of soils with TSF water	Operations	Possible	Minor	Medium	Pipeline installed as per Australian standard (AS/NZS 4130:2003-Polyethylene pipes for pressure applications). Pipeline contained within a V drain with regularly installed sumps to contain leaks Pre-use inspection and commissioning does not identify any leaks. Daily pipeline inspection for leaks, ruptures or any signs of damage	Rare	Minor	Low
10		Rupture in tails pipeline leads to contamination of soils with tails	Operations	Possible	Minor	Medium	Pipeline installed as per Australian standard (AS/NZS 4130:2003-Polyethylene pipes for pressure applications). Pipeline contained within a V drain with regularly installed sumps to contain leaks Pre-use inspection and commissioning does not identify any leaks. Daily pipeline inspection for leaks, ruptures or any signs of damage	Rare	Minor	Low
11	Water resources	Groundwater contaminated	Operations	Unlikely	Minor	Medium	Geochemical test work confirms metals are not readily leachable. Daily pipeline inspections.	Rare	Minor	Low

		with leached metals								
12		Cyanide within water leads to contamination of groundwater or surface waters.	Operations	Unlikely	Minor	Medium	Free cyanide dissociates within waters. Monthly monitoring. Cyanide sampling at mill discharge to confirm WAD-CN is below 50mg/L on a monthly basis.	Rare	Minor	Low
13		Leachate from the Landfill impacts groundwaters	Operations	Unlikely	Minor	Low	Minimum 3m of tails underneath the landfill. Trench not dug into TSF impermeable layer.	Rare	Minor	Low
14	Biodiversity	Clearing impacts priority species	Operations	Unlikely	Minor	Low	Area has been subject to flora and vegetation surveys. No species of conservation significance identified.	Rare	Minor	Low
15	Closure	Failure to revegetate due to unconsolidated tails	Closure	Unlikely	Minor	Low	Testing has confirmed that tails will consolidate quickly upon deposition. Drainage from the tails will continue for several months post cessation of deposition, but the surface tails will be consolidated. Visual and geotechnical inspections to be undertaken to determine whether IWL is suitable for rehab, or develop a timeline for when rehabilitation can commence	Rare	Minor	Low
16		Insufficient cover for closure	Closure	Unlikely	Minor	Low	Topsils to be stripped prior to construction of the IWL. Topsoil volume to be surveyed for adequacy. Should further soils be required these will be sourced for excess soils available due to the ongoing open pits.	Rare	Minor	Low

11.3 Monitoring and Management of Risk

The Project accepts that the key risks to the IWL are over topping, leaks in the pipelines, and general safety. The Risk associated with the landfill is generally lower, however relevant risk have been included within the table.

The proposed management and monitoring are outlined in the following sections.

A summary of the proposed monitoring is outlined in the table below;

Monitoring Component	Frequency	Monitoring Component	Outcomes/ Triger levels/ Reporting
Tails volume deposited	Weekly	M^3 and Tonnes of tailings entering the pit	Tails volume to remain at approved run rates (currently 365ktpa)
Decant water recovered	Weekly	Litres of water recovered from the pit	Check flow metre and record
Freeboard	Weekly	Visual inspections to ensure sufficient freeboard remains within the IWL and overtopping is not a risk	Freeboard is about the 0.7m Limit
Tailings and return water pipelines	Daily	Pipelines to be inspected for leaks, ruptures and any signs of damage.	Complete inspection checklist
Groundwater depth	Weekly	Depth of water remains below 4mbgl	Recover water faster and deposit tails slower if levels are at, or trending toward 4mbgl Stop discharge if required
Groundwater chemistry outside the pit bund	Monthly	pH, Conductivity, TDS, major cations and anions, dissolved and total metals	Groundwater chemistry to remain consistent with baseline chemistry
Animals and Birds around the IWL	Ongoing	Visual inspections occur to ensure animals and birds aren't interacting with the pit. Register of deaths maintained	NA

The results of all monitoring will be included within the AER. Any Exceedances of trigger levels will be reported to DWER as an incident as per the Meeka Metals Incident Reporting Procedure, nominally within 24 hours of the issue being identified.

A figure of the in pit TSF and potential monitoring bore locations is shown in Figure 7. Meeka proposes to install two bores targeting the rock aquifer north and south of the pit. Further bores will be installed if required, likely to the south of the facility. The existing bores around the current TSF will not be impacted, with the exception of TSFMB007, the remaining monitoring bores should be sufficient to assess groundwater quality and potential changes.

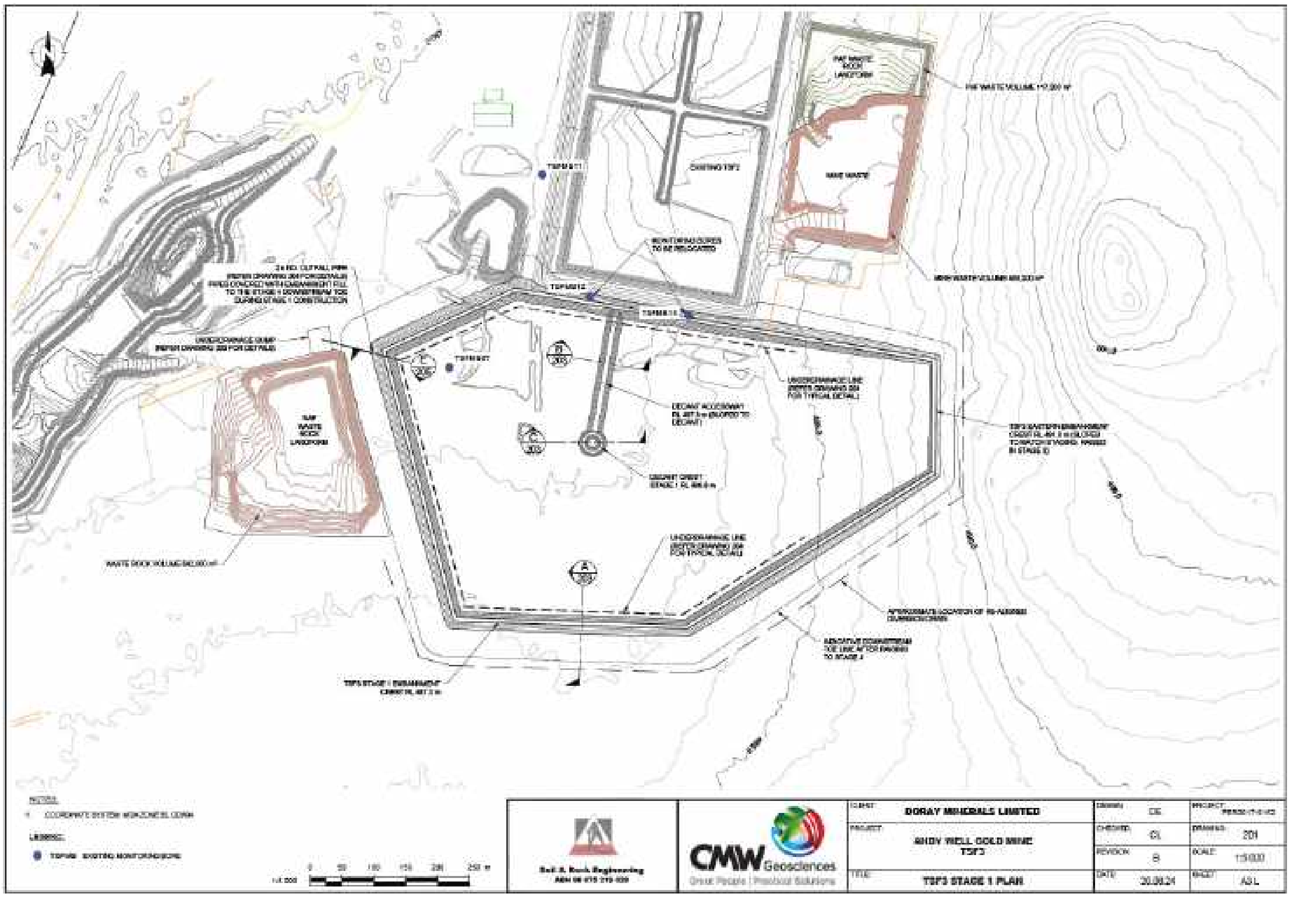

Figure 7 IWL and Potential Monitoring Bore Locations

11.3.1 Tailings Deposition

To optimise tailings storage capacity and reduce the risks associated with embankment stability and seepage, tailings will be deposited from the embankment and along the perimeter of the storage as depicted in the drawings. Tailings deposition and beaching will be controlled, such that the supernatant solution is ponding around the decant pump. Tailings will be deposited such that the insitu densities within the stored tailings and the solution return for reuse in the process plant, is maximised.

The following considerations have been incorporated into the design of the TSF3:

i) The tailings discharge into the TSF3 will be from a multiple spigots starting on the western side such that the supernatant pond is maintained near the decant with the water recovery pump. The discharge points will be moved from the western side around to southern and northern sides as the level of tailings rises. The formation of the tailings beach against the pit wall will minimise the potential for seepage.

iv) Supernatant water will be recovered by a pontoon-mounted decant pump in the rock filter.

v) Keeping the supernatant pond (surface water) to a small size will have the effect of reducing seepage and evaporation from the surface of the pond and hence will assist in optimising the water recovery and tailings density.

Depending on the decommissioning plan adopted for the storage, it may be necessary to alter the deposition philosophy near the end of the mine life. Appropriate procedures shall be developed if changes to deposition or freeboard criteria are required. If necessary, appropriate government authorities shall be advised of any changes, especially to freeboard criteria.

Towards the end of the life of the pit, the facility should have an adequate freeboard of 0.7 m (minimum) available which includes approximately 0.182 m to store the design storm event of a 1% annual exceedance probability (AEP), 72-hour storm event, plus 0.2 m, during the operation of the facility. Operational freeboard for tailings deposition is 0.3 m (minimum). Total freeboard is say, 0.7 m.

Frequent inspections (once per shift, twice daily) should be made of the spigot, tailings lines, water return lines, pumps and related facilities, the position of the pond in relation to the water-recovery pump and the containment embankments. The return lines should be checked regularly for quantity and quality of water return. Only by regular inspection and appropriate remedial action, can the performance of the water return system be optimised and additional operational problems avoided. Monthly inspections by the Process Plant Manager must be undertaken.

Monitoring bores adjacent to the pits will be utilised as monitoring/recovery bores. Water samples will be taken every three (3) months from the monitoring bores to check water quality, with water levels in the monitoring bores being read on a monthly basis. Operation, safety and environmental aspects should be periodically reviewed during an inspection by a suitably experienced and qualified engineer. This inspection should be done at least annually.

11.3.2 Groundwater Mounding

Groundwater mounding is not expected to be an issue with the IWL. The design of the IWL is such that seepage from the facility is diverted to an underground drain where water is then recovered and returned into the decant system. This will prevent interaction of the IWL and the natural groundwater table.

Further to the above, dewatering within the active mining area will lower the local water table. Prior to any mining at the site, the local groundwater table was at approximately 6m below ground level. After a five year period of mining the groundwater currently sits at approximately 20m below ground level. When underground operations resume, dewatering will again influence groundwater levels and the water table will again be lowered. During the operation of the IWL there is therefore no mechanism for groundwater mounding to occur because the Andy Well Underground site below and adjacent to the IWL.

The limited potential for mounding to occur is further supported by the past operation of TSF 1, where mounding was not seen to be an issue. Given the tails are the same physically and chemically, the behaviour of the tails can be expected to be the same with consolidation and drying expected to occur quickly. A decant system within the IWL will seek to remove as much water as possible from the tails to limit the potential for water to seep from the system. This design is included within the IWL design report and is included as Appendix 1 to this document.

Water quality monitoring has been ongoing since the inception of the Andy Well mine. As part of the resumption of operations Meeka has been monitoring groundwater levels and quality. In 2024 two level readings of the SWL around the existing TSF were undertaken. The results are shown in the table below.

Table 13 Andy Well Mine Groundwater Levels

Bore Name	April (mbgl)	September (mbgl)
MB01	17.4	16.53
MB03	16.95	15.78
MB04	16.86	16.01
MB06	17.07	16.53
MB07	15.91	15.08

Groundwater quality has also been monitored as part of licence conditions and developing a baseline chemistry suite. The quality of groundwater within the mine area is generally high, with low levels of dissolved metals and other salts.

Table 14 Andy Well Mine Groundwater Chemistry

Analyte Name	Unit	Drinking Water Guideline	Bore ID and Sample Date					
			Mono A Jan 2019	Mono B Jan 2019	RL1395 Jan 2019	Suzie Open Pit Jan 2019	Camp Water Bore July 2024	TSF MB07 May 2025
pH	pH Unit	(6.5-8.5)	8.1	8	7.93	8.1	7.7	7.3
Conductivity @ 25 C	µS/cm	-		2300	2000		7200	

Analyte Name	Unit	Drinking Water Guideline	Bore ID and Sample Date					
			Mono A Jan 2019	Mono B Jan 2019	RL1395 Jan 2019	Suzie Open Pit Jan 2019	Camp Water Bore July 2024	TSF MB07 May 2025
Total Dissolved Solids	mg/L	(600)	1300	1500	1270	1300		2000
Total Alkalinity as CaCO3	mg/L	-	150	140	154	160	240	
Bicarbonate, HCO3	mg/L	-	150	180	188	160	190	
Carbonate Alkalinity as CO3	mg/L	-	<5	<1		<5	<1	
Chloride	mg/L	(250)	420	340	429	370	2000	
Sulphate	mg/L	**500** (250)	220	200	242	210	710	440
Nitrate, NO_3 as NO_3	mg/L	**50**	51	33		46	210	9.0
Calcium Ca	mg/L	-	66	83	73	63	250	
Iron Fe	mg/L	(0.3)	0.12	0.17	<0.05	0.42	45	880
Potassium K	mg/L	-	17	17	21	15	25	
Magnesium Mg	mg/L	-	49	65	55	47	270	
Manganese Mn	mg/L	**0.5** (0.1)	0.016				<1	13

Analyte Name	Unit	Drinking Water Guideline	Bore ID and Sample Date					
			Mono A Jan 2019	Mono B Jan 2019	RL1395 Jan 2019	Suzie Open Pit Jan 2019	Camp Water Bore July 2024	TSF MB07 May 2025
Sodium Na	mg/L	(180)		310	247	230	800	360
Silicon Si	mg/L	-						
Silica Soluble	mg/L	(80)	65			64	52	
Total Organic Carbon	%	-	1		0	<1	<1	

11.3.3 Groundwater Quality

Groundwater quality with be taken from within the pit and also from a bore located outside the pit abandonment bund. Monitoring will be done on a monthly basis and will test for pH, TSD, conductivity, major cations and anions and total and dissolved metals.

Groundwater quality from outside the pit bund will be compared with historical water quality, to ensure that water within the aquifer is not being influenced from water being deposited into the TSF.

The potential for the water to contain cyanide has been raised by the pastoralists as part of the consultation efforts. Cyanide within the water will volatilise readily within waters where the temperature is above 14°C. the pit water temperature will always be above this temperature and therefore cyanide in water is not considered a risk (SRE, 2024). Monitoring will be undertaken for WADCN which will be the only form of cyanide within the water and is expected to be well below DWER limits.

11.3.4 Leaks

The pipeline will be installed as per Australian Standard As/NZS 4130:2003 Polyethylene pipes for pressure applications. This will ensure the potential for a rupture, or a leak is minimised. Prior to the use of the pipeline, it will be commissioned to ensure that there are no leaks or welding issues.

Once tailings and water are being pumped through the pipelines, the pipeline will be inspected daily for leaks or damage, which will then be repaired.

The pipeline will be located within a V drain or similar bunding to prevent leaks entering the local environment.

There is no plan to use telemetry or automatic cut off values at the Andy Well Mine. The plant operated between 2012 and 2017 without this and experienced no issues. The tailings from the plant are considered inert, with no PAF potential or readily leachable metals. The WAD from the plant will be less than 50mg/L. The pipeline will be inspected twice daily prior to the start of each shift and issues immediately rectified.

11.3.5 Birds and Fauna

The TSF is located within a migratory bird route and has the potential to attract birds to the pooled water. The site was operated between 2012 and 2017 and there are no records of birds interacting with the TSF, for this reason the potential for birds to access the TSF is considered to be low.

The quality of water within the TSF will be high enough that no impacts to fauna should occur if they interact with the water. The WAD will be below 50mg/L, which does not pose an issue. Metals from the tails are not leachable and will not impact fauna.

To manage the risk to birds, the project will dewater the tails as soon as possible, ensuring pooled water is kept to a minimum. The tails from the Andy well mine were demonstrated to settle quickly and water recovery was able to occur quickly after deposition. The noise and lighting at the TSF and from the mill will serve to distract birds.

There are no records of birds or other fauna interacting with the TSF when in operation previously. This suggests that birds and fauna were not an issue and required no further management. After discussions with site management, some of which have re-joined the project in 2025 to run the plant, including the site environmental officer from 2017, this statement is confirmed to be true and accurate and not from a lack of reporting. The entire Mining Lease is fenced off and there were no incidents of cattle or kangaroos in the dams either.

12 Commissioning Plan

The Design Report contains an earthworks specification (Appendix C). A reputable civil contractor will construct the IWL to this specification and CMW (client civil engineers) will attend site during construction. Following the construction of the IWL the facility will be inspected and tested to ensure the facility has been built as per the requirements. The testing will be carried out by a suitably qualified person who will sign off on the construction and allow the facility to be used (SRE, 2024, Appendix C).

When the facility has been certified to be constructed correctly, Meeka will begin the commissioning process. This is outlined by the below steps:

1. Update the current TSF Management Plan and TSF Commissioning Plan(Appendix 18.3 and 18.4)
2. Begin commissioning:
    a. Pressure test all pipework for leaks using raw water
    b. Begin filling dam with raw water. Monitor runoff to decant tower.
    c. Check on spiggot discharge and erosion over 24hr period.
    d. Flow rate tests on decant pumps for flow and pressure
    e. Seepage collection testing using raw water
    f. Groundwater monitoring of bores prior to commissioning

g. Inspection of upstream runoff diversion bund to manage inundation of TSF
h. Inspection of TSF walls with water in dam

Once the facility has been determined to be operating as required, the site will implement the TSF Operating Manual for the ongoing use of the IWL.

The commissioning phase is expected to take up to 120 days.

13 Operating Plan

As part of the design of the IWL, SRE developed a IWL operating manual for the IWL. This manual will be implemented to ensure the operation of the IWL is done in accordance with the appropriate legislation, regulations, guidelines and industry standards.

14 Fee Calculation

The category applied for is category 5, processing of metallic and non-metallic ore. Meeka will process over 500,000t of ore per year, but less than 5,000,000.

The IWL will cost approximately $21,051,000 to construct, which includes all civil and earthworks, as well as pipelines and other associated infrastructure. This comprises five stages over an 8-year construction timeframe. The stages of the construction are supplied in the table below.

Stage	Storage Capacity (Mm^3)	Storage Capacity (Mt)	Cost to Construct (AUD)
1	0.93	1.396	$4,188,000
2	0.96	1.442	$4,326,000
3	1.022	1.533	$4,599,000
4	1.064	1.596	$4,788,000
5	0.64	1.050	$3,150,000
Total	4.623	6.934	$21,051, 000

The DWER fee calculator was used to calculate the fee associated with the Works Approval. The calculator determined that the cost was 300 fee units, and totalling $4,080.

15 Reporting

The use of the IWL will be included within the Mine's Annual Environmental Report. This report will detail how the IWL has been used over the reporting period and will outline as a minimum:

- The volumes of tails sent to the IWL
- The volume of water recovered from the IWL
- Outline any incidents or issues that occurred over the reporting period
- Highlight and explain any instances of non-compliance over the reporting period
- Detail the results of the proposed monitoring over the reporting period and outlining any instances of non-compliance

- Outline any remedial work or active monitoring of the TSF management process that have occurred over the reporting period that have been required to ensure the TSF is operated as per the design report.

16 Conclusion

The IWL can be constructed and operated safely and with little environmental impact. The IWL will make use of existing waste material and tailings and consolidate these all into a single landform which will be fully closed and rehabilitation as part of the mine's operation.

17 References

Bamford Consulting Ecologists. 2012. Fauna Assessment of the Andy Well Mining Lease Area. Prepared by Jeff Turpin, Mike Bamford and Natalia Huang, 3 January 2012.

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Soil and Rock Engineering. 2024. Tailings Storage Facility 3 Design Report. Unpublished report for Meeka Metals Limited.

18 Appendices

18.1 Appendix 1 – Soil and Rock Engineers (2024) Andy Well Project – Tailings Storage Facility 3 Design Report

18.2 Appendix 2 – Pendragon Environmental (2024)- Gnaweeda Project: Turnberry and St Annes Mining Areas Tailings Characterisation

18.3 AWM-PLN-P-011 - TSF Management Plan_Adopted for IWL

18.4 PRO-P-AWM-039 - Tails Storage Facility Cell 3 Commissioning Management Plan_Adopted for IWL