MINING MANAGEMENT PLAN
Stage 1A Amendment

Nathan River Project

Mining Operations and Bing Bong Loading Facility

Operator name:	NRR Services Pty Ltd
Project name:	Nathan River Project
Authorisation:	1062-01
MMP reporting year:	2023 - 2024
Date:	28 June 2023
Document distribution list:	DITT
	NRR Services Pty Ltd

NRR ENDORSEMENT

	Author	Reviewed by	Approved by
Date	26/06/2023	26/06/2023	26/06/2023
Name	Emerson Pollard (METServe)	Dave Moss (METServe)	Simon Peat (NRR Director)

I, Simon Peat (Director) declare that to the best of my knowledge the information contained in this mining management plan is true and correct and commit to undertake the works detailed in this plan in accordance with all the relevant Local, Northern Territory and Commonwealth Government legislation.

SIGNATURE:

DATE: 26/06/2023

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1 INTRODUCTION

1.1 Project Description

The Nathan River Project (NRP) (previously referred to as the Roper Bar Iron Ore Mine (RBIOM)) is operated by Nathan River Resources (NRR) and is comprised of three areas; the mine, the haul road and the Bing Bong Loading Facility (BBLF).

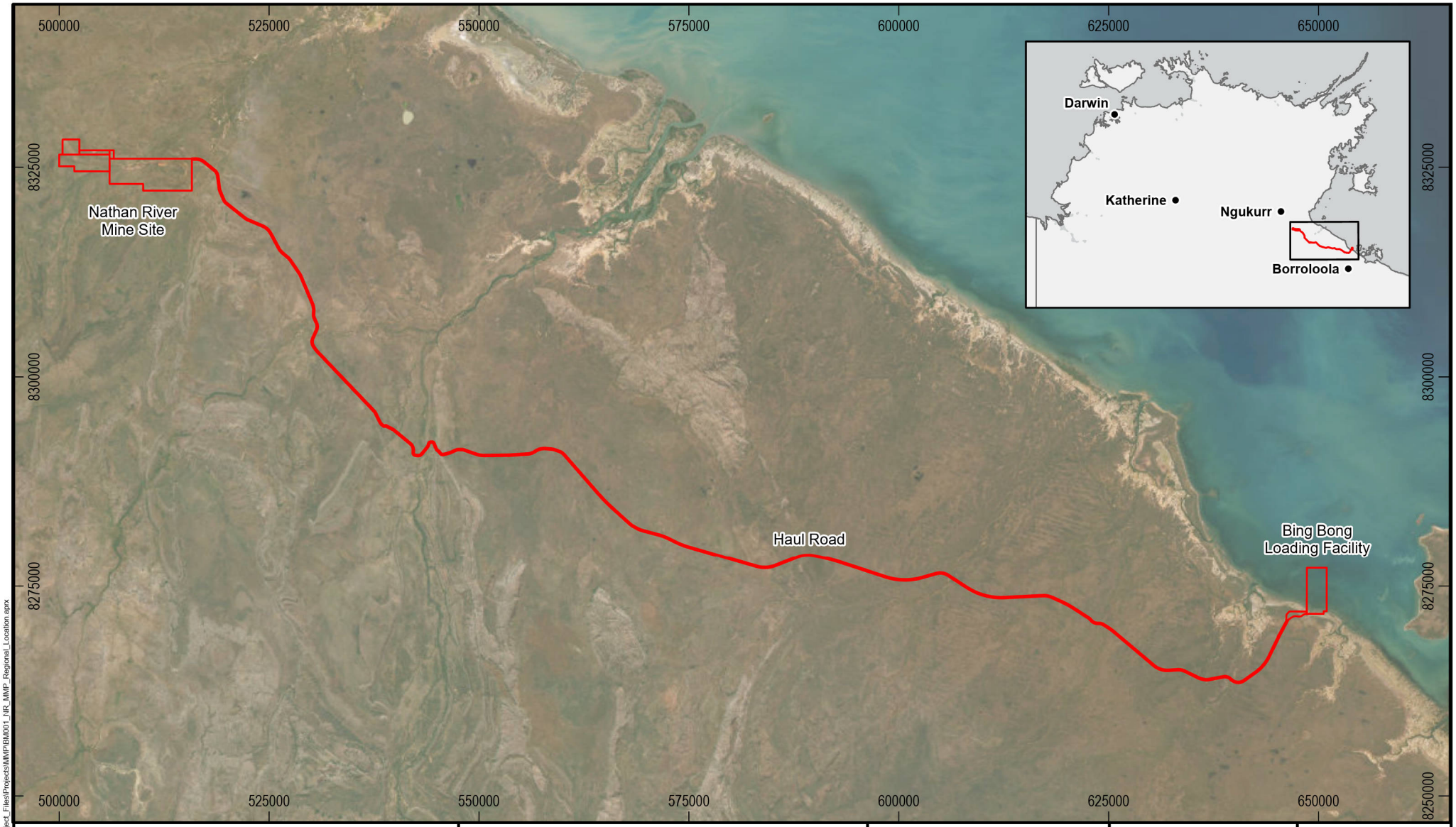
The NRP mine site is located approximately 530 kilometres (km) southeast of Darwin, approximately 30 km from the coast of the Gulf of Carpentaria. The mine is within mining lease (ML 28264). The haul road, owned and operated by NRR, stretches for 171 km and connects the mine to the BBLF allowing the haulage of material to the loading facility. The BBLF is situated within ML 29628, located on the south-western coast of Gulf of Carpentaria approximately 50 km north of Borroloola. Glencore's McArthur River Mine operates a larger loading facility at the Bing Bong Port, whereby the transhipment channel and swing basin is currently maintained by Glencore. The regional location of the NRP is presented in **Figure 1-1**.

The previous operator, Western Desert Resources (WDR) commenced mine construction and operations in 2013 following the approval of the Roper Bar Iron Ore Project (RBIOP) Environmental Impact Statement (EIS) under the previous *Environmental Assessment Act.*

NRR currently holds an approved mining authorisation (1062-01) for the NRP. The NRP was placed into care and maintenance (C&M) in November 2021, with the recommencement of minor operations in March 2023 following the approval of the low-grade ore (LGO) MMP amendment. Activities which are currently approved at the NRP include:

- Processing and sorting of existing LGO stockpiles;
- Haulage of LGO to the BBLF; and
- Transhipment of LGO from the BBLF.

NRR is proposing an amendment to the Mining Management Plan (MMP) approved by authorisation 1062-01 to allow the recommencement of mining activities at the NRP.



Legend

Tenement Boundaries

Source: Geoscience Australia 2006, Northern Territory Government (Department of Industry, Tourism and Trade) 2022, Nathan River Resources 2018-2020, METServe 2023, Earthstar Geographics.

Nathan River Project

Regional Location

0 5 10 20

Kilometers

Scale: 1:640,000 (A4)

14/06/2023

Datum: GDA2020
Projection: MGA53

FIGURE 1-1

Nathan River Resources

METSERVE
Mining & Energy Technical Services Pty Ltd

Path: S:\Projects\BM001 Nathan River\ArcGIS\Project_Files\Projects\MMP\BM001_NR_MMP_Regional_Location.aprx

1.2 MMP Amendment

This MMP amendment seeks to vary the activities currently approved under the LGO MMP whilst continuing to implement management plans and policies approved in the previous consolidated MMP (2020). The MMP amendment proposes the recommencement of mining operations within the Danehill and Zabeel mining areas. A short-term mining operation (six months) will focus on mining the Danehill pit saddle and Zabeel North open-cut pit. Ore mined from these areas will supplement the processing of LGO, with majority of the processing, haulage and transhipment activities currently approved to remain the same.

To facilitate mining activities proposed in this amendment, dewatering and internal water transfers are required. A significant amount of water has accumulated in the open-cut pits during various care and maintenance stages of the NRP. In order to begin mining the Danehill saddle, water levels in both Danehill pits need to be lowered. Water which has accumulated in the Zabeel North pit over the 2022-23 wet season will also require dewatering. All water will be managed on-site, transferring water to and from other approved water storages / pits. A waste discharge license (WDL) will not be required to facilitate Stage 1A operations.

Further information on the proposed mining activities is presented in **Section 2**.

1.3 Proponent details

Table 1-1 Summary of proponent details

Operator:	NRR Services Pty Ltd (Australia)
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Postal and Street address:	47 Callantina Road, Hawthorn, Victoria, 3122
Key contact/s:	Simon Peat Simon.peat@nathan-river.com 0418 124 024

2 OPERATIONAL ACTIVITIES

This section of the MMP details the operational activities proposed for Stage 1A at the NRP. Stage 1A proposes the recommencement of mining activities at the NRP, following on from the current LGO operation. Mining at the NRP has not occurred since the NRP was placed into care and maintenance in November 2022.

Stage 1A operations will target two previously disturbed mining areas; Danehill pit saddle and Zabeel North open-cut pit. The Danehill saddle is a land bridge which currently separates the Danehill East and West pits, with the proposed mining aiming to remove a proportion of this separating saddle. Zabeel North pit will be mined concurrently with the Danehill saddle, with ore extracted from both mining areas supplementing the currently approved LGO operation.

To facilitate mining operations of the Danehill saddle, water stored in Danehill East and West pits will require dewatering and transfer to another on-site water storage. Minor dewatering activities will also be required at the Zabeel North pit. All water will be managed and stored onsite, preventing the need for a WDL during Stage 1A (refer to **Section 2.5** for more detail).

2.1 Danehill Saddle

2.1.1 Danehill Saddle Mining

NRR is seeking to commence mining of the saddle which currently separates the Danehill East and West open-cut pits. Mining of the saddle will continue to use open-cut mining methods utilising a small truck and shovel fleet. Ore which is extracted from the saddle will be transported to the Danehill Processing Area adjacent to the Danehill WRD (see **Section 2.3** for details). Approximate dimensions of the saddle mining area are provided in **Table 2-1**, with the footprint of the saddle mining area presented in **Figure 2-1**.

Table 2-1 – Danehill Saddle Mining Area

	Danehill Saddle Mining Area
Length (m)	350
Width (m)	50
Depth (m below current surface)	25

Approximately 151,000 tonnes (t) of > 40% iron (Fe) ore will be extracted from the saddle mining area. The proposed mining of the Danehill saddle is scheduled to be complete within six months of commencement (once approval has been received). **Table 2-2** presents the estimated amount of material extracted per month for the Danehill saddle mining. Material amounts shown in **Table 2-2** are a combination of ore and waste rock.

Table 2-2 – Monthly Production Schedule for Danehill Saddle

Danehill Saddle Mining Area	Month						TOTAL
	1	2	3	4	5	6	
Material moved (tonnes)	85,501	56,002	57,003	56,004	58,005	41,704	354,198

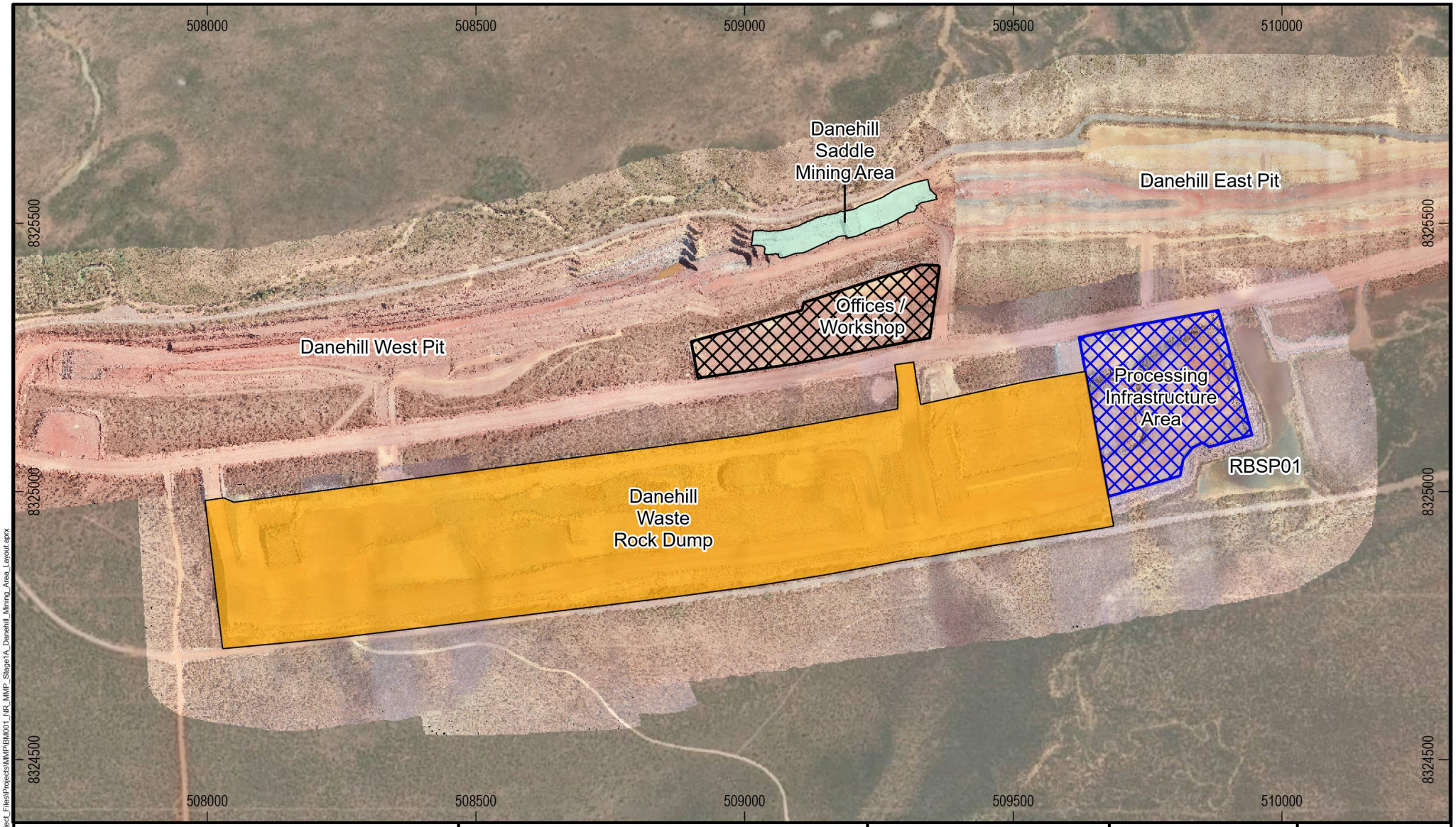
Blasting will be required to facilitate mining at the Danehill saddle during Stage 1A. Blasting activities are expected to occur once a fortnight and will follow blasting procedures previously implemented prior to the C&M phase.

It should be noted that the mine design proposed for Stage 1A Danehill saddle (previously referred to as Area F) is within the mining footprint assessed and approved in the RBIOP EIS (2012).

2.1.2 Danehill Waste Rock Dump

An estimated 205,000 t of waste rock (< 40% Fe) will be removed from the saddle mining area. Waste rock from the Danehill saddle mining area will be transported to the Danehill Waste Rock Dump (WRD) adjacent to the mining area for storage. Given the storage of additional material, the maximum height of the Danehill WRD is proposed to increase to 25 m above surrounding surface level, an increase of 15 m from its current height.

No potentially-acid-forming (PAF) material is expected to be uncovered during Stage 1A saddle mining. The existing Danehill resource model indicates a small amount of PAF 10 m below the maximum depth of saddle mining in Stage 1A. Should this material be encountered in the Stage 1A mining, it will be hauled and stored within the existing PAF cell on the Danehill WRD. PAF material will be managed in accordance with the previously approved *Acid and Metalliferous Drainage Management Plan* (Pendragon 2019). The footprint of waste rock storage on the Danehill WRD is presented in **Figure 2-1**.



Legend

- ML Boundary
- Offices / Workshop
- Danehill Processing Infrastructure Area
- Danehill Saddle Mining Area
- Danehill Waste Rock Dump

Source: Nathan River Resources 2021-2023, METServe 2023, Earthstar Geographics, Maxar. *High resolution imagery captured between September and November 2021.*

Nathan River Project

Stage 1A Danehill Mining Area Layout

0 100 200 300

Meters

Scale: 1:10,000 (A4)

14/06/2023

Datum: GDA2020
Projection: MGA53

FIGURE 2-1

Nathan River Resources

METSERVE
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2.2 Zabeel North Pit

2.2.1 Zabeel North Mining

In addition to Danehill saddle mining, NRR are seeking to recommence mining at the Zabeel North open-cut pit. Prior to the C&M phase in November 2021, Zabeel North began construction and was the focus of mining within the Zabeel mining area. The approximate footprint for the proposed mining at the Zabeel North pit is presented in **Figure 2-2**, and pit dimensions for Stage 1A are detailed in **Table 2-3**.

Table 2-3 – Zabeel North Open Pit

	Zabeel North Open Pit
Length (m)	500
Width (m)	130
Depth (m below current surface)	25

Approximately 482,000 t of > 45% Fe ore will be removed from the Zabeel North pit. Mining in the Zabeel North pit will utilise a small fleet of trucks and excavators. Ore extracted from the Zabeel North pit will be transported to the existing Run-of-Mine (ROM) pad for processing. Zabeel North will be mined simultaneously with the Danehill saddle and is expected to be completed within six months of commencement. **Table 2-4** presents the estimated amount of material extracted per month for the Zabeel North pit during Stage 1A. Material amounts shown in **Table 2-4** are a combination of ore and waste rock.

Table 2-4 – Monthly Production Schedule for Zabeel North

Zabeel North	Month						TOTAL
	1	2	3	4	5	6	
Material moved (tonnes)	114,000	140,000	142,500	140,000	145,000	142,500	824,000

Similar to Danehill saddle mining, blasting will be required to facilitate mining in the Zabeel North pit during Stage 1A. Blasting at the Zabeel North pit is expected to occur once a fortnight and will follow blasting procedures previously implemented prior to the C&M phase.

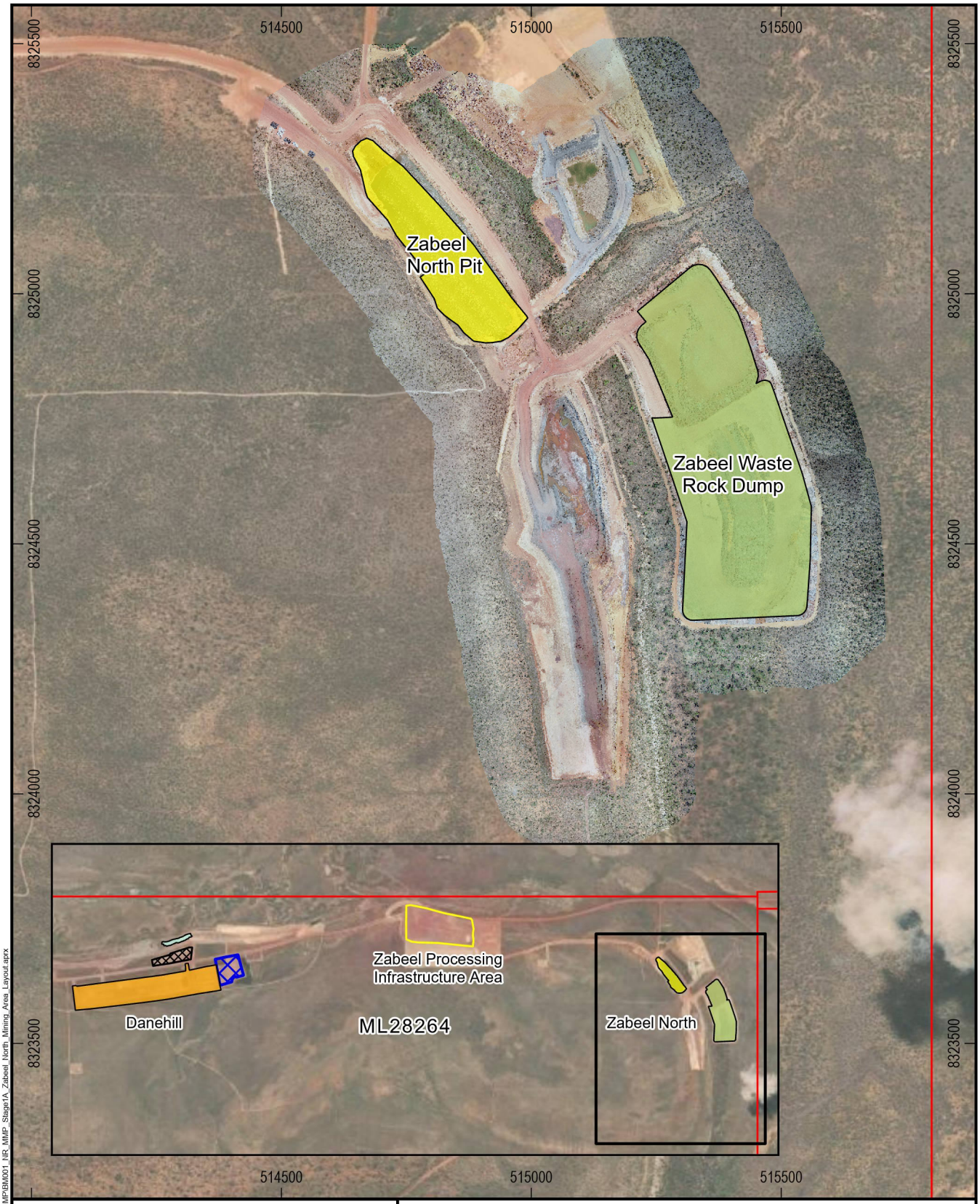
It should be noted that the mine design proposed for Stage 1A Zabeel North pit (previously referred to as Area E) is within the mining footprint assessed and approved in the RBIOP EIS (2012).

2.2.2 Zabeel North Waste Rock Dump

An estimated 1,245,622 t of waste rock (< 45% Fe) is proposed to be removed from the Zabeel North pit. Waste rock extracted from the Zabeel North pit will be transported to the existing Zabeel Waste Rock Dump (WRD). The proposed additional waste rock material will require the maximum height of the Zabeel WRD to be increase by 8 m from its current height, with a proposed maximum height of approximately 30 m above the surrounding surface level.

No potentially-acid-forming (PAF) material is expected to be uncovered during Stage 1A Zabeel North operation. The existing Zabeel North resource model shows no PAF within the area targeted for mining in Stage 1A. Should PAF material be identified during the proposed Stage 1A mining, it will be hauled and stored within the existing PAF cell on the Danehill WRD.

No PAF material has historically been stored on the Zabeel WRD, with the only dedicated PAF cell at the NRP located on the Danehill WRD. PAF material will be managed in accordance with the previously approved *Acid and Metalliferous Drainage Management Plan* (Pendragon 2019). The footprint of waste rock storage on the Zabeel WRD is also presented in **Figure 2-2**.



Legend

- ML Boundary
- ROM Pad
- Zabeel North Pit
- Zabeel Waste Rock Dump
- Offices / Workshop
- Danehill Processing Infrastructure Area
- Danehill Saddle Mining Area
- Danehill Waste Rock Dump

Source: Nathan River Resources 2021-2023, METServe 2023, Earthstar Geographics, Maxar. *High resolution imagery captured in September 2021.*

Path: S:\Projects\BM001 Nathan River\ArcGIS\Project_Files\Projects\MMP\BM001_NR_MMP_Stage1A_Zabeel_North_Mining_Area_Layout.aprx

Nathan River Project

Stage 1A Zabeel North Mining Area Layout

0 100 200 400

Meters

Scale: 1:11,000 (A4)

14/06/2023

Datum: GDA2020
Projection: MGA53

FIGURE 2-2

Nathan River Resources

METSERVE Mining & Energy Technical Services Pty Ltd

2.3 Production and Ancillary Activities

2.3.1 Production and Processing

The Stage 1A mining operation is expected to remove approximately 6,500 t of material per day from either the Danehill saddle or Zabeel North mining areas. The proposed mining activities will only occur during daylight hours, with no night-shift operations proposed for Stage 1A. As mentioned in **Section 2**, Stage 1A will utilise open-cut mining methods via truck and shovel equipment. The following mining equipment fleet is proposed for Stage 1A mining operations:

- 90 t excavators;
- 50 t moxie mine trucks;
- Grader;
- Front end loader;
- Tracked Dozer;
- Water truck;
- Service truck; and
- Mobile crushing, processing and sorting plant.

Mobile processing infrastructure will alternate positions between the current location (adjacent to the Danehill WRD) and the existing ROM pad. Generally, the mobile processing equipment will be positioned on the Danehill WRD when ore stockpiles from the Danehill saddle are being processed. Whereas, ore stockpiles sourced from Zabeel North will be processed on the existing ROM pad. Mobile processing equipment allows for operational flexibility, shorter haulage distances and separation of different ore grades between the two mining areas.

Ore processing throughout Stage 1A is expected to achieve approximately 4,000 t per day, with 1,000 t of ore per day sorted and ready for haulage to the BBLF. Although the amount of stockpiled ore is expected to vary throughout Stage 1A, stockpiled ore at the mine will not exceed 100,000 t at any one time.

No chemical processing of material is proposed for Stage 1A, with only crushing, screening and sorting of ore material occurring. Rejects and residual material from processing activities will either be stockpiled on the ROM for alternate use (i.e. stoking material for blasting), or transported to the Danehill WRD for storage.

Dust suppression will continue during mining and processing operations. A fleet of water trucks will be operational, using water from RBSP01 to suppress dust in operational mining areas. Mobile processing equipment, when located at the Danehill WRD, will utilise a continuous water supply from nearby RBSP01 to reduce dust during processing. Water trucks will provide dust suppression to processing equipment when located on the ROM pad. All water used for dust suppression at the mine site will be sourced from RBSP01, supplemented by Danehill pit water.

2.3.2 Haulage

Haulage of ore will utilise triple trailer road trains, transporting approximately 2,000 t of ore to the BBLF per day. Haulage activities will occur over a 24-hour period with an anticipated 17 return truck movements between the mine and the BBLF per day. NRR will continue to conduct routine roadway inspections of the entire haul road and bridges to ensure it remains in a safe and operational condition. Should any issues with the haul road be identified (i.e. unsafe road conditions), haulage will be paused until such issues are rectified allowing a safe haulage operation.

2.3.3 Watercourse Diversion

No watercourse diversions (namely the Towns River Diversion) are proposed as part of Stage 1A.

2.3.4 Exploration Activities

No exploration activities are proposed as part of the Stage 1A MMP amendment.

2.3.5 Disposal of waste tyres

Mining activities generate a number of waste tyres which require disposal. Investigations into recycling options have been undertaken but due to remoteness of the site and the fact that tyres contain steel, opportunities are limited and costs prohibitive.

NRR will dispose of the waste tyres on site, encapsulated within the WRDs, in accordance with best practice methods used in Western Australia:

- Stack tyres no more than 3 high.
- No more than 100 in the same area / layer.
- Fill the centre of the tyres with waste rock to prevent subsidence.
- Place waste rock over to fully encapsulate and repeat the process on top.
- Place a final cover of waste rock a minimum 5 m thick.

The methodology outlined above will prevent subsidence of the final landform and mitigate potential environmental impacts e.g. fire.

2.4 Bing Bong Loading Facility

The BBLF will continue to be used for transhipment activities, with the proposed Stage 1A operations remaining similar to the LGO MMP. Ore material will be stockpiled at the BBLF within the existing laydown area, whereby material will be loaded onto the transhipment barge using the existing hopper and conveyor infrastructure. Barges are transported using tugboats out to bulk carrier vessels moored in deeper water off the coast of the BBLF. Each barge has a capacity of approximately 4,000 t (subject to tidal conditions). Several barges are required to fill the capacity of each bulk carrier ship, which has a capacity of 60,000 t. During Stage 1A, two bulk carrier ships a month are expected to be filled.

Dust suppression will continue to be the main focus during loading operations at the BBLF. Water stored in the BBLF sediment dams will be used for dust suppression along the loading conveyor belt, wetting the material as it is loaded onto the barge. As sediment dams reduce in water capacity, excess water from the mine will be used to supplement dust suppression water supply at the BBLF.

Shipping operations will follow all procedures which were previously implemented at the BBLF prior to the C&M phase. Glencore's McArthur River Mining (MRM), the other operator of the BBLF, will be notified prior to the commencement of shipping activities. NRR will work with MRM to ensure safe shipping operations at the BBLF.

2.5 Water Management

2.5.1 Mine Dewatering

To facilitate mining operations proposed in Stage 1A, dewatering and internal water transfers are required. Danehill East and West pits have increased in water volume over the recent 2022-23 wet season in response to one of the highest rainfall seasons in the Gulf of Carpentaria on record. Given the extreme events of the subsequent wet season, an updated water balance has been completed to provide current estimates on water volumes within the Danehill and Zabeel pits. Estimated pit water volumes as of June 2023 are presented in **Table 2-5**, along with water volumes from November 2022 for comparison.

Table 2-5 – Water volumes of Danehill and Zabeel Pits

	Total Capacity (ML)	November 2022 (ML)	June 2023 (ML)	Change in volume over 2023-24 wet season (ML)
Danehill East Pit	1,750	55	455	400
Danehill West Pit	3,700	615	1,059	444
Zabeel South Pit	1,370	240	466.5	226.5
Zabeel North Pit	250	0	32.9	32.9
TOTAL	7,070	910	2,013.4	1,074.4

To achieve safe mining conditions within the Danehill saddle mining area, water levels of the Danehill East and West pits must be reduced. As of June 2023, approximately 1,514 ML is stored within the two pits combined (**Table 2-5**) (WRM 2023). The proposed Danehill saddle mine plan will mine to -5 RL (25m below the current saddle surface). To ensure safe conditions, a 3 m buffer between pit water levels and the depth of saddle mining is required (to -8 RL). Danehill saddle mining will require approximately 720 ML of water to be dewatered from the two pits combined. Majority of the Danehill pit water is proposed to be transferred and stored in the Zabeel South pit for the duration of Stage 1A as no mining operations are proposed in Zabeel South during the MMP period. In addition to Zabeel South, water will be transferred to other storages with capacity (i.e. RBSP01, WD1) and used for dust suppression supply. A small volume of water (< 50 ML) has accumulated in the Zabeel North pit which also requires dewatering. Zabeel North water will be transferred to Zabeel South or other storages with capacity prior to mining operations commencing.

In accordance with the updated water balance (WRM 2023) (**Appendix A**), Zabeel South pit has adequate storage capacity to receive water from the Danehill pits to facilitate saddle mining, remaining below the maximum operating value (MOV) and spill level until the commencement of the 2023-24 wet season. Prior to and during the 2023-24 wet season, the Zabeel south pit may require dewatering to other water storages (i.e. back to Danehill pits) to prevent the pit from spilling to the receiving environment. Under the 'very wet' climatic scenario, the Zabeel south pit has a predicted 10% spill probability if it is not dewatered. Given this risk, all water transfer infrastructure will remain in place over the duration of the wet season to facilitate transfer of water from Zabeel South into Zabeel North and Danehill pits.

Stage 1A does not require nor propose a WDL for the MMP period. All water will be appropriately managed onsite during this period without discharge to the receiving environment. However, in preparation for the 2023-24 wet season and next stage of mining operations, an application for a WDL will be sought.

2.5.2 Bing Bong Loading Facility

As discussed in **Section 2.4**, water stored in the sediment dams at the BBLF will be used for dust suppression during loading activities.

NRR intends to conduct maintenance on all BBLF sediment dams during Stage 1A in preparation for the 2023-24 wet season. Once sediment dams are emptied / dry, sediment dams will be cleaned out and re-contoured using an excavator, along with rock armouring of dam spillways. Such maintenance measures aim to limit the amount of sediment laden water from discharging into the surrounding environment in the event that sediment dams overflow (due to extreme rainfall).

3 ENVIRONMENTAL MANAGEMENT

Stage 1A MMP amendment does not propose any changes to the existing Environmental Management System or management plans previously implemented by operations prior to the C&M phase. All management plans previously approved in the 2020 MMP will continue to be implemented along with the updated 2022 Dust Management Plan approved by the LGO MMP amendment.

4 REFERENCES

Pendragon (2019) Acid and Metalliferous Drainage Management Plan.

Western Desert Resources (2012) Roper Bar Iron Ore Project Environmental Impact Statement.

WRM (2023) Nathan River Water Balance Modelling Update.

WRM (2023) Nathan River Water Balance Modelling Update Addendum Memo.

Appendix A – WRM Water Balance Model Update

WRM
WATER + ENVIRONMENT

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MEMORANDUM

Date	27 June 2023
Attention	Emerson Pollard
Company	METServe
WRM ref.	1547-13-E1
Subject	Nathan River Resources MMP Amendment - Site Water Balance Update

Dear Emerson,

1 INTRODUCTION

As requested, we have updated the Nathan River Resources Pty Ltd (NRR) site water balance assessment based on the recent pit water level information and the updated water management strategy provided in the Indus presentation on 12 June 2023.

The existing site water balance model (WBM) (WRM, 2023) was developed to assess the NRR water management system for the Mine Management Plan (MMP) period between May 2023 and December 2024. This update has been undertaken to account for the proposed MMP amendment between July 2023 and December 2023. Hence, this WBM update assessed for the 18-month MMP, which consists of two periods:

- MMP amendment period between July 2023 and December 2023; and
- Remaining MMP period between January 2024 and December 2024.

The following mining strategy was defined for the six-month MMP amendment period by METServe in consultation with NRR and OreTech mine planners:

- Use Zabeel South pit as a water storage for Danehill pit water;
- Mine the Danehill pit saddle, which separates Danehill East and Danehill West pits;
- Commence mining of Zabeel North pit.

The water balance model was run for the 18-month MMP period between July 2023 and December 2024 to assess the performance of the proposed water management strategy for a full containment scenario. The WRM (2023) WBM was updated for this assessment to reflect the proposed changes for the MMP amendment period.

2 WATER BALANCE ASSUMPTIONS

This section outlines the changes made to the previous water balance model (WRM, 2023) based on the information provided in the OreTech presentation and discussion with the site personnel. The key changes made include:

- Update RBSP01 and RBSP02 as the primary and secondary supply of haul road dust suppression demand;
- Update initial water level of site storages;
- Update storage capacity of Zabeel South from 1,224 (17 mRL) to 1,307 (18 mRL); and

- Update all open pit Maximum Operating Volumes (MOV).

Where possible, water will be pumping out of Danehill pits when they exceed their Maximum Operating Level (MOL) to Zabeel South pit when it is below its MOL. Table 1 shows the adapted initial water volumes, MOV and total capacity for each storage based on information provided by NRR. Table 2 shows the initial level and MOL in each pit.

Table 1 Adopted storage characteristics for NRR storages

Dam name	Initial Volume (June 2023) (ML)	MOV (ML)	Total Capacity (ML)
Danehill West	1059	770.5	3700
Danehill East	455	0*	1750
Zabeel North	32.9	32.9	250
Zabeel South	466.5	1307	1307
RBSP02	450	10	590
RBSP01	40	40	60
Total	2503.4	2160.4	7657

* Danehill east is emptied for mining

Table 2 Adopted Pit initial level and MOL

Dam name	Initial Level (mRL)	MOL (mRL)
Danehill West	-4	-8
Danehill East	6	-8
Zabeel North	14	14
Zabeel South	6	17

3 RESULTS

This section assesses the water balance model results run from July 2023 to December 2024. The results were assessed for the two MMP periods:

- MMP amendment period (July 2023 and December 2023); and
- Remaining MMP period (January 2024 and December 2024).

The modelled water inventories in the Danehill pits (combined), Zabeel South and Zabeel North over the 18-month water balance modelling period are shown in Figure 1, Figure 2 and Figure 3 respectively. The ROM dam (RBSP02) water inventory is shown in Figure 4.

3.1 INTERPRETATION OF RESULTS

The water balance model has been run using historic climate data over a forecast period of 18 months. In interpreting the forecast results, it should be noted they provide a statistical analysis of the WMS performance over the next 18 months of mine life, based on 131 different climatic sequences (realisations).

The forecast results are represented as a band, with the 50th percentile (median trace) in the middle of the band. When viewing storage inventories, the 90th percentile represents 10% exceedance (i.e. generally very wet conditions) and the 10th percentile results represent 90% exceedance (i.e. generally very dry conditions). There is an 80% chance that the result will fall within the 10th and 90th percentiles and a 98% chance the result will fall between the 1st and 99th percentiles. It is important to note that a percentile trace shows the percentage chance of exceeding particular value on any particular day, and does not represent continuous results from a single model realisation (e.g. the 90th percentile trace does not represent a single continuous 90th percentile climate scenario over the simulation, rather it shows the volume/rate exceeded by 90% of the 131 realisations on each day of the simulation).

3.2 WATER BALANCE RESULTS

3.2.1 MMP amendment period (July 2023 to December 2023)

The Danehill pits dewatering at 10.4 ML/d is predicted to take approximately 2.5 months to reach the MOV at -8 mAHD. Assuming dewatering starts on 1 July, approximately 720 ML will be dewatered from the Danehill pits and approximately 40 ML will be evaporated to reach the MOV on 9 September. The predicted Danehill pit behaviour during the MMP amendment period includes:

- Under the P50 trace (50% exceedance probability), Danehill pits remain below their MOV.
- Under the P90 trace (10% exceedance probability), Danehill pits remain below the MOV.
- Under the P99 trace (1% exceedance probability (very wet)), Danehill pits exceed their MOV in early December 2023 which will potentially affect mining of pit saddle during the MMP amendment period.

The Zabeel South pit inventory is predicted to increase by approximately 710 ML between July and September 2023 due to 750 ML of pumped inflow from the Danehill and Zabeel North pits and 40 ML of evaporation loss. The Zabeel south pit water inventory is predicted to reach 1,180 ML by September 2023, which is 120 ML below its capacity and just below the toe level of Zabeel South pit levee wall. The predicted Zabeel pit behaviour during MMP amendment period includes:

- Under the P50 trace (50% exceedance probability), the Zabeel South pit remains below its MOV and the pit levee wall.
- Under the P90 trace (10% exceedance probability (wet)), the Zabeel South pit is predicted to pond against pit levee wall from mid-December 2023 but remains below its MOV.
- Under the P99 trace (1%ile exceedance probability (very wet)), the Zabeel South pit is predicted to pond against pit levee wall by late November 2023 and reach its MOV by early December 2023. Inundation of Zabeel North pit is predicted in December 2023. Water from Zabeel South pit to Zabeel North pit and/or Danehill pits may be required to maintain Zabeel South pit at its MOV.

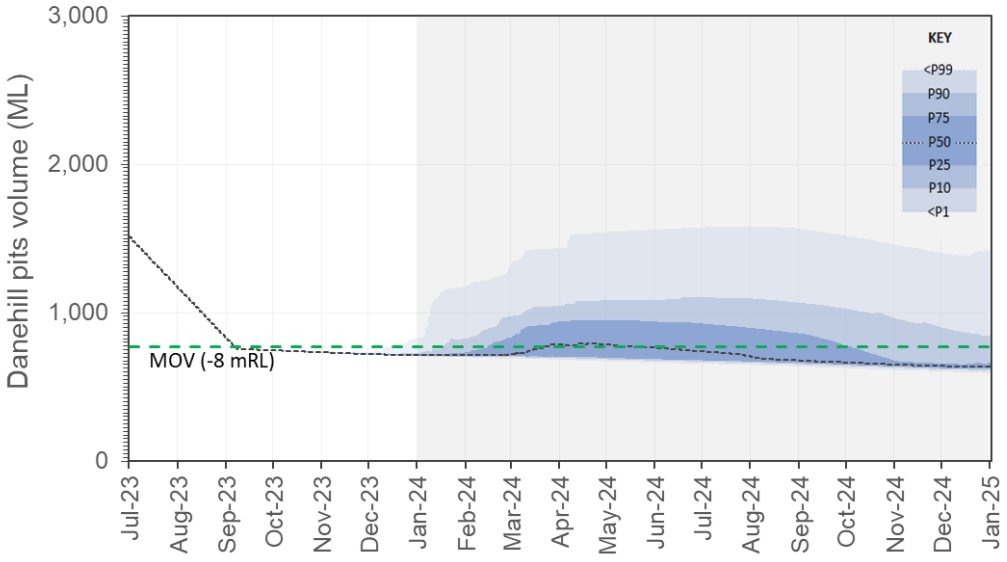
RSPB01 is predicted to be empty by August 2023 and RSPB02 is expected to meet haul road dust suppression demand for all climatic scenarios.

3.2.2 Remaining MMP Period (January 2024 to December 2024)

- The predicted Danehill pit behaviour during remaining MMP period include:
    - Under the P50 trace (50% exceedance probability), the combined Danehill pit starts collecting rainfall runoff water around March 2024 and predicted to reach its peak volume of 810 ML in April 2024.

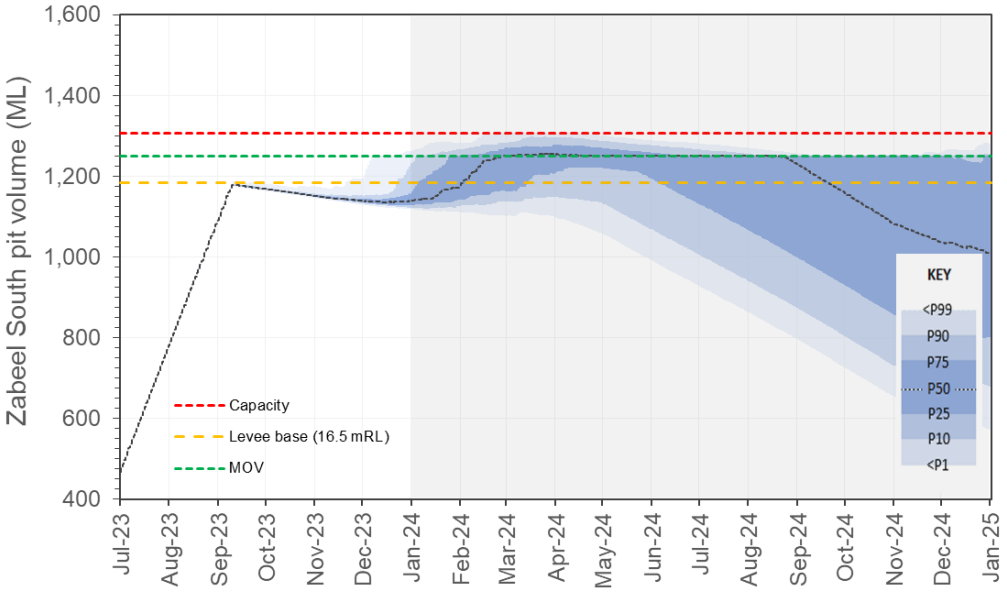
- Under the P90 trace (10% exceedance probability (wet)), the combined Danehill pit starts collecting rainfall runoff water from January 2024 and predicted to reach up to 1,100 ML during 2024 wet season.
- Under the P99 trace (1%ile exceedance probability (very wet)), Danehill starts collecting water from December 2023 (MMP amendment period) and reach up to 1,680 ML during 2024 wet season.

- The predicted Zabeel pits behaviour during remaining MMP period include:
  - Under the P50 trace (50% exceedance probability), the Zabeel South pit starts at 1,140 ML and reaches its MOV in late February, disrupting Zabeel north pit dewatering. Zabeel north pit starts collecting water around February but is not predicted to be inundated.
  - Under the P90 trace (10% exceedance probability (wet)), the Zabeel South pit starts at 1,230 ML and reaches MOV in early January 2024. Disruption to Zabeel north pit is predicted to occur from January 2024 to August 2024 due to unavailability of Zabeel south for pit dewatering. Spillage of Zabeel south is not predicted to occur. Dewatering of Zabeel pits to combined Danehill pit may be required to avoid inundation of Zabeel north pit.
  - Under the P99 trace (1%ile exceedance probability (very wet)), the Zabeel South pit starts at 1,260 ML and is predicted to spill by mid-February 2024. Zabeel North pit is predicted to be inundated from Mid-December 2023 (MMP amendment period) to October 2024 due to unavailability of Zabeel South pit for dewatering.
- Zabeel South pit is predicted to spill to environment in 13 of the 131 modelled climatic sequences during the 2023/24 wet season (i.e., approximately 10% probability) unless it is dewatered.
- The predicted RBSP01 and RBSP02 behaviour during remaining MMP period include:
  - Under the P50 trace (50% exceedance probability), RBSP01 is predicted to be empty and RBSP02 is predicted to be 140 ML at the start of remaining MMP period. The mine water dams can supply haul road dust suppression demand till July 2024 from water collected over 2024 wet season, after which pit water will be used to meet the demand.
  - Under the P99 trace (1% exceedance probability (very wet)), RBSP01 is predicted to be at MOV and RBSP02 is predicted to be 310 ML at the start of remaining MMP period. The mine water dams can supply haul road dust suppression for the extended MMP period.
  - Under the P1 trace (99% exceedance probability (very dry)), RBSP01 is predicted to be at empty for the extended MMP period. RBSP02 is predicted to be 110 ML at the start of remaining MMP period and can supply haul road dust suppression till March 2024, after which pit water will be used to meet the demand.
- RSBP02 is predicted to spill to the environment in 3 of the 131 modelled climate sequences (i.e. approximately 2% of the time) during 2023/24 wet season.



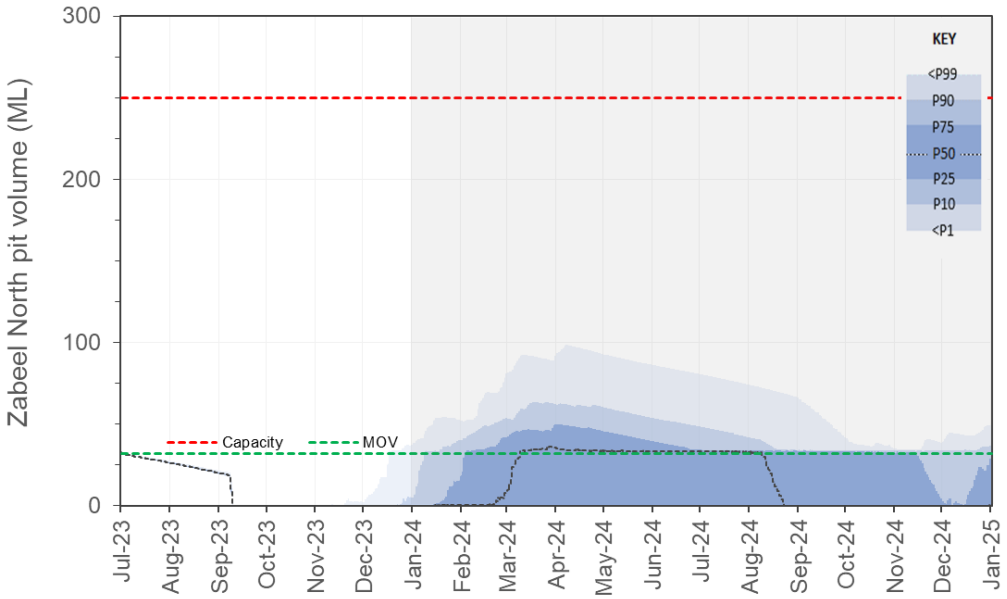
Notes:
1. Results presented for combined NRR storages: Danehill East and Danehill West.
2. Non-shaded area of the chart represents MMP amendment period and shaded area represents remaining MMP period
3. Probablistic model results presented using blue shading.

Figure 1 – Danehill pits forecast storage inventory



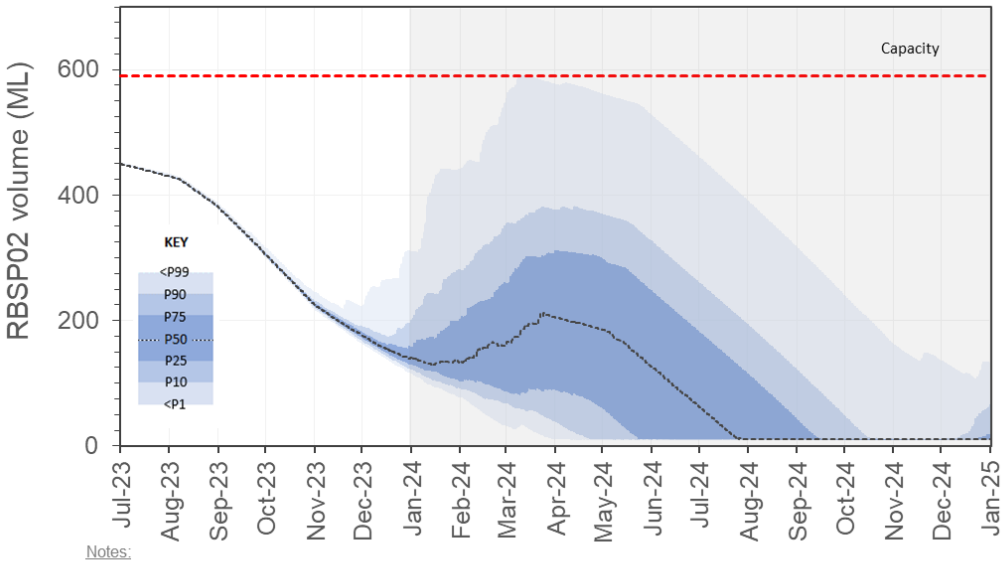
Notes:
1. Non-shaded area of the chart represents MMP amendment period and shaded area represents remaining MMP period.
2. Probablistic model results presented using blue shading.

Figure 2 – Zabeel South pit forecast storage inventory



Notes:
1. Non-shaded area of the chart represents MMP amendment priod and shaded area represents remaining MMP period.
2. Probablistic model results presented using blue shading.
3. Change in pit charecteristics due to mining is not modelled.

Figure 3 – Zabeel North pit forecast storage inventory



Notes:
1. Non-shaded area of the chart represents MMP amendment priod and shaded area represents remaining MMP period.
2. Probablistic model results presented using blue shading.

Figure 4 – RBSP02 forecast storage inventory

Regards,

Julian Orth

Principal Engineer

REFERENCES

WRM (2023)	*Nathan River Project Zabeel Surface Water Assessment.* WRM Water & Environment, document number 1547-13-C, March 2023