Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6421/2020/1
Works approval holder	Pilbara Iron Company (Services) Pty Ltd
ACN	107 210 248
Registered business address	152-158 St Georges Terrace PERTH WA 6000
DWER file number	DER2020/000296
Duration	26/02/2021 to 25/08/2025
Date of issue	25/02/2021
Date of amendment	19 April 2024
Premises details	Paraburdoo Iron Ore Mine and Eastern Range Project AML70/246, AG70/4 and AG70/14 ROCKLEA WA 6751

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	**Assessed design capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore	30,000,000 tonnes per annual period
Category 64: Class II putrescible landfill site	5,000 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 19 April 2024, by:

Jarrod Abrahams
Digitally signed by Jarrod Abrahams
Date: 2024.04.19 13:41:43 +08'00'

MANAGER, RESOURCE INDUSTRIES
REGULATORY SERVICES
an officer delegated under section 20 of
the *Environmental Protection Act 1986* (WA)

Works approval history

Date	Reference number	Summary of changes
25/02/2021	W6421/2020/1	Works approval granted.
2/11/2022	W6421/2020/1	Works approval amended to extend time limited operation duration (condition 11) and updated the works approval template.
30/11/2023	W6421/2020/1	Works approval amended to extend commissioning period from 60 calendar days to 150 calendar days under condition 6 and extend the expiry date for an additional 18 months.
19/04/2024	W6421/2020/1	Works approval amended to extend commissioning period from 150 calendar days to 270 calendar days under condition 6 (the duration therefore ceasing on 6 June 2024)

Interpretation

In this works approval:

(a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;

(b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;

(c) where tables are used in a condition, each row in a table constitutes a separate condition;

(d) any reference to an Australian or other standard, guideline, or code of practice in this works approval:

  (i) if dated, refers to that particular version; and

  (ii) if not dated, refers to the latest version and therefore may be subject to change over time;

(e) unless specified otherwise, any reference to a section of an Act refers to that section of the EP Act; and

(f) unless specified otherwise, all definitions are in accordance with the EP Act.

NOTE: This works approval requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this works approval.

Works approval conditions

The works approval holder must ensure that the following conditions are complied with:

Construction phase

Infrastructure and equipment

1. The works approval holder must:

(a) construct and/or install the infrastructure and/or equipment;

(b) in accordance with the corresponding design and construction / installation requirements; and

(c) at the corresponding infrastructure location,

(a)as set out in Table 1.

Table 1: Design and construction / installation requirements

Infrastructure	Design and construction / installation requirements	Infrastructure location
All	Areas cleared only as required to reduce open areas.	Located within Schedule 1, Figure 1.
TSF1 Northern Cell		
TSF1 Northern Cell	• 2 m upstream raise of the confining embankments from RL 371 m AHD to RL 373 m AHD. • 7 m wide crest. • 1V:3H batters. • Homogeneous embankment constructed from select fill (non-dispersive). • Contain inflows from a 1:100 Annual Exceedance Probability, 72 hour flood duration.	As depicted in Schedule 1, Figure 1 'TSF1 North Cell', Figure 2 'Northern Cell Main Embankment' and Figure 3.
Tailings deposition pipeline	• Existing HDPE lined carbon steel pipe, approximately 3.2 km long which ties into the TSF perimeter pipelines. • Flow meter installed at the end of the pipeline to provide leak detection capabilities. • Sumps in low areas along the pipeline route to contain spillages.	As depicted in Schedule 1 Figure 2 'Waste Fines Pipeline' and Figure 4 – existing deposition pipeline (light blue dotted line).
TSF perimeter pipelines	• Installed downstream of the existing tailings deposition pipeline.	As depicted in Schedule 1 Figure 4 (green dotted line).
Return water transfer pipeline	• DN355 PN10 HDPE pipe for the first 2,660 m before an air and vacuum release valve, where the water flows under gravity for the remaining 3,200 m in a DN250 PN8 HDPE pipe to the process water tank.	As depicted in Schedule 1 Figure 4 (dark blue dotted line).

Infrastructure	Design and construction / installation requirements	Infrastructure location
	• Flow meter installed at the pump station. • Pressure transmitters are included at the pump station. • Sumps in low areas along the pipeline route to contain spillages.	
Spigots	• Network of spigots located at 40 to 80 m centres around the cell perimeter. • Beach slope of 0.5% to 0.7%.	As depicted in Schedule 1 Figure 5.
Return water sump	• Maximum operational capacity (base of pond to invert of spillway) of 3,300 m^3. • Total volume of 5,000 m^3. • Covered with shotcrete extending 1 m from the crest of the embankment. • Shotcrete is 150 mm thick at the return water sump base and on the spillway embankment and 100 mm thick for all other areas. • The spillway invert is 349.7 m AHD and the 300 mm thick spillway discharge rock protection extends for 10 m. • Return water sump spillway/overflow drain designed to prevent the return water sump from overtopping and the overflow drain has a cross sectional area of approximately 0.8 m^2 and an estimated discharge capacity of 4 m^3/s.	As depicted in Schedule 1 Figure 6.
Decant system	• Skid/trailer mounted pump and floating suction turret system centrally located on a permanent decant causeway.	As depicted in Schedule 1 Figure 7.
Landfill Facilities		
4EE Waste Dump Landfill	• 3,000 tonnes per annual period. • Drive-in trenches • Trenches 30 m x 50 m x 3 m. • Tipping area less than 30 m. • Earthen bund constructed around the perimeter to divert surface water flows away from the landfill and prevent stormwater from coming into contact with waste. • A sump or bunding constructed to collect any surface water that has come into contact with waste.	As depicted in Schedule 1, Figures 1 and 2 'Proposed Landfill Area'.
Subsequent Landfill Facilities	Landfill facilities will have the following location requirements:	Located within Schedule 1, Figure 1.

Infrastructure	Design and construction / installation requirements	Infrastructure location
	• Located within prescribed premises boundary. • Not located within an Environmentally Sensitive Area. • Located more than 100 m from any permanent or perennial watercourse. • Located so that vertical distance between the waste and the highest seasonal and expected post mining ground water level is no less than 3 m (waste dump landfill) or 10 m (putrescible landfill). Landfill facilities will have the following requirements: • Signage erected which clearly indicates types of waste accepted for burial. • Stormwater management structures (i.e. bunding) to divert surface water flows away from the landfill. • A sump or bunding within the landfill to collect any surface water that has come into contact with waste. • Firebreak at least 3 m in width around the perimeter of the putrescible landfill. • Putrescible landfill will be fenced to an appropriate height, gated and locked and the fencing will be regularly inspected for damage and cleared of waste.	

Compliance reporting

2. The works approval holder must within 30 calendar days of an item of infrastructure or equipment required by condition 1 being constructed and/or installed:

(a) undertake an audit of their compliance with the requirements of condition 1; and

(b) prepare and submit to the CEO an Environmental Compliance Report on that compliance.

3. The Environmental Compliance Report required by condition 2, must include as a minimum the following:

(a) certification by a suitably qualified and experienced Engineer (eligible for membership of the Institute of Engineers, Australia) that the items of infrastructure or component(s) thereof, as specified in condition 1, have been constructed in accordance with the relevant requirements specified in condition 1;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 1; and

(c) be signed by a person authorised to represent the works approval holder and contains the printed name and position of that person.

4. Where an item of infrastructure has been certified as not being located or constructed, or does not comply with the corresponding requirements, the works approval holder must correct the non-compliant or defective works, prior to re-certifying, or provide to the CEO a description of, and explanation for, any departures from the requirements specified in condition 1 that do not require relocation or rectification and do not constitute a material defect along with the Environmental Compliance Report.

Environmental commissioning phase

Environmental commissioning requirements

5. The works approval holder may only commence environmental commissioning of an item of infrastructure listed in condition 6 once the Environmental Compliance Report has been submitted for that item of infrastructure in accordance with condition 2 of this works approval.

6. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 2 may only be carried out:

(a) in accordance with the corresponding commissioning requirements; and

(b) for the corresponding authorised commissioning duration.

Table 2: Environmental commissioning requirements

Infrastructure	Commissioning requirements	Authorised commissioning duration
TSF1 Northern Cell including tailings deposition and return water transfer pipelines and spigots	Subject to completing the requirements for condition 2.	Until 6 June 2024

7. During environmental commissioning, the works approval holder must ensure that the emission(s) specified in Table 3, are discharged only from the corresponding discharge point(s) and only at the corresponding discharge point location(s).

Table 3: Authorised discharge points during commissioning

Emission	Discharge point	Discharge point location
Waste fines	Spigots	As per Schedule 1 Figure 5.

Environmental commissioning reporting

8. The works approval holder must submit to the CEO an Environmental Commissioning Report within 30 calendar days of the completion date of environmental commissioning for each item of infrastructure specified in Table 2.

9. The works approval holder must ensure the Environmental Commissioning Report required by condition 8 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes and amount of waste fines deposited;

(b) a summary of the environmental performance of each item of infrastructure as constructed or installed;

(c) a review of the works approval holder's performance and compliance against the conditions of this works approval; and

(d) where compliance has not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Time limited operations phase

Commencement and duration

10. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 1:

(a) where the item of infrastructure is not authorised to undertake environmental commissioning, the Environmental Compliance Report as required by condition 2 has been submitted by the works approval holder for that item of infrastructure; and

(b) where the item of infrastructure is authorised to undertake environmental commissioning under condition 6, the Environmental Commissioning Report for that item of infrastructure as required by condition 8 has been submitted by the works approval holder.

11. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 12, Table 4:

(a) for a period not exceeding **270 calendar days** from the day the works approval holder meets the requirements of condition 12, Table 4 for that item of infrastructure: or

(b) until such time as a licence for that item of infrastructure is granted in accordance with Part V of the *Environmental Protection Act 1986*, if one is granted before the end of the period specified in condition 11(a).

Time limited operations requirements

12. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 4 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 4.

Table 4: Infrastructure and equipment requirements during time limited operations

Site infrastructure and equipment	Operational requirement	Infrastructure location
TSF1 Northern Cell	• Embankment of RL 373 m AHD. • 1:100 Annual Exceedance Probability, 72 hour flood duration. • Maintain a minimum total freeboard of 500 mm. • Continuous volume of tailings discharge recorded and to location, while discharging. • Decant pond radius of 300 m (distance to embankment 650 m; distance to exclusion zone 450 m). • Deposition occurs in batches along the	As depicted in Schedule 1, Figures 1 and 2 'TSF1 North Cell' and Figure 3.

Site infrastructure and equipment	Operational requirement	Infrastructure location
	perimeter. • Beach slope of 0.5% to 0.7%. • Decant rate of 180,000 m^3/month to 222,000 m^3/month.	
Landfills	• Landfill facilities (waste dump and putrescible) to have a combined maximum capacity of <5,000 tonnes per annual period. • Only accept approved types of waste as authorised under the existing licence L5275/1972/12. • Waste disposed to landfill facilities recorded. • Tipping area of the putrescible landfill not greater than 30 m in length and 3 m above the ground level height. Waste in the landfill facilities will be covered: • Weekly (putrescible landfill) to at least 200 mm so that no waste is left exposed (including at final landform design). • On an ad-hoc basis (waste dump landfill) when required, to at least 200 mm at final landform design.	Located within Schedule 1, Figure 1.

Monitoring during time limited operations

13. The works approval holder must monitor the groundwater during time limited operations in accordance with Schedule 2: Monitoring.

Specified actions

14. During the first **30 days** of time limited operations, the works approval holder must collect at least 10 individual representative tailings samples, including pore water, to determine the likely behaviour of elements under a range of leaching conditions, which may include, but not be limited to:

(a) Testing using the LEAF Test Method 1313 pH-dependent leaching test (United States Environmental Protection Agency, 2017);

(b) Geotechnical characterisation of tailings including: particle size distribution, volume of solids, settling test (drained and undrained), air drying test and hydraulic conductivity of the same tailings tested in (a); and

(c) Testing for the contaminants listed in Table 5.

All test results shall be collated and provided in a report to the CEO no later than **60 days** after the sample results become available.

Table 5: Tailings characterisation parameters

Stream	Contaminants		
Tailings leachate and pore water (mg/L)	Ag - Silver	Fe – Iron	Sb – Antimony
	Al – Aluminium	Hg – Mercury	Se – Selenium
	As – Arsenic	K – Potassium	Si - Silicon
	Ba – Barium	Mg – Magnesium	Sn - Tin
	B - Boron	Mn - Manganese	Sr - Strontium
	C total – Carbon total	Mo – Molybdenum	Zn – Zinc
	C carbonate – Carbon carbonate	Na – Sodium	TDS (total dissolved solids)
	Ca – Calcium	Ni – Nickel	Total Nitrogen
	Cd – Cadmium	P – Phosphorus	Sulfur total
	Co - Cobalt	Pb – Lead	SO_4^{-2} – Sulphate
	Cr – Chromium	Cu – Copper	Acrylamide
Tailings leachate and pore water (pH units)	pH		

Inspections

15. The works approval holder must conduct visual inspections of the infrastructure during commissioning and time limited operations at the frequency specified in Table 6.

Table 6: Inspections of infrastructure

Infrastructure	Type of inspection	Frequency
TSF1 Northern Cell embankment freeboard	To confirm required freeboard capacity is available	Daily
Tailings deposition and return water transfer pipelines	Integrity check / loss of containment	

Time limited operations - compliance reporting

16. The works approval holder must submit to the CEO a report on the time limited operations within **60 calendar days** of the completion date of time limited operations

17. The works approval holder must ensure the report required by condition 16 includes the following:

(a) a summary of the time limited operations, including timeframes;

(b) waste fines density (solid vs water content);

(c) water balance over the TSF1 Northern Cell including site rainfall, evaporation rate, volume of tailings deposited, decant water recovery volumes and estimate of seepage losses;

(d) a summary of the monitoring results obtained during time limited operations under condition 13.

(e) a summary of the environmental performance of all infrastructure as constructed or installed (as applicable), which includes records detailing the:

(i) operations of the infrastructure; and

(ii) testing the infrastructure.

(f) a review of performance against the works approval; and

(g) where they have not been met, measures proposed to meet the manufacturer's design specifications and the conditions of this works approval, together with timeframes for implementing the proposed measures.

Records and reporting

18. The works approval holder must record the following information in relation to complaints received by the works approval holder (whether received directly from a complainant or forwarded to them by the Department or another party) about any alleged emissions from the premises:

(a) the name and contact details of the complainant, (if provided);

(b) the time and date of the complaint;

(c) the complete details of the complaint and any other concerns or other issues raised; and

(d) the complete details and dates of any action taken by the works approval holder to investigate or respond to any complaint.

19. The works approval holder must maintain accurate and auditable books including the following records, information, reports, and data required by this works approval:

(a) the works conducted in accordance with condition 1;

(b) any maintenance of infrastructure that is performed in the course of complying with conditions of this works approval;

(c) monitoring results recorded in accordance with condition 13;

(d) comparison of the data from condition 13 with the *ANZECC 2000* 95% level of species protection for freshwater ecosystems;

(e) visual inspections undertaken in accordance with condition 15; and

(f) complaints received under condition 18.

20. The books specified under condition 19 must:

(a) be legible;

(b) if amended, be amended in such a way that the original version(s) and any subsequent amendments remain legible and are capable of retrieval;

(c) be retained by the works approval holder for the duration of the works approval; and

(d) be available to be produced to an inspector or the CEO as required.

Definitions

In this works approval, the terms in Table 7 have the meanings defined.

Table 7: Definitions

Term	Definition
annual period	a 12 month period commencing from 1 January until 31 December in the same year.
AHD	Australian Height Datum.
ANZECC 2000	means the Australian and New Zealand Environment and Conservation Council (ANZECC) and the Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) 2000, *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*, National Water Quality Management Strategy; no. 4.
AS/NZS 5667.1	Australian/New Zealand Standard 5667.1:1998 *Water quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples*.
AS/NZS 5667.11	Australian/New Zealand Standard 5667.11:1998 *Water Quality – Sampling – Guidance on Sampling of Groundwaters*.
books	has the same meaning given to that term under the EP Act.
CEO	means Chief Executive Officer. CEO for the purposes of notification means: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Part V Division 3 of the EP Act.
discharge	has the same meaning given to that term under the EP Act.
emission	has the same meaning given to that term under the EP Act.
Engineering / geotechnical specialist	means a person who: (a) holds a tertiary academic qualification in geotechnical science or engineering; and (b) has a minimum of 5 years of experience working in the field of geoscience.
environmental commissioning	means the sequence of activities to be undertaken to test equipment integrity and operation, or to determine the environmental performance, of equipment and infrastructure to establish or test a steady state operation and confirm design specifications.
Environmental	means a report on any commissioning activities that have taken place

Term	Definition
Commissioning Report	and a demonstration that they have concluded, with focus on emissions and discharges, waste containment, and other environmental factors.
Environmental Compliance Report	means a report to satisfy the CEO that the conditioned infrastructure and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
HDPE	high density polyethylene.
LEAF	means Leaching Environmental Assessment Framework.
mbgl	metres below ground level.
Method 1313	means Method 1313: Liquid-Solid Partitioning as a Function of Extract pH using a Parallel Batch Extraction Procedure.
premises	the premises to which this works approval applies, as specified at the front of this works approval and as shown on the premises map (Figure 1) in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
SWL	Standing Water Level.
time limited operations	refers to the operation of the infrastructure and equipment identified under this works approval that is authorised for that purpose, subject to the relevant conditions.
TSF1	Tailings Storage Facility 1.
waste	has the same meaning given to that term under the EP Act.
works approval	refers to this document, which evidences the grant of the works approval by the CEO under section 54 of the EP Act, subject to the conditions.
works approval holder	refers to the occupier of the premises being the person to whom this works approval has been granted, as specified at the front of this works approval.
µS/cm	means microSiemens per centimetre.

END OF CONDITIONS

Schedule 1: Maps

Premises map

The boundary of the prescribed premises is shown in the map below (Figure 1).

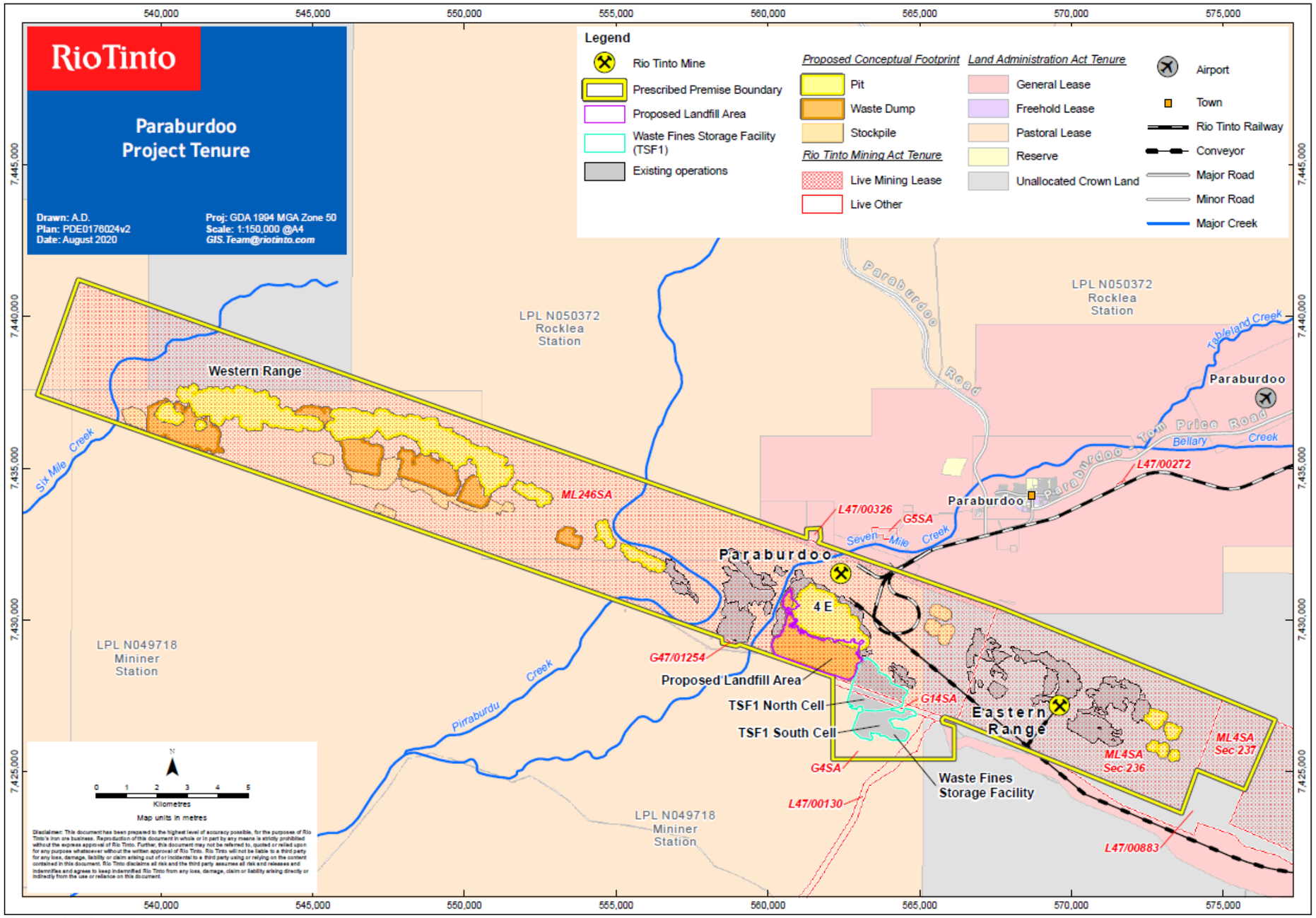

Figure 1: Map of the boundary of the prescribed premises

Infrastructure

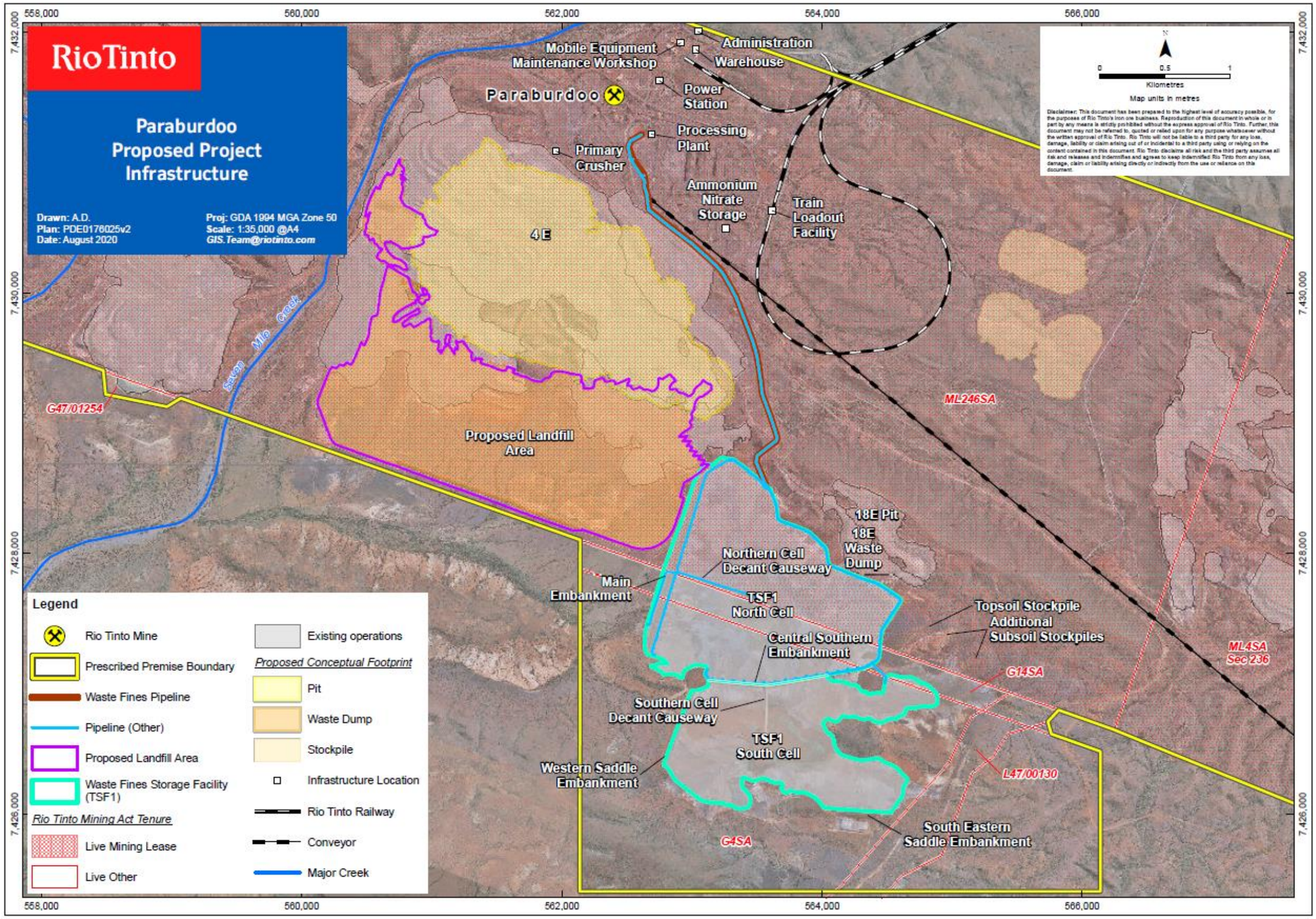

Figure 2: Map of infrastructure

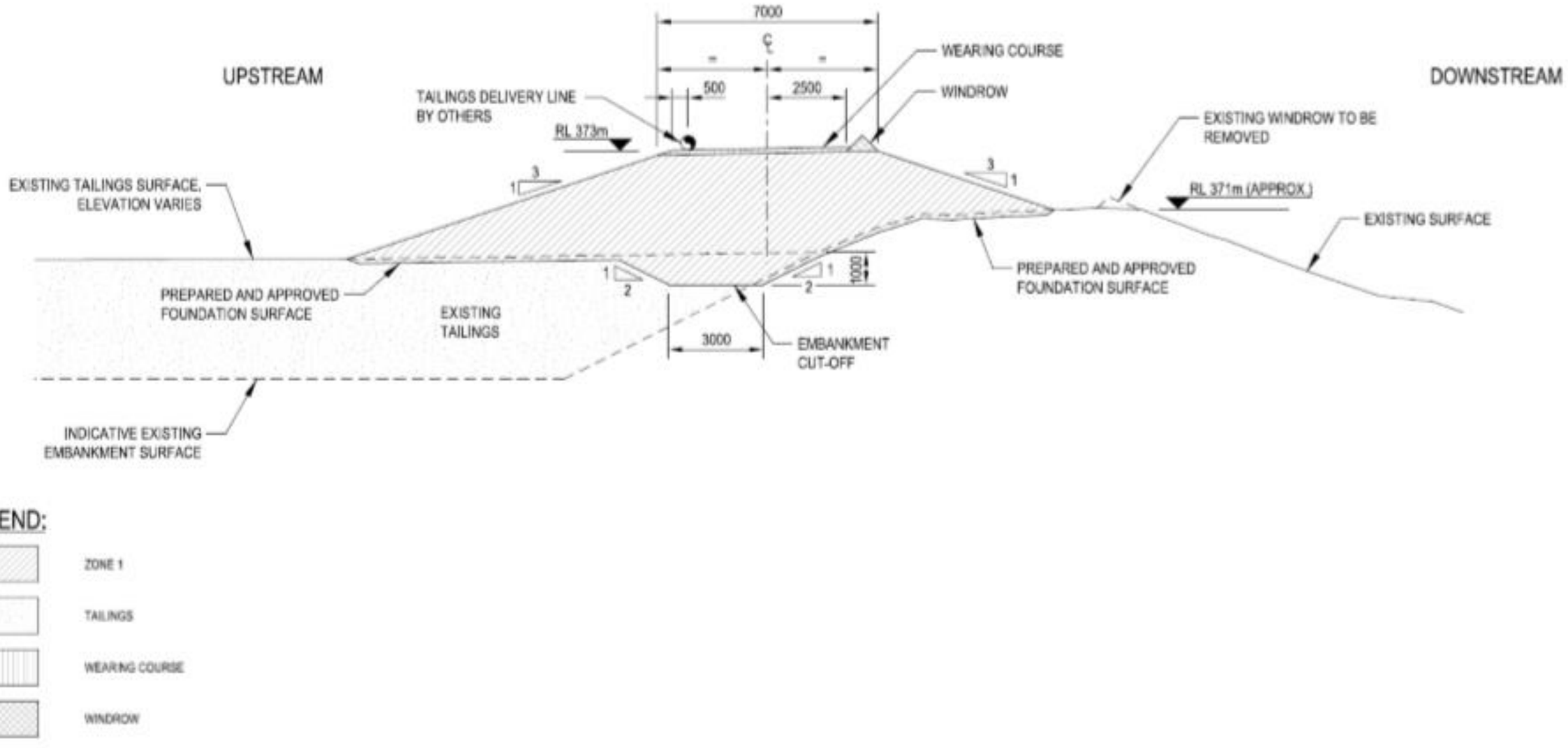

Figure 3: TSF1 Northern Cell – embankment raise

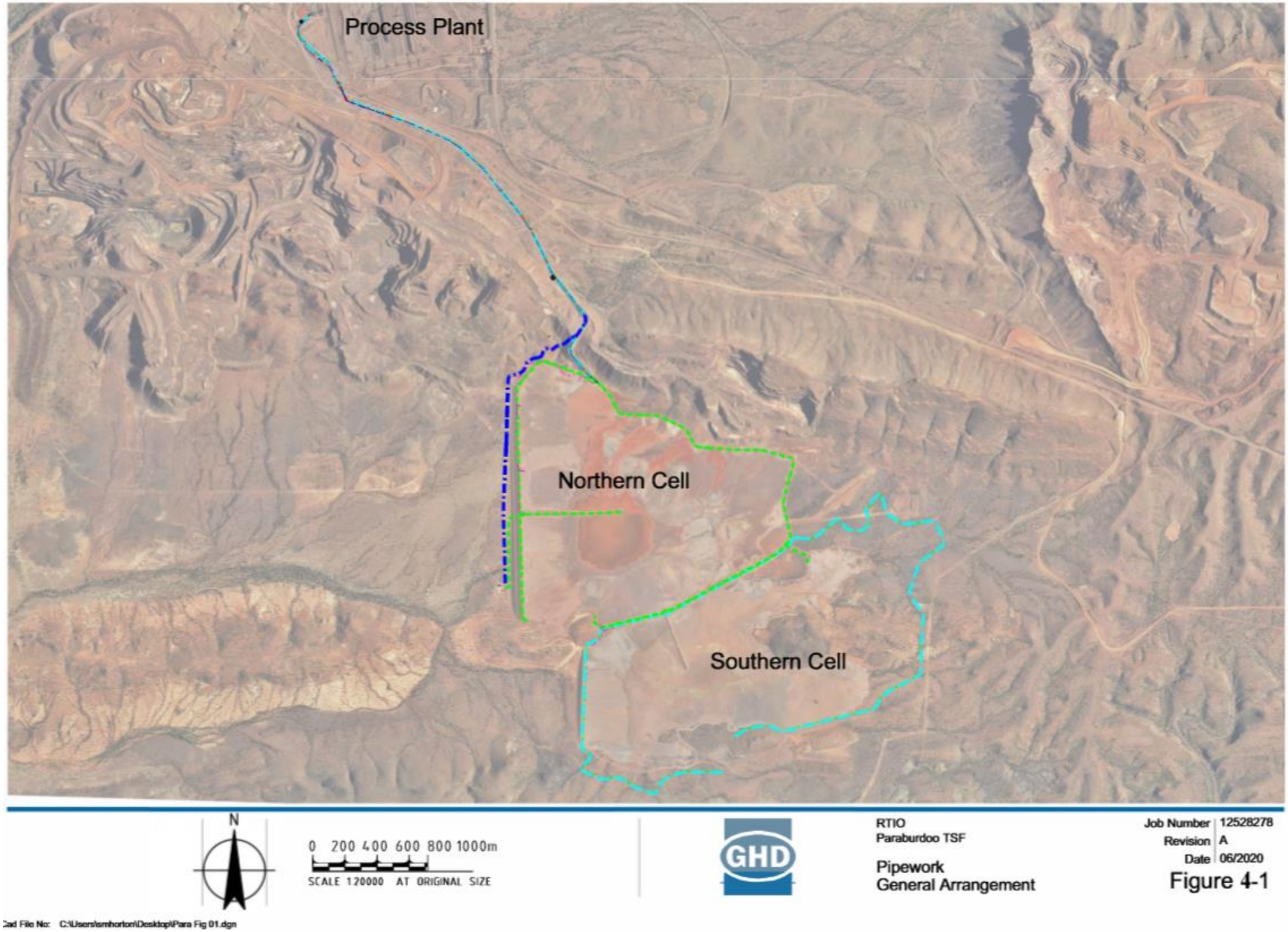

Figure 4: Pipework general arrangement

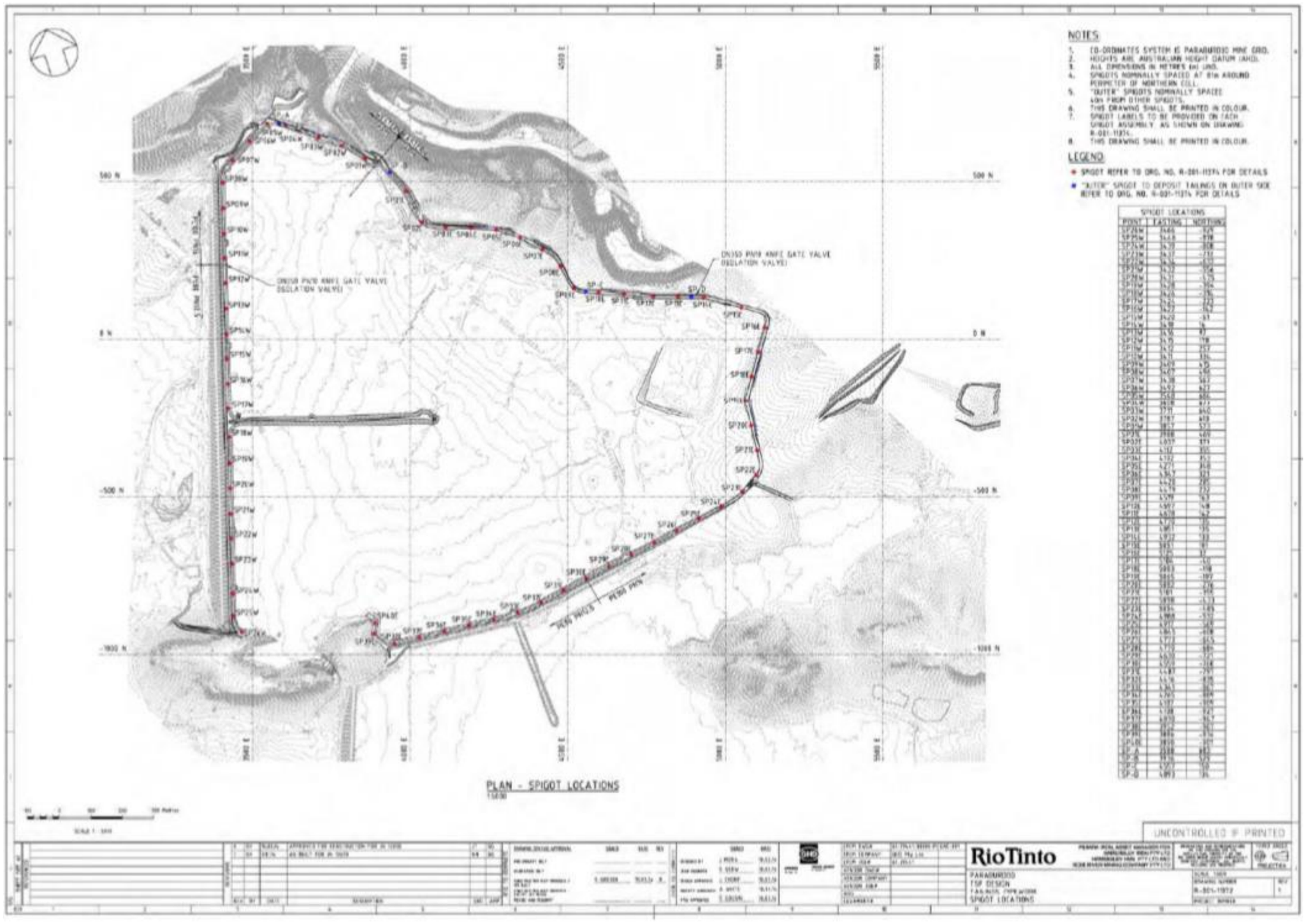

Figure 5: TSF1 Northern Cell deposition system

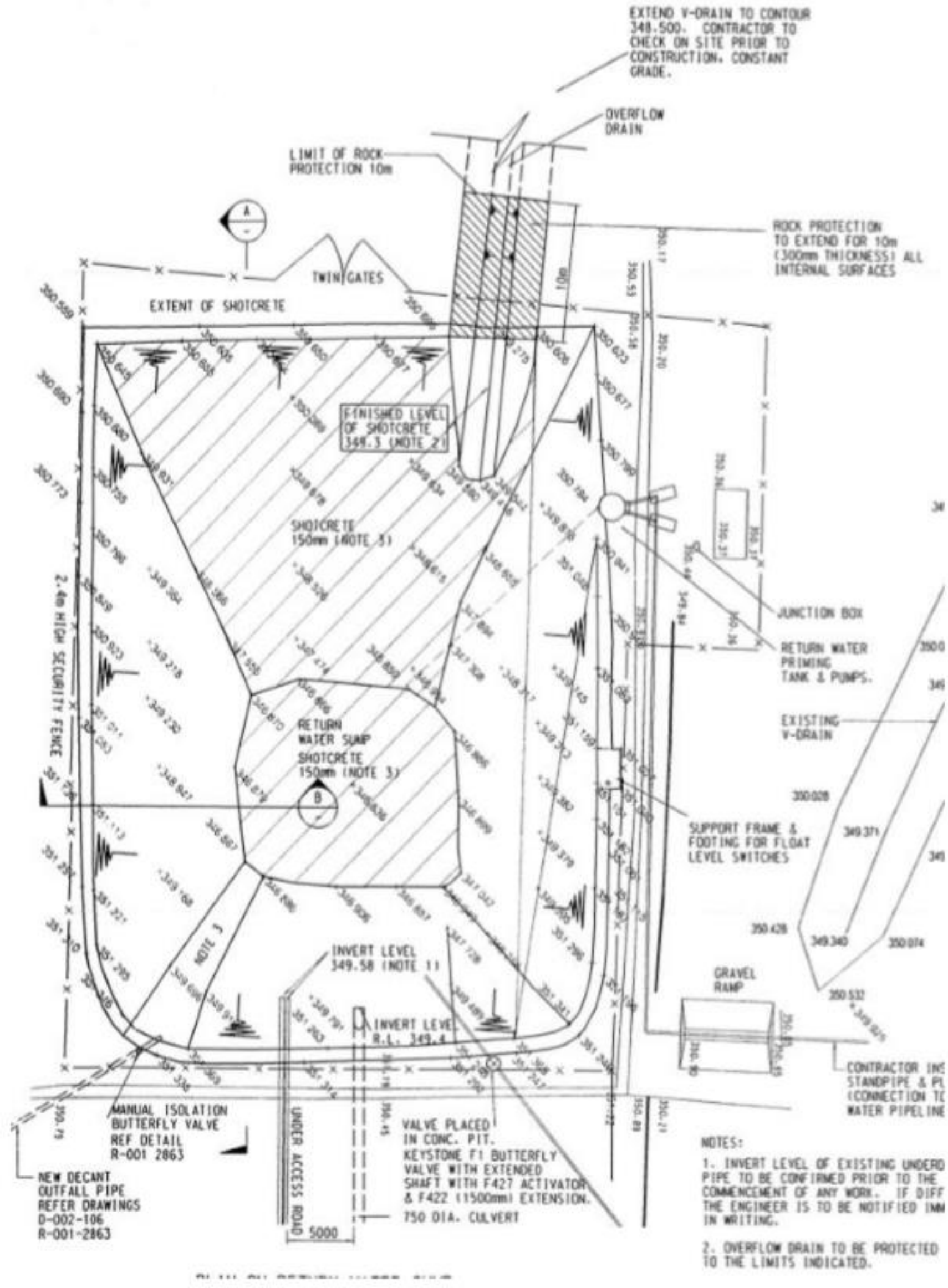

Figure 6: Proposed return water sump

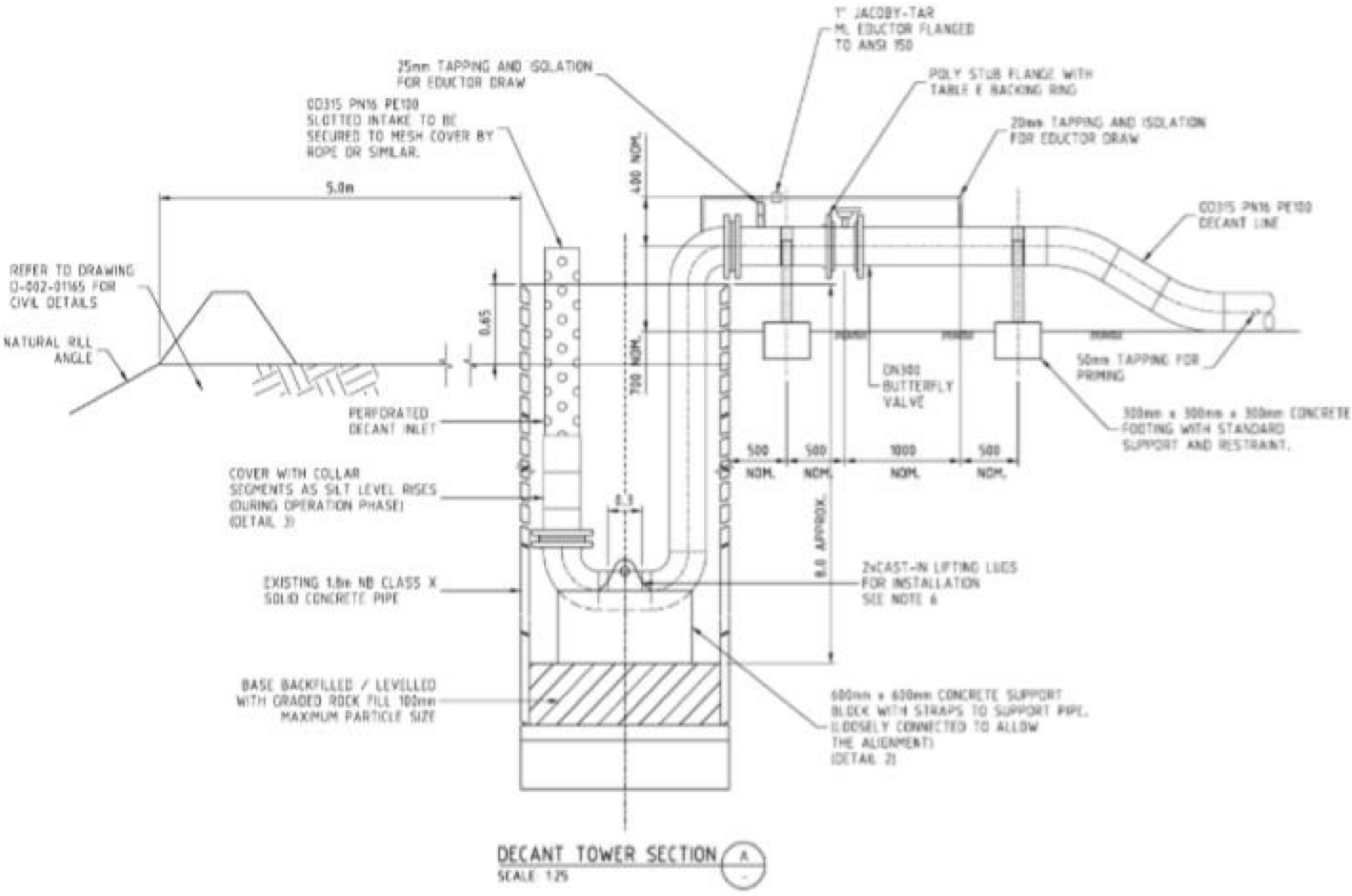

Figure 7: Proposed decant system layout

Monitoring

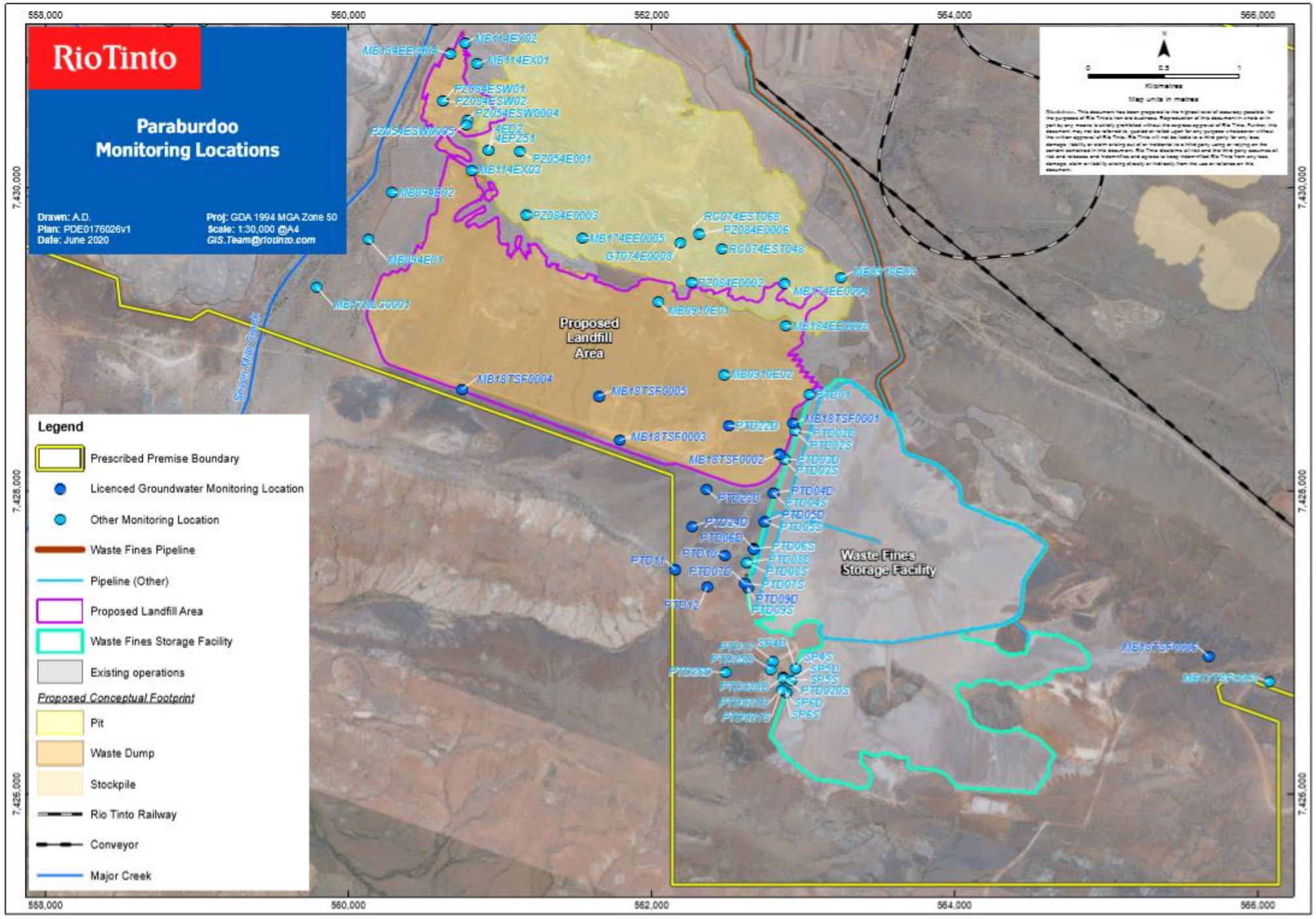

Figure 8: Groundwater monitoring bore location

Schedule 2: Monitoring

Monitoring location	Parameter	Unit	Frequency	Averaging period	Method
MB18TSF0001 MT18TSF0002 MB18TSF0003 MB18TSF0004 MB18TSF0005 MB18TSF0006 PTD04D PTD05D PTD06D PTD07D PTD08D PTD09D PTD10 PTD11 PTD12 PTD021D PTD22D PTD23D PTD24D PTD26D As depicted in Schedule 1, Figure 8.	SWL	mbgl	Quarterly during time limited operations	Spot sample	AS/NZS 5667.1 AS/NZS 5667.11
	pH[1]	pH units			
	Electrical Conductivity[1]	µS/cm			
	Total Dissolved Solids	mg/L			
	Alkalinity (CaCO3)				
	Acrylamide				
	Nutrients: Nitrate as N Nitrite as N Reactive Phosphorus				
	Major ions: Calcium Chloride Fluoride Magnesium Potassium Sodium Sulfate				
	Metals / metalloids: Aluminium Antimony Arsenic Barium Boron Cadmium Chromium Cobalt Copper Iron Lead Manganese Mercury Molybdenum Nickel				

Monitoring location	Parameter	Unit	Frequency	Averaging period	Method
	Selenium Silver Strontium Tin Uranium Vanadium Zinc				

Note 1: In-field non-NATA accredited analysis permitted