Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6760/2022/1
Works approval holder **ACN**	Round Oak Jaguar Pty Ltd 060 620 751
Registered business address	HQ South Tower Suite 22, Level 2, 520 Wickham Street, Fortitude Valley, QLD, 4006
DWER file number	DER2022/000546
Duration	23/03/2023 to 23/03/2028
Date of issue	23 March 2023
Premises details	Jaguar Operation – Tailings Storage Facility 3 Mining tenements M37/44, M37/1257 and M37/1153 LEONORA WA 6438 as depicted in Schedule 1

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed production / design capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore: premises on which – (a) metallic or non-metallic ore is crushed, ground, milled or otherwise processed; (b) tailings from metallic or non-metallic ore are reprocessed; or (c) tailings or residue from metallic or non-metallic ore are discharged into a containment cell or dam.	3,200,000 tonnes per year

This works approval is granted to the works approval holder, subject to the attached conditions, on 23 March 2023, by:

Christine Pustkuchen
Digitally signed by Christine Pustkuchen
Date: 2023.03.23 14:54:16 +08'00'

A/MANAGER, RESOURCE INDUSTRIES REGULATORY SERVICES

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

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 the critical containment infrastructure;

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

(c) at the corresponding infrastructure location,

as set out in Table 1.

Table 1: Critical containment infrastructure design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location
1.	Jaguar TSF3 starter embankment (initial stage)	(a) To comprise of two approximately parallel embankments, connecting to existing TSF2 to the south and meeting elevated natural ground surface in accordance with Figure 3 of Schedule 1. (b) The embankment is to comprise of a low permeability compacted clayey mine waste zone and a traffic compacted mine waste rock zone. (c) The embankment area and internal basin foundation area of TSF3 must be ripped, moisture conditioned and compacted. (d) Embankment height to be constructed up to RL 472.0m. (e) The target minimum permeability of the embankment is to be 1 x 10^{-7} m/s. (f) A cut-off trench with a 2m wide base, filled with compacted clayey mine waste is to be constructed underneath the embankment. (g) The TSF is to be designed to allow for temporary storage capacity a 1:100 Annual Exceedance Probability (AEP) 72-hour storm event, while maintaining a pond level at least 500mm below the embankment crest. (h) The embankment crest to be sheeted with a nominal 100mm thick layer of wearing course material. (i) Vibrating wire piezometers to be installed within embankment. (j) Stormwater from upstream must be diverted away from TSF3. (k) All boreholes in the TSF3 footprint are to be grouted.	Embankment shown as 'starter embankment RL472.0m' in Figure 3 of Schedule 1 Piezometer location shown in Figure 4 and Figure 5 of Schedule 1

	Infrastructure	Design and construction requirements	Infrastructure location
	Decant tower, pump and causeway	(a) Causeway to be constructed of traffic compacted mine waste. (b) Decant tower to comprise of slotted concrete ring structure, surrounded by clean rockfill of nominal 10m radius.	Shown as 'decant causeway' and 'decant structure' in Figure 3 of Schedule 1.
	Underdrainage system	(a) Underdrainage system to comprise of slotted pipe covered in filter sand / fine aggregate wrapped in geotextile and stabilised with coarse aggregate or select rockfill; (b) Underdrainage system to run approximately north-south on the TSF3 basin floor, to the underdrainage/ toe drain collection sumps; with (c) A minimum fall/gradient of the underdrainage pipe is 0.2%	Shown in Figure 3 of Schedule 1.
	South-west and south-east underdrainage/ toe drain collection sumps	(a) Collection sumps to be constructed of concrete with a silt trap. (b) Collection sumps to be equipped with a pump operated by float switch when the collected water reaches a specified level.	Shown as 'collection sump' in Figure 3 of Schedule 1.
	Embankment toe drain	(a) Toe drain to direct collected seepage and stormwater to the underdrainage/ toe drain collection sumps	Shown as 'perimeter toe drain' in Figure 3 of Schedule 1.
	Toe drain protection bund	(a) Toe drain protection bund to be constructed to prevent stormwater from entering TSF3 or the toe drain.	Shown as 'toe drain protection bund' in Figure 3 of Schedule 1.
2.	Tailings and decant pipelines extended from TSF2 to TSF3	(a) Pipelines to have secondary containment adequate to contain any spill for a period equal to the time between routine inspections. (b) Flow meters to be installed at TSF3 end of both tailings and return water pipelines, and telemetry to detect pressure differentials between the process plant and TSF3.	Shown as 'TSF3 tailings line' and 'TSF3 decant line' in Figure 2 of Schedule 1.

2. The works approval holder must:

(a) construct the infrastructure;

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

(c) at the corresponding infrastructure location,

as set out in Table 2.

Table 2: Design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location
1.	Jaguar TSF3 stage 2 embankment lift	(a) Upstream embankment raise by 2.5m to RL 474.5m, plus a new embankment to RL 474.5m across the northern side of the TSF3 footprint (b) Embankment crest to be sheeted with a nominal 100 mm thick layer of wearing course material (c) Decant tower and causeway also lifted by 2.5m to RL 474.5m.	Above the starter embankments constructed according to condition 1, as well as in a straight line between the northern terminuses of those embankments (approximately) as shown by the 'TSF3 tailings line' in Figure 2.
2.	Jaguar TSF3 stage 3 embankment lift	(a) Upstream embankment lift by 2.5m to RL 477m. (b) Embankment crest to be sheeted with a nominal 100 mm thick layer of wearing course material (c) Decant tower and causeway also lifted by 2.5m to RL 477m.	Above the stage 2 embankment constructed according to this condition.

3. The works approval holder must design, construct, and install groundwater monitoring wells in accordance with the requirements specified in Table 3.

Table 3: Infrastructure requirements – groundwater monitoring wells

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
Groundwater monitoring wells 23JGMB025 - 23JGMB038	<u>Well design and construction:</u> Designed and constructed in accordance with *ASTM D5092/D5092M-16: Standard practice for design and installation of groundwater monitoring bores*. Well screens must target the part, or parts, of the aquifer most likely to be affected by contamination[1]. Where temporary/seasonal perched features are present, wells must be nested, and the perched features individually screened.	As depicted in Schedule 1, Figure 6: Proposed groundwater monitoring bore locations	Must be constructed, developed (purged), determined to be operational prior to commencement of time limited operations of the TSF3 starter embankment under condition 13.
	<u>Logging of borehole:</u> Soil samples must be collected and logged during the installation of the monitoring wells. A record of the geology encountered during drilling must be described and classified in accordance with the Australian Standard Geotechnical Site Investigations AS1726. Any observations of staining / odours or other indications of contamination must be included in the bore log.		
	<u>Well construction log:</u>		

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
	Well construction details must be documented within a well construction log to demonstrate compliance with *ASTM D5092/D5092M-16*. The construction logs shall include elevations of the top of casing position to be used as the reference point for water-level measurements, and the elevations of the ground surface protective installations.		
	Well development: All installed monitoring wells must be developed after drilling to remove fine sand, silt, clay and any drilling mud residues from around the well screen to ensure the hydraulic functioning of the well. A detailed record should be kept of well development activities and included in the well construction log.		
	Installation survey: the vertical (top of casing) and horizontal position of each monitoring well must be surveyed and subsequently mapped by a suitably qualified surveyor.		
	Well network map: a well location map (using aerial image overlay) must be prepared and include the location of all monitoring wells in the monitoring network and their respective identification numbers.		

Note 1: refer to Section 8 of Schedule B2 of the *Assessment of Site Contamination NEPM* for guidance on well screen depth and length.

Compliance reporting

4. The works approval holder must within 30 calendar days of all the Critical Containment Infrastructure identified by condition 1 being constructed:

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

(b) prepare and submit to the CEO a Critical Containment Infrastructure Report on that compliance.

5. The Critical Containment Infrastructure Report required by condition 4 must include as a minimum the following:

(a) certification by a suitably qualified engineer that each item of critical containment infrastructure or component thereof, as specified in condition 1, has been built and installed in accordance with the requirements specified in condition 1;

(b) as constructed plans and a detailed site plan showing the location and dimensions for each item of critical containment infrastructure or component thereof, as specified in condition 1;

(c) photographic evidence of the installation of the infrastructure; and

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

6. The works approval holder must within 30 calendar days of an item of infrastructure required by condition 2 being constructed:

(a) undertake an audit of their compliance with the requirements of condition 2; and

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

7. The Environmental Compliance Report required by condition 6, must include as a minimum the following:

(a) certification by a suitably qualified engineer that the infrastructure or component(s) thereof, as specified in condition 2, have been constructed in accordance with the relevant requirements specified in condition 2;

(b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 2; and

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

8. The works approval holder must, within 30 calendar days of the monitoring wells in condition 3 being constructed, submit to the CEO a well construction report evidencing compliance with the requirements of condition 3.

Environmental commissioning phase

Environmental commissioning requirements and emission limits

9. The works approval holder may only commence environmental commissioning for an item of infrastructure specified in Table 4:

(a) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report as required by condition 4 meets the requirements of that condition; or

(b) at least 45 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 4 has been submitted to the CEO.

10. Any environmental commissioning activities undertaken for an item of infrastructure specified in Table 4 may only be carried out:

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

(b) for the corresponding authorised commissioning duration.

Table 4: Environmental commissioning requirements

Infrastructure	Commissioning requirements	Authorised commissioning duration
Tailings and decant pipelines extended from TSF2 to TSF3	(a) Fill pipes with water for static pressure head only, check for leaks and repair/replace if required and retest. (b) Check interlocked flow meters for both tailings and return water lines will trigger alarm in operations room if there is a disparity between their measurements. (c) Run site water through pipes, test for leaks, repair/replace if required and retest. (d) Discharge only to within the TSF3 embankment	For a period not exceeding 14 calendar days in aggregate.

11. 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 4.

12. The works approval holder must ensure the Environmental Commissioning Report required by condition 11 of this works approval includes the following:

(a) a summary of the environmental commissioning activities undertaken, including timeframes and amount of site water used;

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

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

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

Time limited operations phase

Commencement and duration

13. The works approval holder may only commence time limited operations for all the critical containment infrastructure identified in condition 1:

(a) Where the well construction report required by condition 8 has been submitted to the CEO;

(b) where the infrastructure does require commissioning, the Environmental Commissioning Report as required by condition 10 has been submitted to the CEO; and

(c) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report as required by condition 4 meets the requirements of that condition; or

(d) where at least 45 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 4 has been submitted to the CEO.

14. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 2 where the Environmental Compliance Report as required by condition 6 has been submitted by the works approval holder for that item of infrastructure.

15. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 16:

(a) for a period not exceeding 180 calendar days from the day the works approval holder meets the requirements of condition 13 or 14; or

(b) until such time as operation of that infrastructure is authorised under a licence in accordance with Part V of the *Environmental Protection Act 1986*, if this occurs before the end of the period specified in condition 15(a).

Time limited operations requirements and emission limits

16. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 5 and located at the corresponding

infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 5.

Table 5: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Jaguar TSF3 starter embankment (initial stage)	(a) An operational freeboard of 300mm plus beach freeboard, giving a total freeboard of at least 500m below the embankment crest must be maintained at all times. (b) Inspections are to be carried out once every 12 hour shift, with no more than 15 hours between inspections. Inspections to include freeboard, pipeline checks, decant pond management and operation of the underdrainage sumps and sump pumps. (c) Records to be kept of all inspections (d) The supernatant pond shall be kept a minimum distance of 120 m from the perimeter embankment.	Embankment shown as 'starter embankment RL472.0m' in Figure 3Figure 2 of Schedule 1
2.	Tailings and decant pipelines extended from TSF2 to TSF3	(a) Inspections are to be carried out once every 12 hour shift, with no more than 15 hours between inspections. Inspections to include checking for external damage, potential fractures, stress due to temperature extremes, leaking valves, leaking welds or flange / joint leaks. (b) Records are to be kept of all inspections.	Shown as 'TSF3 tailings line' and 'TSF3 decant line' in Figure 2 of Schedule 1.

17. During time limited operations, the works approval holder must ensure that the emission specified in Table 6 are discharged only from the corresponding discharge point and only at the corresponding discharge point location.

Table 6: Authorised discharge points

	Emission	Discharge point	Discharge point location
1.	Tailings	TSF3	Shown as 'Proposed tailings storage facility 3' in Schedule 1, Figure 2.

Process monitoring during time limited operations

18. The works approval holder must monitor emissions during time limited operations in accordance with Table 7.

Table 7: Emissions and discharge monitoring during time limited operations

Discharge point	Parameter	Period	Unit
TSF3	Volume of tailings deposited into the TSF	Each calendar month	Tonnes
	Volumes of water recovered from the TSF		kL
	Volume of seepage water recovered from the TSF		

19. The works approval holder must record the results of all monitoring activity required by condition 18.

Ambient groundwater monitoring during time limited operations

20. The works approval holder shall ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;

(b) all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and

(c) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured (unless indicated otherwise in relevant table).

21. The works approval holder shall ensure that:

(a) monthly monitoring is undertaken at least 15 days apart; and

(b) quarterly monitoring is undertaken at least 45 days apart.

22. The works approval holder must monitor the groundwater during time limited operations for concentrations of the identified parameters in accordance with Table 8.

Table 8: Monitoring of ambient concentrations during time limited operations

Monitoring location	Parameter	Unit	Frequency	Averaging period
TSF3 monitoring bores 23JGMB025 - 23JGMB038	Standing water level	mbgl	Monthly	Spot sample
	cobalt (Co) nickel (Ni) mercury (Hg) antimony (Sb) copper (Cu) zinc (Zn) lead (Pb) thallium (Tl) cadmium (Cd) arsenic (As) selenium (Se) sulfate (SO_4^{2-}) chloride (Cl^-) sodium (Na^+)	mg/L	Quarterly	

Monitoring location	Parameter	Unit	Frequency	Averaging period
	potassium (K^+) calcium (Ca^{2+}) magnesium (Mg^{2+}) carbonate (CO_3^{2-}) bi-carbonate (HCO_3^-)			
	Total alkalinity[1]			
	Total acidity[1]			
	pH[1]	-		
	Total dissolved solids (TDS)	ppm		
	Electrical conductivity (EC)	µSv/cm		

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

23. The works approval holder must record the results of all monitoring activity required by condition 22.

Compliance reporting

24. The works approval holder must submit to the CEO a report on the time limited operations within 30 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is the sooner.

25. The works approval holder must ensure the report required by condition 24 includes the following:

(a) a summary of monitoring results obtained during time limited operations under condition 18 and condition 22;

(b) a summary of the environmental performance of all infrastructure as constructed;

(c) a review of performance and compliance against the conditions of the works approval; and

(d) where the design specifications and the conditions of this works approval have not been met, what measures will the works approval holder take to meet them, and what timeframes will be required to implement those measures.

Records and reporting (general)

26. 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.

27. 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, condition 2 and condition 3;

(b) any activities or maintenance of infrastructure that is performed in the course of complying with condition 16;

(c) monitoring programmes undertaken in accordance with condition 18 and condition 22; and

(d) complaints received under condition 26.

28. The books specified under condition 27 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 9 have the meanings defined.

Table 9: Definitions

Term	Definition
Assessment of Site Contamination NEPM	means the *National Environment Protection (Assessment of Site Contamination) Measure 1999*, as amended from time to time;
AS1726	means the Australian Standard AS1762 *Geotechnical site investigations*, as amended from time to time;
ASTM D5092/D5092M-16	means the ASTM international standard for *Standard practice for design and installation of groundwater monitoring wells (Designation: ASTM D5092/D5092M-16)*, as amended from time to time.
business day	means a normal business day in Western Australia. Monday to Friday, excluding public holidays.
books	has the same meaning given to that term under the EP Act.
calendar day	means every day, including weekends and public holidays
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
condition	a condition to which this works approval is subject under section 62 of the EP Act.
critical containment infrastructure	means the items of infrastructure listed in condition 1.
Critical Containment Infrastructure Report	means a report to satisfy the CEO that works of critical containment infrastructure have been constructed in accordance with the works approval.
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.
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.

Term	Definition
Environmental Commissioning Report	means a report on any commissioning activities that have taken place 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 has been constructed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	Environmental Protection Regulations 1987 (WA).
mbgl	means metres below ground level
mg/L	means milligrams per litre
premises	means the premises to which this licence applies, as specified at the front of this licence 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.
suitably qualified engineer	suitably qualified engineer who holds as a minimum a Bachelor of Engineering recognised by the Australian Institute of Engineers and has a minimum professional experience of three years.
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.
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.

END OF CONDITIONS

Schedule 1: Maps

Premises map

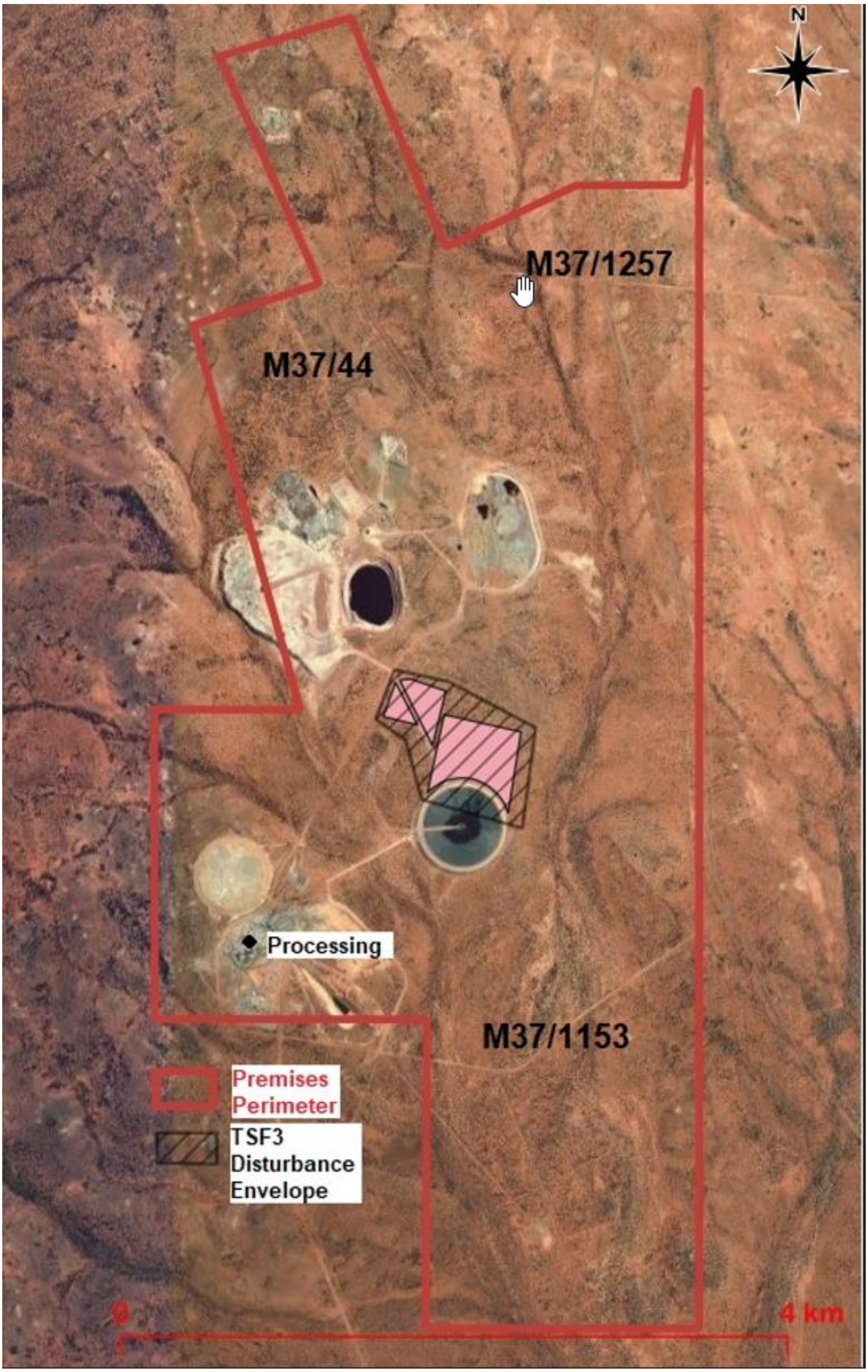


Figure 1: Map of the boundary of the prescribed premises, showing TSF3 disturbance envelope (not only embankment)

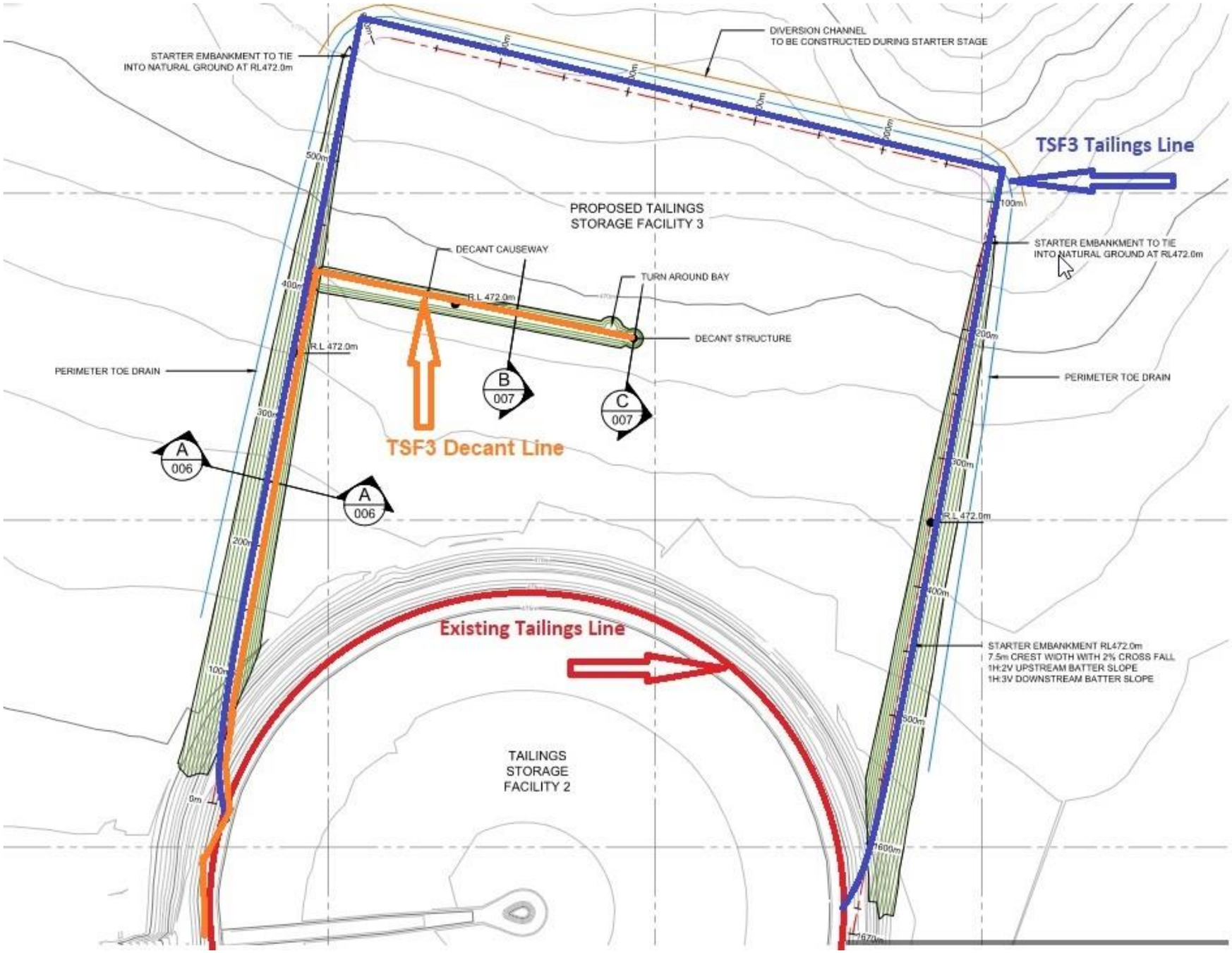


Figure 2: TSF3 embankment location and pipeline layout plan

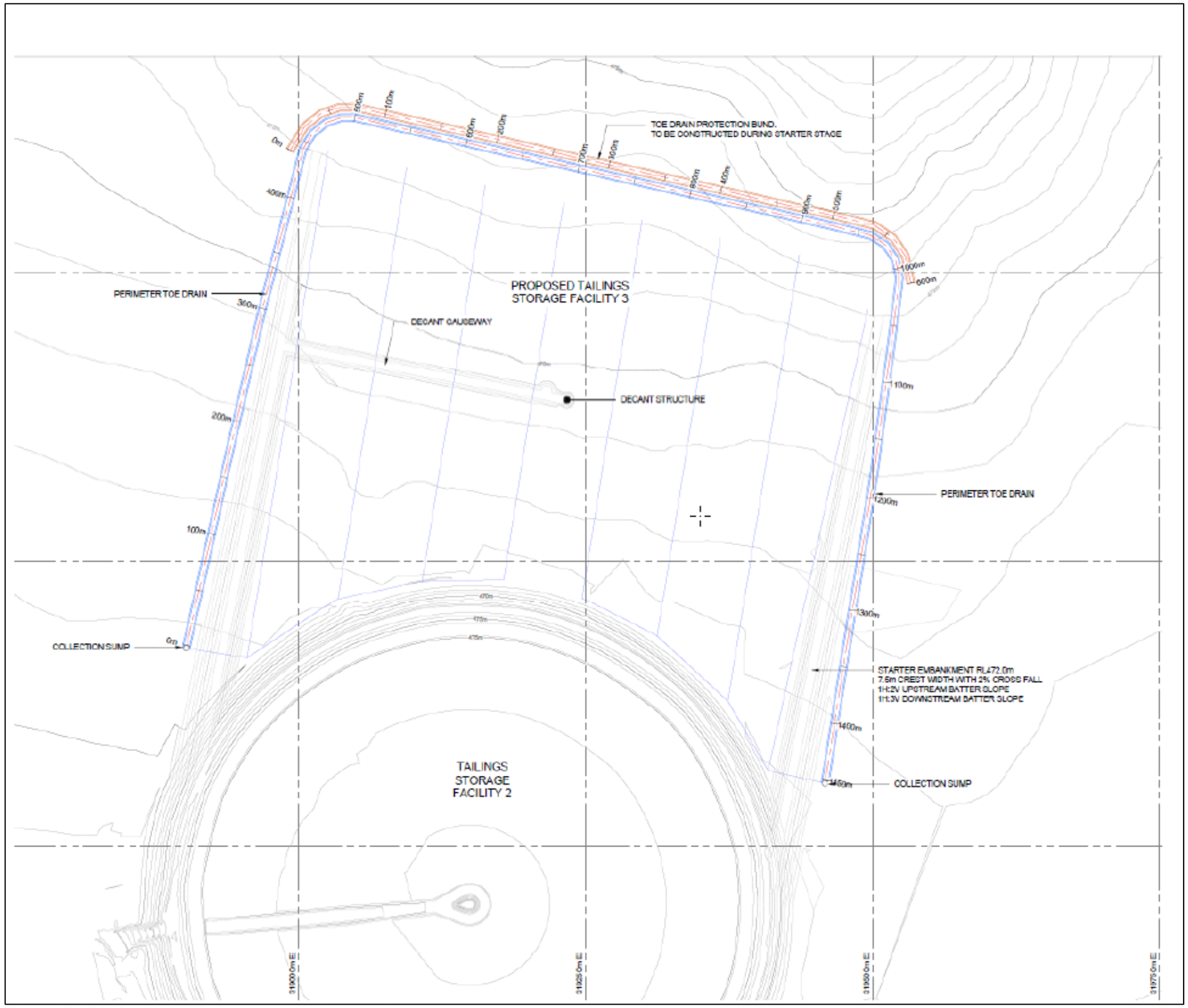
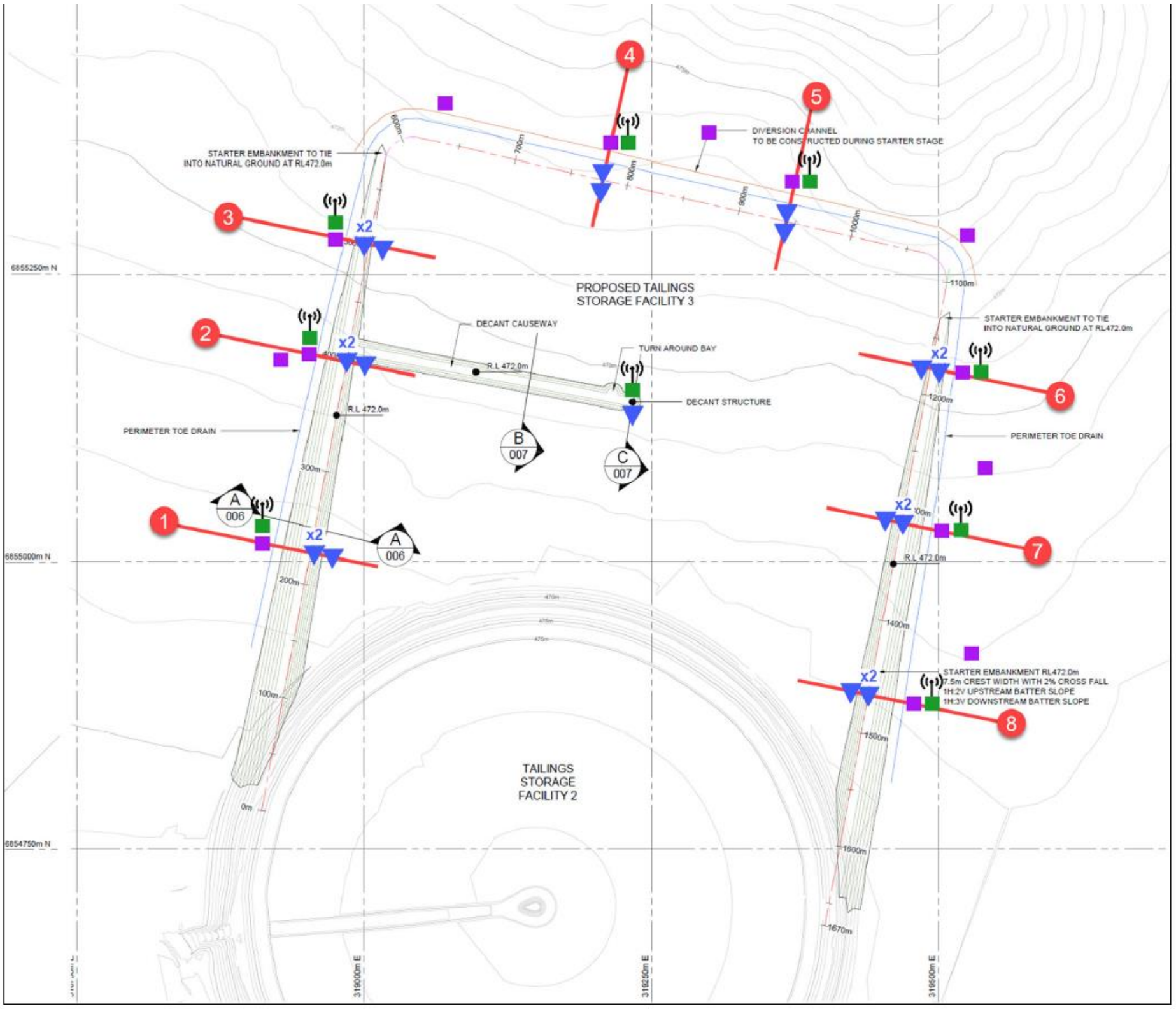


Figure 3: TSF3 underdrainage system layout plan



LEGEND:

2 — **proposed monitoring section**

vibrating wire piezometer (VWP)

monitoring bore (likely to be standpipe piezometer) [design by others]

data logger field station with wireless communication with gateway

Figure 4: Indicative layout of the locations of the groundwater monitoring instrumentation to be installed with TSF3

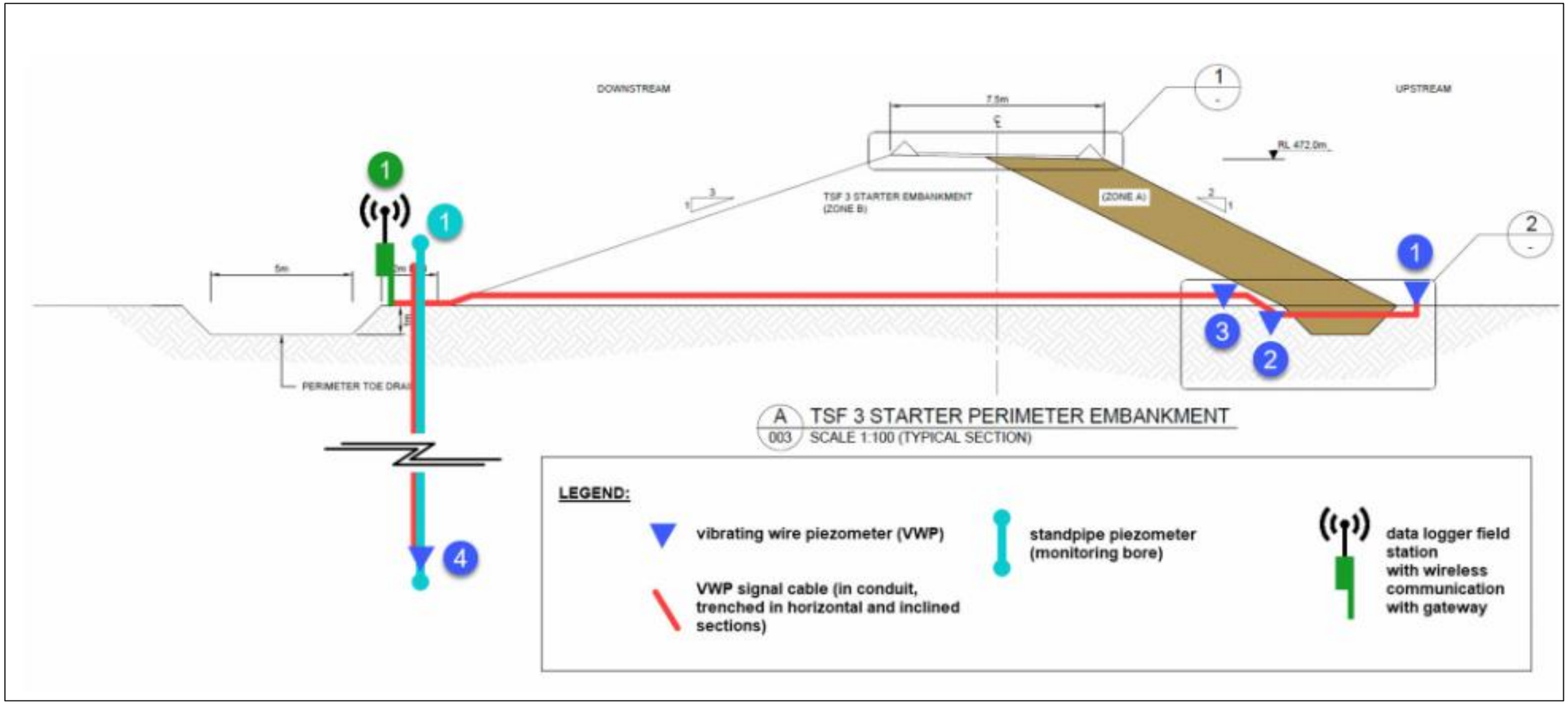


Figure 5: Indicative sectional layout of the locations of the piezometers to be installed with TSF3

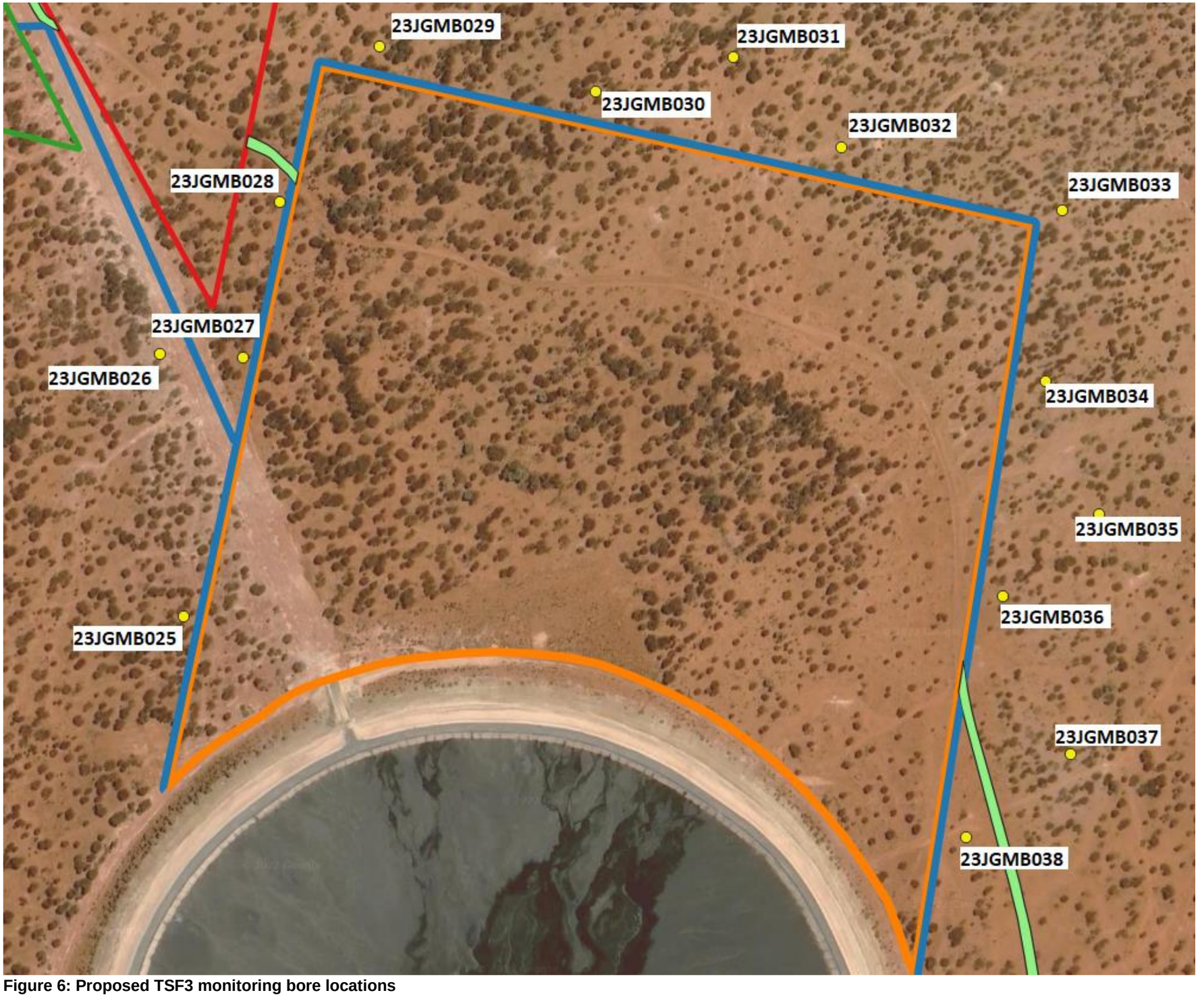


Figure 6: Proposed TSF3 monitoring bore locations