Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6789/2023/1
Works approval holder	GMA Garnet Pty Ltd
ACN	009 344 227
Registered business address	Level 4/108 St Georges Terrace Perth WA 6000
DWER file number	DER2023/000039
Duration	07/07/2023 to 07/07/2026
Date of issue	07/07/2023
Date of amendment	16/12/2025
Premises details	Port Gregory Garnet Mine 1420 George Grey Drive YALLABATHARRA WA 6535 Legal description - Mining Tenement M70/856 and General Purpose Lease G70/171.

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed production / design capacity**
Category 8: Mineral sands mining or processing	3,000,000 tonnes per annual period

This works approval is granted to the works approval holder, subject to the attached conditions, on 16 December 2024, by:

Jarrod Abrahams Digitally signed by Jarrod Abrahams
Date: 2024.12.16 16:11:51 +08'00'

MANAGER, RESOURCE INDUSTRIES
INDUSTRY REGULATION (STATE-WIDE DELIVERY)
Officer delegated under section 20
of the Environmental Protection Act 1986

Works approval history

Date	Reference number	Summary of changes
07/07/2023	W6789/2023/1	Works approval granted.
16/12/2024	W6789/2023/1	Works approval amendment to extend the duration of the time-limited operations by 180 days

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;

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

(c) at the corresponding infrastructure location;

as set out in Table 1.

Table 1: Design and construction / installation requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	Concrete bund	a) Constructed with 100 mm perimeter bunding with a minimum capacity of 93 m^3.	As labelled in Figure 2, Schedule 1.
2.	5,010 m^3 Thickener tank	a) Installed within bunded concrete pad (see item 1); and b) Fitted with overtopping alarm and associated automatic cut offs.	
3.	88,000 L Tailings separation tank	a) Fitted with monitoring of tank level and alarm; and b) Installed within bunded area.	
4.	5,000 L reagent storage tank	a) Constructed in accordance with AS/NZS3833:2007; and b) Installed within bunded concrete pad.	
5.	2 x 300 m^3 Recycle water tank	a) Installed per location in Figure 2, Schedule 1	
6.	New attritioners	a) Installation of up to a bank of 8 cells within existing processing facility.	
7.	100,000 L concrete sump	a) Constructed with impermeable concrete foundation and walls; b) Minimum freeboard capacity to allow for a 1% AEP 72-hour rain event; and c) Fitted with control valve and pump to direct outflow to water recycle tank.	
8.	Tailings transfer facilities	a) Constructed as per design drawings shown in Figure 8, Figure 9, Figure 10 and Figure 11 in Schedule 1; b) 2 x coarse tailings transfer facilities with a total capacity of 210,800 m^3;	Located as seen in Figure 5-Figure 7, Schedule 1

	Infrastructure	Design and construction / installation requirements	Infrastructure location
		c) 2 x fine tailings transfer facilities with a total capacity of 122,800 m^3; d) earthen bunding constructed around the perimeter of the facility to divert stormwater away from facility; and e) fine transfer facilities to be lined with a compacted layer of coarse sand.	
9.	Heavy and light vehicle washdown bays	a) Constructed to the dimensions as shown in Figure 12, Schedule 1; b) Both wash pads to be constructed with a perimeter bunding of no less than 75 mm height c) Wash pads designed to direct water run-off to the settlement sumps; d) Drying pad to be constructed with perimeter bunding 100 mm in height; e) 3 x concrete settlement sumps; f) Oily water separator tank with capacity to process 5,000 L/hour to be in a bunded area.	As labelled in Figure 1, Schedule 1. Layout as shown in Figure 12, Schedule 1.
10.	Tailings delivery pipelines and return pipelines	a) Pipelines constructed using 110 mm HDPE pipes; b) Installed in secondary containment adequately sized to contain any spills for a period equal to the time between routine inspections; and c) Return water pipeline fitted to discharge to the concrete sump.	As shown as 'Return water line' from the modified tailings storage ponds in Figure 1, Schedule 1 Design drawing for the decant system shown in Figure 13, Schedule1.
11.	Water recovery system for existing solar ponds		

2. 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 2.

Table 2: Critical containment infrastructure design and construction requirements

	Infrastructure	Design and construction / installation requirements	Infrastructure location
1.	Tailings Storage Ponds: • 1 x 5,571 m^3 pond; and • 1 x 25,102	a) Constructed per the design drawings shown in Figure 3 and Figure 4; b) Designed to enable a minimum 500 mm total freeboard above the normal operating pond level; c) Designed with a ramp slope of 1V:10H and	As labelled on Figure 1, Schedule 1.

	Infrastructure	Design and construction / installation requirements	Infrastructure location
	m^3 pond	internal batter slope of 1V:3H; d) Maximum embankment height of 4 m above the ground surface; e) Fine tailings discharge points to be installed only on northern and eastern batter slopes of each pond; f) Water recovery system installed in each pond with turret pump to direct decant water to concrete sump (see item 6, Table 1); and g) 0.5 m high earthen perimeter bunding around the outer embankment of the pond.	

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

Table 3: Groundwater monitoring well construction requirements

Infrastructure	Design, construction and installation requirements	Monitoring well location(s)	Timeframe
Groundwater Monitoring wells MB03, MB04, MB07 and MB08.	Well design and construction: 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. Logging of borehole: 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. Well construction log: 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	As depicted in Figure 3, Schedule 1	Must be constructed, developed (purged), and determined to be operational prior to the commencement of time limited operation activities under condition 15 and 16.

	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.		

4. The works approval holder must manage dust generation during the construction of infrastructure in condition 1 and 2 by wetting down unsealed roads and exposed areas with water carts.

Compliance reporting

5. 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.

6. The Environmental Compliance Report required by condition 5, must include as a minimum the following:

(a) certification by a suitably qualified geotechnical or civil engineer 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.

7. The works approval holder must within 30 calendar days of the critical containment infrastructure identified 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 a Critical Containment Infrastructure Report on that compliance.

8. The Critical Containment Infrastructure Report required by condition 7 must include as a minimum the following:

(a) certification of a suitably qualified geotechnical or civil engineer that each item of critical containment infrastructure or component thereof, as specified in condition 2 has been built and installed in accordance with the requirements specified in condition 2;

(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 2;

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

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

9. The works approval holder must, within 60 calendar days of the monitoring wells in Table 3 being constructed and developed, submit to the CEO a well construction report evidencing compliance with the requirements of Table 3.

Baseline Groundwater Monitoring

10. The works approval holder must undertake baseline ambient groundwater monitoring in accordance with Table 4 following submission of the well construction report required by condition 10.

11. All sample analysis must be undertaken by laboratories with current accreditation from the National Association of Testing Authorities (NATA) for the relevant parameters, unless otherwise specified, in Table 4.

Table 4: Baseline groundwater monitoring of ambient concentrations

Monitoring well location	Parameter	Unit	Frequency	Method
Groundwater monitoring wells MB03, MB04, MB07 and MB08 as depicted in Figure 3, Schedule 1	Standing water level	mbgl	Once off sample prior to time-limited operations commencing	Spot sample in accordance with AS/NZS 5667.11.
	pH	pH unit		
	Electrical conductivity	µS/cm		
	Total dissolved solids	mg/L		
	Total Hardness (as $CaCO_3$)			
	Total Alkalinity (as $CaCO_3$)			
	Calcium, Magnesium, Sodium, Potassium, Ammonia, Phosphate, Carbonate, Sulphate, Nitrate, Silica, Aluminium, Arsenic, Cadmium, Copper, Lead, Iron, Manganese, Selenium and Nickel			

Environmental commissioning phase

Environmental commissioning requirements and emission limits

12. The works approval holder may only commence environmental commissioning of the tailings delivery pipelines once the department has received and endorsed the Environmental Compliance Report required under condition 5 for that item of infrastructure.

13. Environmental commissioning activities undertaken for the item of infrastructure specified in Table 5 may only be carried out:

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

(b) for the corresponding authorised commissioning duration.

Table 5: Environmental commissioning requirements

Infrastructure	Commissioning requirements	Authorised commissioning duration
Tailings delivery pipelines and associate infrastructure	• Flush to capacity with process water to check for leaks; and • Corrective measures taken for early detection of leaks.	For a period not exceeding 30 calendar days in aggregate.

14. 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 5.

Time limited operations phase

Commencement and duration

15. The works approval holder may only commence time limited operations for an item of infrastructure identified in condition 17:

(a) where the item of infrastructure is not authorised to undertake environmental commissioning, the Environmental Compliance Report as required by condition 5 or Critical Containment Infrastructure Report as required by condition 8 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 13, the Environmental Commissioning Report for that item of infrastructure required by condition 14 has been submitted by the works approval holder.

16. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 17 (as applicable):

(a) for a period not exceeding 360 calendar days from the day the works approval holder meets the requirements of condition 15 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 16(a).

Time limited operations requirements and emission limits

17. During time limited operations, the works approval holder must ensure that the premises infrastructure and equipment listed in Table 6 and located at the corresponding infrastructure location is maintained and operated in accordance with the corresponding operational requirement set out in Table 6.

Table 6: Infrastructure and equipment requirements during time limited operations

	Site infrastructure and equipment	Operational requirement	Infrastructure location
1.	Concrete sump	• Maintain a minimum 300 mm operational freeboard at all times.	As labelled in Figure 2, Schedule 1
2.	Thickener	• Confirm automatic pump cut-off is functional.	
3.	Tailings storage ponds	• Maintain a minimum 300 mm operational freeboard at all times.	As labelled in Figure 3, Schedule 1
4.	Tailings delivery and return water pipelines	• Maintain secondary containment to contain spills from pipeline rupture. • Return water to be directed to the recycle water tank via the concrete sump.	As labelled in Figure 1, Schedule 1.
5.	Washdown Bay	• Direct all run-off from wash pads to settlement pits.	
6.	Tailings Transfer Facilities	• Dust suppressant applied during visible dust lift off events.	

18. The works approval holder must:

(a) Undertake the inspections detailed in Table 7;

(b) Where any inspection identifies that an appropriate level of environmental protection is not being maintained, take corrective action to mitigate adverse environmental consequences as soon as practicable; and

(c) Maintain a record of all inspections undertaken.

Table 7: Inspections of infrastructure

	Site infrastructure and equipment	Type of inspection	Infrastructure location
1.	Thickener tank	Daily visual inspection of tank capacity, tank integrity and concrete bund capacity	As labelled in Figure 2, Schedule 1.
2.	Reagent tank		
3.	Concrete sump	Daily visual inspection to check minimum freeboard meets requirements of Table 6	
4.	Tailings and return pipeline	Daily visual inspection to confirm integrity	As labelled in Figure 1, Schedule 1.
5.	Tailings Storage ponds	Daily visual inspection to check minimum freeboard meets requirements of Table 6 and confirm integrity of batter slopes are free from erosion	As shown in Figure 3, Schedule 1.
6.	Tailings transfer facility	Daily visual inspection to confirm integrity of bunding	As shown in Figure 5-Figure 7, Schedule 1.

7.	Washdown Bay	Daily visual inspection to confirm integrity of perimeter bunding and tanks	As labelled in Figure 1, Schedule 1.

Monitoring during time limited operations

19. The works approval holder must conduct a groundwater monitoring program in accordance with the requirements specified in Table 8 and record the results of all monitoring activity conducted under that program.

20. All sample analysis must be undertaken by laboratories with current accreditation from the National Association of Testing Authorities (NATA for the relevant parameters, unless otherwise specified in Table 8.

Table 8: Ambient groundwater monitoring

Monitoring well location	Parameter	Unit	Frequency	Method
Groundwater monitoring wells MB03, MB04, MB07 and MB08, as depicted in Figure 3, Schedule 1.	Standing water level	mbgl	Monthly	Spot sample in accordance with AS/NZS 5667.11.
	pH	pH unit		
	Electrical conductivity	µS/cm		
	Total dissolved solids	mg/L	Quarterly	
	Total Hardness (as $CaCO_3$)			
	Total Alkalinity (as $CaCO_3$)			
	Calcium, Magnesium, Sodium, Potassium, Ammonia, Phosphate, Carbonate, Sulphate, Nitrate, Silica, Aluminium, Arsenic, Cadmium, Copper, Lead, Iron, Manganese, Selenium and Nickel			

Compliance reporting

21. 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 the time limited operations.

22. The works approval holder must ensure the report required by condition (above) includes the following:

(a) a summary of the time limited operations, including timeframes and the volume of tailings discharged into the drying ponds and volume of water returned to concrete sump;

(b) results of groundwater monitoring programme as required by condition 19;

(c) a summary of the environmental performance of all infrastructure as constructed or installed (as applicable);

(d) a review of performance and compliance against the conditions of the works approval and the Environmental Commissioning Report; and

(e) where the manufacturer's 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)

23. 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.

24. 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 and 2;

(b) any maintenance of infrastructure that is performed while complying with condition 17;

(c) monitoring programmes undertaken in accordance with condition 19; and

(d) complaints received under condition 23.

25. The books specified under condition 24 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
AEP	means Annual Exceedance Probability
annual period	a 12 month period commencing from 1 January until 31 December of the immediately following year.
AS/NZS 3833:2007	means the Australian Standard AS/NZS3833:2007 *The storage and handling of mixed classes of dangerous goods, in packages and intermediate bulk containers*.
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 Water Quality – *Sampling – Guidance on sampling of groundwater.*
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
critical containment infrastructure	means the items of infrastructure listed in condition 2.
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.
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 and/or equipment has been constructed and/or installed in accordance with the works approval.
EP Act	*Environmental Protection Act 1986* (WA).

Term	Definition
EP Regulations	*Environmental Protection Regulations 1987* (WA).
HDPE	High Density Polyethylene
mbgl	means metres below ground level
monthly	means a one-month period commencing from day 1 of a month until final day of the same month.
NATA	National Association of Testing Authorities, Australia
NATA accredited	means in relation to the analysis of a sample that the laboratory is NATA accredited for the specified analysis at the time of the analysis.
premises	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.
quarterly	means a period of time where at least 45 days have occurred between the days on which samples are taken in successive quarters.
spot sample	means a discrete sample representative of the time and place at which the sample is taken.
suitably qualified geotechnical or civil engineer	means a person who: (a) holds a relevant tertiary academic qualification related to geotechnical or civil engineering; and (b) has a minimum of three years of experience working in the field of geotechnical and or civil engineering.
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

The boundary of the prescribed premises is shown in the map below (comprising Mining Tenement M70/856 and General Purpose Lease G70/171).

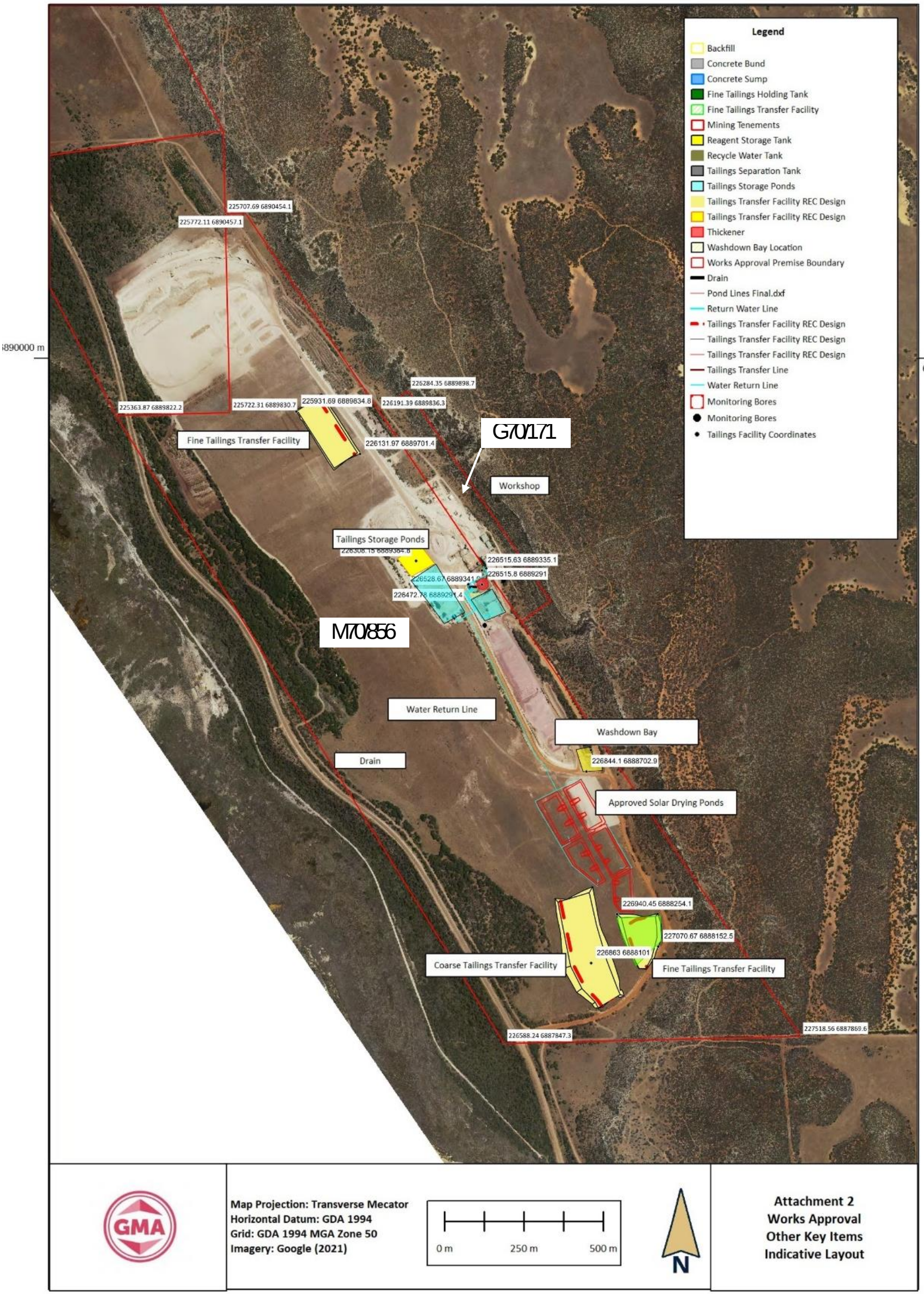

Figure 1: Map of the boundary of the prescribed premises

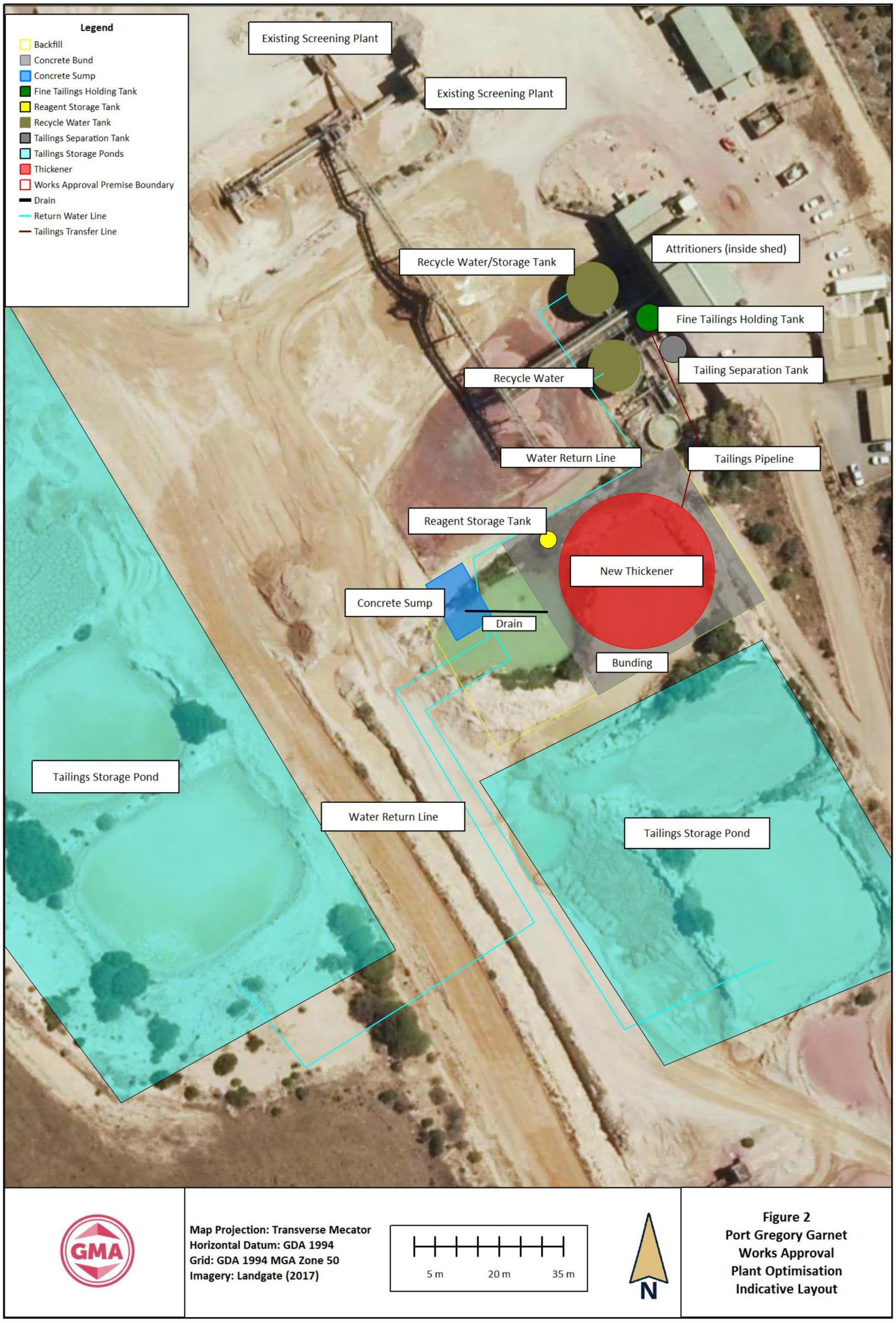

Figure 2: Proposed key plant infrastructure

Figure 3: Proposed location for the two modified tailings storage ponds and groundwater monitoring bore locations

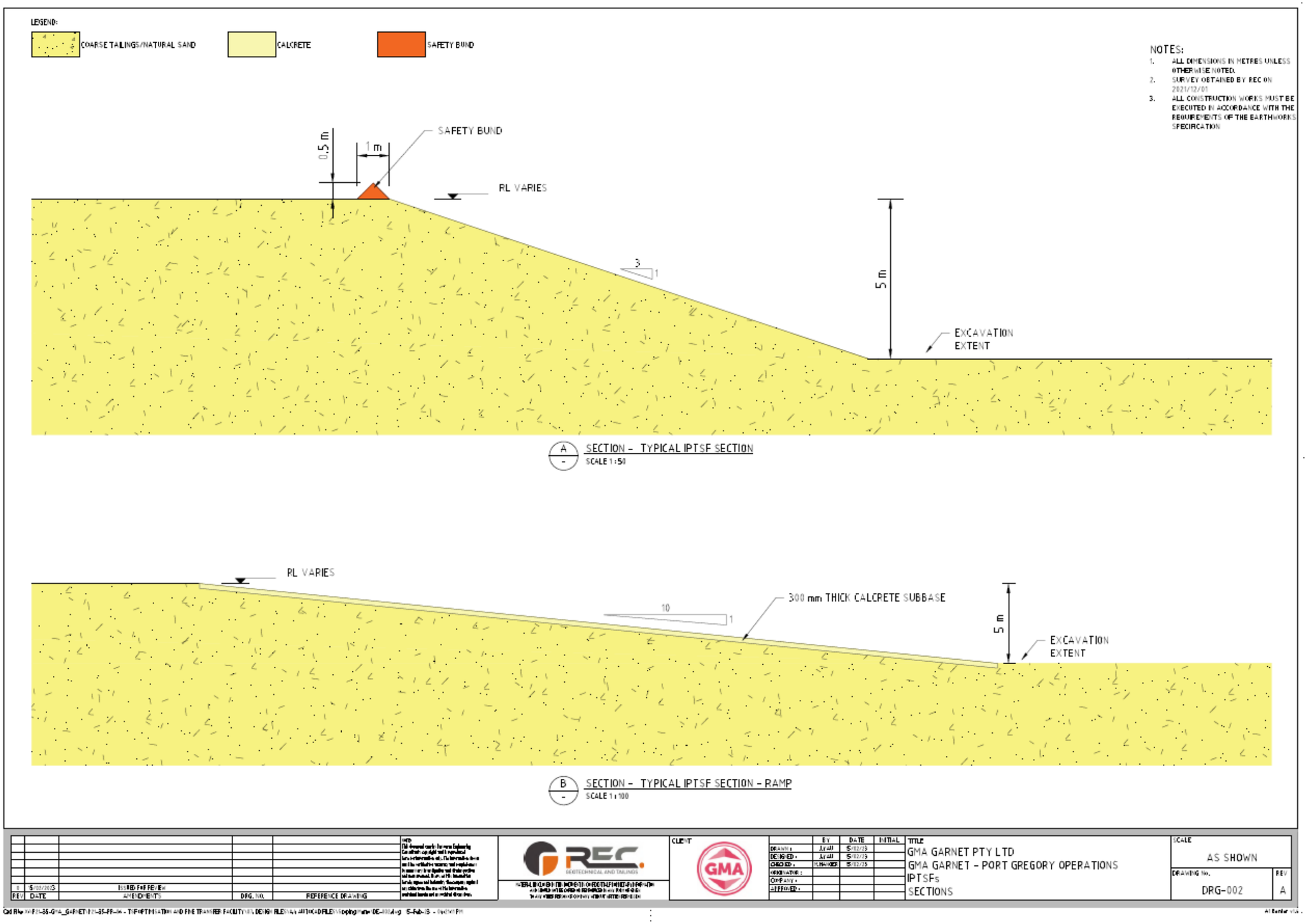

Figure 4: Cross section for the tailings storage ponds showing the ramp and batter slopes

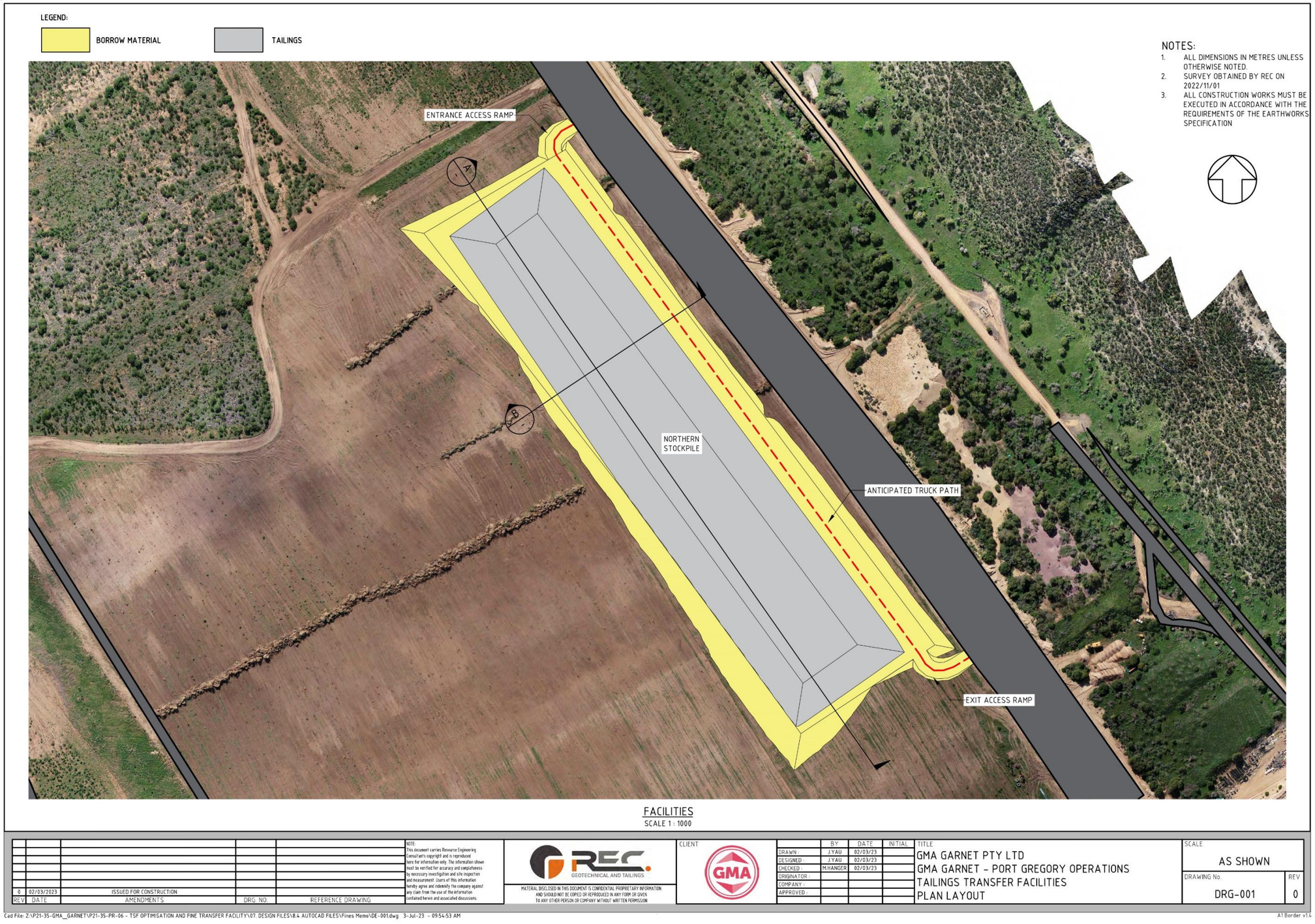

Figure 5: Location of proposed northern (fine) tailings transfer facility

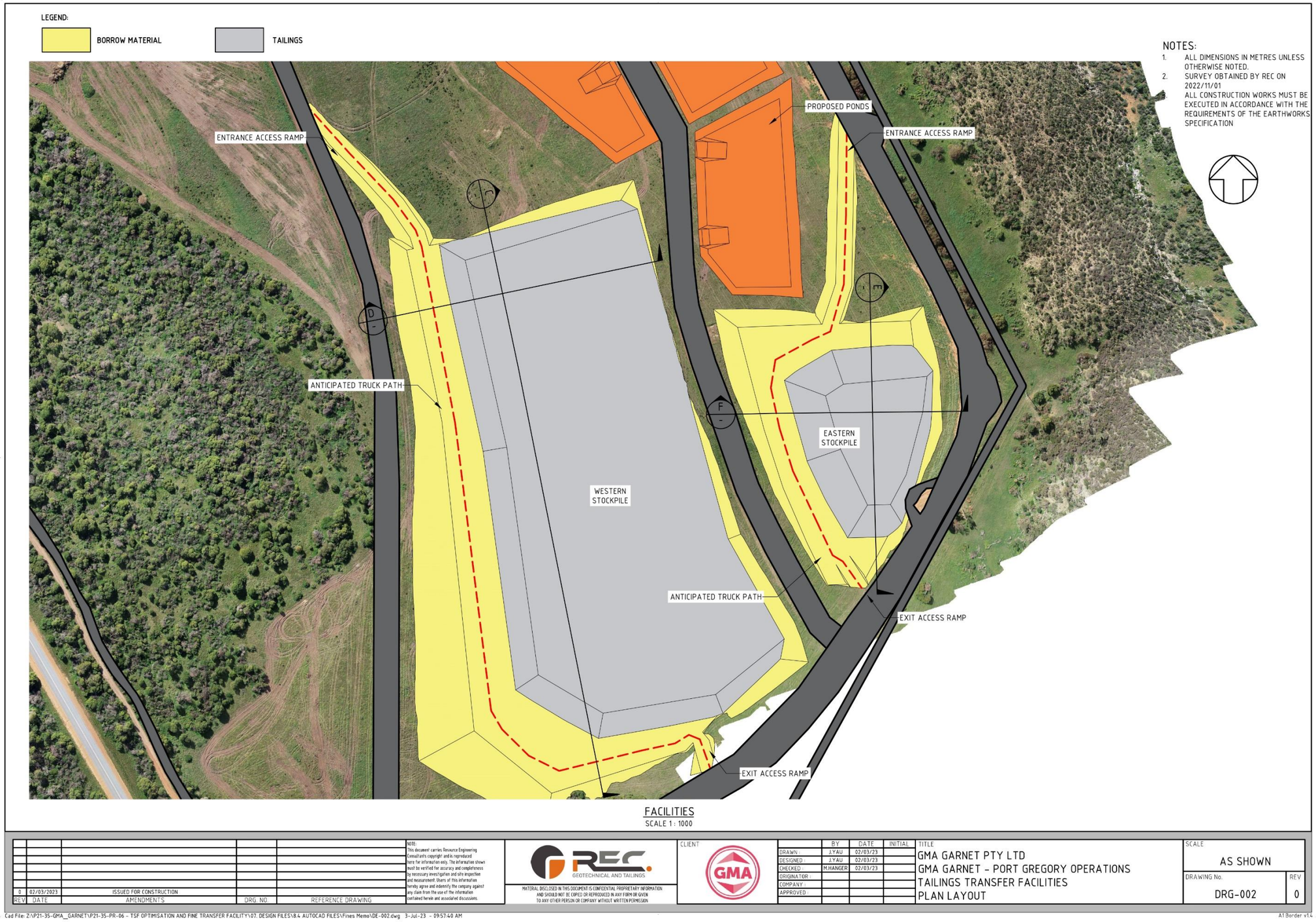

Figure 6: Location of proposed western (coarse) and eastern (fine) tailings transfer facilities

Figure 7: Location of proposed re-profiled existing (coarse) tailings transfer facility

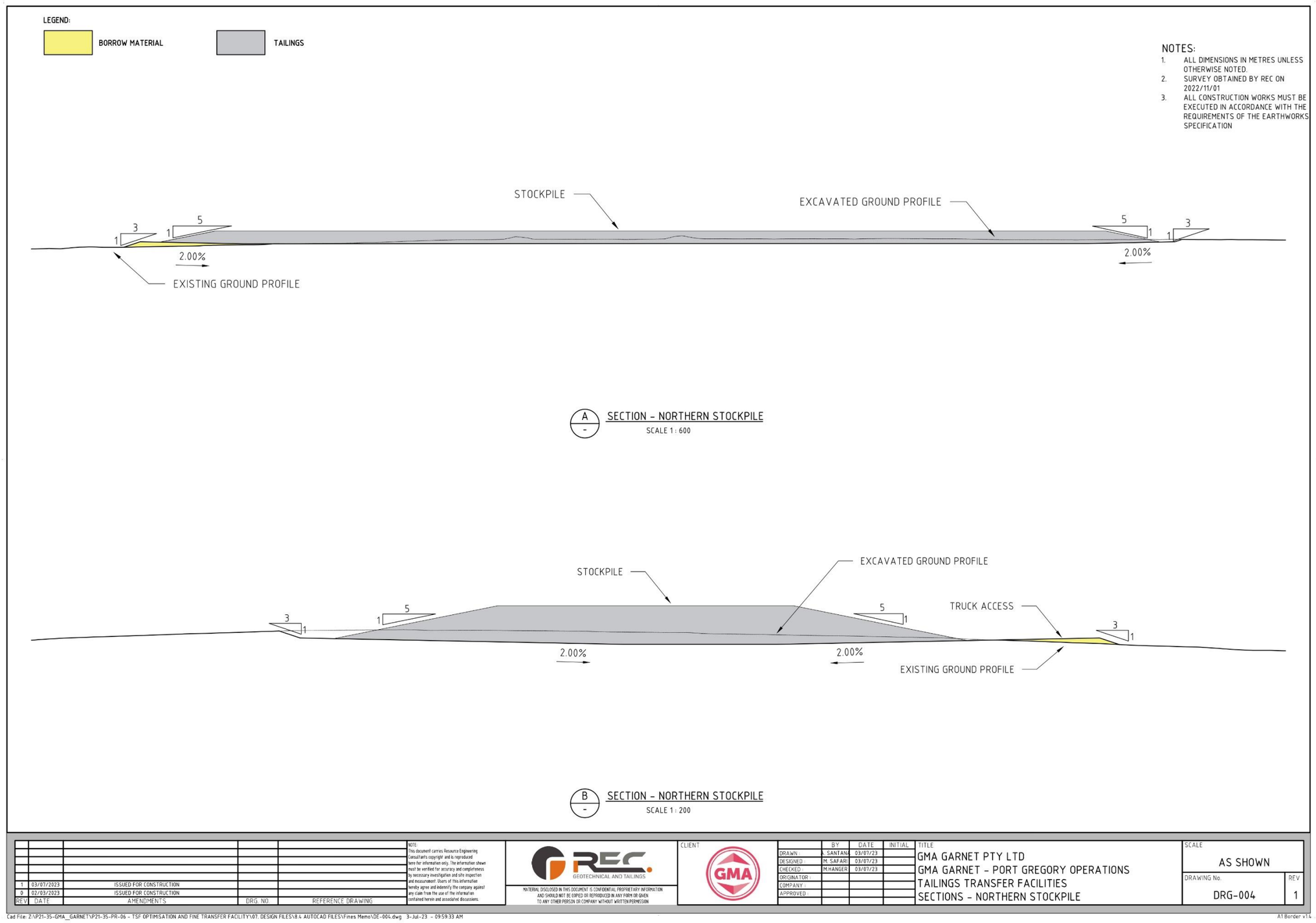

Figure 8: Design drawings of Northern (fine) tailings transfer facilities

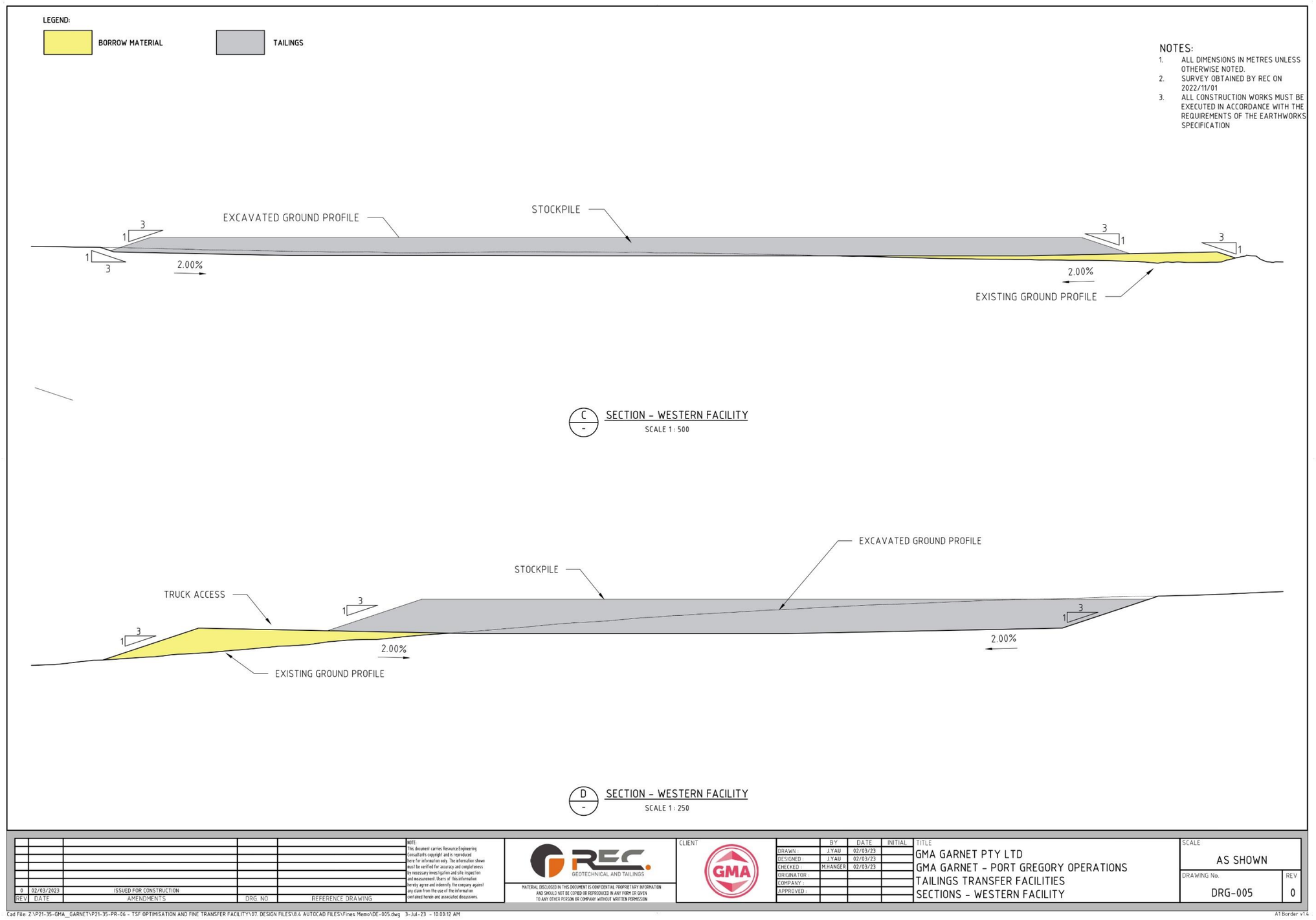

Figure 9: Design drawings for the Western (coarse) tailings transfer facility

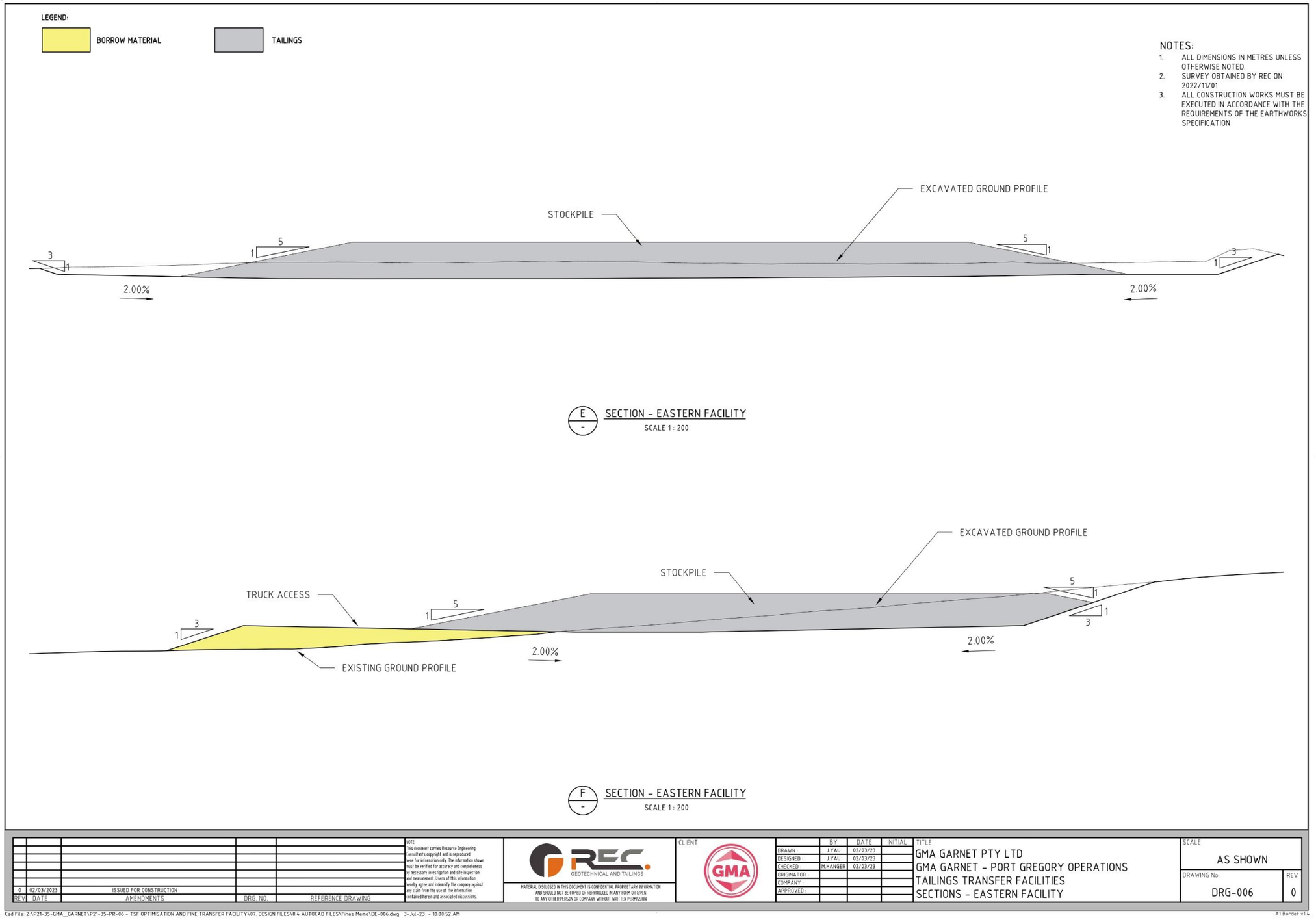

Figure 10: Design drawings for the Eastern (fine) tailings transfer facility

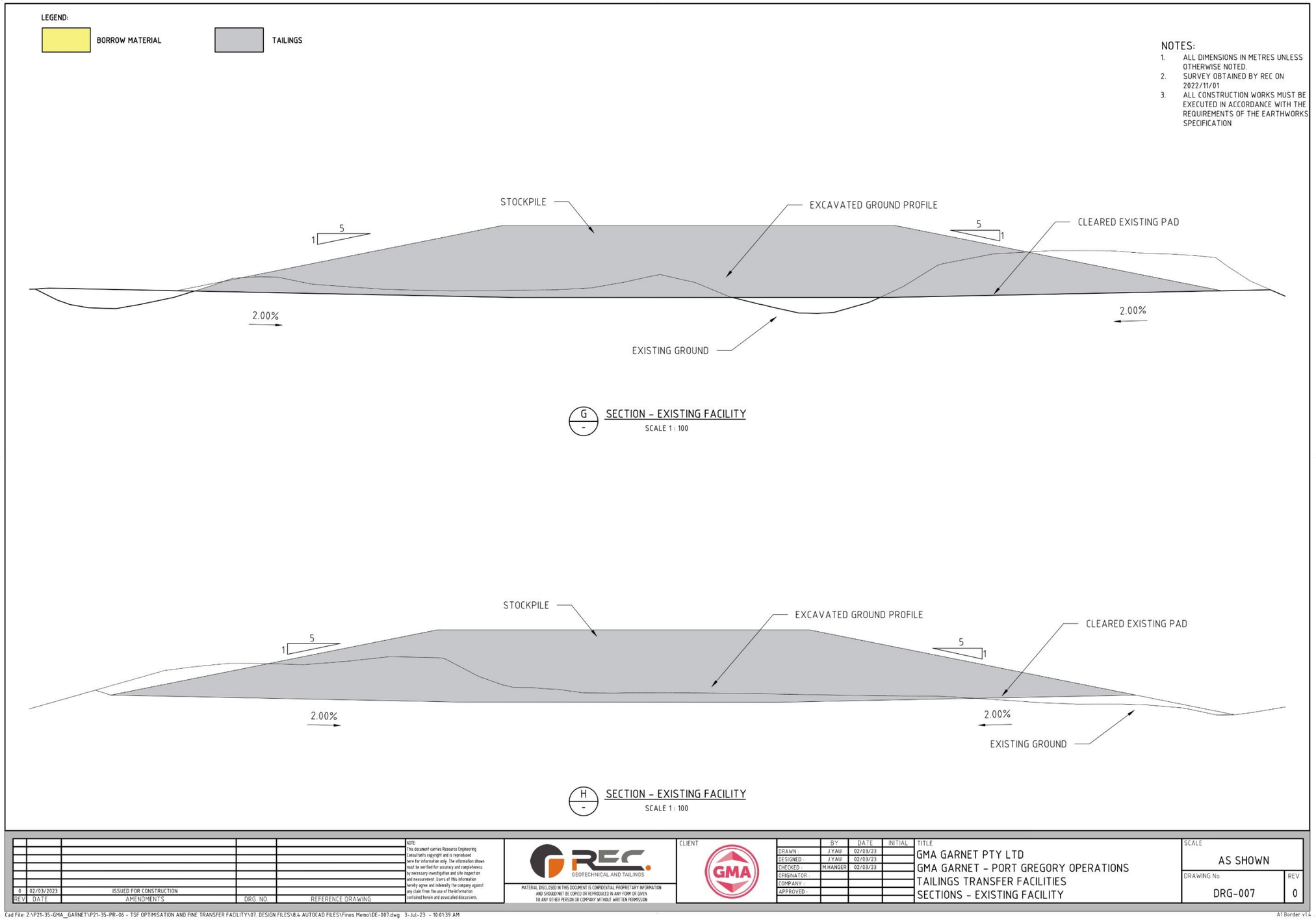

Figure 11: Design drawings for the Pre-existing (coarse) tailings transfer facility

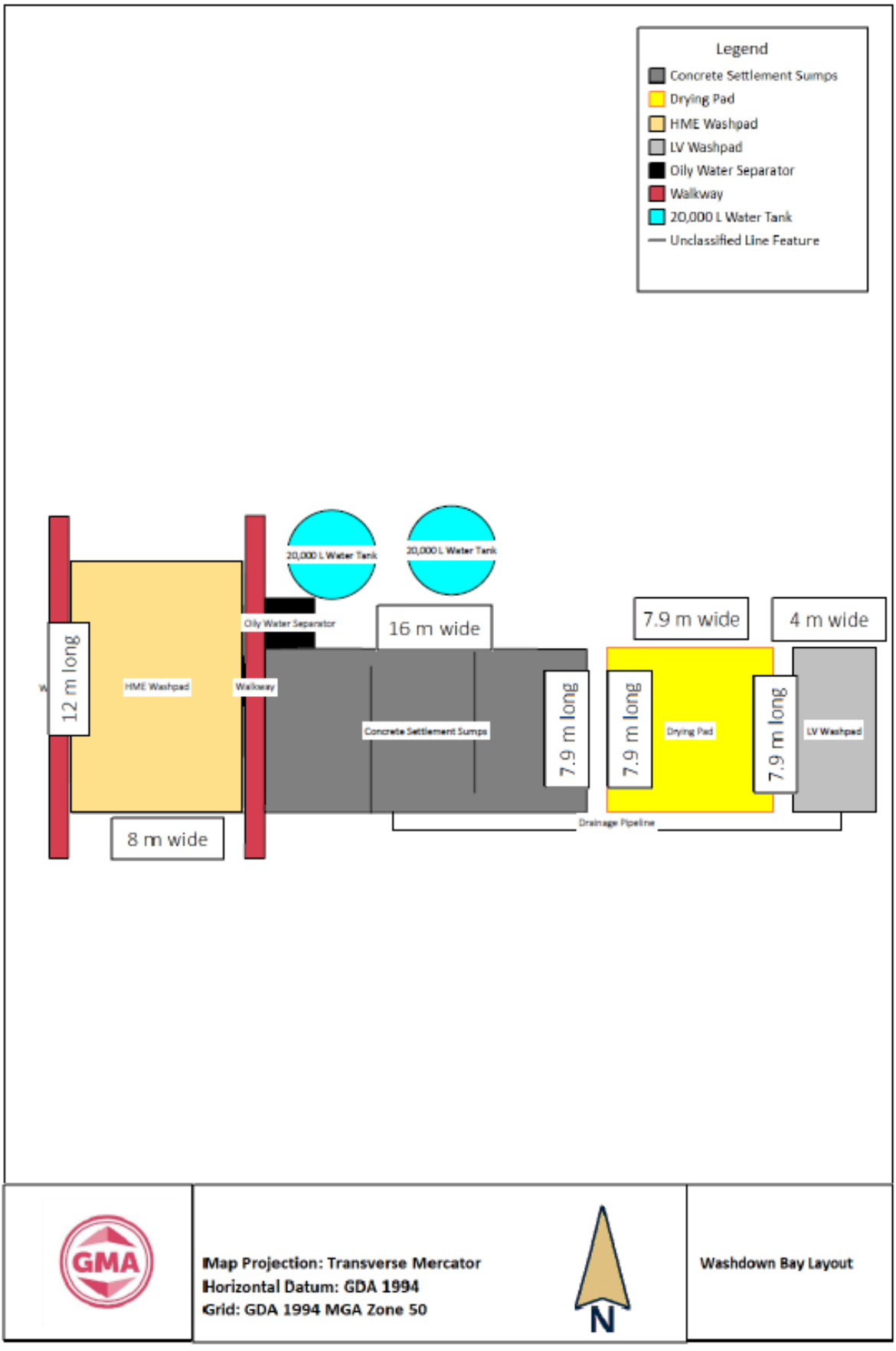

Figure 12: Layout of Washdown Bay

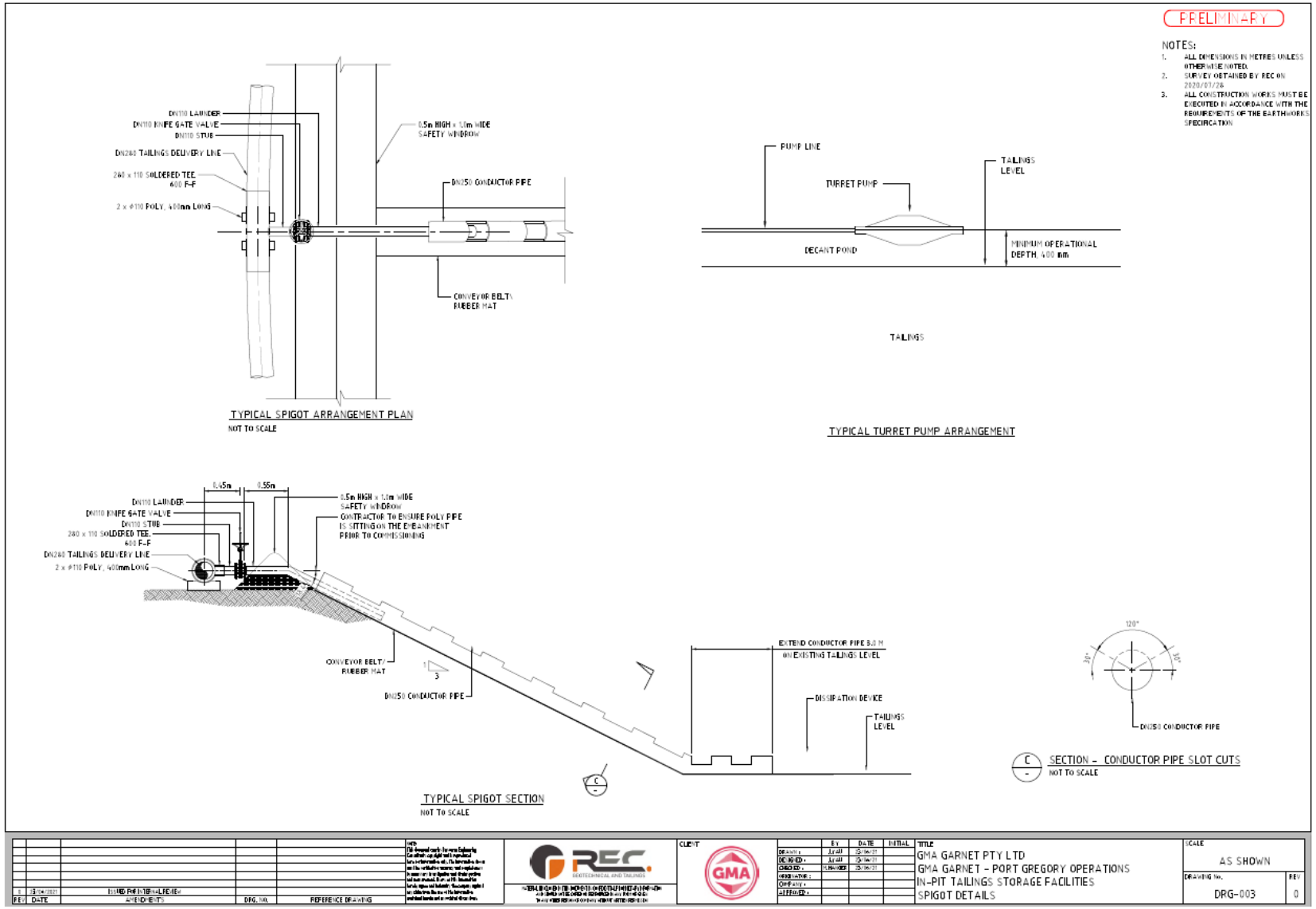

Figure 13: Decant water return system for solar ponds approved under W6584/2021/1 and for new modified tailings storage ponds