Government of Western Australia
Department of Water and Environmental Regulation

Works Approval

Works approval number	W6618/2021/1
Works approval holder	Talison Lithium Australia Pty Ltd
ACN	139 401 308
Registered business address	216 St Georges Terrace PERTH, WA 6000
DWER file number	DER2021/000628
Duration	08/03/2022 to 07/03/2026
Date of issue	08/03/2022
Date of amendment	27/03/2024
Premises details	Talison Lithium Mine Maranup Ford Road Greenbushes WA 6254 Part of mine tenements M01/6 and M01/7 As defined by the premises maps in Schedule 1

Prescribed premises category description **(Schedule 1, *Environmental Protection Regulations 1987*)**	**Assessed design capacity**
Category 5: Processing or beneficiation of metallic or non-metallic ore	7 000 000 tonnes per year

This works approval is granted to the works approval holder, subject to the attached conditions, on 27 March 2024, by:

Jarrod Abrahams
Digitally signed by Jarrod Abrahams
Date: 2024.03.27 11:32:36 +08'00'

A/SENIOR 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
08/03/2022	W6618/2021/1	Works approval for construction of TSF4 granted.
04/07/2023	W6618/2021/1	Works approval amended to allow staged construction of starter embankment of TSF4 Cell 1.
01/09/2023	W6618/2021/1	Works approval amended for modification of TSF4 Cell 1 liner.
27/03/2024	W6618/2021/1	Works approval amended for modification of TSF4 Cell 2 liner.

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(s); and

as set out in Table 1.

Table 1 Critical containment infrastructure design and construction requirements

	Infrastructure	Design and construction requirements	Infrastructure location

1.	Tailings Storage Facility (TSF4): Cell 1 (comprising Stage 1a to 261 m AHD and Stage 1b to 265 m AHD)	• Constructed within mining tenement M01/6 and M01/7, covering area of approximately 230 ha
		• Combined storage capacity of 68 Mt of tailings material
		• Constructed to provide a minimum 0.9 metre total freeboard (including an allowance for the 1 in 100 year event, 72 hour period of 217 mm) above the normal operating pond
		• Sandy soils removed from footprint of the embankment prior construction
		• Embankment constructed with low permeability core keyed through the alluvial material into underlying low permeability clay
		• Decant structure in cell 1 and cell 2
		• Pumping capacity up to 1800 m^3/h
		• Equipped with pumps with capacity based on water balance
		• With suction pipe with screen to avoid suction intake of tailings during operations
		• Returns water returned to the Clear Water Dam for process plant reuse
		
		<u>Embankment (Starter and raise)</u>
		• Cell 1 Stage 1a starter embankment constructed to a height of 261 m AHD
		  ○ Starter embankment to be keyed into hard clay foundation, with 4 m wide cut off trench
		• Cell 1 Stage 1b embankment to be raised to a height of 265 m AHD
		• Cell 2 starter embankment to be constructed to a height of 265 m AHD
		  ○ Starter embankment to be keyed into hard clay foundation, with 4 m wide
			TSF4 location as shown in Figure 1 of Schedule 1
			
			Embankment as shown in Figure 3 of Schedule 1

2.	Tailings Storage Facility (TSF4): Cell 2 to 265 m AHD		

	Infrastructure	Design and construction requirements	Infrastructure location
		cut off trench • Divider embankment separating TSF4 into 2 cells (centreline construction method) • Embankment constructed using non-acid forming waste rock <u>Dust controls</u> • Operation of water carts during dry and windy conditions targeting high risk areas	
3.	Tailings and return water pipelines	• Tailings and return water pipelines are high density polyethylene (HPDE) • Equipped with process monitoring, alarms and indicators to alert operator or abnormal conditions • Installed within earthen/rock bund • all pipelines containing environmentally hazardous substances are provided with secondary containment adequate to contain any spill for a period equal to the time between routine inspections	Pipelines as shown in Figure 2 of Schedule 1
4.	Seepage control for TSF4	**<u>Cell 1 liner</u>** • TSF4 cell 1 lined with 12.8 hectares bituminous geomembrane liner (BGM) as shown in Figure 12 of Schedule 1. BGM liner to be constructed with the following specifications: ○ Pebbles on the surface underlying the BGM will not be angular and will not have a diameter greater than 20 mm; ○ Installed by a competent and appropriately qualified installer from the top of the embankment floor; ○ Panels to be joined by overlapping the edges by 200 mm and torch welding the overlapped BGM together to form a watertight seam; ○ The leading edges of the BGM to be tied into the embankments in a 1.0 m wide and 0.6 m deep anchor trench (as shown in Figure 13, Schedule 1). Once the BGM has been placed in the anchor trench it will be backfilled with the excavated soil and compacted; ○ The BGM liner to be anchored in a 600 x 600 mm anchor trench located on the powerline corridor on the southern TSF1 embankment and on the crest of the north-eastern TSF4 embankment; ○ High friction angle BGM to be used on the embankments to further prevent the BGM from slipping down the embankment during deposition; and	TSF4 cell 1 lined with 12.8 hectares bituminous geomembrane liner (BGM) as shown in Figure 12 of Schedule 1. Remainder of TSF4 lined with engineered clay liner as shown in Figure 4 of Schedule 1. Seepage collection infrastructure as shown in Figure 5, Figure 6 and Figure 8 of Schedule 1

	Infrastructure	Design and construction requirements	Infrastructure location
		○ The BGM to be tied into the placed clay liner (as shown in Figure 13, Schedule 1) with a tie-in trench and the trench backfilled with the excavated clay and compacted. • Remaining footprint of TSF4 cell 1 lined with: 3 x 200 mm layered engineered clay liner with permeability of < 1 x 10^{-9} m/s as shown in Figure 4 of Schedule 1 • Northern section of TSF4 cell 1 clay lining (where not lined by BGM): ○ Minimum of 7.5 m wide clay lining between TSF1 southern embankment and TSF4 northern section ○ Widened to 15 m adjacent to Cell 1 divider embankment ○ Clay facing keyed into clay liner on the floor of storage, with 4 m wide cut off trench ○ Toe underdrainage system **<u>Cell 2 liner</u>** • TSF4 cell 2 lined with a bituminous geomembrane liner (BGM) as shown in Figure 14 of Schedule 1. BGM liner to be constructed with the following specifications: ○ BGM liner is to cover the cell floor and embankments up to 265 m AHD, as indicated in Figure 14, Schedule 1; ○ Pebbles on the surface underlying the BGM will not be angular and will not have a diameter greater than 20 mm; ○ Installed by a competent and appropriately qualified installer from the top of the embankment floor; ○ Panels to be joined by overlapping the edges by 200 mm and torch welding the overlapped BGM together to form a watertight seam; ○ The leading edges of the BGM to be tied into the northern, southern and divider embankments of Cell 2 in a 1.0 m wide and 0.6 m deep anchor trench (as shown in Figure 13, Schedule 1). Once the BGM has been placed in the anchor trench it will be backfilled with the excavated soil and compacted; ○ The BGM liner to be anchored in a 600 x 600 mm anchor trench located along the crest of the perimeter and divider embankments (as shown in Figure 15) and 265 m AHD contour through Cell 2 (as shown in Figure	

	Infrastructure	Design and construction requirements	Infrastructure location
		16); and ○ High friction angle BGM to be used on the embankments to further prevent the BGM from slipping down the embankment during deposition. **Cell 1 and 2 drainage and seepage recovery** • Underdrainage system ○ Upstream toe drains above and below the engineered clay or BGM liner, discharging directly into seepage collection sumps ○ Sand drainage blanket downstream of clay core, discharging to toe drain, reporting to collection sumps ○ Gravel finger drain outlets to sand blanket along southern boundary; seepage collected by twin collector pipes, discharging into collection sumps • Toe drains ○ Collecting runoff from embankment and surrounding catchments; seepage from underdrainage system and sand drainage blanket • Collection sumps ○ minimum of 3 ○ at low points along final embankment toe ○ equipped with valves which close automatically in event of water level in sump rising to maximum level or in case of pump failure ○ sized to accommodate approximately 3 hours of seepage from facility & to accommodate runoff from perimeter embankment toe drain and additional 10 % AEP 24 storm event • All seepage recovery systems equipped with remotely operated pumps and standby and/or back up pumps to prevent overflows	

2. The works approval holder must design, construct, and install groundwater monitoring wells in accordance with the requirements specified in Table 2.

Table 2 Infrastructure requirements – groundwater monitoring wells

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
Monitoring well network for TSF4	<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. At each location, nested wells to target three different aquifer depths (shallow, intermediate, deep).	As depicted in Schedule 1, Figure 9 and labelled as 01, 08, 21, 22, 23, 24	Must be constructed, developed (purged), and determined to be operational prior to the commencement of time limited operations as per condition 7
	<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> 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.		
	<u>Well development:</u> 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.		
	<u>Installation survey:</u> the vertical (top of casing) and horizontal position of each monitoring well must be surveyed and subsequently mapped by a suitably qualified surveyor.		
	<u>Well network map:</u> a well location map (using aerial image overlay) must be prepared and		

Infrastructure	Design, construction, and installation requirements	Monitoring well location(s)	Timeframe
	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

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

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

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

4. The Critical Containment Infrastructure Report required by condition 3 must include as a minimum the following:

(a) certification by a suitably qualified geotechnical 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;

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

(e) monitoring data indicating the baseline ambient environmental conditions at the premises prior to and immediately following construction of the item(s) of infrastructure;

(f) updated hydrogeological conceptual model incorporating:

(i) additional permeability testing of the saprolitic profile beneath the TSF4 footprint; and
(ii) confirmation of the permeability, lateral continuity and expected seepage and migration rates from TSF4.

5. The monitoring of the baseline ambient environmental conditions required under condition 4(e) must be undertaken in accordance with Table 3.

Table 3 Determination of baseline ambient environmental conditions

Monitoring location	Parameter	Unit	Frequency	Averaging period	Method
Clear Water Dam (Figure 1)	Redox potential (Eh)	mV	At least one campaign	Spot sample	AS/NZS 5667.1 AS/NZS 5667.11
	Dissolved Oxygen	mg/L			
Clear Water Dam (Figure 1) Groundwater bores: 01, 08, 21, 22, 23, 24 (Figure 9) Surface water: SW20/02 (Figure 10)	Standing water level (applicable for groundwater monitoring bores only)	m(AHD) & mbgl			
	pH	-			
	TDS	mg/L			
	Chloride, Cl-				
	NO_3- as N				
	Sulfate, SO_4-				
	Arsenic, As				
	Copper, Cu				
	Manganese, Mn				
	Nickel, Ni				
	Uranium, U				
	Cobalt, Co				
	Iron, Fe				
	Lithium, Li				
	Thorium, Th				
	Magnesium, Mg				
	Sodium, Na				
	Antimony, Sb				

6. The works approval holder must, within 30 calendar days of the monitoring wells being constructed, submit to the CEO a well construction report evidencing compliance with the requirements of condition 0.

Time limited operations phase

Commencement and duration

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

(a) where the CEO has notified the works approval holder that the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 3 meets the requirements of that condition; or

(b) where at least 45 business days have passed after the Critical Containment Infrastructure Report for that item of infrastructure as required by condition 3 has been submitted to the CEO.

8. The works approval holder may conduct time limited operations for an item of infrastructure specified in condition 9 (as applicable):

(a) for a period commencing the day the works approval holder meets the requirements of condition 7 for that item of infrastructure and ending on 30 June 2025; 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 8(a).

Time limited operations requirements and emission limits

9. 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
1.	TSF4 (Cell 1a, Cell 1b and Cell 2 to 265 m AHD)	• Maintaining freeboard of 0.9 m • Daily visual inspections to ensure compliance with freeboard • Captured seepage is returned into the mine water circuit • Deposited tailings have pH of approximately 8 • Operated with decant pond size of approximately 300 m^2 • Decant is pumped into Clear Water Dam for treatment (by existing Water Treatment Plant and Arsenic Remediation Unit) <u>Dust controls</u> • Deposition to maximise wet areas by rotation through perimeter spigots • Application of dust suppressant on tailings if dry • Operation of water carts during dry and windy conditions targeting high risk areas	TSF4 location as shown in Figure 1 of Schedule 1

	Site infrastructure and equipment	Operational requirement	Infrastructure location
2.	Tailings and return water pipelines	• Daily visual inspections to ensure integrity of pipelines and bunding • Remediation action undertaken as soon as practicable possible if abnormalities identified	Pipelines as shown in Figure 2 of Schedule 1
3.	Seepage and stormwater runoff control for TSF4	• all drains, sumps and pumps returning captured water or seepage to Mine Water Circuit • daily inspections of integrity and sufficient capacity of collection sumps • Rainfall and runoff from TSF4 directed to Clear Water Dam for re-use in the mine water circuit • Maintain drainage systems to manage stormwater flows	Seepage collection infrastructure as shown in Figure 5, Figure 6 and Figure 8 of Schedule 1

Monitoring during time limited operations

10. The works approval holder must conduct a groundwater and surface water monitoring programme in accordance with the requirements specified in Schedule 2 and record the results of all monitoring activity conducted under that programme.

11. The works approval holder must adhere to the field quality assurance and quality control procedures specified in Schedule 2 for the monitoring required by condition 10.

12. 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 Schedule 2.

13. The works approval holder must record the results of all monitoring activity required by conditions 10.

Compliance reporting

14. 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.

15. The works approval holder must ensure the report required by condition 14 includes the following:

(a) a summary of the time limited operations, including timeframes and amount of tailings deposited;

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

(i) total seepage from TSF4, including the volume of seepage not captured by seepage management infrastructure;

(c) a summary of performance of the Water Treatment Plant and the and Arsenic Remediation Unit

(i) including available pre and post treatment measurements and comparison to expected performance;

(ii) monthly trends of arsenic and lithium concentrations during time limited operations.

(d) updated seepage management plan, including

(i) An updated seepage model reflecting actual data collected from additional hydrogeological studies and actual tailings characteristics;

(ii) Trigger values for groundwater and surface water monitoring to identify potential impacts from seepage from TSF4, and actions undertaken to respond to potential seepage impacts;

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

(f) 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.

(g) a groundwater monitoring report demonstrating their compliance with conditions 10, 11 and 12 for the time limited operations period, and must include:

(i) a clear statement of the scope of work carried out;

(ii) a description of the field methodologies employed;

(iii) a summary of the field and laboratory quality assurance / quality control (QA/QC) program;

(iv) copies of the field monitoring records and field QA/QC documentation;

(v) an assessment of reliability of field procedures and laboratory results;

(vi) a tabulated summary of results, as well as all raw data provided in an accompanying Microsoft Excel spreadsheet digital document/file (or a compatible equivalent digital document/file), with all results being clearly referenced to laboratory certificates of analysis;

(vii) a diagram with aerial image overlay showing all monitoring locations and depicting groundwater level contours, flow direction and hydraulic gradient (relevant site features including discharge points and other potential sources of contamination must also be shown);

(viii) an interpretive summary and assessment of the results against relevant assessment levels for water, as published in the Guideline Assessment and management of contaminated sites;

(ix) an interpretive summary and assessment of results against previous monitoring results, including the baseline results collected under condition 5; and

(x) trend graphs to provide a graphical representation of historical results and to support the interpretive summary.

Note 1: General guidance on report presentation can be found in the Department's *Guideline: Assessment and management of contaminated sites*.

Records and reporting (general)

16. 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.

17. 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 0

(b) any maintenance of infrastructure that is performed in the course of complying with conditions 1 and 9

(c) monitoring programmes undertaken in accordance with conditions 10, 11 and 12 and

(d) complaints received under condition 16.

18. The books specified under condition 17 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 5 have the meanings defined.

Table 5 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;
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 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.
EP Act	*Environmental Protection Act 1986* (WA).
EP Regulations	*Environmental Protection Regulations 1987* (WA).
Guideline: Assessment and management of contaminated sites	means the document titled *Assessment and management of contaminated sites, Contaminated sites guidelines* (Department of Environment Regulation, November 2021), as amended from time to time
monthly period	means a one-month period commencing from the first day of a month until the last day of the same month.
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)

Term	Definition
	in Schedule 1 to this works approval.
prescribed premises	has the same meaning given to that term under the EP Act.
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 (Figure 1).

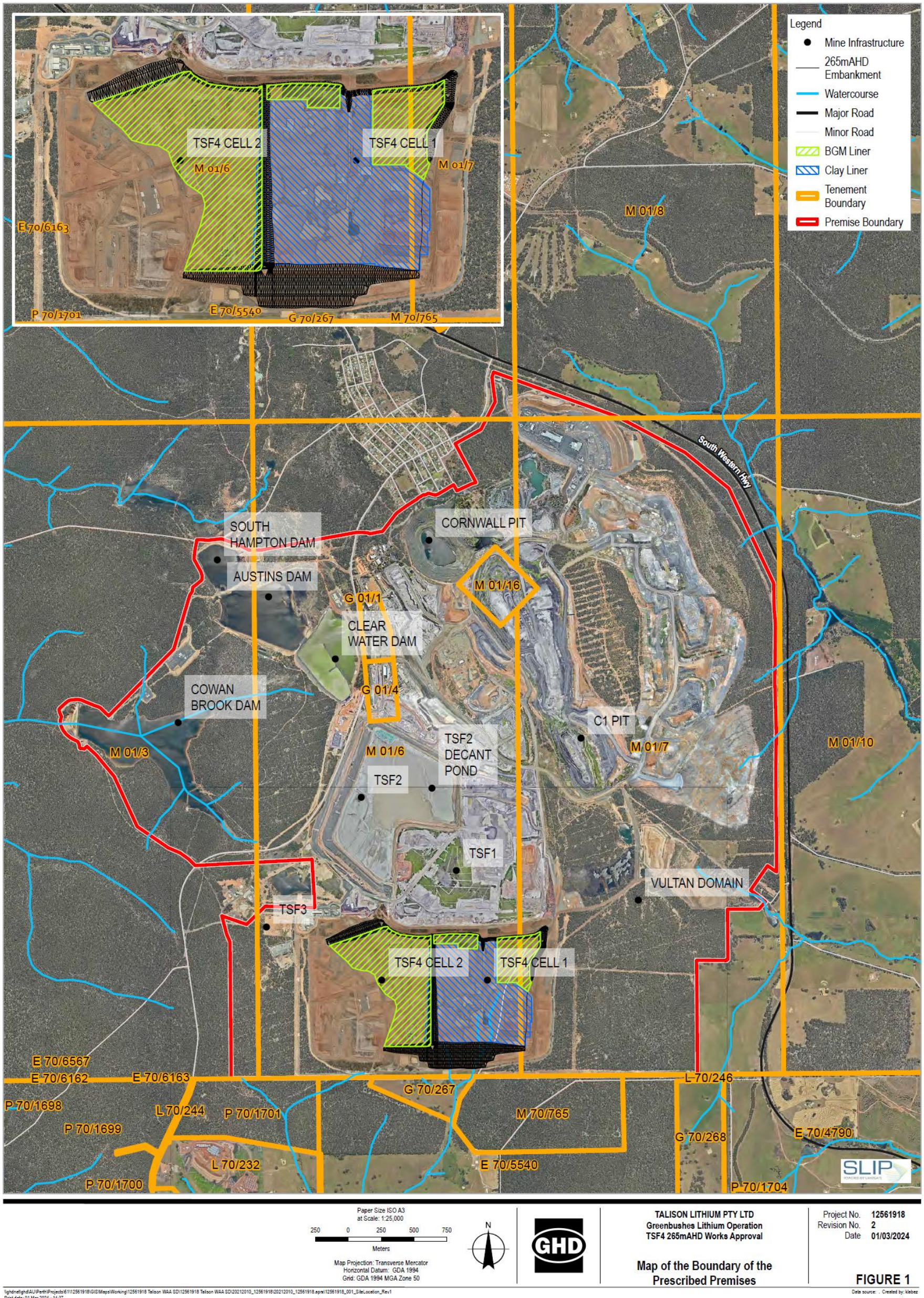


Figure 1: Map of the boundary of the prescribed premises.

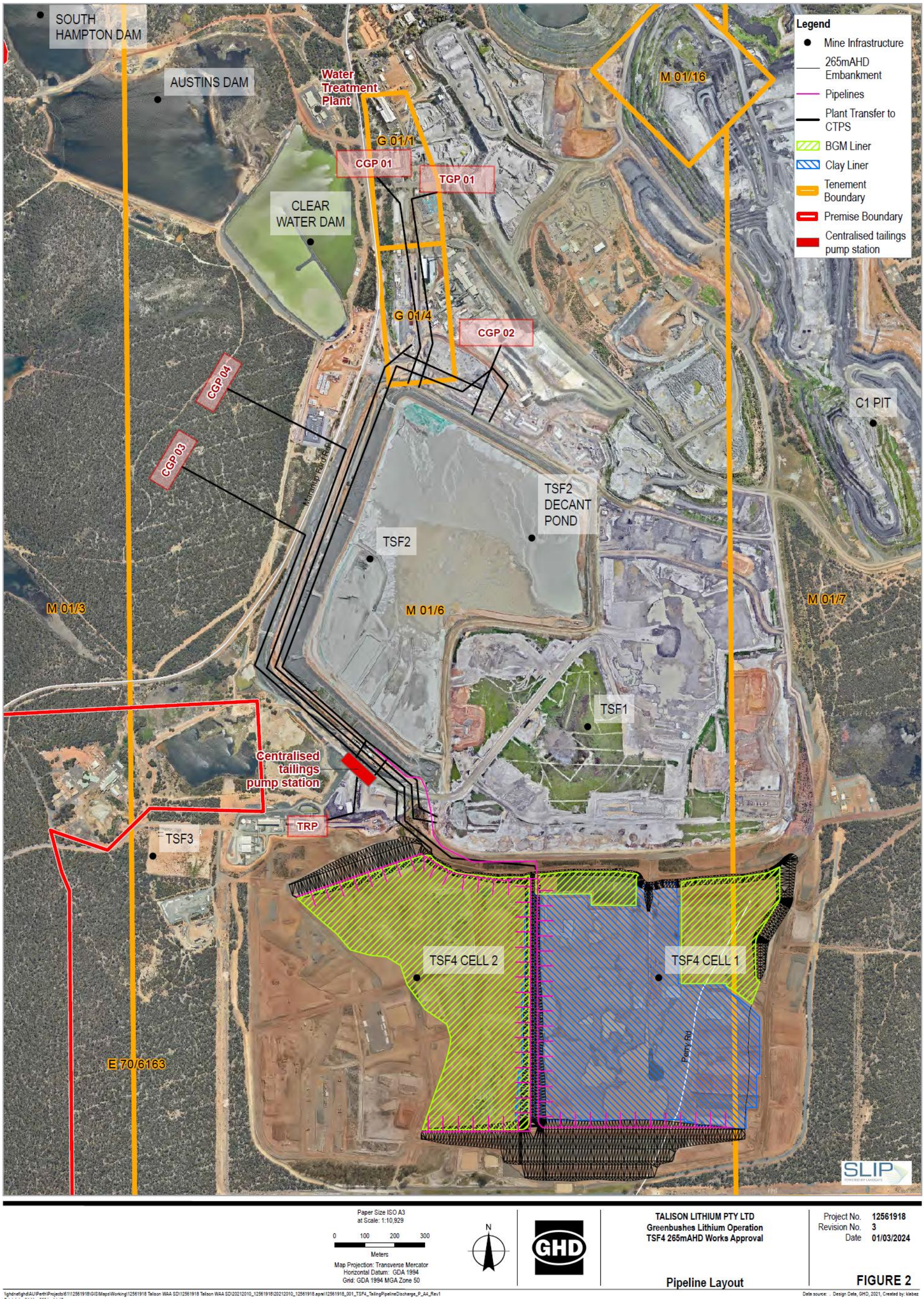


Figure 2 Pipeline layout

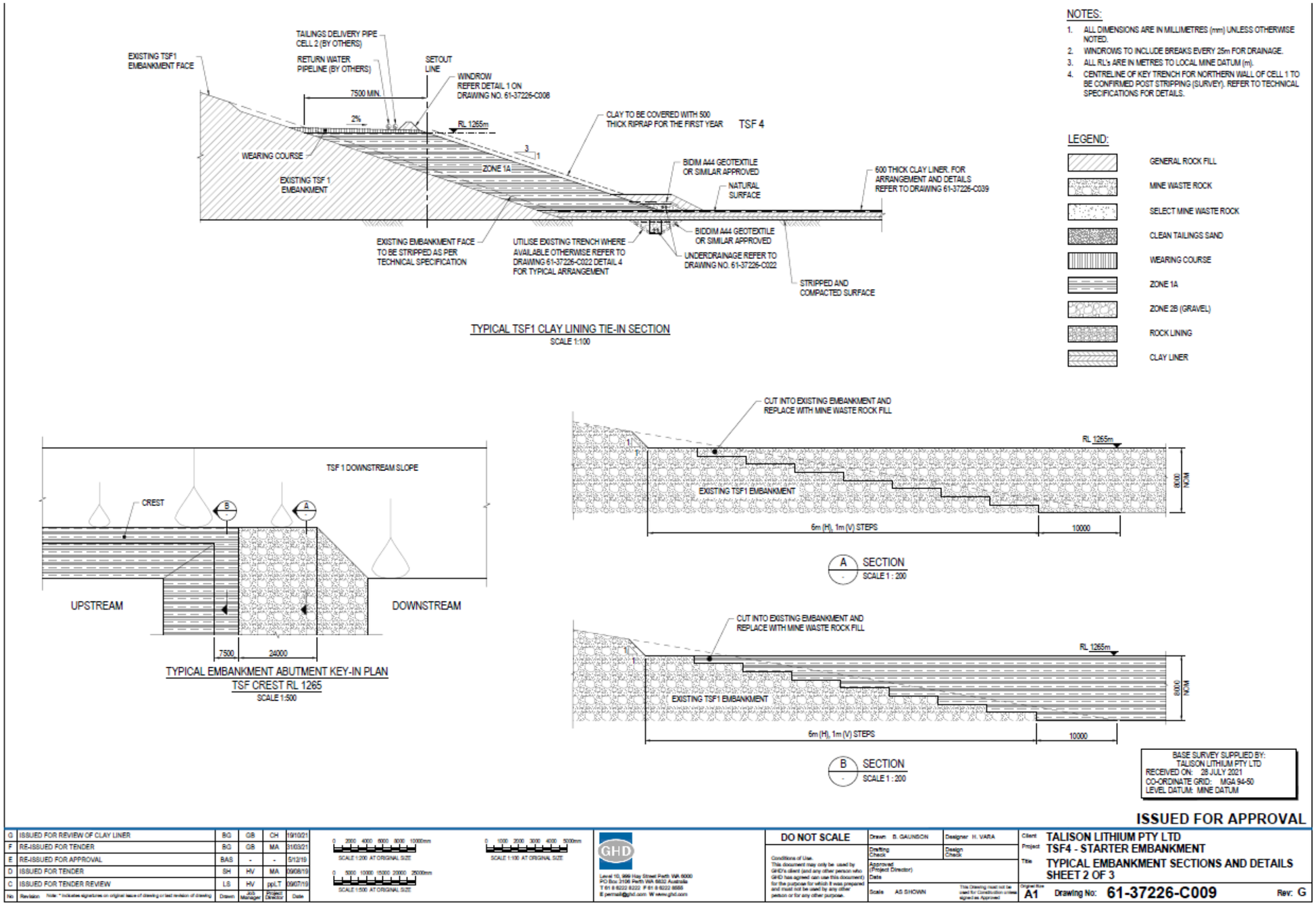


Figure 3 Northern embankment (adjacent to TSF1)

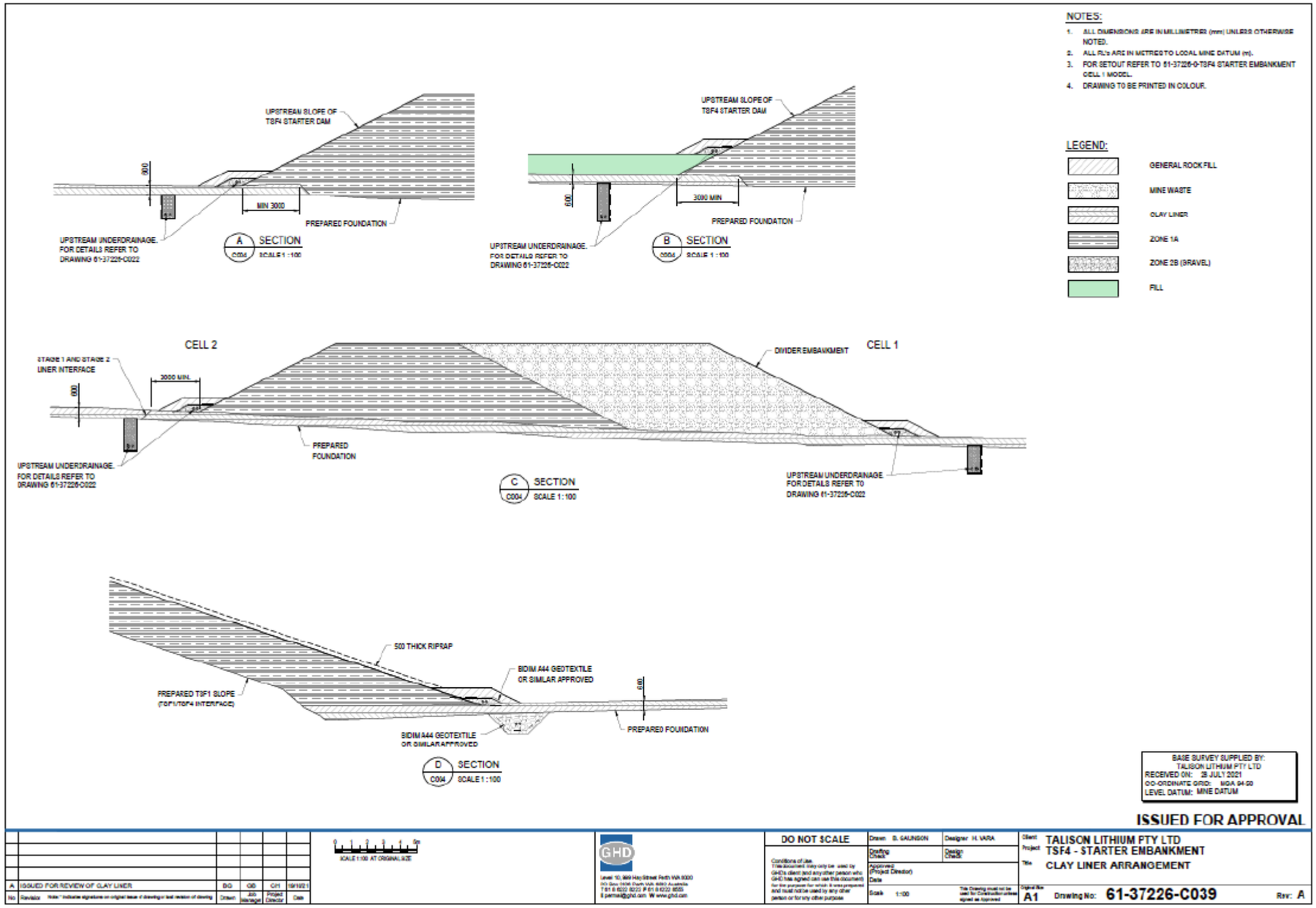


Figure 4 Engineered clay liner and underdrainage layout

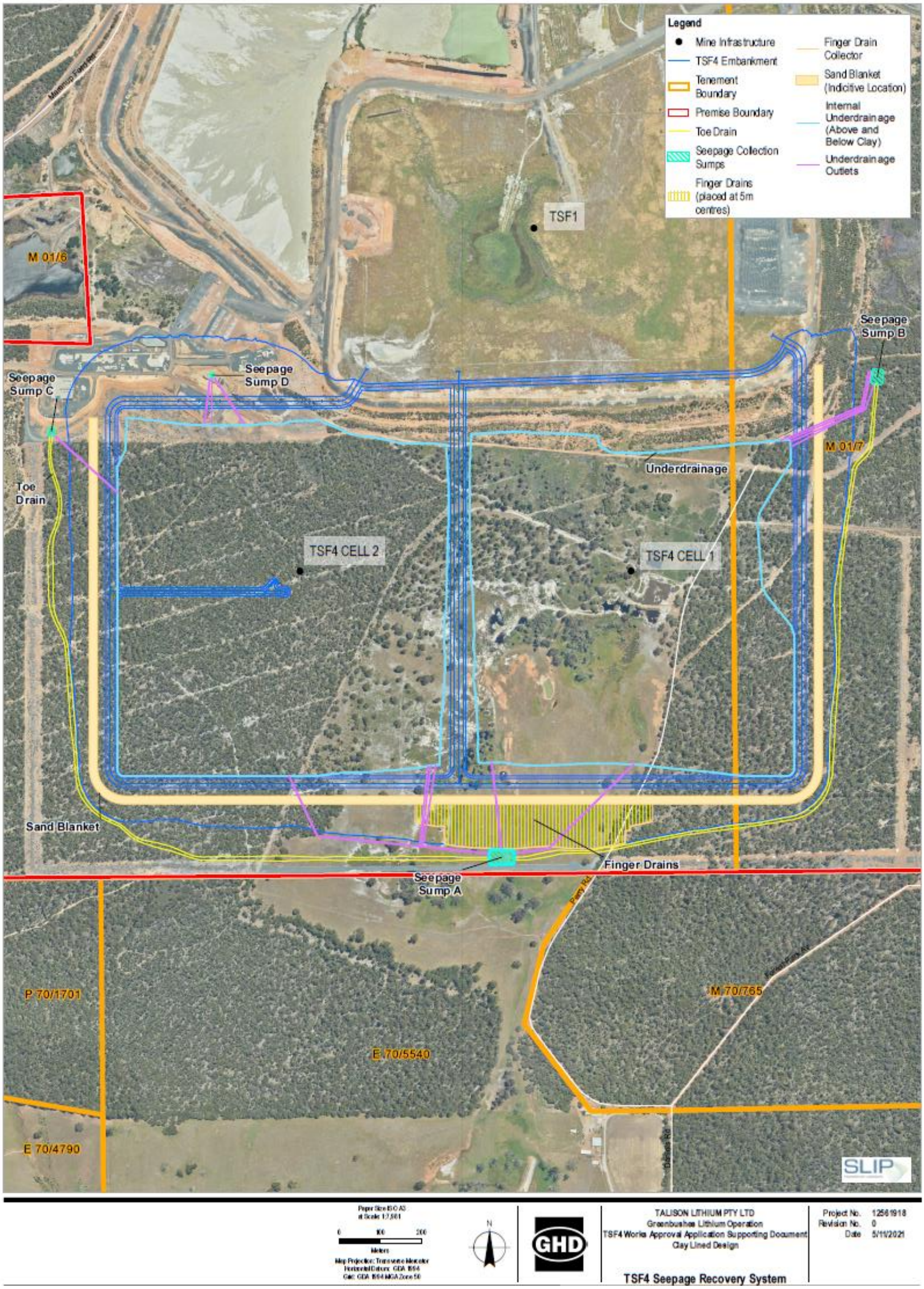


Figure 5 TSF4 Seepage recovery system layout

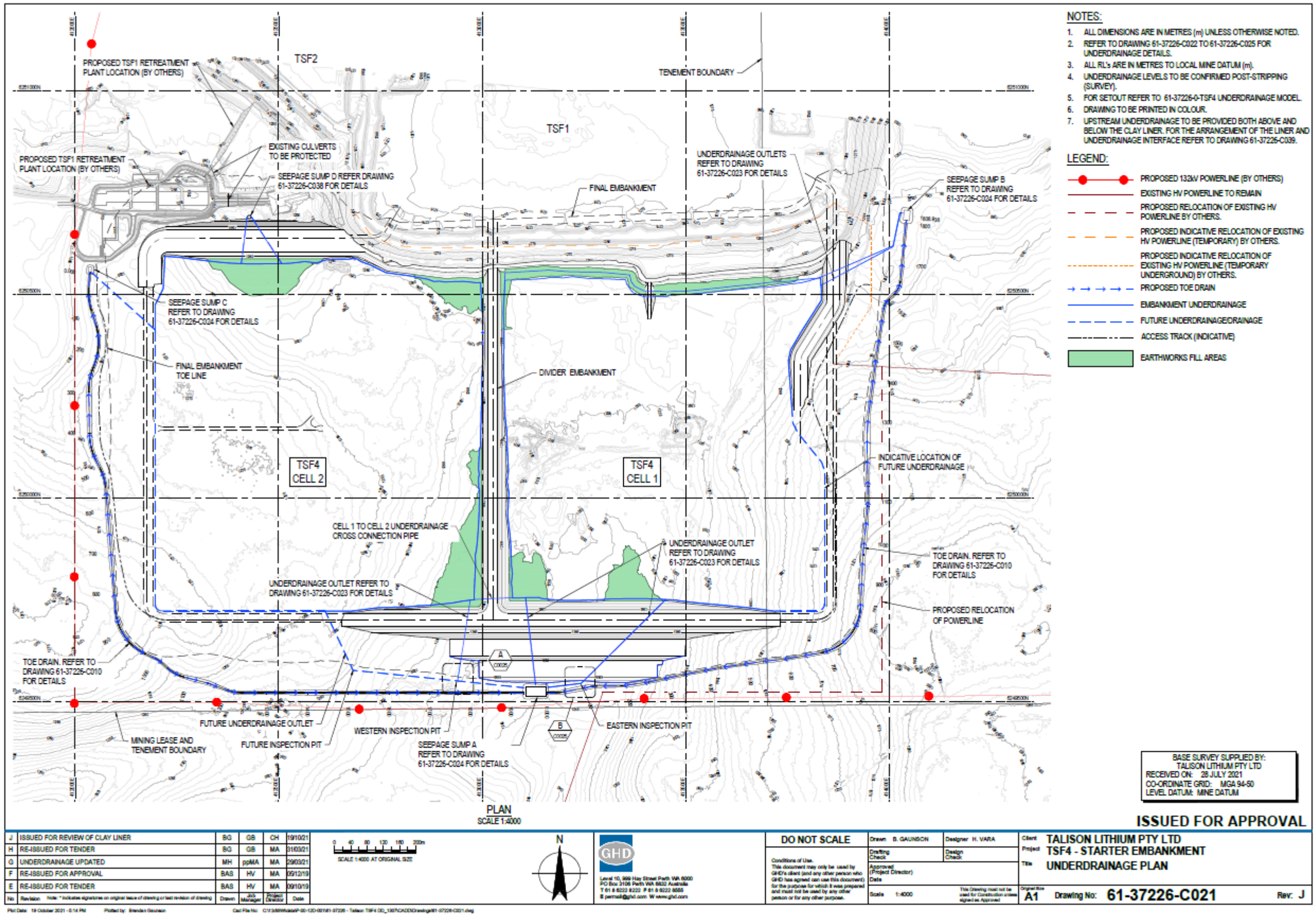


Figure 6 Underdrainage layout and sumps

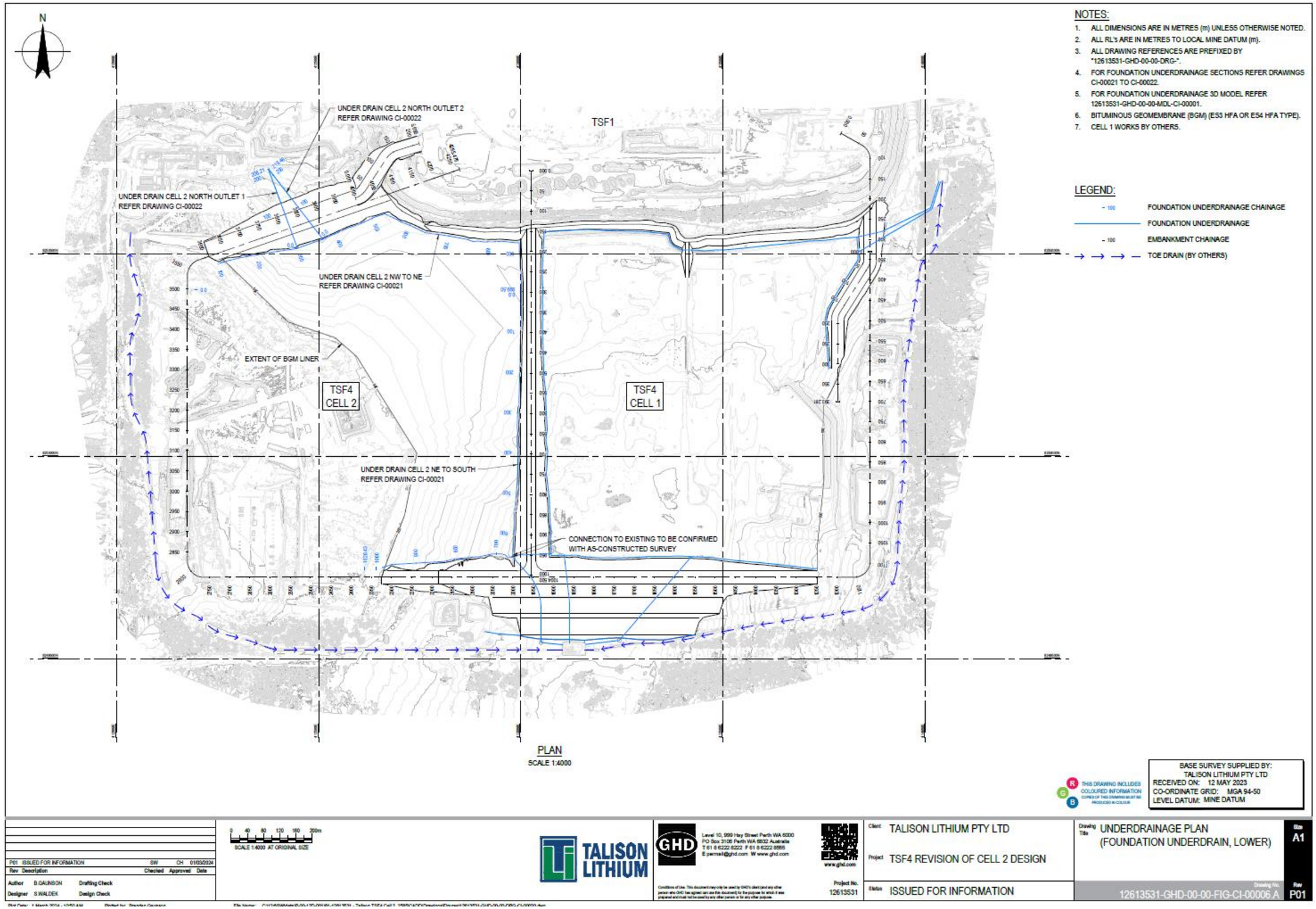


Figure 7 Cell 2 underdrainage plan

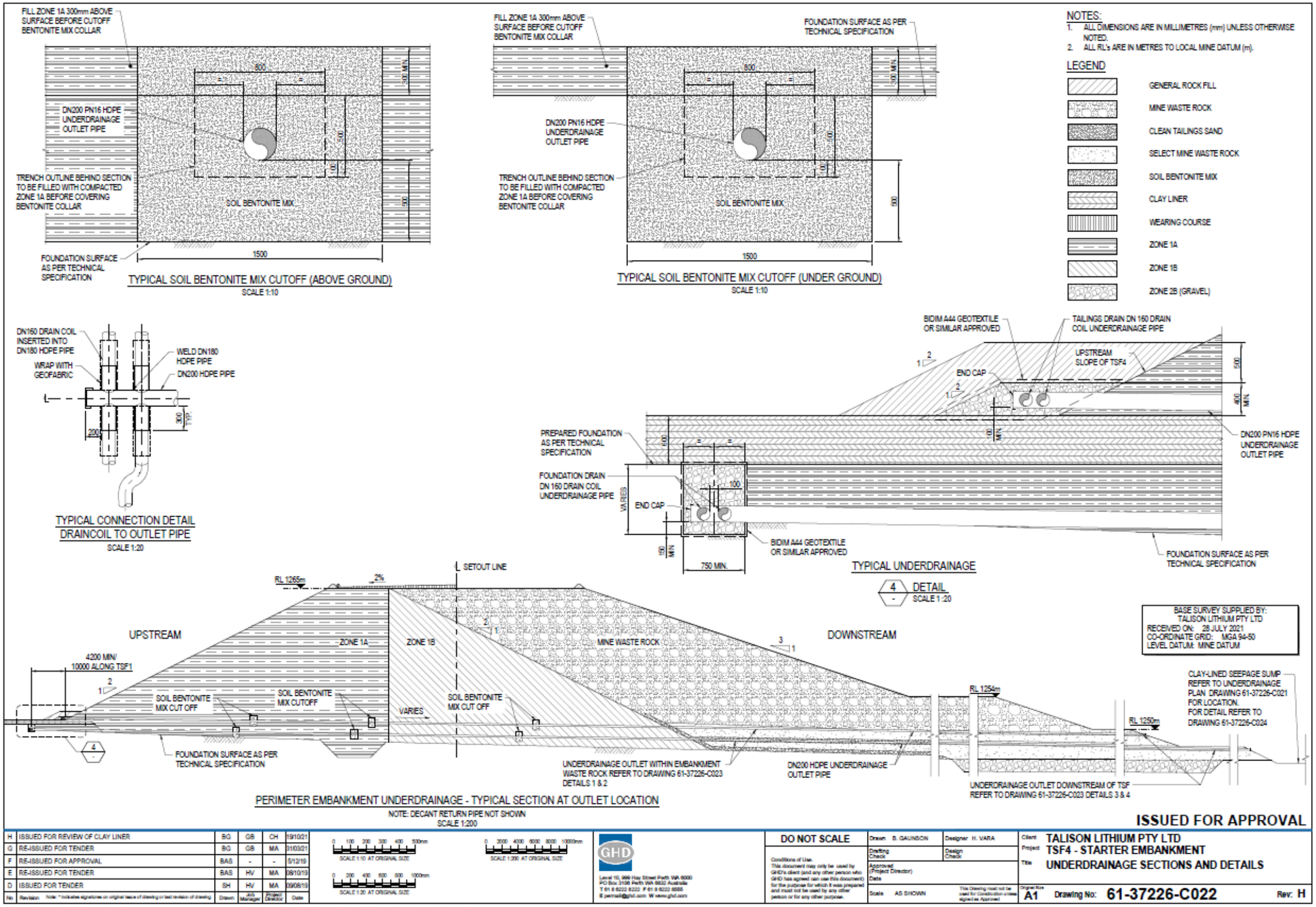


Figure 8 Underdrainage outlets

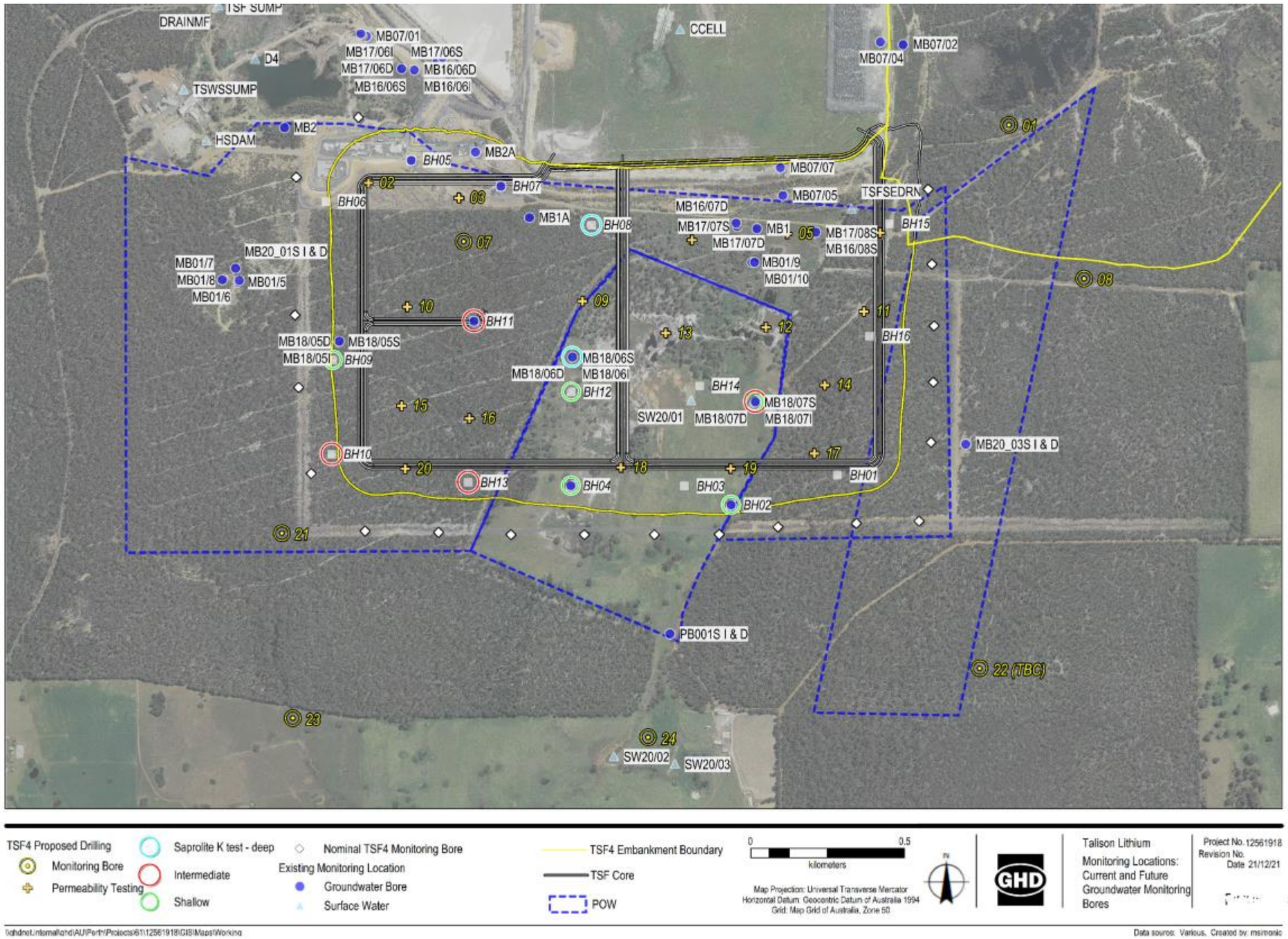


Figure 9 Groundwater monitoring locations

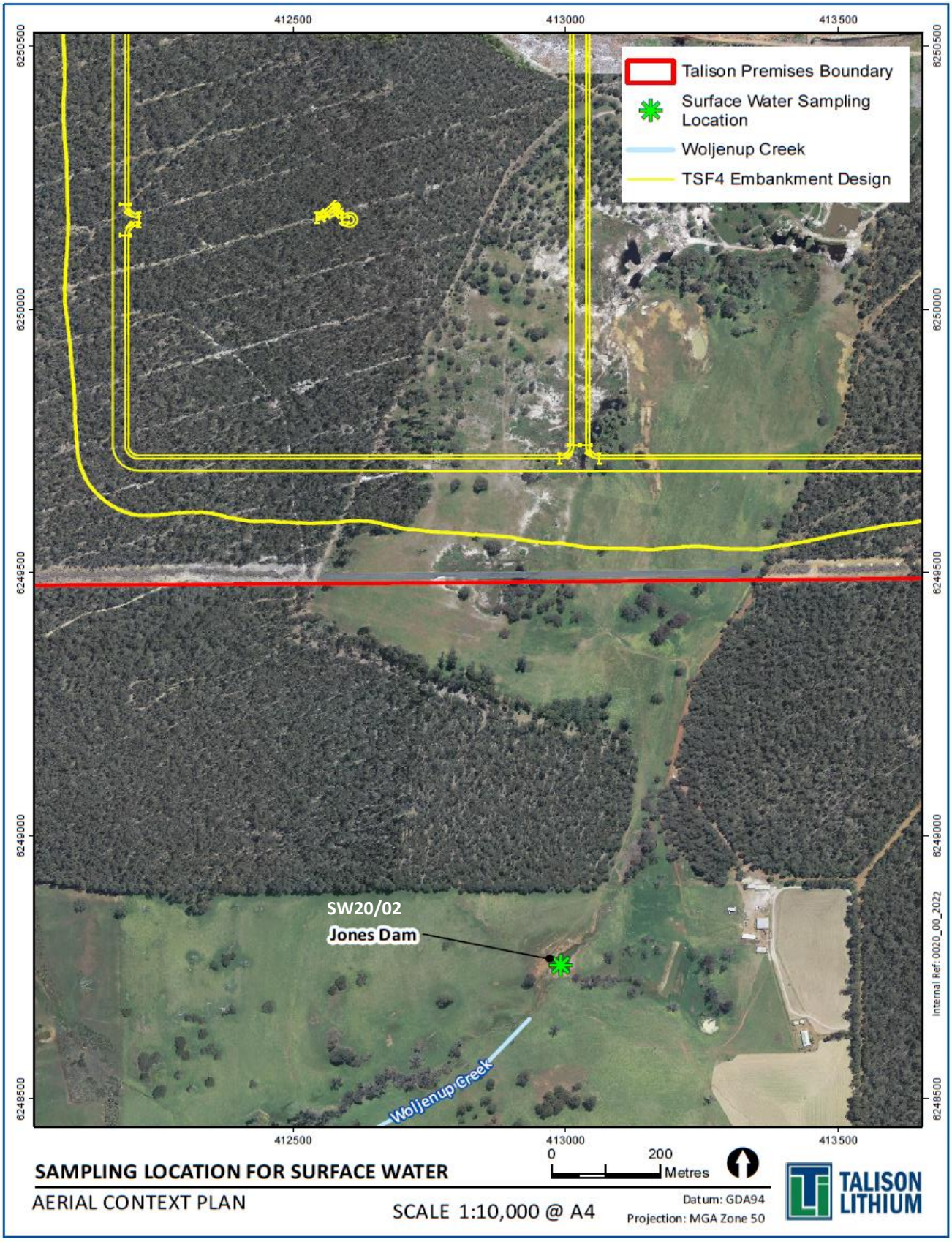


Figure 10 Surface water sampling location

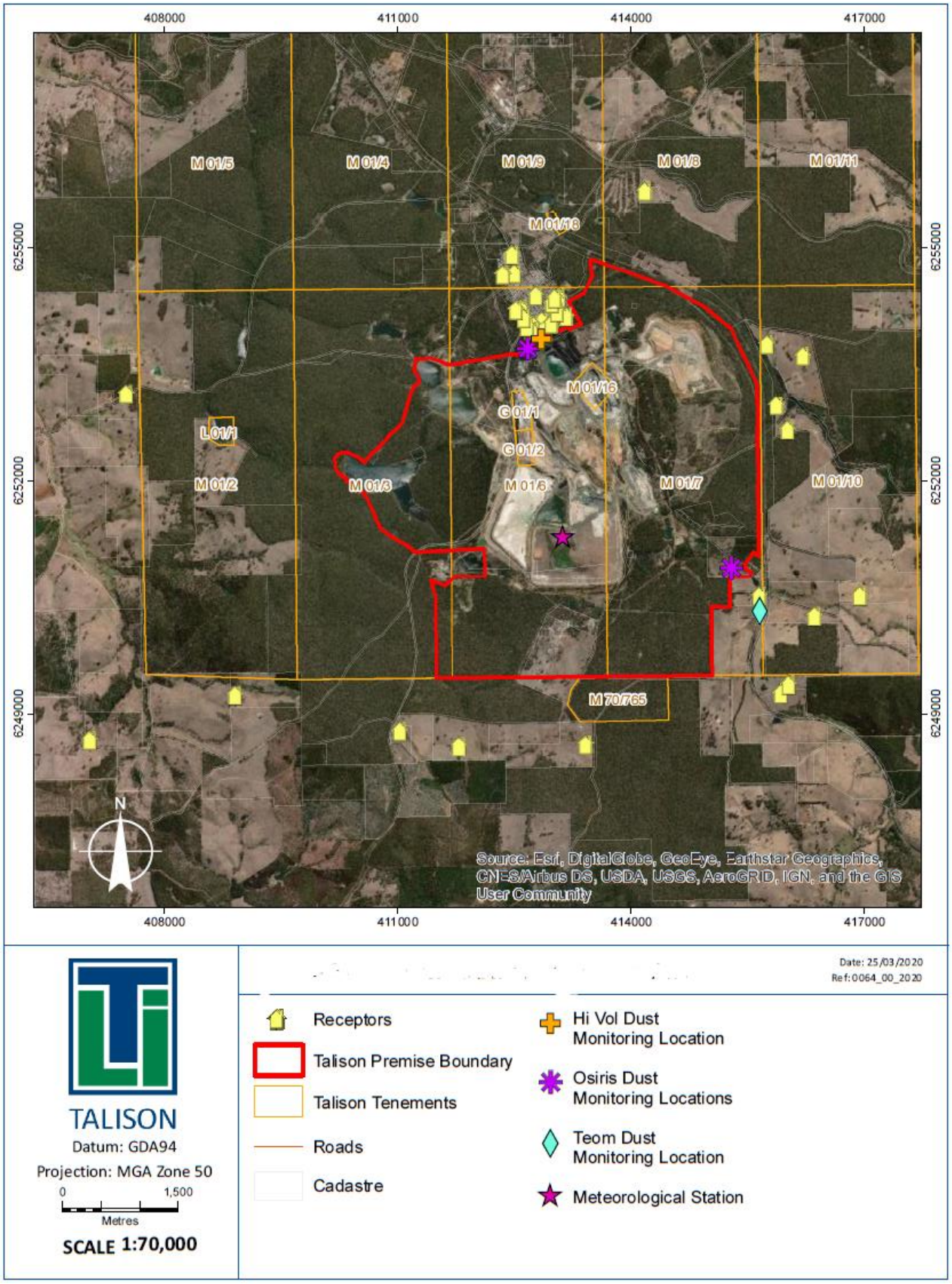


Figure 11 Dust and meteorological monitoring locations

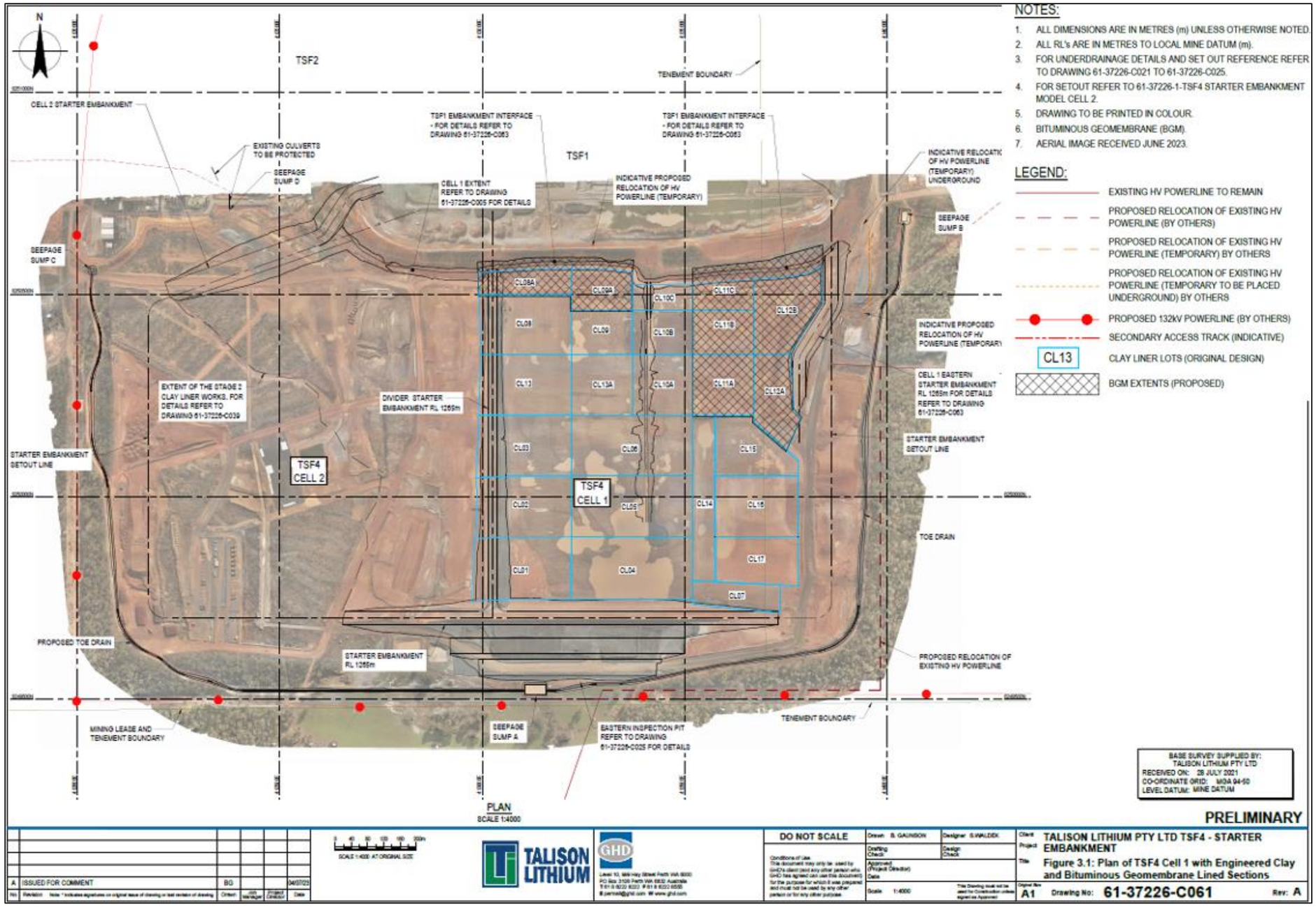
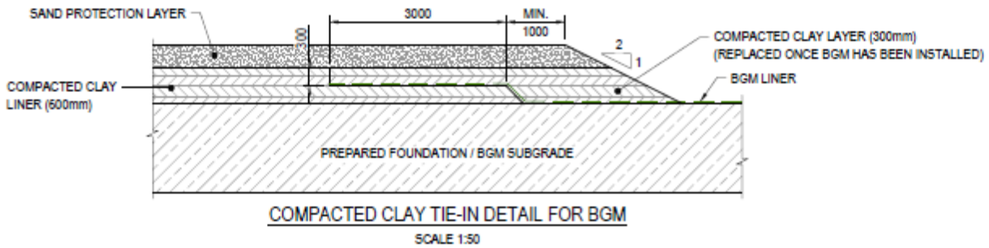
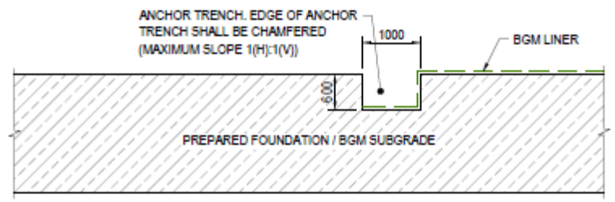


Figure 12 Bituminous geomembrane lined sections of TSF4 cell 1



COMPACTED CLAY TIE-IN DETAIL FOR BGM

SCALE 1:50

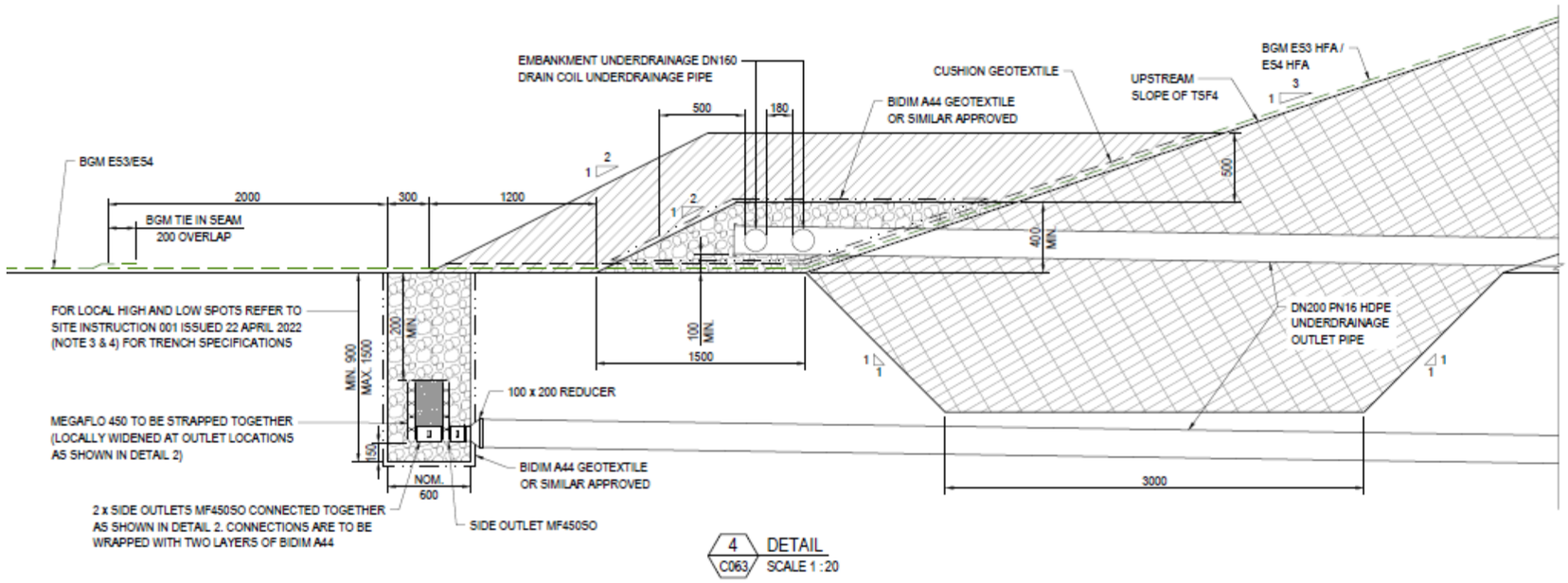


EMBANKMENT LEADING EDGE TIE-IN DETAIL

SCALE 1:50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.
2. ALL RL's ARE IN METRES TO LOCAL MINE DATUM (m).
3. WINDROWS TO INCLUDE BREAKS EVERY 40m FOR DRAINAGE.
4. STARTER EMBANKMENT HAS WIDER CREST THAN THE FINAL DAM, HENCE SET OUT LINE (INCLUDED IN STARTER DAM MODELS) IS OFFSET FROM THE FINAL DAM CENTRELINE. STARTER EMBANKMENT SETOUT LINE TO BE USED FOR STARTER DAM CONSTRUCTION.
5. EDGE OF ANCHOR TRENCH SHALL BE CHAMFERED (MAXIMUM SLOPE 1(H):1(V).
6. BITUMINOUS GEOMEMBRANE (BGM).



LEGEND:

- GENERAL ROCK FILL
- MINE WASTE ROCK
- SELECT MINE WASTE ROCK
- CLEAN TAILINGS SAND
- COMPACTED CLAY LINER
- PREPARED FOUNDATION / BGM SUBGRADE
- BGM
- SAND PROTECTION
- WEARING COURSE
- ZONE 1A
- ZONE 1B
- ZONE 2B (GRAVEL)
- ROCK LINING

Figure 13 TSF4 Cell 1 and Cell 2 starter embankment bituminous geomembrane tie-in detail

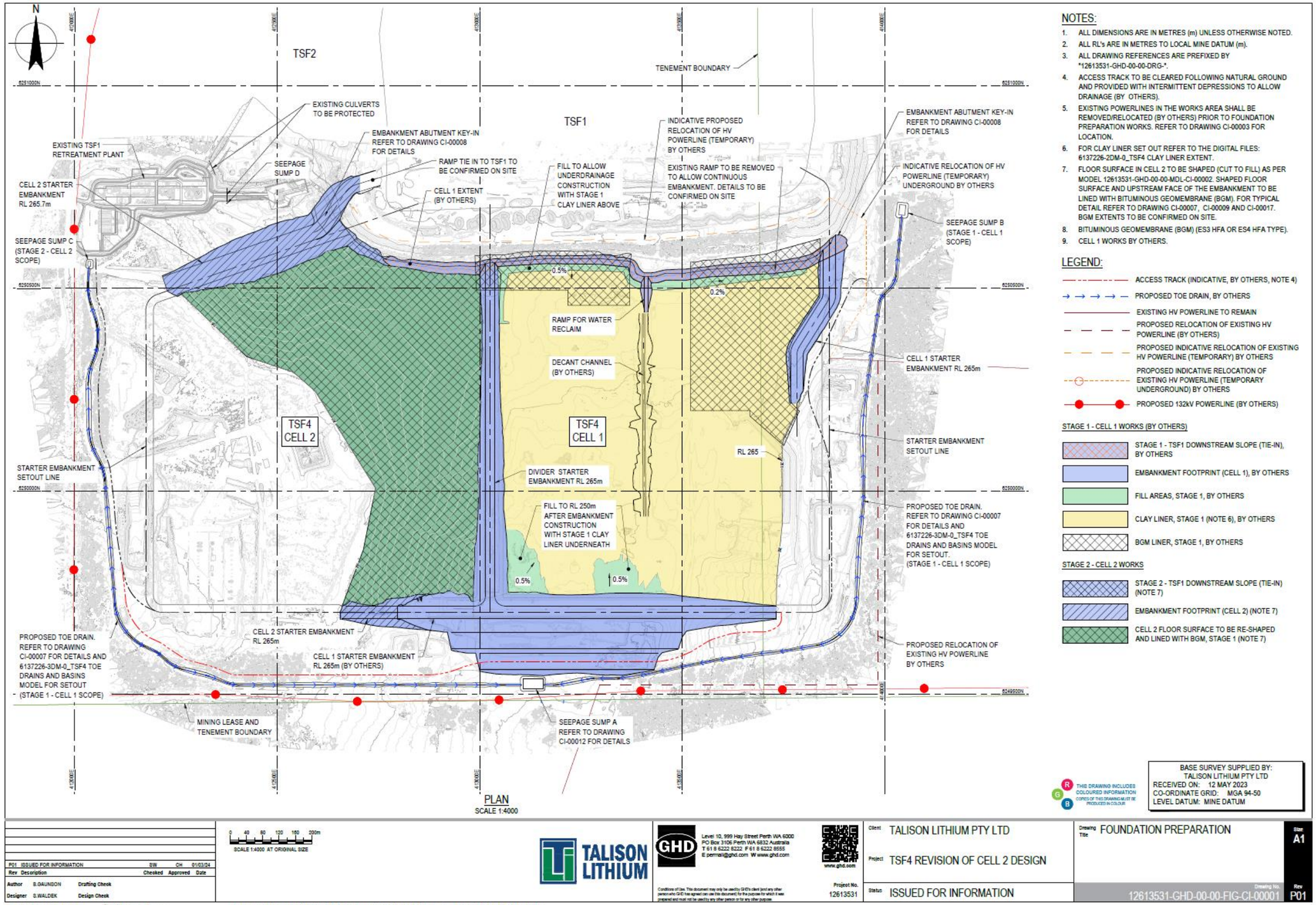
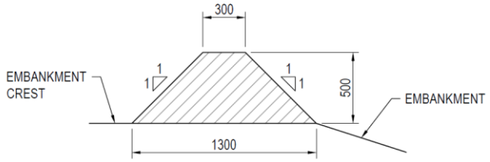
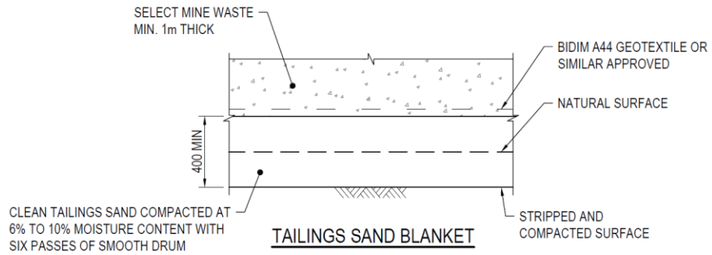


Figure 14 Bituminous geomembrane lined sections of TSF4 cell 2



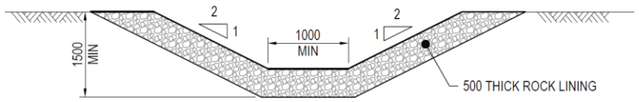
TYPICAL WINDROW

1 DETAIL
SCALE 1 : 20



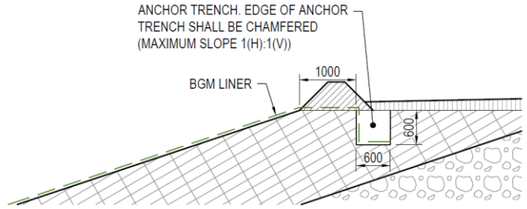
TAILINGS SAND BLANKET

2 DETAIL
SCALE 1 : 20



TYPICAL TOE DRAIN (BY OTHERS)

3 DETAIL
SCALE 1 : 50



ANCHOR TRENCH DETAIL FOR BGM

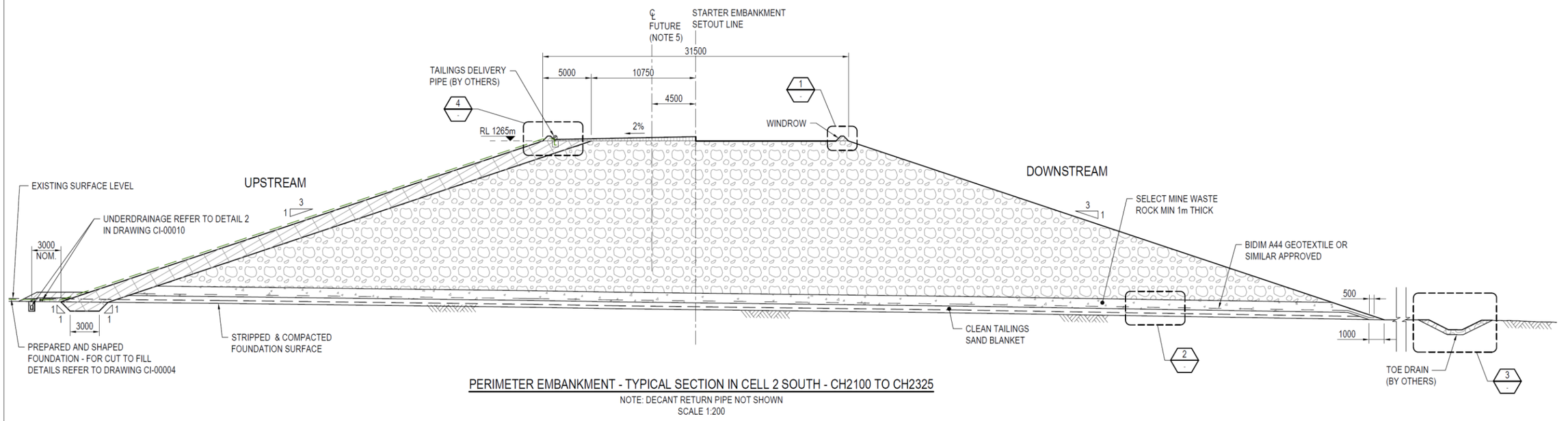
4 DETAIL
SCALE 1 : 50

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETRES (mm) UNLESS OTHERWISE NOTED.
2. ALL RL's ARE IN METRES TO LOCAL MINE DATUM (m).
3. ALL DRAWING REFERENCES ARE PREFIXED BY "12613531-GHD-00-00-DRG-".
4. WINDROWS TO INCLUDE BREAKS EVERY 40m FOR DRAINAGE.
5. STARTER EMBANKMENT HAS WIDER CREST THAN THE FINAL DAM, HENCE SET OUT LINE (INCLUDED IN STARTER DAM MODELS) IS OFFSET FROM THE FINAL DAM CENTRELINE. STARTER EMBANKMENT SETOUT LINE TO BE USED FOR STARTER DAM CONSTRUCTION.
6. BITUMINOUS GEOMEMBRANE (BGM) (ES3 HFA OR ES4 HFA TYPE).
7. CELL 1 WORKS BY OTHERS.

LEGEND:

- GENERAL ROCK FILL
- MINE WASTE ROCK
- SELECT MINE WASTE ROCK
- WEARING COURSE
- CLEAN TAILINGS SAND
- BGM LINER SUBGRADE
- ZONE 2B (GRAVEL)
- ROCK LINING
- BGM



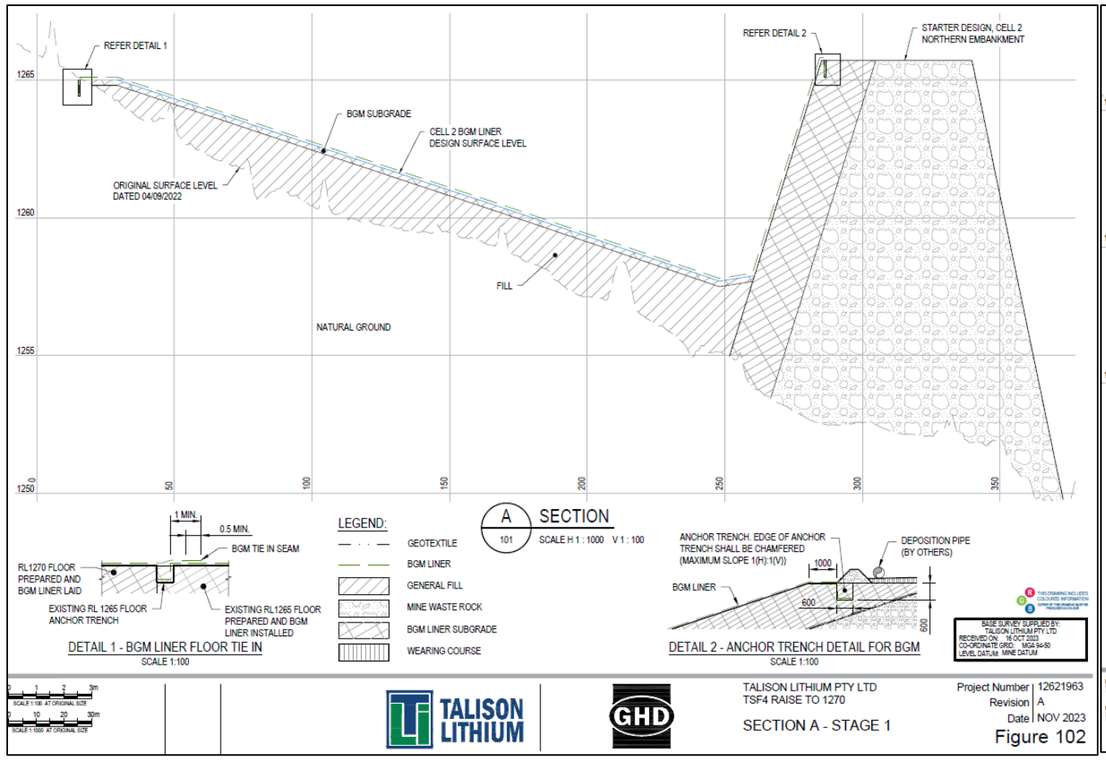
PERIMETER EMBANKMENT - TYPICAL SECTION IN CELL 2 SOUTH - CH2100 TO CH2325

NOTE: DECANT RETURN PIPE NOT SHOWN
SCALE 1:200

THIS DRAWING INCLUDES COLOURED INFORMATION
COPIES OF THIS DRAWING MUST BE PRODUCED IN COLOUR

BASE SURVEY SUPPLIED BY:
TALISON LITHIUM PTY LTD
RECEIVED ON: 12 MAY 2023
CO-ORDINATE GRID: MGA 94-50
LEVEL DATUM: MINE DATUM

Figure 15 TSF4 cell 2 starter embankment bituminous geomembrane anchor trench tie-in detail along northern and divider embankments



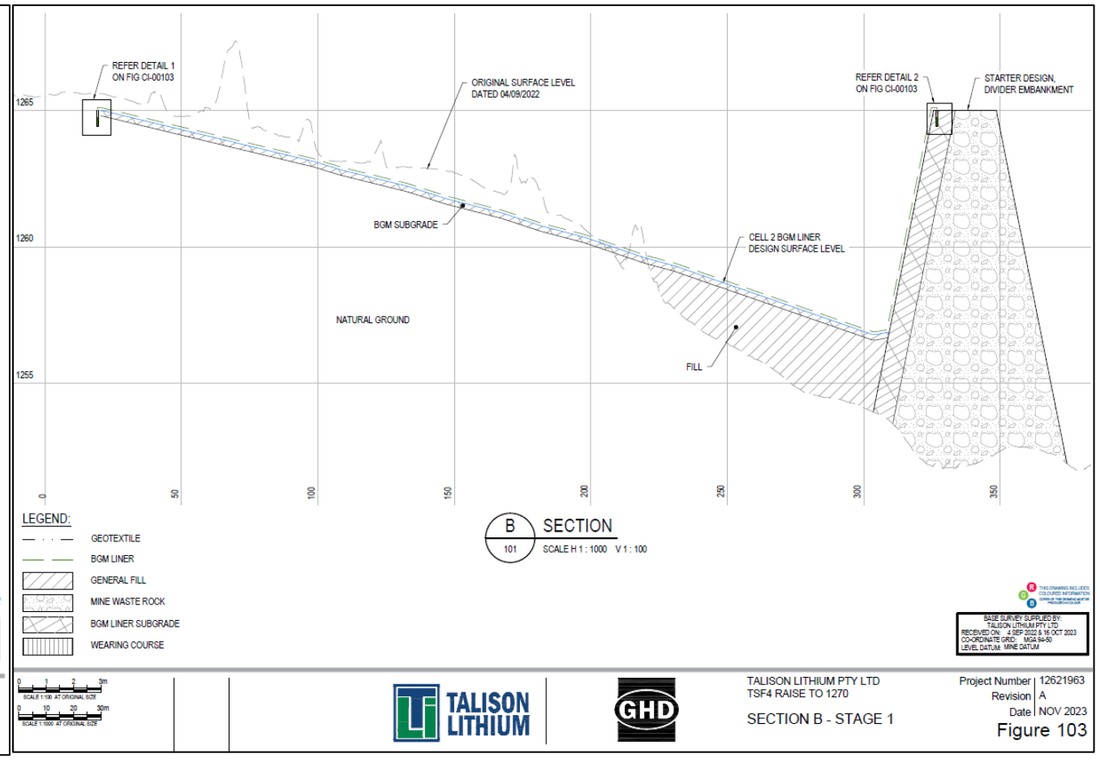


Figure 16 TSF4 Cell 2 BGM liner anchor trench tie-in at 265 mAHD contour

Schedule 2: Monitoring

Groundwater and surface water monitoring

19. The licence holder must monitor groundwater for concentrations of the identified parameter(s) in accordance with Table 6

Table 6: Monitoring of ambient concentrations during time limited operations

Monitoring location	Parameter	Unit	Frequency	Averaging period	Method
Clear Water Dam (Figure 1)	Redox potential (Eh)	mV	Monthly (for shallow depths); Quarterly for intermediate and deep depths)	Spot sample	AS/NZS 5667.1 AS/NZS 5667.11
	Dissolved Oxygen	mg/L			
Clear Water Dam (Figure 1) Groundwater bores: 01, 08, 21, 22, 23, 24 (Figure 9) Surface water: SW20/02 (Figure 10)	Standing water level (applicable for groundwater monitoring bores only)	m(AHD) & mbgl			
	pH	-			
	TDS	mg/L			
	Chloride, Cl-				
	NO_3- as N				
	Sulfate, SO_4-				
	Arsenic, As				
	Copper, Cu				
	Manganese, Mn				
	Nickel, Ni				
	Uranium, U				
	Cobalt, Co				
	Iron, Fe				
	Lithium, Li				
	Thorium, Th				
	Magnesium, Mg				
	Sodium, Na				
	Antimony, Sb				

Quality assurance and quality control requirements

20. The licence holder must adhere to the following field quality assurance and quality control procedures, as specified in Schedule B2 of the Assessment of Site Contamination NEPM, and must include as a minimum:

(a) decontamination procedures for the cleaning of tools and sampling equipment before sampling and between samples;

(b) field instrument calibration for instruments used on site;

(c) blind replicate samples and rinsate blanks must be collected in the field and sent to the primary laboratory to determine the precision of the field sampling and laboratory analytical program;

(d) completed field monitoring sheets / sampling logs for each sample collected, showing:

  (i) time of collection;

  (ii) location of collection;

  (iii) initials of sampler;

  (iv) sampling method;

  (v) field analysis results;

  (vi) duplicate type / location (if relevant); and

  (vii) site observations and weather conditions, and

(e) chain-of-custody documentation must be completed which details the following information:

  (i) site identification;

  (ii) the sampler;

  (iii) nature of the sample;

  (iv) collection time and date;

  (v) analyses to be performed;

  (vi) sample preservation method;

  (vii) departure time from site;

  (viii) dispatch courier(s); and

  (ix) arrival time at the laboratory.