



Works Approval Number	W6209/2019/1
Works approval holder	Hastings Technology Metals Limited
ACN	122 911 399
Registered business address	167 St Georges Terrace Perth WA 6000
DWER file Number	DER2019/000040
Duration	17/06/2020 to 16/06/2025
Date of issue	17/06/2020
Prescribed details	Legal description - Mining Tenements G09/14, M09/158, M09/157, G09/16, G09/18, G09/17 and M09/161 WEST LYONS RIVER WA 6705

Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)	Assessed design capacity
Category 5: Process or beneficiation of metallic or non-metallic ore	1.1 Mtpa
Category 6: Mine dewatering	60 000 tpa
Category 52: Electric power generation	20.16 MW pa
Category 64: Class II or III putrescible landfill site	3487 tpa
Category 73: Bulk storage of chemicals etc.	1225 m ³ in aggregate
Category 85: Sewage facility	34m ³ /d

This Works Approval is granted to the Works Approval Holder, subject to the attached conditions, on 17 June 2020, by:

Alana Kidd

Manager, Resources Industries

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

Works approval history

Date	Reference number	Summary of changes
17/06/2020	W6209/2019/1	Works approval granted

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 means the version of the standard, guideline or code of practice in force at the time of granting of this Works Approval and includes any amendments to the standard, guideline or code of practice which may occur from time to time during the course of the works approval;
- (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.

Works approval conditions

The Works Approval Holder must ensure that the following conditions are complied with:

Construction phase

Infrastructure and equipment

1. The Works Approval Holder must:
 - (a) construct and/or install the infrastructure and/or equipment;
 - (b) in accordance with the corresponding design and construction / installation requirements; and
 - (c) at the corresponding infrastructure location
 as set out in Table 1.

Table 1: Design and construction / installation requirements

Infrastructure	Design and construction / installation requirement	Infrastructure location
Ore processing facility: • ROM pad • Beneficiation circuit • Hydrometallurgical circuit	(a) Beneficiation circuit and hydrometallurgical circuit (b) Equipment located over bunded concrete slabs for the containment of spillage (c) Tanks containing process slurries and/or liquors are located within concrete bunds sized to capture 110% of the volume of the largest tank. (d) Stormwater runoff directed to sedimentation pond designed for runoff from a 5-day, 85 th percentile rainfall (rainfall event of 23.5mm) event without discharge. (e) Sedimentation pond fitted with pumping system to recover spills (f) ROM pad fitted with sprinkler systems for dust suppression (g) Perimeter of the processing facility bunded with granite to divert uncontaminated stormwater away from the facility	Bunded compounds as indicated by pink shaded areas in Ore Processing Plant Stormwater Drainage Plan in Schedule 1. Sedimentation pond as shown in Ore Processing Plant Stormwater Drainage Plan in Schedule 1.
Ore processing facility: • Acid bake kiln normal scrubbing system and normal discharge stack	(a) Emissions via a 35 m high normal scrubber stack. (b) Scrubber system design as shown in the Schedule 1: Map of Acid Bake Kiln scrubbing system consisting of: (i) Low pressure drop fixed throat venturi scrubber (ii) Medium pressure drop fixed throat venturi scrubber (iii) Chevron type entrainment separator (iv) Wet electrostatic precipitator (WESP) (v) Dual alkali scrubber consisting of counter current packed tower scrubber system and an alkali regeneration system (vi) Duty/standby main ID fans (c) Stack emission air quality design criteria of: (i) H₂SO₄ (measured as SO₃ equivalent) less than 45mg/Nm³ (ii) SO₂ less than 280 ppm	Location as shown in Processing Plant Site Layout in Schedule 1. Process flow diagram as shown in Acid Bake Kiln normal and emergency scrubbing systems Process Flow Diagram in Schedule 1.

Infrastructure	Design and construction / installation requirement	Infrastructure location
	(iii) HF less than 50 mg/Nm ³ (iv) Total suspended particulates less than 200 mg/Nm ³ (v) PM ₁₀ less than 10 mg/Nm ³ (d) Continuous emissions monitoring system that: (i) Monitors total suspended particulates, sulphur dioxide, carbon monoxide, hydrogen fluoride and sulphur trioxide; (ii) Adheres to the installation, calibration and operational quality controls of EN14181 (e) Stack must be fitted with monitoring ports that meet the requirements of AS 4323.1	
Ore processing facility: • Acid Bake Kiln emergency scrubbing system and emergency discharge stack	(a) Emissions via a 35 m high emergency scrubber stack (b) Scrubber system design as shown in the Schedule 1: Map of Acid Bake Kiln scrubbing system consisting of: (i) Counter current emergency packed tower scrubber with fixed throat venturi scrubber on the gas inlet; (ii) Candle-type emergency fibre bed mist eliminator vessel; (iii) Duty/standby main ID fan (c) Stack must be fitted with monitoring ports that meet the requirements of AS 4323.1	Location as shown in Processing Plant Site Layout in Schedule 1. Process flow diagram as shown in Acid Bake Kiln normal and emergency scrubbing systems Process Flow Diagram in Schedule 1.
Power station	(a) Six 3.36MW gas reciprocating generator sets with respective air emission stacks (b) One 800 kW diesel black start generator set with air emission stack	Power station location as shown in the Processing Plant Site Layout in Schedule 1.
Ore processing facility sewage treatment plant and irrigation area	(a) Five stage Bardenpho activated sludge sewage treatment plant with the following treated effluent water quality design criteria: (i) pH between 6.8-8.5 (ii) Biochemical oxygen demand less than 20 mg/L (iii) Total suspended solids less than 30 mg/L (iv) Total nitrogen less than 30 mg/L (v) Total phosphorus less than 8 mg/L (vi) E.coli less than 1,000 cfu/100 ml (b) High level alarm float switches on the balance tank and irrigation tank; instrumentation interlocked to process control system (c) 1 hectare irrigation sprayfield with sprinkler system (d) Continuous flow meter to measure volumes discharged to the irrigation sprayfield (e) Wet weather event contingency storage of at least 5,000 L within each pump station and a further capacity of 15 KL within the balance and irrigation tanks (equivalent to approx. 1 day's capacity in total)	WWTP location as shown in the Processing Plant Site Layout in Schedule 1. Infrastructure components as shown in Map of ore processing facility sewage treatment plant in Schedule 1.
Putrescible and inert	(a) putrescible waste landfill bunker and inert waste landfill bunker at each of the Frasers Pit waste rock dump and	Refer to indicative locations in

Infrastructure	Design and construction / installation requirement	Infrastructure location
landfill bunkers	Bald Hill Pit waste rock dump (b) Bunkers to be nominally 50 m long, 10 m wide and 2 m deep (c) Bunkers are to incorporate an approximate 2 percent slope to the rear to retain stormwater collected within bunkers/ (d) Bunkers are to include perimeter stormwater diversion drainage.	'Premises Map' in Schedule 1. Bunker design as per 'Map of landfill bunker design' in Schedule 1.
Discharge of dewater from Fraser Pit and Bald Hill Pit	(a) Frasers Pit and Bald Hill Turkey Nests lined with HDPE (b) Controlled overflow discharge pipe from each of the Frasers Pit and Bald Hill Turkey Nests to convey water to the nearest drainage line. (c) A spreader pipe from the discharge point to manage flow and reduce inundation downstream of the discharge point. (d) Rock pitching at the discharge point to disperse kinetic energy and protect bed and banks adjacent to the discharge point.	Authorised discharge locations as per 'Map of dewater discharge points' in Schedule 1.
Tailings and return water pipelines	(a) Pipelines are to be constructed of HDPE. (b) With the exception of pipeline sections that traverse a waterway, pipelines are to be installed in bundled corridors that direct spillage to low point spillage containment ponds or into a TSF. (c) Pipeline corridor spillage containment points are to be designed for 12 hours of maximum flow from the largest pipe. (d) Sections of pipelines that traverse a waterway are to be double sleeved and installed on an elevated pipe bridge. (e) Pipelines are to be fitted with a continuously monitored pressure alarm system that activate an alarm system and automated tail pumping system shutdown in the event of pressure drop detection.	Pipeline routes as shown in 'TSF pipeline route and stormwater diversion plan' in Schedule 1.
Bulk storage of chemicals	(a) RE-60 truck loading comprise: (i) Truck loading on a concrete apron with a drive over kerb incorporating a slope back to the storage tank bund (b) Bunded concrete compound for bulk chemical storage capable of containing 110% of the volume of the largest vessel/ container in the bund.	Bulk chemical storage area as shown in Ore Processing Plant Stormwater Drainage Plan in Schedule 1.
Groundwater monitoring bores	(a) Six groundwater monitoring bores installed at approximate locations shown on the <i>Map of TSF groundwater and piezometer monitoring locations</i> in Schedule 1 that intercept groundwater in the confined aquifer and include a shallow nested bore to identify upward seepage from the confined aquifer. (b) Groundwater monitoring bores are to be installed no later than 6 months from the Works Approval issue date.	Schedule 1: Maps - Map of TSF groundwater and piezometer monitoring locations

Critical containment infrastructure

2. The Works Approval Holder must:
- (a) construct the critical containment infrastructure;
 - (b) in accordance with the corresponding design and construction; and
 - (c) at the corresponding infrastructure location
- set out in Table 2 and Table 3.

Table 2: Beneficiation TSF Critical containment infrastructure design and construction requirements

Criteria	Design and construction requirements	Infrastructure location
General	(a) 86 hectare area with design for maximum volume of 6.5 Mm³ (approximately 9.745 Mt solids) (b) Paddock style facility with perimeter discharge via spigots	TSFs location as shown in the Premises Map and Map of TSF groundwater and piezometer monitoring locations in Schedule 1. Pipeline route as shown in the TSF pipeline route and stormwater in Schedule 1
Stormwater and freeboard controls	(c) Stormwater storage capacity equivalent to a 1:5 wet season plus 1:100 AEP, 72 hour flood (d) A spillway for a 1:100,000 AEP, critical flood plus 1:10 AEP wave run-up or PMF (e) Level gauge boards and/or automated level sensors for monitoring water levels (f) Decant pumping system and decant (return water) pipeline to the ore processing facility.	
Seepage controls	(a) Minimum 300 mm of clayey in-situ soils at the base of the pond impoundment area that are proof compacted during construction to achieve a hydraulic conductivity of at least 1×10^{-8} m/s. (b) Contingency measures incorporated into the as constructed TSF are to include: (i) treatments of any identified preferential seepage paths between the TSF and downstream receptors using barrier systems such as cement grouting or cut-off walls; (ii) seepage interception systems such as trenches or recovery bores; and (iii) geosynthetic lining of collection drains within the final TSF landform to further reduce long term seepage rates.	

Table 3: Hydromet TSF Critical containment infrastructure design and construction requirements

Criteria	Design and construction requirements	Infrastructure location
General	(a) 36 hectare area with design for maximum volume 1.9 Mm³ (approximately 0.72 Mt solids) (b) Paddock style facility with decant pond, decant tower and single point discharge	TSF locations shown in Premises Map and TSF pipeline route and stormwater diversion map in
Stormwater and freeboard	(c) Stormwater storage capacity equivalent to a 1:5 wet season plus 1:100 AEP, 72 hour flood	

Criteria	Design and construction requirements	Infrastructure location
controls	(d) Additional freeboard equivalent to a 1:10 AEP wind run-up plus 0.3 m (e) A spillway for a 1:100,000 AEP, critical flood plus 1:10 AEP wave run-up or PMF (f) Installation of level gauge boards and/or automated level sensors for monitoring water levels	Schedule 1.
Seepage controls	(a) Geocomposite lining system to achieve a hydraulic conductivity of 10^{-9} m/s or less comprising; (i) Minimum 300 mm thick compacted clay liner below a HDPE liner; and (ii) Minimum 1.5 mm thickness HDPE liner (iii) Installation to follow QA/QC procedures (iv) Electrical leak location survey to be completed post installation (v) Any holes or defects identified in the leak location survey to be repaired. (b) Underdrainage collection in the valley of the TSF installed above HDPE liner	

Compliance reporting – infrastructure and equipment

3. The Works Approval Holder must within 60 calendar days of each item of infrastructure and/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.
4. The Environmental Compliance Report required by condition 3, must include as a minimum the following:
 - (a) certification that the items of infrastructure or component(s) thereof, as specified in condition 1, have or have not been constructed and/or installed 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.
5. Where an item of infrastructure has been certified as not being located or constructed, or does not comply with the corresponding requirements, the works approval holder must correct the non-compliant or defective works, prior to re-certifying, or provide to the CEO a description of, and explanation for, any departures from the requirements specified in condition 1 that do not require relocation or rectification and do not constitute a material defect along with the Environmental Compliance Report.

Compliance reporting – critical containment infrastructure

6. The Works Approval Holder must within 60 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.
7. The Critical Containment Infrastructure Report required by condition 6 must include as a minimum the following:
 - (a) certification by the Tailings Design Engineer of Record or their delegate 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; and
 - (c) be signed by a person authorised to represent the Works Approval Holder and contains the printed name and position of that person within the company.
8. Where an item of infrastructure has been certified as not being located or constructed, or does not comply with the corresponding requirements, the works approval holder must correct the non-compliant or defective works, prior to re-certifying, or provide to the CEO a description of, and explanation for, any departures from the requirements specified in condition 2 that do not require relocation or rectification and do not constitute a material defect along with the Critical Containment Infrastructure Report.

Commissioning phase

Commencement and duration

9. The Works Approval Holder is permitted to commission the WWTP for a period of three months from the date of completion of construction. The Works Approval Holder must notify the CEO of the start of commissioning, at least seven days prior to the commencement of commissioning.
10. During the commissioning period the Works Approval Holder must monitor the treated effluent stream post the WWTP for the parameters as listed in Table 10 in Schedule 3 and ensure the effluent meets the limits specified.

Reporting

11. Within 14 days of the end of the commissioning period the Works Approval Holder shall submit a report demonstrating compliance with condition 10.

Time limited operations phase

Commencement and duration

12. The Works Approval Holder may only commence time limited operations for an item of infrastructure identified in condition 1 (with the exception of the WWTP) where the Environmental Compliance Report as required by conditions 3 and 4 has been submitted by the Works Approval Holder for that item of infrastructure.
13. The WWTP may commence time limited operations following submission of the commissioning report as listed in condition 11.

- 14.** The Works Approval Holder may only commence time limited operations for an item of critical containment infrastructure identified in condition 2:
- (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 2 meets the requirements of that conditions 6 and 7; 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 6 and 7 has been submitted to the CEO.
- 15.** The Works Approval Holder may conduct time limited operations for an item of infrastructure specified in conditions 1 or 2 (as applicable):
- (a) for a period not exceeding 180 calendar days from the day the Works Approval Holder meets the requirements of conditions 12 or 14 (as applicable) 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*.

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 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

Premises infrastructure and equipment	Operational requirement	Infrastructure location
Acid bake kiln	(a) In the event of an acid bake kiln normal operations scrubbing system malfunction or failure, air emissions must be directed to the emergency operations scrubbing system and emitted via the emergency operations stack until the acid bake kiln is offline. (b) The Emergency operations scrubbing system must be maintained in a fit for purpose standby state at all times while emissions from the normal operations stack are occurring. (c) Operation of the acid bake kiln must not recommence after an event in part (a), unless caustic scrubbing fluid in the emergency operations scrubbing system has been replaced and the scrubbing system is fit for purpose in a standby state.	As shown in the Processing Plant Site Layout in Schedule 1. Process flow diagram as shown in Acid Bake Kiln normal and emergency scrubbing systems Process Flow Diagram in Schedule 1.

- 17.** During time limited operations, the Works Approval Holder must ensure that the emissions specified in Table 5 are discharged only from the corresponding discharge point and only at the corresponding discharge point location.

Table 5: Authorised discharged points

Emission	Discharge point	Discharge point height (m)	Discharge point location as shown in relevant map in Schedule 1
Particulate matter (PM), nitrogen oxides (NO _x), sulfur dioxide (SO ₂), sulfuric acid mist/ sulfur trioxide (H ₂ SO ₄ / SO ₃), hydrogen fluoride (HF), carbon monoxide (CO)	Acid bake kiln normal operations stack	35	Processing Plant Site Layout
	Acid bake kiln emergency operations stack		
Particulate matter (PM), nitrogen oxides (NO _x), sulfur dioxide (SO ₂), carbon monoxide (CO)	Gas-fired generator stacks 1-3	8.5	
	Diesel black start generator stack		
Fraser Pit dewater	Fraser's Pit turkeys nest discharge pipe	N/A	Map of dewater discharge points
Bald Hill Pit dewater	Bald Hill turkeys nest discharge pipe		Sprayfield as shown in Processing Plant Site Layout in Schedule 1.
Treated sewage wastewater	Irrigation sprayfield discharge pipe		

- 18.** During time limited operations, the Works Approval Holder must ensure that emissions from the discharge point listed Table 6 in do not exceed the corresponding limit(s) when monitored in accordance with condition 19.

Table 6: Discharge point emission limits

Discharge point	Parameter	Limit (mg/m ³)	Averaging period
Acid bake kiln normal operations stack	H ₂ SO ₄ (as SO ₃ equivalent)	45	60-minutes
	HF	50	

Monitoring during time limited operations – emissions

- 19.** The Works Approval Holder must monitor point source air emissions during time limited operations in accordance with Table 7.

Table 7: Point source emissions to air monitoring requirements

Discharge point	Parameter	Frequency	Averaging period	Units ^{1,2}	Method ^{3,4}
Acid Bake Kiln Normal Operations scrubber stack	TSP, NO _x , SO ₂ , SO ₃ , HF, flowrate	Continuous Monitor availability ≥90% of the time per calendar month when the source is operating	1-minute and 60-minutes	mg/m ³ g/s	EN 14181
	TSP	Two separate sample events separated by at least one week during environmental commissioning	60-minutes	mg/m ³ g/s	USEPA Method 5
	NO _x				USEPA Method 7E
	SO ₂				USEPA Method 8
	SO ₃				USEPA Method 8
	HF				USEPA Method 26 or 26A
	Flow rate			m ³ /s	USEPA Method 2

Note 1: All units are referenced to STP dry

Note 2: Concentrations to be corrected to STP at 3% oxygen on a dry basis.

Note 3: Duplicate sample runs conducted consecutively on the same sample day.

Note 4: Where any USEPA method refers to USEPA Method 1 for the sampling plane, this must be read as referral to AS 4323.1

20. The Works Approval Holder must monitor treated wastewater emissions during time limited operations in accordance with Table 10 in Schedule 3.
21. The Works Approval Holder must complete the following for TSFs during time limited operations:
 - (a) Twice daily inspections of the tailings storage facilities' freeboard; and
 - (b) Twice daily inspections to record any visible seepage (e.g. through the embankment) or loss of containment from the TSF or delivery and return pipelines.
22. The Works Approval Holder must complete an individual monthly water balance over the Beneficiation TSF and Hydromet TSF, considering:
 - (a) The volume of tailings deposited to the TSF;
 - (b) Evaporation;
 - (c) Rainfall;
 - (d) Tailings decant return (for Beneficiation TSF only)
 To derive a seepage loss volume.

Monitoring during time limited operations – ambient

23. The Works Approval Holder must monitor groundwater and surface water quality during time limited operations for concentrations of the identified parameters in accordance with Table 11 and Table 12 in Schedule 3.

Specified actions during time limited operations

24. The Works Approval Holder shall sample and analyse the soluble fluoride, molybdenum and REEs concentrations in Beneficiation tailings decant recycled weekly during the TSF Time Limited Operations period. Samples may be analysed in a non NATA registered laboratory.
25. During the TSF Time Limited Operations period, the Works Approval Holder shall conduct a sampling program of Hydromet TSF pore water to assess the contaminant concentrations. The number of samples analysed shall be consistent with the advice given in DER (2014) *Assessment and Management of Contaminated Sites Guidelines*. The parameters assessed will be as specified in Table 11 of Appendix 4 for the TSF monitoring bores. The results of the monitoring program are to be compared against the estimated TSF3 pore water data submitted in the Works Approval Holder's Application.
26. The Works Approval Holder shall complete and submit to the CEO a whole site GoldSim water balance using data obtained during TSF Time Limited Operations to confirm assumptions of the preliminary water balance (as detailed in the Application).
27. The Works Approval Holder shall submit to the CEO a scope of work to conduct a desktop assessment of potential impacts to fauna from exposure to both TSFs during the TSF Time Limited Operations period. The desktop assessment shall be completed by an ecologist or an equivalent qualified professional with experience in assessing wildlife ecotoxicological impacts from mine waste storages.
28. The Works Approval Holder shall complete and record daily observations of fauna accessing the TSFs during the TSF Time Limited Operations period. Observations shall be recorded by personnel trained in identifying wildlife species.

Compliance reporting

29. The Works Approval Holder must submit to the CEO a report on the time limited operations within 60 calendar days of the completion date of time limited operations or 30 calendar days before the expiration date of the works approval, whichever is the sooner.
30. The Works Approval Holder must ensure the report required by condition 29 includes the following:
 - (a) a summary of the time limited operations, including timeframes and amount of ore processed
 - (b) a summary of the monitoring results obtained during the time limited operations under conditions 19, 20, 21, 23 and 28;
 - (c) reports as required by conditions 24, 25, 26 and 27;
 - (d) a review of performance and compliance against the conditions of the works approval; and
 - (e) where the manufacturers design specifications and the conditions of this Works Approval have not been met, the measures the Works Approval Holder will take to meet them, and the timeframes required to implement those measures.

Records and reporting (general)

- 31.** 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
- 32.** 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 conditions 1 and 2 of this works approval;
 - (b) any maintenance of infrastructure that is performed in the course of complying with the conditions of this works approval;
 - (c) monitoring programmes undertaken in accordance with conditions 19, 20, 23 and 28 of this works approval; and
 - (d) complaints received under condition 31 of this works approval.
- 33.** The books specified under condition 32 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 8 have the meanings defined.

Table 8: Definitions

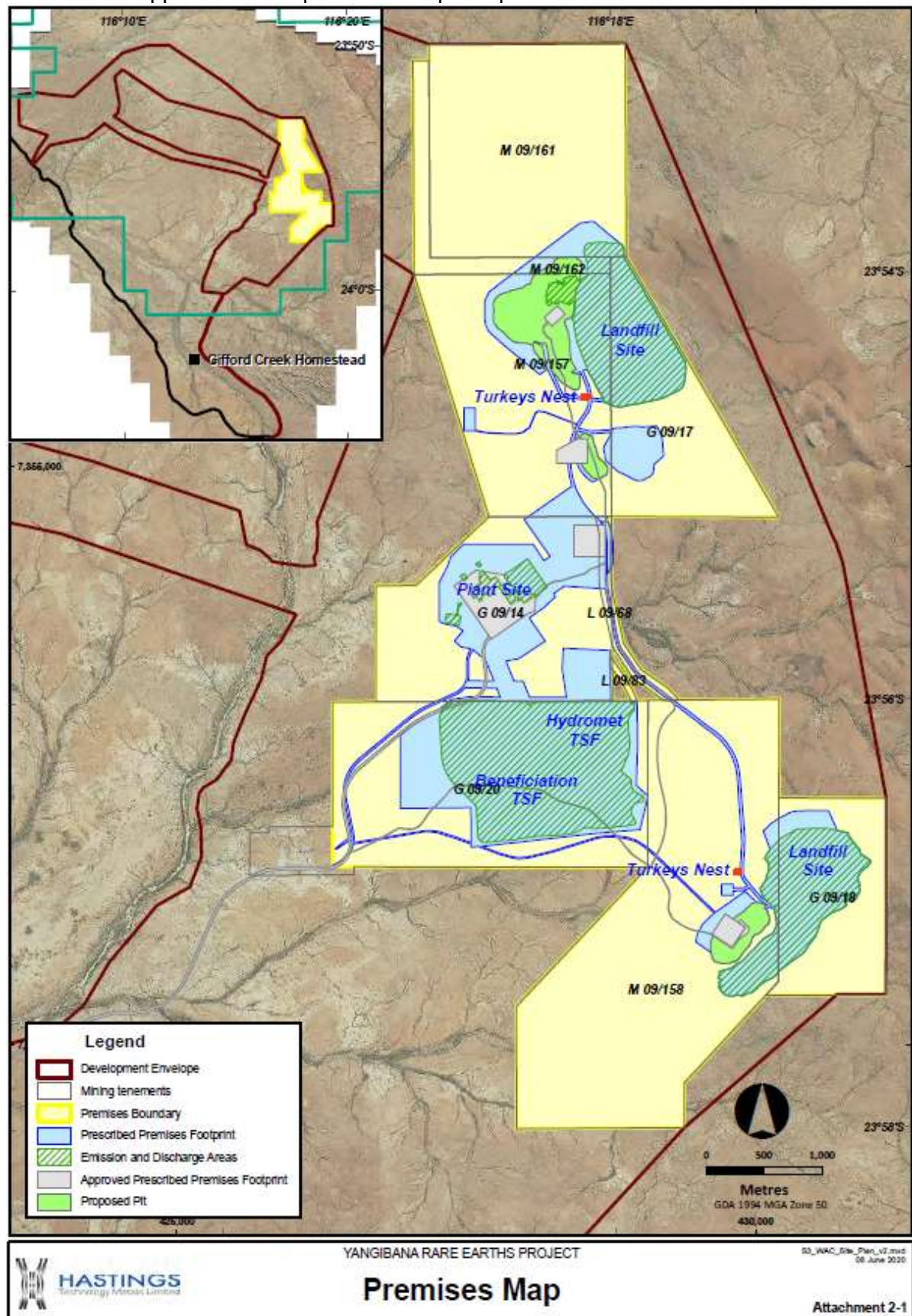
Term	Definition
AS 4323.1	means Australian Standard AS 4323.1 <i>Stationary source emissions: selection of sampling positions</i> .
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 <i>Water Quality – Sampling – Guidance on the design of sampling programs, sampling techniques and the preservation and handling of samples</i> .
AS/NZS 5667.9	means the Australian Standard AS/NZS 5667.9 <i>Water Quality – Sampling – Guidance on the sampling of surface waters</i> .
AS/NZS 5667.10	means the Australian Standard AS/NZS 5667.10 <i>Water Quality – Sampling – Guidance on the sampling of waste waters</i> .
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 <i>Water quality - sampling - guidance on sampling groundwater</i> .
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 <i>Environmental Protection Act 1986</i> Locked Bag 10 Joondalup DC WA 6919 info@dwer.wa.gov.au
Department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> 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.
critical containment infrastructure	means the infrastructure critical to operations as listed in Table 2 and Table 3.
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.
DER (2014)	Means the DER (2014) <i>Assessment and Management of Contaminated Sites</i> , Department of Environment Regulation, Perth, December 2014.
EN 14181:2014	means the European Standard <i>EN 14181:2014 Stationary source emissions – Quality assurance of automated measuring systems</i> , Comite Europeen de Normalisation (CEN), 2014
Environmental Compliance Report	means a report to satisfy the CEO that works have been constructed in accordance with the works approval.
EP Act	means the <i>Environmental Protection Act 1986</i> (WA).
EP Regulations	means the <i>Environmental Protection Regulations 1987</i> (WA).
HDPE	High density polyethylene
NATA	National Association of Testing Authorities, Australia
premises	refers to the premises to which this Works Approval applies, as specified at the front of this Works Approval and as shown on the map in Schedule 1 to this Works Approval.
prescribed premises	has the same meaning given to that term under the EP Act.
REEs	Rare earth elements
Tailings Design Engineer	means a person who: (a) holds a relevant tertiary academic qualification; and (b) has a minimum of five years of experience working in the area / field of design engineering and certification of TSFs

Term	Definition
time limited operations	refers to the limited operation of the primary activities described in Schedule 2 of this works approval, at locations shown in Schedule 1 of this works approval, subject to the conditions, whilst a licence application is being assessed.
TSF	Tailings Storage Facility
waste	has the same meaning given to that term under the EP Act.
works	refers to the works described in Schedule 2, at the locations shown in Schedule 1 of this Works Approval to be carried out at the premises, subject to the conditions.
works approval	refers to this document, which evidences the grant of the Works Approval by the CEO under s.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.

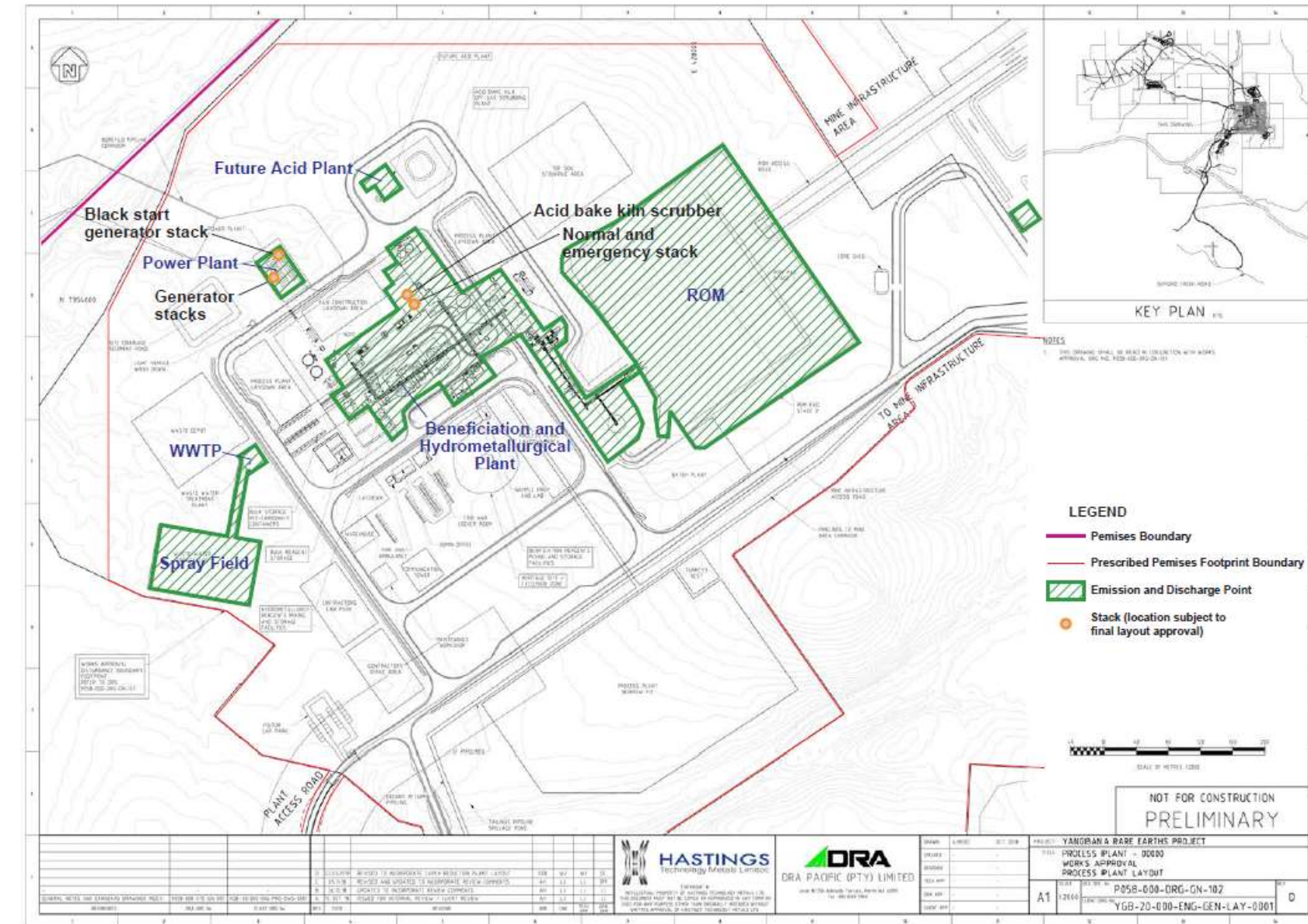
Schedule 1: Maps

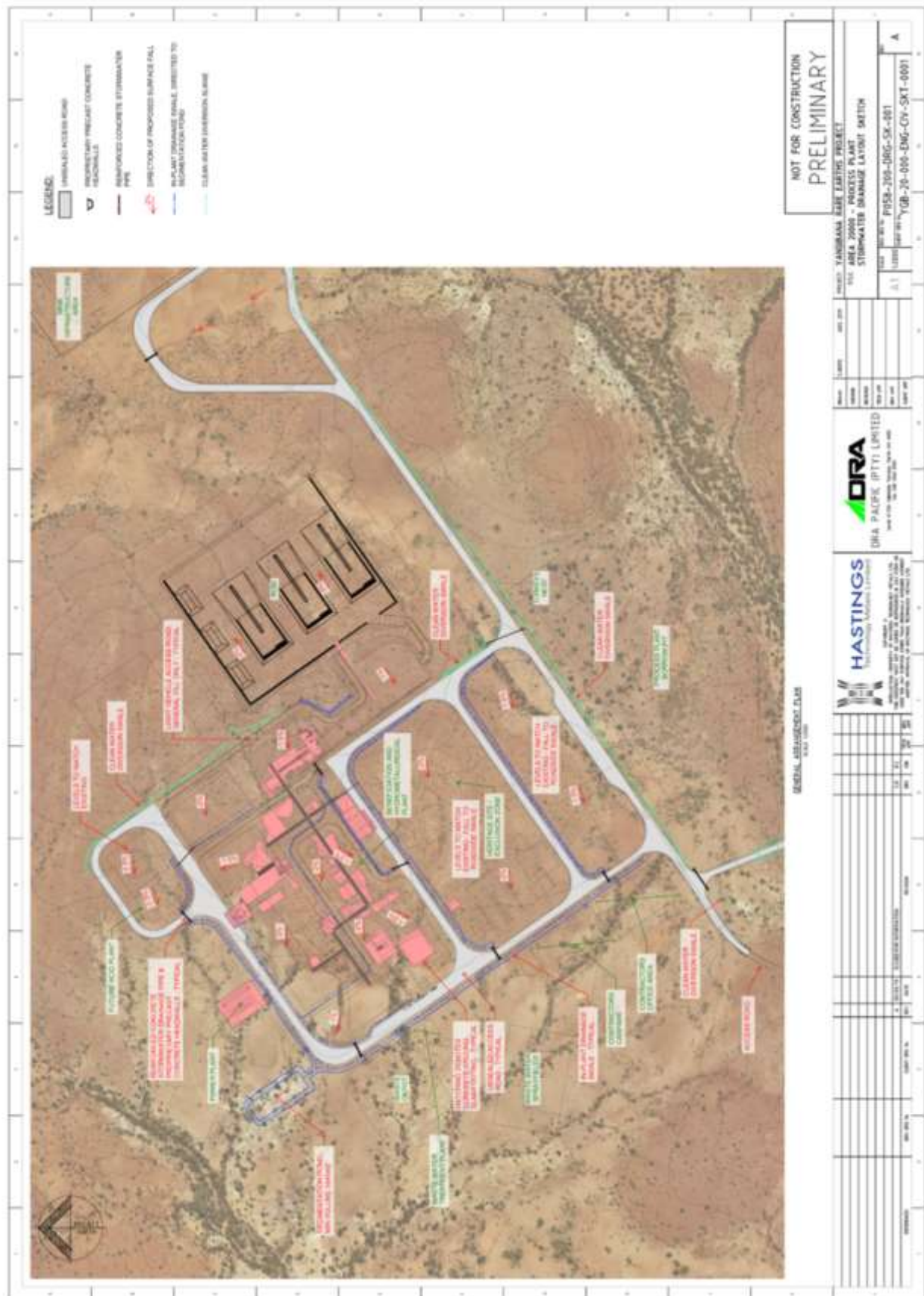
Premises map

The Prescribed Premises boundary is shown in the map below in yellow. The brown line indicates the approved development envelope as per Ministerial Statement MS 1110.



Processing Plant Site Layout

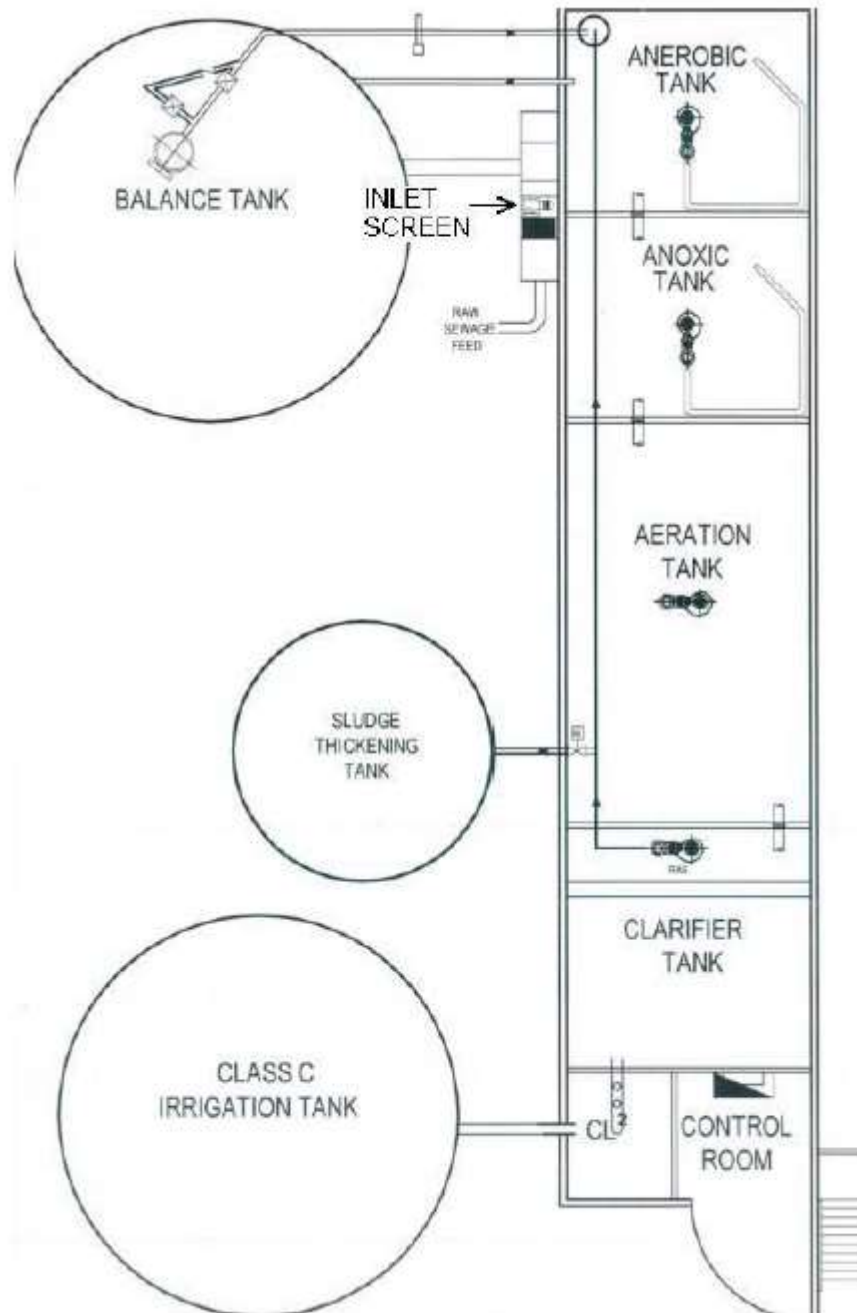




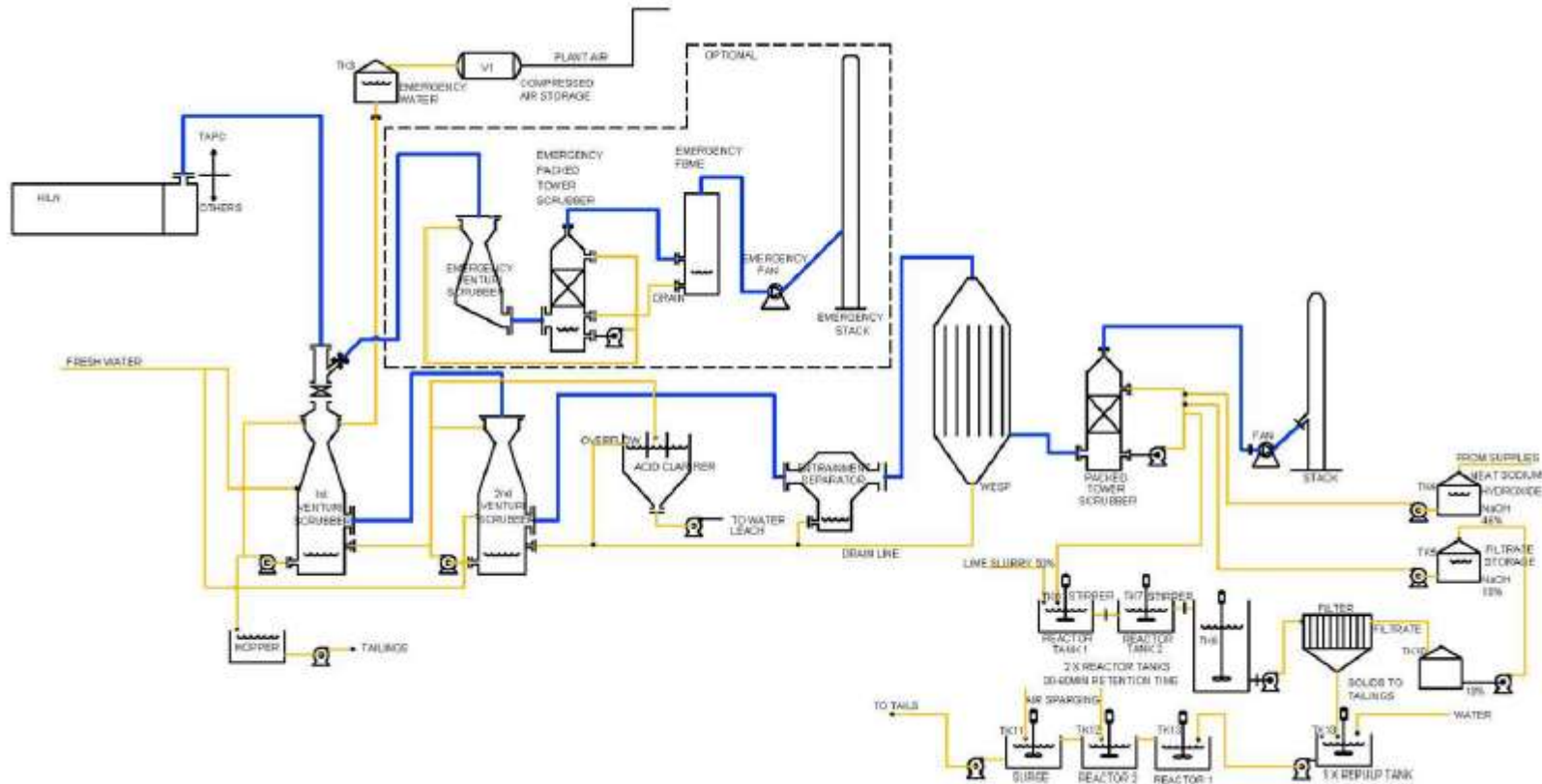
W6209/2019/1 (17/06/2020)



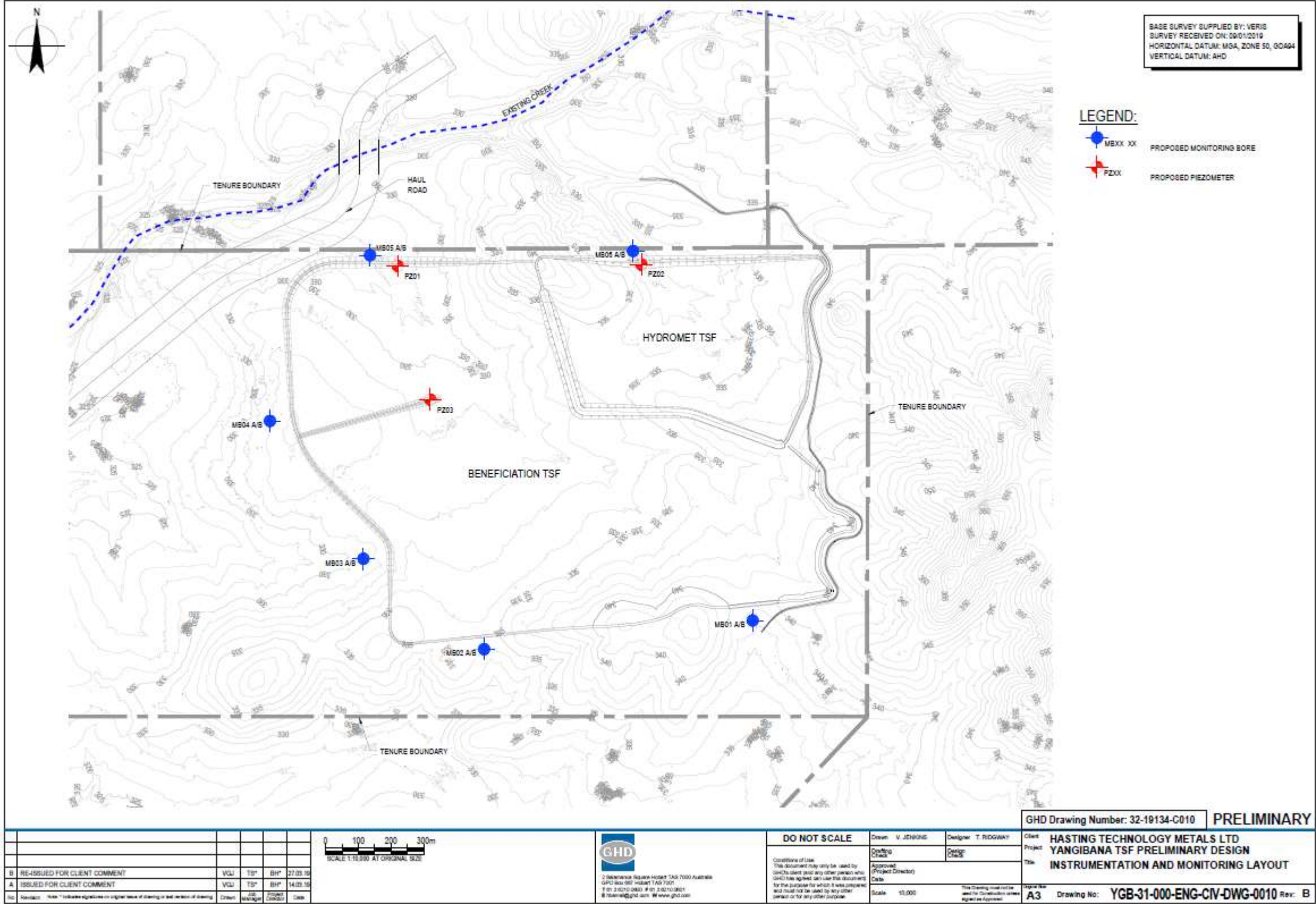
Map of ore processing facility sewage treatment plant



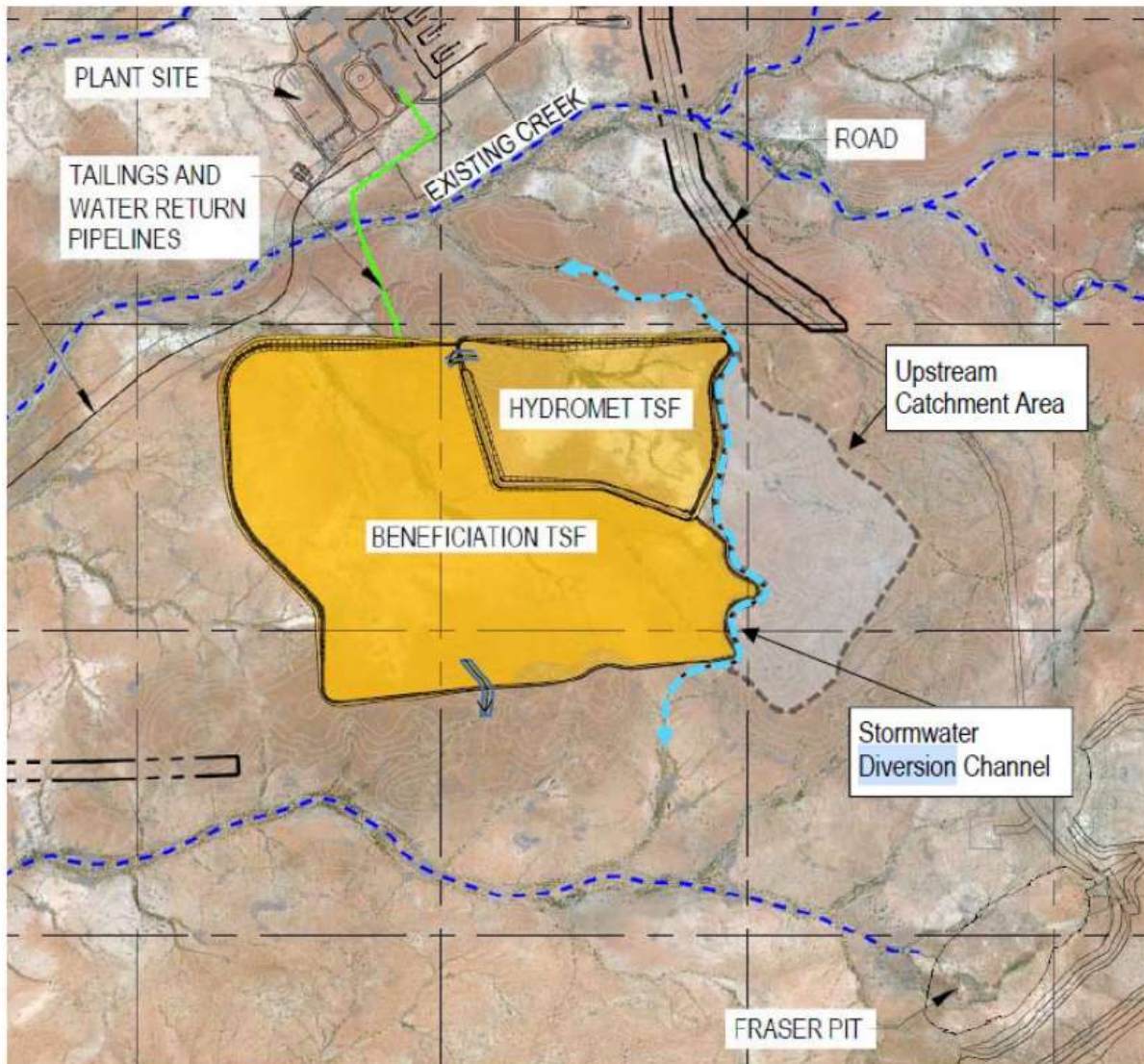
Acid Bake Kiln normal and emergency scrubbing systems Process Flow Diagram



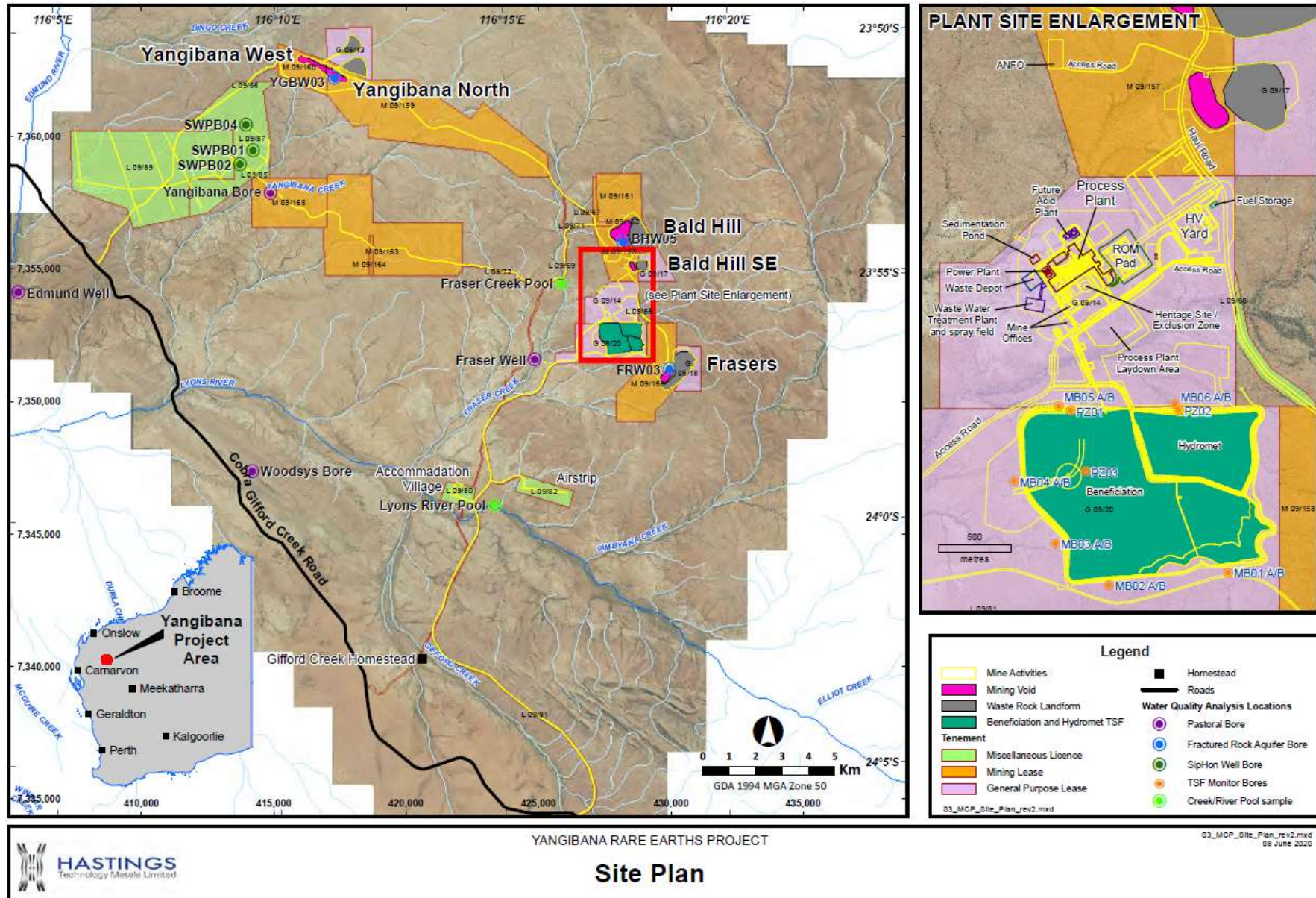
Map of TSF groundwater and piezometer monitoring locations



TSF pipeline route and stormwater diversion map

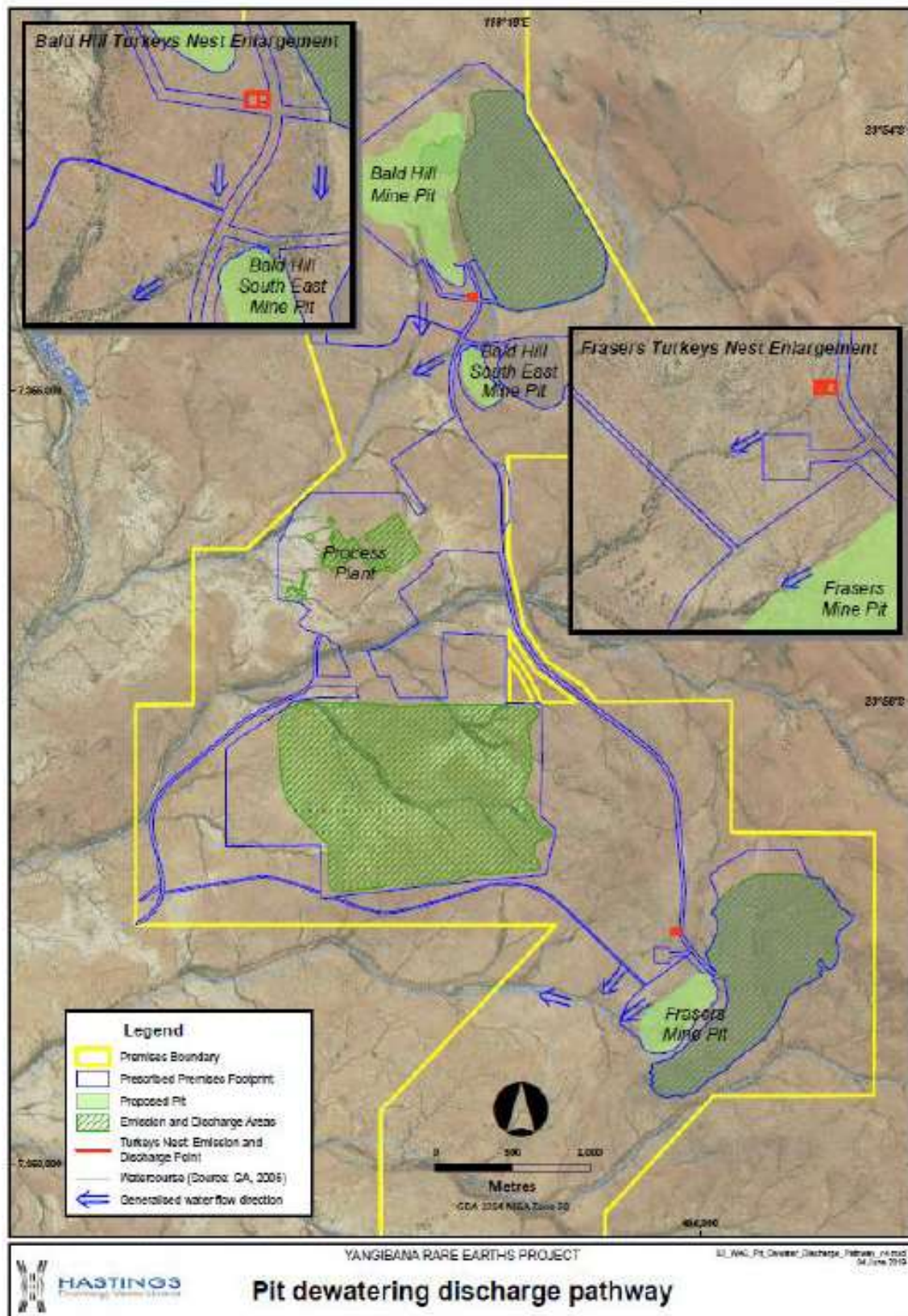


Map of surface water and groundwater monitoring sites



Map of dewater discharge points

The location of discharge points for the Bald Hill Pit dewater Turkey's Nest and Frasers Pit dewater Turkey's Nest are shown in the map below.



Schedule 2: Works

Table 9: Yangibana Project Category 6, 6, 52, 64, 73 and 85 infrastructure

	Infrastructure	Site Plan Reference in Schedule 1
Prescribed Activity Category 5		
Processing and concentrating up to 1.1 Mtpa of REE to produce a MREC for export. Processing steps include crushing, screening and grinding, acid baking in a kiln and concentration through the ore processing plant that includes a Beneficiation Plant and Hydrometallurgical Plant. Tailings generated from the plants are stored in the respective Beneficiation TSF and Hydromet TSF.		
Beneficiation Plant		
1	Key components including: • ROM pad • Ore crushers, screeners and grinders • Flotation cells, conditioning tanks, thickeners and filters • Gas-fired concentrate drier	Premises general layout map; Ore processing plant general layout map
Hydrometallurgical Plant		
2	Key components including: • Acid bake rotary kiln • Acid bake kiln off-gas treatment unit • Water leaching equipment including tanks, vessels, thickeners, filters water leaching, impurity removal, uranium removal, precipitation and effluent treatment • Product bagging and packaging infrastructure	Premises general layout map; Ore processing plant general layout map
Beneficiation TSF		
3	• Paddock style facility with perimeter discharge via spigots with 11 m maximum embankment height. • Tailings delivery and return water pipelines.	Premises general layout map; TSF general layout map
Hydromet TSF		
4	• Paddock style facility with decant pond, decant tower and single point discharge 36 ha Hydromet TSF • HDPE lined facility • Tailings and return water pipelines.	Premises general layout map; TSF general layout map
Prescribed Activity Category 6		
Discharge of excess Frasers Pit and Bald Hill Pit dewater from respective turkey nests to a localised drainage line during a modelled worst-case operating scenario (process plant shutdown coinciding with a 1:100 year ARI rainfall event).		
1	Bald Hill Pit Turkeys Nest and discharge point	Premises general layout map
2	Frasers Pit Turkeys Nest and discharge point	
Prescribed Activity Category 52		
A power station with gas reciprocating generator sets and a diesel black start generator. The maximum load will be 12.1 MW and the average load is 10.9 MW with an installed generation capacity of 20.16 MW.		
1	Six 3.36 MW gas reciprocating generator sets	Ore processing plant general layout map
2	One 800 kW diesel black start generator set	
3	Diesel Fuel storage tank	
Prescribed Activity Category 64		
Class II putrescible landfill bunker with 3,487 tpa putrescible and inert waste burial capacity and expected burial		

	Infrastructure	Site Plan Reference in Schedule 1
rate of approx. 3,170 tpa		
1	Approx. 1000m ² waste depot	Ore processing plant general layout map
2	Frasers waste rock dump – putrescible waste bunker and inert waste bunker	Premises general layout map
3	Bald Hill waste rock dump - putrescible waste bunker and inert waste bunker	
Prescribed Activity Category 73		
Bulk storage of 1,255 m ³ of RE-60, Rinkalore F410 and diesel in aggregate.		
1	968 m ³ maximum capacity self-bunded diesel storage tank with refuelling bay connected to a drainage sediment pond	Not specified.
2	267 m ³ maximum capacity RE-60 storage bladders on flatbed trucks upon an surface apron with a drive over kerb sloping back into the storage tank bund	
3	20 m ³ maximum capacity Rinkalore F410 in IBCs within the storage tank bund	
Prescribed Activity Category 85		
A 34 m ³ /day maximum capacity sewage treatment plant for the ore processing plant and mine support buildings. Treated wastewater discharged to a 1 ha sprayfield.		
1	Five stage Bardenpho activated sludge treatment plant	Premises general layout map
2	One hectare irrigation sprayfield	

Schedule 3: Monitoring

Table 10: Treated effluent monitoring table

Location	Parameter	Units	Limit	Averaging Period	Frequency	Method
WWTP treated effluent discharge pipeline (post treatment and pre-discharge)	Biochemical Oxygen Demand (BOD)	mg/L	≤30 mg/L	Spot sample	Once during commissioning and then quarterly	Sample collection and preservation as per AS/NZS 5667.1; analysis as per AS/NZS 5667.10
	Total Suspended Solids	mg/L	≤40 mg/L			
	Total Nitrogen	mg/L	≤50 mg/L			
	Total Phosphorus	mg/L	≤12 mg/L			
	pH	-	6.5 – 8.5			
	Thermo-tolerant Coliforms (<i>E.Coli</i>)	cfu/100ml	<1000 cfu/100ml			

Table 11: Groundwater monitoring requirements

Location	Parameter	Frequency	Averaging period	Units	Method
TSFs: MB01 A/B, MB02 A/B, MB03 A/B, MB04 A/B, MB05 A/B and MB06 A/B (as shown in Map of surface water and groundwater monitoring sites in Schedule 1)	<u>Physical</u> Standing water level (mbgl), pH (pH units), electrical conductivity (µS/cm) and total dissolved solids (mg/L)	Monthly upon installation of all bores until TSF time limited operations. Quarterly upon commencement of TSF time limited operations.	Spot sample	Refer to parameter listed	Sampling in accord with AS/NZS 5667.1; and analysis in accord with AS/NZS 5667.11
	<u>Dissolved Major Cations and Anions</u> Bicarbonate, Carbonate, Calcium, magnesium, potassium, phosphorus sodium and sulfate			mg/L	
	<u>Dissolved metal(loid)s</u> Aluminium, Antimony, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Chromium (hexavalent and trivalent), Copper, Lanthanum, Manganese, Molybdenum, Nickel, Lead, Selenium, Thorium, Uranium (including hexavalent), Vanadium, Zinc, Iron			mg/L	
				mg/L	
	Total recoverable mercury, Fluoride	mg/L			
	<u>Radionuclides</u> Total alpha radioactivity Total beta radioactivity Radium 226 and radium 228	Once pre TSF time limited operations and then six monthly		Bq/L	
	<u>Rare Earth Elements</u> Yttrium Lanthanum Cerium Praseodymium Neodymium Samarium Gadolinium Dysprosium	Once pre TSF time limited operations and then six monthly		mg/L	
Frasers Well (as shown in Map of surface water and groundwater monitoring sites in Schedule 1)	<u>Physical</u> Standing water level (mbgl), pH (pH units), electrical conductivity (µS/cm) and total dissolved solids (mg/L)	Monthly pre time limited operations		Refer to parameter listed	
	<u>Dissolved Major Cations and Anions</u> Bicarbonate, Carbonate, Calcium, magnesium, potassium, phosphorus sodium and sulfate	Quarterly upon commencement of TSF time limited operations		mg/L	
	<u>Dissolved metal(loid)s</u> Aluminium, Antimony, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Lanthanum, Manganese, Molybdenum, Nickel, Lead, Selenium, Thorium, Uranium, Vanadium, Zinc, Iron			mg/L	

	Total recoverable mercury, fluoride			mg/L	
	<u>Radionuclides</u> Total alpha radioactivity Total beta radioactivity Radium 226, Radium 228	Once pre TSF time limited operations and then six monthly		Bq/L	
	<u>Rare Earth Elements</u> Yttrium Lanthanum Cerium Praseodymium Neodymium Samarium Gadolinium Dysprosium	Once pre TSF time limited operations and then six monthly		mg/L	

Table 12: Surface water monitoring requirements

Location	Parameter	Frequency	Averaging period	Units	Method
Lyons River Pools	<u>Physical</u> pH (pH units), electrical conductivity ($\mu\text{S}/\text{cm}$) and total dissolved solids (mg/L)	Biannually (summer and winter) after rainfall	Spot sample	Refer to parameter listed	AS/NZS 5667.9
	<u>Dissolved Major Cations and Anions</u> Bicarbonate, Carbonate, Calcium, magnesium, potassium, phosphorus sodium and sulfate			mg/L	
	<u>Dissolved metal(loid)s</u> Aluminium, Antimony, Arsenic, Boron, Barium, Beryllium, Cadmium, Cobalt, Chromium, Copper, Lanthanum, Manganese, Molybdenum, Nickel, Lead, Selenium, Thorium, Uranium, Vanadium, Zinc, Iron			mg/L	
	Total recoverable mercury, fluoride			mg/L	
	<u>Radionuclides</u> Total alpha radioactivity Total beta radioactivity Radium 226, Radium 228			Bq/L	
	<u>Rare Earth Elements</u> Yttrium Lanthanum Cerium Praseodymium Neodymium Samarium Gadolinium Dysprosium			mg/L	