Licence

Licence number	L8612/2011/1
Licence holder	Pantoro South Pty Ltd
ACN	633 003 737
Registered business address	1 Phoenix Road NORSEMAN WA 6443
DWER file number	2011/010196-1
Duration	17/11/2011 to 18/11/2030
Date of issue	17/11/2011
Date of amendment	19 April 2024
Premises details	Norseman Gold Project Being part mining tenements Miscellaneous Licence: L63/32 Mining lease: M63/11, M63/13, M63/14, M63/15, M63/29, M63/36, M63/42, M63/43, M63/48, M63/68, M63/112, M63/133, M63/140, M63/142, M63/155, M63/156, M63/173, M63/214, M63/257, M63/275, M63/325 and M63/659 As depicted in Schedule 1 (Figure 1)

Prescribed premises category description (Schedule 1, *Environmental Protection Regulations 1987*)	Assessed production capacity
Category 5: Processing or beneficiation of metallic or non-metallic ore	1,500,000 tonnes per annual period
Category 6: Mine dewatering	2,380,000 tonnes per annual period
Category 52: Electric power generation	10 MWe
Category 64: Class II putrescible landfill site	5,000 tonnes per annual period
Category 70: Screening etc. of material	50,000 tonnes per annual period

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

Jarrod Abrahams
Digitally signed by Jarrod Abrahams
Date: 2024.04.19 11:03:12 +08'00'

MANAGER, RESOURCE INDUSTRIES

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

Licence history

Date	Reference number	Summary of changes
22/10/2015	L8612/2011/1	Conversion of licence to new template and increase in landfill throughput
25/06/2019	L8612/2011/1	Amendment notice 1 Amend the frequency of dewatering discharge monitoring, remove monitoring requirements associated with inactive TSFs, require an inspection of the integrity of the Phoenix Processing Plant prior to recommencing operations, correct administrative errors and update the improvement condition. Parameters for groundwater and surface water have been amended to include the full suite of major ions and metal(loid)s expected to be associated with gold deposits.
30/04/2021	L8612/2011/1	Transfer of licence from Central Norseman Gold Pty Ltd to Pantoro South Pty Ltd. Consolidation of amendment notices and administrative amendments.
19/04/2024	L8612/2011/1	Licence amendment to: • Increase the production/design capacity for category 5 from 700,000 to 1,500,000 tpa; • Update the processing plant infrastructure and TSF4 Stage 3 works constructed under W6472/2020/1; • Allow the reprocessing of TSF Bluebird tailings; • Increase the production/design capacity for category 6 from 2,000,000 to 2,380,000 tpa and include infrastructure constructed under W6472/2020/1; • Increase the production/design capacity for category 64 from 500 to 5,000 tpa and include the landfills constructed under W6472/2020/1; • Inclusion of category 70 and the infrastructure constructed under W6472/2020/1; • Include infrastructure from W6472/2021/1 still requiring construction; and • Extension of the premises boundary.

Interpretation

In this licence:

(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 licence:

  (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 licence requires specific conditions to be met but does not provide any implied authorisation for other emissions, discharges, or activities not specified in this licence.

Licence conditions

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

General conditions

1. The Licence Holder must operate and maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant and effective internal management system.

2. The Licence Holder must immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.

3. The Licence Holder must:
- (a) implement all practical measures to prevent stormwater run-off becoming contaminated by the activities on the Premises; and
- (b) treat contaminated or potentially contaminated stormwater as necessary prior to being discharged from the Premises.

Premises operation

4. The Licence Holder must ensure all above ground pipelines containing saline water, acidic or alkaline liquors or tailings and tailings return water are:
- (a) provided with secondary containment sufficient to contain any spill for a period equal to the time between routine inspections; and
- (b) when in operation are equipped with telemetry systems and pressure sensors along pipelines to allow for the detection of leaks and failures; or/and
- (c) equipped with automatic cut-outs in the event of a pipeline failure.

5. The Licence Holder must ensure that any saline dewatering effluent must only be managed in the following manner:
- (a) used for dust suppression in a manner that minimises damage to surrounding vegetation;
- (b) discharged to Lake Cowan and/or Lake Dundas at discharge points defined in Schedule 1;
- (c) used in the Phoenix Mill; or
- (d) recirculated for underground mining operations.

6. The Licence Holder must ensure that the materials described in Table 1 are only discharged into the site infrastructure and equipment listed in Table 1 and that the infrastructure and equipment is maintained and operated in accordance with the corresponding operational requirements set out in Table 1.

Table 1: Infrastructure and equipment operational requirements

Containment point reference	Material	Operational requirements-	Location
Venture TSF	Tailings	Maintain a minimum top of embankment freeboard of 300 mm or a freeboard to contain a 1 in 100 year/72 hour storm event (whichever is greater)	Figure 2
Phoenix TSF	Tailings		Figure 3
Butterfly TSF	Tailings		
TSF 123	Tailings		Figure 4

Containment point reference	Material	Operational requirements-	Location
TSF4 - Stage 3 (RL 309 m) TSF4 – Stage 4 (RL 312 m) TSF4 – Stage 5 (RL 315 m)	Tailings	Clay lined Maintain a minimum top of embankment freeboard of 300 mm or a freeboard to contain a 1 in 100 year/72 hour storm event (whichever is greater). Manage TSF4 containment infrastructure in such a way that: (a) methods of operation minimise the likelihood of erosion of the embankments by wave action; and (b) no vegetation is growing on the inner embankments of any ponds.	Figure 5 Figure 6 (Stages)
Seepage recovery bores (e.g. SRB1)	NA	Maintain functioning water level sensors which activate bore pumps for water delivery to underdrainage water collection tank, water pumped back to decant pond	Figure 5
Process plant and associated infrastructure	N/A	Dust suppression via sprays must be operational Water cart sprays must be available during operation for dust suppression on stockpiles Noise barriers must be maintained	Figure 7
Dams and ponds	Contaminated process water, reagents, runoff water reused for process	**Process plant events dam** HDPE lined Maintain a freeboard 750 mm Water level controlled by telemetry system Store capacity to capture 10% AEP 24-hour rainfall Storm water from process plant must report to Environmental dam and Process plant events dam via Transfer Point 1 Run-off water (and potentially contaminated process water in the event of an emergency) reports to the Process Plant Events Dam. Overflow from the Process Plant Events Dam reports to the Environmental Dam. Clean water from the existing washbay triceptor system reports to the Environmental Dam Process Plant Events Dam allows for adequate road and plant site stormwater runoff, specifically through a water transfer rock lined channel named	Figure 8 (note: Process Plant Events Dam is labelled as WSF which stands for Water Storage Facility)

Containment point reference	Material	Operational requirements-	Location
		'Transfer Point 1'	
	Water that is processed through the nearby upgraded triceptor system	**Environmental Dam** HDPE lined Maintain a freeboard 750 mm Water level controlled by telemetry system Overflow from the Process Plant Events Dam reports to the Environmental Dam. Clean water from the existing washbay triceptor system reports to the Environmental Dam.	Figure 8
	Mine dewater Decant / return water Raw / saline water Rainwater	**Process Water Pond** HDPE lined Maintain a freeboard of 300 mm Water level controlled by telemetry system Recovery pumps so excess water can be reclaimed for re-use	Figure 8
	Containing raw water for process plant, gland seal water requirements and for dust suppression	**Raw water tanks** NA	Figure 7
OK Water Storage Facility (WSF)	Treated industrial wash water and mine water	HDPE lined	Figure 14
Harlequin Ponds 1 and 2	Oily water from vehicle wash area		Figure 10 (depicted as 'Harlequin washdown pond')
TSF123 Return Water Dam (pond)	Saline groundwater	HDPE lined	Figure 11
Transfer Point 1	Process water and contaminated stormwater	Rock lined drainage channel If a significant emergency event (such as a full processing plant failure) occurs, this channel is to be cleaned up to ensure that it is functioning adequately and not cause uncontrolled over-flows	Figure 8

Containment point reference	Material	Operational requirements-	Location
Bioremediation treatment cells	Hydrocarbon contaminated soil	Clay lined (or equivalent) with a permeability of 10^{-9} m/s or less All leachate runoff is directed to, and contained within, an impermeable leachate collection sump with capacity to contain a 1 in 100 year, 72 hour duration rainfall event The leachate collection sump is lined in accordance with Water Quality Protection Note 27, Liners for containing pollutants, using engineered soils, August 2013 or Water Quality Protection Note 26, Liners for containing pollutants, using synthetic membranes, August 2013	Figure 12
Dewatering activities	Mine Water	Maintain a minimum freeboard of 5 m for pit to pit transfers Maintain a minimum freeboard of 300 mm in water storage/transfer ponds **Scotia pit to Lake Dundas:** Dewatering pond set with level control activating automatic start and stop of pump to transfer water to the lake **to Bullen underground and process plant from OK:** Groundwater is pumped from underground via the rising main located to the south of the laydown area to the eastern most pond The dewatering pump is maintained as such that activates automatic start and stop the pump **to Scotia water storage facility from Green Lantern:** Mine water from the Green Lantern pit will link into the existing Scotia dewatering pipeline (pit to pit transfer) and will discharge to the Scotia water storage facility **To raw water storage tanks and process water pond from the mainfields area, including the existing Ajax shaft:** Interconnected underground workings of the mainfields area, including the existing Ajax shaft located adjacent to Bullen will be dewatered Mine water will be used in processing plant operations as an alternative water	Ok dewatering - Figure 13 and Figure 14 North Royal, Slippers and GEV – Figure 15 Scotia - Figure 16

Containment point reference	Material	Operational requirements-	Location
		supply	
Mobile crushing and screening plant	NA	The total maximum design capacity of plant located within the premises must not exceed 50,000 tonnes per annum Dust suppression on mobile crushing and screening plant must be used whilst material is being crushed and screened The stockpiles must be maintained within bunded working area Crushing and screening activities must be undertaken on day-shift only	To be located within the Waste Rock Dump, Harlequin, Bullen, OK or Scotia as shown in Schedule 1, Figure 17

7. The Licence Holder must:

(a) undertake inspections as detailed in Table 2;

(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 2: Inspection of infrastructure

Scope of inspection	Type of inspection	Frequency of inspection
Tailings pipelines	Visual integrity	Daily
Return water lines	Visual integrity	
Dewatering pipelines	Visual integrity	
Embankment freeboard of actively used containment infrastructure defined in Table 1	Visual to confirm required freeboard capacity is available	Weekly and as soon as practicable after a 1 in 100 year, 72 hour duration rainfall event

Note 1: Infrastructure only to be inspected when in use.

8. The Licence Holder must ensure that where wastes produced on the Premises are not taken off-site for lawful use or disposal, they are managed in accordance with the requirements in Table 3.

Table 3: Waste processing

Waste type	Process(es)	Process limits[1, 2]
Inert Waste Type 1 Special Waste Type 1 (asbestos) Clean Fill Putrescible Waste Inert Waste Type 2	Receipt, handling, associated storage and disposal of waste by landfilling	<u>All waste types</u> Cumulative waste disposal must not exceed 5,000 tonnes per annual period. Disposal of waste (other than tyres) by landfilling must only take place within the Bullen Landfill Area, Butterfly, Harlequin, Scotia, OK, GEV landfills as shown in Schedule 1, Figure 12. The separation distance between the base of the landfill and the highest groundwater level must not be less than 2 m. <u>Inert Waste Type 2</u> Disposal of tyres by landfilling must only take place within the Harlequin, OK WRD, GEV, Bullen, Scotia, and Scotia WRD landfills as shown in Schedule 1, Figure 12. The Licence Holder must ensure that: (a) no burnt tyres (or tyres that appear burnt) are disposed at the Premises; and (b) no tyres are burnt on the Premises. <u>Special Waste Type 1 (asbestos)</u> Can be disposed of to a designated trench at Butterfly landfill (Schedule 1, Figure 12). Asbestos demolition waste is wrapped and contained. GPS location of each load is recorded.
Hydrocarbon contaminated waste	Bioremediation	All bioremediation areas are located: (a) at least 50 m from surface water bodies; (b) at least 50 m from any odour sensitive receptors; and (c) in an area where groundwater is at a depth of greater than 3 m below ground surface. Ensure soil is bioremediated by: (a) maintaining an appropriate moisture content and nutrient level within the soil which sustains biological activity; and (b) at least monthly soil aeration when facility is in use.

Note 1: Requirements for landfilling tyres are set out in Part 6 of the *Environmental Protection Regulations 1987*.

Note 2: Additional requirements for the acceptance and landfilling of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

9. The Licence Holder must ensure that cover is applied and maintained on landfilled wastes in accordance with Table 4 and that sufficient stockpiles of cover are maintained on site at all times.

Table 4: Cover requirements

Waste Type	Material	Depth	Timescales
Inert Waste Type 2	Type 1 Inert waste or soil	100mm	Monthly or as soon as practicable after deposit and prior to compaction.
Putrescible Waste	Type 1 Inert waste or soil	100mm	Weekly
Special Waste Type 1 (asbestos)	Type 1 Inert waste or soil	150 mm	As soon as practicable and no later than the end of the working day in which the asbestos waste was deposited.
Inert Waste Type 1	No cover required		

Note 1: Additional requirements for the covering of tyres are set out in Part 6 of the *Environmental Protection Regulations 1987.*

10. The Licence Holder must:

(a) implement security measures at the landfill area to prevent as far as is practical, unauthorised access to the site;

(b) undertake regular inspections of all security measures at the landfill area and repair damage as soon as practicable; and

(c) ensure that any entrance gates to the landfill area are securely locked when the landfill area is unattended.

11. The Licence Holder must take measures to ensure that no wind-blown waste escapes from the Premises and that wind-blown waste is collected on at least a weekly basis and returned to the tipping area.

12. The Licence Holder must construct and/or install the infrastructure listed in Table 5 in accordance with the corresponding design and construction requirements and at the corresponding infrastructure location as set out in Table 5.

Table 5: Design and construction requirements

Item	Infrastructure	Design and construction requirement	Infrastructure location
1	Landfill trenches: (a) GEV (b) Harlequin (c) Scotia WRD	Constructed to the dimensions of: 30 m in length, 2 m in depth and 10 m in width	Figure 12
2	Dewatering infrastructure and discharge pipeline(s) Dewatering ponds and tanks: (a) from Slippers pit, Daisy pit and GEV (Gladstone/ Everlasting) pit to Lake Cowan[1] (b) from pit to pit Note 1: the GEV water storage facility (WSF) forms part of the dewatering infrastructure in point (a) Dewatering pipelines: (a) to Lake Cowan from Slippers pit, Daisy pit and GEV (Gladstone/Everlasting) pit (b) from pit to pit (c) to raw water storage tanks and process water pond from the mainfields area, including the existing Ajax shaft (d) to the Scotia WSF from Green Lantern pit (e) to the Scotia WSF from Scotia Underground (f) to the raw water supply from Bluebird bore	Dewatering ponds and tanks to be: Lined with HDPE Equipped with automatic water level controls Dewatering pipelines to be: Constructed of HDPE Meet the following standards at a minimum: (i) AS/NZS 2033: Installation of polyethylene pipe systems; (ii) AS/NZS 4129: Fittings for polyethylene (PE) pipes for pressure applications; (iii) AS/NZS 4130: Polyethylene (PE) pipes for pressure applications; and (iv) AS/NZS 4131: Polyethylene (PE) compounds for pressure pipes and fittings	Figure 13 Figure 14 Figure 15 Figure 16
3	TSF4 – Stage 4 TSF4 – Stage 5	TSF4 raises: TS4 - Stage 4 raise from RL 309 m to RL 312 m TS4 - Stage 5 raise from RL 312 m to RL 315 m Construction of two saddle dams (South Saddle and Northeast Saddle) Upstream construction methods used for each raise Upstream raise of main embankment, South Saddle and Northeast Saddle dams and construction of the Northwest and	Figure 6

Item	Infrastructure	Design and construction requirement	Infrastructure location
		North saddle dams Saddle dams constructed with compacted tailings and compacted waste rock Main embankment formed by compacted tailings and compacted mine waste rock Decant structure: Spigots placed on the South embankment, and East where tailings are beached away from the embankment The decant facility will comprise a mobile pump with floating suction	

13. The Licence Holder must operate the landfills; dewatering infrastructure and discharge pipelines; and TSF4 lifts in accordance with the conditions of this Licence, following submission of the compliance document required under condition 34.

Emissions

General

14. The Licence Holder must record and investigate the exceedance of any descriptive or numerical limit specified in the Emission section of this licence.

Point source emissions to air

15. The Licence Holder must ensure that where waste is emitted to air from the emission points in Table 6 and identified on the map of emission points in Figure 8 it is done so in accordance with the conditions of this licence.

Table 6: Emission points to air

Emission point reference and location on Map of emission points	Emission Point	Emission point height (m)	Source, including any abatement
A1 – A10	Stack	5.5	Diesel power generators

Point source emissions to surface water

16. The Licence Holder is permitted, subject to conditions in the licence, to emit wastes to water from the emissions point listed in Table 7 and identified in Figure 18 (W1) and Figure 19 (W2).

Table 7: Emission points to surface water

Emission point reference and location on Map of emission points	Description	Source including abatement
W1	Discharge to Lake Cowan	Mine water from North Royal Pit, HV1 Pits and North Royal and Harlequin underground operations. Discharged via an HDPE lined rock riffle channel. Mine water from Slippers Pit, Daisy Pit and GEV (Gladstone/Everlasting) Pit to Lake Cowan.
W2	Discharge to Lake Dundas	Mine water from Scotia pit to Scotia WSF to Lake Dundas. Mine water from Green Lantern pit and Scotia Pit to Scotia WSF to Lake Dundas.

17. The Licence Holder must not cause or allow point source emissions to surface water greater than the limits listed in Table 8.

Table 8: Point source emission limits to surface water

Emission point reference	Parameter	Limit (including units)	Averaging Period
W1	Volumetric flow rate	2,000,000 kL	Annual
	pH[1]	Between 5.0 and 8.0	N/A
W2	Volumetric flow rate[2]	380,000 kL	Annual
	pH[1]	Between 5.0 and 8.0	N/A

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

Monitoring

General monitoring

18. The Licence Holder must ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1;
(b) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;
(c) all sediment sampling is conducted in accordance with AS/NZS 5667.12;
(d) all laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

19. The Licence Holder must ensure that :

(a) monthly monitoring is undertaken at least 15 days apart;
(b) quarterly monitoring is undertaken at least 45 days apart;
(c) six monthly monitoring is undertaken at least 5 months apart; and
(d) annual monitoring is undertaken at least 9 months apart between the months October to December.

Monitoring of point source emissions to surface water

20. The Licence Holder must undertake the monitoring in Table 9 according to the specifications in that table and record and investigate results that do not meet any limit specified.

Table 9: Monitoring of point source emissions to surface water

Emission point reference	Parameter[2]	Limit	Units	Averaging Period	Frequency
W1 W2	Volumetric flow	N/A	kL	Monthly	Continuous during dewatering discharge
	pH[1]	5 to 8	N/A	Spot sample	Six-monthly during dewatering discharge
	Electrical Conductivity	N/A	µS/cm		
	Total Dissolved Solids		mg/L		
	Nitrite + Nitrate				
	Total Nitrogen				
	Total Phosphorous				
	Sulphate				
	Arsenic				
	Cadmium				
	Chromium				
	Cobalt				
	Copper				
	Lead				
	Manganese				
	Mercury				
	Nickel				
	Selenium				
	Zinc				

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

Note 2: All metals to be analysed as dissolved metals.

Monitoring of inputs and outputs

21. The Licence Holder must undertake the monitoring in Table 10 according to the specifications in that table.

Table 10: Monitoring of inputs and outputs

Input/Output	Parameter	Units	Averaging period	Frequency
Waste Inputs	Inert Waste Type 1, Inert Waste Type 2, Putrescible Waste, Special Waste Type 1 (asbestos)	m^3 (where no weighbridge is present)	N/A	Each load arriving at the landfill
Waste Outputs	Waste type as defined in the Landfill Definitions	m^3 (where no weighbridge is present) or kL		Each load leaving or rejected from the Premises

Ambient environmental quality monitoring

22. The Licence Holder must undertake the monitoring in Table 11, Table 12 and Table 13 according to the specifications in those tables and record and investigate results that do not meet any limit specified.

Table 11: Monitoring of ambient groundwater quality

Monitoring point reference and location	Parameter[1, 3]	Limit	Units	Averaging period	Frequency
Venture TSF: V1, V2, V3, V7, V8, V9 and V10 (Figure 2) **TSF 123:** P1, P2, P3, P4, P5, P7, P8 and P9 (Figure 4) **TSF4:** MB1, MB2, MB3, MB4, MB5, MB6, MB7, MB8, MB10, MB12, MB13, SRB1 and PB2 (Figure 20)	Standing water level	5 **Trigger**: 7	mbgl	Spot sample	Monthly
	pH[2]	N/A	N/A		Quarterly
	Electrical Conductivity		µS/cm		
	Total Dissolved Solids		mg/L		
	Weak Acid Dissociable Cyanide	0.8			
	Total Cyanide	N/A			
	Free Cyanide				
	Aluminium				
	Antimony				
	Arsenic				
	Bicarbonate				

Monitoring point reference and location	Parameter[1, 3]	Limit	Units	Averaging period	Frequency
	Cadmium				
	Calcium				
	Carbonate				
	Chloride				
	Cobalt				
	Copper				
	Iron				
	Lead				
	Manganese				
	Magnesium				
	Mercury				
	Molybdenum[4]				
	Nickel				
	Potassium				
	Selenium				
	Sodium				
	Sulfate				
	Zinc				

Note 1: Metals shall be analysed as dissolved metals.

Note 2: In-field non-NATA accredited analysis permitted.

Note 3: All metals to be analysed as dissolved metals.

Note 4: Measure **molybdenum** groundwater concentration as per Table 11, **before the deposition of re-processed Bluebird tailings commences**.

23. The Licence Holder must ensure the Groundwater, Seepage and Dewatering Management Plan is implemented when the standing water level in the monitoring bores are shallower than seven (7) m below ground level, as per Table 11.

Table 12: Monitoring of ambient surface water quality

Monitoring point reference and location	Parameter[2]	Units	Averaging period	Frequency
Lake Cowan (Figure 18) CM1 CM2 CM3 CM4 CM5 CM6 CM7 Lake Dundas (Figure 19) LDP1 LDP2 LDP3 LDP4 LDP5 LDP6 LDP7 LDP8	pH[1]	N/A	Spot sample	Annually
	Electrical Conductivity	µS/cm		
	Total Dissolved Solids	mg/L		
	Nitrite and Nitrate			
	Total Nitrogen			
	Total Phosphorous			
	Antimony			
	Arsenic			
	Bicarbonate			
	Cadmium			
	Calcium			
	Carbonate			
	Chromium			
	Chloride			
	Cobalt			
	Copper			
	Manganese			
	Magnesium			
	Mercury			
	Nickel			
	Sodium			
	Selenium			
	Sulphate			
	Zinc			

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

Note 2: All metals to be analysed as dissolved metals.

Table 13: Monitoring of ambient sediment quality

Monitoring point reference and location	Parameter	Units	Averaging Period	Frequency
Figure 18: Lake Cowan monitoring points CM1 CM2 CM3 CM4 CM5 CM6 CM7 Figure 19: Lake Dundas Ecological monitoring Points LDP1 LDP2 LDP3 LDP4 LDP5 LDP6 LDP7 LDP8	pH[1]	N/A	Spot sample	Annually in between October and December in the same year
	Salt crust thickness	cm		
	Moisture Content	%		
	Electrical Conductivity	µS/cm		
	Total Dissolved Solids	mg/kg		
	Arsenic			
	Bicarbonate			
	Calcium			
	Cadmium			
	Carbonate			
	Chloride			
	Chromium			
	Cobalt			
	Copper			
	Lead			
	Magnesium			
	Mercury			
	Nickel			
	Nitrite and Nitrate			
	Selenium			
	Sodium			
	Sulphate			
	Total Nitrogen			
	Total Phosphorus			
	Zinc			

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

Note 2: All metals to be analysed as dissolved metals.

24. The Licence Holder must undertake the assessment of vegetation health as detailed in Table 14. The assessments must:

(a) photograph and record the presence and condition of vegetation at the locations defined in Table 14;
(b) measure plants species richness, cover and health;
(c) compare the results of the assessment against previous years assessments and identify whether any deterioration in the presence and/or quality of vegetation has taken place; and
(d) be undertaken by a person suitably qualified in vegetation identification and sampling.

Table 14: Vegetation health monitoring

Monitoring point reference and location	Frequency
Lake Cowan dune vegetation: Photographic Monitoring Points: CT1, CT2, CT3, CT4, CT5, CT8 (Figure 18) **Lake Cowan woodland vegetation:** Photographic Monitoring Points: CT6, CT7, CT9, CT10, CT11, CT12 (Figure 18) **Lake Dundas dune and woodland vegetation:** Photographic Monitoring Points: LD02, LD08, LD15, LD16, LD17, LD18, LD19, LD20, LD21, LD22, LD23, LD24 (Figure 19)	Annually between the months October to December

25. The Licence Holder must undertake the assessment of vegetation health as detailed in Table 15. The assessments must:

(a) photograph at the photographic monitoring locations defined in Table 15;
(b) record the qualitative tree condition and quantitative foliage cover of sample trees at locations defined in Table 15;
(a) compare the results of the assessment against previous years assessments and identify whether any deterioration in the presence and/or quality of vegetation has taken place; and
(b) be undertaken by a person suitably qualified in vegetation identification and sampling.

Table 15: TSFs tree health monitoring

Monitoring point reference and location (Figure 21)	Frequency
TSF 123 (Figure 4): Photographic Monitoring Points: PH1, PH2, PH3, PH4, PH5, PH6, PH7 **Venture TSF** (Figure 2): Photographic Monitoring Points: VE1, VE2, VE3, VE3 SAP, VE6, VE7, VE8 **TSF4** (Figure 20): Sample trees that are flagged and numbered: 1A. 1B, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B, HM01 **Control Site** (Figure 22): Sample trees that are flagged and numbered. Photographic Monitoring Points: CPP1, CPP 2, CPP 3	Six-monthly between the months of April to June and October to December
TSF4: Photographic Monitoring Points: 1A, 1B, 2A, 2B, 3A, 3B, 4A, 4B, 5A, 5B	Quarterly

26. The Licence Holder must prepare an implement an Adaptive Discharge Management Plan for Lake Dundas. The plan shall include, but not be limited to:

(a) monitoring details for dewatering discharges to confirm discharge rate and electrical conductivity concentrations, before and during a major fill event, to confirm volume and change in salinity of water due to rainfall runoff and inputs in dewatering areas;
(b) monitoring of electrical conductivity of the lake immediately after filling, and weekly thereafter to monitor changes in salinity with evapoconcentration;
(c) sampling in the northern basin of the lake, where cysts have been recorded, for presence of hatched Parartemia sp., to relate hatching to timing of a fill event and with respect to salinity concentrations;
(d) measuring water depth after a major fill event, and record changes in depth as the lake recedes and evapoconcentrates;
(e) triggers for suspending dewatering discharges to Lake Dundas where unacceptable increases in salinity in the Northen Basin is detected in the first month after a fill event; and
(f) other lake monitoring requirements as captured in conditions of this licence.

27. The Licence Holder must undertake an annual water balance for TSF4. The water balance must as a minimum consider the following:

(a) site rainfall;
(b) evaporation;
(c) decant water recovery volumes;
(d) seepage recovery volumes; and
(e) volumes of tailings deposited.

Records and Reporting

28. The Licence Holder must record the following information in relation to complaints received by the licence 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 Licence Holder to investigate or respond to any complaint.

29. The Licence Holder must:

(a) undertake an audit of their compliance with the conditions of this licence during the preceding annual period; and
(b) prepare and submit to the CEO by no later than 90 days after the end of that annual period an Annual Audit Compliance Report in the approved form.

The Licence Holder must submit to the CEO an Annual Environmental Report by 30 November after the end of the annual period. The report must contain the information listed in Table 16 in the format or form specified in that table.

Table 16: Annual Environmental Report

Condition or table	Parameter	Format or form
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
-	Volumes of ore processed	None specified
20, Table 9	Monitoring of point source discharges to surface water	
21, Table 10	Monitoring of inputs and outputs	
22, Table 11	Monitoring of ambient groundwater quality - refer to Schedule 3 for reporting requirements Provide historical (since January 2020 onwards) and current ionic ratios Ca/Na, Mg/Na and SO_4/Cl	
23	Implementation of the Groundwater, Seepage and Dewatering Management Plan	
22, Table 12	Monitoring of ambient surface water quality - refer to Schedule 3 for reporting requirements	
22, Table 13	Monitoring of ambient sediment quality - refer to Schedule 3 for reporting requirements	
24, Table 14	Lake Cowan and Dundas dune and woodland vegetation monitoring	
25, Table 15	TSFs tree health monitoring	
26	Summary of actions and monitoring implemented under the Adaptive Discharge Management Plan for Lake Dundas	
27	Annual water balance for TSF4	
28	Complaints summary	
29	Audit of annual compliance	Annual Audit Compliance Report (AACR)

30. The Licence Holder must ensure that the Annual Environmental Report also contains:

(a) an assessment of the information contained within the report against previous monitoring results and licence limits;
(b) a summary of issues raised from inspections or incident responses during the reporting period and details of how these have been, or are scheduled to be, addressed and/ or rectified; and
(c) if a dewatering discharge to the environment has occurred in the reporting period, a Dewatering Discharge Report.

31. The Dewatering Discharge Report required by condition 30(c) must address the environmental effects of mine dewater discharge to the Lake Cowan and Lake

Dundas environment and include but not be limited to:

a) the monthly cumulative volumes and average discharge rates of mine dewater discharged to Lake Cowan, as identified by the mine water discharges from the North Royal, HV1 Slippers, Daisy and GEV mines:
    i) monthly total volumes must be reported in cubic metres; and
    ii) average discharge rate must be reported in litres per second for each quarter.
b) the monthly cumulative volumes and average discharge rates of mine dewater discharged to Lake Dundas, as identified by the mine water discharges from Scotia mine, and OK underground;
    i) monthly total volumes must be reported in cubic metres; and
    ii) average discharge rate must be reported in litres per second for each quarter.
c) contaminant loading to the area of impact measured in kilograms per hectare per year for all parameters listed in Table 10;
d) salt crust monitoring (depth, percentage cover and rates of spread) along the lake bank in the impact and control zones;
e) ambient sediment monitoring data required by Table 13;
f) flood level monitoring data of the MFLM regularly logged and reported where exceeded;
g) discussion of the impact of any alteration of the receiving environment, especially with respect to how these will be managed, including requirements of the monitoring program; and
h) ongoing dewatering plans including an estimate of future dewatering volumes and timeframes.

32. The Licence Holder must maintain accurate and auditable books including the following records, information, reports, and data required by this licence:

(a) the calculation of fees payable in respect of this licence;
(b) the works conducted in accordance with condition 6 and 12 of this licence;
(c) any maintenance of infrastructure that is performed in the course of complying with conditions of this licence;
(d) monitoring programmes undertaken in accordance with condition 20, 21, 22, 23, 24, 25 and 26 of this licence; and
(e) complaints received under condition 28 of this licence.

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 Licence Holder for the duration of the licence; and
(d) be available to be produced to an inspector or the CEO as required.

Notification

34. The Licence Holder must ensure that the parameters listed in Table 17 are notified to the CEO in accordance with the notification requirements of the table.

Table 17: Notification requirements

Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
-	Breach of any limit specified in the licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
12, Table 5	The Licence Holder must: (a) undertake an audit of their compliance with the requirements of condition 12; and (b) prepare and submit to the CEO an Environmental Compliance Report on that compliance. The Environmental Compliance Report required, must include as a minimum the following: (a) certification by a suitably qualified geotechnical or civil engineer that items of infrastructure or component(s) thereof, as specified in condition 12 have been constructed in accordance with the relevant requirements specified in condition 12; (b) as constructed plans and a detailed site plan for each item of infrastructure or component of infrastructure specified in condition 12; 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 30 days of the completion of construction	None Specified

Note 1: Notification requirements in the licence must not negate the requirement to comply with s72 of the Act

Note 2: Forms are in Schedule 2

Definitions

In this works approval, the terms in Table 18 have the meaning defined.

Table 18: Definitions

Term	Definition
Annual Audit Compliance Report (AACR)	means a report submitted in a format approved by the CEO (relevant guidelines and templates may be available on the Department's website)
ACN	means Australian Company Number as registered with the Australian Securities & Investments Commission
AEP	Means 'annual exceedance probability' - the probability that a given rainfall total accumulated over a given duration will be exceeded in any one year
Act	means the *Environmental Protection Act 1986*
AER	means Annual Environmental Report
annual period	means a 12 month period commencing from 1 October until 30 September in the immediately following year
AS1726	means the Australian Standard AS1762 Geotechnical site investigations, as amended from time to time
AS/NZS 5667.1	means the Australian Standard AS/NZS 5667.1 *Water Quality – Sampling – Guidance of the Design of sampling programs, sampling techniques and the preservation and handling of samples*
AS/NZS 5667.11	means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters*
AS/NZS 5667.12	means the Australian Standard AS/NZS 5667.12 *Guidance on sampling of bottom sediments*
ASTM D5092/D5092M-16	means the ASTM international standard for Standard practice for design and installation of groundwater monitoring wells (Designation: ASTM D5092/D5092M-16), as amended from time to time
Assessment of Site Contamination NEPM	means the National Environment Protection (Assessment of Site Contamination) Measure 1999, as amended from time to time
averaging period	means the time over which a limit is measured or a monitoring result is obtained
books	has the same meaning given to that term under the EP Act
Clean Fill	has the meaning defined in Landfill Definitions
CEO	means Chief Executive Officer of the Department of Water and Environmental Regulation
CEO	means Chief Executive Officer of the Department

Term	Definition
	"submit to / notify the CEO" (or similar), means either: Director General Department administering the *Environmental Protection Act 1986* Locked Bag 10 Joondalup DC WA 6919 or: info@dwer.wa.gov.au
controlled waste	has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*
Department	means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of the EP Act, which includes Part V Division 3
HDPE	means high density polyethylene
Inert Waste Type 1	has the meaning defined in Landfill Definitions
Inert Waste Type 2	has the meaning defined in Landfill Definitions
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
licence	refers to this document, which evidences the grant of a licence by the CEO under section 57 of the EP Act, subject to the specified conditions contained within
Licence Holder	refers to the occupier of the premises, being the person specified on the front of the licence as the person to whom this licence has been granted
major fill event	means when a major fill occupies more than a 1/3 of the lakebed area
MFLM	means maximum flood level markers
NATA	means the 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	refers to 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 licence
Prescribed premises	has the same meaning given to that term under the EP Act
quarterly	means the 4 inclusive periods from 1 October to 31 December and in the following year 1 January to 31 March, 1 April to 30 June and 1 July to 30 September
Groundwater, Seepage and Dewatering Management Plan	Means a comprehensive strategy designed to effectively manage groundwater, seepage, and dewatering activities. This include but not limited to: a) monitor groundwater, seepage and dewatering

Term	Definition
	b) assess groundwater quality and potential impacts on sensitive receptors c) assess seepage, identify seepage pathways, potential impacts on sensitive receptors, stablish actions where seepage is found, stablish methodologies to reduce/control seepage d) dewatering impact assessment, assessing environmental receptor changes, establish mitigation measures to reduce risk for environmental receptors e) define targets and indicators to evaluate environmental performance of the plan and effectiveness to reduce/manage risk f) reevaluation/improvement measures resulting from the evaluation of environmental performance
Schedule 1	means Schedule 1 of this licence unless otherwise stated
Schedule 2	means Schedule 2 of this licence unless otherwise stated
Schedule 3	means Schedule 3 of this licence unless otherwise stated
six monthly	means the 2 inclusive periods from 1 April to 30 September and 1 October to 31 March in the following year
TSF	means an engineered containment pond or dam used to store tailings
usual working day	means 0800 – 1700 hours, Monday to Friday excluding public holidays in Western Australia.
waste	has the same meaning given to that term under the EP Act

Schedule 1: Maps

Premises map

The Premises is shown in the map below. The red line depicts the Premises boundary. Norseman townsite is excluded from the Premises.

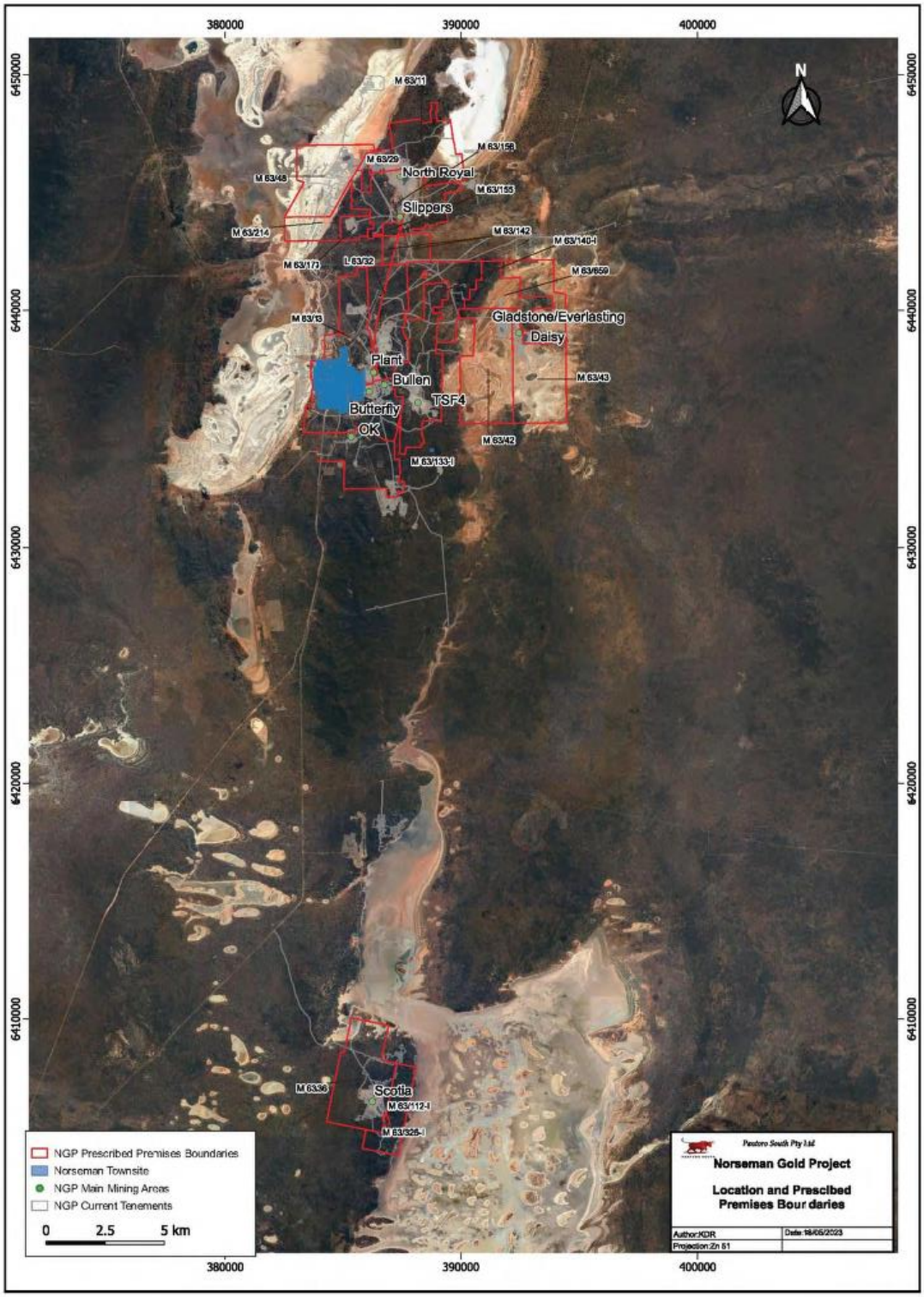

Figure 1: Map of the boundary of the prescribed premises

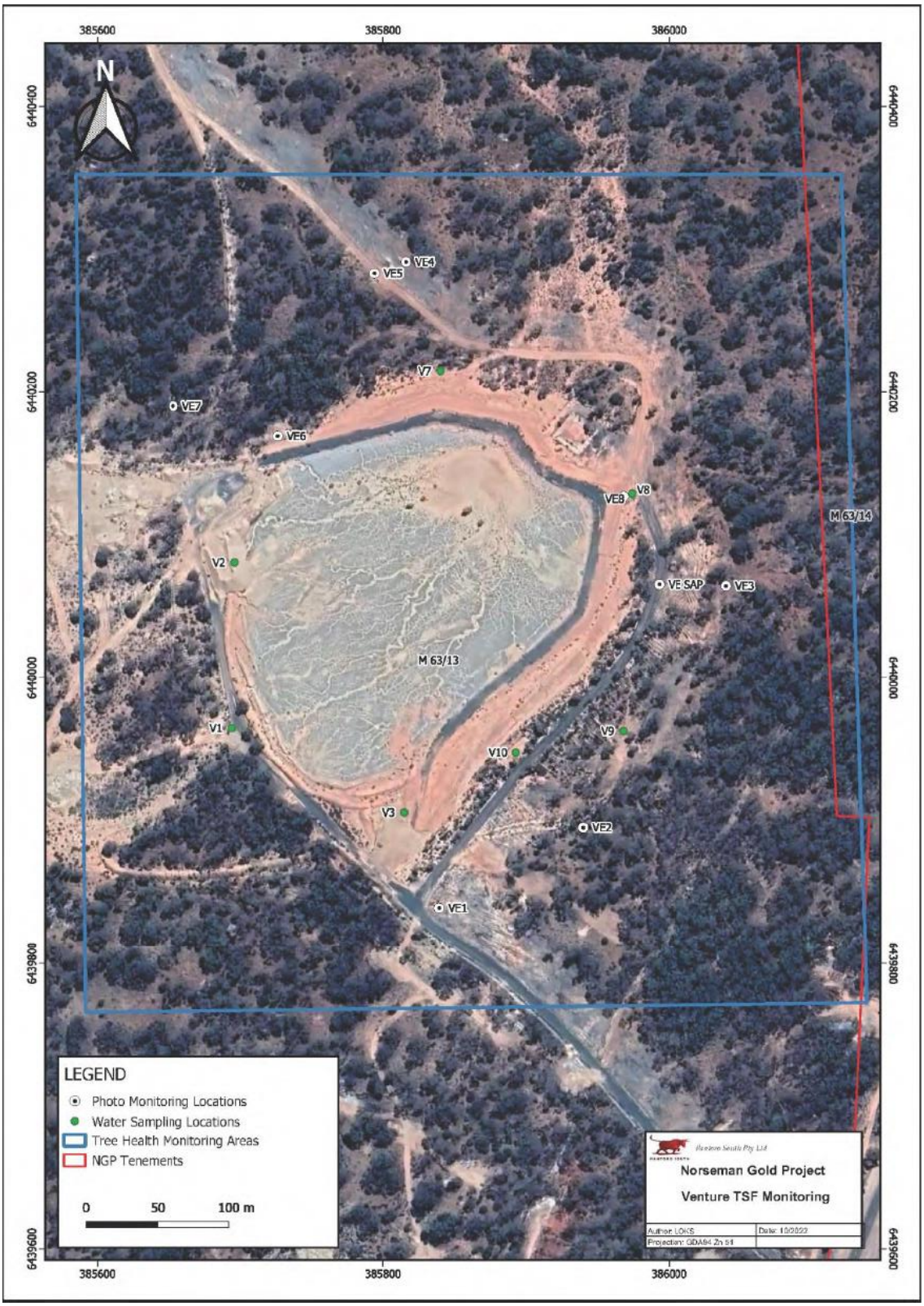

Figure 2: Venture TSF and related monitoring points

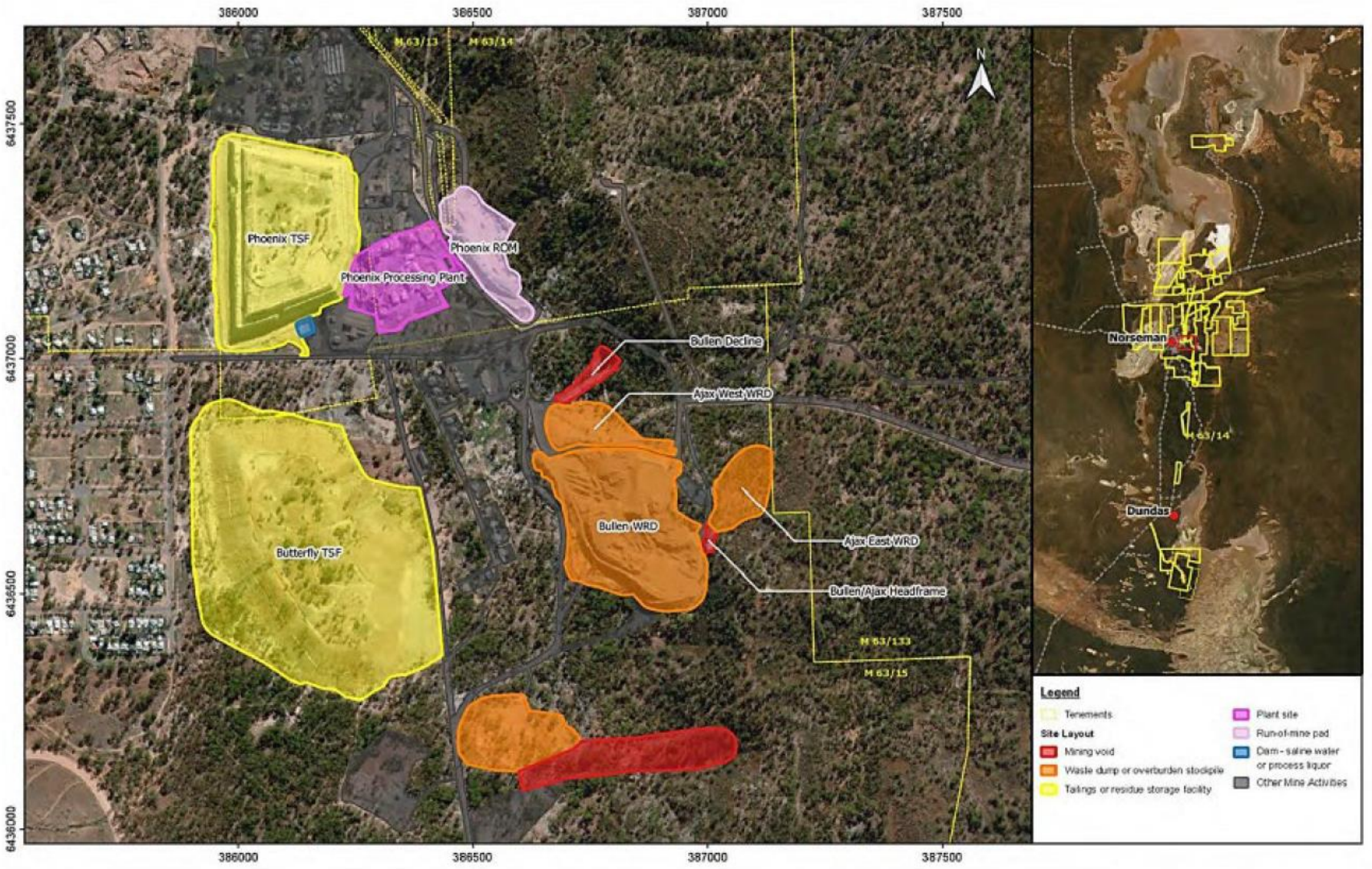

Figure 3: Phoenix TSF and Butterfly TSF locations

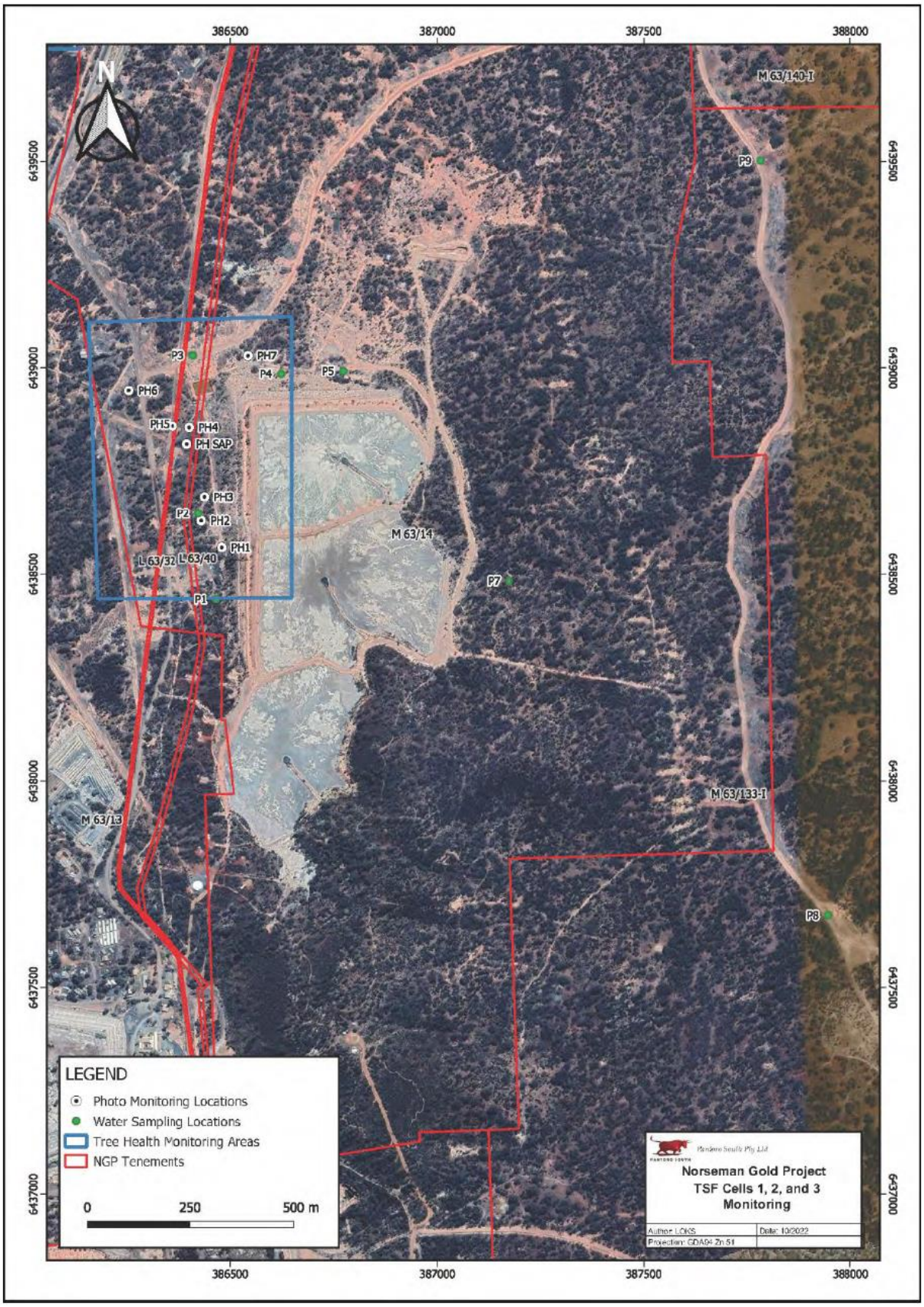

Figure 4: TSF 123 and related monitoring points

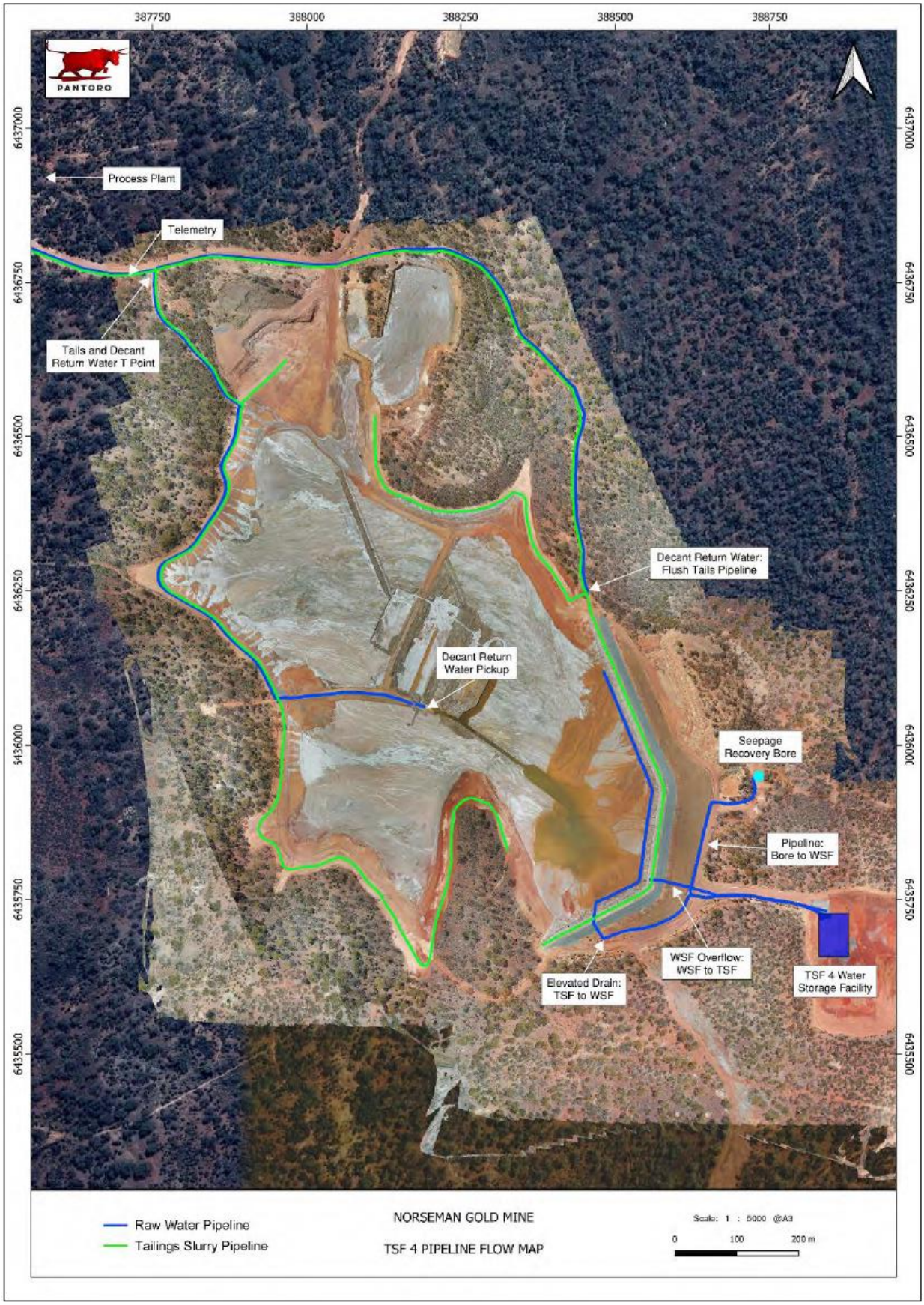

Figure 5: TSF4 and related pipeline flow map (note: Seepage Recovery Bore - SRB1)

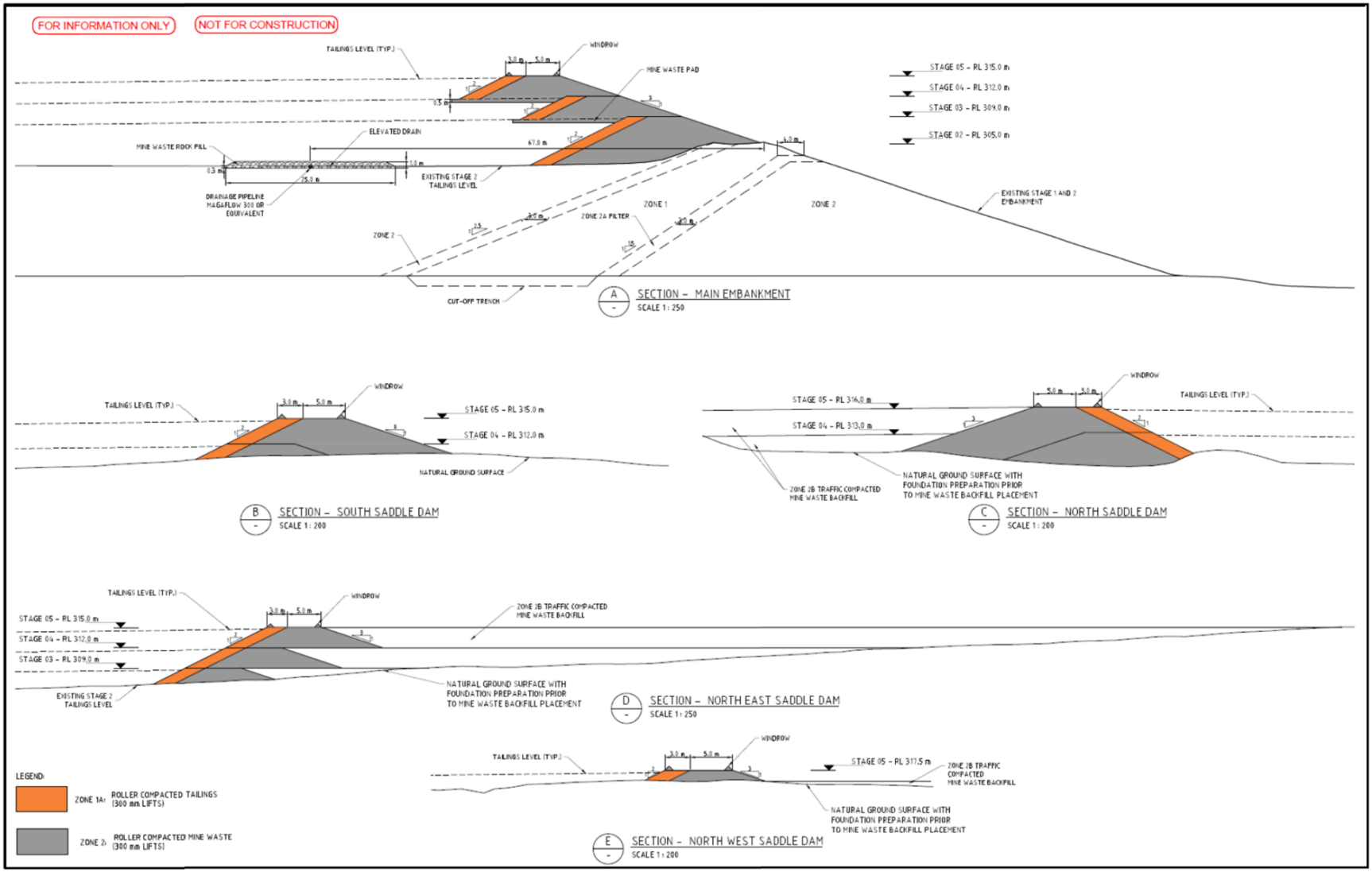

Figure 6: TSF4 embarkment raise stages

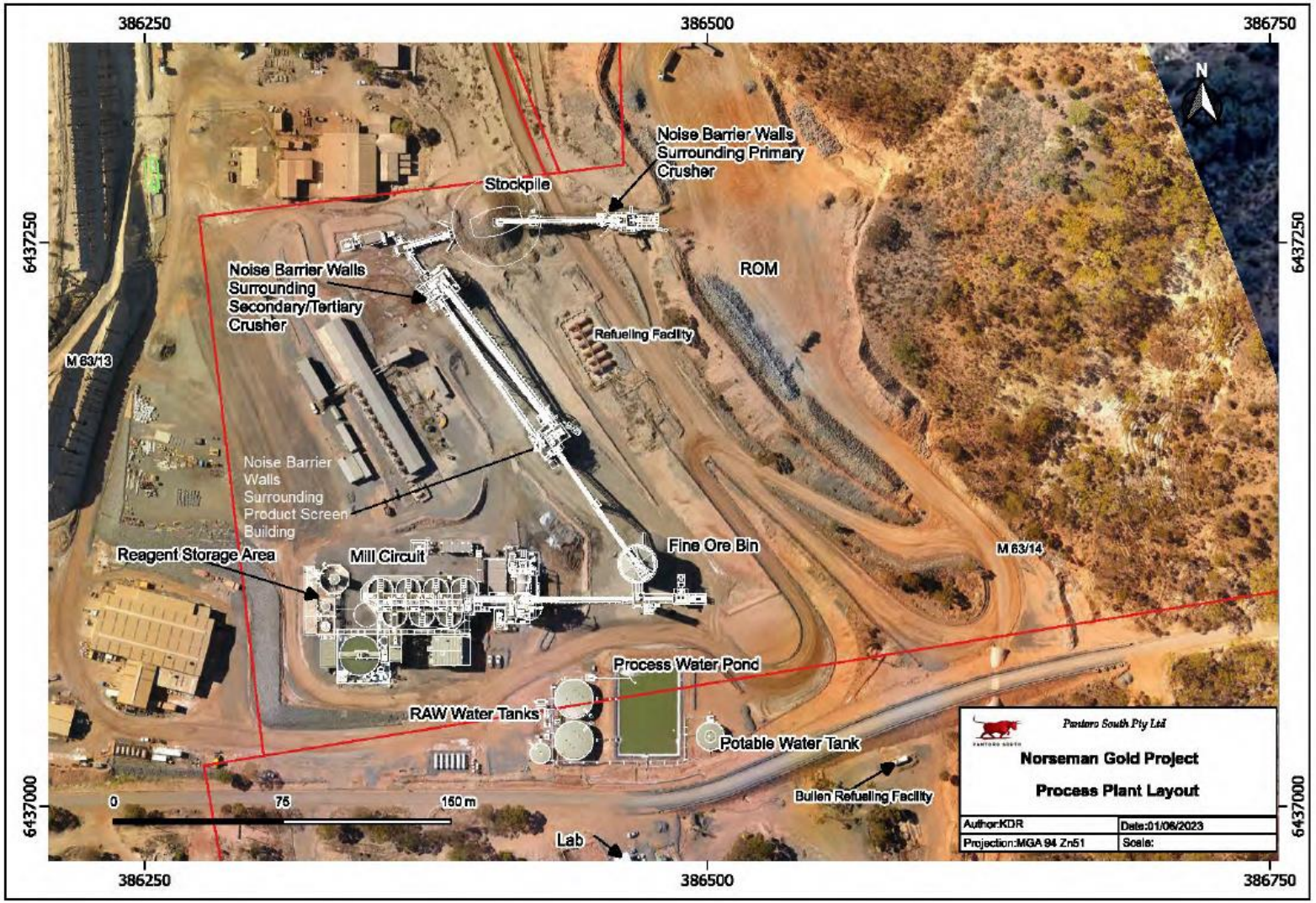

Figure 7: Process Plant Layout

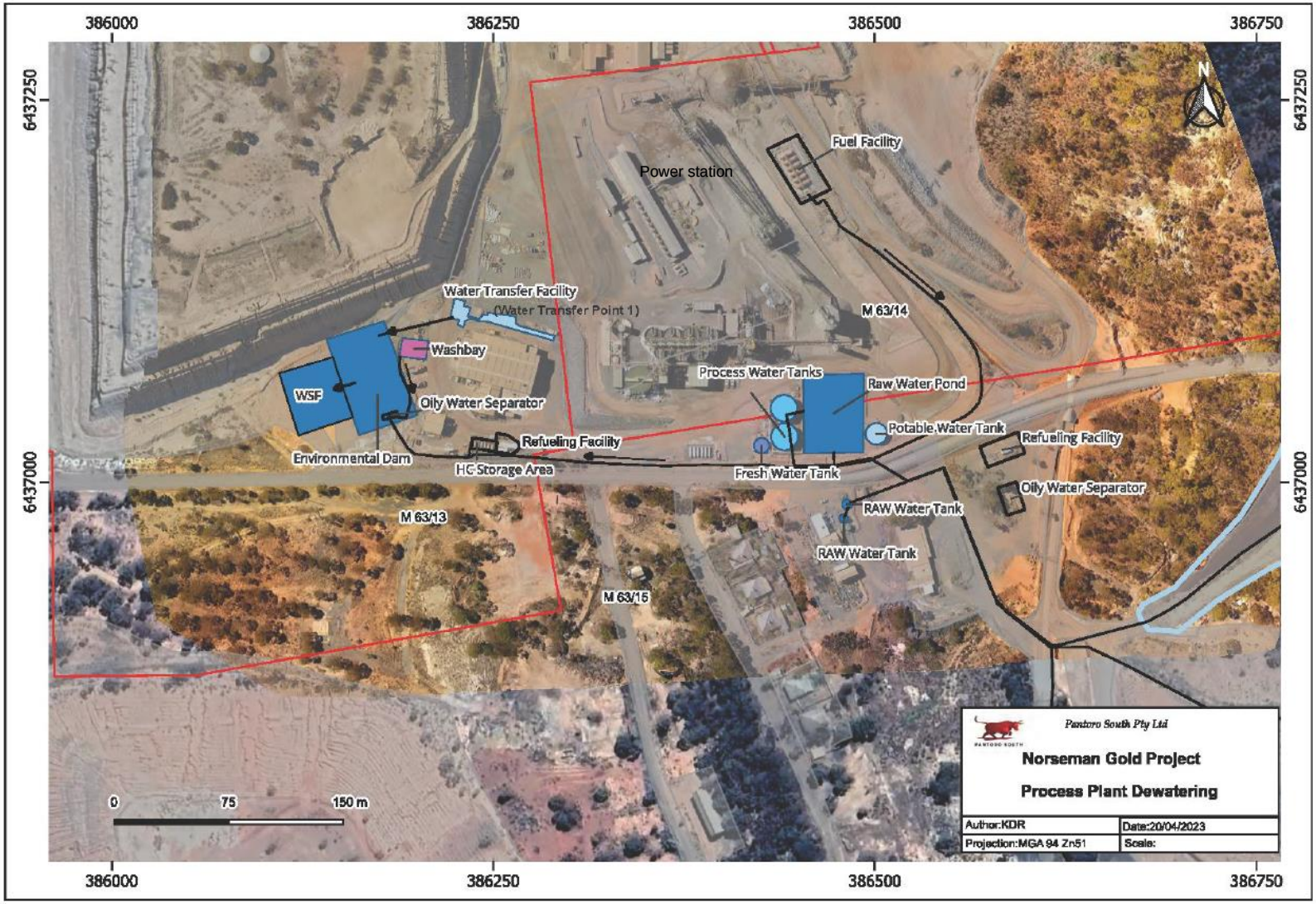

Figure 8: Process Water Pond, Water Storage Facility (WSF) (Process plant events dam), Environmental Dam, and the Power Station (emission points A1-A10 are located at the Power Station)

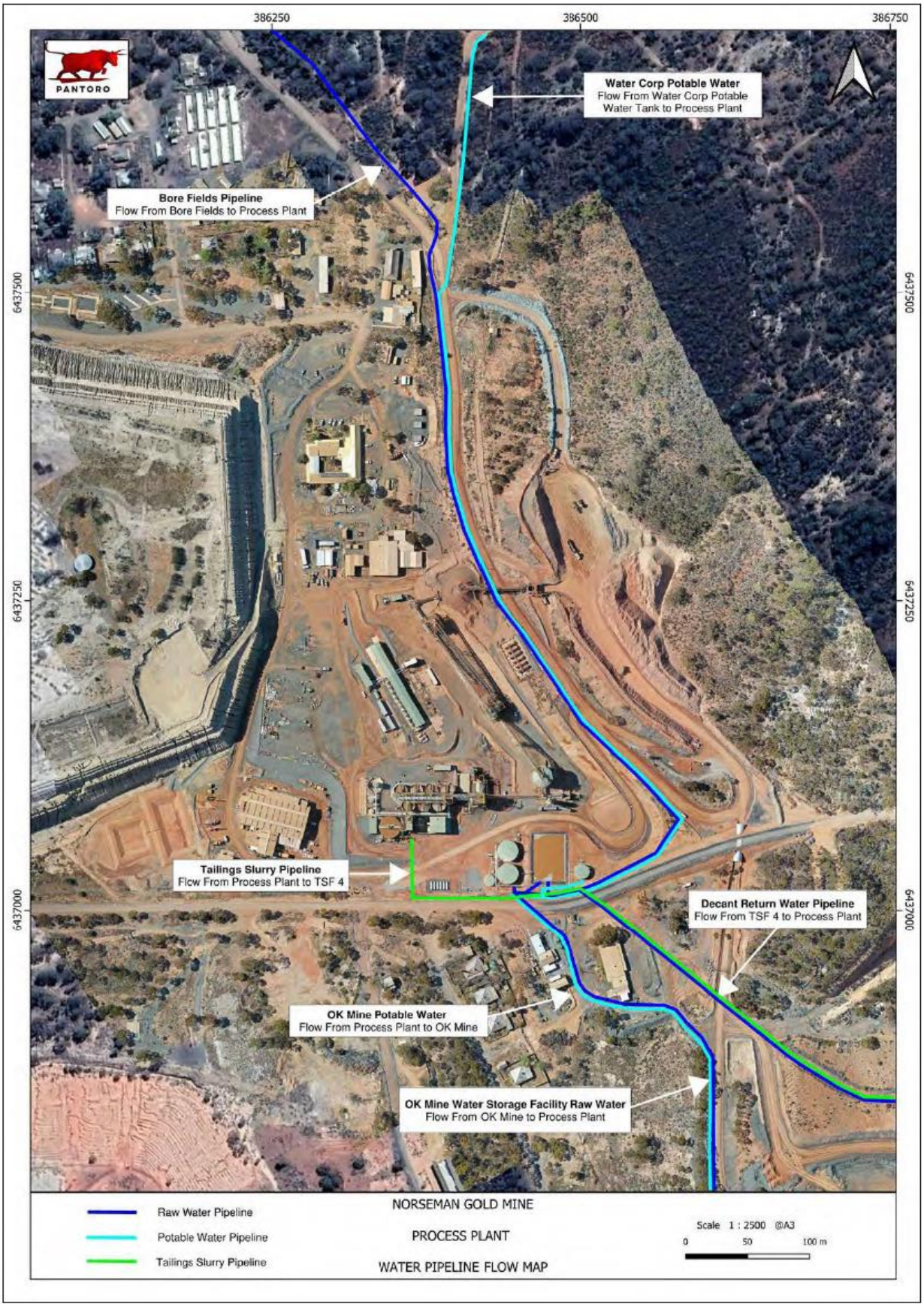

Figure 9: Processing Plant Water Pipeline Flow Map

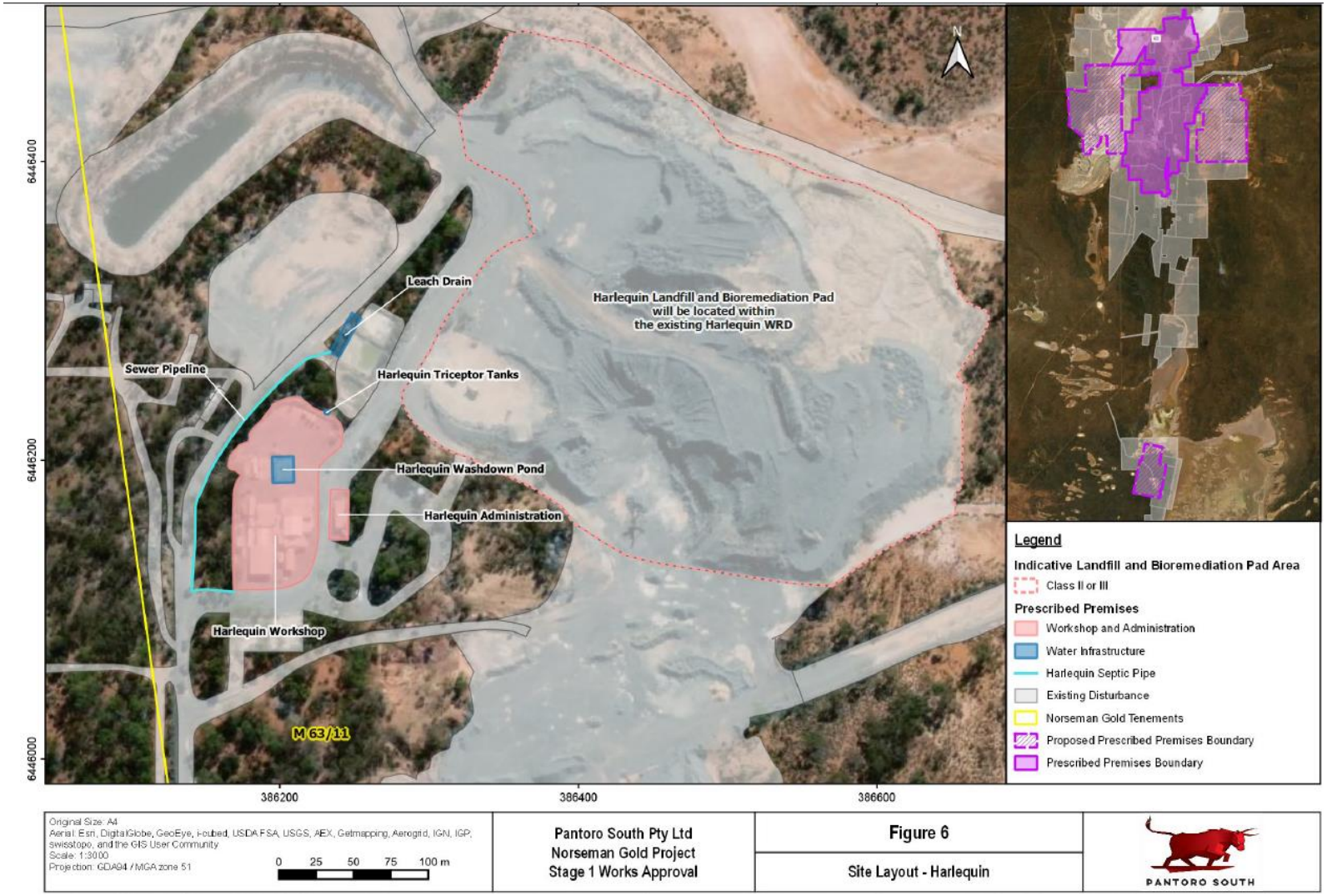

Figure 10: Location of containment infrastructure at Harlequin

Figure 11: TSF123 Return Water pond

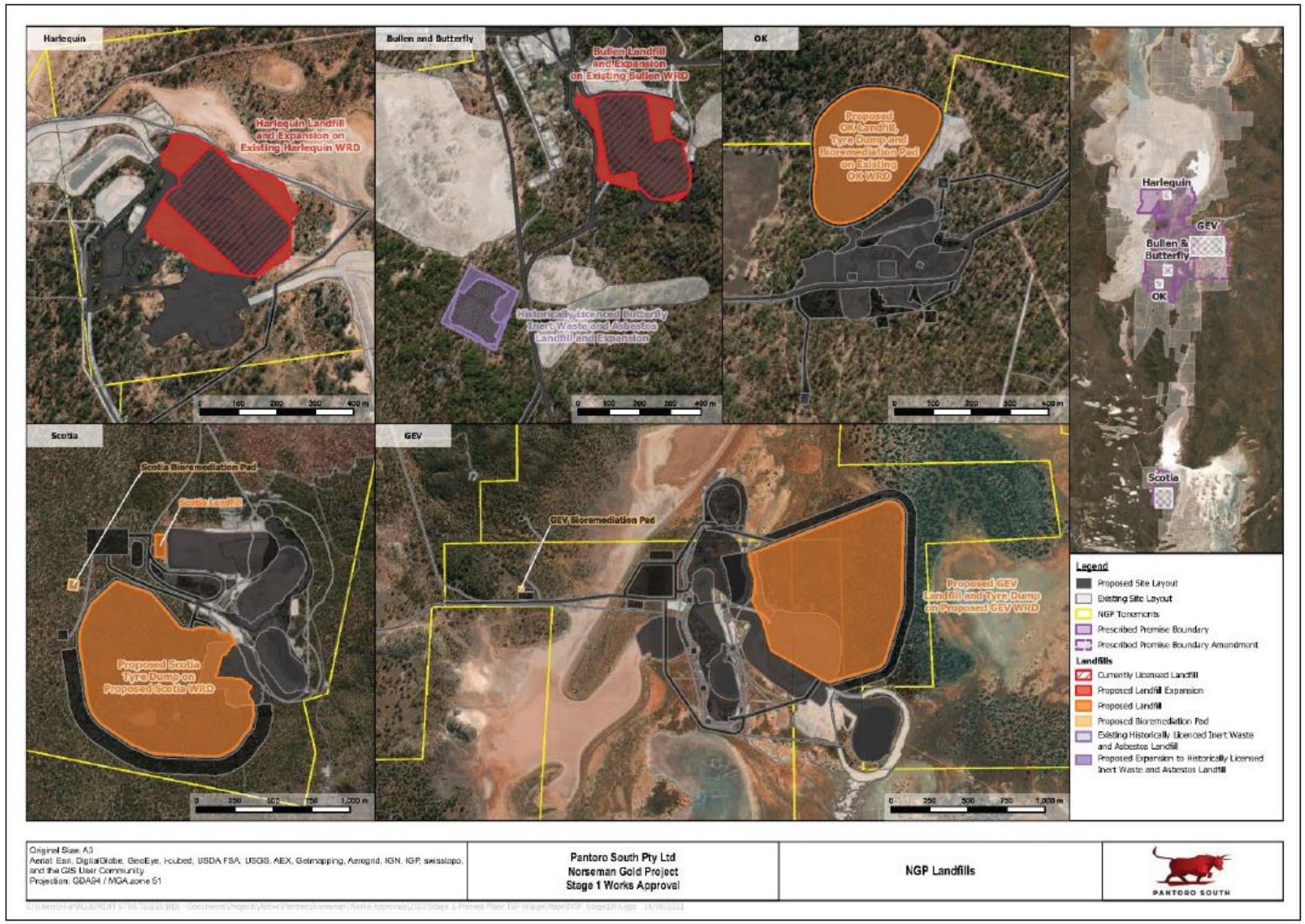

Figure 12: Landfills, landfill extensions and proposed bioremediation pads locations

Figure 13: Locations of containment and dewatering infrastructure OK Mine

Figure 14: OK Mining Area and infrastructure

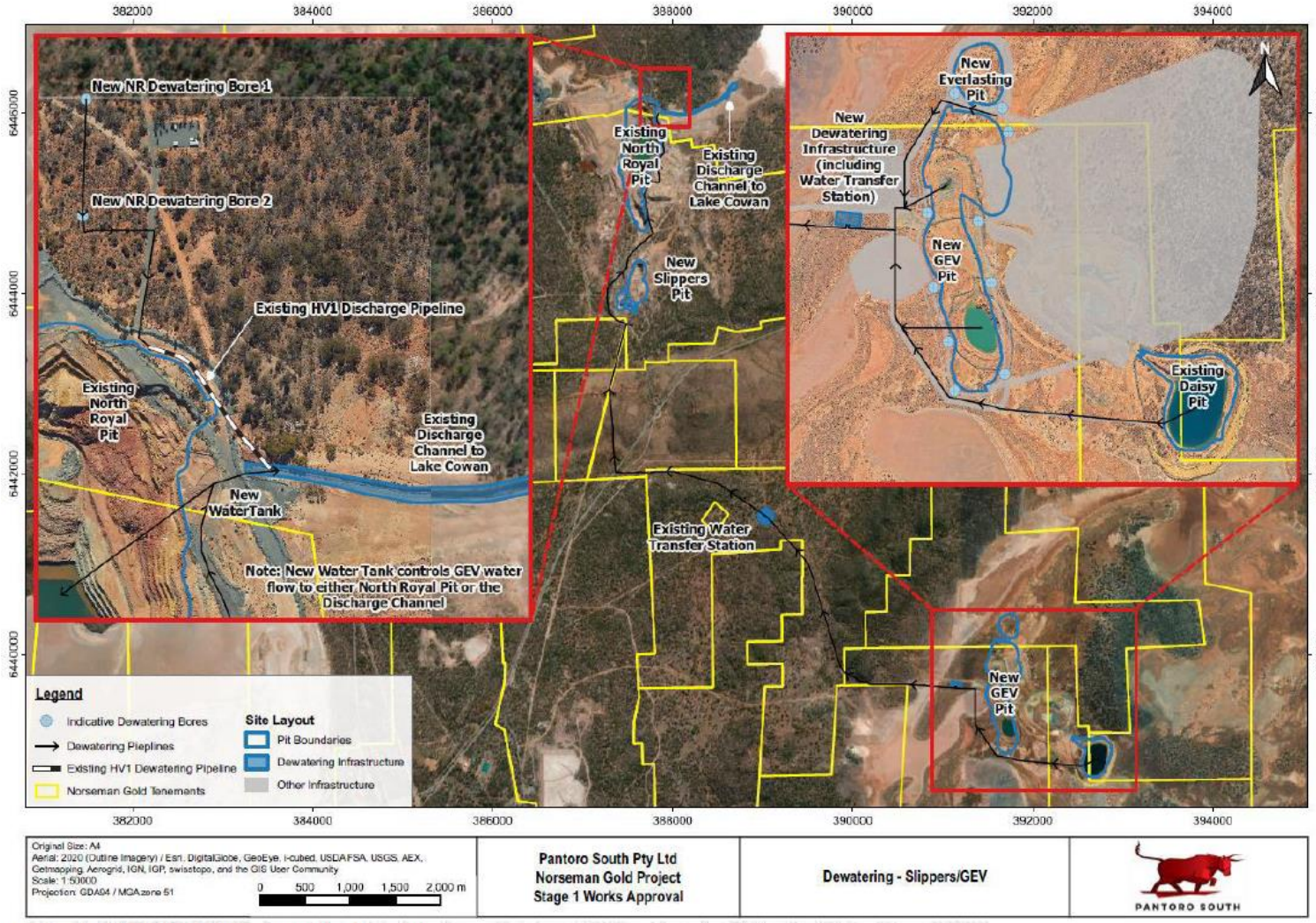

Figure 10: North Royal and Slippers dewatering infrastructure

Figure 15: North Royal, Slippers and GEV dewatering infrastructure

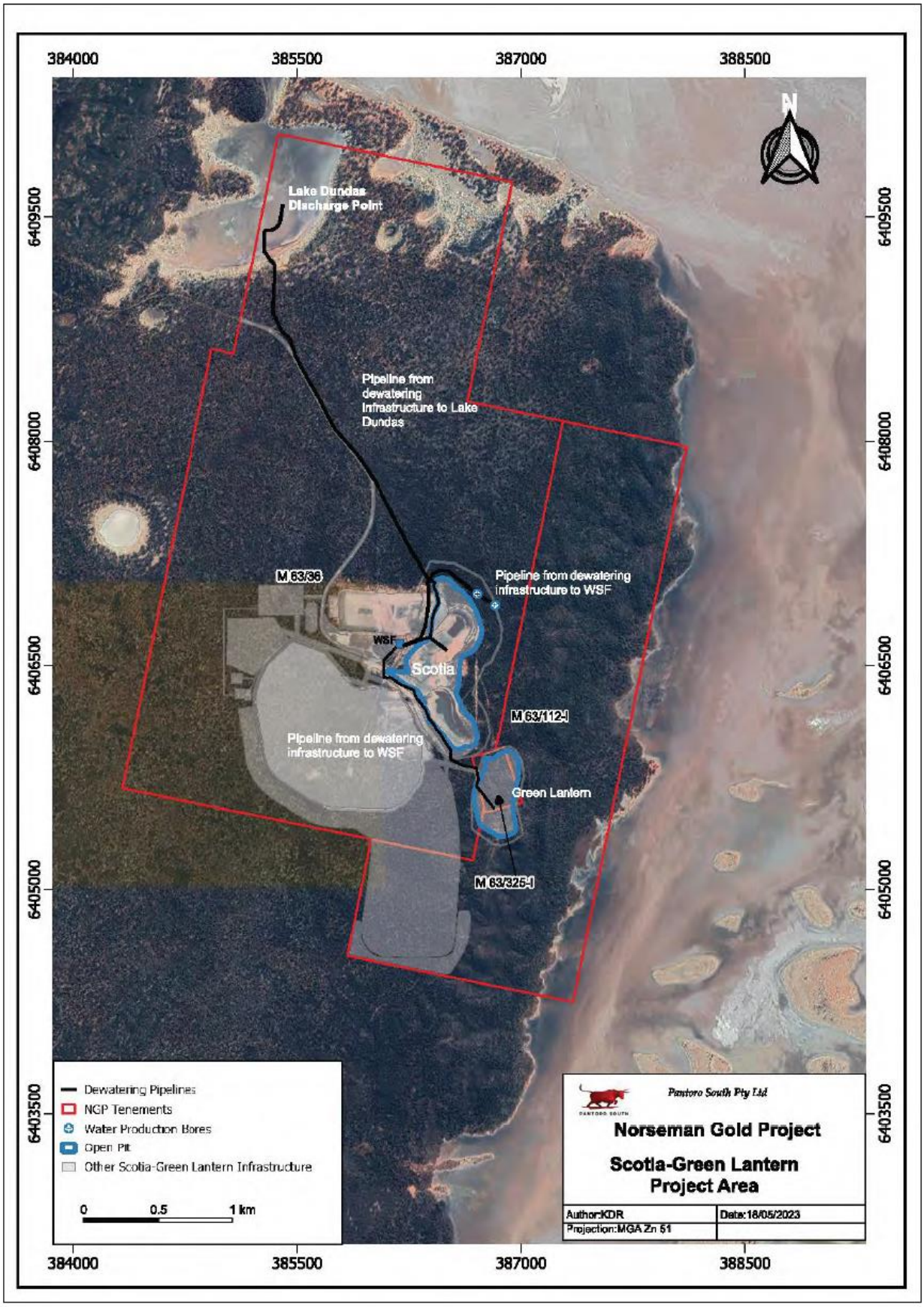

Figure 16: Scotia – Dewatering Layout

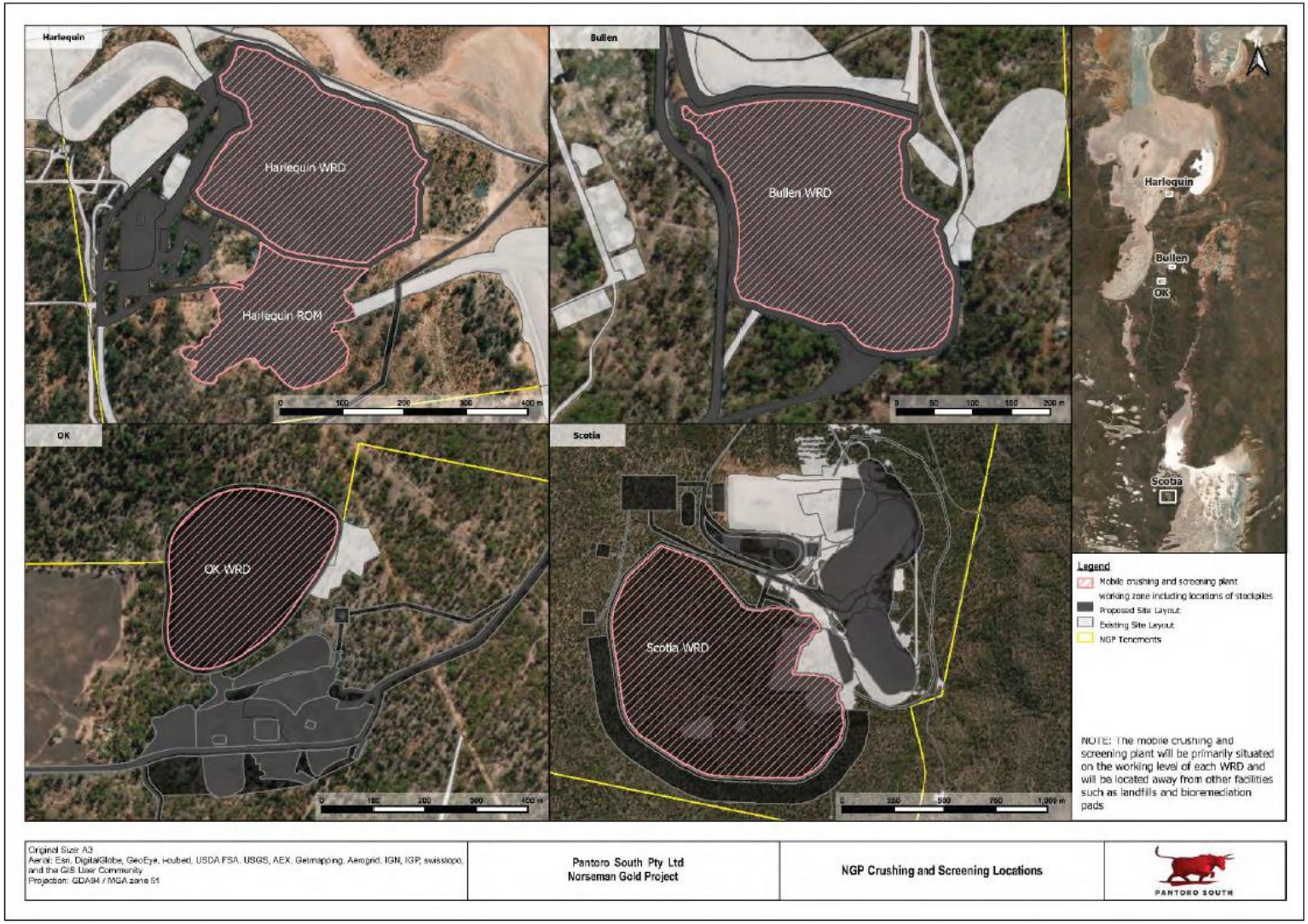

Figure 17: Mobile crushing-screening plant areas

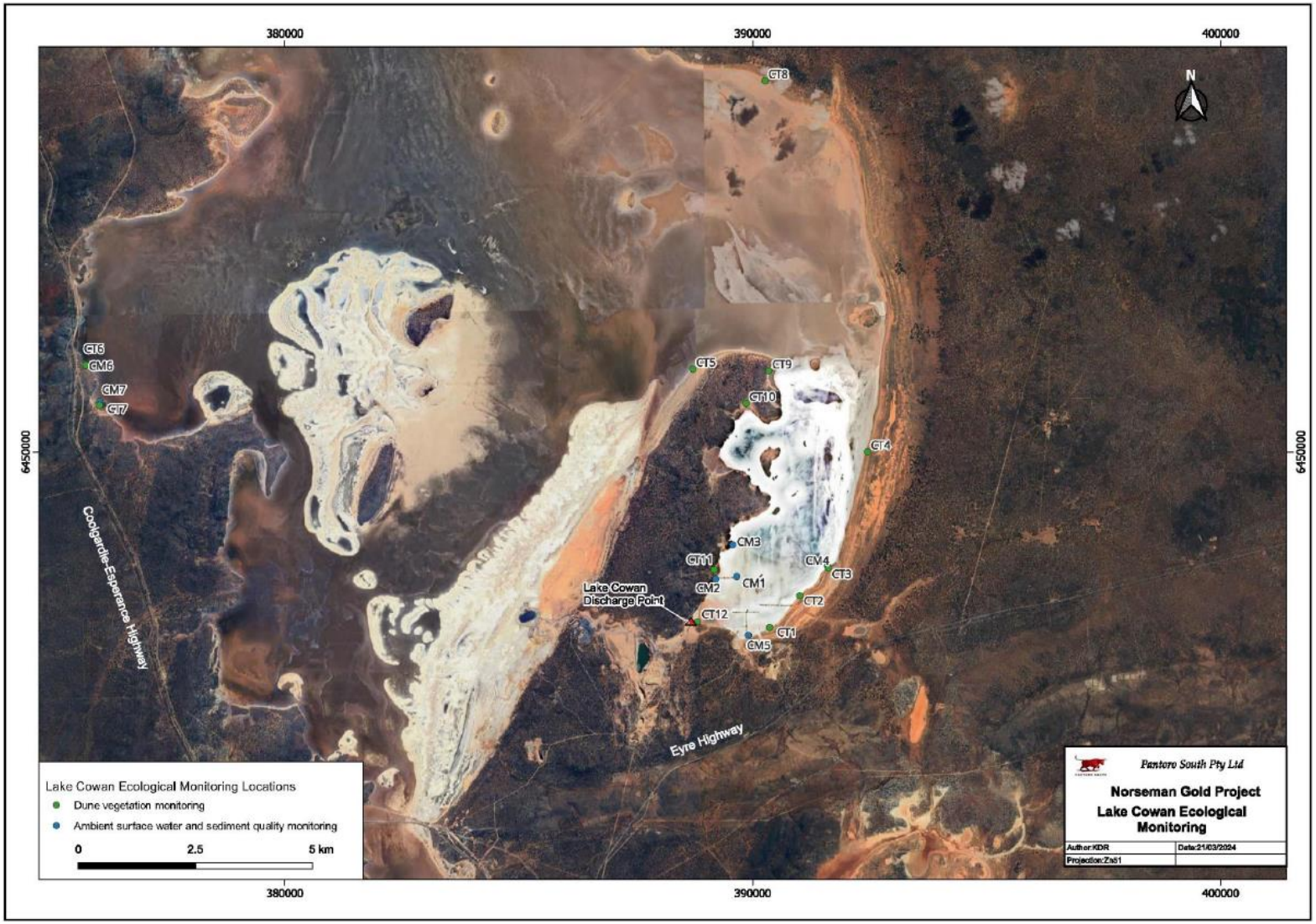

Figure 18: Locations of the monitoring points on Lake Cowan and emission point W1

Figure 19: Lake Dundas Ecological monitoring Points and emission point W2

Figure 20: Locations of ambient groundwater quality monitoring points and monitoring points for TSF4

Figure 21: Tree Health Monitoring Areas

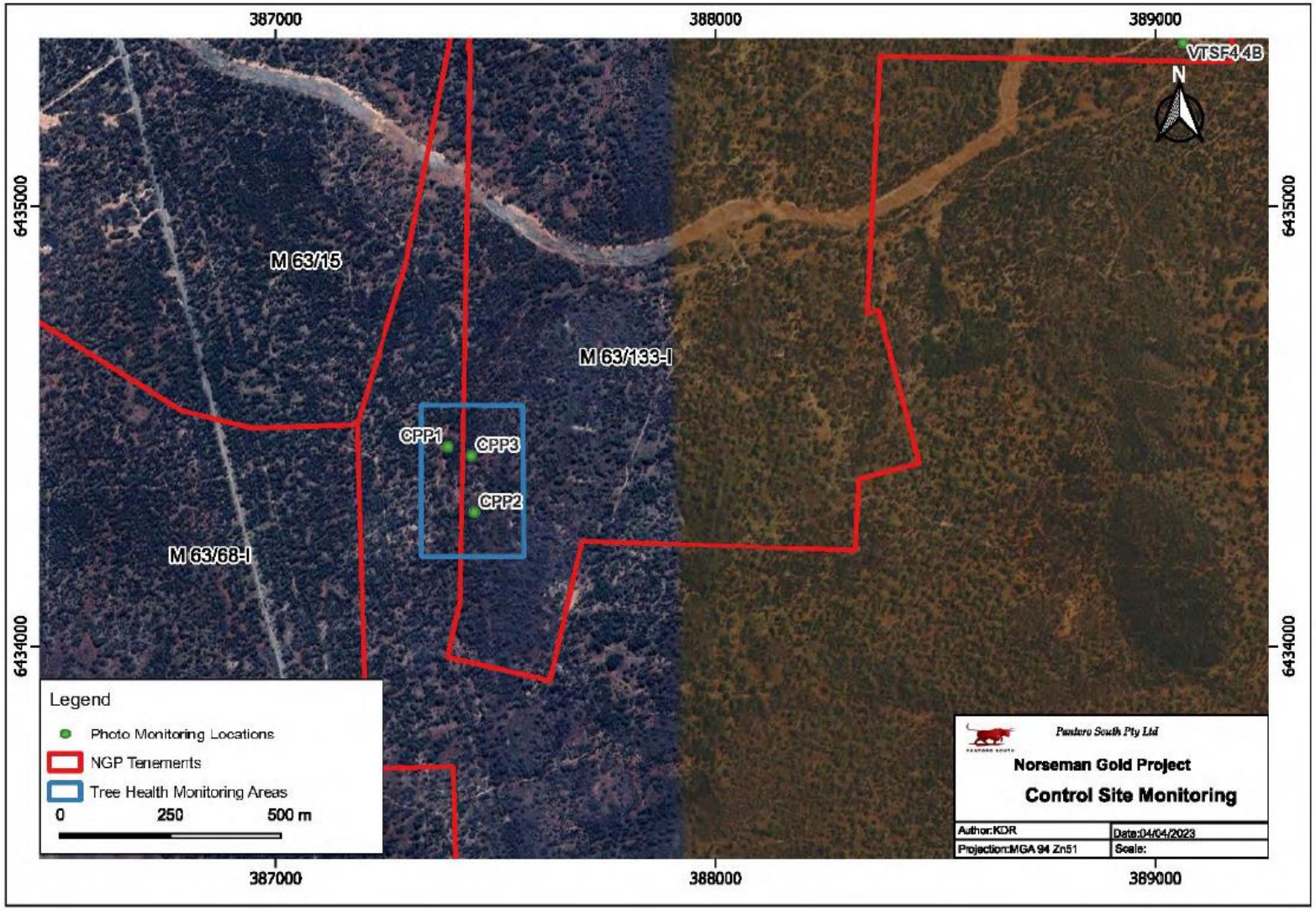

Figure 22: Control monitoring points

Schedule 2: Notification and Form

Licence:	Licence holder:
Form: N1	Date of breach:

Notification of detection of the breach of a limit.

These pages outline the information that the operator must provide.

Units of measurement used in information supplied under Part A and B requirements must be appropriate to the circumstances of the emission. Where appropriate, a comparison should be made of actual emissions and authorised emission limits.

Part A

Licence number	
Name of operator	
Location of premises	
Time and date of the detection	

Notification requirements for the breach of a limit	
Emission point reference/source	
Parameter(s)	
Limit	
Measured value	
Date and time of monitoring	
Measures taken, or intended to be taken, to stop the emission	

Part B

Any more accurate information on the matters for notification under Part A.	
Measures taken, or intended to be taken, to prevent a recurrence of the incident.	
Measures taken, or intended to be taken, to rectify, limit or prevent any pollution of the environment which has been or may be caused by the emission.	
The dates of any previous N1 notifications for the Premises in the preceding 24 months.	

Name	
Post	
Signature on behalf of licence holder	
Date	

Schedule 3: Ambient environmental reporting

The licence holder must submit the following information in the annual environmental report for the monitoring requirements specified in Condition 22:

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

(b) a description of the field methodologies employed;

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

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

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

(f) 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;

(g) a diagram with aerial image overlay showing all monitoring locations;

(h) for groundwater monitoring, a diagram or aerial image overlay showing all monitoring locations and depicting groundwater level contours, flow direction and hydraulic gradient;

(i) an interpretive summary and assessment of results against previous monitoring results;

(j) an interpretive summary and assessment of the results against relevant assessment levels for water or sediment (as the case requires), as published in the Guideline: Assessment and management of contaminated sites; and

(k) 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.