Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: Savannah Nickel Mines Pty Ltd

Licence: L7967/2003/6

Registered office: Level 9
553 Hay Street
PERTH WA 6000

ACN: 103 729 282

Premises address: Savannah Project
Mining Tenements M80/179, M80/180 and M80/181
WARMUN WA 6740
as depicted in Schedule 1

Issue date: Thursday, 31 July 2014

Commencement date: Saturday, 2 August 2014

Expiry date: Sunday, 1 August 2032

Prescribed premises category
Schedule 1 of the *Environmental Protection Regulations 1987*

Category number	Category description	Category production or design capacity	Approved Premises production or design capacity
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes or more per year	50,000 tonnes per annual period
6	Mine dewatering	50,000 tonnes or more per year	100,000 tonnes per annual period
54	Sewage facility	100 cubic metres or more per day	200 cubic metres per day
64	Class II putrescible landfill site	20 tonnes or more per year	5000 tonnes per annual period

Conditions
This Licence is subject to the conditions set out in the attached pages.

Date signed: 18 July 2016

Danielle Eyre
Senior Manager – Industry Regulation (Resource Industries)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

DER's industry licensing role
The Department of Environment Regulation (DER) is a government department for the state of Western Australia in the portfolio of the Minister for Environment. DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. DER also monitors and audits compliance with works approvals and licence conditions, takes enforcement action as appropriate and develops and implements licensing and industry regulation policy.

Licence requirements
This Licence is issued under Part V of the Act. Conditions contained within the Licence relate to the prevention, reduction or control of emissions and discharges to the environment and to the monitoring and reporting of them.

Where other statutory instruments impose obligations on the Premises/Licensee the intention is not to replicate them in the licence conditions. You should therefore ensure that you are aware of all your statutory obligations under the Act and any other statutory instrument. Legislation can be accessed through the State Law Publisher website using the following link: http://www.slp.wa.gov.au/legislation/statutes.nsf/default.html

For your Premises relevant statutory instruments include but are not limited to obligations under the:

- *Environmental Protection (Unauthorised Discharges) Regulations 2004* – these Regulations make it an offence to discharge certain materials such as contaminated stormwater into the environment other than in the circumstances set out in the Regulations.

- *Environmental Protection (Controlled Waste) Regulations 2004* - these Regulations place obligations on you if you produce, accept, transport or dispose of controlled waste.

- *Environmental Protection (Noise) Regulations 1997* – these Regulations require noise emissions from the Premises to comply with the assigned noise levels set out in the Regulations.

You must comply with your licence. Non-compliance with your licence is an offence and strict penalties exist for those who do not comply.

Licence holders are also reminded of the requirements of section 53 of the Act which places restrictions on making certain changes to prescribed premises unless the changes are in accordance with a works approval, licence, closure notice or environmental protection notice.

Licence fees
If you have a licence that is issued for more than one year, you are required to pay an annual licence fee prior to the anniversary date of issue of your licence. Non-payment of annual licence fees will result in your licence ceasing to have effect meaning that it will no longer be valid and you will need to apply for a new licence for your Premises.

Ministerial conditions
If your Premises has been assessed under Part IV of the Act you may have had conditions imposed by the Minister for Environment. You are required to comply with any conditions imposed by the Minister.

Premises description and Licence summary
Savannah Nickel Mines Pty Ltd (the Licensee) is a wholly owned subsidiary of Panoramic Resources Limited (Panoramic). The Licensee processes nickel-copper-cobalt bearing ore by conventional crushing, milling and flotation plant to produce nickel concentrate. Operations at the Savannah Project (Savannah) currently consist of a decommissioned open pit, an underground mine, paste plant, processing plant with tailings and water storage facilities, supporting mine site infrastructure and an accommodation village. The current mineral resource is estimated to extend the Life of Mine (LOM) until 2018. Savannah is located approximately 40 kilometres (km) south of Warmun and 120 km north of Halls Creek. The process plant is currently designed to treat 950,000 tonnes of sulfide nickel/copper/cobalt ore per year.

The primary discharge from the Premises occurs through the treatment and storage of tailings and tailings supernatant water.

Tailings Storage Facility (TSF)
The existing TSF is a valley fill style impoundment located approximately 1 km north of the processing plant and immediately upstream of Water Storage Facility 1 (WSF1). It has a footprint of approximately 16 hectares (ha). All tailings will be left in-situ in the TSF upon full capacity and the TSF will have an engineered cover when completed.

The TSF is operated in the conventional manner, with tailings deposition cycled around the facility to maximise tailings consolidation and density.

WSF1
Immediately downstream of the TSF is WSF1. WSF1 was originally designed to capture and treat seepage from the TSF. WSF1 has a capacity of approximately 1,500,000 cubic metres (m^3). A drainage blanket directs seepage through the embankment to the seepage recovery sump in a controlled manner. The crest of WSF1 is protected from over-topping by a spillway excavated through the saddle to the south of WSF1.

The Licensee operates a Class II putrescible landfill, undertakes mine dewatering for underground operations and treats sewage from the Accommodation Camp. Treated wastewater is irrigated to an area of approximately 1.33 ha located adjacent to the accommodation camp.

This Licence is the result of an amendment sought by the Licensee to gain approval to dispose of 70 tonnes of tyres at two locations within the site's waste rock dumps and to reduce the approved throughput capacities of category 5, 54 & 64 as the site has recently gone into care and maintenance (May 2016).

The licences and works approvals issued for the Premises since 2003 are:

Instrument log		
Instrument	**Issued**	**Description**
W3800/2003/1	2003	New Works Approval
L7967/2003/1	2004	New Licence
L7967/2003/2	01/08/2005	New Licence
L7967/2003/3	02/08/2006	New Licence
L7967/2003/4	02/08/2008	New Licence
W4622/2009/1	01/11/2010	Works Approval for TSF lift
L7967/2003/4	21/11/2011	Licence amendment to allow concrete batching on site

L7967/2003/4	02/02/2012	Licence amendment to allow Emergency Response Training on site
L7967/2003/5	02/08/2012	New Licence
W5208/2012/1	03/12/2012	Works Approval for TSF lift
W5208/2012/1	01/08/2013	Works Approval amendment for TSF lift
L7967/2003/5	17/10/2013	Licence amendment to allow new putrescible landfill
L7967/2003/6	01/08/2014	New Licence and conversion to new licence format
L7967/2003/6	09/10/2014	Licence amendment to increase category 5 production and design capacity
W5208/2012/1	27/08/2015	Works Approval amendment to extend the expiry date until the 31/03/2017
L7967/2003/6	18/07/2016	Licence amendment to allow for tyre burial within waste rock dump and to reduce design capacities of premises while during C&M.

Severance

It is the intent of these Licence conditions that they shall operate so that, if a condition or a part of a condition is beyond the power of this Licence to impose, or is otherwise *ultra vires* or invalid, that condition or part of a condition shall be severed and the remainder of these conditions shall nevertheless be valid to the extent that they are within the power of this Licence to impose and are not otherwise *ultra vires* or invalid.

END OF INTRODUCTION

Licence conditions

1 General

1.1 Interpretation

1.1.1 In the Licence, definitions from the *Environmental Protection Act 1986* apply unless the contrary intention appears.

1.1.2 For the purposes of this Licence, unless the contrary intention appears:

'Act' means the *Environmental Protection Act 1986*;

'Annual period' means the inclusive period from 1 January until 31 December in the same year;

'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 5667.6' means the Australian Standard AS/NZS 5667.6 *Water Quality – Sampling – Guidance on sampling of rivers and streams*;

'AS/NZS 5667.10' means the Australian Standard AS/NZS 5667.10 *Water Quality – Sampling – Guidance on sampling of waste waters;*

'AS/NZS 5667.11' means the Australian Standard AS/NZS 5667.11 *Water Quality – Sampling – Guidance on sampling of groundwaters;*

'AS/NZ 2031' means the Australian Standard AS/NZS 2031: 2001 *Selection of containers and preservation of water samples for microbiological analysis;*

'Averaging period' means the time over which a limit is measured or a monitoring result is obtained;

'CEO' means Chief Executive Officer of the Department of Environment Regulation;

'CEO' for the purpose of correspondence means;
Chief Executive Officer
Department Administering the Environmental Protection Act 1986
Locked Bag 33
CLOISTERS SQUARE WA 6850
Email: info@der.wa.gov.au;

'cfu/100mL' means colony forming units per 100 millilitres;

'Clean fill' has the meaning defined in Landfill Definitions;

'Contaminated solid waste' has the meaning defined in Landfill Definitions;

'Controlled waste' has the definition in *Environmental Protection (Controlled Waste) Regulations 2004*;

'Freeboard' means the distance between the maximum water surface elevations and the top of retaining banks or structures at their lowest point;

'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;

'Landfill Definitions' means the document titled "Landfill and Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer of the Department of Environment and Conservation as amended from time to time;

'Licence' means this Licence numbered L7967/2003/6 and issued under the Act;

'Licensee' means the person or organisation named as Licensee on page 1 of the Licence;

'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;

'NWQMS 1997' means the most recent version and relevant parts of the "National Water Quality Management Strategy, Australian Guidelines for Sewerage Systems - Effluent Management" as published by the Agriculture and Resource Management Council of Australia and New Zealand and Australian and New Zealand Environment and Conservation Council, 1997;

'Premises' means the area defined in the Premises Map in Schedule 1 and listed as the Premises address on page 1 of the Licence;

'Putrescible' has the meaning defined in Landfill Definitions;

'Quarterly' means the 4 inclusive periods from 1 January to 31 March, 1 April to 30 June, 1 July to 30 September and 1 October to 31 December;

'Schedule 1' means Schedule 1 of this Licence unless otherwise stated;

'Schedule 2' means Schedule 2 of this Licence unless otherwise stated;

'Special Waste Type 1' has the meaning defined in Landfill Definitions;

'Special Waste Type 2' has the meaning defined in Landfill Definitions;

'Spot sample' means a discrete sample representative at the time and place at which the sample is taken;

'SWL or standing water level' means the water level of any surface water or in any piezometer measured prior to sampling and expressed in metres AHD (Australian Height Datum);

'TSF' means Tailings Storage Facility; and

'WSF' means Water Storage Facility.

1.1.3 Any reference to an Australian or other standard in the Licence means the relevant parts of the standard in force from time to time during the term of this Licence.

1.1.4 Any reference to a guideline or code of practice in the Licence means the version of that guideline or code of practice in force from time to time, and shall include any amendments or replacements to that guideline or code of practice made during the term of this Licence.

1.2 Premises operation

1.2.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit in this section.

1.2.2 The Licensee shall ensure that where waste produced on the Premises are not taken off-site for lawful use or disposal, they are managed according to the requirements in Table 1.2.1.

Table 1.2.1: Management of Waste

Facility as depicted in Schedule 1	Waste type	Management Strategy	Requirements[1]
Waste Water Treatment Plant	Sewage	Biological and physical treatment	Treatment of sewage waste shall be at or below the treatment capacity of 200 m^3/day.
Landfill	Clean fill Inert Waste Type 1 Inert Waste Type 2 Putrescible waste Contaminated Solid Waste Special Waste Type 1 (Asbestos) Special Waste Type 2 (Biomedical and Clinical Waste)	Handling, storage prior to or disposal of waste by landfilling	<u>All waste types</u> No more than 5,000 tonnes per annual period of all waste types cumulatively shall be disposed of by landfilling. Disposal of waste (except tyres) by landfilling shall only take place within the Landfill area shown on the Premises map in Schedule 1. Place waste within a defined trench or within an area enclosed by earthen or other bunds. Restrict the tipping area to a maximum linear length of 30 m. The separation distance between the base of the landfill and the highest groundwater level shall not be less than 3 m. Must meet the acceptance criteria for a Class II landfill. <u>Special Waste Type 1 (Asbestos)</u> Only to be disposed of into a designated asbestos disposal area within the landfill. Not to be deposited within 2 m of the final tipping surface of the landfill. No works shall be carried out on the landfill that could lead to a release of asbestos fibres. <u>Special Waste Type 2 (Biomedical and Clinical Waste)</u> Only to be disposed of into a designated biomedical waste disposal area within the landfill.

			Not to be deposited within 2 m of the final tipping surface of the landfill. No works shall be carried out on the landfill that could lead to biomedical wastes being excavated or uncovered.
North and South Waste rock dumps	Inert Waste Type 2 (Tyres only)	Handling and disposal by landfilling	Inert Waste Type 2 (Tyres)[2] No more than 70 tonnes of tyres per annual period shall be disposed of by landfilling. Tyres shall only be landfilled within the North waste rock dump and South waste rock dump as shown on the Premises map in Schedule 1. The location of where tyres are buried will be surveyed and latitude and longitude recorded.
TSF1	Tailings	Containment in TSF or directed to paste plant	Disposal of tailings shall only take place within TSF1 as shown on the Premises map in Schedule 1.

Note 1: 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.*
Note 2: Requirements for landfilling tyres are set out in Part 6 of the *Environmental Protection Regulations 1987*.

1.2.3 The Licensee shall ensure that cover is applied and maintained on landfilled wastes in accordance with Table 1.2.2 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.2.2 Cover requirements[1]

Waste Type	Material	Depth	Timescales
Inert Waste Type 1	No cover required.		
Inert Waste Type 2	Tyres only[1]		
Inert Waste Type 2 (excluding tyres)	Inert Waste Type 1 or soil	150 mm	By the end of the working day in which the waste was deposited. Plastic waste with the potential to become windblown shall be covered as soon as practicable after deposit.
Special Waste Type 1		300 mm	As soon as practicable after deposit and prior to compaction.
		300 mm	By the end of the working day in which the asbestos waste was deposited.
Special Waste Type 2		300 mm	As soon as practicable after deposit and prior to compaction.
Putrescible Waste		300 mm	Weekly.

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

1.2.4 The Licensee shall ensure that tailings, decant water, dewater effluent and process water are only discharged into containment cells and/or a water storage facility with the relevant infrastructure requirements and at the locations specified in Table 1.2.3 and identified in Schedule 1.

Table 1.2.3: Containment infrastructure			
Containment point reference	**Vessel or compound**	**Material**	**Requirements**
TSF1	TSF1	Tailings	Maintain a minimum top of embankment freeboard of 300 mm
	Paste Plant	Tailings	Tailings from Paste Plant to report to Underground operations.
WSF1	WSF1	Seepage water from TSF1	Maintain a minimum top of embankment freeboard of 500 mm
WSF2	WSF2	Bore field water	1.5 mm HDPE liner to achieve a permeability of $<10^{-9}$m/s or equivalent. Maintain a minimum top of embankment freeboard of 300 mm in the process area run-off pond.
WSF3	WSF3	Bore field water	1.5 mm HDPE liner to achieve a permeability of $<10^{-9}$m/s or equivalent. Maintain a minimum top of embankment freeboard of 300 mm.
P1	Process area run-off water pond	Process water and stormwater from process plant	1.5 mm HDPE liner to achieve a permeability of $<10^{-9}$m/s or equivalent. Maintain a minimum top of embankment freeboard of 300 mm.

1.2.5 The Licensee shall manage the irrigation of treated wastewater such that:
- (a) no irrigation generated run-off, spray drift or discharge occurs beyond the boundary of the defined irrigation area(s);
- (b) treated wastewater is evenly distributed over the irrigation area;
- (c) no soil erosion occurs;
- (d) irrigation does not occur on land that is waterlogged; and
- (e) vegetation cover is maintained over the irrigation areas identified in Table 2.3.1.

1.2.6 The Licensee shall ensure that all pipelines containing tailings, decant water, dewater effluent and process water are either:
- (a) equipped with automatic cut-outs in the event of a pipe failure; or
- (b) provided with a secondary containment sufficient to contain any spill for a period equal to the time between routine inspections.

1.2.7 The Licensee shall:
- (a) undertake inspections as detailed in Table 1.2.4; and
- (b) maintain a record of all inspections undertaken.

Table 1.2.4: Inspection of infrastructure		
Scope of inspection	**Type of inspection**	**Frequency of inspection**
Mine dewater pipelines	Visual integrity	Daily
Tailings delivery pipelines	Visual integrity	
Tailings return water lines	Visual integrity	
Internal embankment freeboard of the TSF	Visual to confirm required freeboard capacity is available	

1.2.8 The Licensee shall ensure the limits specified in Table 1.2.5 are not exceeded.

Table 1.2.5: Production or design capacity limits		
Category[1]	**Category description[1]**	**Premises production or design capacity limit**
5	Processing or beneficiation of metallic or non-metallic ore	50,000 tonnes per annual period
6	Mine dewatering	100,000 tonnes per annual period

Note 1: *Environmental Protection Regulations 1987,* Schedule 1.

2 Emissions

2.1 General

2.1.1 The Licensee shall record and investigate the exceedance of any descriptive or numerical limit specified in any part of section 2 of this Licence.

2.2 Point source emissions to surface water

2.2.1 The Licensee shall ensure that where waste is emitted to surface water from the emission point in Table 2.2.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emission points to surface water		
Emission point reference and location on Map of emission points	**Description**	**Source including abatement**
E1	Overflow from WSF1 via spillway to mine creek	Overflow from WSF1

2.3 Emissions to land

2.3.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.3.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.3.1: Emissions to land		
Emission point reference and location on Map of emission points	**Description**	**Source including abatement**
L1	Discharge of treated wastewater from oil water separator at Generator shed	Treated wastewater from the oil water separator at Generator shed
L2	Discharge of wastewater to a 1.33 ha spray irrigation field	Treated wastewater from the accommodation camp wastewater treatment plant

2.3.2 The Licensee shall not cause or allow emissions to land greater than the limits listed in Table 2.3.2.

Table 2.3.2: Emission limits to land			
Emission point reference	**Parameter**	**Limit (including units)**	**Averaging period**
L1	Total Recoverable Hydrocarbons	15 mg/L	Spot sample

3 Monitoring

3.1 General monitoring

3.1.1 The Licensee shall ensure that:
(a) all water sampling is conducted in accordance with AS/NZS 5667.1;
(b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
(c) all groundwater sampling is conducted in accordance with AS/NZS 5667.11; and
(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.

3.1.2 The Licensee shall ensure that:
(a) quarterly monitoring is undertaken at least 45 days apart; and
(b) monthly monitoring is undertaken at least 15 days apart.

3.1.3 The Licensee shall ensure that all monitoring equipment used on the Premises to comply with the conditions of this Licence is calibrated in accordance with the manufacturer's specifications.

3.1.4 The Licensee shall, where the requirements for calibration cannot be practicably met, or a discrepance exists in the interpretation of the requirements, bring these issues to the attention of the CEO accompanied with a report comprising details of any modifications to the methods.

3.2 Monitoring of point source emissions to surface water

3.2.1 The Licensee shall undertake the monitoring in Table 3.2.1 according to the specifications in that table.

Table 3.2.1: Monitoring of point source emissions to surface water

Emission point reference	Parameter	Units	Frequency
E1	Estimated volume discharged	m^3/day	When discharging
	pH[1]		Weekly when discharging
	Total Dissolved Solids	mg/L	
	Selenium		
	Sulfate		
	Manganese		
	Nickel		
	Copper		
	Cobalt		

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

3.3 Monitoring of emissions to land

3.3.1 The Licensee shall undertake the monitoring in Table 3.3.1 according to the specifications in that table.

Table 3.3.1: Monitoring of emissions to land

Emission point reference	Parameter	Units	Frequency
L1	Total Recoverable Hydrocarbons	mg/L	Quarterly
L2 - Wastewater Treatment Plant – outlet sample tap	pH[1]		
	Biochemical Oxygen Demand	mg/L	
	Total Suspended Solids		
	Total Nitrogen		
	Total Phosphorus		
	E.coli	cfu/100mL	

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

3.4 Monitoring of inputs and outputs

3.4.1 The Licensee shall undertake the monitoring in Table 3.4.1 according to the specifications in that table.

Table 3.4.1: Monitoring of inputs and outputs

Input/output	Monitoring point reference	Parameter	Units	Averaging period	Frequency
Treated wastewater discharge to irrigation areas	L2 - Flow meter devices on outgoing pipelines	Volumetric flow rate (cumulative)	m^3/day	Daily	Continuous
Waste Inputs	Landfill	Clean fill, Inert Waste Type 1, Inert Waste Type 2, Putrescible waste, Contaminated Solid Waste, Special Waste Type 1, Special Waste Type 2	m^3	N/A	Monthly
	North and South Waste Rock Dumps	Inert Waste Type 2 (tyres)			

3.5 Ambient environmental quality monitoring

3.5.1 The Licensee shall undertake the monitoring in Table 3.5.1 according to the specifications in that table.

Table 3.5.1: Monitoring of ambient groundwater and surface water quality

Monitoring point reference and location as specified on Map in schedule 1.	Parameter	Units	Averaging period	Frequency
Groundwater monitoring bores: SMMB1 SMMB2 SMMB3 PARPMB01	Standing Water Level	m(AHD)	Spot sample	Quarterly
	pH[1]			
	Total Dissolved Solids	mg/L		
	Total Recoverable Hydrocarbons			
	Selenium			
	Sulfate			
	Manganese			
	Nickel			
	Copper			
	Cobalt			
	Aluminium			
	Chloride			
	Zinc			
Surface water monitoring points: WSF1 Wall base Box Cut Base 1 Box Cut base 2 Mine Creek Fletcher creek above Fletcher creek below	Total Dissolved Solids			
	Manganese			
	Selenium			
	Sulfate			
	Nickel			
	Copper			
	Cobalt			
	pH[1]			

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

4 Information

4.1 Records

4.1.1 All information and records required by the Licence shall:
- (a) be legible;
- (b) if amended, be amended in such a way that the original and subsequent amendments remain legible or are capable of retrieval;
- (c) except for records listed in 4.1.1(d) be retained for at least 6 years from the date the records were made or until the expiry of the Licence or any subsequent licence; and
- (d) for those following records, be retained until the expiry of the Licence and any subsequent licence:
  - (i) off-site environmental effects; or
  - (ii) matters which affect the condition of the land or waters.

4.1.2 The Licensee shall complete an Annual Audit Compliance Report indicating the extent to which the Licensee has complied with the conditions of the Licence, and any previous licence issued under Part V of the Act for the Premises for the previous annual period.

4.1.3 The Licensee shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

4.2 Reporting

4.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 120 calendar days after the end of the annual period. The report shall contain the information listed in Table 4.2.1 in the format or form specified in that table.

Table 4.2.1: Annual Environmental Report

Condition or table (if relevant)	Parameter	Format or form[1]
-	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
-	Summary of surface water monitoring data as required by *Savannah Nickel Project Operating Strategy*, prepared by RPS Aquaterra Pty Ltd for Savannah Nickel Mines Pty Ltd, 20 November 2013	None specified
Table 3.2.1	Monitoring results for the discharge of overflow water from WSF1 during discharge events	None specified
Table 3.3.1	Total Recoverable Hydrocarbons	LR1
	Monitoring results for the wastewater treatment plant with a comparison against NWQMS 1997	None specified
Table 3.4.1	Cumulative volumes to irrigation area and waste inputs	None specified
Table 3.5.1	Groundwater bore monitoring results - Standing Water Level, pH, Total Dissolved Solids, Total Recoverable Hydrocarbons, Selenium, Sulfate, Manganese, Nickel, Copper, Cobalt	AGWQ1
Table 3.5.1	Surface water monitoring results	None specified
4.1.2	Compliance	Annual Audit Compliance Report (AACR)
4.1.3	Complaints summary	None specified

Note 1: Forms are in Schedule 2

4.2.2 The Licensee shall ensure that the Annual Environmental Report also contains an assessment of the information contained within the report against previous monitoring results and Licence limits.

4.2.3 The Licensee shall submit the information in Table 4.2.2 to the CEO according to the specifications in that table.

Table 4.2.2: Non-annual reporting requirements

Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form
-	Copies of original monitoring reports submitted to the Licensee by third parties	Not Applicable	Within 14 days of the CEOs request	As received by the Licensee from third parties

4.3 Notification

4.3.1 The Licensee shall ensure that the parameters listed in Table 4.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 4.3.1: Notification requirements

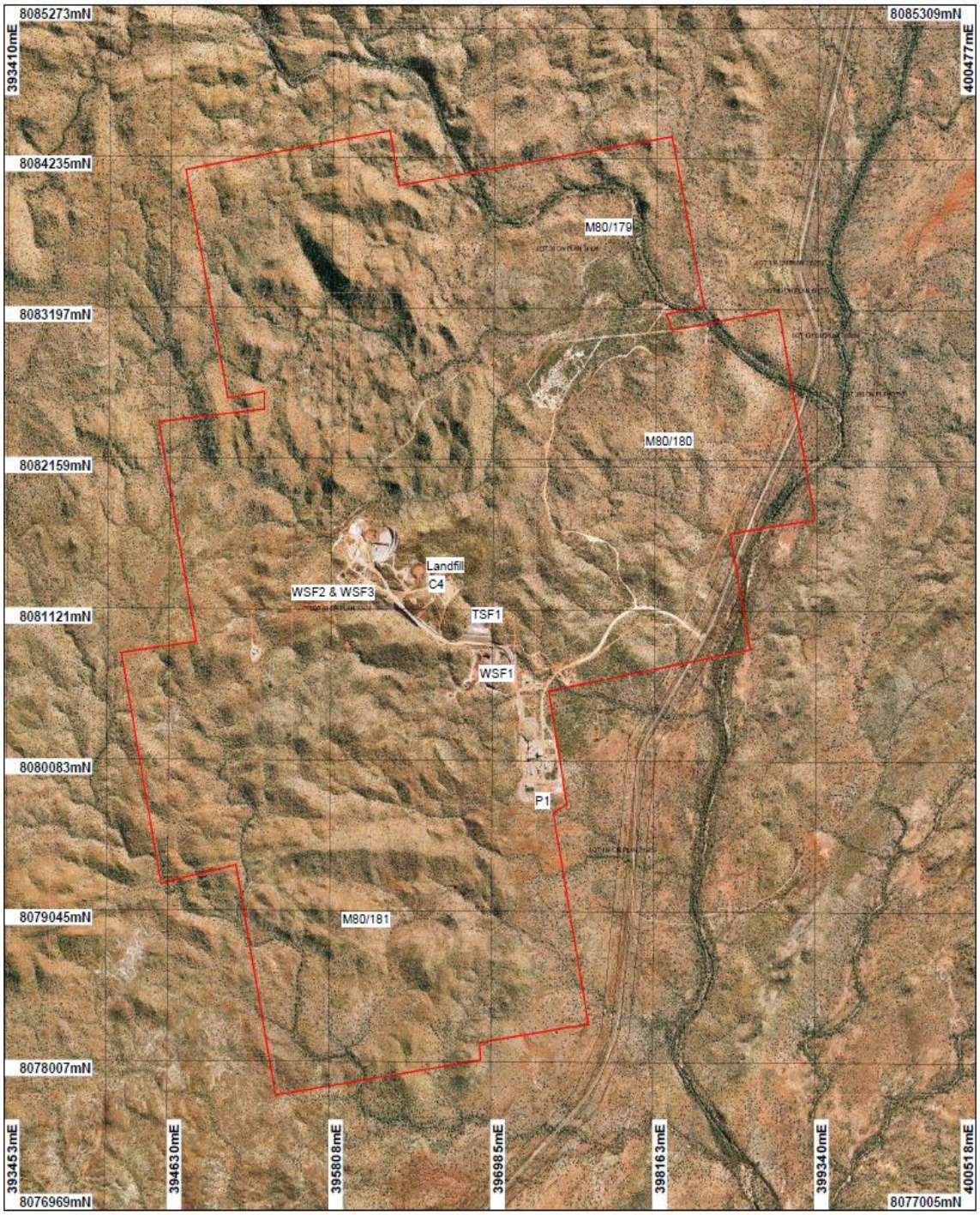
Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
-	Recommencing start-up of operations (after a period of care and maintenance)	At least 90 days prior to recommencing production	None specified
1.3.1 and 2.1.1	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
3.1.4	Calibration report	As soon as practicable	None specified

Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the Act
Note 2: Forms are in Schedule 2

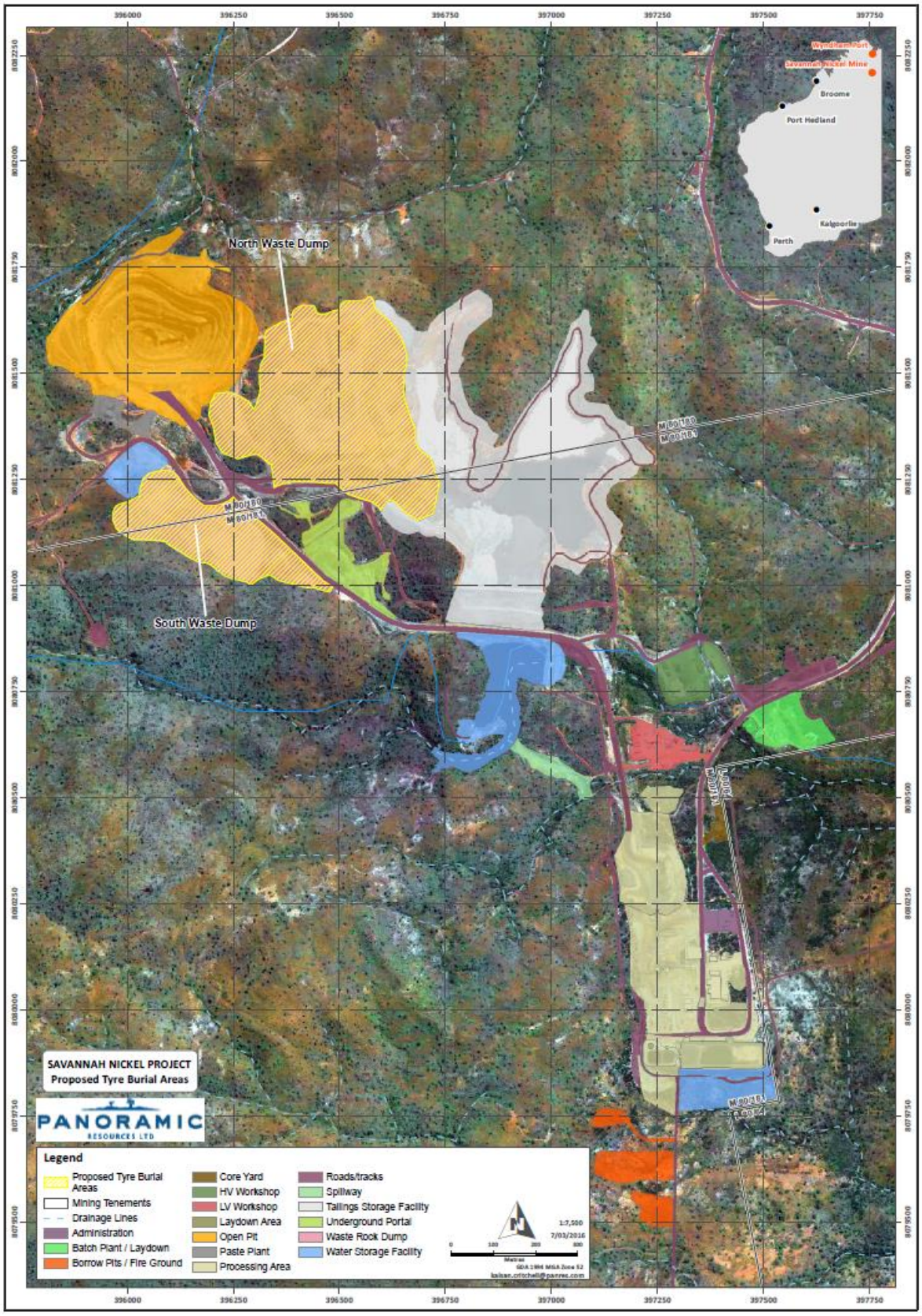
Schedule 1: Maps

Premises map

The Premises is shown in the map below. The red line depicts the Premises boundary.

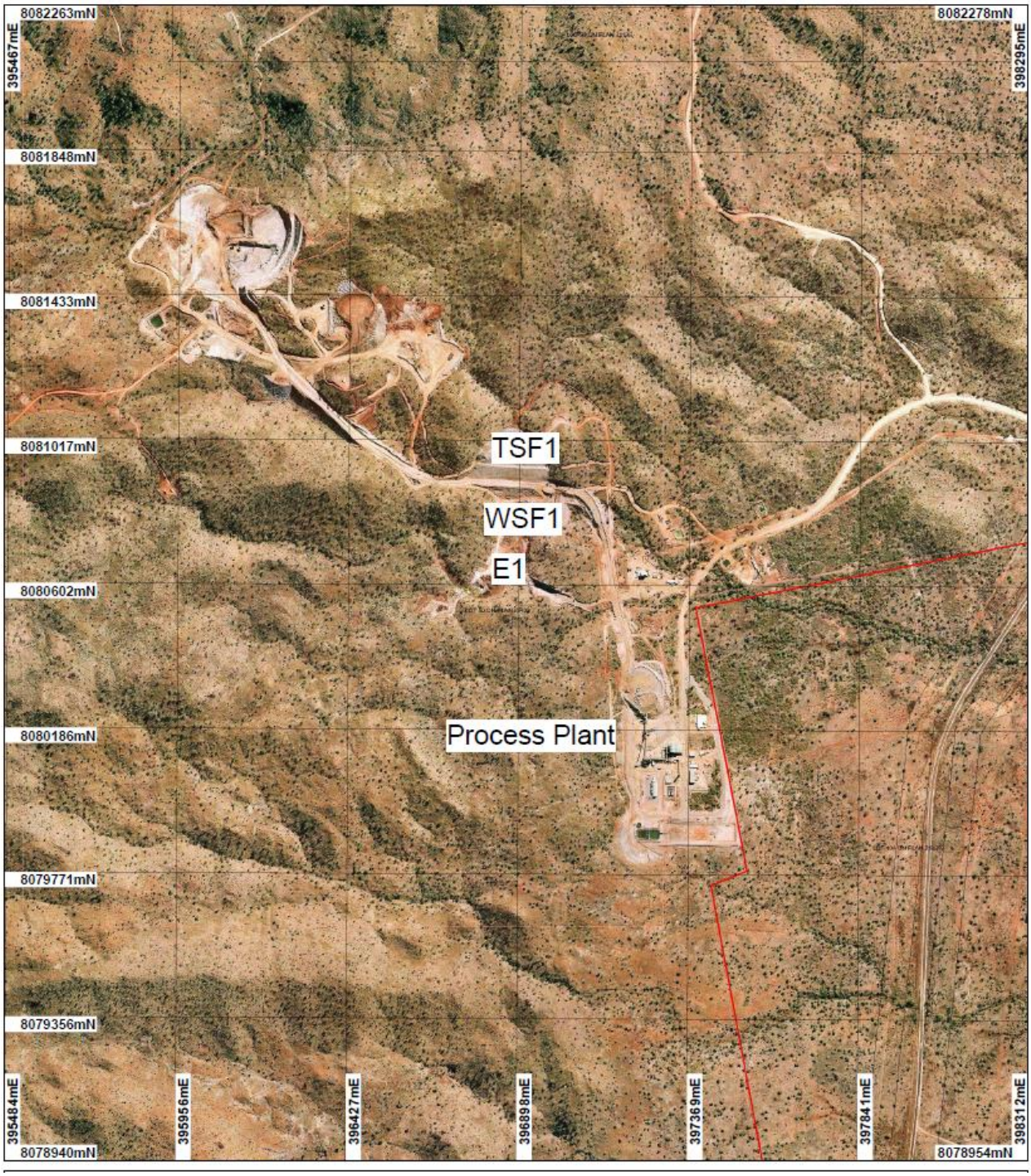


The location of the waste facilities and storage areas defined in Tables 1.2.1 and 1.2.3 are shown below.

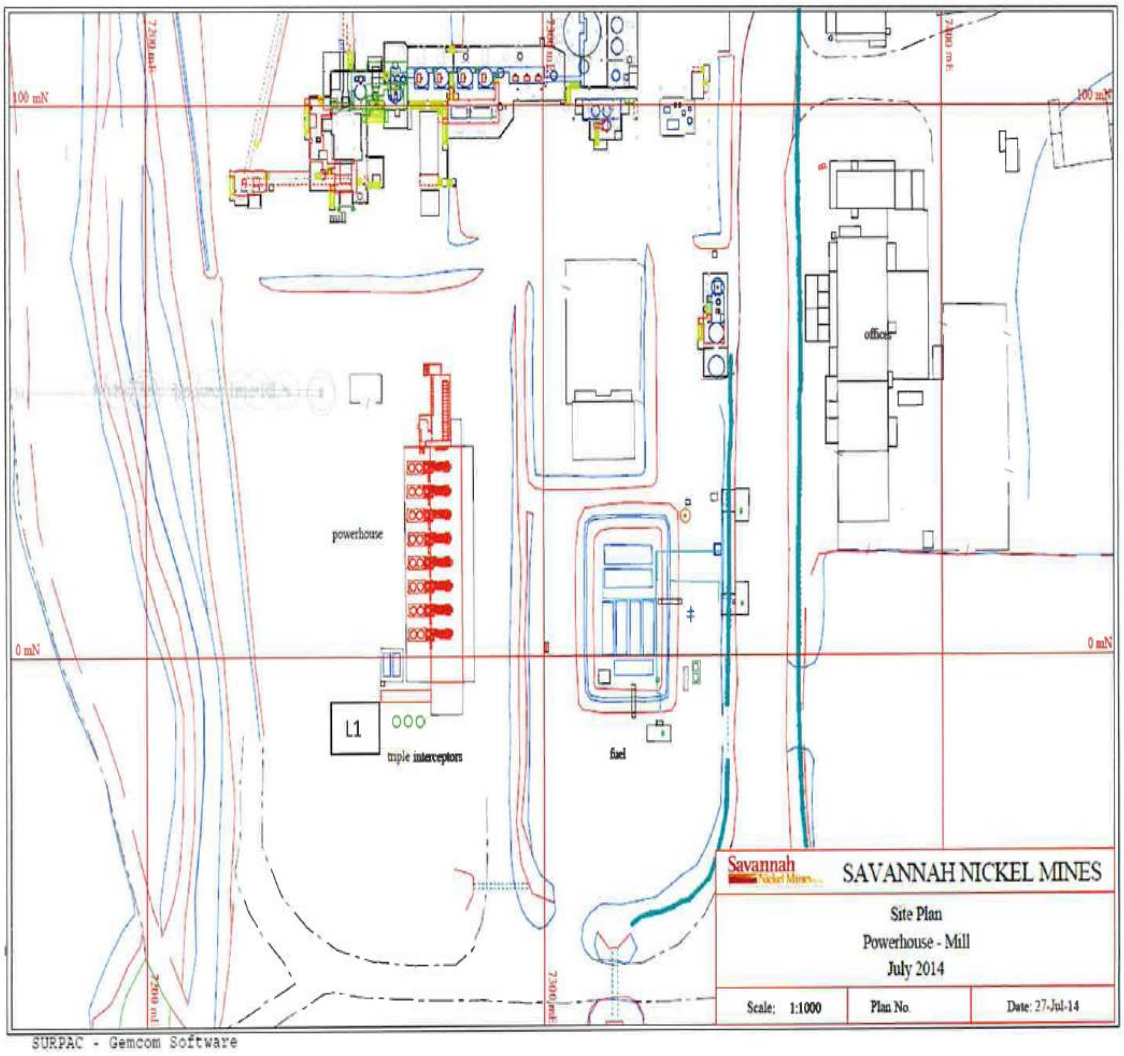


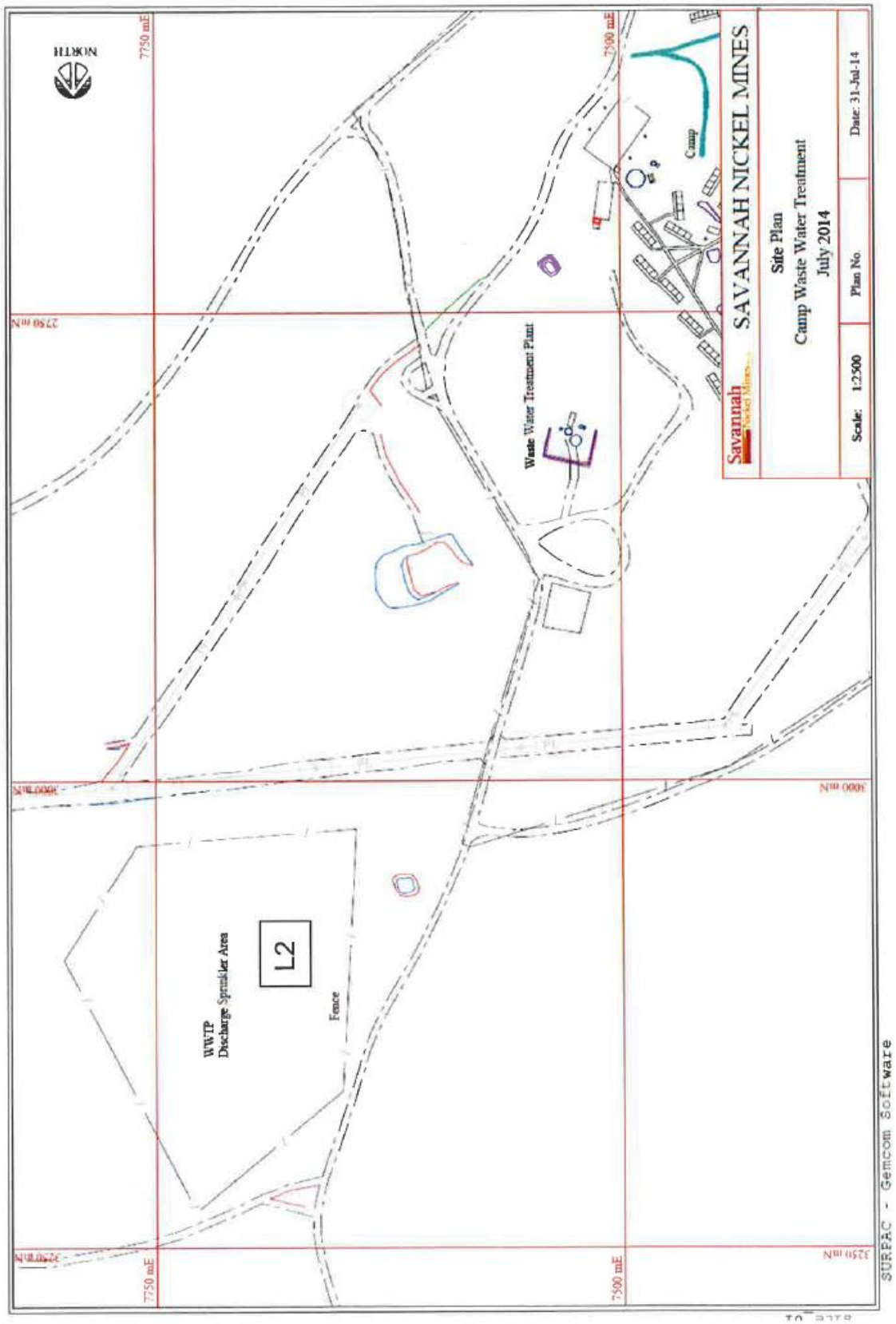
Map of emission points

The location of the emission point E1 defined in Table 2.2.1 is shown below.



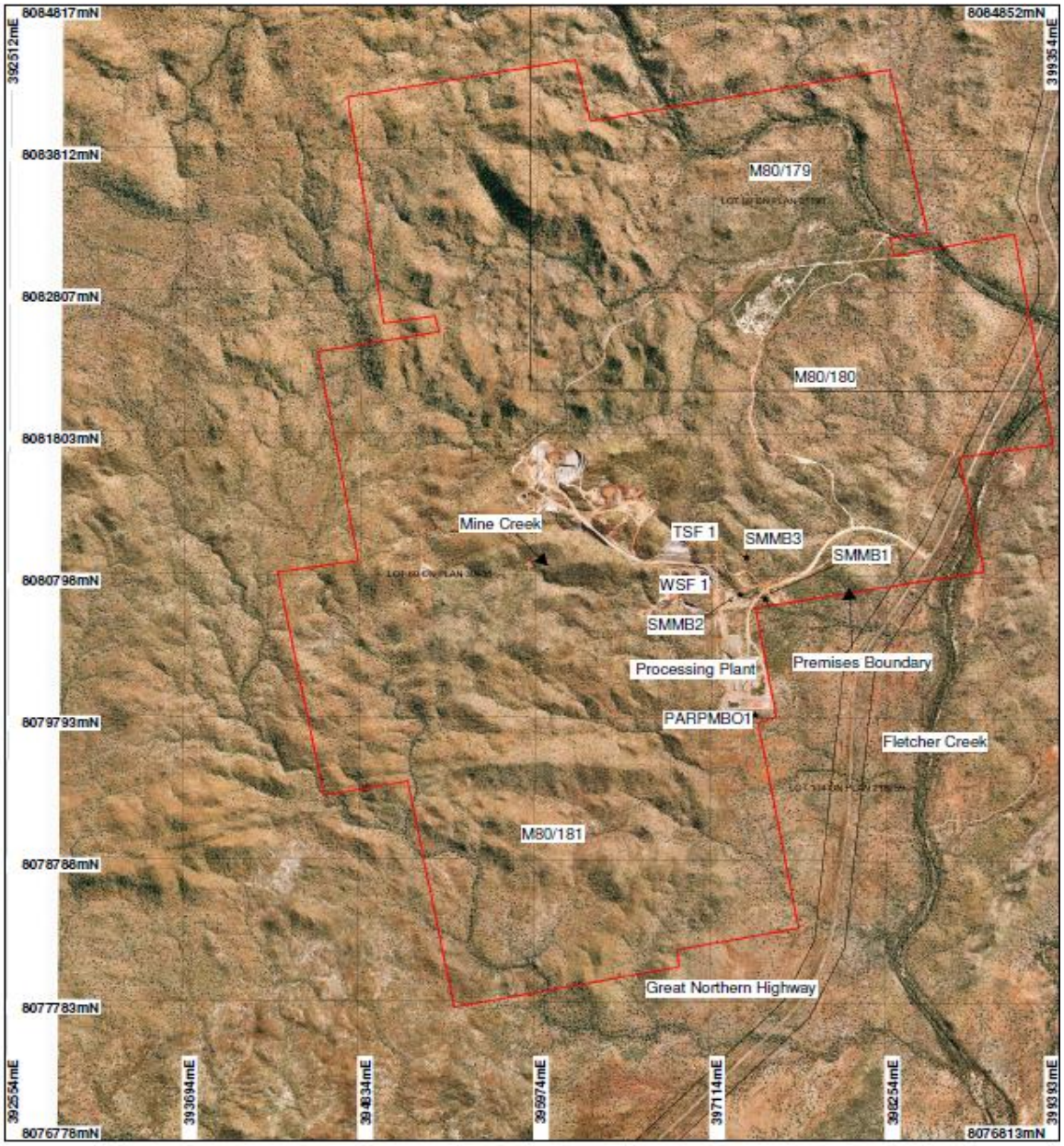
The locations of the emission points L1 and L2 defined in Table 2.3.1 are shown below.

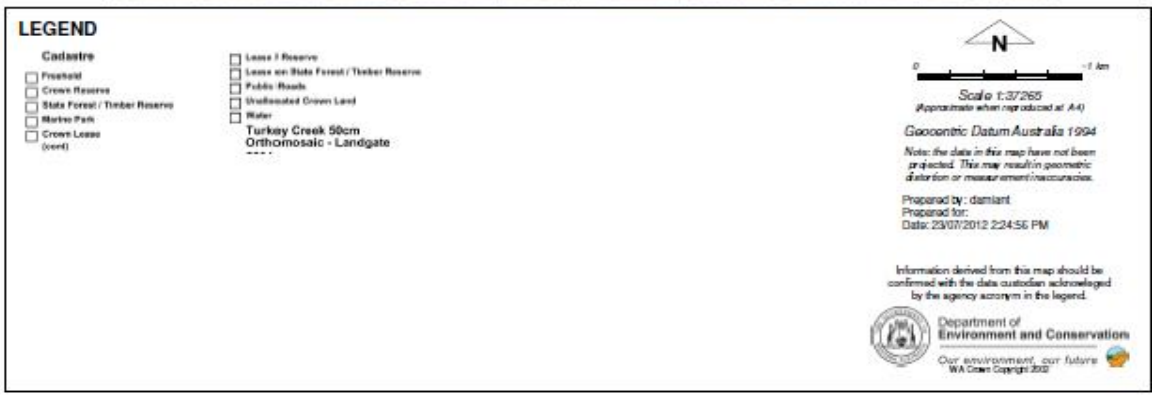



NORTH
7750 mE
7500 mE
Camp
Waste Water Treatment Plant
SAVANNAH NICKEL MINES
Site Plan
Camp Waste Water Treatment
July 2014
Scale: 1:2500
Plan No.
Date: 31-Jul-14
WWTP
Discharge Sprinkler Area
L2
Fence
SURPAC - Gemcom Software

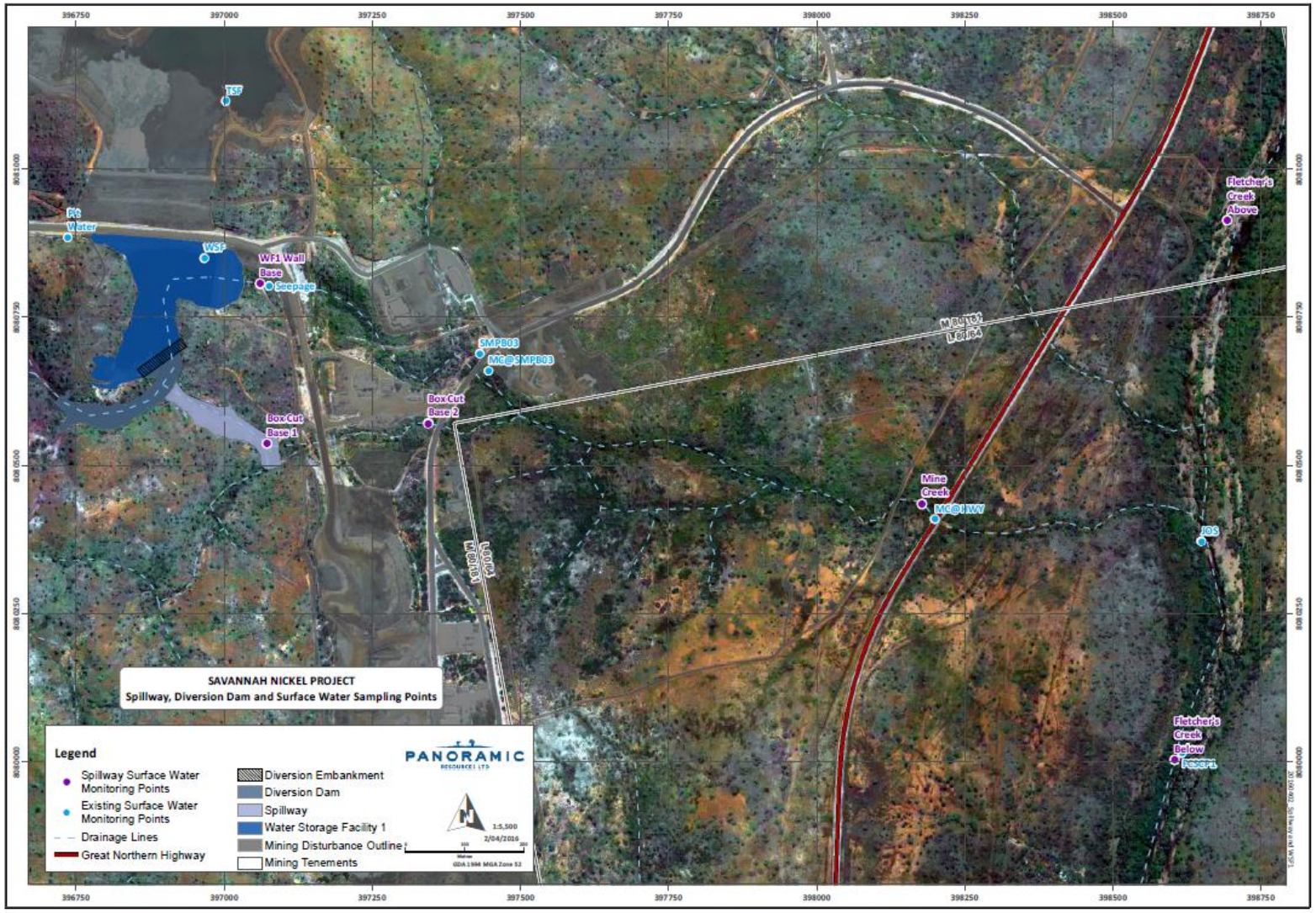
Map of monitoring locations

The locations of the monitoring points defined in Table 3.5.1 are shown below.





Surface water monitoring sites



Schedule 2: Reporting & notification forms

These forms are provided for the proponent to report monitoring and other data required by the Licence. They can be requested in an electronic format.

ANNUAL AUDIT COMPLIANCE REPORT PROFORMA

SECTION A

LICENCE DETAILS

Licence Number:	Licence File Number:
Company Name: Trading as:	ABN:
Reporting period: _____ to _____	

STATEMENT OF COMPLIANCE WITH LICENCE CONDITIONS

1. Were all conditions of the License complied with within the reporting period? (please tick the appropriate box)

Yes ☐ Please proceed to Section C

No ☐ Please proceed to Section B

Each page must be initialled by the person(s) who signs Section C of this Annual Audit Compliance Report (AACR).

Initial:

SECTION B

DETAILS OF NON-COMPLIANCE WITH LICENCE CONDITION.

Please use a separate page for each License condition that was not complied with.

a) License condition not complied with:	
b) Date(s) when the non-compliance occurred, if applicable:	
c) Was this non compliance reported to DER?:	
☐ Yes ☐ Reported to DER verbally Date _____ ☐ Reported to DER in writing Date _____	☐ No
d) Has DER taken, or finalised any action in relation to the non compliance?:	
e) Summary of particulars of the non compliance, and what was the environmental impact:	
f) If relevant, the precise location where the non compliance occurred (attach map or diagram):	
g) Cause of non compliance:	
h) Action taken, or that will be taken to mitigate any adverse effects of the non compliance:	
i) Action taken or that will be taken to prevent recurrence of the non compliance:	

Each page must be initialled by the person(s) who signs Section C of this AACR

Initial:

SECTION C

SIGNATURE AND CERTIFICATION

This Annual Audit Compliance Report (AACR) must only be signed by a person(s) with legal authority to sign it. The ways in which the AACR must be signed and certified, and the people who may sign the statement, are set out below.

Please tick the box next to the category that describes how this AACR is being signed. If you are uncertain about who is entitled to sign or which category to tick, please contact the licensing officer for your premises.

If the license holder is		The Annual Audit Compliance Report must be signed and certified:
An individual	□ □	by the individual licence holder, or by a person approved in writing by the Chief Executive Officer of the Department of Environment Regulation to sign on the licensee's behalf.
A firm or other unincorporated company	□ □	by the principal executive officer of the licensee; or by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A corporation	□ □ □ □ □ □	by affixing the common seal of the licensee in accordance with the *Corporations Act 2001*; or by two directors of the licensee; or by a director and a company secretary of the licensee, or if the licensee is a proprietary company that has a sole director who is also the sole company secretary – by that director, or by the principal executive officer of the licensee; or by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
A public authority (other than a local government)	□ □	by the principal executive officer of the licensee; or by a person with authority to sign on the licensee's behalf who is approved in writing by the Chief Executive Officer of the Department of Environment Regulation.
a local government	□ □	by the chief executive officer of the licensee; or by affixing the seal of the local government.

It is an offence under section 112 of the *Environmental Protection Act 1986* for a person to give information on this form that to their knowledge is false or misleading in a material particular. There is a maximum penalty of $50,000 for an individual or body corporate.

I/We declare that the information in this annual audit compliance report is correct and not false or misleading in a material particular.

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SIGNATURE: _____

NAME:
(printed) _____

POSITION: _____

DATE: _____/_____/_____

SEAL (if signing under seal)

Licence: L7967/2003/6
Form: LR1
Name: Monitoring of emissions to land

Licensee: Savannah Nickel Mines Pty Ltd
Period:

Form LR1: Monitoring of emissions to land						
Emission point	**Parameter**	**Limit**	**Result**	**Averaging period**	**Method**	**Sample date & times**
L1	Total Recoverable Hydrocarbons	15 mg/L	mg/L	Spot Sample		

Signed on behalf of Savannah Nickel Mines Pty Ltd: …….. Date: …….

Licence: L7967/2003/6
Form: AGWQ1
Name: Monitoring of ambient groundwater quality

Licensee: Savannah Nickel Mines Pty Ltd
Period:

Form AGWQ1: Monitoring of ambient groundwater quality					
Emission point	**Parameter**	**Result**	**Averaging period**	**Method**	**Sample date & times**
SMMB1 SMMB2 SMMB3 PARPMB01	Standing Water Level	m(AHD)	Spot sample		
	pH		Spot sample		
	Total Dissolved Solids	mg/L	Spot sample		
	Total Recoverable Hydrocarbons	mg/L	Spot sample		
	Sulfate	mg/L	Spot sample		
	Copper	mg/L	Spot sample		
	Manganese	mg/L	Spot sample		
	Nickel	mg/L	Spot sample		
	Cobalt	mg/L	Spot sample		
	Selenium	mg/L	Spot sample		
	Aluminium	mg/L	Spot sample		
	Chloride	mg/L	Spot sample		
	Zinc	mg/L	Spot sample		

Signed on behalf of Savannah Nickel Mines Pty Ltd: …….. Date: …….

Licence: L7967/2003/6 Licensee: Savannah Nickel Mines Pty Ltd
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 shall 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 Savannah Nickel Mines Pty Ltd	
Date	

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Savannah Nickel Mines Pty Ltd

Licence: L7967/2003/6

Registered office:	Level 9 553 Hay Street PERTH WA 6000
ACN:	103 729 282
Premises address:	Savannah Project Mining Tenements M80/179, M80/180 and M80/181 WARMUN WA 6740
Issue date:	Thursday, 31 July 2014
Commencement date:	Saturday, 2 August 2014
Expiry date:	Sunday, 1 August 2032

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue an amended licence. DER considers that in reaching this decision, it has taken into account all relevant considerations

Decision Document prepared by:	Sonya Poor / Christine Pustkuchen Licensing Officer
Decision Document authorised by:	Tim Gentle Delegated Officer

Contents

1 Purpose of this Document

This decision document explains how DER has assessed and determined the application and provides a record of DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to DER's assessment and decision making under Part V of the *Environmental Protection Act 1986.* Other approvals may be required for the proposal, and it is the proponent's responsibility to ensure they have all relevant approvals for their Premises.

2 Administrative summary

Administrative details		
Application type	Works Approval ☐ New Licence ☐ Licence amendment ☒ Works Approval amendment ☐	
Activities that cause the premises to become prescribed premises	**Category number(s)**	**Assessed design capacity**
	5	50,000 tonnes per annual period
	6	100,000 tonnes per annual period
	54	200 cubic metres per day
	64	5,000 tonnes per annual period
Application verified Application fee paid	Date: N/A Date: N/A	
Works Approval has been complied with Compliance Certificate received	Yes☐ No☐ N/A☒ Yes☐ No☐ N/A☒	
Commercial-in-confidence claim	Yes☐ No☒	
Commercial-in-confidence claim outcome	N/A	
Is the proposal a Major Resource Project?	Yes☒ No☐	

Was the proposal referred to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*?	Yes☒ No☐	Referral decision No: Managed under Part V ☒ Assessed under Part IV ☐
Is the proposal subject to Ministerial Conditions?	Yes☐ No☒	Ministerial statement No: EPA Report No:
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the *Environmental Protection Act 1986*)?	Yes☐ No☒ Department of Water consulted Yes ☐ No ☒	
Is the Premises within an Environmental Protection Policy (EPP) Area Yes☐ No☒ If Yes include details of which EPP(s) here.		
Is the Premises subject to any EPP requirements? Yes☐ No☒ If Yes, include details here, eg Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

Savannah Nickel Mines Pty Ltd (the Licensee) is a wholly owned subsidiary of Panoramic Resources Limited (Panoramic). The Licensee processes nickel-copper-cobalt bearing ore by conventional crushing, milling and flotation plant to produce nickel concentrate. Operations at the Savannah Project (Savannah) currently consist of a decommissioned open pit, an operating underground mine, paste plant, processing plant with tailings and water storage facilities, supporting mine site infrastructure and an accommodation village. The current mineral resource is estimated to extend the Life of Mine (LOM) until 2018. Savannah is located approximately 40 kilometres (km) south of Warmun and 120 km north of Halls Creek. The process plant is currently designed to treat 950,000 tonnes of sulphide nickel/copper/cobalt ore per year.

The Licensee operates a Class II putrescible landfill, undertakes mine dewatering for underground operations and treats sewage from the Accommodation Camp. Treated wastewater is irrigated to an area of approximately 1.33 hectares (ha) located adjacent to the accommodation camp.

The Licensee has applied to amend the licence to gain approval for the disposal of 70 tonnes of tyres at two locations within the sites waste rock dumps (north waste rock dump (NWRD) and the south waste rock dump (SWRD)). The design capacity of category 64 does not require increasing as the 70 tonnes is captured within the approved 5,000 tonnes per annual period.

During this amendment the following changes have been made to the Licence:

- Updated to reflect Departmental reform as published on DER's website under "Administrative changes implemented within the Department of Environment Regulation" www.der.wa.gov.au;
- Updated to reflect version 2.9 (v2.9) licence template;
- Administrative changes;
- Definitions updated;
- Reduction in approved site category design capacities as site has gone into 'Care and Maintenance' as of May 2016.
- Removal of reference to Class III for the putrescible landfill site;
- Previous condition L1.2.1 has been deleted;

- Removal of previous condition L1.2.3;
- Inclusion of condition L1.2.1;
- Inclusion of tyre disposal requirements in Table 1.2.1;
- Inclusion of L1.2.3 for cover requirements;
- Removal of bioremediation pad reference in Table 1.3.3;
- Removal of previous conditions L1.3.4 and L1.3.5 and L1.3.6;
- Inclusion of condition L1.2.8 for production or design capacity limits;
- Previous conditions L2.2, L2.4, L2.7, L2.8, L3.2, L3.4, L3.7 and L3.9 have been removed in line with v2.9 of the licence template;
- Removal of conditions L2.6.1 and L2.6.2;
- Inclusion of condition L3.2.1 for the monitoring of point source emissions to surface water;
- Inclusion of monitoring conditions in Table 3.3.1 for the wastewater treatment plant (WWTP);
- Inclusion of waste input monitoring in Table 3.4.1
- Inclusion of extra parameters and a requirement to monitor surface water quarterly in table 3.5.1;
- Removal of previous condition L4.1.1;
- Removal of previous condition L5.1.2
- Table 4.2.1 has been updated;
- Inclusion of condition L4.2.3 for non-annual reporting requirements; and
- Schedule 2 forms have been updated.

Where conditions have been added or removed to the existing Licence these have been justified in Section 4.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and DER's Operational Procedure on Assessing Emissions and Discharges from Prescribed Premises. Where other references have been used in making the decision they are detailed in the decision document.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
Premises category production capacities	N/A	As the Savannah Nickel Mine is moving towards Care and Maintenance (C&M) status the licensee has requested a decrease in production or design capacity for three of its four approved premises categories; - Category 5 capacity reduced from 950,000 tonnes per annual period to 50,000 tonnes per annual period. - Category 64 capacity reduced from 55,000 tonnes per annual period to 5000 tonnes per annual period. - Category 54 capacity reduced from 1880 cubic meters per day to 200 cubic meters per day. - Category 6 – no change to approved capacity. - Apart from a change in throughput, there will be no other variation to the premises operations. The methods of waste management, maintenance of the tailings and water storage facilities, and scheduled monitoring commitments will continue whilst Savannah is in C&M. Savannah will also continue to maintain records of its monitoring program and provide an Annual Report to the DER.	N/A.
General conditions	N/A.	Previous condition L1.2.1 has been removed. It is not a condition but an explanatory statement for the licensee. Previous condition L1.2.2 has been removed. This condition is a redundant condition and no longer is required to be on the licence. The condition is not enforceable as it's not sufficiently detailed or clear enough in what is required.	General provisions of the *Environmental Protection Act 1986*. Australian Standard 1940-

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Previous condition L1.2.3 has been removed. The storage of environmentally hazardous materials is adequately regulated by the *Dangerous Goods Safety Act 2004* and associated Regulations. Unauthorised discharges of environmentally hazardous materials may be subject to the provisions of the *Environmental Protection (Unauthorised Discharges) Regulations 2004*. Previous condition L1.2.4 has been removed. This condition is a redundant condition no longer is required to be on the licence. Previous condition L1.2.5 has been removed. This condition is a redundant condition no longer is required to be on the licence. The condition is not enforceable as it's not sufficiently detailed or clear enough in what is required. Unauthorised discharge of contaminated stormwater is covered by the *Environmental Protection (Unauthorised Discharges) Regulations 2004.*	2004 The Storage and Handling of Flammable and Combustible Liquids. Code of Practice for the Storage and handling of dangerous goods. *Environmental Protection (Unauthorised Discharges) Regulations 2004*
Premises operation	L1.2.1 – L1.2.8.	DER's assessment and decision making are detailed in Appendix A.	Email titled "Form P4_Amendment of Category 64 in L7967/2003/6 and associated W5208/2012/1, received from Mark Bantich, 13 November 2015
Point source emissions to surface water including	L2.2.1 and L3.2.1.	DER's assessment and decision making are detailed in Appendix B.	General provisions of the *Environmental Protection Act*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
monitoring			*1986*. *Environmental Protection (Unauthorised Discharges) Regulations 2004*
Emissions to land including monitoring	L2.3.1, L2.3.2 and L3.3.1.	DER's assessment and decision making are detailed in Appendix C.	General provisions of the *Environmental Protection Act 1986*. *Environmental Protection (Unauthorised Discharges) Regulations 2004*
Fugitive emissions	N/A.	Previous conditions L2.6.1 and L2.6.2 have been removed as these can be sufficiently regulated by section 49 of the *Environmental Protection Act 1986*. This is also in accordance with the administrative changes being implemented by DER outlined on DERs website ww.der.wa.gov.au	General provisions of the *Environmental Protection Act 1986*. Website: der.wa.gov.au
Monitoring of inputs and outputs	L3.4.1.	The recording of waste inputs for the landfill and TSF1 have been included in the licence in Table 3.4.1. The Licensee will also be required to report this data in the Annual Environmental Report for assessment.	N/A.
Ambient	L3.5.1	The licensee currently monitors groundwater quality surrounding the TSF1 at four	N/A.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
environmental quality monitoring		locations. Condition 3.5.1 has been updated to include an additional four parameters– Aluminium, Chloride and Zinc. These parameters have been added to allow for a more adequate suite of data to be collected to indicate the effects of seepage on the surrounding environment. This change also allows for consistency across other similar Nickel licences.	
Improvements	N/A.	Previous condition L4.1.1 has been removed. Please refer to Appendix B and C (Regulatory controls).	N/A.
Information	L4.1.1 – L4.1.3, L4.2.1 – L4.2.3 and 4.3.1.	Condition 5.1.2 of the original licence has been deleted. The condition was in regards to the person left in charge of the premsies being aware of the conditions of the licence. This condition is unclear as to the requirements for compliance and it's the Licensee's responsibility to ensure they comply with the conditions of the licence regardless. Table 4.2.1 has been updated to align with licence conditions. Condition L4.2.3 has been included on the licence in line with v2.9 of the licence template for non-annual reporting requirements. Condition L4.3.1 has been updated in line with v2.9 of the licence template and previous conditions L1.3.6(c) has been removed and is now covered under Table 4.3.1. The licensee has notified DER that the site will enter into a 'care and maintenance' phase in May 2016. Therefore a requirement has been added to table 4.3.1 to ensure that DER is notified when recommencement of operations occur.	N/A.
Licence duration	N/A.	The duration of the licence has been extended to 1 August 2032 (from 1 August 2019) in accordance with DER's *Guidance statement: Licence Duration.*	DER Guidance Statement: Licence duration (Final November 2014, Revised May 2015)

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
26/04/2016	Proponent sent a copy of draft instrument	No comments received	Not applicable
6/05/2016	Copy of draft instrument sent to the following for comment: • Department of Water; and • Department of Mines and Petroleum	No comments received from DMP Comments received from DoW - DoW has no objections to disposal of tyres within waste rock dumps - DoW has suggested that monitoring of surface water quality be included in the Part V operating licence as it is not regulated by DoW under the RIWI Act 1914 as SNM do not hold a surface water licence.	Monitoring of surface water conditions have been added to the licence.

6 Risk Assessment

Note: This matrix is taken from the DER Corporate Policy Statement No. 07 - Operational Risk Management

Table 1: Emissions Risk Matrix

Likelihood	Consequence				
	Insignificant	Minor	Moderate	Major	Severe
Almost Certain	Moderate	High	High	Extreme	Extreme
Likely	Moderate	Moderate	High	High	Extreme
Possible	Low	Moderate	Moderate	High	Extreme
Unlikely	Low	Moderate	Moderate	Moderate	High
Rare	Low	Low	Moderate	Moderate	High

Appendix A

Premises operation
Removal of reference to Class III putrescible landfill site. In accordance with the former Department of Environment and Conservation *Landfill Waste Classification and Waste Definitions 1996* (As amended December 2009) a Class III landfill is a lined landfill, which may include leachate collection, designed to accept putrescible and inert wastes. The landfill at the Project is a Class II un-lined landfill designed to accept putrescible and inert wastes.

Condition L1.2.1 has been added to the licence to ensure any limit exceedances in this section are investigated.

Waste Rock Dumps – Tyre disposal
The Licensee is proposing to dispose of up to 70 tonnes of tyres into the south and north waste rock dumps (WRD). Depth to groundwater at the WRDs is approximately 30 metres below ground level (mbgl). The tyres will be transported from the maintenance departments and deposited at the base of the WRDs and covered in-situ as quickly as possible.

Tyres are to be buried in accordance with Regulation 14(2) of the *Environmental Protection Regulations 1987*. A limit of 70 tonnes per annual period of tyres to be disposed of in the WRDs has been added to the licence and conditions have been added to Table 1.2.1 for tyre disposal.

Condition L1.2.3 has been added to the licence for the cover requirements for the landfill waste and tyres in the WRDs.

The design capacity of category 64 does not require increasing as the 70 tonnes is captured within the approved 5,000 tonnes per annual period.

Other conditions
Previous condition L1.3.4 has been removed. The WWTP is a reactive tank system which is fully enclosed. The location is wrapped around by an earthen bund to contain runoff. These conditions are not applicable.

Previous condition L1.3.6 and the notification requirement in table 4.3.1 have been removed. The Licensee regularly undertakes emergency response training which includes burning materials in firefighting exercises. The previous conditions required the Licensee to undertake burning of waste in a low permeability compound and to collect all firewater and to notify the Director three days prior to the training. This activity is not a prescribed activity or a contributory activity and therefore does not require regulation. This is in accordance with DERs *Guidance statement: Licensing and works approvals process.* General provisions of the *Environmental Protection Act 1986* and the *Environmental Protection (Unauthorised Discharge) Regulations 2004* apply.

Previous condition L1.3.5 has been removed. The bioremediation facility is not a prescribed activity or a contributory activity (as defined in the *Guidance statement: Licensing and works approvals process*) and therefore does not require regulation. Recent inspection reports for the site indicate there have been no issues with the bioremediation facility. It has therefore been deemed low risk to the environment and the conditions have been removed. General provisions of the *Environmental Protection Act 1986* and the *Environmental Protection (Unauthorised Discharges) Regulations 2004* apply.

Previous condition L1.3.6(c) has been removed and is now covered under Table 4.3.1 for notification requirements.

The recording and the establishment of limits for process throughputs has been included in the licence through condition L1.3.9 – Production or design capacity limits. This has been included to ensure the Licensee does not exceed the approved throughputs for each category of the licence.

Appendix B

Point source emissions to surface water including monitoring

Historically, the Water Storage Facility's (WSF) primary function was for the collection and storage of clean water at Savannah and to act as an environmental buffer between seepage from the TSF and the local creek system (Mine and Fletcher Creeks) downstream of the WSF. The majority of seepage water from either the TSF or WSF that reports at the base of the WSF embankment is returned to WSF1.

Minor groundwater seepage and surface water inflow to the open pit is directed into the underground operations through sink holes at the base of the pit. Water is then abstracted from the underground operations in order to maintain safe mining conditions below the water table. "Clean" water (free of suspended solids) from the open pit is transferred via a pipeline to the WSF. "Dirty" water (water with suspended solids) from the underground operations is transferred to the Tailings Storage Facility (TSF) via the underground dewatering system.

WSF1–3, receives rainfall run-off from the local catchment and within the mine, as well as groundwater abstracted from the Savannah borefield. Occasionally, the WSFs also receive rainfall run-off collected in the Savannah pit. Water held in the WSFs is the primary water supply source for the site's process plant. The water circuit involves WSF2 receiving water from the paste plant and the underground mine for reuse back underground, in the paste plant and for site dust suppression activities. WSF3 receives seepage recovery water and excess borefield water, which is used in the processing plant. The water circuit allows for water to be pumped between the two facilities.

WSF1 is currently dewatered as part of the *Savannah Nickel Project Operating Strategy*, prepared by RPS Aquaterra Pty Ltd for Savannah Nickel Mines Pty Ltd, 20 November 2013 (Operating Strategy), which was approved by the Department of Water (DoW) on 30 January 2014. WSF1 has a storage capacity of up to 136,000 kilolitres (kL), however to minimise seepage the level in WSF1 is maintained at around 70,000 kL storage level (approximately one month's process demand).

WSF1 is located within the Mine Creek catchment. Stoney Creek and Mine Creek both drain into Fletcher Creek that in turn drains into the Ord River, approximately 12 km south. The Ord River then flows into Lake Argyle, a Ramsar wetland.

Mine Creek is considered to be a category three highly disturbed system. It is an ephemeral drainage line with no known, social or cultural values. Surface water quality downstream of the TSF and WSF1 has been significantly impacted by historic seepage and overflow events, with sulfate concentrations ranging between 700 and 1,900 mg/L (average 1,300 mg/L). Bicarbonate alkalinity is reduced and nickel concentrations are elevated in Mine Creek downstream of the TSF and WSF1 as a result of seepage and overflows.

To assist in reducing water stored in WSF1 (and to minimise seepage) a diversion embankment was constructed within WSF1 during the stage 1 lift (2011) to divert surface water flow from the undisturbed southern portion of the Mine Creek catchment. Runoff will flow via the existing spillway to join Mine Creek downstream of WSF1 (Figure 1). The WSF1 diversion embankment weir was constructed in 2011 and has a catchment area of 25 hectares (ha). The internal WSF1 weir is 1 m higher than the existing emergency spillway cutting. The intent of the design is to divert clean, upstream runoff through the emergency spillway into Mine Creek.

Figure 1: WSF1 and Spillway

The internal WSF1 weir has been designed to overtop during larger storm events (1:1000 year event; 320mm in 24hr event) in order to maintain safety and integrity of the main WSF1 embankment. The Licensee has stated that due to revised water management controls, the internal WSF1 weir is not likely to overtop unless a large and extreme storm event occurs (1:1000 year event). If overtopping of the internal WSF1 weir were to occur, then clean, unaltered water would likely already be exiting the WSF1 through the original wall cutting emergency spillway. The Licensee has stated that in the event that altered water overtops the internal diversion embankment wall, this water would be highly diluted with fresh, clean rainwater which would then mix with cleaner upstream Mine Creek water already exiting the spillway.

Emission: Overflow from WSF1 from emergency spillway to Mine Creek and seepage of stored water from WSF1 to Mine Creek.

Impact: Reduction in surface water quality, local groundwater and localised groundwater mounding. Historical data for Mine Creek has shown elevated concentrations of salinity and major ions including sulfate as a result of background hydrogeology and impacts from mining activities including seepage from the TSF. Mounding associated with the solute plume may result in inundation of plant roots, though due to the natural variation of ecosystems in the Kimberley as a result of extreme wet and dry fluctuations and subsequent adaptation of ecosystems to these conditions, it is unlikely vegetation will be adversely affected.

Controls: (to minimise seepage and to prevent overflow of WSF1)

- The internal WSF1 weir has been designed to overtop during large storm events (1:1,000 year event; 320 mm in 24 hour event) in order to maintain safety and integrity of the main WSF1 embankment;
- The spillway has been engineered to minimise erosional impacts and prevent overtopping of the facility's main embankment;
- The base of the WSF embankment seeps water into a small artificial wetland, which contains a sump and recovery pump;
- Seepage is recovered into WSF1 and then pumped into WSF2 and WSF3 to be used within the processing water circuit;
- Seepage recovery bores are operated and will continue to be operated during the care and maintenance phase while the water mound drains down; and
- Natural flows from the undisturbed upper catchment of Mine Creek are diverted into the lower section of Mine Creek to dilute solute concentrations in downstream surface water.

Risk Assessment
Consequence: Minor
Likelihood: unlikely
Risk Rating: Moderate

Regulatory Controls
Previous condition 4.1.1 (IR3) has been removed. This improvement condition required the licensee to develop and submit to the CEO, parameter standards, including but not limited to, pH, Total Dissolved Solids, Nickel, Sulfate and Copper, suitable for use as targets and limits for the discharge of water from WSF1 spillway into mine creek. The Licensee submitted an email titled *L7967/2003/6 – Improvement Programme* received from Mark Bantich, 23 December 2014.

To replace improvement condition IR3 the following conditions have been added to the licence during this June amendment;

- Condition L3.2.1 has been added to the licence for the monitoring of point source emissions to surface water associated with the overflow discharge from the spillway to Mine Creek. The Licensee will be required to monitor the volume of water and quality of water discharged from the spillway to Mine creek during overtopping events;
- Condition 3.5.1 (Table 3.5.1) has been updated to include surface water monitoring at 5 points along Mine and Fletcher creeks on a quarterly basis. This will ensure that the environmental impact of overflow events and seepage from the WSF1 are monitored by DER. Currently the Licensee already undergoes this monitoring as part of their Savannah Nickle Mine Water Operating Strategy, required by the Department of Water.

Residual Risk
Consequence: Minor
Likelihood: unlikely
Risk Rating: Moderate

Appendix C

Emissions to land including monitoring
Emission: Discharge from the Accommodation Camp WWTP to a 1.33 ha spray irrigation.

Impact: Contamination of surrounding environment and potential impacts on the ecology of ground and surface water from the addition of nutrients. The WWTP and spray irrigation area are 200 m and 500 m from the village bore respectively. Depth to groundwater is closely related to topographic elevation and seasonal recharge. Seasonal variations of 3 – 15 m occur as a result of direct infiltration and local recharge.

Controls:
- Designed to treat wastewater to a secondary treatment level;
- The design and slope of the irrigation field is such that the western perimeter is higher than the eastern perimeter, which prevents excess water flowing into the field during the wet season;
- The irrigation field consists of seven irrigation lines each with several 1 metre high sprinklers for effective evaporation; and
- The lines are utilised on a rotational basis to ensure the surrounding soil does not become waterlogged.

Risk Assessment
Consequence: Minor
Likelihood: Unlikely
Risk Rating: Moderate

Regulatory Controls
Previous condition 4.1.1 (IR1 and IR2) have been removed. The Licensee submitted an email titled *L7967/2003/6 – Improvement Programme* received from Mark Bantich, 25 October 2014 for the monitoring programme for the irrigation of WWTP wastewater. The program outlined a monitoring schedule and targets in line with the *National Water Quality Management Strategy, Australian Guidelines for Sewerage Systems - Effluent Management*, Agriculture and Resource Management Council of Australia and New Zealand and Australian and New Zealand Environment and Conservation Council, 1997 (NWQMS 1997).

Condition L3.3.1 has been added to the licence and requires the Licensee to monitor the effluent quality of the wastewater quarterly and report these results in the Annual Environmental Report along with an assessment and comparison against the NWQMS 1997. Limits have not been added to the licence; instead the comparison required by condition L4.2.1 will allow DER to see trends in the WWTP performance over time and will make changes if required.

A condition (L1.2.5) already exists on the licence that requires the Licensee to manage the irrigation of treated wastewater appropriately (minimise run-off and soil erosion and maintenance of vegetation cover). The WWTP and spray irrigation field is also subject to regular compliance inspections to ensure they are being managed appropriately.

Residual Risk
Consequence: Minor
Likelihood: Rare
Risk Rating: Low