Government of Western Australia
Department of Environment Regulation

Licence

Environmental Protection Act 1986, Part V

Licensee: Billabong Gold Pty Ltd

Licence: L6868/1989/12

Registered office: Level 30 Bankwest Tower
108 St Georges Terrace
PERTH WA 6000

ACN: 613 900 922

Premises address: Plutonic Gold Mine
Mining Tenements: M52/171, M52/170, M52/148, M52/149, M52/150, M52/295, M52/296, and M52/301
MEEKATHARRA WA 6642
As depicted in Schedule 1

Issue date: Thursday, 4 September 2014

Commencement date: Thursday, 18 September 2014

Expiry date: Tuesday, 17 September 2024

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	5 000 000 tonnes per annual period
6	Mine dewatering	50 000 tonnes or more per year	1 300 000 tonnes per annual period
52	Electric power generation	20 MW or more in aggregate (using natural gas)	24.1 MW (natural gas)
54	Sewage facility	100 cubic metres or more per day	140 cubic metres per day
57	Used tyre storage (general)	100 tyres or more	200 tyres
89	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: 29 September 2016
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Alana Kidd
Manager Licensing – (Resource Industries)
Officer delegated under section 20
of the *Environmental Protection Act 1986*

Contents

Introduction

This Introduction is not part of the Licence conditions.

The 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. The DER's purpose is to advise on and implement strategies for a healthy environment for the benefit of all current and future Western Australians.

The DER has responsibilities under Part V of the *Environmental Protection Act 1986* (the Act) for the licensing of prescribed premises. Through this process, the DER regulates to prevent, control and abate pollution and environmental harm to conserve and protect the environment. The 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 with 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 the Premises has been assessed under Part IV of the Act, it 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
Billabong Gold Pty Ltd hold *Environmental Protection Act 1986* licence L6868/1989/12 for the Plutonic Gold Mine (Plutonic).

Plutonic was assessed as a prescribed premises under categories:
- 5 - Processing or beneficiation of metallic or non-metallic ore;
- 6 - Mine dewatering;
- 54 - Sewage facility;
- 57 – Used tyre storage (general);
- 52 – Electric power generation (replaced Category 84 under previous amendment); and
- 89 - Putrescible landfill site.

Plutonic is situated within the boundary of the Three Rivers Station in the Peak Hill Goldfields area of the Gascoyne Basin 180km NNE of Meekatharra in the Shire of Meekatharra.

Mining commenced at Plutonic during 1989 with both open cut and underground mining methods used onsite. As of June 2005, Plutonic surface operations ceased with underground mining now the sole mining operation at the site. No surface operations are planned in the near future.

Plutonic treatment process originally consisted of two crushing circuits and two separate process plants. Process Plant 1 was used to treat primary ore, and Process Plant 2 is used for treating oxide ore. Processing Plant 1 is no longer in operation since above ground mining operations ceased in 2005. Three methods of tailings disposal have been utilised on site and include; in-pit tailings facilities; traditional tailings facilities; and paste fill treatment. Tailings are no longer deposited in in-pit storage facilities.

The December 2015 amendment is the result of several amendments sought by the proponent to authorise discharge of water into a natural creek that flows and pools at the base of the Main Waste Rock Dump, on the eastern wall. This discharge would only occur during extreme rainfall events when the Laterite pit has reached capacity, is putting the Main pit (and underground operations) at risk of flooding and where there are no other water-holding facilities with capacity. Water analysis of the Laterite pit water in November 2014 indicates that all parameters fall under the Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines (ANZECC, 2000) for livestock drinking water and short-term irrigation. Water quality analysis, erosion prevention measures and vegetation monitoring have been included in the Licence in relation to the proposed water discharge.

Other changes implemented as part of the December 2015 amendment include:
- Addition of the wastewater treatment ponds and their management on to the Licence;
- Addition of the treated wastewater irrigation area on to the Licence and associated monitoring conditions;

- Updates to the reporting requirements to reflect the current Licence; and
- Updates to the notification requirements.

In addition, the DER noted in the 2015 fee renewal that the power generation capacity on site exceeded the threshold for Category 52 – Electrical power generation, Schedule 1, *Environmental Protection Regulations 1987*. The Category 52 threshold had been exceeded when two additional gas generators had been installed in the Plutonic Power Station in December 2014. On 17 August 2015 the proponent applied to the DER to replace Category 84 (Electrical power generation) with Category 52. The capacity of the power station is 24.1 MW (natural gas).

In January 2016 a licence amendment was requested to add in category 57 for tyre storage. Associated conditions have been included on the licence. This is further discussed in the Decision Document.

In April 2016 a licence amendment was requested for the tailings storage facility (TSF) 2 and TSF3 lifts.

The licences and works approvals issued for Plutonic for the past 5 years are:

Instrument log		
Instrument	**Issued**	**Description**
W4567/2009/1	26/11/2009	New application for a works approval – Category 5
W4811/2010/1	06/01/2011	New application for a works approval – Category 61
W4836/2010/1	28/04/2011	New application for a works approval – Category 5
L6868/1989/11	19/09/2011	Licence re-issue
W5030/2011/1	27/10/2011	New application for a works approval - Category 5
L6868/1989/12	04/09/2014	Licence re-issue
L6868/1989/12	10/12/2015	Amendment to authorise discharge of water from Laterite Pit. Addition of the wastewater treatment ponds and irrigation area. Category 52 – Electrical Power generation added to replace Category 84.
L6868/1989/12	10/03/2016	Licence amendment to add category 57 tyre storage.
L6868/1989/12	29/09/2016	Licence amendment for TSF2 and TSF3 lifts. Licence was also transferred from Northern Star Resources Ltd to Billabong Gold Pty Ltd.

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;*

'Anniversary Date' means 31 December of each year;

'Annual Period' means a 12 month period commencing from 1 January until 31 December;

'APHA' means the American Public Health Association: *Standard Methods for the Examination of Water and Wastewater*, 22nd Edition;

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

'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 5667.10' 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;*

'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 purposes of notification means:

Chief Executive Officer
Department Div.3 Pt.V EP Act
Locked Bag 33 Cloisters Square
Perth WA 6850
info@der.wa.gov.au

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

'CLMB' means Callop Monitoring Bore;

'Compliance Report' means a report in a format approved by the CEO as presented by the Licensee or as specified by the CEO from time to time and published on the Department's website;

'Contaminated Solid Waste' has the meaning defined in Landfill Definitions;

'dangerous goods' has the meaning defined in the *Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007*;

'Department' means the department established under s.35 of the Public Sector Management Act and designated as responsible for the administration of Division 3 Part V of the *Environmental Protection Act 1986*;

'**Emergency Response Training'** means for the purposes of an exercise to train staff to manage emergency responses and that each member of the training team is authorised by the premises Mine Manager to undertake the exercise and supervised at all times by an accredited instructor. Waste types permitted for burning in the emergency response training exercise include liquid fuel, car bodies and timber (not treated timber);

'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 Waste Classification and Waste Definitions 1996" published by the Chief Executive Officer of the Department of Environment Regulation as amended from time to time;

'Licence' means this Licence numbered L6868/1989/12 and issued under the Act*;*

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

'mbgl' means metres below natural ground level;

'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;

'PIRMB' means Piranha Monitoring Bore;

'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;

'RL' means reduced level;

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

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

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

'TDS' means Total Dissolved Solids;

'TRH' means Total Recoverable Hydrocarbons;

'TRTMB' means Trout Monitoring Bore;

'TSF' means Tailings Storage Facility;

'WAD Cyanide' means cyanide species liberated at moderate pH of 4.5; and

'WWTP' means wastewater treatment plant.

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 General conditions

1.2.1 The Licensee shall immediately recover, or remove and dispose of spills of environmentally hazardous materials outside an engineered containment system.

1.2.2 The Licensee shall install and maintain mechanisms to ensure that stormwater from the following areas, is diverted to facilities for treatment and disposal or reuse:
(a) Process plants;
(b) Washdown bays;
(c) Refuelling areas; and
(d) Mechanical workshops.

1.3 Premises operation

1.3.1 The Licensee shall only accept waste on to the landfill if:
(a) it is of a type listed in Table 1.3.1;
(b) the quantity accepted is below any quantity limit listed in Table 1.3.1;
(c) it meets any specification listed in Table 1.3.1; and
(d) it conforms to the description in the documentation supplied by the producer and holder.

Table 1.3.1: Waste acceptance

Waste	Quantity Limit	Specification
Clean fill	<u>All waste types</u> No more than 5000 tonnes per annual period of all waste types cumulatively shall be disposed of by landfilling. <u>Putrescible waste</u> No more than 500 tonnes per annual period. <u>Contaminated solid wastes</u> No more than 500 tonnes per annual period.	None specified
Inert Waste Type 1		None specified
Inert Waste Type 2		None specified
Putrescible waste		None specified
Contaminated solid wastes		Waste is to meet waste acceptance criteria specified for class I or II landfills
Special Waste Type 1	N/A.	• Only to be disposed of into a designated asbestos disposal area within the landfill; • Not to be deposited within 2m of the final tipping surface of the landfill; and

		• No works shall be carried out on the landfill that could lead to a release of asbestos fibres.
Special Waste Type 2	N/A.	• Only to be disposed of into a designated biomedical waste disposal area within the landfill; • Not to be deposited within 2m of the final tipping surface of the landfill; and • No works shall be carried out on the landfill that could lead to biomedical wastes being excavated or uncovered.

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 of controlled waste (including asbestos and tyres) are set out in the *Environmental Protection (Controlled Waste) Regulations 2004*.

1.3.2 The Licensee shall ensure that wastes accepted onto the landfill are only subjected to the process set out in Table 1.3.2 and in accordance with any process limits described in that Table.

Table 1.3.2: Waste processing

Waste type	Process	Process limits
Contaminated Solid Waste	Written or electronic records of all contaminated waste accepted for burial at the landfill. Records to include but not be limited to: (i) the time and date the waste was received; (ii) the type of contaminated solid waste; (iii) the nature of the contaminated solid waste; (iv) the quantity of the contaminated solid waste; (v) the disposal location by grid reference; and (vi) the source of the contaminated solid waste.	None specified
Used Tyres	Storage	Storage of tyres shall only take place within the tyre storage/burial areas shown on the Landfill Area Map in Schedule 1. • Not more than 200 used tyres shall be stored at the premises at any one time; • Used tyre stacks shall not exceed 200 tyres per stack and 4m in height; • Used tyre stacks are to be stored no less than 6m from any other stored tyre stacks; • Tyres shall be stored on their side walls or if

		stored on treads the area shall be baled with a securing device made of non-combustible material; and • Tyres shall be stored on level ground.

Note 1: Requirements for landfilling tyres are set out in Part 6 of the *Environmental Protection Regulations1987.*

1.3.3 The Licensee shall manage the landfilling activities to ensure:
(a) waste is disposed of in a defined trench or within an area enclosed by earthen bunds;
(b) the size of the tipping face is kept to a minimum and not larger than 30m in length and 2m above ground level in height; and
(c) the separation distance between the base of the landfill and the highest groundwater level shall not be less than 2m.

1.3.4 The Licensee shall ensure that cover is applied to waste in the tipping area in accordance with Table 1.3.3 and that sufficient stockpiles of cover are maintained on site at all times.

Table 1.3.3: Cover requirements

Waste type	Material	Depth	Timescale
Putrescible wastes	Clean fill and Inert Waste Type 1	A minimum of 200 mm. No waste is to be left exposed after covering	Cover shall be applied monthly
Inert Waste Type 2	Clean fill and Inert Waste Type 1	500mm	Once 200 tyres have been stored.
Contaminated solid wastes	Clean fill and Inert Waste Type 1	100mm	As soon as practicable after deposit.
Special Waste Type 1	Type 1 Inert waste, soil or clay	300mm	As soon as practicable after deposit and prior to compaction.
		1000mm	By the end of the working day in which the asbestos waste was deposited.
Special Waste Type 2		100mm	As soon as practicable after deposit.

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

1.3.5 The Licensee shall take all reasonable and practical measures to ensure that no wind-blown waste escapes from the Premises and that wind-blown waste is collected on at least a quarterly basis and returned to the tipping area.

1.3.6 The Licensee shall ensure that tailings and effluent are only discharged into containment cells/dams/ponds with the relevant infrastructure requirements and at the location specified in Table 1.3.4 and identified in Schedule 1.

Table 1.3.4: Containment infrastructure		
Containment point reference	**Material**	**Infrastructure requirements**
TSF2	Tailings	-
TSF3	Tailings	-
WWTP	Ponds 1, 2, 3 and 4	HDPE lined

1.3.7 The Licensee shall manage the TSFs such that:
(a) a minimum top of embankment freeboard of 300mm is maintained;
(b) stormwater run-off is diverted from the tailings dam/s to prevent flooding or erosion; and
(c) a perimeter drain is maintained downstream of the external toe of the tailings dam/s to recover any liquid matter resulting from seepage or breach of the embankment.

1.3.8 The Licensee shall manage all wastewater treatment ponds such that:
(a) overtopping of the ponds does not occur;
(b) the integrity of the containment infrastructure is maintained;
(c) trapped overflows are maintained on the outlet of ponds to prevent carry-over of surface floating matter; and
(d) vegetation and floating debris (emergent or otherwise) is prevented from encroaching onto pond surfaces or inner pond embankments.

1.3.9 The Licensee shall ensure that all pipelines containing environmentally hazardous substances are either:
(a) equipped with telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures;
(b) equipped with automatic cut-outs in the event of a pipe failure; or
(c) provided with secondary containment sufficient to contain any spill for a period equal to the time between inspections.

1.3.10 The Licensee shall ensure the limits specified in Table 1.3.5 are not exceeded.

Table 1.3.5 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	5,000,000 tonnes of ore per annual period
6	Mine dewatering	1,300,000 tonnes per annual period
52	Electrical power generation	24.1 MW (natural gas)
54	Sewage Facility	140 cubic metres per day
57	Used tyre storage (general)	200 tyres
89	Class II putrescible landfill	5,000 tonnes per annual period

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

1.3.11 The Licensee must not depart from the specifications in Column 1 and 2 for the infrastructure in each row of Table 1.3.6 except:
a) where such departure is minor in nature and does not materially change or affect the infrastructure; or
b) where such departure improves the functionality of the infrastructure and does not increase risks to public health, public amenity or the environment;
and in accordance with all other conditions in this Licence.

Table 1.3.6: Works specifications	
Column 1	**Column 2**
Infrastructure	**Specifications (design and construction)**
TSF2 & 3 lifts	The TSF2 & 3 lifts must: (a) be constructed at the current TSF2 & 3 as depicted in Schedule 1; (b) be no more than 2.5m raises in stages from RL522.9m up to RL532.0m; (c) utilize the existing piezometer and groundwater monitoring program associated with TSF2 & 3; and (d) be designed to accommodate a 1 in 100 year 72 hour rainfall event.

1.3.12 The Licensee shall operate the TSF2 and TSF3 lifts in accordance with the conditions of this Licence, following submission of the compliance document required under condition 5.3.1.

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 air

2.2.1 The Licensee shall ensure that where waste is emitted to air from the emission points 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 air

Emission point reference and location on Map of emission points	Emission Point and source	Emission point height (m)	Source, including any abatement
A1	Exhaust from Gas Engines 1, 2 & 3, via vent stack A1	19.9	Engines 1, 2 and 3, used for power generation
A2	Exhaust from Gas Engine 4 via vent stack A2	19.9	Engine 4, used for power generation
A3	Exhaust from Gas Engine 5 via stack A3	12.2	Gas Engine 5, used for power generation
A4	Exhaust from Gas Engine 6 goes into stack A4	12.2	Gas Engine 6, used for power generation
A5	Heat exhaust from Elution Boiler vented through stack A5	6.5	Elution Boiler used during gold desorption
A6	Exhaust from Regen kiln vented through stack A6	Not specified	Regen kiln used for reactivating activated carbon
A7	Exhaust from Gold Room Furnace vented from vent stack A7	8.9	Gold room furnace, used for gold smelting

2.3 Point source emissions to surface water

2.3.1 The Licensee shall ensure that where waste is emitted to surface water 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: Emission points to surface water

Emission point reference	Description	Source including abatement
W1	Discharge to ponding area at base of Main Waste Rock Dump	Water from Laterite Pit only. Only to occur when rainfall has caused overtopping risk and no other water-holding structures on site have capacity to take water. Rock armour mound at discharge point to reduce erosion risk.

2.4 Emissions to land

2.4.1 The Licensee shall ensure that where waste is emitted to land from the emission points in Table 2.4.1 and identified on the map of emission points in Schedule 1 it is done so in accordance with the conditions of this Licence.

Table 2.4.1: Emissions to land

Emission point reference	Description	Source including abatement
L1	Discharge to irrigation area	Treated wastewater from final wastewater treatment pond.

3 Monitoring

3.1 General monitoring

3.1.1 The Licensee shall ensure that:

(a) all water samples are collected and preserved in accordance with AS/NZS 5667.1 unless stated in Condition 3.1.1(b);

(b) groundwater samples for the monitoring of WAD Cyanide are collected and preserved in accordance with APHA;

(c) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;

(d) all groundwater sampling is conducted in accordance with AS/NZS 5667.11;

(e) all microbiological samples are collected and preserved in accordance with AS/NZS 2031; and

(f) all samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in relevant table.

3.1.2 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.

3.2 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
W1	Volumetric flow rate	m^3/day	Cumulative (when discharge occurring)
	pH[1]	pH units	Spot-sample (when discharge occurring)
	TDS TRH Aluminium Antimony Arsenic Boron Cadmium Chromium Cobalt Copper Fluoride Iron Lead Manganese Mercury Molybdenum Nickel Selenium Sulphate Thallium Total Nitrogen Total Phosphorus Uranium Zinc WAD Cyanide	mg/L	

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

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	Averaging Period	Frequency
L1	Volumetric flow rate (cumulative)	L/s or m^3/day	Monthly	Continuous
	pH[1]	-	Spot sample	Quarterly
	Total Suspended Solids	mg/L		
	Total Dissolved Solids			
	Biochemical Oxygen Demand			
	Total Nitrogen			
	Total Phosphorus			
	Escherichia coli	cfu/100 mL[2]		

Note 1: In-field non-NATA accredited analysis permitted for pH measurement.
Note 2: Actual units are to be reported except where the result is greater than the highest detectable level of 24,000 cfu/100mL.

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	Parameter	Units	Averaging period	Frequency
Waste Inputs	Clean Fill Inert Waste Type 1 Inert Waste Type 2 Putrescible Waste Contaminated Solid Waste	m^3 (where no weighbridge is present)	Monthly	Each load disposed at the Premises
Waste Outputs	Waste type as defined in the Landfill Definitions			Each load leaving or rejected from the Premises

3.5 Ambient environmental quality monitoring

3.5.1 The Licensee shall undertake the monitoring specified in Tables 3.5.1 and 3.5.2 and record and investigate the exceedance of any limit specified.

Table 3.5.1: Monitoring of ambient groundwater quality

Monitoring point reference	Parameter	Limit (including units)	Averaging period	Frequency
TD1-2, TD1-5, TD2-1, TD2-3, TD3-2, TD3-7, CMB1, CMB2 and CMB3 PMB56, PMB64, PMB67 and PMB72 DMB2 and DMB3 CLMB1 CLMB2, CLMB3 and CLMB4 PIRMB1, PIRMB2, PIRMB3 and PIRMB4 PIRMB5 and PIRMB6 TRTMB3, TRTMB4, TRTMB5, TRTMB6 and TRTMB7 TRTMB1 and TRTMB8 TRTMB2	pH[1]	-	Spot sample	Quarterly
	TDS	-		
	Aluminium	-		
	Antimony	-		
	Arsenic	<0.5 mg/L		
	Boron	-		
	Cadmium	-		
	Chromium	-		
	Cobalt	-		
	Copper	<1.0 mg/L		
	Fluoride	-		
	Iron	-		
	Lead	-		
	Manganese	-		
	Mercury	-		
	Molybdenum	-		
	Nickel	<1.0 mg/L		
	Selenium	-		
	Sulphate	-		
	Thallium	-		
	Total Nitrogen	-		
	Total Phosphorus	-		
	Uranium	-		
	Zinc	-		
	WAD Cyanide	<0.8 mg/L		
	SWL	>7 mbgl		

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

Table 3.5.2: Monitoring of vegetation

Purpose	Monitoring point reference	Parameter	Frequency
Monitor the vegetation in the zone of influence of discharge from point W1.	V1 V2 V3	Photographs of vegetation taken from monitoring points in a fixed direction towards discharge point.	Quarterly

4 Improvements

4.1 Improvement program

4.1.1 The Licensee shall complete the improvements in Table 4.1.1 by the date of completion in Table 4.1.1.

Table 4.1.1: Improvement program

Improvement reference	Improvement	Date of completion
IR1	The Licensee shall provide to the CEO, management recommendations and commitments including those for seepage, with associated timeframes for completion (inclusive of all inactive TSFs onsite) following: 1. A review of the Hydrogeological Review conducted by WorleyParsons, dated 16 October 2012, which recommended the capping of the Perch Pit TSF; and 2. A review of current and historic groundwater monitoring data for the premises.	30 November 2016
IR2	Development of groundwater quality limit values for Aluminium, Antimony, Boron, Cadmium, Chromium, Cobalt, Fluoride, Iron, Lead, Manganese, Mercury, Molybdenum, Selenium, Sulphate, Thallium, Total Nitrogen, Total Phosphorus Uranium and Zinc using baseline water quality results and in the context of Australian freshwater guidelines. These limits should be used to evaluate water quality results and to guide management of groundwater at the premises.	30 April 2017

5 Information

5.1 Records

5.1.1 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 5.1.1(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.

5.1.2 The Licensee must submit to the CEO within 90 days after the Anniversary Date, a Compliance Report indicating the extent to which the Licensee has complied with the Conditions in this Licence for the Annual Period.

5.1.3 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.

5.2 Reporting

5.2.1 The Licensee shall submit to the CEO an Annual Environmental Report within 90 calendar days after the end of the annual period. The report shall contain the information listed in Table 5.2.1 in the format or form specified in that table.

Table 5.2.1: 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
Table 3.2.1	Monitoring of point source emissions to surface water	WR1
Table 3.3.1	Monitoring of emissions to land	LR1
Table 3.4.1	Monitoring of inputs and outputs	None specified
Table 3.5.1	Monitoring of ambient groundwater quality	GR1
Table 3.5.2	Monitoring of vegetation	None specified
5.1.2	Compliance	Annual Audit Compliance Report (AACR)
5.1.3	Complaints summary	None specified

Note 1: Forms are in Schedule 2

5.2.2 The Licensee shall ensure that the annual environmental report also contains:
- (a) any relevant process, production or operational data recorded under Condition 3.1.2;
- (b) an assessment of the information contained within the report against previous monitoring results and Licence limits; and
- (c) a list of any original monitoring reports submitted to the Licensee from third parties in the reporting period and make these reports available on request.

5.3 Notification

5.3.1 The Licensee shall ensure that the parameters listed in Table 5.3.1 are notified to the CEO in accordance with the notification requirements of the table.

Table 5.3.1: Notification requirements

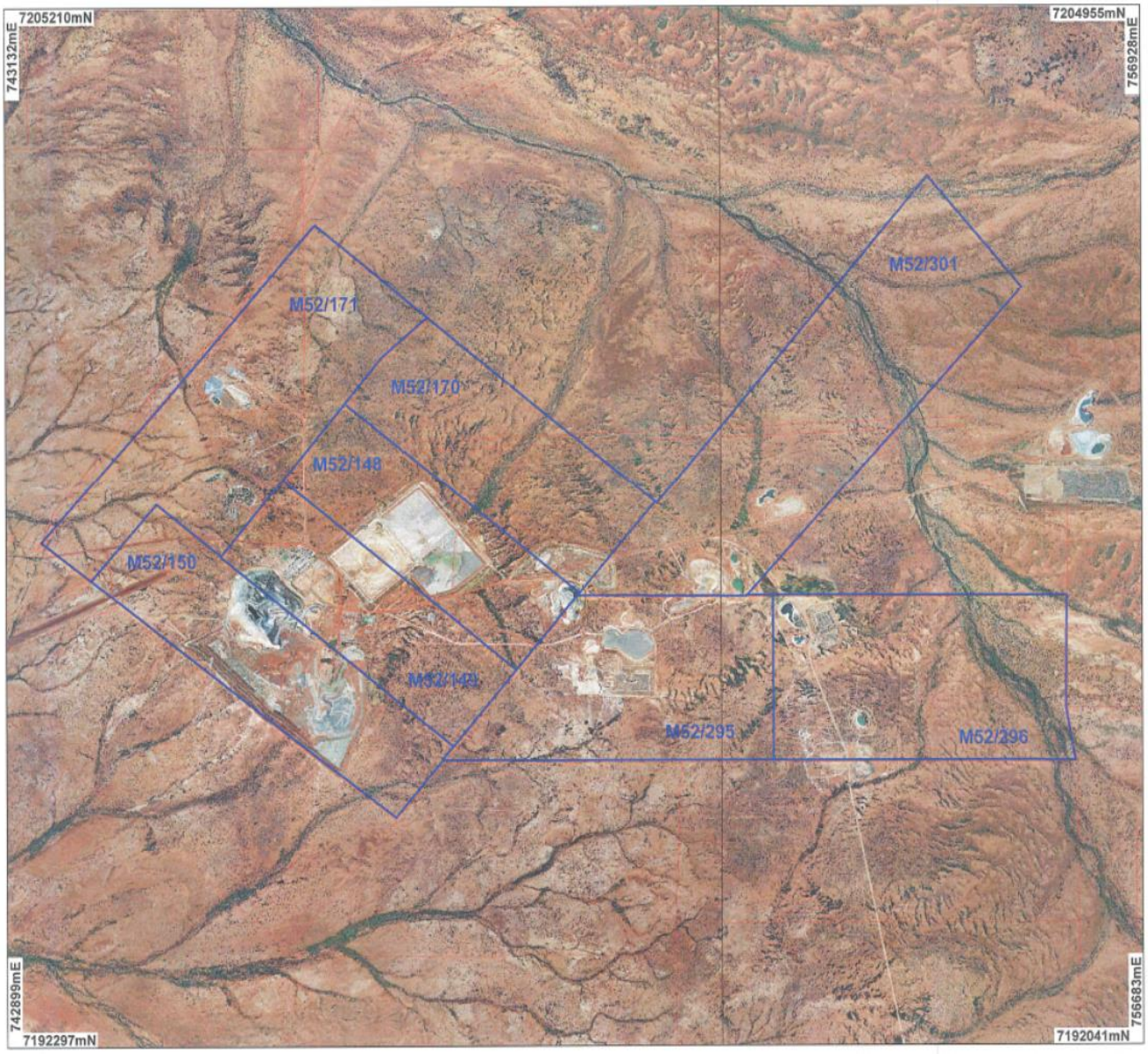
Condition or table (if relevant)	Parameter	Notification requirement[1]	Format or form[2]
-	Breach of any limit specified in the Licence	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
-	Production ceasing for an unspecified period of time	As soon as practicable after the decision has been made	None Specified
-	Production recommencing	At least 28 days prior to production recommencing	None specified
1.3.12	The Licensee shall submit a compliance document to the CEO, following construction of the TSF2 and TSF3 lifts. The compliance document shall: a) certify that the works were constructed in accordance with the specifications in Table 1.3.6; and b) be signed by a person authorised to represent the Licensee and contain the printed name and position of that person within the company.	Within 7 days of the completion of construction	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

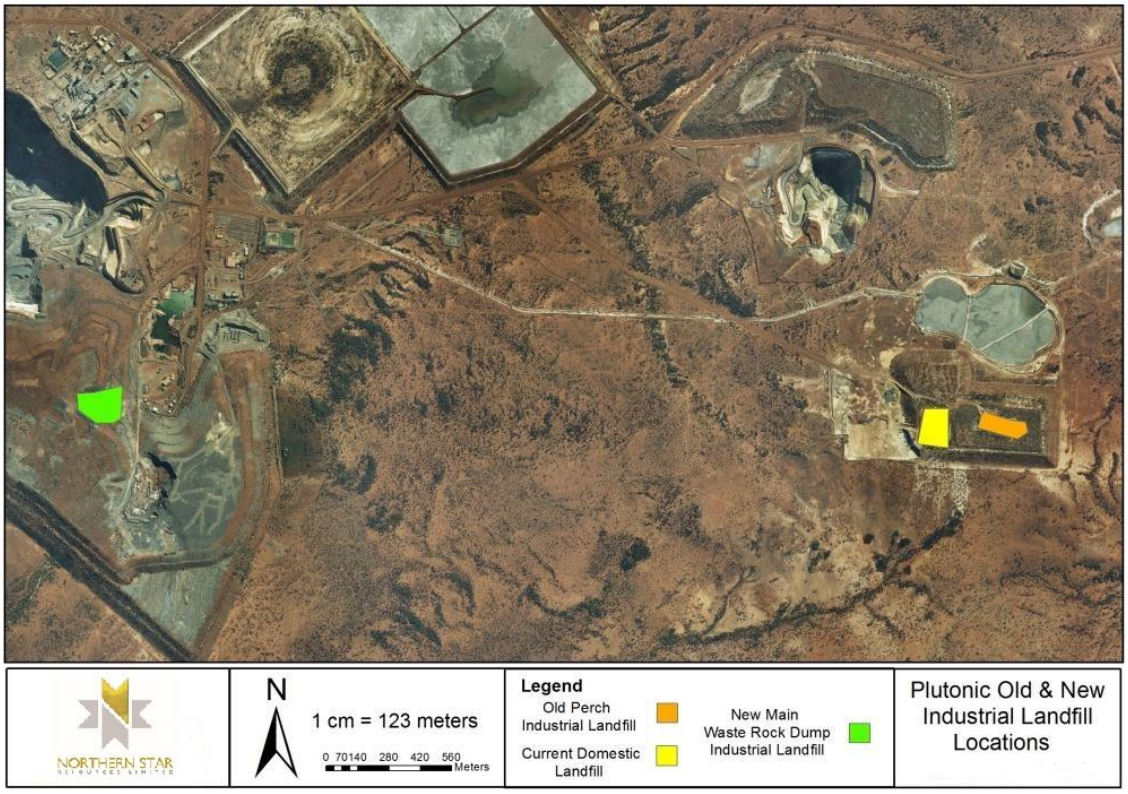
Schedule 1: Maps

Premises map

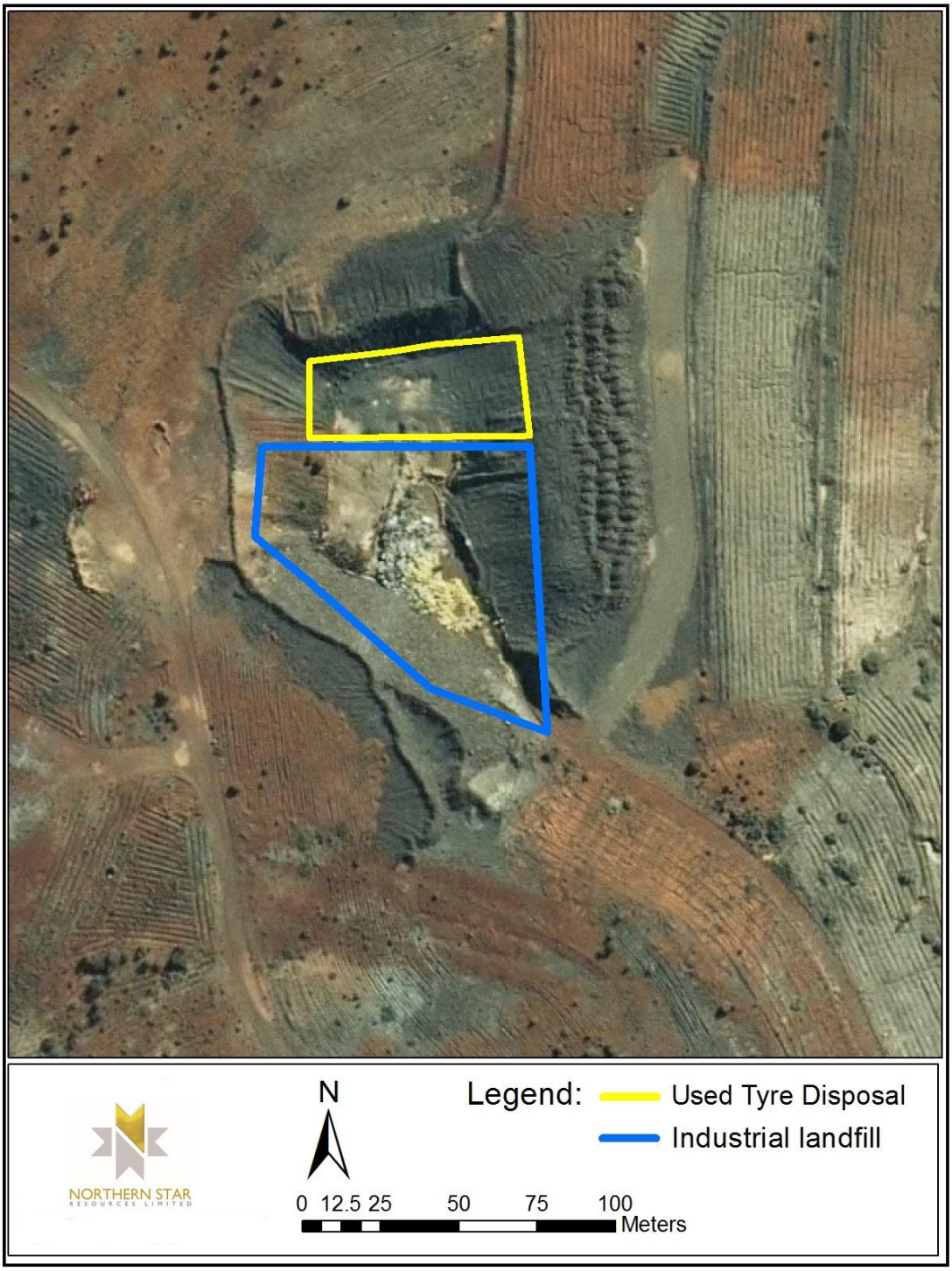
The Premises is shown in the map below. The blue line depicts the Premises boundary.



The Landfill Area Map is shown below.



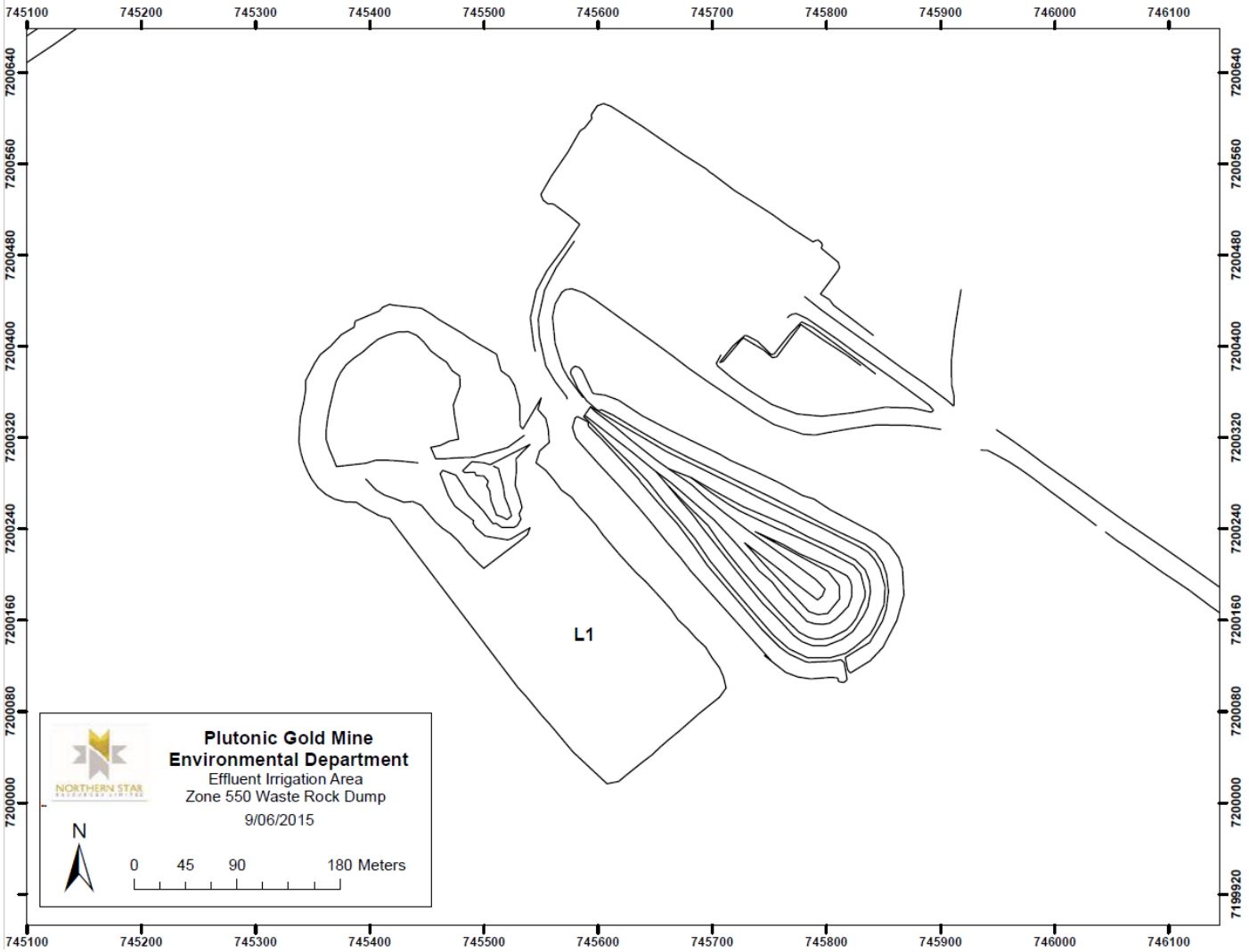
The tyre storage and disposal location at the New Main Rock Waste Dump Industrial Landfill is shown in the map below by the yellow line.



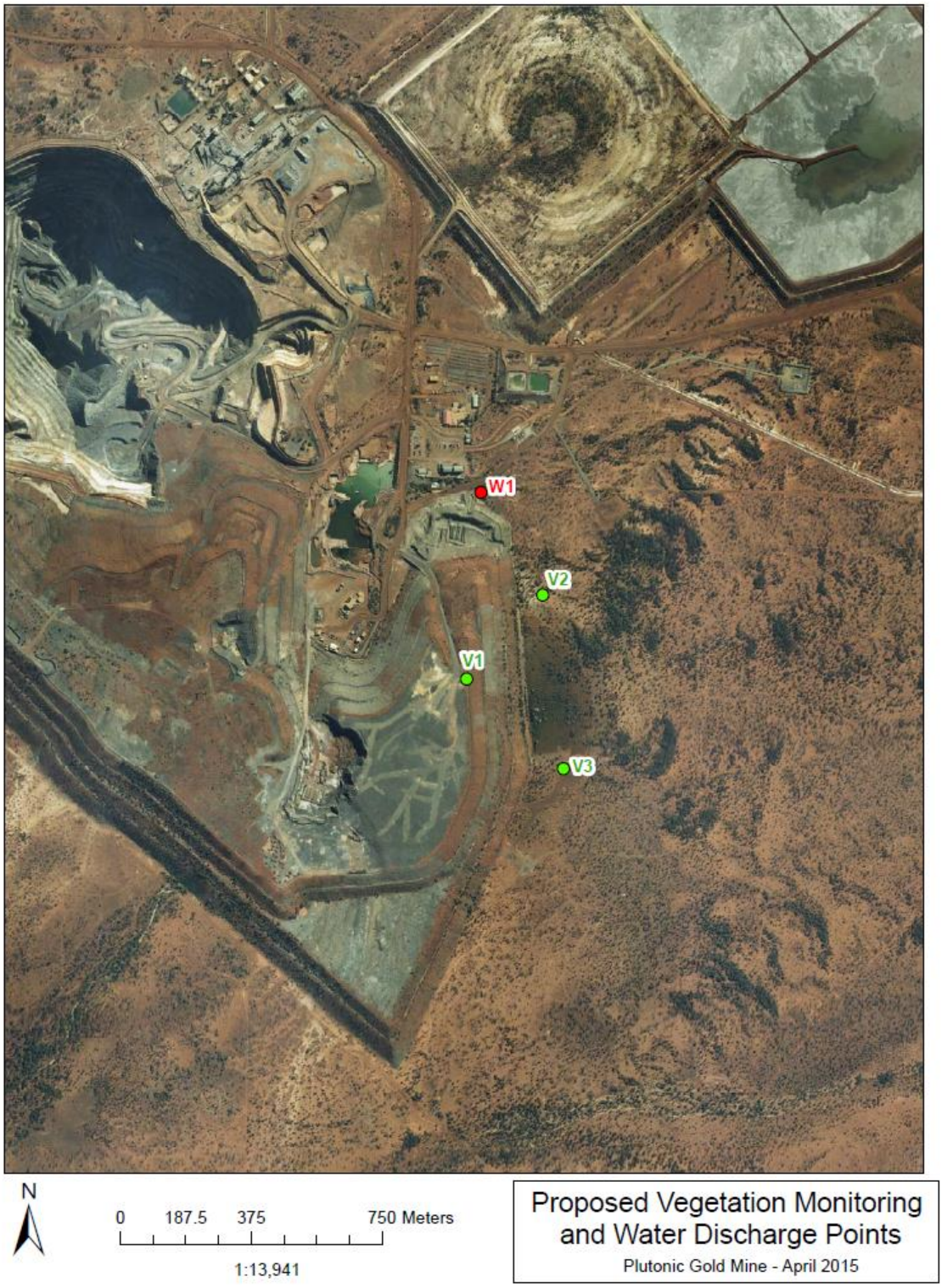
Map of emission points

The locations of the emission points defined in Table 2.2.1 are shown below.

The locations of the emission point defined in Table 2.4.1 is shown below.

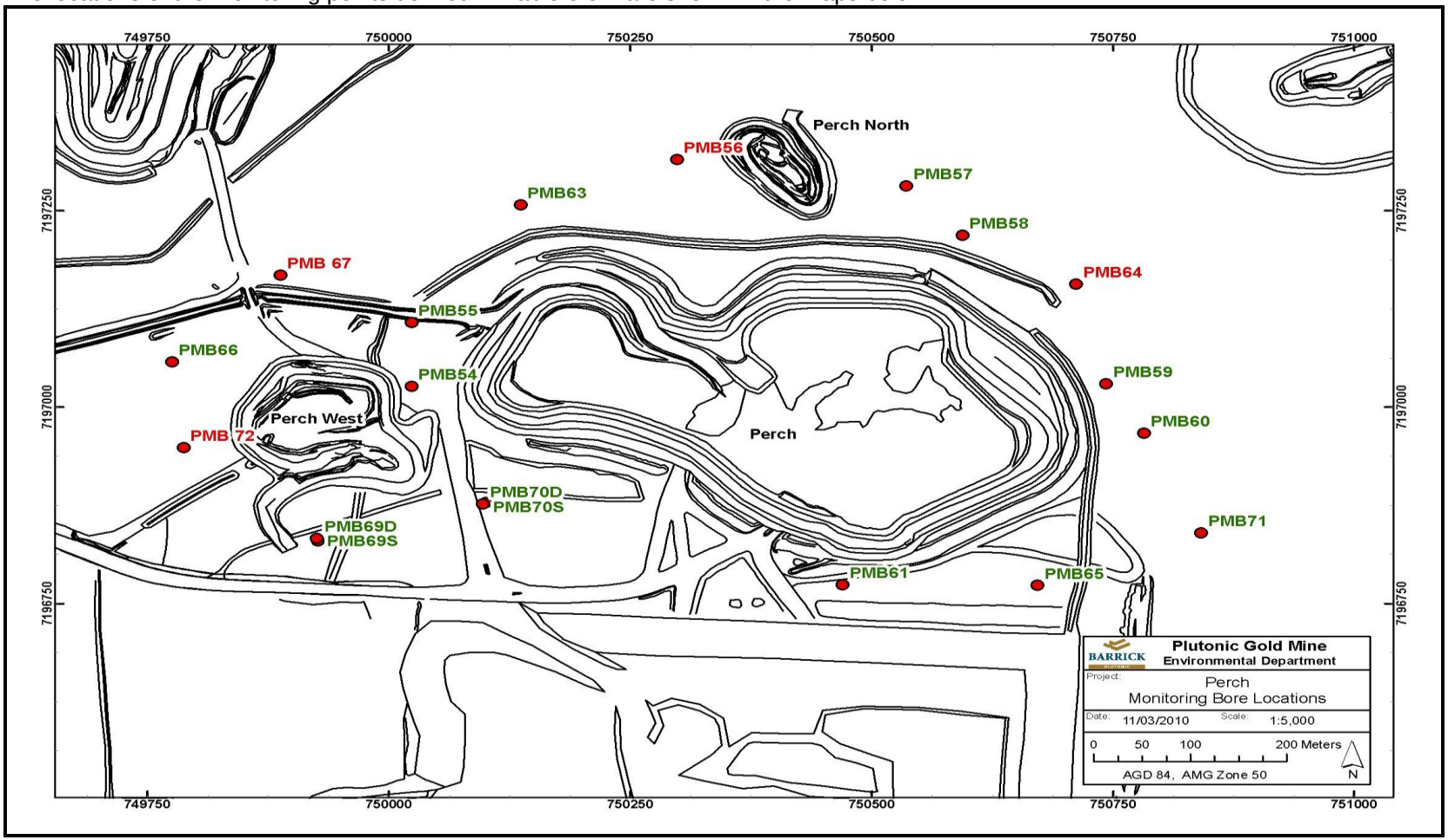


The locations of the emission point defined in Table 2.3.1 is shown below. The locations of the monitoring points defined in Table 3.5.2 are also shown below.

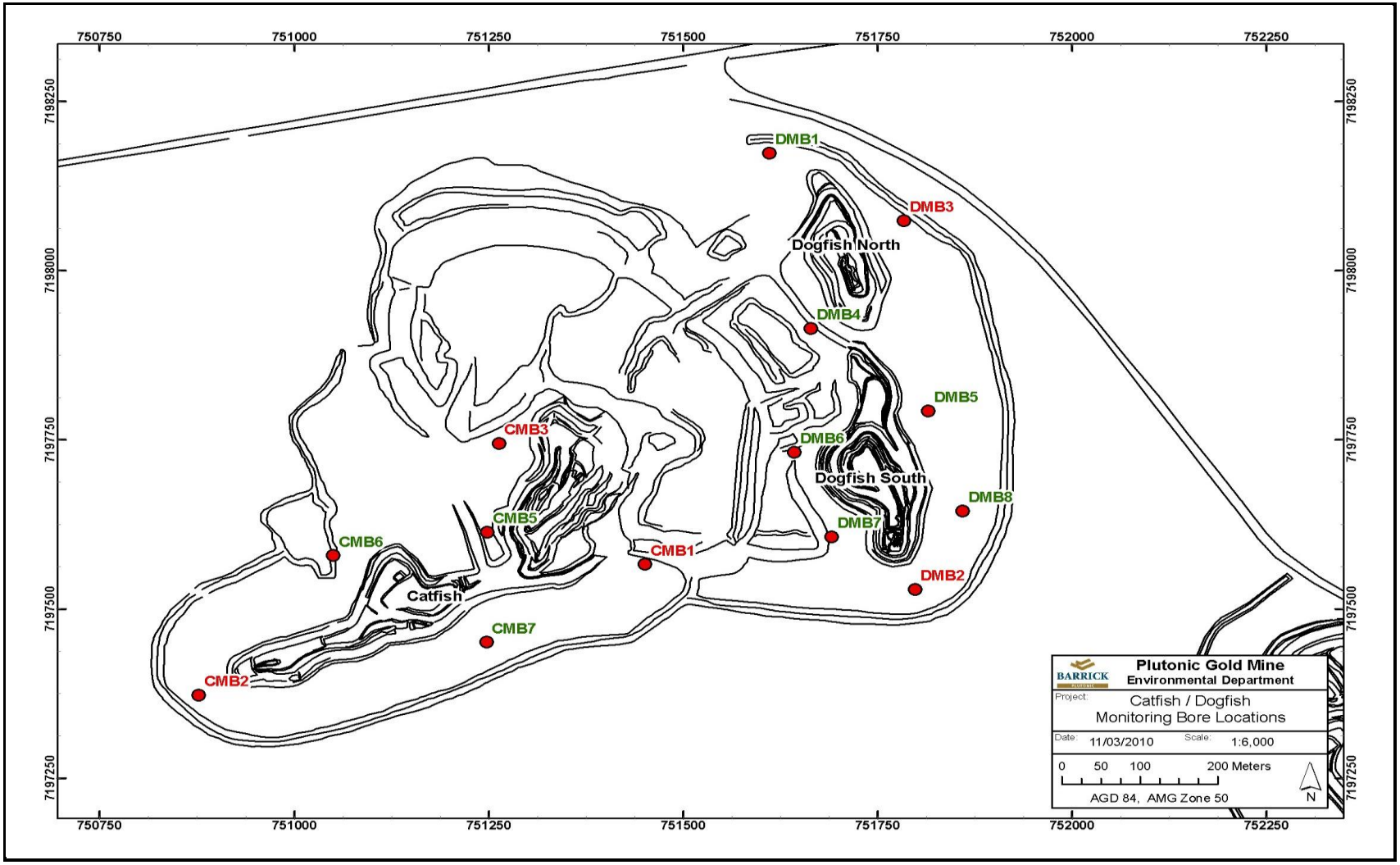


Map of monitoring locations

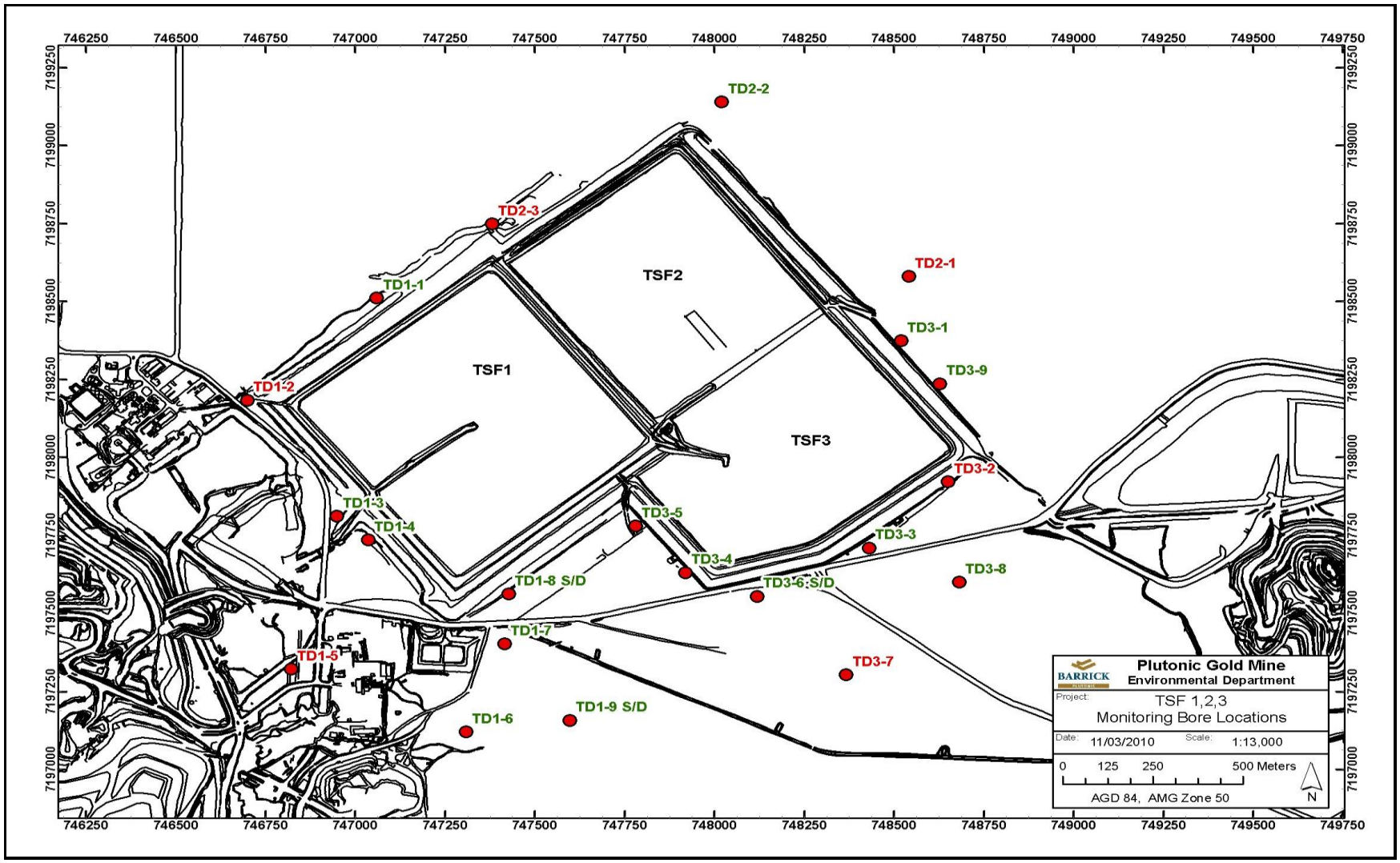
The locations of the monitoring points defined in Table 3.5.1 are shown in the maps below.



Perch In-Pit TSF monitoring bore locations



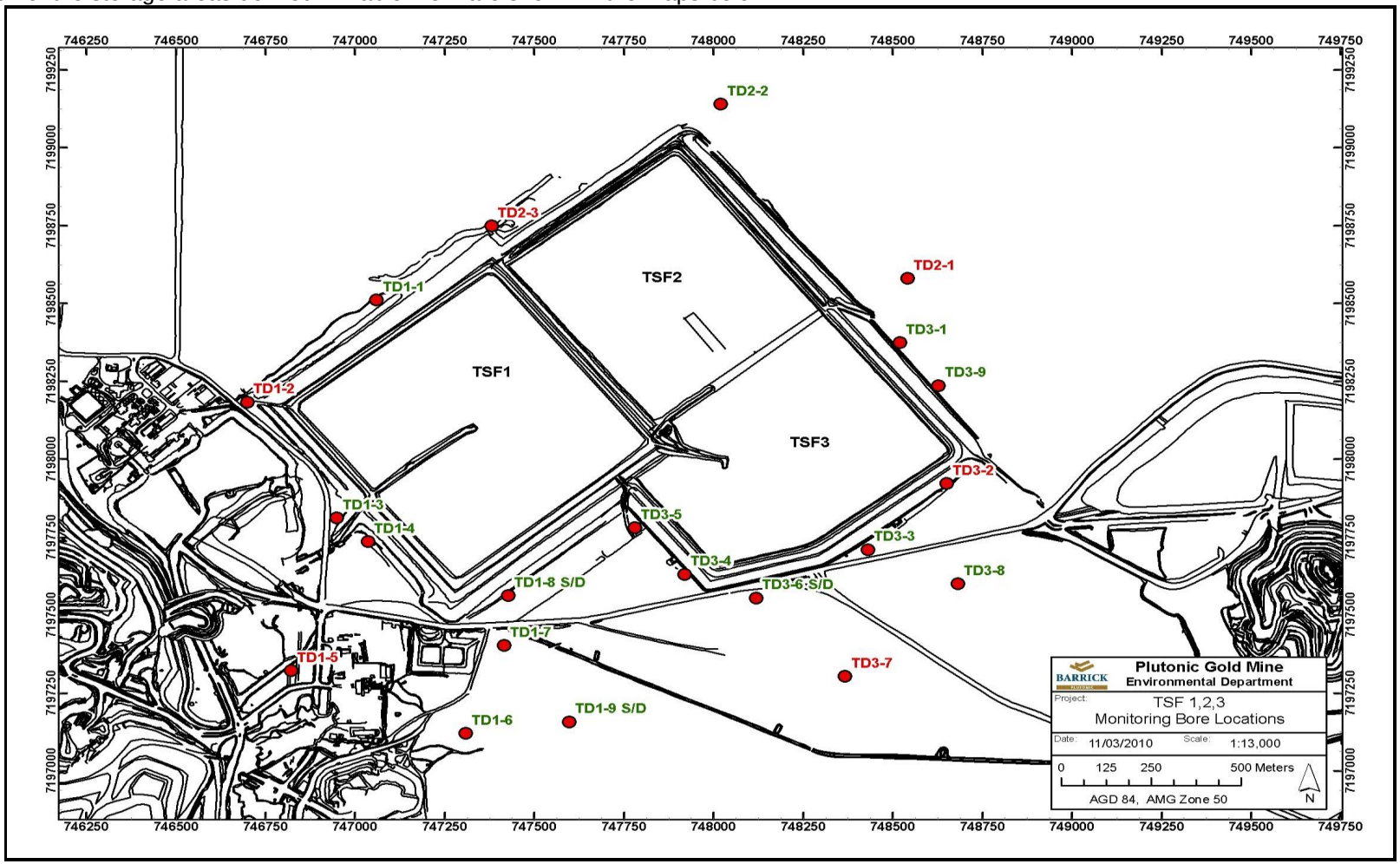
Dogfish/Catfish In-Pit TSF monitoring bore locations

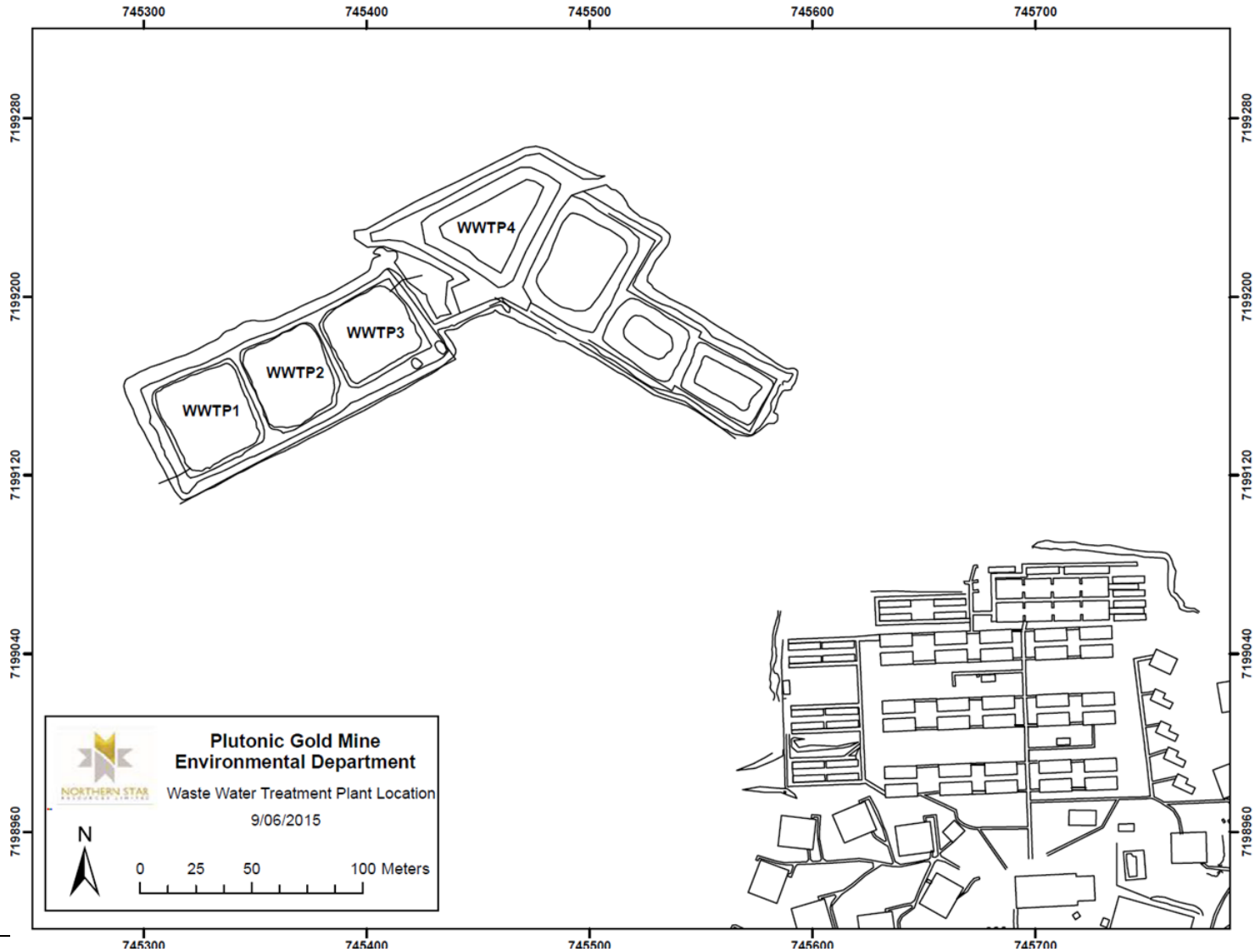


TSF 1, 2 and 3 monitoring bore location

Map of storage locations

The location of the storage areas defined in Table 1.3.4 are shown in the maps below.




745300
745400
745500
745600
745700
7199280
7199200
7199120
7199040
7198960
WWTP4
WWTP3
WWTP2
WWTP1
Plutonic Gold Mine
Environmental Department
Waste Water Treatment Plant Location
9/06/2015
N
0
25
50
100 Meters

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.

Licence: L6868/1989/12 Licensee: Billabong Gold Pty Ltd
Form: WR1 Period :
Name: Monitoring of point source emissions to surface water

Form WR1: Monitoring of point source emissions to surface water						
Emission point	**Parameter**	**Unit**	**Result**	**Averaging period**	**Method**	**Sample date & times**
W1	Volumetric flow rate	m^3/day		Cumulative (when discharging)		
	pH	-		Spot sample		
	Total Dissolved Solids	mg/L		Spot sample		
	Total Recoverable Hydrocarbons	mg/L		Spot sample		
	Aluminium	mg/L		Spot sample		
	Antimony	mg/L		Spot sample		
	Arsenic	mg/L		Spot sample		
	Boron	mg/L		Spot sample		
	Cadmium	mg/L		Spot sample		
	Chromium	mg/L		Spot sample		
	Cobalt	mg/L		Spot sample		
	Copper	mg/L		Spot sample		

	Fluoride	mg/L		Spot sample		
	Iron	mg/L		Spot sample		
	Lead	mg/L		Spot sample		
	Manganese	mg/L		Spot sample		
	Mercury	mg/L		Spot sample		
	Molybdenum	mg/L		Spot sample		
	Nickel	mg/L		Spot sample		
	Selenium	mg/L		Spot sample		
	Sulphate	mg/L		Spot sample		
	Thallium	mg/L		Spot sample		
	Total Nitrogen	mg/L		Spot sample		
	Total Phosphorus	mg/L		Spot sample		
	Uranium	mg/L		Spot sample		
	Zinc	mg/L		Spot sample		
	WAD Cyanide	mg/L		Spot sample		

Signed on behalf of Billabong Gold Pty Ltd: …….. Date: …….

Licence: L6868/1989/12 Licensee: Billabong Gold Pty Ltd
Form: LR1 Period :
Name: Monitoring of emissions to land

Form LR1: Monitoring of emissions to land						
Emission point	**Parameter**	**Units**	**Result**	**Averaging period**	**Method**	**Sample date & times**
L1	Volumetric flow rate	L/s or m^3/day		Monthly		
	pH	-		Spot sample		
	Total Suspended Solids	mg/L		Spot sample		
	Total Dissolved Solids	mg/L		Spot sample		
	Biochemical Oxygen Demand	mg/L		Spot sample		
	Total Nitrogen	mg/L		Spot sample		
	Total Phosphorus	mg/L		Spot sample		
	Escherichia coli	cfu/100 mL^2		Spot sample		

Signed on behalf of Billabong Gold Pty Ltd: …….. Date: …….

Licence: L6868/1989/12
Form: GR1
Name: Monitoring of ambient groundwater quality

Licensee: Billabong Gold Pty Ltd
Period :

Form GR1: Monitoring of ambient groundwater

Emission point	Parameter	Limit	Result	Sample date & times
TD1-2, TD1-5, TD2-1, TD2-3, TD3-2, TD3-7, CMB1, CMB2 and CMB3 PMB56, PMB64, PMB67 and PMB72 DMB2 and DMB3 CLMB1 CLMB2, CLMB3 and CLMB4 PIRMB1, PIRMB2, PIRMB3 and PIRMB4 PIRMB5 and PIRMB6 TRTMB3, TRTMB4, TRTMB5, TRTMB6 and TRTMB7 TRTMB1 and TRTMB8 TRTMB2	pH	N/A	-	
	TDS	N/A	mg/L	
	WAD Cyanide	< 0.8 mg/L	mg/L	
	SWL	> 7 mbgl	m	
	Aluminium			
	Antimony			
	Arsenic	< 0.5 mg/L	mg/L	
	Boron			
	Cadmium			
	Chromium			
	Cobalt			
	Copper	< 1.0 mg/L	mg/L	
	Iron			
	Lead			
	Manganese			
	Mercury			
	Molybdenum			
	Nickel	< 1.0 mg/L	mg/L	

	Selenium			
	Sulphate			
	Thallium			
	Total Nitrogen			
	Uranium			
	Zinc			

Signed on behalf of Billabong Gold Pty Ltd: …….. Date: …….

Licence: L6868/1989/12 Licensee: Billabong Gold 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 Billabong Gold Pty Ltd	
Date	

Government of Western Australia
Department of Environment Regulation

Decision Document

Environmental Protection Act 1986, Part V

Proponent: Billabong Gold Pty Ltd
Licence: L6868/1989/12

Registered office:	Level 30 Bankwest Tower, 108 St Georges Terrace PERTH WA 6000
ACN:	613 900 922
Premises address:	Plutonic Gold Mine Mining Tenements: M52/171, M52/170, M52/148, M52/149, M52/150, M52/295, M52/296, and M52/301 MEEKATHARRA WA 6642
Issue date:	Thursday, 4 September 2014
Commencement date:	Thursday, 18 September 2014
Expiry date:	Tuesday, 17 September 2024

Decision

Based on the assessment detailed in this document the Department of Environment Regulation (DER), has decided to issue a licence. The DER considers that in reaching this decision, it has taken into account all relevant considerations and legal requirements and that the Licence and its conditions will ensure that an appropriate level of environmental protection is provided.

Decision Document prepared by:	Cathy Scheib/ Suzy Roworth Licensing Officer
Decision Document authorised by:	Alana Kidd Manager Licensing

Contents

1 Purpose of this Document

This decision document explains how the DER has assessed and determined the application and provides a record of the DER's decision-making process and how relevant factors have been taken into account. Stakeholders should note that this document is limited to the 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

<table>
<tr><th colspan="3">Administrative details</th></tr>
<tr><td>Application type</td><td colspan="2">Works Approval ☐
New Licence ☐
Licence amendment ☒
Works Approval amendment ☐</td></tr>
<tr><td rowspan="6">Activities that cause the premises to become prescribed premises</td><td>Category number(s)</td><td>Assessed design capacity</td></tr>
<tr><td>5</td><td>5 000 000 tonnes per annual period</td></tr>
<tr><td>6</td><td>1 300 000 tonnes per annual period</td></tr>
<tr><td>52</td><td>24.1 MW (natural gas)</td></tr>
<tr><td>54</td><td>140 cubic metres per day</td></tr>
<tr><td>57</td><td>200 tyres</td></tr>
<tr><td>89</td><td>5000 tonnes per annual period</td></tr>
<tr><td>Application verified
Application fee paid</td><td colspan="2">Date: N/A
Date: N/A</td></tr>
<tr><td>Works Approval has been complied with</td><td colspan="2">Yes☐ No☐ N/A☒</td></tr>
</table>

Compliance Certificate received	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, e.g. Site is subject to SO_2 requirements of Kwinana EPP.		

3 Executive summary of proposal and assessment

The Plutonic Gold Mine (Plutonic) is situated within the boundary of the Three Rivers Station in the Peak Hill Goldfields area of the Gascoyne Basin 180km NNE of Meekatharra in the Shire of Meekatharra. Plutonic has been operating since 1989. Information on the existing environment is detailed in Appendix A.

<u>December 2015 Amendment</u>
The proponent applied for a licence amendment (December 2015) to authorise discharge of water into a natural creek that flows and pools at the base of the Main Waste Rock Dump, on the eastern wall. This discharge would only occur during extreme rainfall events when the Laterite pit has reached capacity and is putting the Main pit (and underground operations) at risk of flooding and where there are no other water-holding facilities with capacity. Water analysis of the Laterite pit water in November 2014 indicated that all parameters fall under the Australian and New Zealand Guidelines for Fresh and Marine Water Quality guidelines (ANZECC, 2000) for livestock drinking water and short-term irrigation. Water quality analysis, erosion prevention measures and vegetation monitoring were included in the Licence in relation to the proposed water discharge.

In addition, DER noted in the 2015 fee renewal that the power generation capacity on site exceeded the threshold for Category 52 – Electrical power generation, Schedule 1, *Environmental Protection Regulations 1987*. The Category 52 threshold had been exceeded when two additional gas generators had been installed in the Plutonic Power Station (PPS) in December 2014. The proponent also applied to the DER to replace Category 84 (Electrical power generation; less than 20 MW in aggregate) with Category 52 (Electrical power generation; 20MW or more in aggregate using natural

gas). The capacity of the power station is 24.1 MW (natural gas). Further details of the PPS are included in Appendix B.

Details of wastewater treatment and irrigation were also added to the licence to ensure site activities are appropriately authorised as detailed in Section 4.

January 2016 Amendment

This licence amendment was to update the requirement that the proponent shall cover tyres at the end of each working day. As there are few tyres each day, the proponent found this impractical. The proponent's method involves the following:

- Tyres are placed flat in the area, spaced at least 100mm from each other;
- Once the area is completely filled with tyres (<200) it is covered with a minimum of 500mm of material;
- The area is filled until it can be levelled to produce a new disposal area; and
- Tyres are then placed on the area spaced at least 100mm from each other and the process is repeated.

The facility becomes full once 200 tyres are deposited, and is then covered on average every 6 – 8 months.

September 2016 Amendment

The licence was amended to include construction conditions for the TSF2 and TSF3 lifts (TSF 2 & 3), which will not affect the premises production or design capacity. The surface water and groundwater monitoring network was aligned. Redundant conditions were also removed; DER considers these conditions unclear, not risk based and unenforceable.

The main emissions from the Premises are the discharge of tailings into tailings storage facilities, irrigation of treated wastewater to land, noise and dust. A separation distance of 38 km exists between the operation and the nearest sensitive premises.

During this amendment the licence was transferred from Northern Star Resources Ltd to Billabong Gold Pty Ltd.

Section 4 below details and justifies the licence conditions and changes.

4 Decision table

All applications are assessed in line with the *Environmental Protection Act 1986*, the *Environmental Protection Regulations 1987* and the 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**
General conditions	L1.2.1 – L1.2.2	Generic changes have been made to the General Conditions of this Licence as part of Departmental reform and updates to licence templates. These changes include removing conditions referencing the Code of Practice for the Storage and handling of dangerous goods. The General conditions will be reassessed at the next amendment to ensure they align with DER's reform process. During the September 2016 amendment redundant conditions have been removed. Removal of conditions is discussed in Appendix D.	General provisions of the *Environmental Protection Act 1986.* *Environmental Protection (Unauthorised Discharges) Regulations 2004.* Regulatory principles. *Environmental Protection Act 1986, Part V*; Effective and efficient regulation. Department of Environment Regulation. July 2015.
Premises operation	L1.3.1 L1.3.2 – L1.3.3	Minor changes to Table 1.3.1 were made as part of the December 2015 amendment to ensure that the overall waste acceptance limit of 5000 tonnes per annual period was included as a condition. No other changes were made to the waste acceptance criteria or approved acceptance volume. During the September 2016 amendment, asbestos was added to Table 1.3.1. No changes were made during the December 2015 amendment to condition	General provisions of the *Environmental Protection Act 1986.* *Environmental Protection Regulations 1987*, including Part 6 –

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		L1.3.2 regarding waste processing, and condition 1.3.3 regarding landfill activities. During the January 2016 amendment to include category 57, condition 1.3.2 was modified to include the appropriate storage of tyres. Emission Description *Emission:* Fugitive emissions and dark smoke from burning tyres, as a result of fires. *Impact:* Air quality impacts as a result of increased particulate matter and amenity issues to nearby receptors, native vegetation, wildlife and safety. *Controls:* The proponent's storage method involves the following: • Tyres are placed flat in the area, spaced at least 100mm from each other; • Once the area is completely filled with tyres (<200) it is covered with a minimum of 500mm of material; • The area is filled until it can be levelled to produce a new disposal area; and • Tyres are then placed on the area spaced at least 100mm from each other and the process is repeated. Risk Assessment *Consequence*: Minor *Likelihood:* Unlikely *Risk Rating:* Moderate Regulatory Controls Condition 1.3.2 has been applied to the Licence to ensure that tyres are stored appropriately. Residual Risk *Consequence*: Minor *Likelihood:* Rare	Tyres. *Environmental Protection (Unauthorised Discharges) Regulations 2004.*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Residual Risk Rating: Low During the September 2016 amendment, cover requirements for asbestos were added to Table 1.3.3 to ensure appropriate coverage of this material, as during the site's inspection it was noted that asbestos was being deposed of at the landfill. Groundwater varies onsite from 12 – 45 metres below ground level.	
	L1.3.4	During the December 2015 amendment cover requirements were updated in condition 1.3.4 to ensure all approved waste types have specified cover requirements. Table 1.3.3 was updated to cover tyres once 200 have been stored and with 500mm material to be in line with Part 6 – Tyres of the *Environmental Protection Regulations 1987.*	
	L1.3.5	Condition 1.3.5 ensures that windblown waste is recovered to prevent litter.	
	L1.3.6	Old condition 1.3.6 that required the Licensee to ensure that no waste is burnt at the premises except for the purpose of emergency response training was removed during the September 2016 amendment as the *Environmental Protection (Unauthorised Discharges) Regulations 2004* cover this. Condition 1.3.6 identifies the authorised tailings discharge and wastewater treatment locations.	
	1.3.7	Condition 1.3.7 requires adequate freeboard, stormwater diversion around the TSFs and seepage recovery. This reduces the risk of potential overflows, fresh stormwater ingression to the TSF working areas and becoming contaminated and ensures that seepage is recovered.	
	L1.3.8	<u>Emission Description</u> *Emission:* Discharge of untreated or partially treated effluent due to overtopping of wastewater treatment ponds, seepage from the base of ponds or accidental spillage.	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Impact: Potential for localised contamination of surrounding soils (including groundwater) and stormwater. *Controls:* The wastewater treatment ponds are lined with High-density polyethylene (HDPE), maintained and protected from stormwater by bunding. <u>Risk Assessment</u> *Consequence*: Minor *Likelihood:* Unlikely *Risk Rating:* Moderate <u>Regulatory Controls</u> Condition 1.3.8 has been applied to the Licence to ensure that overtopping of the ponds does not occur and that the integrity of the containment infrastructure is maintained including ensuring vegetation does not cause damage to the ponds. <u>Residual Risk</u> *Consequence*: Minor *Likelihood:* Rare *Residual Risk Rating:* Low	
	L1.3.9	L1.3.9 requires pipeline controls to ensure that environmentally hazardous materials are prevented from entering the environment.	
	L1.3.10	Condition 1.3.10 has been added to the Licence to ensure that approved production or design capacity for each category that is not specified in Table 1.3.1 is not exceeded. The landfill requirements have been added during the January 2016 amendment.	
	L1.3.11 - 1.3.12	Construction requirements have been added to Table 1.3.6 (Condition 1.3.11) for the September 2016 amendment. Condition 1.3.12 has been	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		added, requiring the Licensee to operate the TSF2 & 3 lifts in accordance with the conditions of this Licence, following submission of the compliance document. DER's assessment and decision making for TSF2 & 3 lifts are detailed in Appendix C.	
Emissions general	L2.1.1	Descriptive and numerical limits are set through conditions 2.2.1, 2.3.1 and 2.4.1 of the Licence and therefore a condition regarding recording and investigation of exceedances of limits is included in the Licence.	General provisions of the *Environmental Protection Act 1986.*
Point source emissions to air including monitoring	L2.2.1	**Normal Operation** <u>Emission Description</u> *Emission:* Point source emissions to air from the Power Station (natural gas). Off-gas released to air from carbon regeneration and from the gold room. *Impact:* Reduced local air quality above National Environmental Protection (Ambient Air Quality) Measure standards. *Controls:* The Plutonic Power Station operates on natural gas; supplied to site by a pipeline. Every 1000 hours the flue gas is analysed in order to tune the engine. This is performed using a Testo 340 Flue Gas Analyser and the engine is tuned based on NOx readings. Further details of the power generation system are provided in Appendix B. Emissions from carbon regeneration will be determined by ore composition/impurities. Point source emissions are reported annually via the National Pollutant Inventory (NPI) reporting system. The nearest sensitive premises are 38 km away. <u>Risk Assessment</u> *Consequence:* Minor *Likelihood*: Rare *Risk Rating:* Low	General provisions of the *Environmental Protection Act 1986.* *Environmental Protection (Unauthorised Discharges) Regulations 2004.*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Regulatory Controls Condition 1.2.1 requires equipment including emissions control measures to be maintained on a regular basis. Condition 2.2.1 defines authorised air emission points. No emission limits are applied as the activity has been assessed as low risk. Residual Risk *Consequence*: Minor *Likelihood:* Rare *Residual Risk Rating:* Low	
Point source emissions to surface water including monitoring	L2.3.1 and L3.2.1	**Emergency operation** Emission Description *Emission:* Discharge of water from Laterite Pit. Water comprises dewatering effluent mixed with rainfall. Laterite Pit contains elevated levels of Total Nitrogen due to mine explosives. *Impact:* Potential inundation of vegetation, changes to soil quality and infiltration to groundwater. Increased sedimentation introduced to the creek line. *Controls:* Water quality results from the Laterite pit demonstrate no exceedances when compared to ANZECC water quality guidelines for short-term irrigation and for livestock drinking water. During discharge water quality will be monitored. Discharge will only occur in emergency circumstances where high rainfall is experienced and no other water holding facilities have available capacity. Water naturally pools in the area after rainfall. The discharge point will be rock armoured to reduce erosion. The discharge point will be inspected after discharge events to monitor the effectiveness of the erosion control. Risk Assessment *Consequence*: Minor	General provisions of the *Environmental Protection Act 1986.* *Environmental Protection (Unauthorised Discharges) Regulations 2004.* *National Water Quality Management Strategy. Australian and New Zealand Guidelines for Fresh and Marine Water Quality Volume 1. The Guidelines. October 2000.*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		Likelihood: Unlikely *Risk Rating:* Moderate <u>Regulatory Controls</u> Condition 2.3.1 has been applied to ensure that discharge only occurs at the discharge point W1 and with the specified controls. Condition 3.2.1 ensures that when discharge occurs, volumes and water quality are monitored and recorded. Additional parameters were included to align with the parameters for groundwater monitoring to ensure these are also being sampled for, to understand the source of contamination, should these be detected in groundwater. It should also be noted that Laterite pit samples have returned readings in the vicinity of 80mg/L for Total Nitrogen. This is likely to be due to mine explosives being used in the area. This parameter has been included on the licence and Total Phosphorus has also been included to ensure it is limiting to reduce eutrophication risks. Groundwater varies onsite from 12 – 45 metres below ground level and Total Nitrogen has been added to the ambient groundwater monitoring section of the licence to ensure this is monitored to detect issues early. <u>Residual Risk</u> *Consequence*: Minor *Likelihood:* Unlikely *Risk Rating:* Moderate	
Point source emissions to groundwater including monitoring	L – no conditions	There are no point source emissions to groundwater from the premises that require regulation through this section. Note: The proponent previously operated in-pit TSF's at Plutonic however these facilities are no longer used.	General provisions of the *Environmental Protection Act 1986.* *Environmental Protection (Unauthorised Discharges) Regulation*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			2004.
Emissions to land including monitoring	L2.4.1 and L3.3.1	Emissions to land were not reassessed as part of the licence reissue in 2014. The previous licence did not impose any conditions for emissions to land including monitoring. However, treated wastewater is used to irrigate land and therefore this was reassessed during the December 2015 amendment. **Normal operation** Emission Description *Emission:* Treated wastewater applied to land potentially containing elevated nutrients, BOD and *E.coli*. *Impact:* Impacts may occur to the irrigation area such as waterlogging, negative affects to vegetation health, increased weed growth and increased nutrient loadings. *Controls:* The irrigation area is a rehabilitated area on a remote waste rock dump with no potential for the treated waste water to enter surface water systems. The Zone 550 Waste dump where irrigation occurs has a high fines fraction within the waste rock and therefore has a high absorption capacity for water. The emerging vegetation will benefit from the nutrients contained in the treated wastewater. Risk Assessment *Consequence*: Minor *Likelihood:* Rare *Risk Rating:* Low Regulatory Controls Condition 2.4.1 ensures that the proponent is authorised to discharge treated wastewater to land at the authorised discharge point L1. Condition 3.3.1 ensures that water quality is monitored to track plant performance and	*Environmental Protection (Unauthorised Discharges) Regulations 2004.* General provisions of the *Environmental Protection Act 1986.*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		ensures that irrigation water quality is monitored so that corrective actions can be implemented if required. No emission limits are applied as the activity has been assessed as low risk. Residual Risk *Consequence*: Minor *Likelihood:* Rare *Residual Risk Rating:* Low	
Fugitive emissions	L – no conditions	**Normal Operation** Emission Description *Emission:* Fugitive dust may result from the daily operation of Plutonic Gold Mine where sources of dust can be attributed to stockpiles, materials handling and crushing, decommissioned tailings storage facilities and vehicle movements on dirt roads. The TSF2 & 3 lifts have the potential to generate dust from movement of materials. *Impact:* Dust emissions can be harmful to human health and the environment. Elevated total suspended particulates (TSP) can impact ambient environmental quality resulting in amenity impacts and can smother vegetation. *Controls:* the proponent implements a series of dust control measures including dust suppressants and reticulation. The nearest sensitive premises is 38 km away. Risk Assessment *Consequence:* Insignificant *Likelihood:* Unlikely *Risk Rating:* Low Regulatory Controls The *Environmental Protection (Unauthorised Discharges) Regulations 2004* apply, and no further regulatory control is required. The previous licence did	*Environmental Protection (Unauthorised Discharges) Regulations 2004.* General provisions of the *Environmental Protection Act 1986.*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		not impose any conditions for the control of fugitive dust emissions. <u>Residual Risk</u> *Consequence:* Insignificant *Likelihood:* Unlikely *Residual Risk Rating:* Low	
Odour	L – no conditions	Odour is not anticipated to be an issue associated with operation of the Plutonic Gold Mine. The nearest sensitive premises is 38 km away. The proponent is required to comply with the *Environmental Protection (Unauthorised Discharges) Regulations 2004* and no further regulatory controls are applied in the Licence.	*Environmental Protection (Unauthorised Discharges) Regulations 2004.*
Noise	L – no conditions	The proponent is required to comply with the *Environmental Protection (Noise) Regulations 1997* and therefore no further regulatory controls are applied in the Licence.	*Environmental Protection (Noise) Regulations 1997*
Monitoring general	L3.1.1 - L3.1.2	Since in-field non-NATA accredited analysis has been authorised for pH measurements, condition 3.1.2 has been added to ensure that field equipment is calibrated in accordance with manufacturer's specifications.	N/A
Monitoring of inputs and outputs	L3.4.1	Condition 3.4.1 specifies that waste volumes are estimated both of inputs to the landfill, and any waste rejected from the premises. This is a standard addition.	Landfill Waste Classification and Waste Definitions 1996 published by the Chief Executive Officer of the Department of Environment Regulation as amended from time to time.
Process monitoring	L – no conditions	No process monitoring is specified in this Licence.	General provisions of the *Environmental*

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
			Protection Act 1986.
Ambient quality monitoring	L3.5.1	**Normal operation** Emission Description *Emission:* Tailings held in TSF's are a waste product from processing and may contain heavy metals, cyanide and accumulation of soluble salts. Seepage from the TSF's into groundwater may occur over time as tailings are deposited. *Impact: S*oluble salts, cyanide, metals and metalloids derived from tailings deposition may impact the quality of groundwater causing adverse effects to groundwater dependant ecosystems and other groundwater users. Depth to groundwater is approximately >14m at the Piranha monitoring bores and > 9m at the trout monitoring bores. *Controls:* The Licensee utilises the following controls: • Maximising water return to process plant; and • Installation of monitoring bores to record standing water levels and water quality. Risk Assessment *Consequence:* Minor *Likelihood*: Possible *Risk Rating:* Moderate Regulatory Controls Condition 3.5.1 is included in the licence requiring the Licensee to monitor ambient groundwater quality around the TSFs on a quarterly basis. The results are then compared against previous year's results, and report the results through the Annual Environmental Report (AER). Target values have been removed from the Licence under the December 2015 amendment but	General provisions of the *Environmental Protection Act 1986.* Plutonic gold Mine. Annual Environmental Report January – December 2014. Published March 2015.

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		may still be used as an internal management tool by the proponent (for example in a Groundwater Management Plan) to ensure that Licence limits are not exceeded. Licence limits are set for: • Standing Water Level, which should be maintained at depths greater than 7m below ground level (compared to a former Licence target of 9m) to prevent impacts to vegetation and soils; • WAD cyanide in groundwater of less than 0.8 mg/L (compared to the former Licence target of 0.5 mg/L) based on reference to the DER publication "*Assessment and management of contaminated sites, contaminated sites guidelines, December 2014*"; and • Arsenic (<0.5 mg/L), Copper (<1.0 mg/L), and Nickel (<1.0 mg/L) which are consistent with the former Licence targets but, based on assessment of groundwater data from the relevant bores between 2012 – 2015, are considered appropriate limits. Further groundwater information is given in Appendix A. During the September 2016 amendment the monitoring suite was updated to include additional metals/metalloids for monitoring at gold mines as these may also be of concern, and to ensure that all bores are monitored for relevant parameters. Additional parameters were also included to align with the parameters for surface water discharge. It has been noted that there is elevated readings of Total Nitrogen in the Laterite Pit. Monitoring bore TD1-5 is the closest to the Laterite Pit to monitor for groundwater quality. Total Nitrogen has been added to the monitoring suite for all bores. <u>Residual Risk</u> *Consequence:* Moderate *Likelihood*: Unlikely *Risk Rating:* Moderate	

DECISION TABLE			
Works Approval / Licence section	**Condition number W = Works Approval L= Licence**	**Justification (including risk description & decision methodology where relevant)**	**Reference documents**
		In addition, Table 3.5.2 has been added to ensure that quarterly photographic vegetation monitoring occurs at the W1 discharge point.	
Meteorological monitoring	L – no conditions	No meteorological monitoring is specified in this Licence.	N/A
Improvements	L4.1.1	Condition 4.1.1, old condition IR1, was added to the Licence to assess the longer-term options in relation to water containment infrastructure and discharge on site. Emergency discharge at point W1 was previously authorised by the DER twice (February 2011 and January 2012) before being authorised on the Licence under the December 2015 amendment. Condition 4.1.1 also ensures that the environmental impacts of discharge at point W1 are assessed. This condition has been removed as the report was provided to DER by the due date. The report requires further assessment and additional improvement conditions, which may be implemented to address the site water balance at a later date. WAD Cyanide levels at PMB56 are elevated when compared to other groundwater monitoring bores. The Licensee has also declared that there is potential that cyanide is being transported from the TSF to the groundwater via seepage, as the facility is not lined. Due to the risks of contamination identified, DER considers it necessary that additional measures be investigated, these have been added to the licence via improvement conditions. An improvement condition (new conditions IR1) has been added to the licence requiring the Licensee to provide management recommendations and commitments including those for seepage, with associated timeframes for completion (inclusive of all inactive TSFs onsite) following: 1. A review of the Hydrogeological Review conducted by WorleyParsons, dated 16 October 2012, which recommended the capping of the Perch Pit TSF; and 2. A review of current and historic groundwater monitoring data for the	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**
		premises. A second improvement condition (new condition IR2) requiring the development of groundwater quality limit values for Aluminium, Antimony, Boron, Cadmium, Chromium, Cobalt, Fluoride, Iron, Lead, Manganese, Mercury, Molybdenum, Selenium, Sulphate, Thallium, Total Nitrogen, Total Phosphorus, Uranium and Zinc using baseline water quality results and in the context of Australian freshwater guidelines. These limits should be used to evaluate water quality results and to guide management of groundwater resources onsite. Following the above information being provided, DER will conduct a review of the licence and be able to determine how and if, the risks identified are being appropriately managed.	
Information	L5.1.1 – L5.1.3 L5.2.1 – L5.2.2 L5.3.1	Updates to L5.2.1 made under the December 2015 amendment are to reflect the current Licence. Correction to L5.2.2 made under the December 2015 amendment. Notifications (Table 5.3.1) have been updated to add a notification requirement for production ceasing or recommencing. This is a standard addition. Condition 5.3.1 has been updated to ensure appropriate compliance documentation is submitted following the completion of the works authorised under condition 1.3.11 and 1.3.12.	N/A

5 Advertisement and consultation table

Date	Event	Comments received/Notes	How comments were taken into consideration
12/11/2015	Proponent sent a copy of draft instrument	The proponent replied on 23/11/2015 and requested: • Clarification on cover requirements for tyres (Type 2 Inert Waste); • That freeboard requirements reflect the gravity feed pond system that results in a freeboard of 150mm (Pond 1), 200mm (Pond 2), 350mm (Pond 3) and 1000mm (Pond 4); and • That monitoring of waste inputs and outputs have an averaging period of monthly to reflect the contractor reporting systems currently in place at the site.	The DER addressed the comments as follows: • The DER clarified that the definition of tyre storage includes deposit, and therefore the current practice at Plutonic comprises storage. Where 100 or more tyres are stored, the proponent should apply to add *Category 57 – Used tyre storage*, to the Licence. Up to 100 tyres, no such category is required. Disposal of tyres should occur in accordance with condition 1.3.4 including cover requirements. • Specified freeboard was removed from the Licence as condition 1.3.8 includes the provision that no overtopping shall occur. Pond 4 is considered to provide sufficient freeboard for the pond system. • A monthly averaging period has been added to the monitoring of inputs and outputs to accommodate the current system on site.
7/7/2016	Proponent sent a copy of draft instrument via 21 day letter	Proponent provided comments regarding the Improvement conditions requesting time for a review of the previous Hydrogeological Review be conducted.	DER modified the Improvement conditions to reflect this.
15/9/2016	Proponent sent a copy of draft instrument via 21 day letter	No comments received.	DER confirmed with the proponent that there were no issues with transferring the licence to the new occupier during this amendment.

6. Emissions and discharges risk assessment framework

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

Existing Environment Information

Landform
The project area contains ephemeral watercourses draining towards the Gascoyne River, located approximately 70 km from site. The surrounding landscape has an overall shallow fall to the north-northeast.

Soils and Geology
Surface soils throughout the Plutonic site typically comprise thin colluvium over laterite cap rock.

The Plutonic Project is located near the south western end of the 50 km long, north east – south west Plutonic Well Greenstone Belt, which occurs in the central portion of the Marymia Inlier. The Plutonic Well Greenstone Belt is interpreted as a regional scale fold thrust belt. The generalised stratigraphic column of the Plutonic Well Greenstone Belt consists of mafic-ultramafic-BIF dominated sequence at the base, passing into mafic dominated and finally clastic sediments at the top.

Surface Water
There are no surface water bodies in the area which are maintained by groundwater flowing from fractured rock aquifers.

Groundwater
Groundwater monitoring at Plutonic since 1993 has shown groundwater quality to be significantly variable over the premises, particularly in relation to total dissolved solid (TDS) levels, which is consistent with fractured rock aquifers and confirms the highly localised nature of the aquifers at Plutonic. Table 1 below shows the variability of groundwater TDS levels at three different pits *prior to tailings deposition*. As shown, TDS varies from 14 000 mg/L near the Dogfish Pit to 480 mg/L near the Perch Pit. Indeed, the variability of groundwater quality over small spatial scales is illustrated at the Perch Pit, where TDS varies from 480 to 1750 mg/L, depending on which fracture is intersected by the monitoring bore. TDS limits have not been set under the December 2015 amendment due to the naturally variable nature of TDS in groundwater.

Table 1: Average level of total dissolved solids from in-pit tailings facilities monitoring bores prior to tailings deposition.

Pit	Bore	Total dissolved solids (mg/L)
Dogfish	DMB1	7080
Dogfish	DMB2	14 000
Dogfish	DMB3	10 220
Callop	MB1	665
Callop	MB2	815
Perch	PMB54	480
Perch	PMB56	1050
Perch	PMB58	1750

Groundwater levels recorded before dewatering commenced at the Trout, Perch, Bream and Barra pits indicate that groundwater ranged from 20 to 30 m below ground level and flowed towards the west.

Water from the trout dewatering bores was sampled in 1999 and 2000 and from the Trout pit in 2002 and 2010. The results are shown in Table 2 below.

Table 2: Groundwater quality around the Trout Pits (all units are in mg/L except for pH).

Parameter	Source			
	TDB1 (13/7/99)	TDB2 (3/2/00)	Trout Pit (24/11/02)	Trout Pit (13/9/10)
TDS	990	675	1000	742
Calcium	1	66	72	65
Copper	<0.01	<0.01	<0.01	0.002
Arsenic	<0.001	0.11	0.26	0.145
Nickel	-	-	<0.01	<0.001
Nitrate	36	48	69	39
pH	8	8.1	8.55	8.21
WAD cyanide	-	<0.01	<0.01	<0.004

The water was fresh (675–1000 mg/L TDS) at Trout, whereas it was saline (19,000 mg/L TDS, Dogfish South pit) in Catfish and Dogfish: the salinity was inversely proportional to dewatering pumping rates (and permeability). That is, the pits intersecting the most permeable rocks (Trout) have the freshest water.

The groundwater is mildly alkaline, and of a sodium chloride/sulphate type, with high magnesium, bicarbonate and nitrate concentrations, and high hardness. It generally has very low metal concentrations, but there are commonly elevated arsenic levels.

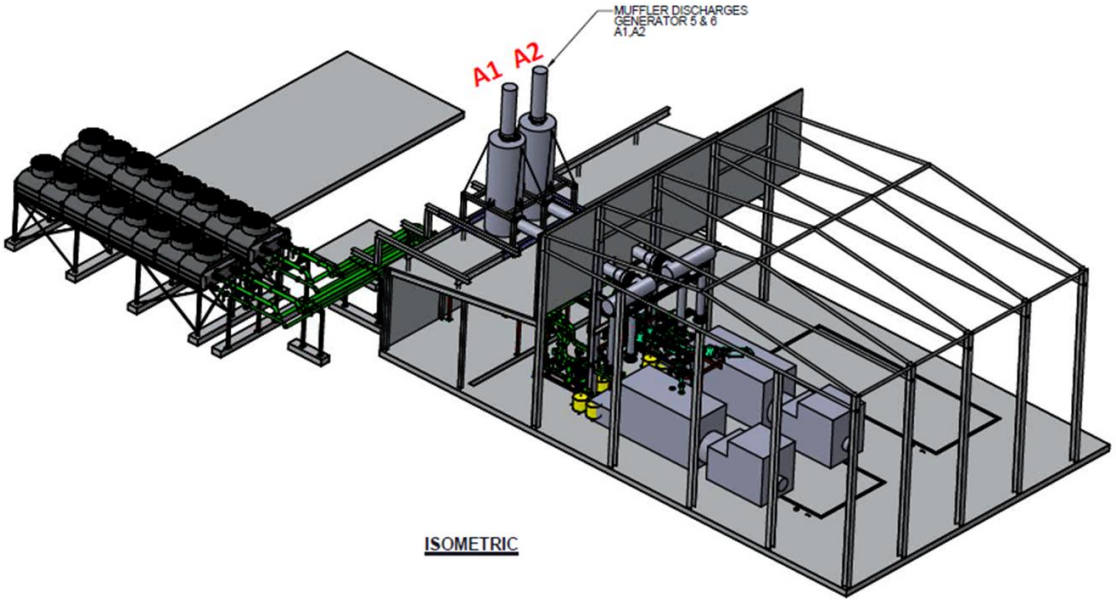
Beneficial use of groundwater

There are no groundwater dependant ecosystems or surface water bodies maintained by fractured rock aquifers. The principal use of groundwater in this area is for stock drinking water; but the nearest bores for stock use are 5.9 km from the Trout Pits.

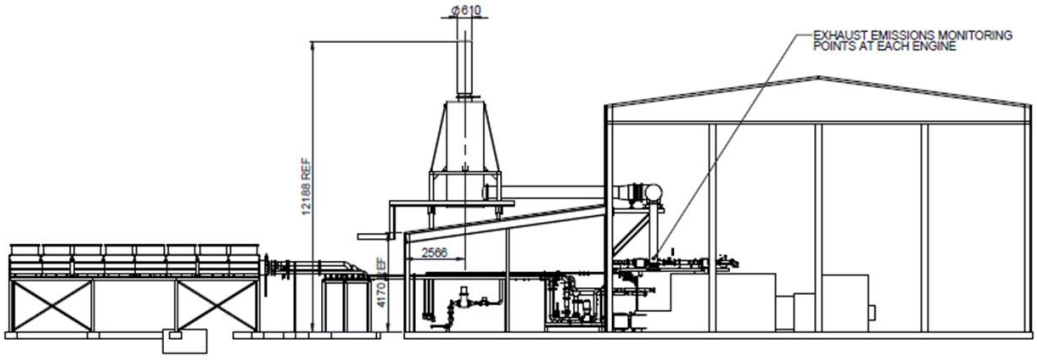
Appendix B

Plutonic Power Station (PPS)

The Plutonic Power Station operates on natural gas; supplied to site by a pipeline. The operating hours are varied on a day to day basis but are approximately 8000 hours per engine per year. A complete stack testing regime is not completed however every 1000 hours the flue gas is analysed in order to tune the engine. This is performed using a Testo 340 Flue Gas Analyser and the engine is tuned based on NOx readings.



ISOMETRIC

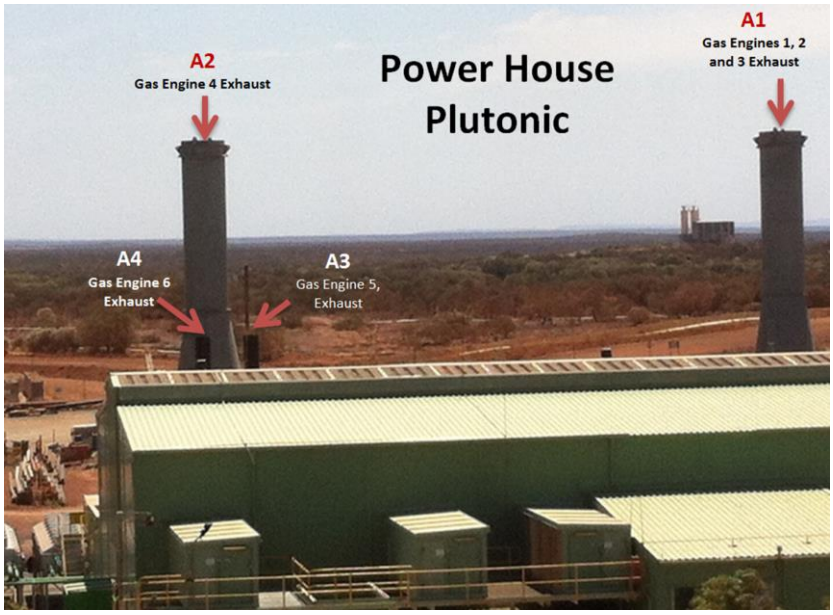


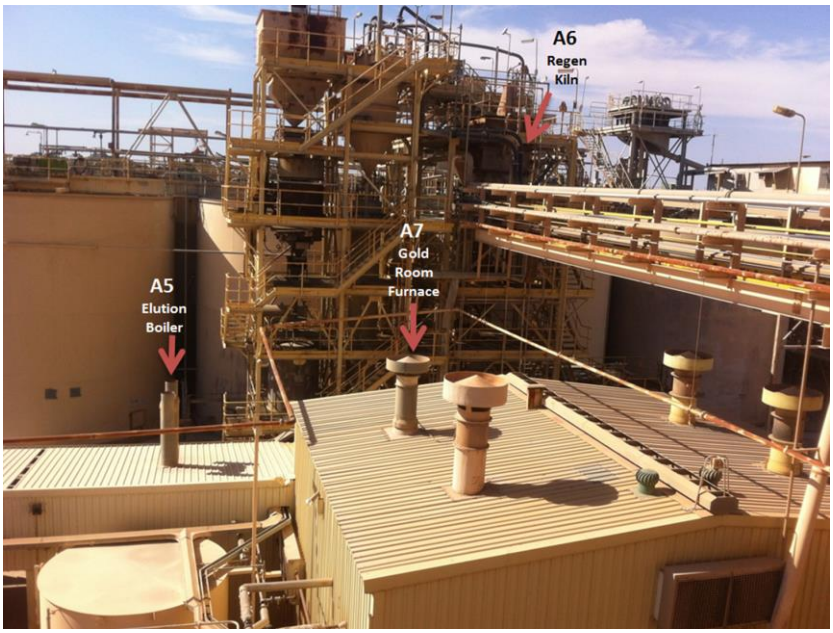
SIDE ELEVATION

	Zenith Pacific Pty Ltd 80 Fearnley Street, CAIRNS, QUEENSLAND, 4870 Ph: (07) 4051 9533 Fax: (07) 4051 9599 23 Brennan Way, Belmont, WESTERN AUSTRALIA, 6104 Ph: (08) 9477 1522 Fax: (08) 9477 1833 Email: Solutions@ZenithPacific.com.au Zenith Pacific This drawing must not be copied or reproduced in any form or used for any purpose other than originally intended without written approval of ZENITH PACIFIC		BY	DATE	TITLE NORTHERN STAR RESOURCES PLUTONIC GOLD MINE POWER STATION UPGRADE EXHAUST SYSTEM - DISCHARGE/MONITORING DETAIL
		DRAWN	G.DOHLER	02.09.2015	
		CHK'D.			
		DES'N.	ZENITH PACIFIC	02.09.2015	
		CHK'D.			
		APP'D.			
					SCALE: 1:100 | A1 | DRG. No.: NP004-DX-825 | REV.: A

In December 2014 two additional gas generators were installed in the Plutonic Power Station. These generators are rated at 3049kW each with an electrical efficiency of 41.6% each (Jenbacher JGS 620 GS-S.L). The generators were installed as the plant load has dropped in recent years as a result of decreased mining activity and the existing generators were too large to operate efficiently with the smaller demand; so the two smaller engines were installed to maintain efficiency.

Photographs of air emission points – both from energy production, carbon regeneration and gold smelting are shown below.





Appendix C

Premises Operation

Tailings Storage Facility 2 & 3 lifts
The current embankments will be raised using a 2.5m embankment lift from the present crest level of RL522.9m to RL525.4m. There will be three 2.5m embankment raises and one 1.6m raise to the final design crest of RL532.0m. The material to be used for the embankment raise will be compacted dried tailings from within TSF2 & 3.

There may be a short term increase in the water requirements and power usage onsite during the construction phase, however, no additional extractions are required.

The lifts have been approved by the Department of Mines and Petroleum.

Emission Description - Seepage
Emission: Seepage containing cyanide and metals/metalloids emitted to groundwater. There could be an increase of 13% to around 374 m^3/day or 4.3 L/sec with a 2 m lift. *Impact:* Contamination of groundwater from seepage and potential mounding. Groundwater varies onsite from 12 – 45 metres below ground level and has a TDS in the vicinity of the TSFs of 344 – 2240 mg/L in the last reporting period. There is no artificial liner for the facilities.
Controls: TSFs managed and operated in general accordance with the Operations Manual. TSFs structure and stability is regulated by DMP. Independent audits will be performed on an annual basis as a minimum, the existing piezometer and groundwater monitoring program will continue, a detailed rehabilitation /decommissioning plan will be prepared prior to decommissioning of TSF2 & 3. It is generally the pond size, depth and location that will drive any modification to seepage rates and, therefore, there will be no significant change at the site as the proponent intends to maintain the operations as outlined by the tailings operating manual.

A geochemical assessment of tailings samples indicates the solids are non-acid forming with trace sulphides and carbonates. The slurry and return water are mildly alkaline and saline. Water is removed from the TSFs via centrally located decant structure and is pumped directly to the processing plant.

Existing seepage collection trenches will be maintained for the operation of the TSF2 & 3 lifts. Review of the seepage recovery measures is performed annually for its effectiveness.

Seepage could potentially increase due to the additional storage capacity added from the lifts, however, water pond on TSF2 & 3 will be kept to a minimum. Ambient monitoring will be conducted to record standing water levels and water quality. Though it should be noted that the TSF bores currently only monitor for pH, TDS and WAD Cyanide, however, the monitoring suite has been extended as part of this amendment. Any seepage collected in downstream trenches should be pumped back to the TSF / process water dam at the plant. Installation/utilisation of recovery bores if required.

Risk Assessment
Consequence: Moderate
Likelihood: Possible
Risk Rating: Moderate

Regulatory Controls
Condition 1.3.11 ensures the TSF2 & 3 lifts are constructed to the standard specified in the design report. Condition 5.3.1 ensures that compliance documentation is submitted. Groundwater monitoring

is required by condition 3.5.1. Results to date have monitored for pH, TDS and WAD Cyanide. The most recent AERs indicate acceptable results for these parameters in the vicinity of TSF2 & 3. TD2-3 has shown higher concentrations of TDS, and WAD Cyanide was slightly higher than the other TSF bores, but dropped back to the lower level at the end of the reporting period. As part of this amendment, the suite has been extended to include additional metals/metalloids for monitoring at gold mines so this will provide a better indication of any seepage. Additional parameters were also included to align with the parameters for surface water discharge.

Residual Risk
Consequence: Moderate
Likelihood: Unlikely
Residual Risk Rating: Moderate

Emission Description - Overtopping
Emission: Tailings and decant water containing cyanide and metals/metalloids would be emitted if the TSF overtopped or failed.
Impact: Contamination of surrounding soils and surface water systems, infiltration of contaminants to groundwater with potential impact to groundwater.
Controls: TSF managed and operated in general accordance with the Operations Manual. Independent audits will be performed on an annual basis as a minimum, the existing piezometer and groundwater monitoring program will continue, a detailed rehabilitation /decommissioning plan will be prepared prior to decommissioning of TSF2 & 3.

Piezometers have remained static for several years, indicating that any seepage is via the floor of the TSFs rather than through the embankments.

Decant water pond is keep to a minimum, there is allowance for 72-hr Major 1:100 year event and operational freeboard is kept to 300mm (minimum).

Embankments are maintained via checking for signs of erosion after rainfall events, crest sloped inwards to shed water into the TSF and embankment downstream slope covered with rock armour to protect from erosion.

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

Regulatory Controls
Condition 1.3.11 ensures the TSF2 & 3 lifts are constructed to the standard specified in the design report. Condition 5.3.1 ensures that compliance documentation is submitted. Groundwater monitoring is required by condition 3.5.1.

Conditions 1.3.7 and 1.3.9 require adequate freeboard, stormwater diversion around the TSFs, seepage recovery and pipeline controls.

Residual Risk
Consequence: Moderate
Likelihood: Rare
Risk Rating: Moderate

Appendix D

Removal of Conditions

The following conditions were removed during this amendment and are discussed here as per the Director General's Instructions: Decision Document and Conditioning.

Nothing in the Licence shall be taken to authorise any emission that is not mentioned in the Licence, where the emission amounts to:
(a) pollution;
(b) unreasonable emission;
(c) discharge of waste in circumstances likely to cause pollution; or
(d) being contrary to any written law.

The above condition (old condition 1.1.5) was removed as per Operational Procedure IR-OP-02 Redundant Conditions. This condition is not valid, enforceable or risk based. This provision is not a condition. It is an explanatory statement that attempted to provide clarification of the operation of a licence.

The Licensee shall operate and maintain all pollution control and monitoring equipment to the manufacturer's specification or any relevant and effective internal management system.

The above condition (old condition 1.2.1) was removed as per Operational Procedure IR-OP-02 Redundant Conditions. This condition is not enforceable as it is not sufficiently clear or certain. It is unclear, in that:

- the "pollution control and monitoring equipment" required to be operated and maintained is not specified; and
- the maintenance schedule is not specified and is at the discretion of the licence holder though an internal management system, which is subject to a subjective test of being "effective".

The Licensee shall submit to the CEO a report detailing:
1. *An assessment of the site water-balance including:*
   a) *Dewatering rate;*
   b) *Water storage capacity;*
   c) *Water usage rate (demand/outflow rate); and*
   d) *Water storage buffer required for climatic conditions.*
2. *An assessment of the adequacy of current site water storage infrastructure.*

Environmental risk assessment of periodic discharge to W1 area.

This condition (old condition 4.1.1, IR1) has been removed as the report was provided to DER by the due date. The report requires further assessment and additional improvement conditions, which may be implemented to address the site water balance at a later date.