



Licence number	L8148/2006/4	
Licence Holder	Koolan Iron Ore Pty Ltd	
ACN	099 455 277	
Registered business address	First Floor 2 Kings Park Road WEST PERTH WA 6872	
DWER file number	DER2014/000374-1	
Duration	12 June 2014 to	17 June 2025
Date of amendment	24 July 2020	
Premises details	Koolan Iron Ore Mine and Port Facility Mining Tenements M04/416, M04/417 and L04/29 KOOLAN ISLAND (BUCCANEER ARCHIPELAGO) WA 6733 As depicted in Schedule 1.	

Prescribed premises category description (Schedule 1, <i>Environmental Protection Regulations 1987</i>)	Assessed production capacity
Category 5: Processing or beneficiation of metallic or non-metallic ore	4,000,000 tonnes per Annual Period
Category 6: Mine dewatering	5,000,000 tonnes per Annual Period
Category 12: Screening	2,000,000 tonnes per Annual Period
Category 54: Sewage facility	100 cubic metres per day
Category 58: Bulk material loading or unloading	75,000 tonnes per day
Category 64: Class II or III putrescible landfill site	4,500 tonnes per Annual Period
Category 73: Bulk storage of chemicals	1,200 cubic metres in aggregate

This licence is granted to the licence holder, subject to the attached conditions, on 24 July 2020, by:

Alana Kidd

Manager, Resource Industries

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

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Licence history

The licences and works approvals issued for the Premises since 20/06/2006 are:

Instrument log		
Instrument	Issued	Description
W4220/2006/1	20/06/2006	Works approval issued for construction of the ship loading facility on Koolan Island.
W4225/2006/1	21/08/2006	Works approval issued for construction of infrastructure including the processing plant, bulk chemical storage facility, landfill and sewage facility.
L8148/2006/1	18/06/2007	New licence application issued to allow operation of the processing plant, ship loader, bulk chemical storage facility, landfill and sewage facility.
W4315/2006/1	17/12/2007	Works approval issued for construction of the dewatering diffuser, sediment sump and associated pumps and pipework for the dewatering of Main Pit.
L8148/2006/2	18/06/2009	New Licence.
W4961/2011/1	30/06/2011	Works approval issued for construction of equipment to dewater Mullet Pit and re-use of water onsite for dust suppression and wash-down water.
W5056/2011/1	05/12/2011	Works approval issued for construction of new wastewater treatment plant and infiltration areas. Also assessed new workshop facilities to contain waste (wash down bays connected to interceptors/separators and bulk fuel storage).
L8148/2006/3	18/06/2012	New Licence.
L8148/2006/4	12/06/2014	New Licence and conversion to new format.
L8148/2006/4	18/06/2015	Licence amendment following Minister's appeal determination number 123 of 2014.
L8148/2006/4	31/03/2016	Licence amendment to include category 12 to allow for the crushing and screening of quartzite to produce aggregate for construction purposes, increase the category 73 design capacity and make changes to the groundwater monitoring requirements. The Licence also updated in accordance with licence template and relevant guidance statements.
L8148/2006/4	29/04/2016	Amendment of Licence expiry date.
L8148/2006/4	19/05/2016	Licence amendment to change the approved production limits for each Licence category to the minimum threshold amount (site in care and maintenance).
L8148/2006/4	17/02/2017	Amendment Notice 1 Licence amendment to increase the throughput for category 12.

Instrument log		
Instrument	Issued	Description
L8148/2006/4	18/10/2017	Amendment Notice 2 Licence amendment to increase the design capacity of category 6 and 64.
L8148/2006/4	12/09/2018	Amendment Notice 3 Licence amendment to increase the design capacity for category 5, 58 and 73. Site coming out of care and maintenance, operations to resume.
L8148/2006/4	19/07/2019	Amendment Notice 4 Licence amendment to revert back to Total Suspended Solids with a limit of 20 mg/L for point source emissions to surface water.
L8148/2006/4	N/A	Amendment Notice 5 Withdrawn
L8148/2006/4	19/05/2020	Amendment to consolidate Amendment Notices 1 to 5
L8148/2006/4	24/07/2020	Amendment to allow for contingency dewater discharge from emission point W1.

Interpretation

In this licence:

- (a) the words 'including', 'includes' and 'include' in conditions mean "including but not limited to", and similar, as appropriate;
- (b) where any word or phrase is given a defined meaning, any other part of speech or other grammatical form of that word or phrase has a corresponding meaning;
- (c) where tables are used in a condition, each row in a table constitutes a separate condition;
- (d) any reference to an Australian or other standard, guideline, or code of practice in this licence:
 - (i) if dated, refers to that particular version; and
 - (ii) if not dated, refers to the latest version and therefore may be subject to change over time;
- (e) unless specified otherwise, any reference to a section of an Act refers to that section of the *Environmental Protection Act 1986*; and
- (f) unless specified otherwise, all definitions are in accordance with the *Environmental Protection Act 1986*.

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

Licence conditions

1 General

1.1 Interpretation

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

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

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

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

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

'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 5667.4' means the Australian Standard AS/NZS 5667.4 *Water Quality – Sampling – Guidance on sampling from lakes, natural and man-made*;

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

'AS/NZS 5667.9' means the Australian Standard AS/NZS 5667.9 *Water Quality – Sampling – Guidance on sampling from marine waters*;

'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;

'bund' means an embankment or wall which may form part of or all of the perimeter of secondary containment infrastructure;

'CEO' means Chief Executive Officer;

'CEO' for the purposes of notification means;

Director General
Department Administering the *Environmental Protection Act 1986*
Locked Bag 10
JOONDALUP DC WA 6919
info@dwer.wa.gov.au;

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

'department' means the department established under section 35 of the *Public Sector Management Act 1994* and designated as responsible for the administration of Division 3 Part V of the EP Act;

'Irrigation Area' means the wastewater irrigation areas on the premises on which treated wastewater is discharged to land (as depicted in Schedule 1);

'Licence' means this amended Licence numbered L8148/2006/4 and issued under the Act;

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

'm³' means cubic metres;

'mg/L' means milligrams per litre;

'mL' means millilitre;

'm(AHD)' means metres in Australian Height Datum;

'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;

'Plant and equipment' means equipment, infrastructure, drainage systems and monitoring equipment associated with the authorised activities, but does not include items that have been decommissioned but are still on the premises;

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

'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 in the same year;

'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;

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

'STP dry' means standard temperature and pressure (0°Celsius and 101.325 kilopascals respectively), dry; and

'µS/cm' means microsiemens per centimetre.

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 Licence Holder shall maintain on site a register of the following Plant and Equipment:
- (a) Loading systems, including but not limited to enclosures and launder systems;
 - (b) Crushing and screening plants;
 - (c) Sediment basins;
 - (d) Secondary containment infrastructure, including but not limited to bunding and hard stand areas; and
 - (e) Dust suppression systems including but not limited to sprinklers, enclosures and water carts.

All Plant and Equipment on the register must be maintained in accordance with a documented maintenance plan or program that ensures the Plant and Equipment is maintained in good working order.

1.3 Premises operation

- 1.3.1 The Licence Holder shall only bury waste on the Premises in the following locations:
- (a) Waste Dumps 1, 2, 3 and 4; and
 - (b) Main Pit East.
- 1.3.2 The Licence Holder shall only bury waste on the Premises if:
- (a) it is of a type listed in Table 1.3.1;
 - (b) the quantity accepted is below any limit listed in Table 1.3.1; and
 - (c) it meets any specification listed in Table 1.3.1.

Table 1.3.1: Waste acceptance		
Waste	Quantity Limit	Specification
Clean fill	Combined total of up to 4,500 tonnes per Annual Period	None specified
Inert Waste Type 1		
Inert Waste Type 2		
Putrescible waste		
Special Waste Type 1 (Asbestos)		Must be wrapped in heavy duty plastic prior to acceptance
Special Waste Type 2 (Biomedical and Clinical Waste)		The Licence Holder or their representative must note in writing any discrepancies between waste declared and waste received
Contaminated Solid Waste		Must be supported by documentation that demonstrates compliance with the acceptance criteria for Class II landfills as defined in the document ' <i>Landfill Waste Classification and Waste Definitions 1996 (As amended)</i> '.

- 1.3.3 The Licence Holder shall ensure that wastes accepted onto the Premises are only subjected to the process(es) set out in Table 1.3.2 and in accordance with any process limits described in Table 1.3.2.

Table 1.3.2: Waste processing		
Waste type	Process(es)	Process Limits ^{1,2}
All	Disposal of waste by landfilling	<ul style="list-style-type: none"> Place waste within a defined trench or within an area enclosed by earthen or other bunds; Cover waste on a weekly basis with at least 150 mm of cover material; Restrict the tipping area to a maximum linear length of 30 m; The separation distance between the base of the landfill and the highest groundwater level shall not be less than 3 m; and Maintain a minimum horizontal distance of at least 100 m between the tipping area and any surface water body.
Special Waste Type 1 (Asbestos)	Receipt, handling, storage prior to or disposal by landfilling	<ul style="list-style-type: none"> Only to be disposed of into a designated asbestos disposal area within the landfill; Not to be deposited within 2 m of the final tipping surface of the landfill; and No works shall be carried out on the landfill that could lead to a release of asbestos fibres.
Special Waste Type 2 (Biomedical and Clinical Waste)	Receipt, handling and disposal by landfilling	<ul style="list-style-type: none"> Only to be disposed of into a designated biomedical waste disposal area within the landfill; Not to be deposited within 2 m of the final tipping surface of the landfill; and No works shall be carried out on the landfill that could lead to biomedical wastes being excavated or uncovered.
Contaminated Solid Waste	Receipt, handling and disposal by landfilling	None specified

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

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

1.3.4 The Licence Holder shall ensure that no ponding or surface run-off of wastewater occurs from application of wastewater to the Irrigation Area.

1.3.5 The Licence Holder shall ensure the limits specified in Table 1.3.3 are not exceeded.

Table 1.3.3 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	4,000,000 tonnes of ore per Annual Period
6	Mine dewatering	5,000,000 tonnes per Annual Period
12	Screening, etc. of material	2,000,000 tonnes per Annual Period
54	Sewage facility	100 cubic metres per day
58	Bulk material loading or unloading	75,000 tonnes per day
64	Class II or III putrescible landfill site	4,500 tonnes per Annual Period
73	Bulk storage of chemicals	1,200 cubic metres in aggregate

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

2 Emissions

2.1 General

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

2.2 Point source emissions to surface water

2.2.1 The Licence Holder shall ensure that where waste is emitted to surface water from the emission points in Table 2.2.1, it is done so in accordance with the conditions of this Licence.

Table 2.2.1: Emission points to surface water		
Emission point ¹	Description	Source including abatement
W1	Main Pit Dewatering Discharge Point	Mine dewater discharged from the settlement pond to the ocean via an ocean discharge diffuser
W1a	Main Pit Contingency Dewatering Discharge Point (Contingency Dewatering Only)	Mine dewater discharged to the ocean via an ocean discharge diffuser
W2	Main Pit Dewatering Discharge Point (Contingency Dewatering Only)	Mine dewater via ocean outlet
W3	Main Pit Dewatering Discharge Point (Contingency Dewatering Only)	
W4	Mullet Pit Dewatering Discharge Point	Mullet Pit mine dewater discharged from Mullet Pit settlement basin to the ocean

Note 1: Location of emission points shown in Schedule 1, Map of emission points.

2.2.2 The Licence Holder shall only conduct contingency dewatering discharge in the event that reuse, in pit disposal and temporary storage are not available or have been exhausted.

2.2.3 The Licence Holder shall not cause or allow point source emissions to surface water greater than the limits listed in Table 2.2.2.

Table 2.2.2: Point source emission limits to surface water				
Emission point ¹	Parameter	Limit (including units)	Averaging period	Frequency
W1 W2 W3 W4	Total Recoverable Hydrocarbons	15 mg/L	Spot sample	Monthly
	Total Suspended Solids	20 mg/L		Daily

Note 1: Location of emission points shown in Schedule 1, Map of emission points.

2.3 Emissions to land

2.3.1 The Licence Holder shall ensure that where waste is emitted to land from the emission points in Table 2.3.1, it is done so in accordance with the conditions of this Licence.

Table 2.3.1: Emissions to land		
Emission point ¹	Description	Source including abatement
L1	Irrigation Area 1 – 0.7 hectare	Treated effluent from the premises wastewater treatment system
L2	Irrigation Area 2 – 2.5 hectare	Treated effluent from the premises wastewater treatment system
L3	Turkeys Nest Dam at workshop	Treated water from workshop oil water separator discharged from Turkeys Nest overflow pipe.

Note 1: Location of emission points shown in Schedule 1, Map of emission points.

2.3.2 The Licence Holder shall not cause or allow point source emissions to land greater than the limits listed in Table 2.3.2.

Table 2.3.2: Emission limits to land			
Emission point ¹	Parameter	Limit (including units)	Averaging period
L3	Total Recoverable Hydrocarbons	15 mg/L	Spot sample

Note 1: Location of emission points shown in Schedule 1, Map of emission points.

3 Monitoring

3.1 General monitoring

3.1.1 The Licence Holder shall ensure that:

- (a) all water sampling is conducted in accordance with AS/NZS 5667.1;
- (b) all wastewater sampling is conducted in accordance with AS/NZS 5667.10;
- (c) all surface water sampling is conducted in accordance with AS/NZS 5667.4, AS/NZS 5667.6 or AS/NZS 5667.9 as relevant;
- (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 laboratory samples are submitted to and tested by a laboratory with current NATA accreditation for the parameters being measured unless indicated otherwise in the relevant table.

3.1.2 The Licence Holder shall ensure that:

- (a) daily monitoring is undertaken at least 8 out of every 10 consecutive days;
- (b) monthly monitoring is undertaken at least 15 days apart; and
- (c) quarterly monitoring is undertaken at least 45 days apart.

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

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

3.2 Monitoring of point source emissions to surface water

3.2.1 The Licence Holder shall undertake the monitoring in Table 3.2.1 according to the specifications in Table 3.2.1.

Table 3.2.1: Monitoring of point source emissions to surface water				
Monitoring point ¹	Parameter	Units	Frequency	Analytical Specifications
M12 M12a	Volumetric flow rate	m ³	Monthly	Flow meter
M13 M14 M15	Volumetric flow rate	m ³	Monthly	Estimate
M12 M12a M13 M14 M15	Total Suspended Solids	mg/L	Daily (during discharge)	Analysis in premises onsite laboratory in accordance with laboratory procedure specified in Schedule 3
M12 M13 M14 M15	Total Recoverable Hydrocarbons	mg/L	Monthly	NATA Accredited Laboratory

Note 1: Location of monitoring points shown in Schedule 1, Map of monitoring points.

3.3 Monitoring of emissions to land

3.3.1 The Licence Holder shall undertake the monitoring in Table 3.3.1 according to the specifications in Table 3.3.1.

Table 3.3.1: Monitoring of emissions to land			
Monitoring point ¹	Parameter	Units	Frequency
M11	Volumetric flow rate ²	m ³	Monthly
M11	Biochemical Oxygen Demand	mg/L	Quarterly
M11	Total Dissolved Solids	mg/L	
M11	pH ¹		
M11	Total Nitrogen	mg/L	
M11	Total Phosphorus	mg/L	
M11	<i>E. coli</i>	Organisms / 100mL	
M16	Total Recoverable Hydrocarbons	mg/L	

Note 1: Location of monitoring points shown in Schedule 1, Map of monitoring points.

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

3.4 Ambient environmental quality monitoring

3.4.1 The Licence Holder shall undertake the monitoring in Table 3.4.1 according to the specifications in Table 3.4.1.

Table 3.4.1: Monitoring of ambient groundwater quality				
Monitoring point ¹	Parameter	Units	Averaging period	Frequency
M1	Standing water level ²	m(AHD)	Spot sample	Annually
M3	pH ²			
M4	Electrical conductivity ²	µS/cm		
M5	Total Recoverable Hydrocarbons	mg/L		
M6	Hardness (as equivalent CaCO ₃)			
M9	Total Alkalinity (as CaCO ₃)			
M10	Total Nitrogen			
	Total Phosphorus			
	Bicarbonate			
	Carbonate			
	Nitrate			
	Sulfate			
	Aluminium			
	Arsenic			
	Barium			
	Boron			
	Cadmium			
	Calcium			
	Chromium			
	Copper			
	Iron			
	Lead			
	Magnesium			
	Manganese			
	Mercury			
	Molybdenum			
	Nickel			
	Potassium			
	Selenium			
	Sodium			
	Zinc			

Note 1: Location of monitoring points shown in Schedule 1, Map of monitoring points.

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

4 Information

4.1 Records

4.1.1 All information and records required by the Licence shall:

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

- 4.1.2 The Licence Holder must submit to the CEO within 90 days after the end of the Annual Period, an Annual Audit Compliance Report indicating the extent to which the Licence Holder has complied with the conditions of this Licence for the Annual Period.
- 4.1.3 The Licence Holder shall implement a complaints management system that as a minimum records the number and details of complaints received concerning the environmental impact of the activities undertaken at the Premises and any action taken in response to the complaint.

4.2 Reporting

- 4.2.1 The Licence Holder 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 4.2.1 in the format or form specified in Table 4.2.1.

Table 4.2.1: Annual Environmental Report		
Condition or table (if relevant)	Parameter	Format or form ¹
-	Summary of any failure or malfunction of any pollution control equipment and any environmental incidents that have occurred during the annual period and any action taken	None specified
Table 2.2.1	Contingency dewatering discharge activities	CD1
Table 1.3.1 Table 1.3.3 Table 2.2.2 Table 2.3.2	Limit Exceedances	None specified
Table 3.2.1	Volumetric Flow Rate, Total Suspended Solids and Total Recoverable Hydrocarbons	WR1
Table 3.3.1	Volumetric flow rate, Biochemical Oxygen Demand, Total Dissolved Solids, pH, Total Nitrogen, Total Phosphorus, <i>E.coli</i> , Total Recoverable Hydrocarbons	LR1
Table 3.4.1	Standing water level, pH, Electrical conductivity, Total Recoverable Hydrocarbons, Hardness (as equivalent CaCO ₃), Total Alkalinity (as CaCO ₃), Total Nitrogen, Total Phosphorus, Bicarbonate, Carbonate, Nitrate, Sulfate, Aluminium, Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Mercury, Molybdenum, Nickel, Potassium, Selenium, Sodium, Zinc	GR1
Condition 4.1.2	Compliance	Annual Audit Compliance Report
Condition 4.1.3	Complaints summary	None specified

Note 1: Forms are in Schedule 2

- 4.2.2 The Licence Holder shall ensure that the Annual Environmental Report required by condition 4.2.1 also contains:
- an assessment of the information contained within the report against previous monitoring results and Licence limits; and
 - a list of any original monitoring reports submitted to the Licence Holder from third parties for the Annual Period and make these reports available on request.

- 4.2.3 The Licence Holder shall submit the information in Table 4.2.2 to the CEO according to the specifications in Table 4.2.2.

Table 4.2.2: Non-annual reporting requirements				
Condition or table (if relevant)	Parameter	Reporting period	Reporting date (after end of the reporting period)	Format or form¹
Table 2.2.2	Total Suspended Solids limit exceedances	Quarterly	28 calendar days	ET1

Note 1: Forms are in Schedule 2

4.3 Notification

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

Table 4.3.1: Notification requirements			
Condition or table	Parameter	Notification requirement¹	Format or form²
Table 1.3.1 Table 1.3.3 Table 2.2.2 Table 2.3.2	Breach of any limit specified in the Licence (exempt parameter of Total Suspended Solids from Table 2.2.2)	Part A: As soon as practicable but no later than 5pm of the next usual working day. Part B: As soon as practicable	N1
Table 2.2.1	Contingency dewatering discharge	Within 24 hours of activation of a contingency dewatering discharge activity	CD1
Table 2.2.1	Contingency dewatering discharge	Within 7 days of cessation of a contingency dewatering discharge activity	CD1

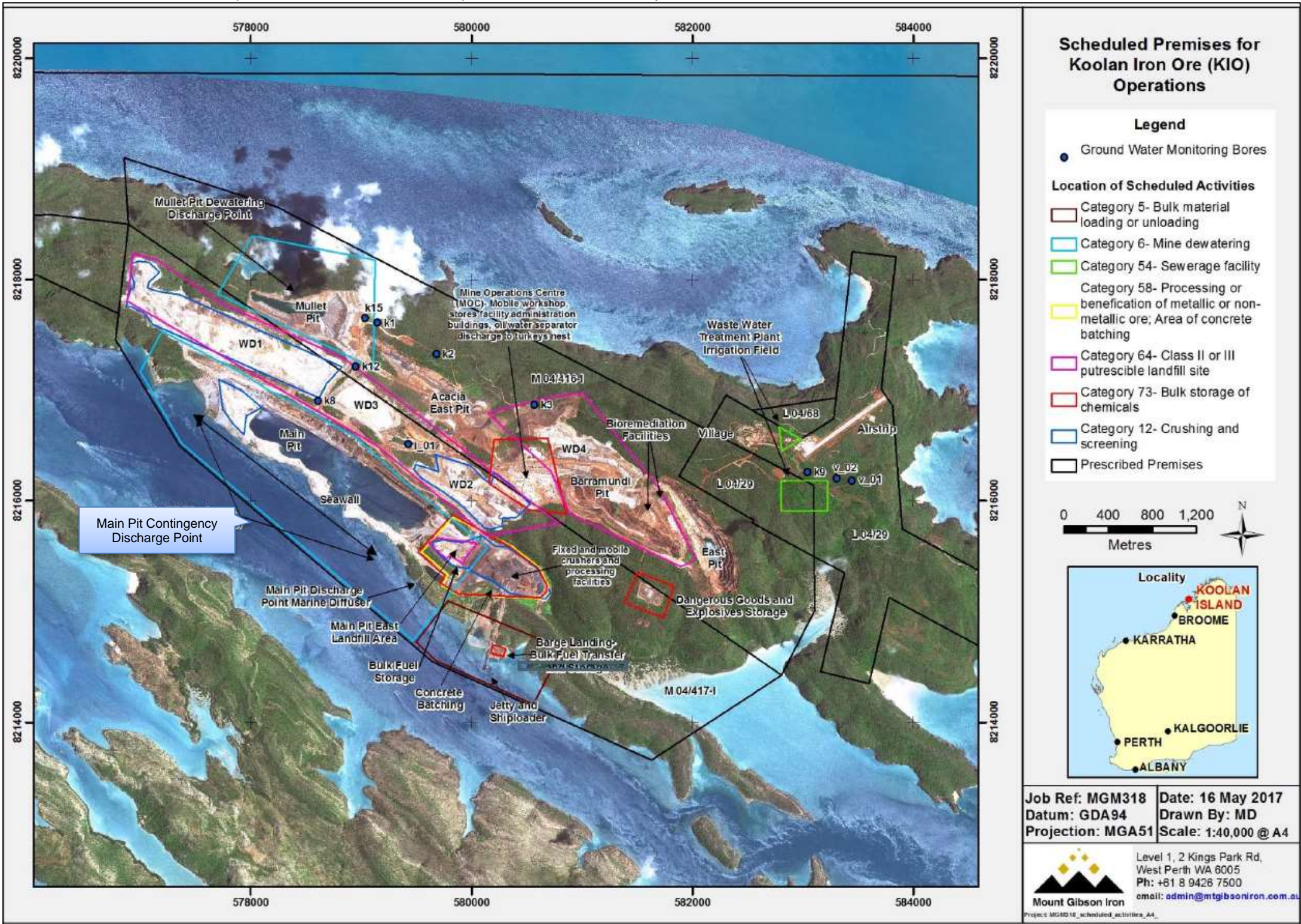
Note 1: Notification requirements in the Licence shall not negate the requirement to comply with s72 of the EP Act

Note 2: Forms are in Schedule 2

Schedule 1: Maps

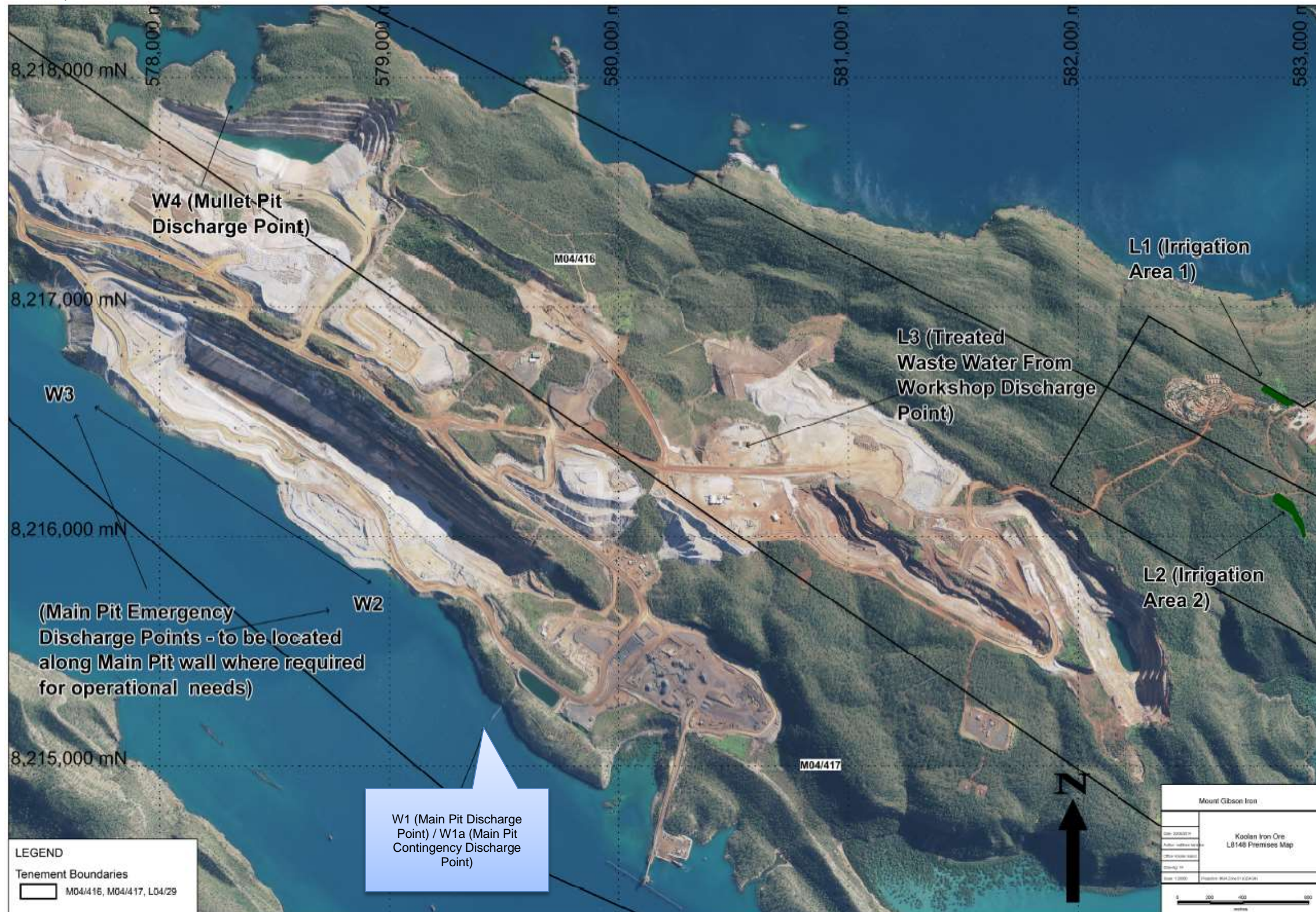
Premises map

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



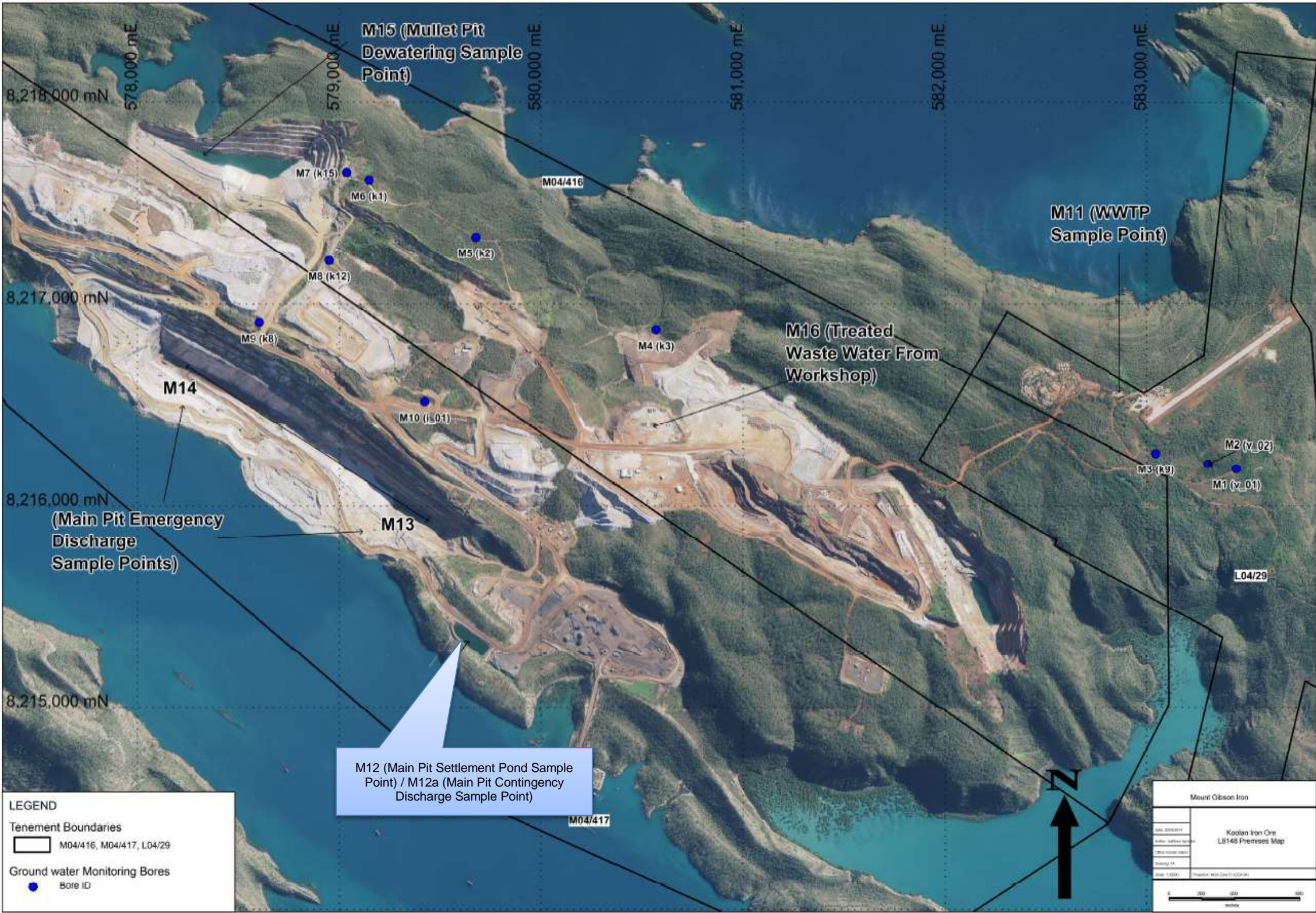
Map of emission points

The locations of the emission points defined in Tables 2.2.1 and 2.3.1 are shown below.



Map of monitoring locations

The locations of the monitoring points defined in Tables 3.2.1, 3.3.1 and 3.4.1 are shown below.



Schedule 2: Reporting & notification forms

Licence: L8148/2006/4

Licence Holder: Koolan Iron Ore 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	Limit	Result ¹	Result ¹	Averaging period	Method	Sample date & times
M12	Volumetric flow rate	-	m ³ /day	m ³ /month	Spot sample		
M12a	Volumetric flow rate	-	m ³ /day	m ³ /month	Spot sample		
M13	Volumetric flow rate	-	m ³ /day	m ³ /month	Spot sample		
M14	Volumetric flow rate	-	m ³ /day	m ³ /month	Spot sample		
M15	Volumetric flow rate	-	m ³ /day	m ³ /month	Spot sample		
M12	Total Suspended Solids	20 mg/L	mg/L		Spot sample		
M12a	Total Suspended Solids	-	mg/L		Spot sample		
M13	Total Suspended Solids	20 mg/L	mg/L		Spot sample		
M14	Total Suspended Solids	20 mg/L	mg/L		Spot sample		
M15	Total Suspended Solids	20 mg/L	mg/L		Spot sample		
M12	Total Recoverable Hydrocarbons	15 mg/L	mg/L		Spot sample		
M13	Total Recoverable Hydrocarbons	15 mg/L	mg/L		Spot sample		
M14	Total Recoverable Hydrocarbons	15 mg/L	mg/L		Spot sample		
M15	Total Recoverable Hydrocarbons	15 mg/L	mg/L		Spot sample		

Note 1: All units are referenced to STP dry

Signed on behalf of Koolan Iron Ore Pty Ltd: Date:

Licence: L8148/2006/4

Form: GR1

Name: Monitoring of ambient groundwater quality

Licence Holder: Koolan Iron Ore Pty Ltd

Period:

Form GR1: Monitoring of point source emissions to groundwater					
Emission point	Parameter	Result ¹	Averaging period	Method	Sample date & times
M1 – M10	Standing water level	m(AHD)	Spot sample		
M1 – M10	pH		Spot sample		
M1 – M10	Electrical conductivity	µS/cm	Spot sample		
M1 – M10	Total Recoverable Hydrocarbons	mg/L	Spot sample		
M1 – M10	Hardness (as equivalent CaCO ₃)	mg/L	Spot sample		
M1 – M10	Total Alkalinity (as CaCO ₃)	mg/L	Spot sample		
M1 – M10	Total Nitrogen	mg/L	Spot sample		
M1 – M10	Total Phosphorus	mg/L	Spot sample		
M1 – M10	Bicarbonate	mg/L	Spot sample		
M1 – M10	Carbonate	mg/L	Spot sample		
M1 – M10	Nitrate	mg/L	Spot sample		
M1 – M10	Sulfate	mg/L	Spot sample		
M1 – M10	Aluminium	mg/L	Spot sample		
M1 – M10	Arsenic	mg/L	Spot sample		
M1 – M10	Barium	mg/L	Spot sample		
M1 – M10	Boron	mg/L	Spot sample		
M1 – M10	Cadmium	mg/L	Spot sample		
M1 – M10	Calcium	mg/L	Spot sample		
M1 – M10	Chromium	mg/L	Spot sample		

Form GR1: Monitoring of point source emissions to groundwater					
Emission point	Parameter	Result¹	Averaging period	Method	Sample date & times
M1 – M10	Copper	mg/L	Spot sample		
M1 – M10	Iron	mg/L	Spot sample		
M1 – M10	Lead	mg/L	Spot sample		
M1 – M10	Magnesium	mg/L	Spot sample		
M1 – M10	Manganese	mg/L	Spot sample		
M1 – M10	Mercury	mg/L	Spot sample		
M1 – M10	Molybdenum	mg/L	Spot sample		
M1 – M10	Nickel	mg/L	Spot sample		
M1 – M10	Potassium	mg/L	Spot sample		
M1 – M10	Selenium	mg/L	Spot sample		
M1 – M10	Sodium	mg/L	Spot sample		
M1 – M10	Zinc	mg/L	Spot sample		

Note 1: All units are referenced to STP dry

Signed on behalf of Koolan Iron Ore Pty Ltd: Date:

Licence: L8148/2006/4
 Form: LR1
 Name: Monitoring of emissions to land

Licence Holder: Koolan Iron Ore Pty Ltd
 Period:

Form LR1: Monitoring of emissions to land						
Emission point	Parameter	Limit	Result ¹	Averaging period	Method	Sample date & times
M11	Volumetric flow rate	-	m ³ /month	Spot sample		
M11	Biochemical Oxygen Demand	-	mg/L	Spot sample		
M11	Total Dissolved Solids	-	mg/L	Spot sample		
M11	pH	-		Spot sample		
M11	Total Nitrogen	-	mg/L	Spot sample		
M11	Total Phosphorus	-	mg/L	Spot sample		
M11	<i>E Coli</i>	-		Spot sample		
M16	Total Recoverable Hydrocarbons	15 mg/L	mg/L	Spot sample		

Note 1: All units are referenced to STP dry

Signed on behalf of Koolan Iron Ore Pty Ltd: Date:

Licence: L8148/2006/4
Form: ET1
Name: Total Suspended Solids limit exceedances

Licence Holder: Koolan Iron Ore Pty Ltd
Period:

Form ET1: Total Suspended Solids limit exceedances

Please provide an analysis of the limit exceedances for the month, including but not limited to:

- (a) the emission point
- (b) the root cause analysis for the exceedances;
- (c) any common or contributory factors;
- (d) a description of remedial measures taken or planned to be taken, including those taken to prevent recurrence of the exceedances;
- (e) complaints received that may have been caused by this exceedance; and
- (f) for those exceedances that may have caused complaints, meteorological details: rainfall, temperature, wind speed and wind direction, humidity.

Signed on behalf of Koolan Iron Ore Pty Ltd: Date:

Licence: L8148/2006/4
 Form: CD1
 Name: Contingency Discharge Form

Licence Holder: Koolan Iron Ore Pty Ltd
 Date of discharge:

Form CD1: Contingency Discharge					
Emission point	Discharge Commencement Date & Time	Discharge Cessation Date & Time	Total Volume Discharged	Volumetric flow rate	Total Suspended Solids levels (average of daily analysis)
			m ³	m ³ /day	mg/L
			m ³	m ³ /day	mg/L
Please provide details of the contingency discharge, including but not limited to: (a) Copies of daily results of Total Suspended Solids monitoring during discharge; (b) Other monitoring data as relevant (e.g. Visual / photographic monitoring) (c) Reason discharge required; and (d) Recorded rainfall (mm) onsite during discharge period.					

Signed on behalf of Koolan Iron Ore Pty Ltd: Date:

Licence: L8148/2006/4
Form: N1

Licence Holder: Koolan Iron Ore Pty Ltd
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 licence holder	
Date	


Schedule 3: Gravimetric Determination of Total Suspended Solids

	Minerals Geochemistry Global	Revision 0.0 Doc Type Method Document Code G_PHY13V Document Number Service Testing Issued Date 17/May/2019 Review Date 17/May/2021 Approved by Russ Calow Stuart Fryer
	Minerals	Gravimetric Determination of Total Suspended Solids

Method Origin: This method has been developed at SGS Minerals.

File / Intranet Ref: <https://sgs.sharepoint.com/sites/global-min-techgov/Tech%20Document%20Library/Geochem1/Forms/AllItems.aspx?viewpath=%2Fsites%2Fglobal-min-techgov%2FTech%20Document%20Library%2FGeochem1%2FForms%2FAllItems.aspx>

Date	Revision	Description	Reviewed By	Authorized
17/May/2019	0.0	First Edition as Global Method	L. Marjanovic, E. Matthews	M. Caverly

	Minerals Geochemistry Global	Revision 0.0 Doc Type Method Document Code G_PHY13V Document Number Service Testing Issued Date 17/May/2019 Review Date 17/May/2021 Approved by Russ Calow Stuart Fryer
Minerals	Gravimetric Determination of Total Suspended Solids	

1. SCOPE

Analyte	TSS (Total Suspended Solids)
Units	mg/L
Lower Report Limit	1
Upper Report Limit	10000
Limiting Repeatability (SLIM)	10%
Analysis Detection Limit (SLIM)	1
Statistical Detection Limit (SLIM)	2.5
Sample size	500mL to 1000mL
Matrix	Water and process solutions
Accreditation status	Refer to laboratory accreditation scope
Performance Study (PT/RR)	Internal RR, CALA

Note: * units for reporting are based on default settings and may be modified according to customer needs based on the information in section 12.

NOTE:

For process solutions less than 500mL can be used as long as the weight of the residue is more than 0.5mg.

2. SUMMARY

Total suspended solids (TSS) is the quantity of material suspended in a known volume of water that is trappable in a filter.


In this gravimetric method, it is determined by filtering the water sample, drying the residue, and reporting the weight of the dried residue as TSS.

3. RESPONSIBILITIES

The Laboratory Manager is responsible to ensure that all resources are available to meet the requirements of GQP-MIN-21 and OIMS. All Minerals Technicians are responsible for following the procedure as written.

4. OPERATIONAL INTEGRITY

This procedure raises several potential safety and health hazards. As part of the work order review and before any testing or preparation activities are performed, a lab specific risk assessment must be included in the work instructions. These documents must consider all relevant local laws, client / site safety rules and programs. They must comply with SGS OIMS Standards and the SGS Rules for Life. The following hazards are referenced in the Global Risk Assessment and must be reviewed by operational managers before job / work order commences. Supervisors must assess the risks before commencing any testing procedures and inform their line managers of any deviations or new hazards that have been identified.

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All staff must have appropriate PPE (personal protective equipment) in accordance with OIMS Standard "L2- 313 PPE", Local / Site Regulations and SGS Rules for Life / SOP's. This must include Lab Coats (preferably flame retardant), safety shoes, safety glasses, and where applicable respiratory protection.



4.1 Hazards


- Electrical shock – equipment
- Material disposal – waste regulations (e.g. all hazardous by-products)
- Slips, trips and falls – poor housekeeping
- Thermal Burns - hot, molten equipment and materials

4.2 Safety Requirements:

- Loose clothing, long hair, dangling accessories, jewelry or other similar items that are likely to be hazardous to the health or safety of an employee in a work place shall not be worn unless they are so tied, covered or otherwise secured as to prevent the hazard. Jewelry must not be worn when working around machinery that may cause entanglement.
- Perform and record any maintenance checks prior to starting equipment. The Lockout/Tagout procedure must be followed prior to any maintenance of the electrical equipment, as per HSE.
- Be aware of and take any additional precautions and containment required due to sample type (e.g. asbestos, NORM). If the work area is temporarily designated for work requiring containment, ensure containment designation is clearly posted. Specific training on the hazards and handling of silica, asbestos, NORM and arsenic must be completed prior to working with samples identified as such. Consult your Supervisor for details and training materials.
- Ensure all ventilation/fume hoods are fully operational. Fume hood draw is critical for safety, and the draw must be kept within specified values to ensure no fumes escape. Extraction systems all indicate their function differently (lights, measurement, readout). Ensure you are aware of the method for your type that indicates it is functioning properly and always check before beginning work. Generally, sashes should be kept closed while processing a sample requiring a fume hood. If fumes escape the fume hood at any time, shut the sash, step away and allow the samples to react. If fumes still escape, stop work and report to the area Supervisor. The fume hood draw is also critical to maintaining consistent analytical recovery.
- Glassware must be inspected prior to use for chipping and cracking and discarded if compromised. Cut resistant gloves are required while cleaning or washing lab glassware, handling glass pipettes, manipulating connections between lab glassware components or handling damaged lab glassware, unless a risk-assessment has been performed to determine this is unnecessary for that step.

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- Disposal of solution/solid material will only be done in a designated waste container specific for the matrix (acidic, basic, cyanide, organic, NORM, etc.). Care must be taken not to mix incompatible material.
- Wear approved PPE for the specific work area:
 - **Weighing** - must wear long pants and work shirt or coveralls or lab coat; nitrile gloves when handling samples; safety glasses, protective footwear. Respirators with appropriate cartridges must be worn when working with hazardous substances. Employees are required to complete a training program and fit test prior to working with a hazardous substance that requires a respirator. Cut resistant gloves must be worn when using safety blades to open boxes or packages.



The MSDS shall have been read and understood prior to handling any reagent.

Always follow the SGS Rules for LIFE

5. DEFINITIONS

Terminology	Definition
DI water	Deionized water, but may also refer to distilled or reverse osmosis water.
SLIM	SGS Laboratory Information Management System
Sub-sample	A sample drawn from a larger sample in order to produce a representative sample aliquot for preparation and measurement.
CAR	Corrective Action Report
CRM	Certified Reference Material. A reference material, accompanied by documentation issued by an authoritative body and providing one or more specified property value with uncertainty and traceability, using valid procedures.
IHRM	In-house Reference Material. A material, sufficiently homogeneous and stable with reference to specified properties, which has been established to be fit for its intended use in measurement, or in examination of nominal properties.


6. INTERFERENCES, LIMITATIONS AND NOTES

Suspended solids are the portion of total solids in the sample retained by a filter. The chemical and physical nature of the material in suspension, the pore size of the filter, the area and thickness of the filter mat, and the amount and physical state of the materials deposited on the filter are the principle factors affecting separation of non-filterable from filterable residue.

Note: Some clays and colloids will pass through a 2-µm filter

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Residues dried at 105°C may retain not only water of crystallization but also some mechanically occluded water. Loss of CO₂ will result in conversion of bicarbonate to carbonate. Loss of organic matter by volatilization usually is very slight at this temperature. Because removal of occluded water is marginal at 105°C, attainment of constant weight is very slow.

7. EQUIPMENT AND MATERIALS

7.1 Equipment



Refer to site equipment listing for equipment details

- 7.1.1 Analytical balance (4 decimal places)
- 7.1.2 Drying oven
- 7.1.3 Vacuum Apparatus

7.2 Materials

- 7.2.1 Dessicator
- 7.2.2 Glass fiber filter disks
- 7.2.3 Beakers, assorted
- 7.2.4 Filter funnels
- 7.2.5 Pipettes
- 7.2.6 Filtering apparatus
- 7.2.7 Graduated cylinder

8. REAGENTS


Reagent name	Traceability / Grade	Storage	Shelf Life
DI water	See water quality testing or certificate on label.	Ambient	Not applicable

9. SAMPLE COLLECTION, PRESERVATION AND HANDLING

Sample Size	>500 mL
Sample Container Requirements	Suitable container, leak proof
Pre-Treatment (sub sampling)	Samples should be well mixed to ensure a homogenous aliquot is taken
Sample Storage Conditions	Refrigerate at 5°C ± 3°C.
Holding Time	Max 7 days
Labeling	SLIM work order #, sample #

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10. PROCEDURE

10.1 Instrument set up



Ensure that daily verification of the analytical balance and laboratory oven has been performed and duly recorded in the associated logbooks. Refer to site work instructions.

10.1.1 Turn on laboratory oven and set to $105^{\circ}\text{C} \pm 5^{\circ}\text{C}$ at least one hour before use to allow temperature to stabilize.

10.2 Analysis

10.2.1 Rinse glass filter disk (wrinkle side up) with de-ionized water. Dry at $105^{\circ}\text{C} \pm 5^{\circ}\text{C}$; cool and weigh to a constant weight (B), not differing more than 0.0005g of the previous weight). Store in desiccator prior to use.

10.2.2 Assemble the filter apparatus.

10.2.3 Using forceps, place the pre-weighed filter on the filter apparatus.

10.2.4 Shake each sample vigorously, prior to pouring.

10.2.5 Use a class A graduated cylinder to measure 500mL (to maximum 1000mL) sample into the filter funnel (volume of sample may depend on sample matrix/availability; see scope)

10.2.6 Record the volume used.

10.2.7 With the vacuum on, rinse the filter funnel wall with deionized water. Allow complete drainage between each washing.

10.2.8 Remove all traces of water by continuing to apply vacuum after the water has passed through.


10.2.9 Remove the funnel then turn off the vacuum. Using forceps carefully remove the filter from the filter support.

10.2.10 Dry filter disk containing residue at $105^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for a minimum of 60 minutes, remove from the oven, and cool in the dessicator for 60 minutes.

10.2.11 Repeat the oven drying and desiccating cycle until a constant weight (weight loss $< 0.0005\text{g}$) is obtained. Record the constant weight (A).

10.3 Maintenance

For daily, routine, preventive maintenance and trouble-shooting of equipment used, refer to site work instruction.

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11. CALCULATIONS

$$\text{TSS (mg/L)} = \frac{(A - B) \times 1000000}{\text{Sample volume (mL)}}$$

Where A = Weight of filter + dried residue (g) (10.2.11)
B = Weight of filter (g) (10.2.1)

12. REPORTING

In SLIM the data is reviewed, validated and reported according to GQP-MIN-21.

Refer to site work instructions for additional requirements for approving and reporting data.


FREQUENTLY REQUESTED EQUIVALENTS FOR REPORTING

%	mg/L	µg/L	ppm	ppb
1	10,000	10,000,000	10,000	10,000,000
0.1	1000	1,000,000	1000	1,000,000
0.01	100	100,000	100	100,000
0.001	10	10,000	10	10,000
0.0001	1	1000	1	1000

13. QUALITY CONTROL

13.1 Quality Control Specifics

Material	Source of Material	Method Protocols/Frequency
Method Blank	Reagents taken through the decomposition stages	Refer to GQP-MIN-21 for the frequency of insertion of method blanks.
Solution Replicate	Customer sample taken at the weighing/volume measurement stage	Refer to GQP-MIN-21 for the frequency of insertion of pulp replicates
Reference Materials - Suspended Solids Check Solution	Suitable certified or in-house reference material at suitable concentration range of customer samples	Refer to GQP-MIN-21 for the frequency of insertion of reference materials.

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13.2 Quality Control Objectives

Material	Data Acceptance Criteria	Actions
Method Blank	The tolerance is calculated by SLIM (Refer to GQP-MIN-21)	If outside these limits then refer to GQP-MIN-21
Solution Replicate	The tolerance is calculated by SLIM (Refer to GQP-MIN-21)	If outside these limits then refer to GQP-MIN-21
Reference Materials - Suspended Solids Check Solution	The tolerance is calculated by SLIM (Refer to GQP-MIN-21)	If outside these limits then refer to GQP-MIN-21

The Supervisor or designated analyst must be informed of quality control parameter failure. Refer to GQP-MIN-21 for Laboratory QC protocols. When required, a CAR will be filed for data failure or inability to repeat the analysis and provide the customer with quality data.

13.3 Validation

The validation process tests the method performance and determines its fitness for purpose. This method is fit for purpose and the validation data and calculations are located in the validation and measurement uncertainty spreadsheet GQT-MIN-05. Refer to GQP-MIN-15 for Method Validation and Measurement Uncertainty procedure.

14. REFERENCES

14.1 Associated Documents

GQP-MIN-21: Laboratory Quality Control
GQP-MIN-15: Method validation and Measurement Uncertainty
GQT-MIN-05: Method Validation and Measurement Uncertainty Template

OI Management System Procedures:

<https://sgs.sharepoint.com/intranet/functions/oi/Pages/20180214-OIMS.aspx>

OIMS Training Manual(s):

<https://sgs.sharepoint.com/intranet/functions/oi/Pages/20180320-TrainingMaterials.aspx>

SGS Rules for Life:

<https://sgs.sharepoint.com/intranet/functions/oi/Pages/20180330-RulesforLife.aspx>

Refer to Addendum for site specific documents which may include quality procedures, work instructions, quality forms, logs and spreadsheets