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COMMISSIONING ENVIRONMENTAL MANAGEMENT PLAN
(Works Approval Compliance Plan)

REVISION CONTROL PAGE

MAIN DOCUMENT

<u>REV.</u>	<u>DATE</u>	<u>DESCRIPTION</u>	<u>COMMENTS</u>
00	03 Feb 2015	Issue for Review	
01	26 May 2015	Final Issue	General Revision. YPNPL comments included (Internal Meetings and Transmittal No. BNP-TRE-T-00705)
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03	20 Jan 2015	Final Issue	Clarifications with DER incorporated

ATTACHMENTS



<u>1</u>	<u>DESCRIPTION</u>	<u>REV.</u>
2-250-329-PRO-TRE-0142-att01	Environmental Reporting Summary	00
2-250-329-PRO-TRE-0142-att02	Supplement Brine Monitoring Prog.	00
2-250-329-PRO-TRE-0142-att03	Overview Schedule	00

TEMPLATES

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1. INTRODUCTION AND BACKGROUND

Yara Pilbara Nitrates Pty. Ltd. (hereinafter referred to as "YPNPL") is proposing to develop a Technical Ammonium Nitrate Production Facility (TANPF) with a production capacity of (circa) 350,000 TPA or 915 MTPD of Technical Ammonium Nitrate (TAN).

The TANPF is located in the King Bay/Hearson Cove Industrial Precinct on the Burrup Peninsula, approximately 13 km north-west of Karratha, Western Australia (WA).

Técnicas Reunidas S.A. (hereinafter referred to as "TRSA") has been engaged by YPNPL in the detail Engineering, Procurement and Construction (EPC) phase of the TANPF.



The TANPF is scheduled to begin operations by the first quarter 2016. Construction started in the final quarter of 2012. By January 2016, the commissioning of the process & storage systems will start with the introduction of ammonia. Please refer Attachment III for overview schedule of commissioning and start up activities

Prior to commissioning, YPNPL was granted environmental approval and licenses for the TANPF under the Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999 [1], the Part IV of the WA Environmental Protection Act 1986 [2] and the Part V of the same Act [2].

All conditions received from the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) [1], the State of WA (OEPA Ministerial Statement 870 [3] and Works Approval [4]), are managed by YPNPL through the Construction Environmental Management Plan (CEMP) [5] and its complementary plans, the MS 870 Compliance Plan [6] and this plan [7]. Refer to Table 1-1.

Table 1-1 Environmental License Conditions Summary

Regulation	Regulator	License	Environmental Compliance Plan
The Environment Protection and Biodiversity Conservation Act 1999	SEWPaC	EPBC license	Construction Environmental Management Plan (CEMP) [5]
Environment Protection Act 1999(Part V)	OEPA	Ministerial Statement 870	MS 870 Compliance Plan [6]
Environment Protection Act 1999 (Part IV)	OEPA/DER	Works Approval	Commissioning Environmental Management Plan [7]

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2. PURPOSE

This document describes the scope, objectives, roles, responsibilities, activities and procedures which are required to manage the environmental conditions from the Works Approval license [8] to prevent, monitor, manage and minimize the environmental impact associated with the emissions and discharges of significance which are to occur during the pre-commissioning, commissioning and start-up phases of the TANPF.

To meet Works Approval Conditions (WAC) and License Conditions (LIC) [8], this document provides details of the following procedures which are required for monitoring and managing emissions and discharges as follows:

- (a) how accidents or malfunctions will be managed;
- (b) start up and shut down procedures and how emissions will be managed during start up and shut down;
- (c) procedures for monitoring and managing discharges from the Clean Surface Water Ponds or Contaminated Surface Water Ponds during commissioning activities including, but not limited to:
 - I details of parameters to be included in any monitoring programs;
 - II targets and/or trigger levels for each parameter; and
 - III contingency actions to be implemented if targets and/or trigger levels are exceeded;

Note: discharges from contaminated ponds or clean ponds to the Multi User Brine Return Line (MUBRL) during commissioning activities are forbidden.
- (d) procedures for monitoring and managing discharges to the MUBRL during commissioning activities including, but not limited to:
 - I details of parameters to be included in any monitoring programs;
 - II targets and/or trigger levels for each parameter;
 - III contingency actions to be implemented if targets and/or trigger levels are exceeded; and
 - IV contingency actions to be implemented if the MUBRL is not available as a disposal option;
- (e) procedures for monitoring and managing noise emissions to ensure that the cumulative noise levels at Hearson Cove are less than 45 dB(A) and where it is not met, proposed measures to reduce noise emissions to this level together with timescales for implementing the proposed measures; and
- (f) procedures for monitoring scrubber performance to ensure that air emitted from the common stack is meeting targets.

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(g) procedures for monitoring nitric acid stack emissions to ensure that air emitted is meeting targets.

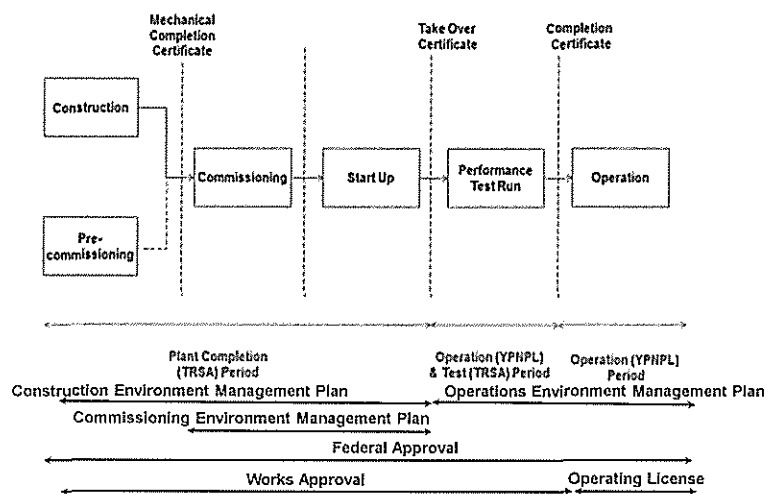
3. SCOPE



This Plan is specifically applicable to all activities and disciplines involved in the pre-commissioning and commissioning phases of the TANPF carried out by TRSA that could have an associated impact of environmental significance. It applies to all workers, management personnel, third parties or visitors entering the site.

The existing Construction Environmental Management Plan (CEMP) [5] runs concurrently with this specific Commissioning Environmental Management Plan and both remain valid for all pre-commissioning, commissioning including introduction of ammonia and start up activities. At this point, the TANPF will be formally taken over by YPNPL Team, and the Operations Environmental Management Plan will apply.

Refer to below Figure 3-1 for information on the different TANPF development stages and division of responsibilities between YPNPL and TRSA.

Figure 3-1 TANPF development stages and Responsibilities



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4. DEFINITIONS, ABBREVIATIONS AND ACRONYMS



4.1 Definitions

4.1.1 General Definitions

YPNPL	Yara Pilbara Nitrates Pty. Ltd.
TRSA	Técnicas Reunidas S.A.
PROJECT	TAN Burrup Project.
SUBCONTRACTOR	Means a third party who has entered into a subcontract with the EPC Contractor (TRSA) of Technical Ammonium Nitrate Production Facility (TANPF).

4.1.2 Specific Definitions

ACCIDENT	Unplanned event which results in injury to persons and/or damage to property, the environment, third parties or which leads to production loss.
CONDITION	Includes restriction or limitation.
ENVIRONMENTAL INCIDENT	Event causing or likely to cause harm to environment.
DANGEROUS GOODS	As per Dangerous Safety Act 2004 [9], DG means a substance or article that is: (a) prescribed by the regulations to be DG; or (b) determined by the Chief Officer under the regulations to be DG.
EMERGENCY	Event or situation, due to an actual or imminent occurrence, that endangers or threatens to endanger the safety or health of persons, destroys/damages or threatens to destroy /damage the environment or property".
LEASE AREA	The entire YPNPL leased land, including the undisturbed area and the TANPF Site.
LOCK OUT TAG OUT	Safety procedure used to ensure that dangerous machines / equipment are properly isolated and unable to operate prior to the completion of maintenance or servicing work. It requires that potential energy sources be "isolated, removed and/or rendered inoperative" before any repair procedure is started.
MULTI USER BRINE RETURN LINE	The multi-user outfall pipeline which is managed by the Water Corporation and discharges into King Bay.
SITE	The location where the plant is constructed and the vicinity there of.

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WORKS

APPROVAL



The Works Approval numbered W4701/2010/1 and issued under the Environmental Protection Act 1986.

4.2 Abbreviations & Acronyms

ALARP	As Low As Reasonably Practicable
AN	Ammonium Nitrate
BAT	Best Available Techniques
CEMP	Construction Environmental Management Plan
CEMS	Continuous Emissions Monitoring System
CEO	Chief Executive Officer of the Office of the Environmental Protection Authority
dB(A)	A-weighted Decibels
DER	Department of Environment Regulation
DG	Dangerous Goods
DoE	Department of Environment
DoA	Department of Agriculture
ERT	Emergency Response Team
FE	Fertilisers Europe
HSE	Health, Safety and Environment
JHA	Job Hazard Analysis
kg/l	kilogram/litre
g/s	grams/second
LIC	License Conditions
LOTO	Lock out tag out
NA	Nitric Acid
MUBRL	Multi User Brine Return Line
MSDS	Material Safety Data Sheet
mg/Nm ³	Milligrams per normal cubic meter
MHF	Major Hazard Facility
MTPD	Metric Ton Per Day
m ³ /s	Cubic meters per second
NATA	National Association of Testing Authorities
OEPA	Office of the Environment Protection Authority

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PFD	Process Flow Diagram
PPE	Personal Protective Equipment
P&ID	Piping and Instrument Diagram
RFC	Ready For Commissioning
RFSU	Ready For Start-Up
PM10	Particulate matter of less than 10 microns in diameter
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities Population and Communities
t	Tons
TAN	Technical Ammonium Nitrate
TANPF	Technical Ammonium Nitrate Production Facility
TRSA	Técnicas Reunidas S.A.
TSP	Total Suspended Particulates
WA	Western Australia
WAC	Works Approval Conditions
wt	Weight
YPNPL	Yara Pilbara Nitrates Proprietary Limited
YPFPL	Yara Pilbara Fertilizers Proprietary Limited

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5. REGULATORY CONTEXT

Part IV Environmental Protection Act 1986, Environmental Impact Assessment

The TANPF was referred to the Office of the Environmental Protection Authority (OEPA) and the level of assessment set at Public Environmental Review (PER) [10]. In January 2011 the OEPA released its report and recommendations on the project and Ministerial Statement 870 (MS870) was granted on 11 July 2011. Seven appeals were received in relation to the assessment of the project. Concerns raised by appellants related to cumulative air emissions and their potential impact on rock art (petroglyphs), the potential impact to heritage values, tourism, recreation and visual amenity on the Burrup Peninsula, explosion and security risks, rehabilitation, flora and plant communities, flood risk and wastewater and noise emissions.

MS 870: Condition 5-1

Condition 5-1 of MS 870 requires that YPNPL implement Best Available Technology (BAT) for controlling emissions from the Prilling Plant "common stack".

At the title of the Part IV assessment, YPNPL indicated that the TANPF would not meet air emission guidelines described in the Fertilisers Europe (FE) booklet No. 6 (formerly EFMA). YPNPL have since revised air emission estimates from the Prilling Plant "common stack" and confirmed that best practice guidelines will be met and adhered to.



MS 870: Condition 5-2

Following assessment of the proposal, the concerns were raised suggesting that the Burrup ambient airshed is approaching capacity for NO_x. Subsequently, the OEPA highlighted that the management of cumulative air quality impacts on the Burrup Peninsula is a significant issue that needs to be addressed recommending the establishment of an industry funded and managed ambient air quality strategy. Following an appeal to the conditions which relate to concerns about impact of air emissions on the environment, rock art and human health, the OEPA implemented condition 5-2 which required YPNPL to develop and implement an ambient monitoring network prior to construction. Following discussions with the OEPA and DER, it was determined that this commitment could be captured under the development of a Burrup air quality management strategy with inputs from all industry on the Burrup Peninsula. YPNPL submitted to the EPA an Air Quality Management Plan which included commitments to monitor impacts on Burrup rock art, in line with Commonwealth environmental conditions (issued by the Department for Sustainability, Environment, Water, Populations and Communities (SEWPaC) under the Environment Protection and Biodiversity Conservation Act 1999), and contribute to the Burrup air quality management strategy (rather than install separate ambient monitors). Other commitments captured under this plan include the monitoring of dust emissions during construction and operation.

The OEPA approved the plan on 18 March 2013, confirming that both condition 5-1 and 5-2 had been satisfied.

Part V Environmental Protection Act 1986, Environmental Management

The TANPF has been assessed under Category 31 of the Environmental Protection Regulations 1987 (Part V of the Act). [11]. A works approval is required to construct the facility and YPNPL are required to apply for a license prior to commencing operations.

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As part of the conditions of the Works Approval (WAC) [4], YPNPL is required to demonstrate to the Department of Environmental Regulation (DER) that appropriate management and monitoring of emissions and discharges of significance is being undertaken during the commissioning phase of the TANPF, including preparation of management plans and procedures.

Other state environmental legislation administered by DER

Environmental Protection (Unauthorized Discharges) Regulations 2004;

Environmental Protection (Controlled Waste) Regulations 2004;

Environmental Protection (Noise) Regulations 1997; and

Contaminated Sites Act 2003.

Other legislation

Dangerous Goods Safety Act 2004;

Dangerous Goods Safety (Explosives) Regulations 2007;

Dangerous Goods Safety (Storage and Handling of Non-explosives) Regulations 2007;



Occupational Safety and Health Act 1984; and

Occupational Safety and Health Regulations 1996.

The Department of Health regulates the construction and operation of sewage treatment facilities.

Rights in Water and Irrigation Act 1914: groundwater is not utilized as part of this proposal and as such no permits under the Rights in Waste and Irrigation Act 1914 are required. Potable water is provided by Water Corporation and demineralised water supplied by YPFPL.

Local Government Authority: the local government authority for this site is the Shire of Roebourne.

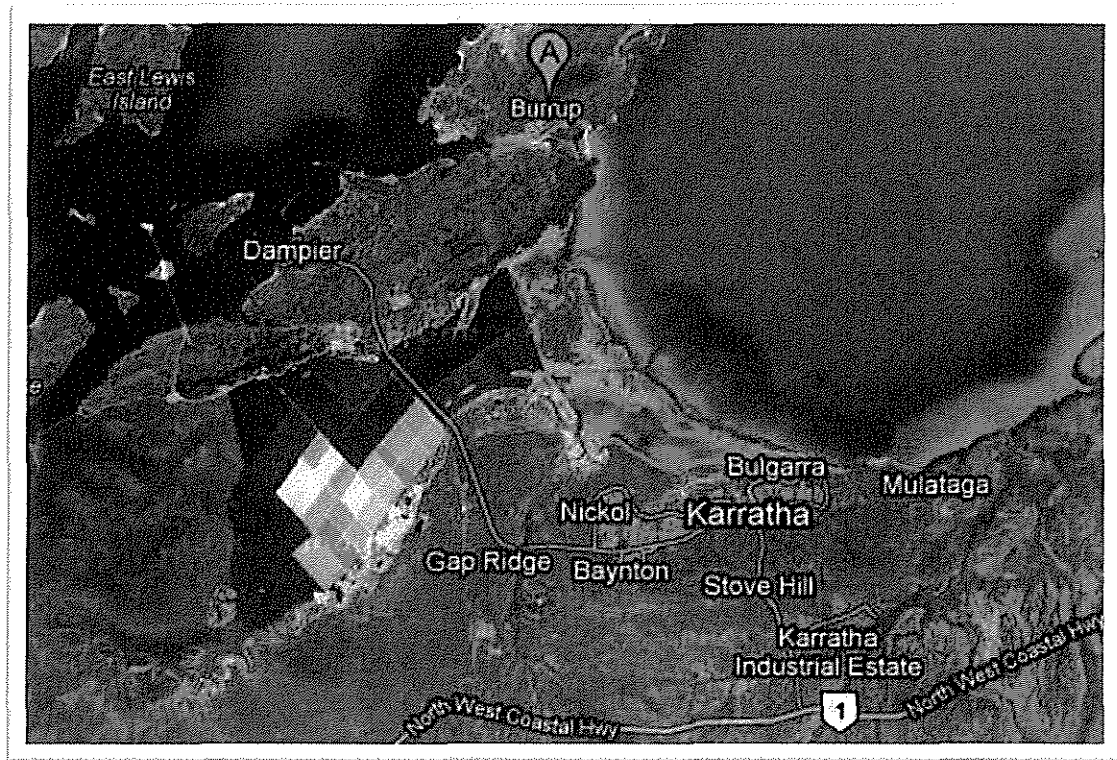
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6. TANPF DESCRIPTION AND LOCATION

6.1 Site Location

The TANPF is located in the King Bay / Hearson Cove Industrial Precinct on the Burrup Peninsula, approximately 13 km northwest of Karratha and 1,300 km north of Perth. This Precinct lies within the greater Burrup Industrial Estate (BIE). The 49 Ha TANPF Site is located adjacent to the existing YPFPL's ammonia plant, with site access from Village Road, Burrup Peninsula, Figure 6.1-1, Figure 6.1-2.

Figure 6.1-1 TANPF Location




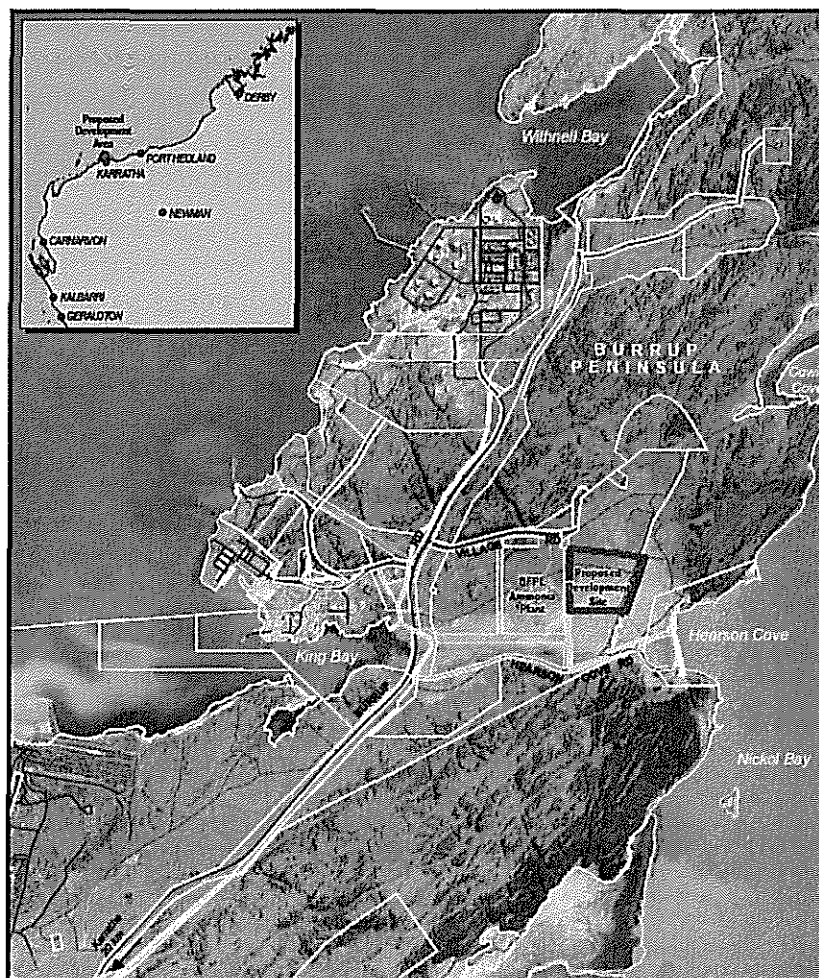
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Figure 6.1-2 Burrup Industrial Area Location




6.2 TANPF Description

YPNPL is developing the TANPF which, when completed, will produce (circa) 350,000 TPA of TAN to be sold to the local Pilbara and WA market. Feedstock for the facility will be provided by the adjacent ammonia plant operated by Yara Pilbara Fertilisers Pty Ltd (YPFPL).

TANPF's design and operation meets the requirements of the DG Storage & Handling Regulations [12] and Security Risk Substances regulations [13]. TANPF has also been designated as a Class A Major Hazard Facility (MHF) under the MHF Regulations [12]. YPNPL's DG Manifest [12] provides further information on the DGs stored and handled onsite.

The TANPF comprises of three major process units, each producing a separate product in the manufacturing process:


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- A Nitric Acid (NA) plant to convert ammonia and atmospheric air into Nitric Acid (NA). The NA unit with capacity of 760 Metric Ton Per Day (MTPD) measured as 100 % weight (wt);
- An Ammonium Nitrate (AN) Solution plant to convert ammonia and NA into AN solution. This Ammonium Nitrate wet section with capacity of 965 MTPD measured as 100 % weight (wt) in balance with nitric acid production capacity level; and
- A TAN plant to convert AN solution into TAN prills (final product). This is a dry section for production of Technical Ammonium Nitrate prills (0.7 and 0.8 kg/l density) with a capacity of 915 MTPD.

In addition to these three plants, other facilities are required as part of the project and include:

- Storage, loading and transport facilities:
 - Liquid ammonia pipeline between TANPF and YPFPL's ammonia plant;
 - Bulk loading system, bagging unit and truck loading;
 - Storage for intermediate product (nitric acid 3,000 m3) and finished products: 12,000 tons (t) bulk storage, 1,800 t storage for big bags, 500 t storage for ammonium nitrate solution;
- Required off-sites;
- Necessary infrastructure.

The main feedstock, ammonia, shall be delivered from the adjacent YPFPL ammonia plant.

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7. YPNPL'S ENVIRONMENTAL POLICY AND OBJECTIVES

7.1 Health, Safety & Environmental (HSE) Policy

YPNPL and TRSA management are both committed to designing, engineering, procuring and constructing the TANPF in a manner that is uncompromising on issues of Health, Safety and Environment (HSE), including aboriginal matters and heritage issues.

YPNPL is committed to high health, safety and environmental standards that minimize risks to people in terms of loss of life and/or body injuries, the environment, neighboring operating plant, heritage sites, rock art and adjacent communities. In line with this commitment, TRSA's Policy is to achieve TANPF execution in the best HSE conditions: incident and injury free goals.

YPNPL's HSE Policy [12] and TRSA's Policy are available upon request.

7.2 Objectives and Performance

The objectives for the Commissioning and Start- up phase of the PROJECT with regard to the management of significant emissions and discharges as defined in Works Approval [4] are summarized as follows:

- Avoid and limit impact on environment by avoiding the release of atmospheric pollutants and when avoidance is not feasible, limit or control emissions to reduce the intensity or load of their intensity to or below the target levels specified in below Table 7.2-1:

Table 7.2-1 Target Point Source Emissions

Emission point reference	Parameter	Target ¹
A1 – Common Stack (Waste Air from the prilling plant combined with cooling and drying air)	Particulates	15 mg/Nm ³
	Ammonia	10 mg/Nm ³
A2 – Nitric Acid Stack (Tail Gas from the Nitric Acid Plant)	Oxides of Nitrogen (NO _x measured as NO ₂)	102.6 mg/Nm ³
	Ammonia (NH ₃)	0.75 mg/Nm ³
	Nitrous Oxide (N ₂ O)	100 ppmv

Note 1: All units are referenced to STP

- Perform air monitoring according with specifications indicated in the following Table 7.2-2 being sampling locations in compliance with the AS4323.1 or relevant part of the Continuous Emission Monitoring System Code (CEMS Code) [13] and conducted by organisation with NATA accreditation.


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Table 7.2-2 Monitoring of Point Source Emissions to Air

Emission point reference	Parameter	Units	Frequency ^{Note 1}	Method
A1 – Common Stack (Waste Air from the prilling plant combined with cooling and drying air)	Volumetric Flow Rate	m ³ /s	One each calendar month during Commissioning of TAN unit ^{Note 2}	USEPA Method 2
	Particulates	mg/Nm ³ g/s		USEPA Method 5 or USEPA Method 17
	Ammonia (NH ₃)	mg/Nm ³ g/s		USEPA CYM 027
A2 – Nitric Acid Stack (Tail Gas from the Nitric Acid Plant)	Volumetric Flow Rate	m ³ /s	One each calendar month during Commissioning of Nitric Acid unit ^{Note 2}	CEMS
	Oxides of Nitrogen (NO _x , measured as NO ₂)	g/s mg/Nm ³		
	Ammonia (NH ₃)	g/s mg/Nm ³		
	Nitrous Oxide (N ₂ O)	g/s ppmv		
	Volumetric Flow Rate	m ³ /s		USEPA Method 2
	Oxides of Nitrogen (NO _x , measured as NO ₂)	g/s mg/Nm ³		USEPA Method 7E
	Ammonia (NH ₃)			USEP CTM 027 or ISC 401
	Nitrous Oxide (N ₂ O)	g/s ppmv		USEPA CTM 038

Note 1: Monitoring shall be undertaken to reflect normal operating conditions and any limits or conditions on inputs or production

Note 2: Emissions from stack will only occur after introduction of ammonia

- Avoid or minimise the release of other atmospheric pollutants (dust, PM10) from other sources as traffic movement on unmade roads, movement of materials, wind erosion from stockpiles) to meet the applicable ambient air quality standards;
- Maintain the quality of surface water and groundwater, within and surrounding the Site (including the surrounding supra-tidal flats and MUBRL), by minimising the potential for contamination;
- Maintain the existing quality of water resources within and surrounding the Site;
- Perform ground water quality monitoring according with specification in the following Table 7.2-3 being water samples handled and preserved in accordance with AS/NZS 5667 and conducted by organisation with NATA accreditation;


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Table 7.2-3 Ground Water Monitoring

Monitoring Point Reference	Parameter	Units	Averaging Period	Frequency
MW1, MW2, MW3, MW4 and MW5	Cations and anions (calcium, magnesium, ammonia, chloride, nitrate and total nitrogen)	mg/l	Spot sample	Six Monthly
	Total dissolved solids, total suspended solids and total alkalinity	mg/l		
	Metals, aluminium, arsenic, cadmium, chromium (III), chromium (VI), copper, iron, lead, manganese, mercury, nickel and zinc	mg/l		
	Oil and grease	mg/l		
	pH	—		

- Ensure that noise impacts emanating from the TANPF comply with noise requirements as follows:
 - Not adversely impact on the amenity of visitors to Hearson Cove and Deep Gorge (EPA's "Aspiration goal" of 45 dB(A));
 - TANPF shall meet 65 dB(A) at the boundary as per the Environmental Protection (Noise) Regulation 1997 [11];
- Minimise community complaints in relation to air, water and noise quality.

These objectives will be achieved through:

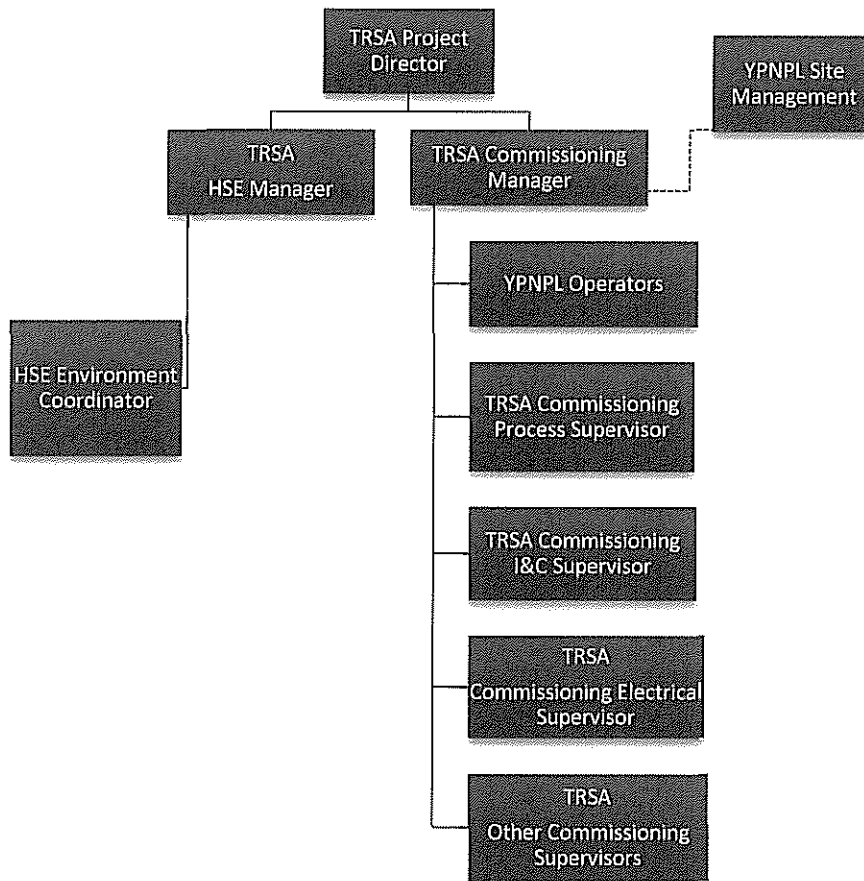
- Applying appropriate mitigation and management measures to prevent, and minimise impacts to applicable sensitive receptors;
- Implementing corrective actions if any deviation or impact to receptor is identified;
- Providing ongoing monitoring and/or sampling to allow prompt identification of any deviation, change or impact and take corrective action.


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8. ENVIRONMENTAL COMMISSIONING ROLES AND RESPONSIBILITIES

The above objectives set up to meet the environmental requirements during commissioning / start-up will be carried out by TRSA in collaboration with YPNPL by means of its TRSA Site Management Team and, in particular, of its Commissioning Manager, Commissioning Team, YPNPL's Operators and Environmental Coordinator. Refer to section 8.1.

Figure 8-1 Environmental Commissioning Organization Chart



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8.1 Responsibilities of YPNPL

As the owner and operator of the TANPF, YPNPL's environmental responsibilities include:


- Be primary liaison with environmental Australian (SEWPAC) and local authorities (OEPA, DER);
- Submit environmental permit applications, revisions and negotiating with relevant government agencies on permits and approvals, as applicable.
- Coordinate any public and agency complaints; YPNPL shall investigate the complaint and YPNPL must advise the OEPA/DER in writing of the action undertaken or proposed if required;
- Maintain a record of complaints and incidents causing serious harm to environment, and actions taken in response to the complaint or incident, and retain the record of complaints required by this condition for five (5) years;
- Carry out environmental inspections in line with its accountability to ensure conditions of the Works Approval (WAC) and License (LIC) [4] are met;
- Manage the groundwater quality monitoring to ensure conditions are complied with;
- Submit required reporting to authorities OEPA/DER;
- Notify OEPA/DER and other regulatory authorities, if applicable, of environmental incidents and maintain a record of events relating to the incident and remedial action taken; and
- Notify OEPA/DER of any activities or site changes that may require to be applied for new or amended environmental permits.

8.2 Responsibilities of TRSA

As the EPC Contractor of TANPF, TRSA is responsible for complying with its obligations set forth in the Contract, including environmental requirements and conditions, during the Engineering, Construction, Pre-Commissioning, Commissioning and Start Up phases of the TANPF. Refer below to the specific responsibilities assigned for this purpose.

TRSA's environmental responsibilities include:

- Submit environmental permit applications, revisions and negotiating with relevant government agencies on permits and approvals, as applicable.
- Support YPNPL and supply required input with regard to incidents and complaints
- Notify YPNPL in case of environmental incident or exceedance and remedial action taken.
- Provide records of environmental monitoring to YPNPL (except groundwater monitoring)

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8.2.1 Responsibilities of Project Director

The Project Director is responsible for ensuring the commitment to environment protection is evident on the TANPF and neighbourhood, workplace and amongst the workforce. He has overall responsibility for the effective implementation and administration of the Commissioning Environmental Management Plan.

8.2.2 Responsibilities of HSE Manager


HSE Manager's main responsibilities regarding environmental protection are:

- Support the Commissioning Manager and Environmental Coordinator for the correct implementation of this Construction Environmental Management Plan [5] and this complementary Commissioning Environmental Management Plan;
- Distribute to SUBCONTRACTORS the standards, procedures or any other document that may be required to organize works and reducing to a minimum the negative environmental impact;
- Develop, maintain and implement during commissioning phase until start up the Construction HSE Management Plan [14] and Construction Management Plan [5];
- Develop, maintain and implement the Emergency Management Plan [15] and Site Emergency Preparedness Procedure [16] to manage the event of an environmental emergency situation to minimise the adverse impacts to people, property and the environment from an incident occurring or impacting on site.

8.2.3 Commissioning Manager

The Commissioning Manager is responsible for the Pre-commissioning, Commissioning and Start up activities of the TANPF. In regard to this plan and having the collaboration of the assigned Commissioning team, YPNPL Operations Team and the Environmental Coordinator, the Commissioning Manager will assume the following responsibilities:

- Develop, maintain and implement the Pre-Commissioning, Mechanical Completion, Commissioning and Start-up Strategy [17] and Pre-commissioning, Mechanical Completion, Commissioning and Take Over procedure [18];
- Implement the Commissioning Environmental Management Plan;
- Planning of the Pre-commissioning, Commissioning and Start Up activities;
- Prepare work procedures and acceptance criteria for all the activities in the Pre-commissioning and Commissioning stage, taking into consideration the environmental requirements, vendor recommendations and YPNPL requirements;
- Acceptance of the systems as Ready for Commissioning and Ready for Start-up;

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- Notify YPNPL and the Site Manager, if applicable, of environmental incidents and maintain a record of events relating to the incident and remedial action taken;
- Notify YPNPL of any activities or site changes that may require YPNPL to apply for new or amended environmental permits.

8.2.4 Commissioning Team

TRSA Commissioning team shall execute the commissioning activities to bring the TANPF into a ready for start-up stage, leading and supervising through different disciplines (process, mechanical, electrical & instrument) as well as the SUBCONTRACTOR and vendor services involved in the activities required during Commissioning and Start Up until Take Over. Commissioning team is responsible for the preparation of instructions and procedures to be used for the performance of Pre-commissioning, Commissioning and Start Up activities and Operation.

TRSA Commissioning team is assisted by YPNPL operator's team. The YPNPL Commissioning team will witness activities and provide certain services.


8.2.5 Responsibilities of Environmental Coordinator

An environmental coordinator will be appointed to ensure compliance with all environmental requirements and conditions and, in particular, to:

- Prepare, implement and update this Commissioning Environmental Management Plan in coordination with the Commissioning Manager;
- Coordinate with the Commissioning Manager and the Commissioning Team the monitoring of emissions and discharges to ensure Work Approval conditions are maintained;
- Carry out inspections to check compliance with all environmental requirements;
- Follow up of all established corrective actions;
- Assist in environmental compliance assessment and reporting of the analytical results relevant to air, noise and water quality monitoring, and provide conditions of discharge (or contingency) based on the comparison to background and trigger values.

9. TANPF COMMISSIONING MANAGEMENT

This section describes the procedures and tools to be used by YPNPL and TRSA in order to implement and monitor activities in a controlled and environmentally safely manner during the Pre-commissioning, Commissioning and Start Up activities until the Take-Over of the facilities by YPNPL (Transfer of Care and Custody).

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For further information, refer to Pre-Commissioning, Mechanical Completion, Commissioning and Start-up Strategy [17] and Pre-commissioning, Mechanical Completion, Commissioning and Take Over procedure [18].

9.1 Latter stage of Construction / Pre-commissioning Phase

Mechanical Completion is defined as the last stage of construction when equipment or a system and material items are fabricated, erected, aligned and finally installed according to relevant drawings and specifications. All specified tests and inspections are carried out and documented in a consistent and uniform way. The installation is then ready for commissioning.


Pre-commissioning is the part of the construction which involves the examination and checkout of individual components, and is generally carried out on equipment and material in a static condition. It confirms continuity and containment of process flow routes, achieves appropriate cleanliness of all plant internals, and checks each item of process equipment for physical integrity and its suitability for service e.g. as follows:

- The integrity of critical isolation systems are statically checked;
- Instrument and electrical items undergo end-to-end continuity, loop and no-load tests to confirm their fitness for functioning;
- Control valves are stroked and protective devices are calibrated and installed;
- Lubrication and hydraulics systems are tested;
- Motors are run uncoupled.
- Water flushing, air blowing and final reinstatement of piping fully integrated with the hydro-test program (construction).

Most of the activities are carried out with the facilities under ambient atmospheric conditions and without being subject to process fluids and operational conditions (temperature and pressure). Therefore process emissions are not expected in this phase.

9.2 Commissioning Phase

Commissioning is carried out after approval of Mechanical Completion for a system. Commissioning activities verify readiness for starting up and involves the functional testing of segments of the facilities to confirm that they are suitably prepared for safe and reliable operation.

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Commissioning activities involve simultaneous multi-discipline checks on a string of process equipment, machinery, instruments, vessels, piping and other items, in simulated dynamic operation. Tests may take place over an extensive area of the plant. Safe fluids and plant conditions are typically used, thus facilitating rapid intervention for any corrective activity found to be necessary. Area / system safety controls will be imposed, including the use of task specific permits to work, rather than generic area work permits used in construction.


Commissioning activities provide an appropriate degree of assurance that safe and reliable operations will be achievable in the period of initial start-up. Where processes contain hazardous fluids with high severity during normal operation, a rigorous sequence of commissioning tests will be necessary. The commissioning activities and the plant start-up activities are performed by TRSA with the assistance of YPNPL operating personnel, leading ultimately to units/ plant operation.

9.3 Start Up Phase

During the plant Start-up of the TANPF the following activities will be completed:

- Nitric Acid delivered to storage for more than 10 continuous days at a rate of at least 85% of design plant load and maintain the temperature and pressure at design conditions;
- Technical Ammonium Nitrate prills delivered to storage for more than 10 continuous days at min. 85% of design plant load (independent of grade produced);
- Demineralized water/polishing unit has been successfully regenerated 3 times in automatic mode;
- Truck loading station for bulk product operated for more than 24 hours and successful loading of 775 tons of product over 24 hours (corresponding to 11 triple road trains loaded);
- Truck loading station for solution operated for more than 6 hours and successful loading of 85 tons of solution over 6 hours (Corresponding to 1 triple road train);
- Bagging unit operated for more than 12 hours at a rate of at least 85% of design load.

Once the plant Start-up is completed, YPNPL takes over the Plant from TRSA (Take-Over).

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10. TANPF COMMISSIONING ENVIRONMENTAL MANAGEMENT

10.1 Emissions and Discharges of Significance

The emissions and discharges of significance shall be monitored during commissioning phase of the TANPF to ensure compliance against conditions imposed by DER under the Works Approval [8]. The emissions and discharges of significance are the following and the conditions are shown in Table 10.1-1.


Table 10.1-1 Significance of Emissions, WA and LIR conditions

Environmental Factor	Significance of Emissions	DER Regulation (EP Act- Part V)
Air emissions (NO _x , Ammonia, N ₂ O, PM ₁₀) from point sources (Nitric Acid Stack and Common Stack)	Emissions Significance – 4 / 3	WAC – Point Source air quality monitoring during commissioning and submission of results, including assessment against targets, in a Commissioning Report. LIC – Conditions relating to maintaining a complaints and reporting complaints. Point source air emissions monitoring and reporting against targets. Conditions requiring notification for planned shutdowns.
Air emissions (dust, PM ₁₀) from other pollutant activities	Emissions Significance – 1	WAC – No conditions. LIC – Standard conditions related to dust.
Odour Emissions	Emissions Significance – 1	WAC – No conditions. LIC – Standard conditions related to odour. Conditions relating to maintaining a complaints register and reporting complaints.
Noise emissions from equipment and noisy activities	Emissions Significance – 4	WAC - Submission of a Commissioning Plan with commitments and managing noise emissions. Conditions requiring submission of an additional noise study assessment based on up to date noise source data. Three months prior to commissioning, the Works Approval Holder shall undertake a noise assessment demonstrating that cumulative noise levels at Hearson Cove will be less than 45dB(A) during commissioning and operations. LIC – Conditions relating to maintain a complaints register and reporting complaints.
Light Emissions	Emissions Significance – 1	WAC – No conditions. LIC – No conditions.

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Environmental Factor	Significance of Emissions	DER Regulation (EP Act- Part V)
Discharges to Water (underground water);	Emissions Significance – 3	<p>WAC –Condition restricting the discharge of dewatering water to the marine environment.</p> <p>Submission of a Commissioning Plan with commitments and managing discharges to the MUBRL.</p> <p>Conditions relating to groundwater monitoring and providing the final location and monitoring bores in the compliance document.</p> <p>LIC – Conditions relating to monitoring and setting targets / limits wastewater discharges to the MUBRL.</p> <p>Conditions relating to monitoring and setting targets / limits groundwater quality.</p> <p>Conditions relating to the discharge of water from the Clean water Ponds to the MUBRL as a contingency measure.</p> <p>Requirement to report incidents to DER along with water quality results.</p>
Discharges to land (cleaned and contaminated water ponds and MUBRL discharges)	Emissions Significance – 1	<p>WAC – Submission of a Commissioning Plan with commitments for monitoring and managing discharges to land.</p> <p>LIC – Condition relating to maintaining freeboards on all evaporation ponds.</p> <p>Conditions relating to monitoring treated effluents quality and settings targets for comparison.</p> <p>Conditions relating to the discharge of water from the Clean Water Ponds to the MUBRL as a contingency measure.</p> <p>Requirement to report incidents to DER along with water quality results.</p>
Solid / Liquid Wastes;	Emissions Significance – 1	<p>WAC – Conditions restricting the discharge of hydrostatic waste to environment.</p> <p>LIC - No conditions.</p>
Hydrocarbon / Chemical Storage	Emissions Significance – 1	<p>WAC - No conditions.</p> <p>LIC – Standard conditions relating to hydrocarbon and chemical storage.</p>

For general management related to other environmental factors i.e. flora, fauna, pest, weed and vegetation, refer to the specific Management Plans under the CEMP [5].

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10.2 Environmental Monitoring, Inspection and Auditing

10.2.1 General

The general CEMP is developed in different attachments as specific Management Plans which address particular requirements to ensure environmental protection during Construction, Pre-Commissioning and Commissioning phases of the TANPF execution. In addition to these, separate and independent Management Plans are issued and complement the general CEMP.

TRSA shall be responsible for ensuring its SUBCONTRACTORS follow the instructions described in this document as well as all applicable laws and regulations.

Periodic inspections will be carried out by TRSA HSE team as per Construction HSE Plan [22] using the HSE Inspection Sheet. Records shall be kept accordingly.


Formal audits on general HSE performance including specific environmental issues will be carried out on a periodic basis (quarterly) by independent TRSA HSE Team. As a result of such audits, an Audit Report will be issued detailing all findings and deviations as well as corrective actions to be implemented.

10.2.2 Air Quality Management Plan

The purpose of the Air Quality Management Plan [19] [20] is to outline how air emissions are going to be managed and monitored in order to comply with environmental limits and ensure environmental protection at all times. Environmental practices focused on air quality preservation include minimizing the potential fugitive dust and gaseous emissions at source to ALARP level and, wherever required, additional mitigation measures shall be implemented.

10.2.2.1 Monitoring of scrubber performance

Process vapours, air from drying/cooling drums and fluid bed cooler as well as exhaust air from the cooling tower scrubber (not recycled back to prill tower) are fed to the final scrubber in unit 32 (TAN prilling section) where AN dust and ammonia are collected before the exhaust air is vented to atmosphere. Ammonia is captured by scrubbing the incoming air with an acidic solution. The pH of the scrubber solution is continuously monitored and controlled by addition of nitric acid to the scrubber tank with a targeted pH of 4.

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10.2.3 Water Quality Management Plan

The Water Quality Management Plan [21] determines appropriate strategies to manage all forms of water taking into account site location and groundwater conditions so as to ensure environmental protection and project environmental impacts minimization. It defines the measures and water quality monitoring regime required to reduce this impact on the groundwater, surface water and marine water affected environment.

10.2.3.1 Supplement for Brine Return Line

Online Analyses


Online analysis will be available when the plant is ready for start-up. Instruments will be ready installed and local indication available end of December 2015 whereas remote indication (DCS in control room) will be available end of January 2016.

Before these instruments are installed there will be no discharge of clean process condensate (contains traces of nitrogen from ammonia and ammonium nitrate) to Water Corporation's multi use brine return line (MUBRL), only sea water blowdown diluted with chilled condensate (from air conditioning), backwash from the sea water filters and the electrochlorination unit. During this period YPNPL will sample from the MUBRL on a daily basis and measure temperature, pH, conductivity, redox and turbidity. In this period there will be no chemical production and a limited amount of steam will be used to operate the steam turbine to flush ducting with air and consequently the load on the cooling tower will be very low.

Control of Chlorine

The sea water cooling tower provides cooling water to the various units. The cooling tower basin provides hold-up of cooled sea water and receives make-up sea water to compensate for evaporation and blow-down. In addition, the cooling water basin receives clean process condensate from the AN solution plant (U-31).

In order to avoid microbiological growth in the sea water circuit sodium hypochlorite is dosed to the cooling tower basin to maintain a level of 0.2 ppm of residual free chlorine in the

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system. This is achieved by a continuous dosing of 2 ppm hypochlorite in the sea water make-up line and an intermittent shock dosing of 5 ppm into the sea water line to the various users. The residual free chlorine level is analyzed in the sea water returned to the cooling tower.

A second cooling tower, Blow-down cooling tower, is provided to ensure that the sea water being discharged is less than 2oC/5oC above the inlet sea water temperature. The blow-down cooling tower basin stores water before being discharged to the MUBRL. The basin also receives chilled condensate (from air conditioning), boiler blowdown and backwash from the sea water filters and the electrochlorination unit.

To achieve zero residual chlorine concentration in the sea water discharged to the MUBRL, sodium metabisulphite is added to the blow-down to neutralize free chlorine. The amount of metabisulphite added is based on on-line analysis of chlorine in the blow-down sea water line to MUBRL. In addition, sulphite shock dosing starts simultaneously with the hypochlorite shock dosing. This will ensure that there is no residual free chlorine in the sea water discharged to the MUBRL. There is no further on-line analysis of chlorine after sodium metabisulphite addition.


Parameters to be monitored

Ammonia will not be introduced until the plant is ready for start-up, i.e. there will be no liquid effluents from the plant containing nitrogen during the commissioning stage. During commissioning the following liquid streams will be discharged to the MUBRL:

- Cooling tower blowdown (sea water)
- Chilled condensate (from air conditioning)
- Backwash from the sea water filters
- Backwash from the electrochlorination unit

After start-up and during operation the following additional liquid effluents will be fed to the MUBRL:

- Clean process condensate from the AN solution plant
- Boiler blowdown (boiler is an integral part of the ammonia reactor)

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All the above effluents will be mixed with the sea water blowdown before discharged to the MUBRL.

Please refer Attachment II Supplement Brine Monitoring Program for frequency.

10.2.4 Construction Erosion Control and Stormwater Management Plan


The Erosion Control and Stormwater Management Plan [22] outlines the required surface water and soil conservation management requirements to ensure environment protection and compliance with all conditions, commitments and requirements. The CESMP describes the controls and measures required to minimize erosion and sedimentation within the disturbed area by proposing and establishing methods to manage stormwater within, and entering the YPNPL lease, and the immediate surrounding land.

10.2.5 Noise Management Plan

The Noise Management Plan [23] lays down the measures to be adopted to minimise noise generation so as to ensure that noise impact does not affect workers, the nearby public and/or amenities and that it complies with applicable statutory regulations. Therefore, this noise management plan is focused on the noisy activities of the TANPF and the main receptors (sensitive) of this noise.

Hearson's Cove and Deep Gorge are considered noise sensitive premises according to regulations' definitions. In order to ensure compliance with noise level criteria set by EPA (aspirational goal of 45 dB(A) in Hearson Cove), sound level measurements will be carried out on a periodic basis and results recorded and reported accordingly. Should the noise measurement results show noise levels above those established or foreseen, additional monitoring will be performed and, if required, sound level measurements will be carried out at noise sensitive premises to ensure no impact is being generated. In case results show non-compliance, action should be taken immediately at source.

In addition, the Environmental Protection (Noise) Regulations 1997 [24] assigns a noise level set at 65 dB(A) (LA10) which shall be met at industrial premises. Compliance against the LA10 which shall not be exceeded for more than 10% of the time during operation will be verified during commissioning of the TANPF by means of sound level measurements.

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The Noise Management Plan explains measure for specific commissioning activities (steam blow out) would result in noise emissions.

During the design necessary measures are foreseen for noise sources and sound enclosures, silencer are furnished to keep noise emission below 45 dB(A). Noise Vibration Study Report is already presented DER.

As communicated by DER, W4071/2010/1 during commissioning and start-up phase the report will be verified

During commissioning phase in addition to event base (steam blow out, unit start up etc.) daily Noise Emission Measurement will be performed at site perimeter and Hearson Cove.

Commissioning Handover documents will include whole set off readings. This readings will be presented to verify noise impact assessment study of the plant.


10.2.6 HSE Management Plan

The purpose of this HSE Management Plan [14] is to describe the Health, Safety & Environmental Management System to be implemented on site and therefore, to outline the main measures to be implemented by TRSA in order to prevent human injuries, property and environmental damage.

In addition to the environmental hazards involved in construction activities (spills, leakage, noise), the special tasks performed during Commissioning and Start-Up phases imply the appearance of some other risks and hazards coming from repairing, adjusting, servicing moving or energized equipment and handle substances which shall be controlled and minimized to be reduced to ALARP levels such as:

- Leakage of equipment, pipes or valves;
- Ammonia and NOx gas/vapor emissions;
- Chemical and/or DG spills (Nitric Acid, Ammonium Nitrate solution , Ammonium Nitrate solid, lube oil, diesel and corrosive substances).

For further information about hazards and risks, refer to HAZID Study [24], MHF Risk Assessment [25] and DG Risk Assessment [26].

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During commissioning, critical operations are subject to a work permit system [27] [28] and a risk assessment requirement to establish the criticality of the job and measures to reduce the hazard to ALARP level.

A work permit is a formal declaration by the person authorising the work that all potential hazards and necessary precautions have been identified and implemented. Before issuing a work permit, there shall be a meeting between the issuer and the receiver of the work permit, to review the work procedures, the hazards involved and the safety precautions. To ensure safe working conditions for all personnel, it may be considered necessary, based on the risk assessment, to perform further safety analysis such as Job Hazard Analysis (JHA) for critical operations or other operations whenever necessary. The risk assessment is a tool to decide the criticality of a job. This can be done either by “building up” the scenario in line with $\text{Risk} = \text{Severity} \times \text{Frequency} \times \text{Probability}$, or “checking of” a list. For further information, refer to YARA-TOPS 1-02 [29].

10.2.7 Hazardous Materials Management Plan

The main aim of Hazardous Materials Management Plan [31] is to ensure hazardous materials are handled, used, stored, transported and removed from the site in an appropriate manner that minimizes environmental impact generated on workers and, especially, on the surrounding community, sensitive habitants, terrestrial fauna and vegetation and rock art.

10.2.8 Emergency Response Management Plan

The Emergency Response Management Plan [15] and Site Emergency Preparedness Procedure [16] prepared for the TANPF describes the emergency management structure, resources, procedures and practices that are implemented in the event of an emergency situation. Their purpose is to minimise the adverse impacts to people, property and the environment from an incident occurring or impacting on site during commissioning and start up.

This plan also outlines the procedures to notify and communicate with emergency services, neighbouring facilities, regulators and local administration/community.

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10.3 Notifications and Environmental Reports

10.3.1 Notifications

(WA 5.2.1) YPNPL (the Works Approval Holder) shall ensure that the parameters listed in Table 10.3.1-1 are notified to the Director in accordance with the notification requirements of the table.

Table 10.3.1-1 Notification Parameters

Parameters	Notification Requirements
Commencement of commissioning	7 days prior to start
Completion of commissioning	7 days after completion

YPNPL (the Works Approval Holder) shall perform air monitoring according with specifications indicated in Table 7.2-2 being sampling locations in compliance with the AS4323.1 or relevant part of the Continuous Emission Monitoring System Code (CEMS Code) [13] and conducted by an organisation with NATA accreditation.

10.3.2 Environmental Construction Report

(WAC 5.1.1) YPNPL (The Works Approval Holder) shall submit a compliance document to the DER Director, following the construction of the works and prior to commissioning of the same.

(WAC 5.1.2) The compliance document shall:


- a) certify that the works were constructed in accordance with the conditions of the works approval; and
- b) be signed by a person authorised to represent the Works Approval Holder and contain the printed name and position of that person within the company.

(WAC 5.1.3) The compliance document shall include a map showing the final location of all operational groundwater monitoring bores and their location coordinates.

10.3.3 Environmental Commissioning Report

(WAC 5.1.4) YPNPL (the Works Approval Holder) shall submit a commissioning report to the Director for approval within one month of the completion of commissioning. The report shall include:

- (a) results of any monitoring conducted;

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(b) a summary of the environmental performance of the equipment as installed against the design specification set out in the works approval application, or target(s) set out in this Works Approval;

(c) a review of performance against the works approval conditions;

(d) where they have not been met, measures proposed to meet the design specification and/or works approval conditions together with timescales for implementing the proposed measures; and

(e) an Operational Groundwater Monitoring Plan that includes; but is not limited to:

- i. Details of the parameters to be included in the operational groundwater monitoring program;
- ii. Targets and/or trigger levels for each parameter; and
- iii. Contingency actions to be implemented if targets and/or trigger levels are exceeded.

(WA 5.1.5) The Works Approval Holder shall ensure that results from CEMS are reported in the Commissioning Report as tabulated data and time series graphs including:

- (a) Time and date;
- (b) Unavailability of abatement and CEMS equipment; and
- (e) An assessment of the information contained within the report against previous results and targets.


10.3.4 Environmental complaints reporting

A complaint report will be managed by the YPNPL Plant Manager (operations), who will have the responsibility of recording any complaint from the community and/or stakeholders in regards to any emission and/or discharges of significance (air emissions, odour, effluents and noise emissions) if it has caused, or has the potential to cause pollution. The Complaint Report will be made available to OEPA/DER upon request.

10.3.5 Environmental Accidents and Near Miss Incidents Report

In the event that an environmental incident occurs, the following steps will be followed immediately:

- Prevent further pollution/environmental harm (including impacts on air, water quality, flora and fauna and noise environment);
- Clean-up and/or control polluting substance(s);
- Implement mitigation measures to prevent recurrence of a similar incident; and
- Document the incident and instigate an incident investigation as appropriate.

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Monitoring results of emissions and discharges of significance are to be recorded and any negative impacts on environment that are identified through the monitoring programs will be investigated and reported in accordance with YPNPL's Incident Investigation and Reporting Procedures:

- Reporting of accidents, near-miss incidents, sick leave, environmental incidents, and security breaches YARA-DIR-01-P01 [30];
- Investigation and follow-up of accidents and near-miss incidents YARA-DIR-01-P02 [31].

In case a serious environmental incident takes place it shall be immediately reported to YPNPL.


A specific incident report shall be prepared by the HSE Manager and submitted to YPNPL within 3 days in order to explain clearly the details of the incident including, as a minimum, the following information:

- Date/ Time;
- Incident description;
- Location on site;
- Causes that led to the incident;
- Corrective actions;
- Measures to prevent recurrence.

For DG related incidents, the DMP's DG incident report template will be used.

The incident report will be managed by the YPNPL Plant Manager (Operations), who will have the responsibility of reporting the incident to the OEPA/DER if it has caused, or has the potential to cause pollution.


Incidents likely to cause off-site impacts or significant environmental harm (serious harm) will be reported by YPNPL to OEPA/DER within 7 days of non-compliance as per MS 870's conditions [3].

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10.3.6 Summary of Environmental Report

Table 10.3.6-1 Summary of Environmental Commissioning Report

Reporting Reference	Reporting Commitment Description	Frequency	Send to
WAC-General-01	Incident Report	Upon event	DER
WAC-General-02	Complaint Report	Upon event	DER
WAC 5.1.1	Environmental Construction Report	Following the construction of the works and prior to commissioning (introduction of ammonia)	DER
WAC 5.1.4	Environmental Commissioning Report	Within one month of the completion of commissioning	DER
WAC 5.1.5	Stack Emissions Monthly Report	Monthly (after introduction of ammonia)	DER


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11. ENVIRONMENTAL COMMISSIONING AND START UP PROCEDURES SUMMARY

The monitoring and mitigation measures to be implemented to meet the objectives (see section 7.2) and environmental conditions in regards to the emissions and discharges of significance (Table 10.1-1) are summarized and explained in Table 11-1.

Table 11-1 Commissioning and Start up procedures summary

Environmental Requirement	TRSA Procedures
Management of Accidents and Near Miss	<ul style="list-style-type: none"> • HSE Management Plan [14] • Work Permit System & Job Hazard Analysis [27] [29] [28] • Lock Out Tag Out (LOTO) Procedure [32] • Work Method Statements • Accident and Incident Investigation procedure [31] • Accident and Incident Reporting procedure [30] • Emergency Management Plan, [33] • Site Emergency Preparedness Procedure, [16]
Management of Air Emissions (Common Stack and scrubber performance, Nitric Acid Stack)	<ul style="list-style-type: none"> • Air Quality Management Plan [19] [20] • Commissioning Procedure Air Scrubber Systems procedure [34] • Commissioning Procedure Tail Gas Reaction System procedure [35] • Operating Instructions: <ul style="list-style-type: none"> ◦ Safe Operation, Start-up and Shutdown Nitric Acid Plant (U12) ◦ Safe Operation, Start-up and Shutdown AN Solution Plant (U31) ◦ Safe Operation, Start-up and Shutdown TAN Nitrate Plant (U32)
Management of TSP matter and PM10	<ul style="list-style-type: none"> • Air Quality Management Plan [19] [20]
Waste Water System going to the contaminated evaporation ponds	<ul style="list-style-type: none"> • Commissioning Procedure Waste Water Collection 92-WW-01 [36] • Operating instructions for unit 92 Waste Water System
Waste Water going to the MUBRL line	<ul style="list-style-type: none"> • Commissioning Procedure Sea Water Cooling Tower System [37] • Operating Instructions for the Sea Water System and Cooling Tower Area
Noise Monitoring	<ul style="list-style-type: none"> • Noise Management Plan [23] • Noise Measurement Procedure
Hydrotesting Water Management	<ul style="list-style-type: none"> • Hydrotesting Procedure (Site) [38] • Construction Waste Management Plan [39]

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Environmental Requirement	TRSA Procedures
Dewatering water Management	<ul style="list-style-type: none"> Water Quality Management Plan [21]
Water Flushing (pipework cleaning) Management	<ul style="list-style-type: none"> Water Flushing Procedure (Site) [40] Water Quality Management Plan [21]
Chemical Cleaning Management	<ul style="list-style-type: none"> Water Quality Management Plan [21] Chemical Cleaning Procedure [41]
Hazardous Substances and/or Dangerous Goods	<ul style="list-style-type: none"> Hazardous Material Management Procedure [42] DG license (DGS021976) MHF License

11.1 Start-up and Shutdown

Project document "2-300-329-LST-TRE-0002, Waste Water Summary & Gaseous Emmissions" [49] includes emissions during start up and provide frequency and durations of transient releases.


Start up and shutdown sequence of the units are described in the respective Operating Manuals

In order to reduce start up emissions, the plant design considers deployment of DeNOX Reactor in the Nitric Acid unit. During the start-up of the plant, external heating is provided to the tail gas to meet the minimum temperature at the inlet of the DeNOx Reactor. For this reason, tail gas is preheated with high pressure steam to 200 °C in the Tail Gas Start-up Heater. Once the gases reach the required temperature, the by-pass valve can be opened and the tail gas bypasses the Start-up Heater.

In case of a plant shut down, nitrous gases are released to the atmosphere in a controlled way through the DeNOx Reactor. At the same time and automatically, the Tail Gas Start up Heater is fed with steam to maintain the temperature of the gases leaving the DeNOx Reactor above 200°C, achieving a colorless emission at the stack. "

By this method excessive start up and shutdown transient emissions are reduced.

During commissioning and startup phase of the project online emission analyzer for unit 12 stack will be in operation and portable analyzer will be available for Technical Ammonium

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Nitrate unit stack. Periodic measurement will be performed through sample ports of the stacks.

12. AWARENESS, INDUCTION AND TRAINING

To a large extent, the success of accident prevention and environment incidents avoidance depends upon educating workers about their work and site conditions. Each worker must be made aware of his tasks, regulations and procedures relevant to his tasks, the hazards of his work, HSE rules, and environmental considerations and what to do in emergency situations.


The first step towards HSE workers' training will be the statutory Construction Industry Induction which shall be undertaken by every worker prior to entering the site and evidenced by means of the White Card as per WA Occupational Health and Safety Regulations [43].

In addition to this, it is mandatory for all construction employees to attend the TRSA HSE Induction Session prior to entry to the worksite. No employee will be permitted to work on site or allowed access to the site without first attending the HSE Induction Session which shall be carried out by qualified personnel and directed to all employees. For further information, refer to HSE Plan [14].

All the commissioning and operation personnel must be familiarized with the operational details as well as with the characteristics, function and location of all plant equipment and instrumentation, to assure proper system operation in a safe and efficient manner.


YPNPL employees are required to undergo formal training to ensure that they fully understand the nature of the equipment with which they are working, the potential hazards and the appropriate accident prevention techniques. The training programs should be followed by a qualification test for the new employee(s), or employee(s) new to the job, to demonstrate the effectiveness of the training and the suitability of the individual to participate in activities requiring a work permit.

Process Flow Diagrams (PFD), P&IDS, and other reference information including environmental information as emissions and discharges management will be included in the training manuals.


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13. REFERENCES

- [1] "Commonwealth Approval decision under Environment Protection and Biodiversity Conservation Act 1999 (14/09/2011).".
- [2] "Western Australia (WA) Environmental Protection Act 1986".
- [3] Ministerial Statement 870 under Environment Protection Act 1999 (07/07/2011).
- [4] YPNPL Works approval by DEC (15/07/2011).
- [5] "Construction Environmental Management Plan, 2-250-329-PRO-TRE-0111".
- [6] "MS 870 Compliance Plan, 2-250-329-PRO-TRE-0104".
- [7] "Commissioning Environmental Management Plan (Works Approval Compliance Plan), 2-250-329-PRO-TRE-0142".
- [8] Works Approval, Environmental Protection Act 1986, Part V. Works Approval number: W4701/2010/1.
- [9] "Dangerous Goods Safety Act 2004, Western Australia".
- [10] "Public Environmental Review (PER) for Burrup Nitrates Pty Ltd, January 2010".
- [11] "Environmental Protection (Noise) Regulation 1997".
- [12] "Dangerous Goods Safety (Storage and Handling of Non-Explosives) Regulations 2007 (the Storage and Handling Regulations)".
- [13] "WA Dangerous Goods Safety (Security Risk Substances) Regulations 2007".
- [14] "Dangerous Goods Safety (Major Hazard Facilities) Regulations 2007, Western Australia".
- [15] "Yara-POL-01 Health, Environment, Safety, Quality and Product Stewardship".
- [16] "CEMS Code, Continuous Emission Monitoring System (CEMS) - Code for Stationary Source Air Emissions, Department of Environment & Conservation, Government of Western Australia".
- [17] "Construction Health, Safety and Environment (HSE Plan), 2-250-329-PRO-TRE-0111-att12".
- [18] "Emergency Management Plan, 2-250-329-PRO-TRE-0111-att13".
- [19] "CEMP Site Emergency Preparedness Procedure, 2-250-329-PRO-TRE-0130".
- [20] "Pre-Comm/ Mechanical Completion, Commissioning and Start-up Strategy, 2-600-329-PRO-TRE-0000".
- [21] "Pre-commissioning, Mechanical Completion, Commissioning and Take Over procedure, 2-600-329-PRO-TRE-0001".
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- [23] "YPNPL's Air Quality Management Plan, ref. 0086269".
- [24] "Construction Air Quality Management Plan, 2-250-329-PRO-TRE-0111-att01".
- [25] "CEMP Water Quality Management Plan, 2-250-329-PRO-TRE-0111-att02".
- [26] "CEMP Erosion Control and Stormwater Management Plan, 2-250-329-PRO-TRE-0111-ATT03".
- [27] "CEMP Noise Management Plan, 2-250-329-PRO-TRE-0111-att07".
- [28] "Environmental Protection (Noise) Regulations 1997".

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- [29] "HAZID CONSTRUCTION_2-250-329-REP-TRE-8018.pdf".
- [30] "Risk Assessment Report, Assumptions Register and ALARP Demonstration, 2-250-329-REP-TRE-8021".
- [31] "Dangerous Goods Risk Assessment report, 2-250-329-REP-TRE-8067".
- [32] "Work Permit System, 2-600-329-PRO-TRE-0016".
- [33] "YPNPL Work Permit System , 650-508-PTW-000-0004".
- [34] "YARA Work Permit System TOPS 1-02".
- [35] "Hazardous Material Management Procedure, 2-250-329-PRO-TRE-0128".
- [36] "Reporting of accidents, near-miss incidents, sickleave, environmental incidents, and security breaches, YARA DIR-01-P01".
- [37] "Investigation and follow-up of accidents and near-miss incidents, YARA-DIR-01-P02".
- [38] "Lock Out Tag Out (LOTO) Procedure, 2-600-329-PRO-TRE-0017".
- [39] "CEMP Emergency Management Plan, 2-250-329-PRO-TRE-0111-att13".
- [40] "Commissioning Procedure Air Scrubber Systems procedure, 2-600-329-PRO-TRE-0032".
- [41] "Commissioning Procedure Tail Gas Reaction System procedure, 2-600-329-PRO-TRE-0007".
- [42] "Commissioning Procedure Waste Water Collection 92-WW-01, 2-600-329-PRO-TRE-0056".
- [43] "Commissioning Procedure Sea Water Cooling Tower System, 2-600-329-PRO-TRE-0046".
- [44] "Hydrotesting Procedure (Site), 2-600-329-PRO-TRE-0013".
- [45] "CEMP Waste Management Plan, 2-250-329-PRO-TRE-0111-att04".
- [46] "Water Flushing Procedure (Site), 2-600-329-PRO-TRE-0014".
- [47] "Chemical Cleaning Procedure (Site) 2-600-329-PRO-TRE-0025".
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- [49] "2-300-329-LST-TRE-0002 - Waste Water Summary & Gaseous Emmisions".

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ATTACHMENT I –ENVIRONMENTAL REPORTING SUMMARY

Table Att. I-1 Reporting Commitment and Frequency

Reporting Reference	Reporting Commitment Description	Frequency	Send to	Comments
CEMP-1	Annual Compliance Report including all relevant environmental issues as applicable	Annual, March	SEWPaC, & OEPA	Annually within 3 months of construction commencement anniversary
CEMP-2	Incident report regarding any incident which impacts in matters of environmental national significance	Upon event	SEWPaC, & OEPA	Notification within 24 hours of incident happening and report to follow within 1 month.
MS870	Annual Compliance Report including all relevant environmental issues as applicable	Annual, September	OEPA	
WAC-General-01	Incident Report	Upon event	DER	
WAC-General-02	Compliance Report	Upon event	DER	
WAC-5.1.1	Environmental Construction Report	Following the construction of the works and prior to commissioning	DER	
WAC-5.1.4	Environmental Commissioning Report	Within one month of the completion of commissioning	DER	
WAC-5.1.5	Stack Emissions Monthly Report	Monthly (after introduction of ammonia)	DER	
AIR QUALITY MANAGEMENT				
CAQMP-1	Incident Report (exceedance of a trigger threshold)	Upon event	SEWPaC, & OEPA	

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Reporting Reference	Reporting Commitment Description	Frequency	Send to	Comments
CAQMP-2	Compliance Monitoring Report	Every 6 months	SEWPaC, & OEPA	
CAQMP-3	Internal TRSA Audit Report (independent chapter for air quality monitoring program)	Annual	SEWPaC, & OEPA	
WATER QUALITY MANAGEMENT				
CWQMP-1	Incident Report (exceedance of a trigger level)	Upon event	SEWPaC, & OEPA	
CWQMP-2	Results of monitoring according to condition 8-4	Every 6 months	SEWPaC, & OEPA	
CWQMP-3	Annual site compliance report	Annual	SEWPaC, & OEPA	
EROSION CONTROL AND STORMWATER				
CECSMP-1	Stormwater quality monitoring results	Cyclone season	SEWPaC, & OEPA	
CECSMP-2	Incident Report	Upon event	SEWPaC, & OEPA	
CECSMP-3	Compliance Monitoring Report	Every 6 months	SEWPaC, & OEPA	
NOISE MANAGEMENT				
NMP-1	Compliance Monitoring Report	Every 6 months	SEWPaC, & OEPA	
NMP-2	Incident Report	Upon event	SEWPaC, & OEPA	


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ATTACHMENT II – SUPPLEMENT BRINE MONITORING PROGRAM

YPNPL propose to undertake sampling at the TAN plant connection to the MUBRL, based on the monitoring program provided in Table Att. II-1, proposed targets are provided in Table Att. II-2.

Table Att. II-1: Monitoring of point source emissions to surface water

Emission point reference	Parameter	Units	Frequency	Method
Sampling point on the TAN pipeline connection to the Ammonia Plant BRL	Turbidity/Total Dissolved Solids	mg/L	Continuous	In line instrumentation
	Flow rate	m3/hour	Continuous	Probe/flow sensor
	Accumulated flow	m3/hour	Continuous	Probe/flow sensor
	Temperature	°Celsius	Continuous	Temperature sensor
	Conductivity	mS/cm	Continuous	In line instrumentation
	Oxidation Reduction Potential	mV	Continuous	In line instrumentation
	pH	pH	Continuous	In line instrumentation
	Ammonium Nitrate (NH ₄ NO ₃)	mg/L	Daily	Daily samples composited and analysed weekly
	Ammonia as ammoniacal nitrogen (NH ₃ -N)			
	Total Phosphorous (TP)			
	Total Nitrogen (TN)			
	Methanol			
	Total Cadmium (Cd)			
	Chromium III (Cr(III))			
	Copper (Cu)			
	Iron (Fe)			
	Lead (Pb)			
	Mercury (Hg)			
	Nickel (Ni)			
	Zinc (Zn)			
	Activated methyl diethanolamine (aMDEA)			
	Total Petroleum Hydrocarbons (TPH)	mg/L	Weekly	Grab sample
	Enterococci			
	Thermotolerant coliforms			

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YPNPL will monitor toxicants and metals through a composite sample taken daily over one week. The use of a composite sampling approach is consistent with the Ammonia Plant at YPFPL and reflects the emissions over the course of a week.

Australian marine water quality guidelines are outlined in the ANZECC and ARMCANZ (2000) Australian and New Zealand Guidelines for Fresh and Marine Water Quality. The Guidelines define standards for physical and chemical water quality. Guidelines for toxicants such as heavy metals and ammonia are defined for marine waters at various Levels of Ecological Protection (LEP) representing trigger values for levels of protection based on ANZECC and ARMCANZ (2000), as described in Table Att.II-3.

Table Att. II-2: Levels of ecological protection and associated protection guidelines


Level of ecological protection	ANZECC and ARMCANZ (2000) protection guidelines to be used for toxicants
Low	80%
Moderate	90%
High	95%
Maximum	99%

Source: DoE 2006

Marine parks and conservation areas are generally identified as requiring a maximum LEP and areas around ports and ocean outfalls are identified as areas requiring a moderate or low LEP. All other marine areas are afforded a high LEP. This is outlined in the guideline for water quality in the Pilbara, the Pilbara Coastal Water Quality Consultation Outcomes (DoE 2006).

The Low Ecological Protection Area (LEPA) is roughly equivalent to the mixing zone for the salinity of brine, which at the time of approval of the MUBRL was the physicochemical stressor of greatest concern. The mixing zone for the 28 port diffuser configuration is approximately 120 m x 400 m (4.8 ha). The mixing zone has been afforded a low LEP (80% protection guideline, Table Att.II-2) and, from the edge of the mixing zone, a high LEP has been assigned (95% protection guideline, Table Att.II-2).

Based on available documentation from the Water Corporation, the dilutions in the LEPA are likely to be around 1:65, with some evidence that the dilutions could be as high as 1:86.


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Consistent with the proposed emissions from the adjacent Ammonia Plant, YPN proposes point source emission targets applied to wastewater to the MUBRL as outlined in Table Att.II-3.

Table Att. II-3: Point source emission targets to surface water

Emission point reference	Parameter	ANZECC and ARMCANZ (2000) 80% protection guideline (including units)	Target (including units)	Averaging period
Sampling point on the TAN pipeline connection to the Ammonia Plant MUBRL	Ammonium Nitrate (NH ₄ NO ₃)	-	15 ppm	
	Ammonia as ammoniacal nitrogen (NH ₃ -N)	-	15 ppm	
	Total Dissolved Solids	N/A	55 000 mg/L	Continuous
	Temperature	N/A	Discharge less than 5°C (less than 2°C for 80% of the time) above ambient seawater temperature	Continuous
	Ammonia	1700 µg/L	1.7 mg/L	Weekly; rolling average monthly
	Cadmium	36 µg/L	0.036 mg/L	Weekly; rolling average monthly
	Chromium (III)	90.6 µg/L	0.0906 mg/L	Weekly; rolling average monthly
	Copper	8 µg/L	0.008 mg/L	Weekly; rolling average monthly
	Lead	12 µg/L	0.012 mg/L	Weekly; rolling average monthly
	Mercury	1.4 µg/L	0.0014 mg/L	Weekly; rolling average monthly
	Nickel	560 µg/L	0.455 mg/L	Weekly; rolling average monthly
	Zinc	43 µg/L	0.043 mg/L	Weekly; rolling average monthly

The ANZECC and ARMCANZ (2000) are intended to be guidelines for the protection of water quality. On this basis, it is not considered appropriate that an 80% species protection level guideline at the point of discharge into the MUBRL be applied as a limit. The marine environment response to discharge concentrations is dependent on the level of mixing in the

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receiving waterbody. Wastewater emissions from the Plant are predicted to be well below available trigger levels for 99% protection guideline at the mixing zone of the MUBRL diffuser. This would indicate that the 80% guideline is conservative.

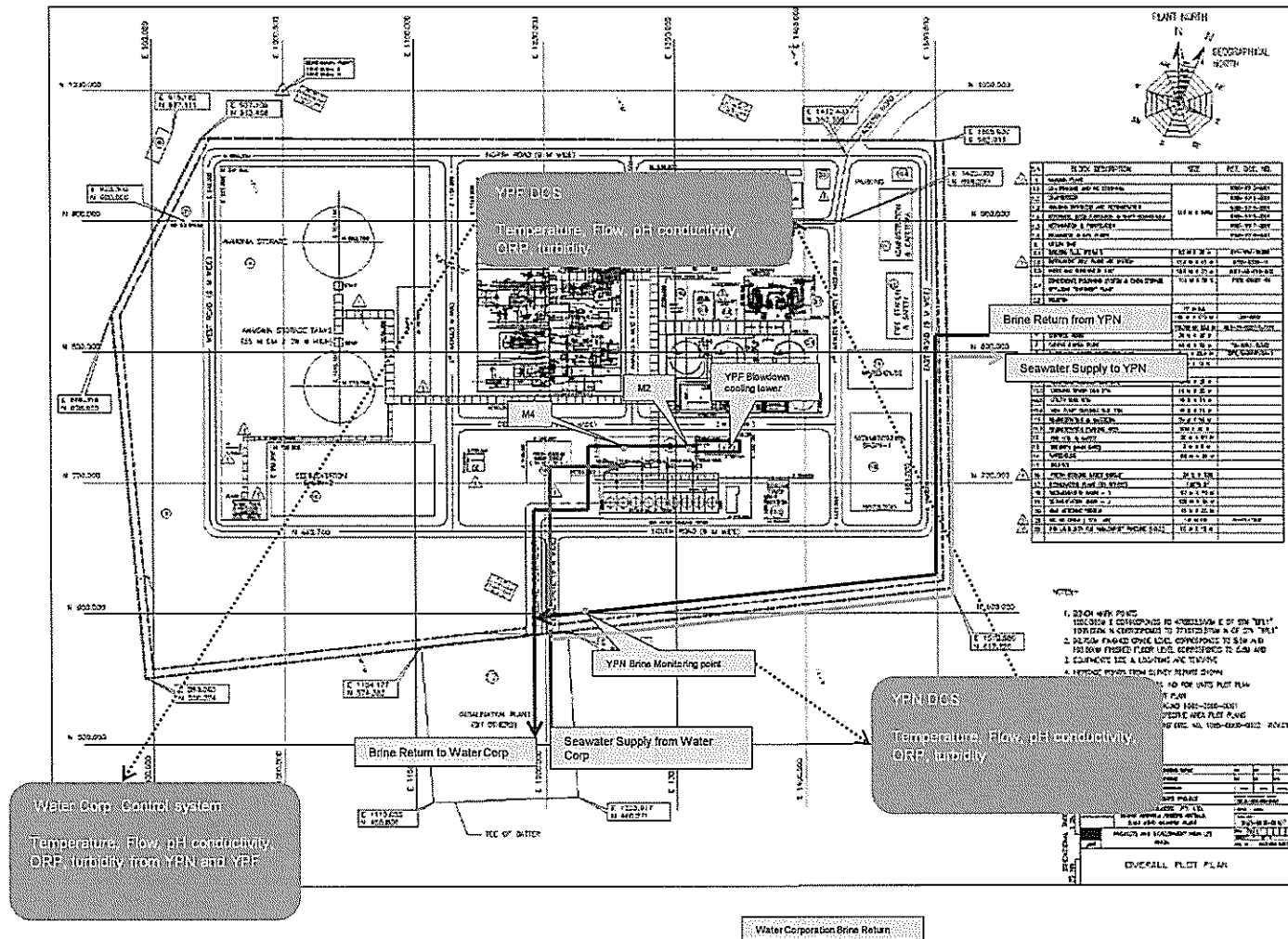
For these reasons, 80% guideline should be a target rather than a limit for wastewater parameters entering the MUBRL at the sampling point on the TAN pipeline connection to the Ammonia Plant MUBRL. The exceptions to the 80% guideline would be for nickel, for which the trigger level in the Water Corporation's Operational Marine Environmental Management Plan is slightly lower than the 80% guideline; this level for nickel has been proposed as the target in this commissioning plan.


The other exception is the mixture of purified process condensate, chiller condensate and boiler blowdown to be discharged to the MUBRL which is expected to contain a maximum of 15 ppm nitrogen from ammonia and 15 ppm nitrogen from ammonium nitrate. At 15 ppm, this results in a concentration of ammonia at the discharge point into the MUBRL of 0.6 ppm (600 µg/m³), which is less than ANZECC guidelines for 80% species protection of 1.7 ppm (1700 µg/L). There is no available ANZECC guideline for ammonium nitrate or total nitrogen. Considering the potential dilutions within the receiving environment, ANZECC guidelines for 99% species protection at the boundary of the LEPA would be achieved.

As indicated above, the proposed monitoring regime for the TAN plant is aligned with the regime proposed for the Yara Pilbara Fertilisers Plant. The monitoring program for the Yara Pilbara Fertilisers Plant is currently the subject of a Licence amendment application and DER is seeking technical advice on the appropriateness of the proposed program.

It is acknowledged that the monitoring program will be reviewed once the plan is operational and may be subject to change pending the outcomes of the licence amendment (and technical advice received on the proposed program) currently being sought for the Yara Pilbara Fertilisers Plant.

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ATTACHMENT III – OVERVIEW SCHEDULE

TAN Burrup Project MANAGEMENT SCHEDULE																																																	
ACTIVITIES	2014												2015												2016																								
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun.	Jul.																		
	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50																		
PRECOMMISSIONING																																																	
COMMISSIONING																																																	
START-UP (UTILITIES)																																																	
START-UP (NITRIC ACID)																																																	
START-UP (AMONIUM NITRATE SOLUTION)																																																	
START-UP (AMONIUM NITRATE DRY)																																																	
PERFORMANCE TEST / COMPLETION CERTIFICATE																																																	

