Yara Pilbara Fertilisers Pty Ltd

Ammonia Plant, Burrup Peninsula - Renewable Hydrogen Project

Construction Environmental Management Plan

July 2020

Summary

This Construction Environmental Management Plan (CEMP) has been prepared by GHD Pty Ltd (GHD) on behalf of Yara Pilbara Fertilisers Pty Ltd (YPF) and ENGIE to support the construction of a Renewable Hydrogen Plant. This CEMP has been prepared in accordance with the Western Australian Environmental Protection Authority (EPA) guideline *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans (*EPA 2018).

The following table summarises the purpose and context of the CEMP within the context of the EPA environmental objectives.

Summary of the Proposal	
Proposal title	Ammonia Plant, Burrup Peninsula
Proponent name	Yara Pilbara Fertilisers Pty Ltd
Ministerial Statement Number	586
Purpose of the CEMP	This CEMP outlines specific mitigation measures and management actions to manage the potential impacts on key environmental factors during construction of the Renewable Hydrogen Plant and associated infrastructure.
Key environmental factors and objectives	The key environmental factors and associated EPA objectives are: • Flora and vegetation – *To protect flora and vegetation so that biological diversity and ecological integrity are maintained.* • Terrestrial fauna – *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.* • Social surroundings – *To protect social surroundings from significant harm.*
Condition clauses	To be determined.
Key Provisions	Management based provisions that align with established industry practices to avoid and minimise potential environmental and heritage impacts.

Table of contents

Table index

Figure index

Acronyms and abbreviations

BC Act	*Biodiversity Conservation Act 2016* (WA)
CEMP	Construction Environmental Management Plan
DPLH	Department of Planning, Lands and Heritage
EP Act	*Environmental Protection Act 1986* (WA)
EPBC Act	*Environment Protection and Biodiversity Protection Act 1999* (Cth)
EPA	Environmental Protection Authority
GHD	GHD Pty Ltd
ha	Hectare
km	kilometre
m	metre
MAC	Murujuga Aboriginal Corporation
MS	Ministerial Statement
MW	Megawatt
PEC	Priority Ecological Community
PV	photovoltaic
T	tonnes
WA	Western Australia
YPF	Yara Pilbara Fertiliser Pty Ltd

1. Context, scope and rationale

1.1 Proposal

Yara Pilbara Fertilisers Pty Ltd (YPF) and ENGIE are proposing to develop a Renewable Hydrogen Plant (the Proposal). The Proposal, including associated infrastructure, will be located adjacent to the existing YPF Plant within the Burrup Strategic Industrial Area, approximately 11 kilometres (km) north-west of Karratha in the Pilbara region of Western Australia.

The Proposal includes the construction of a Renewable Hydrogen Plant and associated infrastructure including: a solar photovoltaic (PV) farm; electrolyser and its balance of plant; and supporting infrastructure including site tracks. The Proposal forms the commercial demonstration (Phase 0) of a longer term, larger scale renewable hydrogen project. Phase 0 focuses on using solar energy (from the PV farm) to generate hydrogen (an electrolysis plant) which is fed into the existing YPF Plant to make ammonia. The PV farm will have a production capacity of 18 megawatt (MW) peak to facilitate the production of approximately 640 tonnes (t) of renewable hydrogen per annum. The overall ammonia plant capacity is not expected to change and will continue at its approved capacity of 2,600 t per day.

The Proposal will be located adjacent to the existing YPF Plant on the Burrup Peninsula. The Renewable Hydrogen Plant Footprint (also referred to as the Proposal Footprint) is approximately 24.78 hectares (ha) and lies completely within the within the existing Yara Development Envelope (approved under Ministerial Statement (MS) 586) (Figure 1-1). This Proposal would amend the existing YPF Part IV approval to include the development of a Renewable Hydrogen Plant.

This Construction Environmental Management Plan (CEMP) has been prepared for the Proposal and is limited to the Proposal Footprint.

1.1.1 Construction details

Construction of the Proposal is anticipated to commence in 2021 and continue until June 2023.

Construction works for the Proposal will include:

- Establishment of temporary construction facilities within the Renewable Hydrogen Plant footprint area, including: temporary lay-down areas for construction, storage facilities for chemicals and materials.
- Ground preparation works for the PV, hydrogen plant and associated infrastructure.
- Installation and operation of hydrogen plant, including, electrolyser modules (based on alkaline or proton exchange membrane technology), purification system (to remove oxygen and water from the renewable hydrogen stream), compression (to achieve required spiking pressure in Haber Bosh existing reactor), cooling system, the balance of plant (separators, potash lye system, heat exchanger, circulation pumps, transformers, rectifier, and metering)
- Installation of required components for the solar PV plant, such as PV modules, mounting structures, foundation, inverters and batteries.
- Storage facilities for chemicals and materials.

Water resources for the Proposal will be provided by the existing YPF Plant. No new access roads are anticipated, although access tracks will be established for maintenance purposes. Drainage and waste water treatments will be routed toward the YPF Plant. No solid waste management facilities are anticipated.

Paper Size ISO A3

0 25 50 75 100

Meters

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Yara Pilbara Fertilisers Pty Ltd
Renewable Hydrogen Project

Proposal Footprint

Project No. **12520684**
Revision No. **2**
Date **20/07/2020**

Figure 1-1

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Print date: 20 Jul 2020 - 14:58

Data source: GHD: YPF Development Envelope, Disturbance Footprint - 20200624, Proposal Footprint - 20200709; Landgate: Roads - 20190128, Cadastre - 20200207, WMS: . Created by: bmorgan

1.2 Key environmental factors

The key environmental factors that have been identified as relevant to the Proposal include:

- Flora and vegetation
- Terrestrial fauna
- Social surroundings.

The Proposal Footprint presented in Figure 1-1 was chosen to avoid areas of elevated environmental and heritage value. The identified Proposal Footprint avoids:

- All Registered Heritage Sites
- Areas that are mapped as the Dampier Archipelago (including Burrup Peninsula) National Heritage Place
- Vegetation and fauna values associated with rocky outcrops including all mapped occurrences of the Burrup Peninsula Rock Pile Communities Priority Ecological Community (PEC) and Department of Biodiversity, Conservation and Attractions (DBCA) Priority listed flora species *Vigna triodiophila* (Priority 3) and *Rhynchosia bungarensis* (Priority 4). Through avoidance of rocky outcrop areas, the Proposal also substantially minimises impacts on Pilbara Olive Python (*Liasis olivaceus* subsp. *barroni*) core habitat and Priority flora species *Terminalia supranitifolia* (Priority 3).
- Vegetation and fauna values associated with the tidal inlet between Hearson Cove and King Bay, including the locally restricted vegetation association, VT05, and waterbody and floodplain fauna habitats which provide foraging habitat for the Australian Painted Snipe and Migratory bird species.

Table 1-1 outlines the key values, Proposal activities and impacts associated with each relevant factor.

1.3 Condition requirements

The Proposal will be assessed by the EPA. The Development Envelope within which the Proposal Footprint is located was included within the development envelope approved under MS 586. While the Proposal will form part of the existing Ammonia Plant project covered by MS 586, this CEMP and accompanying EPA referral only applies to the construction of the Renewable Hydrogen Plant and associated infrastructure outlined in Section 1.1.

1.4 Rationale and approach

1.4.1 Survey and study findings

Table 1-2 presents the studies that have been undertaken for the Proposal, which have informed the rationale and approach for this CEMP.

Table 1-1 Summary of environmental impact assessment of key environmental factors within Proposal Footprint

Flora and vegetation	
Key values	• One Priority 3 flora species, *Terminalia supranitifolia* • Significant vegetation (mapped as *Tecticornia* scattered to open low shrubland) • Adjacent to Murujuga National Park • Adjacent to vegetation representative of the Burrup Peninsula Rock Pile Communities PEC and individuals of *Vigna triodiophila* (Priority 3) and *Rhynchosia bungarensis* (Priority 4)
Proposal activities	• Clearing of native vegetation within Proposal Footprint to accommodate Proposal infrastructure • Deployment of equipment during construction • Construction activities with potential to ignite bushfires.
Impacts	• Disturbance to 24.78 ha (clearing of 23.04 ha native vegetation and two individuals of *Terminalia supranitifolia*) • Potential fragmentation of native vegetation • Potential introduction and spread of environmental weeds • Potential reduction in vegetation health as a result of dust generation during construction • Potential changes to vegetation structure and floristic composition in surrounding/adjacent areas through altered surface water drainage patterns and flows • Alteration of fire regimes
Terrestrial fauna	
Key values	• High and moderate value fauna habitats including Foothills (moderate value), Minor Drainage Line (high value) and Water body (high value). • Habitat for Threatened and Priority fauna including Pilbara Olive Python (Vulnerable) and Western Pebble-mound Mouse (Priority 4)

	• Foraging habitat for 28 bird species including one species listed as Endangered, 26 listed as Migratory species and one listed as Other specially protected fauna • Adjacent to Murujuga National Park
Proposal activities	• Clearing of fauna habitat to create construction footprint and accommodate the proposal infrastructure • Long-term presence of access roads and infrastructure, with ongoing vehicle movements
Impacts	• Disturbance to 24.78 ha (loss of 23.09 ha fauna habitat including conservation significant fauna habitat). • Clearing of four fauna habitats of moderate to high quality. • Potential injury and/or death of fauna as a result of vehicle strike • Habitat fragmentation • Temporary increase in noise and vibration during construction
Social Surroundings	
Key values	• Adjacent to National Heritage Place, Dampier Archipelago (including Murujuga) • Nine Aboriginal heritage sites of cultural importance
Proposal activities	• 24.78 ha of ground disturbance within Proposal Footprint to accommodate Proposal infrastructure • Construction activities
Impacts	• Construction noise, dust, and vibration impacting on social amenity • Potential indirect impacts to heritage sites from dust deposition during construction • Potential accidental disturbance of heritage sites

Table 1-2 Surveys relevant to the Proposal

Key environmental factor	Report (Author Year)	Survey description	Survey findings
Flora and vegetation	Flora and Fauna Survey (GHD 2020a)	GHD completed a detailed flora and vegetation survey and targeted flora survey of areas within and adjacent to the Yara lease boundary (the survey area). The purpose of the survey was to identify and record key flora and vegetation values within the survey area, which includes the Development Envelope and Proposal Footprint. The detailed flora and vegetation survey and targeted flora survey was undertaken during March 2020, which is during the recommended timing for flora and vegetation surveys in the Eremaean Botanical Province (March-June) (EPA 2016a). The survey methodology employed by GHD was undertaken with reference to the EPA *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a).	• Seven vegetation types as well as cleared areas and seasonally inundated/ open water were identified and described for the Development Envelope. Of these, five vegetation types occur within the Proposal Footprint. • The vegetation condition within the Proposal Footprint ranged from Excellent to Degraded. • The Burrup Peninsula Rock Pile Communities PEC was identified within the Development Envelope in Excellent Condition. The Proposal Footprint has been selected to avoid this PEC; none of the Burrup Peninsula Rock Pile Communities PEC occurs within the Proposal Footprint. • *Tecticornia* sp. scattered to open low shrublands was mapped in the tidal inlet between Hearson Cove and King Bay. This vegetation may be considered significant as it has a restricted distribution and has been impacted from threatening processes. There is 6.21 ha of this vegetation type in the Development Envelope and 1.08 ha within the Proposal Footprint. • The field survey recorded a total of 141 flora taxa comprising of 138 native taxa and three introduced taxa. The floristic diversity recorded during the survey is considered representative of the floristic diversity in the local area. • The field survey recorded three Priority flora species, *Terminalia supranitifolia* (Priority 3), *Vigna triodiophila* (Priority 3) and *Rhynchosia bungarensis* (Priority 4). All three species occur within the Development Envelope, but only two individuals of *T. supranitifolia* occur within the Proposal Footprint • No Weeds of National Significance or Declared Pests as listed under the *Biosecurity and Agricultural Management Act 2007* were recorded during the survey.
Terrestrial Fauna	Flora and Fauna Survey (GHD 2020a)	GHD undertook a single season Level 2 fauna survey of areas within and adjacent to the Yara lease boundary (the survey area). The purpose of the survey was to	• Six broad habitat types (excluding disturbed/cleared areas) were recorded within the Development Envelope, five of which occur within the Proposal Footprint. The habitats within the Proposal Footprint have moderate to high habitat value.

Key environmental factor	Report (Author Year)	Survey description	Survey findings
		identify and describe the dominant fauna habitat types present, assess habitats for conservation significant fauna, assess habitat connectivity, and identify and record fauna species opportunistically and through a trapping program. The Level 2 fauna survey was conducted in March 2020, which is considered appropriate timing for the Pilbara IBRA bioregion. Furthermore, the survey was conducted following the wet season which is considered appropriate timing according to the EPA *Technical Guidance – Terrestrial Fauna Surveys* (EPA 2016b).	• The field survey recorded a total of 113 vertebrate fauna species including 57 birds, 36 reptiles, 19 mammals and one amphibian. It was considered that terrestrial vertebrate fauna were adequately sampled and that survey effort was adequate to provide a true representation of the fauna assemblage present at the time of the survey. • Eight conservation significant fauna species were recorded during the field survey: - Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable under the *Biodiversity and Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) - Western Pebble-mound Mouse (*Pseudomys chapmani*) – Listed as Priority 4 by the Department of Biodiversity, Conservation and Attractions (DBCA) - North-western Free-tail Bat (*Mormopetrus ozimops cobourgianus*) – Listed as Priority 1 by DBCA - Caspian Tern (*Hydroprogne caspia*) – Marine and Migratory (International Agreements) under the BC Act and the EPBC Act - Gull-billed Tern (*Gelochelidon nilotica*) – Marine and Migratory (International Agreements) under the BC Act and EPBC Act - Common Sandpiper (*Actitis hypoleucos*) –Marine and Migratory (International Agreements) under the BC Act and EPBC Act - Common Greenshank (*Tringa nebularia*) –Marine and Migratory (International Agreements) under the BC Act and EPBC Act - Red-necked Stint (*Calidris ruficollis*) –Marine and Migratory (International Agreements) under the BC Act and EPBC Act. • A further 23 conservation significant fauna species were considered likely to occur based on a likelihood of occurrence assessment. Of the 23 conservation significant species, 22 were considered likely within the Development Envelope due to the floodplain and water body habitats, but unlikely to occur within the Proposal Footprint due to a lack of suitable habitat.

Key environmental factor	Report (Author Year)	Survey description	Survey findings
Social surrounds	Yara Development Envelope Archaeological Site Verifications, Burrup Peninsula, WA – Report (Land Access Solutions 2020)	Land Access Solutions undertook a desktop heritage survey and an archaeological site verifications survey to verify the heritage values within the Development Envelope. The survey involved archaeologists and an anthropologist and consultation with the Murujuga Aboriginal Corporation (MAC). A	• A desktop assessment identified 32 previously recorded Aboriginal heritage places intersecting the Development Envelope: - Nine of which are 'Registered sites' and have been assessed by the Aboriginal Cultural Material Committee to fall under the *Aboriginal Heritage Act 1972* - Nineteen are 'Lodged' and yet to be assessed - Three were not deemed Aboriginal sites under the *Aboriginal Heritage Act 1972* - One does not fall into any of these categories. - The hills in the northwest of the Development Envelope were considered likely to have a number of heritage sites. In consultation with MAC this area was not surveyed and recommendations made to exclude from development. • The field survey verified eight of the nine heritage sites, with one site (20266) unable to be located. This site was recorded as being on the same granophyre outcrop as another site (20265). • Consultation with MAC representatives acknowledged these nine sites as being of cultural importance, and should not be disturbed. The Proposal Footprint has been designed to avoid all identified heritage sites. • LAS (2020) provides a number of recommendations to manage potential heritage impacts from the Proposal.
		Land Access Solutions completed a follow-up heritage survey in July 2020 to identify heritage values in areas west and east of the existing YPF Plant.	• No heritage values were identified from these areas.

1.4.2 Key assumptions and uncertainties

Key assumptions and uncertainties are detailed in Table 1-3.

Table 1-3 Key Assumptions and uncertainties

Aspect	Assumptions and uncertainties
Flora and vegetation	The flora and vegetation survey (GHD 2020a) has reported nil to minor limitations in either desktop or field components, and does not pose any substantial uncertainty with respect to this CEMP. The survey is considered to be valid for the purposes of this CEMP. It is assumed that the survey undertaken has accurately identified and mapped vegetation associations, and identified Priority flora and populations within the Proposal Footprint and surrounds.
Terrestrial fauna	The findings of the fauna surveys completed to date have formed the basis for the rationale and management approach adopted for the CEMP. It is assumed that the surveys undertaken have accurately identified and mapped fauna habitat and recorded fauna occurrences.
Social surrounds	It is assumed that the assessment undertaken within the Development Envelope has accurately identified and mapped the Aboriginal registered sites with the project area (LAS 2020). It is also assumed that data taken from the Aboriginal Heritage Inquiry System and the State Heritage Register (Inherit) was current and correct at the time of enquiry.

1.4.3 Management approach

The management approach for this CEMP adopts a risk-based approach to identify and prioritise management provisions. This CEMP adopts a management hierarchy in the prioritisation of management provisions and outlines monitoring and reporting procedures to provide for continuous improvement, consistent with an adaptive management approach.

1.4.4 Rationale for choice of provisions

This CEMP adopts management based provisions that align with established industry practices for avoidance and minimisation of environmental and heritage impacts for developments in the Pilbara region. The overall management approach is to avoid disturbance of key environmental and heritage values as far as practicable. Where avoidance is unachievable, the management approach is to minimise and reduce disturbance of key environmental and heritage values.

The management provisions detailed in this CEMP align with the mitigation measures outlined in the Ammonia Plant, Burrup Peninsula – Renewable Hydrogen Project Section 38 Referral Supporting Report (GHD 2020b). The management provisions have considered the direct, indirect and cumulative impacts as a result of the Proposal as well as the expected intensity and duration of these impacts during the construction phase of the Proposal. Recommendations from technical studies have also been considered and included.

2. EMP provisions

This section identifies the management provisions that the proponent will be implement via this CEMP. Sections 2.1, 2.2 and 2.3 detail the management objectives, actions and targets for each key environmental factor.

2.1 Flora and vegetation

Management provisions for flora and vegetation are outlined in Table 2-1.

Table 2-1 Flora and vegetation – management provisions

EPA Objective: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained*.			
CEMP Objective: To minimise clearing of native vegetation and minimise indirect impacts to surrounding native vegetation, as far as practicable			
Key environmental values: Native vegetation including significant vegetation and flora			
Key impacts and risks: • Loss of vegetation and flora through clearing, including significant vegetation and flora • Introduction and spread of environmental weeds • Fragmentation of native vegetation • Potential reduction in vegetation health as a result of dust generation • Changes to vegetation structure and floristic composition in surrounding/adjacent areas through altered surface water drainage patterns and flows • Altered fire regimes.			
Management action	Management target	Monitoring	Reporting
Demarcate Proposal Footprint boundary using appropriate visual markers prior to ground disturbing activities. Visual inspection and approval of Proposal Footprint boundary prior to ground disturbing activities. Visual inspection and record of cleared areas to be undertaken post-clearing to ensure no over clearing. Vehicles and equipment access limited to designated roads/access tracks and cleared areas. All site personnel to be inducted on environmental responsibilities.	No clearing of vegetation to occur outside of Proposal Footprint during and attributable to construction. No impact to significant vegetation and flora outside of Proposal Footprint.	Daily inspection of Proposal Footprint boundary demarcation during clearing activities. Pre-clearance inspections, with any variations between pegged clearing area and approved plans to be investigated and resolved prior to clearing. Daily inspection of clearing extents during clearing activities to confirm no over clearing.	Report unauthorised clearing as soon as practicable after identified. Vegetation clearing records and annual environmental reporting. Induction records.
Vehicles and equipment to be inspected and cleaned of soil, vegetative material and seeds on entry/exit to site. Vehicles and equipment access limited to designated roads/access tracks and cleared areas. Fill material brought to site is to be certified weed free. Areas of known weed infestation within the Proposal Footprint will be flagged. Vehicles and equipment working	Minimise the introduction and spread of environmental weeds.	Weekly spot checks of vehicles and equipment compliance with cleaning. Inspection of fill material and certification. Quarterly weed inspection and management program.	Results of spot checks of vehicle and equipment cleaning compliance. Maintain records of fill material certification. Quarterly weed monitoring report.

Management action	Management target	Monitoring	Reporting
in these areas to be inspected and cleaned of soil, vegetative material and seeds prior to traversing to other areas of the site. Implement a quarterly weed monitoring and management program following completion of ground disturbance activities. All site personnel to be inducted on environmental responsibilities including hygiene management.			Weed and Seeds certificates Induction records.
Vehicles and equipment access limited to designated roads/access tracks and cleared areas. Vehicle speed limits will be imposed and enforced on nominated routes. Dust suppression, including use of water carts on access roads, to be implemented during construction activities as required. All site personnel to be inducted on environmental responsibilities.	Minimise dust generation during ground disturbing activities.	Daily visual monitoring of dust levels by the construction supervisor or representative. Dust suppression and dust control measures will be visually inspected in the monthly environmental compliance inspection.	Incident reporting system.
Local drainage to be considered during site design and layout. Disturbances to drainage lines will be minimised where practicable.	Minimise indirect impacts to surrounding/adjacent areas from altered surface water drainage and flows.	Monthly visual inspections for environmental compliance.	Monthly environmental compliance inspection reports.
All non-essential work is to be stopped or postponed in the event that a Total Fire Ban with Catastrophic fire danger ratings or Emergency Warning is issued for the Burrup Peninsula. All vehicles and machinery undertaking clearing activities to be fitted with firefighting equipment. Vehicles and equipment access limited to designated roads/access tracks and cleared areas. Implementation of a hot work permit system. Smoking will be confined to designated smoking area only. All site personnel to be inducted on environmental responsibilities including fire prevention.	No unplanned fires as a result of Proposal activities.	Daily review of DFES website for fire danger rating applicable to the Burrup Peninsula. Compliance with access requirements. Compliance with hot work permits.	Incident reporting system. Hot work permit record system. Induction records.

2.2 Terrestrial fauna

Management provisions to minimise impacts to terrestrial fauna are provided in Table 2-2.

Table 2-2 Terrestrial fauna – management provisions

EPA Objective: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained*.			
CEMP Objective: To minimise fauna habitat loss and minimise indirect impacts to fauna as far as practicable			
Key environmental values: Moderate and high value fauna habitat, conservation significant fauna and habitats			
Key impacts and risks: • Loss of fauna habitat through clearing, including habitat for conservation significance fauna species • Fauna injury/ death from vehicle strike/clearing activities • Habitat fragmentation • Fauna activity disturbance from temporary increase in noise/vibration during construction.			
Management action	Management target	Monitoring	Reporting
Ground disturbing activities limited to Proposal Footprint. Vehicles and equipment access limited to designated roads/access tracks and cleared areas.	Minimise fauna habitat loss.	Daily inspection of clearing extents during clearing activities to confirm no over clearing.	Report unauthorised clearing as soon as practicable after identified.
Record conservation significant fauna and habitat identified during site surveys (e.g. GHD 2020a) in a centralised database to ensure that habitat areas can be easily identified during construction. Vegetation clearing to occur outside of the Pilbara Olive Python breeding season. Prior to clearing conduct a trapping and relocation program for conservation significant fauna (focus on Pilbara Olive Python) in accordance with DBCA's Standard Operating Procedures (SOPs) and permit/licence conditions as required under the BC Act. The program is to be undertaken by a qualified fauna specialist. Prior to commencing vegetation clearing activities, machinery will idle for at least half an hour. Fauna spotters are required on site during vegetation clearing activities to supervise dispersal and relocation of any fauna. Fauna identified within the demarcated	No avoidable deaths of conservation significant fauna during vegetation clearing for construction. Minimise fauna injury/death during Proposal construction.	Pre-clearing trapping and relocation program. Daily visual inspections for native fauna (fauna spotters) during vegetation clearing. Daily inspections of excavations and trenches to identify trapped fauna and to enable capture and relocation.	Pre-clearing trapping and relocation program report. Record known injuries to, or deaths of conservation significant fauna species in a Conservation Significant Fauna Interaction Register as soon as possible as the injury or death is identified. Annual environmental reporting. Induction records.

Management action	Management target	Monitoring	Reporting
clearing areas unable to move away from the clearing areas without intervention are be moved to a location deemed appropriate for the safety and survival of the fauna individual/s. Clearing to be undertaken progressively in one direction to allow fauna to move on. Excavation and trenches will be kept open only a long as needed for the works. Egress points will be provided in appropriate size excavations and trenches. For trenches or excavations that can be covered by a fence panel, this will be completed to prevent animal egress. Trenches and excavations will be checked for trapped animals. In the event vertebrate fauna is injured during clearing or construction, the animal shall be taken to an authorised veterinarian or trained wildlife carer, or if not possible, humanely euthanized in accordance with DBCA SOPs. Observations of conservation significant fauna species by site personnel are to be reported to the site environment representative. Vehicles and equipment access limited to designated roads/access tracks and cleared areas. Night-time vehicle movements during construction will be restricted where possible to minimise the potential for vehicle strikes. No pets, traps or firearms are allowed within the Development Envelope. No feeding or intentionally harming native fauna. All site personnel to be inducted on environmental responsibilities.			
Develop noise and vibration minimisation strategies to be implemented during Proposal construction. All site personnel to be inducted on environmental responsibilities.	Minimise disturbance to native fauna from noise and vibration during Proposal construction.	Compliance with implementation of noise and vibration minimisation strategies.	Annual environmental report. Induction records.

2.3 Social surroundings

Management provisions to minimise impacts to social surroundings are provided in Table 2-3.

Table 2-3 Social Surroundings – management provisions

EPA objective: To protect social surroundings from significant harm.			
CEMP objective: To minimise impacts to heritage values			
Key environmental value: Adjacent heritage sites and visual amenity.			
Key impacts and risks: • Potential indirect impacts to known Heritage Sites and areas within the National Heritage Place as a result of blasting debris, vibration and dust deposition from ground preparation works during construction • Potential to impact upon amenity (visual, noise and vibration)			
Management action	Management target	Monitoring	Reporting
Prior to conducting ground disturbing activities, known heritage sites and National Heritage Place are to be demarcated via appropriate signage, fencing or flagging. Engagement of Aboriginal heritage monitors through MAC to monitor all ground disturbing earthworks and to manage Aboriginal heritage values of the site and the adjacent areas. Ground disturbing activities, such as clearing or excavation must not occur within a 10 m buffer around each of the nine Aboriginal heritage sites or within National Heritage Place. Enable MAC Rangers to monitor the heritage places to enable knowledge transfer to occur and ensure the heritage values are protected for future generations. Continue to engage and consult with MAC to ensure heritage values are managed. Regularly liaise with MAC to establish and maintain processes and accountability between the parties. Any potential Aboriginal materials or other unexpected finds found on site during excavation, such as Aboriginal burials, will be subject to an immediate shutdown of activities and an exclusion zone of 5 m. The Environment/ Heritage manager will be immediately notified, and the	No disturbance of known Aboriginal Heritage sites. No disturbance of National Heritage Place.	Pre-ground disturbance inspection of known Aboriginal heritage sites and National Heritage Place boundary to verify buffer and/or signage/fencing etc. Daily visual inspections of heritage sites (MAC heritage monitors and rangers) during ground disturbance. Regular engagement with MAC.	Incident reports. Annual environmental reports. Induction records.

Management action	Management target	Monitoring	Reporting
Department of Planning, Lands and Heritage (DPLH) will be notified. DPLH will advise further management. An incident report will be lodged. MAC will be consulted and an archaeologist will be engaged to assess the archaeological material and provide a report to YPF. YPF will work with MAC and the archaeologist to implement an appropriate course of action. All site personnel to be inducted on heritage responsibilities including heritage values.			
Dust suppression, including use of water carts to be implemented during construction activities in proximity to Aboriginal heritage sites as required.	Minimise dust deposition on Aboriginal heritage sites	Daily visual inspections of heritage sites (MAC heritage monitors and rangers) during ground disturbance. Ad hoc inspections of heritage sites (MAC heritage monitors and rangers) during Proposal construction.	Incident reports. Annual environmental reports.
Demarcate Proposal Footprint boundary using appropriate visual markers prior to ground disturbing activities. Visual inspection and approval of Proposal Footprint boundary prior to ground disturbing activities. Vehicles and equipment access limited to designated roads/access tracks and cleared areas. Dust suppression, including use of water carts to be implemented during construction activities in proximity to National Heritage Place as required. Heavy vehicle movements minimised as far as practicable. All site personnel to be inducted on heritage responsibilities including heritage values.	No disturbance to adjacent National Heritage Place	Pre-ground disturbance inspection of Proposal Footprint boundary demarcation.	Incident reports.
Construction works will be undertaken in accordance with the *Environmental Protection (Noise) Regulations 1997.* Construction activities will be limited between 0700 and 1900 Monday to Saturday, excluding public holidays,	Minimise construction noise and vibration	Compliance with *Environmental Protection (Noise) Regulations 1997* and/or approved Noise Management Plan.	Incident reports. Complaint close-out. Annual environmental reports. Induction records.

Management action	Management target	Monitoring	Reporting
unless an out of hours Noise Management Plan is developed and approved by the City of Karratha. Establish a complaints register. Reduce noise emissions as much as practicable. Vibration to be minimised through planned blasting (guided by geotechnical assessment and risk assessment of vibration impact) and the designation of buffer zones as required. Heavy vehicle movements minimised as far as practicable. All site personnel to be inducted on environmental responsibilities including.		Investigation and reporting of all complaints.	
Undertake a glint and glare assessment to ensure there is limited glare towards a road users YPF Plant, Hearson Cove or Karratha airport. Maximise visual amenity through site layout design and construction materials, where possible.	Minimise adverse visual amenity.	Completion of glint and glare assessment and implementation of recommendations, where appropriate.	Glint and glare assessment. Annual environmental reports.

3. Adaptive management and review of the EMP

An adaptive management approach aims to reduce impacts by embedding a cycle of monitoring, reporting and implementing change, where required. This document applies the principles of adaptive management through monitoring, corrective actions and implementing changes.

3.1 Environmental monitoring and corrective actions

Internal monitoring of the environmental aspects outlined in this Plan will occur throughout the construction phase of the Proposal. Any non-conformances or incidents within this CEMP will be investigated, rectified or mitigated as soon as possible to ensure minimal ongoing environmental harm. Relevant procedures will be amended/updated as necessary and inductions and other workforce communication will be undertaken in a timely manner to minimise the risk of re-occurrences.

3.2 CEMP review

This CEMP is intended to be dynamic and may be updated to reflect changes in management practices and the natural environment with time. This will also allow flexibility to adopt new technologies/management measures.

Amendments to management actions and targets will be completed on an as needs basis. This will include revision/amendment of management actions that are not achieving the desired outcomes, monitoring identifying additional impacts and management actions, changes to relevant legislation or improvements to practices to achieve a greater environmental outcome.

3.3 Incident reporting

3.3.1 Environmental incidents / non-compliance

Environmental incidences and non-compliances will be identified and recorded as soon as possible by the relevant responsible persons. Incidents will be mitigated or rectified where possible within 48 hours of being identified. Non-conformances to this plan will be reported to the Construction Manager or equivalent within 48 hours of identification.

3.3.2 Reporting

The environmental performance of the construction activities and the identification of auditing requirements will be assessed by YPF prior to and throughout the construction period. All documents pertaining to environmental management are required to be maintained though a system of document control.

Reporting requirements will be undertaken in accordance with the Ministerial Statement, with annual reporting. If a significant non-conformance with this plan occurs, the regulator will be notified of the non-compliance and subsequent investigation.

4. Stakeholder consultation

YPF undertakes ongoing engagement with key stakeholders. These stakeholders include local Traditional Owners, Commonwealth, State and Local Government members and associated Departments, as well as community members, local and regional industry and media. A summary of the consultation undertaken as part of the environmental approvals process is provided in Ammonia plant, Burrup peninsula – Renewable Hydrogen project, Section 38 Referral Supporting Report (GHD 2020b).

YPF's ongoing consultation will continue throughout the construction phase and beyond, to ensure transparent and clear engagement informs our progress and that all concerns are addressed. Critically, YPF and ENGIE engage extensively with MAC and will continue to work together with the local Aboriginal traditional owner groups to develop commercial, employment and training opportunities.

5. References

Environmental Protection Authority (EPA) (2016a). Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment, Environmental Protection Authority.

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GHD Pty Ltd (2020a). Renewable Hydrogen Project, Flora and Fauna Survey, unpublished report prepared for Yara Pilbara Fertilisers Pty Ltd.

GHD Pty Ltd (2020b). Ammonia plant, Burrup peninsula – Renewable Hydrogen project, Section 38 Referral Supporting Report, unpublished report prepared for Yara Pilbara Fertilisers Pty Ltd.

Land Access Solutions (LAS) (2020). Yara Development Envelope Archaeological Site Verifications, Burrup Peninsula, WA – Report.

ME Trudgen and Associates (2002). A flora, vegetation and floristic survey of the Burrup Peninsula, some adjoining areas and part of the Dampier Archipelago, with comparisons to the floristics of areas on the adjoining mainland Volume 2. For the Department of Mineral and Petroleum Resources. Perth, WA

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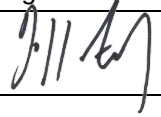
https://projectsportal.ghd.com/sites/pp18_04/yarapilbararnh3proje/ProjectDocs/12520684-REP_Renewable Hydrogen Project Stage 0 CEMP.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	N Lutz S Ascott J Tindiglia	M Brook		J Foley		22/07/2020

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