



**Dampier Bunbury
Pipeline**

PLUTO – NORTH WEST SHELF INTERCONNECTOR

CONSTRUCTION ENVIRONMENT PLAN

E-PLN-032

REVISION 1.1

***PUBLIC SUMMARY
DOCUMENT***

DOCUMENT CONTROL

Rev	Date	Description
0	17/01/2020	Initial Submission
1	12/05/2020	Revised on DMIRS feedback
1.1	18/06/2020	Revised on DMIRS feedback

	Title
Author	Senior HSE Advisor
Reviewed	Project Manager
Approved	General Manager, Transmission Asset Management

Contents

1. Introduction.....	4
2. Proponent	4
3. Location.....	4
4. Existing Environment	6
4.1. Climate	7
4.2. Landforms, Geology and Soils	7
4.3. Contaminated Sites	8
4.4. Vegetation Associations and Communities	8
4.5. Flora.....	9
4.6. Fauna.....	9
4.7. Hydrology and Hydrogeology.....	10
4.8. Community.....	11
4.9. Cultural Heritage.....	11
5. Activity Description.....	12
6. Environmental Risk Management.....	1
6.1. Soil and Sediment.....	1
6.2. Flora.....	2
6.3. Weed and pathogens	3
6.4. Bushfire	3
6.5. Fauna.....	4
6.6. Cultural Heritage and Stakeholder Engagement.....	4
6.7. Air emissions including dust and noise.....	5
6.8. Surface and Ground Water.....	6
6.9. Hazardous Materials Storage and Handling and Spill response.....	7
6.10. Waste management	8
7. Monitoring.....	1
8. Consultation.....	1
9. References	4

1. Introduction

DDG Operations Pty Limited (DDGO) proposes to construct the Pluto-North West Shelf Interconnector (PNI) (herein referred to as the Project), a 3.3 km-long buried steel natural gas pipeline in the industrialised section of the Burrup Peninsula in the Pilbara Region in Western Australia (WA). The Project will commence at the Pluto Compressor Station (PCS) within the DBNGP corridor and connect the Pluto Liquefied Natural Gas (LNG) Plant with the Karratha Gas Plant (KGP).

The Project will enable the transfer of raw gas Pluto LNG Plant to KGP for processing. The KGP is operated by Woodside Energy Limited (Woodside) on behalf of the North West Shelf Joint Venture (NWSJV). The Pluto LNG Plant was commissioned in 2006 and is also operated by Woodside on behalf of the Pluto LNG Joint Venture.

The Project construction has been designed to align with existing disturbed areas to reduce the nature and scale of associated environmental impacts. The first 2.2 km of the Project extending north from the PCS will traverse inside the Dampier to Bunbury Natural Gas Pipeline (DBNGP) corridor. The existing DBNGP Corridor established under Section 31 of the *Dampier to Bunbury Pipeline Act 1997* has been disturbed historically during the original construction of the DBNGP and at sections along the DBNGP Corridor for subsequent inspection, maintenance and expansion activities.

The latter section of the Project will traverse the NWS buffer zone lease (I123605) granted to the NWS Project participants (Buffer Zone Lease) for approximately 400 metres (m) and then into the KGP lease (I123606) granted to the NWS Project participants (KGP Lease) for approximately 700 m (Figure 1). Both leases were granted pursuant to the *North West Gas Development (Woodside) Agreement Act 1979*.

Construction of the Project is scheduled to commence in Q3 2020 and be completed in Q2 2021.

The objective of this document is to provide a succinct and publically available summary of the DMIRS approved DBNGP EP as required under regulation 11 (7) of the Regulations.

2. Proponent

The proponent for the project is DDG Operations Pty Limited (ACN 166 900 170).

Under the *Petroleum Pipelines Act 1969*, DMIRS issued Pipeline Licence 122 (PL122) to DDGO on 23 October 2019.

DDGO is part of the Australian Gas Infrastructure Group (AGIG) and is a wholly owned subsidiary of a consortium comprising CK Infrastructure Holdings Limited, CK Asset Holdings Limited and Power Asset Holdings Limited, all of which are listed companies on the Hong Kong Stock Exchange.

DDGO relies on the services of DBNGP (WA) Nominees Pty Ltd (DBP), the owner of the DBNGP, for the provision of labour and equipment to undertake its business. In this regard, DDGO adopts all AGIG and DBP policies and procedures across the operation of its business.

Public enquiries regarding the PNI may be directed to:

Attn: Land Manager

PO Box Z5267

Perth, St Georges Terrace WA 6831

Telephone: +61 8 9223 4300

land.management@agig.com.au

3. Location

The PNI pipeline commences at Pluto Compressor Station and runs 3.3km in a northerly direction to the Karratha Gas Plant. The pipeline is on the Burrup Peninsula and is approximately 5.5km north east of Dampier. The relevant Pipeline Licence in PL122 issued for construction and operation of the PNI.

Coordinates include (Easting, Northing – GDA94 Zone 50):

- Inlet Station (Pluto Compressor Station) E476070, N7719987
- Metering Station (Dampier Facilities) E476870, N7721801
- Pig Receiving Station (Karratha Gas Plant) E477315, N7722652

The below map (Figure 3-1) indicates the pipeline route, location and above ground facilities.

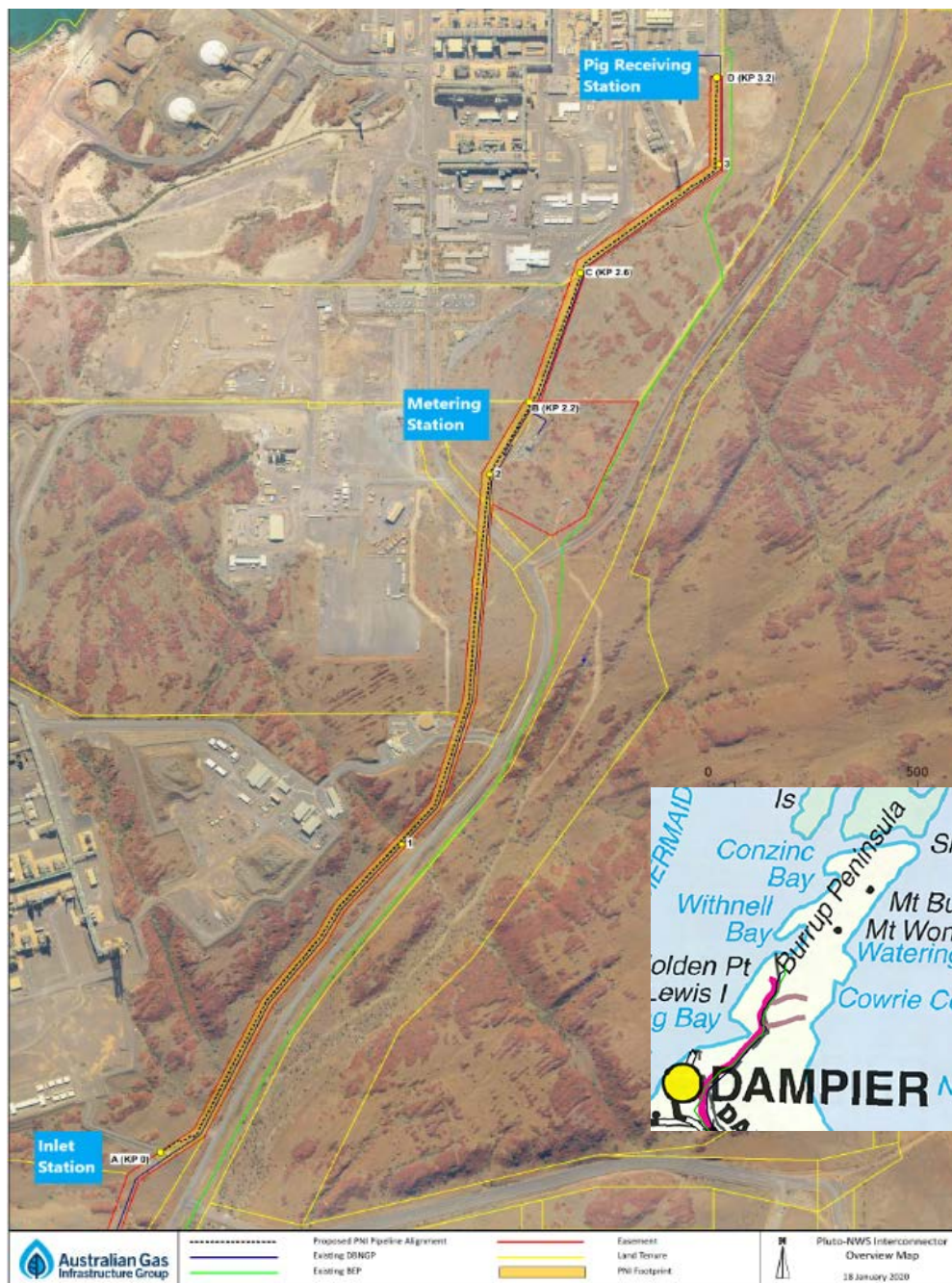


Figure 3-1: Location Map of PNI project

4. Existing Environment

The PNI extends 3.3km along existing pipeline routes to transport natural gas along the previously disturbed pipeline route as shown in Figure 4-1.



Figure 4-1 PNI Location and Priority Flora Location

4.1. Climate

The Project is situated within the Roebourne subregion of the Pilbara Bioregion of Western Australia. This region is classified as arid tropical with two distinct seasons: a hot and wet summer from October to April, and a mild dry winter from May to September (BoM 2018).

Key characteristics of the physical environment in the Pilbara coastal area are:

- Cyclonic activity between November and April with attendant storm surge and flooding of coastal plain and rivers
- Ephemeral creeks and rivers resultant from unreliable and sporadic rainfall

The mean maximum temperature ranges from 36.2 °C in the summer to 26.3°C in the winter and mean minimum temperatures range from 26.8°C in the summer to 13.8°C in the winter. Rainfall is highest between the months of December and April with highest mean monthly rainfall in February (77.1 mm) and lowest mean monthly rainfall in October (0.4 mm).

4.2. Landforms, Geology and Soils

Geology

The geological substrate of the Burrup Peninsula is described as jointed Archean and gneissic granite with intrusive outcrops of granophyric rhyodacite, which is predominantly blue-grey rock with a reddish-brown weathering skin. The original granite capping has likely been eroded away, leaving the rhyodacite exposed as the main surface rock present (Jacobs 2018).

The surface geology of the pipeline corridor is comprised of the Gidley Granophyre unit, which is granophyre, commonly porphyritic and remelted granite (Astron 2018a; Stewart et al. 2008). This unit is at least 2 km thick, and it outcrops over an area of approximately 100 km².

Landforms

The Burrup Peninsula comprises of four land systems: Cheerawarra, Granitic, Littoral and Rocklea. The Project area lies solely within the Granitic land system, characterised by rugged granitic hills supporting shrubby hard and soft spinifex grasslands (Astron 2018a). The distribution of the granitic land system comprises of 4,020 ha within the Pilbara bioregion, where approximately 26% lies within the Project area (10.69 ha).

The pipeline alignment traverses a significant portion of made ground representing areas which have been altered through anthropogenic influences, such as through earthworks and development for infrastructure. The landforms in the Project area are not considered significant.

Soils including Acid Sulphate Soils (ASS)

The Burrup Peninsula comprises of Archean igneous rocks and relatively shallow, heavily weathered red soils reaching a maximum depth of 2.0 m in the lower alluvial slopes. The adjacent Pluto LNG soils are thin and develop between outcrops of rhyodacite. The soils consist of clayey sandy gravels, as a result of erosion from underlying rhyodacite with a transition between soils to very strong rock, with irregular soil-rock interface (Woodside, 2006).

Surface soils have historically been disturbed and modified through the original trenching, blasting and filling during construction of the DBNGP.

A search of the National Map (Australian Government) found no ASS are known to occur within the Indicative Disturbance Footprint. In the southern extent near KGP, on the other side of Burrup Road (outside the Indicative Disturbance Footprint) there is a moderate to low risk of ASS occurring within 3m of natural soil surface but a high to moderate risk of ASS beyond 3 m of natural soil surface (Australian Government, 2018).

4.3. Contaminated Sites

A desktop review of the Department of Water and Environmental Regulation (DWER) Contaminated Sites Database was undertaken to identify the presence or absence of contaminated sites within the Indicative Disturbance Footprint. None were listed at the time of the initial submission of this plan.

In late January 2020, DPLH advised DDGO that contaminated sites listings have occurred over the following:

- Lot 197 on Deposited Plan 30713 – Karratha Gas Plant Buffer Zone
- Lot 199 on Deposited Plan 216680 – Karratha Gas Plant

The current classification is 'possibly contaminated – investigation required'. Further investigations will be undertaken to understand any impacts to the project. Controls shall be implemented for the management of any contaminated soil.

4.4. Vegetation Associations and Communities

The Interim Biogeographic Regionalisation for Australia (IBRA) currently recognises 89 bioregions and 419 subregions (DoE 2013). The Proposal is situated within the Roebourne subregion of the Pilbara Bioregion.

Vegetation Associations and Pre-European Vegetation

Astron Environmental Services (Astron) conducted a biological survey of the Project area. This survey involved an initial desktop survey, including database searches and a literature review. A field flora, vegetation and fauna Reconnaissance (formerly Level 1) surveys was then conducted in June 2018 along a survey corridor approximately 5 km in length and 50 m in width with a total area of 21.1 ha.

Based on the vegetation mapping conducted by Beard (1975), the only pre-European vegetation association mapped within the survey area is vegetation association 117: Abydos Plain – Roebourne (Hummock grassland, grass steppe, soft spinifex *Triodia* species). Within the Roebourne subregion, approximately 92% of the pre-European extent of this vegetation association remains with 32.5% of this protected in conservation estate (Astron, 2018).

The survey report identified 11 vegetation associations consisting of four associations representing undisturbed vegetation (mainly *Triodia* grasslands with or without an upper storey of shrubland and/or woodland), six associations representing drainage line vegetation (mangroves, Eucalypt woodlands and *Terminalia canescens* shrublands/woodlands) and 8 associations representing disturbed vegetation (similar associations to the undisturbed and drainage line vegetation but with *Cenchrus ciliaris* dominant). The vegetation condition of the survey area includes 33% mapped as 'completely degraded' where this area consists of roads and infrastructure with land clear of vegetation.

A comparison of vegetation associations of the survey area was conducted with Trudgen's 2002 mapped vegetation association of the Burrup Peninsula. The 2b and 7b vegetation associations of the 2018 survey was identified to be of the TcBaTe vegetation. The TcBaTe vegetation association is considered significant with two to four known occurrences in the area (Trudgen, 2002). Vegetation 2b consists of 5% of the survey area and 7b vegetation consists of 3% of the survey area, found at the base of the KGP batter in the artificial drainage line. All other vegetation associations that were identified within the survey area were found to have greater than 10 occurrences in the Burrup Peninsula as identified by Trudgen (2002) (Astron, 2018).

Threatened Ecological Communities and Environmentally Sensitive Areas

No Threatened Ecological Communities (TEC) or Priority Ecological Communities (PEC) or habitat were recorded.

However, the survey area is found to be within or adjacent to the buffer of two Priority 1 PECs , namely the Burrup Peninsula rock pile communities; and the Burrup Peninsula Rock pool communities (Astron, 2018).

4.5. Flora

A total of 63 plant taxa which are representative of 51 plant genera and 28 plant families were recorded within the survey area. The majority of the taxa recorded were representative of the Fabaceae (16 taxa), Poaceae (8 taxa) and Malvaceae (8 taxa) families.

No State or Commonwealth Listed Threatened flora were recorded within the survey area. Two State Listed Priority (P) flora species were identified; *Terminalia supranitifolia* (P3) and *Rhynchosia bungeensis* (P4). The species are considered widespread on the Burrup Peninsula (Astron, 2018). A desktop assessment identified one further priority flora species *Vigna triodiophila* (P3) to potentially occur in the area however the species was not recorded in the survey (Astron, 2018).

Two introduced flora species were recorded in the survey area:

- *Aerva javanica* (Kapok bush)
- *Cenchrus ciliaris* (Buffel grass)

C. ciliaris was identified as a key species in the disturbed vegetation of the survey area (Astron, 2018).

No weed species listed as a Weed of National Significance (Australian Weeds Committee 2012) or declared pest plant in Western Australia under the Biosecurity and Agriculture Management Act 2007 (BAM) (Department of Primary Industries and Regional Development 2017) were recorded in the survey area.

4.6. Fauna

A fauna survey was conducted in conjunction with the flora survey in June 2018. The survey area was approximately 50 m in width, which included the Indicative Disturbance Footprint. At the time of survey, it was requested that two additional sites (herein referred to as 'additional survey sites') located outside of the survey corridor also be assessed. These included:

- an area 50 m in width extending approximately 500 m from the north east corner of the survey corridor to the end of the fenced DGBP Corridor; and
- the area of vegetation encapsulated by the southern end of the survey corridor as it bends into the adjacent Pluto LNG plant.

Approximately 33% of the survey corridor area is infrastructure and roads and considered 'highly degraded'. The condition of remaining vegetation within the corridor ranged from 'disturbed' (19%) to 'high quality' with the majority (43%) recorded as 'high quality'. The Indicative Disturbance Footprint traverses three broad habitats based on vegetation types and landforms present in the survey area: grassland; open woodland/shrubland; eucalypt.

The areas of Eucalypt Woodland are of higher value for fauna, particularly for conservation significant species, than the other recorded habitats due to the diversity of microhabitats present and the diversity and complexity of the vegetation. In particular, to the south of the KGP there is a drainage zone and associated narrow drainage line located within the survey corridor that supports a *Terminalia canescens*, *Eucalyptus victrix* and *Corymbia hamersleyana* open low woodland.

A desktop assessment identified total of 59 terrestrial fauna species have the potential to occur within a 20 km buffer of the survey area including; 8 mammal, 3 reptile and 48 birds.

Of the 50 species, two conservation significant species the northern quoll (*Dasyurus hallucatus*) and Pilbara olive python (*Liasis olivaceus barroni*) were considered to have a 'high' likelihood of occurrence within the survey area. Three conservation significant species were considered to have a 'moderate'

likelihood: Lined soil-crevice skink (*Notoscincus butleri*); Fork-tailed swift (*Apus pacificus*) and Peregrine falcon (*Falco peregrinus*).

During the field survey a total of three vertebrate species were opportunistically recorded in the survey area, comprising the euro (*Osphranter robustus erubescens*), short-beaked echidna (*Tachyglossus aculeatus acanthion*) and corella (*Cacatua sanguinea*).

No conservation significant species were recorded during the survey. Given the number and proximity of previous records for both these species on the Burrup Peninsula, it was considered likely that the northern quoll and Pilbara olive python will utilise the survey area for foraging or dispersal purposes. However, the field survey confirmed that the habitats within the survey area were not suitable as shelter habitat. The Pilbara Olive Python is commonly found under rockpiles and spinifex within rocky escarpments, deep gorges and water holes and the Northern Quoll is commonly found within rocky escarpments and open lowland savannah forests.

The Indicative Disturbance Footprint alignment (being a narrower 30m corridor (in most locations) within the wider survey area) has been designed to minimise interaction the Pilbara Olive Python and the Northern Quoll habitat by avoiding the drainage line at the base of the Karratha LNG plant.

Feral and pest animals that are likely to occur within the survey area are the Rock Pigeon, House Sparrow, Eurasian Tree Sparrow, Domestic Dog, Horse, Domestic Cat, House Mouse, Rabbit, Black Rat and the Red Fox (Astron, 2018).

Conservation Areas

No conservation reserves occur within the survey area. One national park (Murujuga National Park), one unnamed nature reserve and six unnamed Section 5(1)(h) reserves are located within a 20km radius from the survey area (Astron, 2018).

4.7. Hydrology and Hydrogeology

The project does not require abstraction of groundwater or excavation below the water level and no standing surface water exists within the Indicative Disturbance Footprint.

The Burrup Peninsula and the wider Pilbara region predominantly relies on the wet season for surface freshwater supplies. Freshwater flows tend to be highly variable and high flow, short period (duration) events often occur. During the dry period surface water supplies are limited with stream flow and recharge of deep water holes and gorges becoming restricted (Woodside, 2006).

The natural topography has been modified and historically disturbed from the existing DBNGP Corridor and KGP and Pluto LNG Plant adjacent to the Project. No permanent natural bodies of fresh surface water exist on site however an ephemeral creek line crosses the site to the east of the Pluto LNG Plant. An ephemeral creek line runs to the east of the Burrup Road emptying into King Bay. Several minor tributaries of this creek line cross the Indicative Disturbance Footprint.

Groundwater aquifers are present across the Burrup Peninsula, occurring as localised systems with regional flow of isolated pockets in rock fractures, joints and cavities of rock mass. The Burrup Peninsula contains soils and underlying weathered bedrock that are highly permeable enabling groundwater recharge from rainfall events. The presence of granophyre governs the rate and nature of groundwater movement. At shallow depths, there is limited potential for long-term subsurface water storage and at lower depths it is expected to be generally tight, solid rock mass, with limited open fractures/joints. Perched water tables are expected to have little groundwater flow, where presence of water is temporary and is subjected to gradual drainage and evaporation. Groundwater aquifers are not used for commercial or domestic abstraction purposes (Woodside, 2006).

4.8. Community

The Indicative Disturbance Footprint falls within the City of Karratha Local Government Area.

The area of the Project is industrial-zoned area, as defined by the Burrup Land Use Plan and Management Strategy (BPMAB 1996) (Woodside, 2006). Adjacent land is used for the operation of the KGP and Pluto LNG Plant.

The Project will traverse the DBNGP Corridor and extend north for approximately 2.2 km to the DBNGP Dampier Facilities before traversing the NWS buffer zone lease (I123605) granted to the NWS Project participants (Buffer Zone Lease) for approximately 400 metres (m) and then into the KGP lease (I123606) granted to the NWS Project participants (KGP Lease) for approximately 700 m.

4.9. Cultural Heritage

Aboriginal

A Site Avoidance Aboriginal Heritage Survey was conducted on 16 and 17 of July 2018 by Horizon Heritage, Yaburara & Mardudunera and Wong-goo-tt-oo representatives. Seven sites were observed within the pipeline corridor, all of which have been previously identified and will be avoided as they are generally not within the preferred pipeline alignment area:

- 9843 Surveyors Valley;
- 9854 LNG Scatter;
- 23333 Woodside Pluto Area B 46;
- 23340 Woodside Pluto Area B 68;
- SRS002;
- SRS004; and
- WPIC 001.

After the survey, the Indicative Development Footprint was revised down to a nominal 30 m wide corridor and subsequently now also avoids site 23340 Woodside Pluto Area B 68, leaving only six heritage sites within the Indicative Disturbance Footprint.

These six heritage sites will not be disturbed during construction of the Project. A full detailed description of the sites is provided in the SAAHSR report (Horizon Heritage, 2018). No new aboriginal heritage sites were identified (Horizon 2018).

The Indicative Disturbance Footprint is within the Burrup and Maitland Industrial Estates Agreement Implementation Deed (the Burrup Agreement), an agreement between the WA Government and three Aboriginal groups being the Ngarluma Yindjibarndi, Yaburara Mardudhunera and Wong-Goo-tt-oo people (Woodside, 2006). Prior to the agreement entered in 2003, three Native Title Claims existed within the area that the Pluto LNG Plant is located. Under the Burrup Agreement, the native title rights were extinguished, allowing for industrial development to occur within the Burrup Peninsula, and also setting aside land for residential and commercial purposes and ensuring the protection of Aboriginal heritage (Woodside, 2006).

The Western Pilbara Region includes the Dampier Archipelago where it is estimated to have over one million pieces of rock art (petroglyphs) (Woodside, 2006) and have a density of 17 and 76 heritage sites per square kilometre (National Trust, 2006). The Ngarluma Yindjibarndi, Yaburara Mardudhunera and Wong-Goo-tt-oo groups are the traditional custodians of the land. The Indicative Disturbance Footprint does not impact on any rock art areas.

European and State Heritage

There were no registered European heritage values in the project area at the time of the Pluto LNG development. A search of the WA Heritage Council database (23/05/2018) indicates two closest registered sites are located east of the project area: Watering Cove (place number 25282) and Burrup Peninsula Hearson's Cove (place number 08663), both on the eastern coastline of the Burrup Peninsula, at least 5 km from the project area

5. Activity Description

Construction of the Project will adopt a construction approach including the following:

- o Surveying, pegging and implementation of a vehicle exclusion zone across existing pipelines;
- o clearing of land required to install the pipe and facilities (10.69ha);
- o controlled chemical blasting and trenching of the pipe ditch;
- o stringing, bending, welding and coating of 3.3 km x DN750 (30 inch) pipe to minimise handling of earth off the easement;
- o lowering in of pipeline and backfill of pipe ditch;
- o rehabilitation of all disturbed areas;
- o installation of above ground facilities at three locations;
- o pre-commissioning and hydro testing of the pipeline prior to operation; and
- o commissioning of pipeline and facilities.

The construction methodology proposed will be based on controlled trenching, laying and tie in of pipe. It is a slow but controlled process to avoid the need to disturb and move mass material from the corridor.

The ultimate size of the Indicative Disturbance Footprint is 10.69 ha. A significant portion of the Indicative Disturbance Footprint is within area of the existing DBNGP (approx. 2.2 km of the length of the PNI), which was constructed in 1982 using blasting and conventional excavation techniques. The DBNGP Corridor has already been disturbed during the construction of the DBNGP as shown in these photographs.





The Original DBNGP being constructed (where the proposed PNI will be installed) in 1982

The construction of the PNI will adopt a construction approach where by shorter sections, two or three 12m lengths will be welded above ground before being lowered into the trench.

Within the DBNGP Corridor, the pipeline will be constructed at a minimum safe distance of 6.5 m from the existing DBNGP pipeline within the existing DBNGP pipeline corridor. Within the KGP Lease and the Buffer Zone Lease, the pipeline could be constructed closer than 6.5 m to the existing pipeline subject to appropriate risk assessments, safety cases and approvals between the relevant parties.

6. Environmental Risk Management

In order to identify, understand and manage all environmental sources of risk and consequent impacts associated with construction of the PNI, a comprehensive Environmental Risk Assessment (ERA) was completed over two workshops held November and December 2019. The ERA was conducted by a multidisciplinary team of in house and construction personnel and followed a structured process which sought to:

- outline key activities undertaken on the PNI;
- identify any risks;
- analyse and evaluate associated hazards and corresponding environmental impacts;
- where necessary, establish suitable controls; and
- systematically assess the residual associated environmental risk.

An Environmental Aspects and Impacts Risk Register was developed to document the ERA outcomes (Appendix A). Each hazard and associated impact identified during the ERA has been addressed with an objective to:

- Define the environmental performance objectives that will be required to be achieved in order to ensure environmental protection
- Define the environmental performance standards that relate to the quality of the performance
- Define the measurement criteria for determining whether the objectives and standards have been met for the activity

An implementation strategy has been developed such that the established performance objectives and standards may be met over the construction period of the PNI including rehabilitation monitoring. Specific control measures have been developed to direct, review and manage activities so that environmental impacts and risks are continually being reduced to ALARP. Sections 6.1 to 6.10 provide a summary of the key control measures established for identified potential environmental impacts.

6.1. Soil and Sediment

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Loss or negative impacts to topsoil: Over-handling, anaerobic conditions in large or long term stockpiles, loss due to wind or water erosion,	Frequent	Severe	High	Native Vegetation Clearance Procedure including: • rehabilitation and reinstatement of non-operational areas • topsoil and subsoil are stockpiled separately • stockpiles <2m high • reinstatement of soil profile following excavation; • ripping of compacted subsoil before reinstating topsoil;	Unlikely	Minor	Low

compaction from vehicles, mixing with subsoil, loss of any potential seed bank, changes in soil chemistry.				• Authorisation to Clear Vegetation (ACV) or an equivalent process is implemented Management of Erosion Risk Areas Procedure controls include: • Minimisation of vehicle movements • Erosion controls of stockpile (as below)			
Erosion and sedimentation: loss of topsoil offsite from wind or runoff, increased impacts to drainage lines (increase in flow or velocity), poor compaction, sedimentation into drainage lines, water ponding	Frequent	Minor	Intermediate	Management of Erosion Risk Areas Procedure controls also include: • the minimisation of vehicle movements including sticking to established tracks; • the installation of erosion controls to prevent sedimentation to waterways; • undertaking remediation works if erosion occurs; • conducting regular inspections of erosion control • managing water discharge through filters, screens or rocks	Remote	Minor	Negligible

6.2. Flora

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Damage to native vegetation: includes clearing over required areas, clearing outside of approved areas	Frequent	Severe	High	Site survey and alignment sheets including GIS data Designated turn around areas Native Vegetation Clearance Procedure including: • Authorisation to Clear Vegetation (ACV) or an equivalent process is implemented • Delineation prior to clearing grade (pegging) • Minimise clearing	Remote	Severe	Low
Biodiversity Conservation - Impact on DRF species or Threatened Ecological Communities (TEC's): includes unapproved taking of flora	Frequent	Severe	High	Pre-clearance surveys Site survey and alignment sheets Native Vegetation Clearing Procedure including • Authorisation to Clear Vegetation (ACV) or an equivalent process is implemented • Delineation prior to clearing grade (pegging)	Remote	Severe	Low

				• Reinstatement post construction Minimise clearing			
--	--	--	--	---	--	--	--

6.3. Weed and pathogens

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Introduction of new weeds	Frequent	Severe	High	Travel on designated tracks (captured under 6.1) Clean and inspection of vehicles prior to mobilization including weed hygiene certificate Visual and brush down inspections Environmental Line List (ELL)	Unlikely	Minor	Low
Spread of existing weeds	Frequent	Severe	High	Construction projects require that all fill is certified weed and seed free prior to use.	Unlikely	Minor	Low

6.4. Bushfire

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Bushfire impacts including: Loss of flora Loss of fauna habitat Erosion Impacts to other locations / services / stakeholders	Occasional	Major	High	Abide by all Bushfire Regulations including total fire ban requirements. Fire-fighting equipment on all mobile plant and vehicles Designated smoking areas Daily checks on fire danger rating and fire bans included in daily pre-start Fire training for selected personnel (i.e. fire watch) Water carts available to specific crews (i.e. welding) Welding canopies	Remote	Major	Intermediate

6.5. Fauna

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Damage to native vegetation fauna habitat including habitat trees and unauthorised clearing outside of approved areas.	Frequent	Severe	High	Site survey and alignment sheets Designated turn around areas Native Vegetation Clearance Procedure including: • Authorisation to Clear Vegetation (ACV) or an equivalent process is implemented • Delineation prior to clearing grade (pegging) Fauna Interaction Procedure • Minimise clearing of habitat trees • Inspection of habitat trees prior to felling	Remote	Severe	Low
Damage to fauna (direct) through vehicle impacts, falling and stuck within trench, predation within trench or post relocation. Fauna in pipe strings	Occasional	Severe	Intermediate	Daily excavation / trench inspections Inspection of trench prior to backfill Trained and licensed fauna handlers (including relocation knowledge) Backfill as soon as possible Inspections and audits Trench ramps every 1km Fauna shelters (hessian bags, rags, wood) every 500m Endcaps	Occasional	Trivial	Low

6.6. Cultural Heritage and Stakeholder Engagement

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk

Impacts to known or unrecorded Aboriginal Heritage Sites:				Cultural Heritage Survey / Archaeological survey Cultural Heritage Management Plan Consultation about project with Traditional Owners Traditional Owner Monitors invited to complete inspections prior to clearing Demarcation of sites within right of way No access outside of right of way Inductions			
Includes impact from dust, vibration (causing downhill slide or movement), inadvertent impact for clearing equipment or vehicle movements	Occasional	Severe	Intermediate		Hypothetical	Minor	Negligible

6.7. Air emissions including dust and noise

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Noise Stakeholder impacts	Occasional	Trivial	Low	Site induction Compliance with Statutory requirements Regular checks Work times (no night works planned)	Remote	Trivial	Negligible
Dust – impacts offsite to: Stakeholders, visual amenity, cultural heritage sites and coverage of flora	Frequent	Minor	Intermediate	Minimise time between clear and grade (stripping) and backfill / reinstatement SWMS / JHA to identify risk at time of activity and apply controls (i.e. water cart/truck)	Occasional	Trivial	Low
Gas emissions	Occasional	Severe	Intermediate	Facility design Gas only introduced post leak testing and pre-commissioning tasks	Unlikely	Minor	Low
Impacts from chemical fracturing (loose rock, reduced stabilization of nearby rock, vibration)	Remote	Severe	Low	Chemical fracturing of rocks only used as least preference method – minimal use and not used if rock breaking achieved through mechanical means Low volumes managed to prevent impacts outside of targeted rock Application through drill holes allows for minor volumes of chemical to be used	Remote	Minor	Negligible

				Chemical (e.g. Driplex) requires mixing with water to activate which is a controlled measured process Low volume (noise) rock breaking chemical to be selected No machinery movement and exclusion zone during fracturing activity Minimal area to be 'fractured' at any one time Blast mat installed over are to be fractured No chemical fracturing within 50m of cultural heritage locations Storage of chemicals includes segregation and protection from water (rain)			
--	--	--	--	--	--	--	--

6.8. Surface and Ground Water

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Over abstraction of water causing water impacts to other users	Occasional	Minor	Low	AGIG Land liaison processes in place Agreement to utilize nearby stand pipe (Water Corporation) Water use monitoring (volumes)	Remote	Minor	Negligible
Impacts to waterways including diversion of flow, sedimentation, damming of flow, increased water pooling, turbidity and velocity of water changes	Occasional	Severe	Intermediate	Weather monitoring MPCK Waterway Crossing Management Plan including - Detailed crossing drawings - Stockpiles away from drainage lines - Erosion and sediment control measures - Designated crossing point installed	Remote	Minor	Negligible

Water Discharge – as above but through flooded trench dewatering. Flooding downstream of discharge, sedimentation and erosion impacts (including CH sites)	Occasional	Severe	Intermediate	Minimised length of open trench Weather monitoring Dewatering Work Method Statement including: • water sampling and WQPN 13 compliance • Erosion and sediment controls (sock, filters, rocks) • Discharge away from watercourses • Identification and discharge away from CH sites.	Unlikely	Minor	Low
---	------------	--------	--------------	--	----------	-------	-----

6.9. Hazardous Materials Storage and Handling and Spill response

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Soil contamination from hydrocarbons or chemicals	Occasional	Severe	Intermediate	SDS available onsite Chemical Register available onsite Spill kits in heavy vehicles and at all storage locations No bulk storage on the right of way Suitably licensed DG transport and waste company Use of drip trays during refueling Self banded / contained storage vessels in line with AS1940 Bunding/self-containment of fixed plant and equipment (i.e. generators)	Unlikely	Minor	Low
Groundwater contamination	Unlikely	Severe	Intermediate	- As above, and; No refueling within 200m of watercourses No storage within 100m of watercourses	Remote	Minor	Negligible
Fire	Unlikely	Severe	Intermediate	See Bushfire Additionally fire extinguishers at all flammable goods storage locations, in mobile plant and on generators	Remote	Minor	Negligible

6.10.Waste management

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Contamination of soil, water or other impacts (fauna) from poor waste management.	Occasional	Minor	Low	Induction Inspections Waste Management Procedure controls including: - Segregation of waste streams where possible - Removal of waste by a licensed contractor to a license waste facility - Covering over skip bins to prevent fauna interaction / birds - Hydrocarbon waste facilities are bunded - Self-contained ablutions with volume monitoring	Remote	Trivial	Negligible

6.11..Rehabilitation

Risk Assessment and Mitigation Measures							
Potential Environmental Impact	Inherent Risk			Controls	Residual Risk		
	Likelihood	Consequence	Risk		Likelihood	Consequence	Risk
Poor rehabilitation leading to: Inadequate recovery of native species, erosion, creation of weed vector, altered drainage lines and features, visual amenity, subsidence, uncontrolled movement of rock	Occasional	Minor	Low	Induction Inspections post construction Removal of all temporary infrastructure including wastes and flagging Reinstatement of right of way as soon as possible Designated access tracks (minimal access) - Rehabilitation Checklists - Rehabilitation monitoring Rehabilitation Criteria	Remote	Minor	Negligible

7. Monitoring

To monitor the effectiveness of control measures in the management of the environmental impacts and risks, targeted monitoring commitments have been specified where relevant. DDGO shall conduct regular inspections of the construction area to assess compliance the requirements of this plan. Monitoring shall also include venting, diesel combustion and waste volumes.

The PNI is subject to an annual environmental compliance review to ensure that the systems and controls detailed within this EP are both adequate and implemented, and also identify opportunities for improvement. DDGO shall also undertake an Audit and Evaluation program that assists in assessing compliance to the EP and procedural controls.

8. Consultation

The purpose of consultation is to:

- Obtain appropriate input into the ongoing improvement of this EP;
- Keep key stakeholders up to date with DBNGP activities;
- Ensure timely response to landholder issues; and
- Maintain dialogue with regulatory authorities, including local councils.

Key stakeholders including the Client, HSE and Construction Contractors participated in two HAZID's to identify and assess the potential environmental hazards associated with the operations and maintenance activities for the DBNGP.

Recent consultation with key stakeholders is described in the below tables.

Table 1: Regulatory Stakeholder and Landholder Consultation

Organisation	Date /s	Topic	Method	Outcome
DWER – EPA referral and approval process	13/11/2018	Referral of project	Online / email submission	Submission received by DWER (project referral)
	10/12/2018 – 10/1/2019	Additional information request and response	Email	Provision of CEMP, GIS data and heritage consultation outcomes
			Email	
	23/1/2019	Assessment decision	Email	Assessment on Referral Information
	12/2/2019	Additional information request	Email	Specific Heritage information requested including survey results
	18/1/2019	Additional information provided	In person presentation	Provided above information
	18/4/2019	EPA Board Presentation	Email	Briefing of EPA Board and answer all queries answered
	30/4/2019	Draft conditions received	Phone	Draft conditions sent out for review
	30/4/2019	Discussion on draft conditions	Email	
	10/5/2019	Response to draft conditions	Phone, email, meeting	Question on CEMP approval in relation to DMIRS EP approval process
	20/6/2019 - 2/11/2019	Draft decision released for public comment		Reviewed and provided minor comment. No substantial issues raised
	27/11/2019	Advised of Appeals against EPA draft decision	Email – published online	Response to appeal questions provided to Appeals Convener
	29/11/2019		Email letter	

Organisation	Date / s	Topic	Method	Outcome
		Advise on Ministerial Decision Compliance Assessment Plan		Approval for project to commence under MS1117 Request for Compliance Assessment Plan
DoEE – EPBC referral – now DAWE	October 2018 7/12/18 18/4/19 24/5/19	Pre-submission meeting Referral of project ETA on project approval Decision received	Meeting Online submission Phone Email	Meeting held to look at referral requirements and options in relation to self-assessment findings and location sensitivity Awaiting / linking projects to Woodside projects Not a Controlled Action
DMIRS	22/11/18 Mid 2019 Ongoing – multiple approval processes	Project briefing Submission of approval documentation	Meeting Email / online submission	Meeting with DMIRS in relation to project proposal including safety case, land access and environmental management Online approval process for Pipeline Licence, Pipeline easement, Environment Plan and Safety Case
DBCA	20/2/2020	Fauna License	Email	Query in regards to the application for fauna license process for relocation including potential conservation species.
DPLH including JTSI	Oct 2018	Project briefing	Meeting	Discussion in regards to easement, pipeline route, access to areas under State Agreement.
Woodside (Customer)	16-17 July 2018 Ongoing consultation (includes fortnightly meetings) 20/1/2020 17/2/2020	Initial FEED Heritage survey combined with WEL personnel Contract negotiations Signed contract Woodside advised of contamination in buffer zone lot which includes pipeline corridor Meeting to discuss approach to contamination investigation	Scope meeting Email, onsite survey Meetings, phone, email	Submitted FEED WEL personnel attended Heritage survey Negotiations including Early Works Agreement Contract executed Review lot location, memorial and potential impacts to health and environment. Woodside to conduct investigations and keep DDGO advised of outcomes that could impact pipeline excavation. This includes potential health considerations
City of Karratha	30/10/18 26/11/18 25//2019	Joint briefing with Woodside to City of Karratha on potential project Meeting with Manager: Planning Services Email from Manager: Planning Services	Meeting Meeting Email	City of Karratha awareness of plans Awareness of project and how land access is managed. Confirmation email that the project is exempt from development approval subject to approval from the Land Access Minister under the DBP Act and

Organisation	Date / s	Topic	Method	Outcome
				the North West Gas Development Act. This includes the grant of an easement under the Petroleum Pipelines Act.

Table 2: Traditional Owner Consultation

Organisation	Date / s	Topic	Method	Outcome
Yaburara & Mardudhunera and Wong-Goo-Tt-Oo	2/7/18	Initial project briefing	Meeting	Agreed approach for heritage surveys. Participants of survey agreed.
Yaburara & Mardudhunera and Wong-Goo-Tt-Oo	16-17/7/18	Onsite heritage survey	Onsite meeting / survey	Site avoidance Heritage Survey and impacts discussion
Yaburara & Mardudhunera and Wong-Goo-Tt-Oo	27-28/7/18	Heritage locations	Meeting	Review and discuss heritage findings within 50m wide corridor Digital mapping of actual locations provided and discussed
Yindjibarndi	28/10/18	Project involvement	Email	Confirmed that the project is not part of Yindjibarndi traditional lands – involvement not required
Ngarluma	26/11/18	Project involvement	Meeting	Discuss involvement in project and opportunities
Murujuga	8/2/19	Project briefing	Meeting	Ensure MAC are aware of the project and consultation to date with member groups. EPA request for a letter to confirm consultation. Discuss potential opportunities including use of offices
Yaburara & Mardudhunera	8/2/19	Project briefing	Meeting	Review consultation to date including previous surveys and project update. EPA request for a letter to confirm consultation.
Murujuga	11/2/19	Consultation letter	Email	Letter in relation to consultation to date with MAC (part of EPA request)
Yaburara & Mardudhunera	14/2/19	Consultation letter	Email	Letter in relation to consultation to date with YACMAC (part of EPA request)
Wong-Goo-Tt-Oo	17/2/19	Consultation letter	Email	Letter in relation to consultation to date with Wong-Goo-Tt-Oo (part of EPA request)
Ngarluma	4/3/19	Consultation letter	Email	Letter in relation to consultation to date with Ngarluma (part of EPA request)
Murujuga	December 2019	Access to rooms and offices (leasing)	Phone and email	Discuss the potential to use office space and confirm current fitout etc.

All contact with stakeholders will be recorded in the Land Management System (LMS). The Land Management department and the HSE department are responsible for the development and distribution of corporate awareness publications to communicate the details of our environmental commitments to key stakeholders. All other relevant details about land use, foreign crossings, landholder concerns and issues are to be recorded on the LMS for future reference and reporting.

9. References

- Bancroft, W. & Bamford, M. J. (2006) *Fauna Values of Stage 5 of the Dampier to Bunbury Naturalgas Pipeline (DBNGP)* Unpublished report prepared for Strategen, June 2006.
- Beard J.S. (1976) *The Vegetation of the Murchison Region. Vegetation Survey of Western Australia – Murchison 1:1000000 Vegetation Series*. Explanatory Notes to Sheet 6. University of Western Australia Press. Beard 1976).
- Beard J.S. (1981) *The Vegetation of the Swan Area. Vegetation Survey of Western Australia – Swan 1:1000000 Vegetation Series*. Explanatory Notes to Sheet 7. University of Western Australia Press.
- Bureau of Meteorology (BOM) (2018) Weather and Climate Data
<http://www.bom.gov.au/climate/data/> Accessed April 2018
- Ecos Consulting (ECOS) (2003) *Bioregion Description Dampier to Bunbury Natural Gas Pipeline*. Unpublished report prepared for Epic Energy. September 2006.
- Land and Water Australia (LAWA) (2001) *Australian Native Vegetation Assessment – 2001. Commonwealth of Australia*
- Mattiske Consulting Pty Ltd (Mattiske) 2006, *Flora and Vegetation Assessment of Alinta Gas pipeline Stage 5 Expansion Geraldton to Dampier*. Unpublished report prepared for Alinta, Perth. September 2006.
- Mattiske Consulting Pty Ltd (Mattiske) 2015, *ERA Phase 2 – Survey for Targeted Priority Flora and Ecological Communities Identified in Phase 1 along the main DBNGP Easement Corridor – Dampier to MLV 9 Section (KP0-85) – Environmental Risk Area Survey*. Unpublished report prepared for DBNGP 2015
- Payne A.L, Curry P.J. and Spencer G.F. (1987) *An inventory and condition survey of rangelands in the Carnarvon Basin, Western Australia*. WA Department of Agriculture Technical Bulletin No.73. Edited by D.A.W Johnston.
- Western Australian Planning Commission (1999) Geraldton Region Plan – Section 5 Natural and Cultural Environment, State of Western Australia.

PROJECT TITLE: Pluto North West Shelf Interconnector (PNI) Feed Pipeline Project										DATE: 3/12/2019												
SESSION NO: 1										PURPOSE / DESIGN IN Facilities Construction HAZID Register												
VENUE: AGIG Office - Perth WA																						
REFERENCE (Item No.)	HAZARD (The source with potential to harm)	CAUSES (How and Why can it happen)	CONSEQUENCES (Impact on People, Enviro, Impact on AGIG, Supply/Outrage, Loss)	CONSEQUENCE DESCRIPTION (what type of extent of injuries/impact)	PHYSICAL SAFEGUARDS (Identify existing Controls)	PROCEDURAL SAFEGUARDS (Identify existing Controls)	RISK ANALYSIS (Considering Existing Controls)			Major Accident Event (MAE)?	ACTION				RESIDUAL RISK ANALYSIS (Additional Controls)			ALARP (Yes/No/ N/A)	Justification / consideration / description for ALARP	MONITOR & REVIEW (effectiveness measurement criteria for mitigation measures/actions)	CLOSE OUT RESPONSE (Verifiable Controls incl Document/Procedure No.)	
							Frequency	Consequence	Risk		Action No.	Action Description	Action By	Action Due	Frequency	Consequence	Risk					
C2	Daily commuting to/from Site (ex-local accommodation)	Vehicle Accidents Driver's fatigue Unfamiliarity with roads. Sun position	Environmental	Environmental impacts - Injury/death to fauna	Travel to and from site on sealed roads.	CEP Speed limitation Planned maintenance and inspection programme in place Project Induction Buses or carpool to reduce traffic where practicable Driver Training Bulbars/Front End protection on vehicles	D. Occasional	1. Trivial	Low	No												
C7	Transfer of weeds & seeds	Vehicle / plant or personnel movements Imported Fill	Environmental	Environmental impact (introduction or spread of weed species) Impact to land owners - serious complaint	Wash downs Working on cleared worksites	AGIG CEP Travel on designated tracks Cleaning & inspection of vehicles prior to mobilisation & demobilisation. All machines and vehicles to have weed hygiene certificate Daily plant prestart checks Project induction Imported fill to be certified weed and seed free	C. Unlikely	2. Minor	Low	No												
C9	Dust	Dust exposure (during excavation works and around site)	Environmental	Environmental impact - surrounding vegetation and visual amenity Cultural Artefact Impacts		CEP Minimise time between stripping and backfill/reinstatement Inspections and audits Wetting Down / dust suppression Project Induction TO Engagement Exclusion/Delineation of construction site	C. Unlikely	3. Severe	Intermediate	No							Yes	No further controls identified in the workshop.	TO Inspection of heritage aspects post ground disturbance and construction and if needed to advise of response required (i.e. clean down).			
C11	Chemical/ Fuel/Hazardous Substance storage & handling	Poorly handled and stored chemicals - (fuel and lubricants)	Environmental	Environmental impacts - contamination and spillage / loss of containment DMIRS Reportable Spill	Designated storage areas Bundling of fixed plant and equipment (generators, pumps, etc.)	CEP [Inclusive of Oil Spill contingency Plan (AGIG)] Ensure establishment of appropriate storage facilities for compressed gas cylinders. MSDS available on site Spill Kits available at each site Project induction and training Audits and inspections No bulk storage on site Suitably licensed diesel and hazardous goods transport provided Drip trays PPE Eye wash kits Bundling	C. Unlikely	2. Minor	Low	No		AGIG to issue CEMP to Valmec	RM	10/12/2019								
C13	Bush Fire	Facilities construction activities / Natural Event	Environmental	Environmental impact - loss of vegetation, injury and death to fauna/stock, soil erosion	Cleared construction ROW and lay down area (post clearing) Scarce vegetation	CEP Fire fighting equipment on all mobile plant and vehicles Designated smoking areas Daily checks on fire hazard rating and environmental conditions Equipment and crew pre-starts Inspections and audits JHA Fire training of select personnel Water carts available to crew Welding canopy's	B. Remote	2. Minor	Negligible	No												
C16	Noise	Machinery / Equipment operations	Environmental	Fauna disturbance Woodside Noise complaints Visitor Centre noise complaints	Plant Exhaust and attenuation systems Separation distance and alignment design greater than 300m from sensitive receptors (only receptors of note are Woodside)	CEP Compliance with Statutory requirements Regular equipment checks / Pre-starts	B. Remote	1. Trivial	Negligible	No												
C18	Scrap metal and general wastes generated, general spills.	Inadequate maintenance Lack of disposal facilities Food waste	Environmental	Pollution, waste remaining after construction activities have been completed	Covered waste skips provided for food waste in camp. Designated lay-down area / storage area.	AGIG CEP Removal of waste by licensed contractor (oil and grease) All general and food waste skip bins to be covered Hydrocarbon waste disposal facilities Covered wheelie bins (food waste) Self contained ablutions Dedicated skips for waste segregation Hazardous waste stored in bunded areas Weekly Inspection (HSE)	B. Remote	1. Trivial	Negligible	No												
C20	Sourcing construction water	Draw-down of local aquifers	Environmental	NCC using local potable water sources																		
C22	Flooded excavations	Flooded excavations following rainfall events	Environmental	Erosion of environment Damage to CH sensitive areas		AGIG CEP Weather monitoring Dewatering JHA Discharge away from watercourses and CH sites Identification of CH sensitive sites	C. Unlikely	2. Minor	Low	No												
F2.08	Grit Blasting	Over Spray	Environmental	Impacts to local flora		Refer common risks Subcontractor selection JHA Dropsheet Blasting humpy to prevent overspray	B. Remote	1. Trivial	Negligible	No	Identify any KGP requirements/restrictions relevant to blasting	RM	30/01/2020									
F3.12	NDT - Developing NDT Film	Chemical spill / inappropriate disposal	Environmental	Environmental impact		Chemicals are stored in original containers Designated chemical waste containers	B. Remote	2. Minor		No												
F4.08	Dewatering	release of test water to ground	Environmental	Erosion and sediment run off		Correctly rated fittings and hoses Prestart equipment checks Experienced personnel Approved Hydro Testing Procedure (with approved dewatering location) CEP Erosion controls Frequent inspection Monitoring of volumes and flow rates All dewatering below licence thresholds (i.e. volume, amount of days).	B. Remote	1. Trivial		No												

PROJECT TITLE: Pluto North West Shelf Interconnector (PN) Feed Pipeline Project						DATE: 27/11/2019															
SESSION NO: 1						PURPOSE / DESIGN IN: Pipeline Construction HAZID Risk Register															
VENUE: AGIG Office - Perth WA																					
REFERENCE (Item No.)	HAZARD (The source with potential to harm)	CAUSES (How and why can it happen)	CONSEQUENCES (Impact on People, Enviro, Impact on AGIG, Supply/Outrage, Loss)	CONSEQUENCE DESCRIPTION (what type of extent of injuries/impact)	PHYSICAL SAFEGUARDS (Identify existing Controls)	PROCEDURAL SAFEGUARDS (Identify existing Controls)	RISK ANALYSIS (Considering Existing Controls)			Major Accident Event (MAE)?	ACTION				RESIDUAL RISK ANALYSIS (Additional Controls)			ALARP (Yes/No/ N/A)	Justification (consideration/description for ALARP)	MONITOR & REVIEW (effectiveness measurement criteria for mitigation measures/actions)	CLOSE OUT RESPONSE (Verifiable Controls and Document/Procedure No.)
							Frequency	Consequence	Risk		Action No.	Action Description	Action By	Action Due	Frequency	Consequence	Risk				
C2	Daily commuting to/from Site (ex-local accommodation)	Vehicle Accidents, Driver's fatigue, Unfamiliarity with roads, Sun position	Environmental	Environmental impacts - injury/death to fauna	4x4 Vehicle 5-star ANCAP rating	SWMS CEP Speed limitation Planned maintenance and inspection programme in place Site Induction Landowner Liaison Rules or control to reduce traffic, where practicable MPC Docs Safe Driving Procedure (CMR PRO 002) Traffic Plant & People Procedure (CMR PRO 003) HSE Risk Management Procedure (874 WHS PRO 115) Journey Management Procedure (WHS PRO 026) approved drivers, driver training Daily vehicle inspections Fitness for Work - Fatigue Management Procedure (WHS PRO 064)	D. Occasional	1. Trivial	Low	Yes											
C7	Transfer of weeds & seeds	Vehicle / plant or personnel movements	Environmental	Environmental impact (introduction or spread of weed species) Impact to land owners - serious complaint	Wash down Inspections at Plant Laydown yards prior to site mobilisation Wash down facilities at camps	MPC CEP Travel on designated tracks Cleaning & inspection of vehicles prior to mobilisation & demobilisation. Visual & brush-down inspections (clothing, boots & plant) Environmental line list All machines and vehicles to have weed hygiene certificate Daily plant prestart checks Project induction Toolbox Inspections and Audits MPC Docs Management of Change Procedure (QUA PRO 008) Environment Impact Procedure (CMR PRO 009) Weed Hygiene Procedure (ENV PRO 001) Erosion and Sediment Control Procedure (ENV PRO 004) Environmental Field Data Management Procedure (ENV PRO 006) Environmental Sustainability Procedure (ENV PRO 007) HSE Risk Management Procedure (874 WHS PRO 115) Clean on entry requirements (MPC EMP)	C. Unlikely	2. Minor	Low	No											
C9	Dust	Dust exposure (during excavation works and around site)	Environmental	Environmental impact - surrounding vegetation and visual amenity	MPC supplied water trucks for dust suppression during works	CEP SWMS/JHA (e.g. wetting down) & Take 5 Minimise time between stripping and backfill/reassessment Inspections and audits MPC Docs Environmental Impact Procedure (CMR PRO 009) Erosion & Sediment Management Plan (874 ENV PLN 127) Dust Management Plan (874 ENV PLN 039) Environmental Sustainability Procedure (ENV PRO 007)	D. Occasional	1. Trivial	Low	No											
C11	Chemical/Hazardous substance storage	Poorly handled and stored chemicals - (fuel and lubricants)	Environmental	Environmental impacts - contamination and spillage / loss of containment Less than 250L	12000L Fuel truck (purpose built) Self banded "baleen" (oil) or banded pallets provided, DG container (preferred) Designated storage areas Banding of feed plant and equipment (generators, pumps, etc.)	CEP MSDS available on site Manifests maintained onsite Spill Kits in all heavy vehicles and as identified via site risk assessments Site induction and training JHA & Take 5 Audits and inspections No bulk storage on the ROW No storage permitted within 100m of waterways Suitably licensed diesel and hazardous goods transport provided Drip trays Induction MPC Docs Environmental Impact Procedure (CMR PRO 009) Hazardous Materials Procedure (874 WHS PRO 113) HSE Risk Management Procedure (874 WHS PRO 119) HSE Training Procedure (TRA PRO 001) Refuelling Plant and Equipment (MPC_SAF_SWMS_056)	C. Unlikely	2. Minor	Low	No											
PROJECT TITLE: Pluto North West Shelf Interconnector (PN) Feed Pipeline Project						DATE: 27/11/2019 PURPOSE / DESIGN IN: Pipeline Construction HAZID Risk Register															
SESSION NO: 1																					
VENUE: AGIG Office - Perth WA																					
REFERENCE (Item No.)	HAZARD (The source with potential to harm)	CAUSES (How and why can it happen)	CONSEQUENCES (Impact on People, Enviro, Impact on AGIG, Supply/Outrage, Loss)	CONSEQUENCE DESCRIPTION (what type of extent of injuries/impact)	PHYSICAL SAFEGUARDS (Identify existing Controls)	PROCEDURAL SAFEGUARDS (Identify existing Controls)	RISK ANALYSIS (Considering Existing Controls)			Major Accident Event (MAE)?	ACTION				RESIDUAL RISK ANALYSIS (Additional Controls)			ALARP (Yes/No/ N/A)	Justification (consideration/description for ALARP)	MONITOR & REVIEW (effectiveness measurement criteria for mitigation measures/actions)	CLOSE OUT RESPONSE (Verifiable Controls and Document/Procedure No.)
							Frequency	Consequence	Risk		Action No.	Action Description	Action By	Action Due	Frequency	Consequence	Risk				

