Greater Western Flank Phase 1 Project:

Pipeline Installation Environment Plan Summary

March 2013
Revision: 0

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1. INTRODUCTION

Woodside Energy Ltd (Woodside), as operator will install a 14.4 km, 16 inch subsea pipeline in Commonwealth waters in Production Licence WA-5-L. The Greater Western Flank Phase 1 Project ('GWF-1') forms part of the Greater Western Flank Development located on the North West Shelf (NWS) approximately 140 km from Karratha. The pipeline will be installed using the pipeline installation vessel (PIV) G1201, operated by Global/Technip Offshore Pty. Ltd ('Global'/Technip).

GWF-1 will comprise recovery of gas and condensate from a total of five subsea production wells located in the Tidepole field (three wells) and the Goodwyn GH field (two wells). Co-mingled production from these wells will be transported via a 16-inch corrosion-resistant alloy (CRA) clad subsea pipeline to the Goodwyn Alpha (GWA) facility.

The GWF-1 Development Pipeline Installation Environment Plan (the EP) has been prepared in accordance with the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (Environment Regulations). The EP has been reviewed and accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA).

Global/Technip has been engaged by Woodside for the GWF-1 Pipeline Installation Program, which is due to commence in mid March with a pre-lay survey (scheduled to be undertaken between mid March and June), followed by pipeline installation from April to August 2013 (depending on pre-lay survey timing), which may continue into late September if weather or other factors cause delays.

The EP summary has been prepared as per the requirements of Regulations 11(7) and (8) of the Environment Regulations.

2. LOCATION OF THE ACTIVITY

The Greater Western Flank (GWF) Phase 1 Project is located in Production Licence WA-5-L, in Commonwealth waters on the North West Shelf of Australia.

The Tidepole field is located approximately 15 km south-south-west of the GWA facility in approximately 112 m water depth; while the Goodwyn GH field is approximately 7 km south-south-west of the GWA facility in approximately 120 m water depth and 33 km from the North Rankin Complex (Figure 2-1). The GWA facility is located approximately 130 km north-west of Dampier, Western Australia, and stands in approximately 131 m water depth.

Table 2-1 summarises the location in which the pipeline installation will be undertaken, including surface coordinates, water depth, and permit areas.

Table 2-1: GWF-1 Pipeline Program Coordinates and Water Depths

Location	Water Depth (m LAT)	Eastings*	Northings*	Production License Area
GWA facility	131 m	387,795 E	7,826,653 N	WA-5-L
GDA manifold	120 m	382,177 E	7,820,562 N	
TPA manifold	112 m	383,732 E	7,814,446 N	

**MGA Zone 54 (GDA94 datum)*

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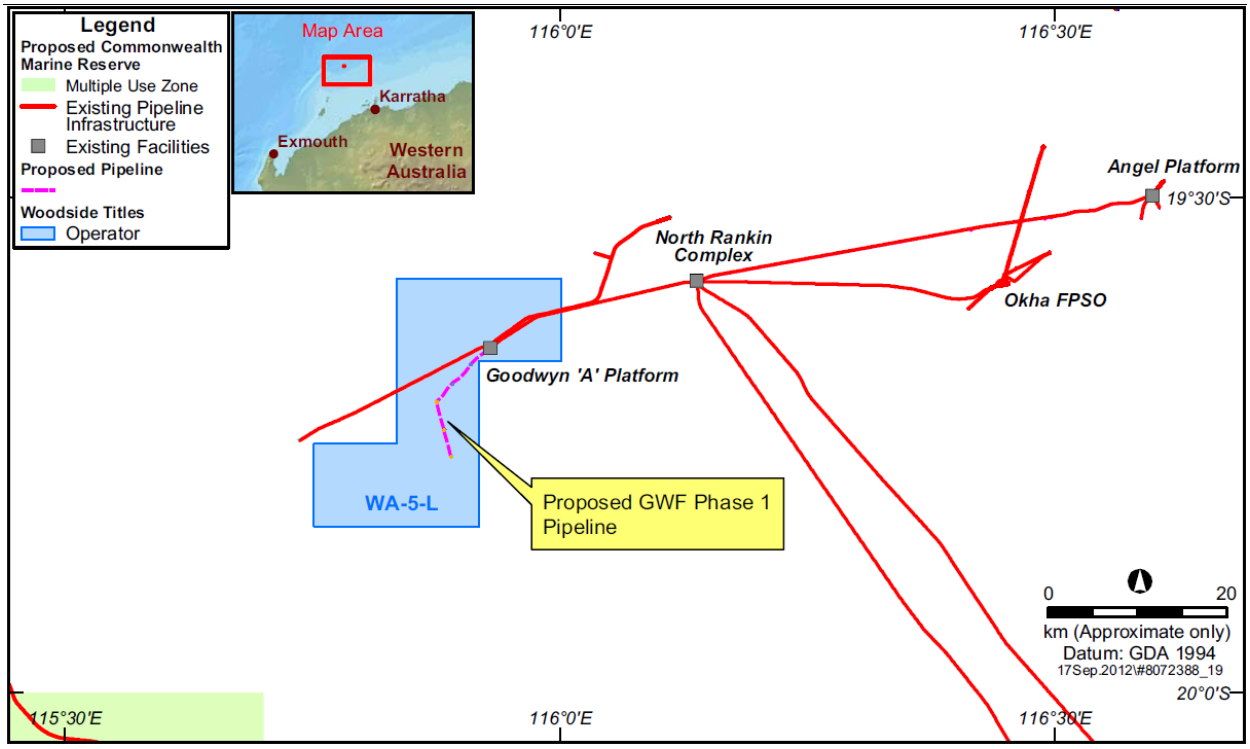

Figure 2-1: Figure showing GWF-1 Pipeline within Production License WA-5-L

3. DESCRIPTION OF THE ENVIRONMENT

3.1 Physical Environment

The GWF-1 pipeline operational area is located in the North West Shelf (NWS) province of the North-West Marine Region (NWMR) within Commonwealth waters, approximately 130 km from Dampier and in water depths of approximately 110 to 130 m.

Broad-scale surveys within the area conducted by Woodside have confirmed that the seabed is flat and featureless. Furthermore, geophysical surveys carried out for a proposed pipeline route from the Tidepole Manifold to the GWA facility in 2011 confirmed this area of seabed as homogenous and featureless, similar to the wider-scale NWS area (as recorded from side scan sonar). Seabed sediment sampling for the GWF-1 Project (RPS 2011) revealed soft sediment composition typical of the NWS comprising coarse sand, gravel and silt, low metal contamination, low nutrient concentrations (TN and TP), and no detection of hydrocarbons or Naturally Occurring Radioactive Materials (NORMs).

3.2 Biological Environment

Studies have revealed that the infauna associated with soft unconsolidated sediment habitat in the area of the NWS as widespread and homogenous along the continental shelf and upper slopes (Rainer 1991; Bowman Bishaw Gorham, 2000; LeProvost, Dames & Moore, 2000; Woodside, 2004; Sinclair Knight Merz, 2006; Brewer *et al.* 2007; RPS 2011). Sampled infauna, collected along the pipeline route, comprised a suite of typical phyla dominated by burrowing polychate worms (Phylum Annelida) and crustaceans (Phylum Crustacea) (RPS 2011). Epifauna of the offshore, deeper region is typically sparse, patchy and associated with areas of hard substrate.

Offshore seabed surveys across the NWS detected a general reduction in epibenthic coverage with increasing depth with large epifauna (greater than 25 cm) rare beyond the 100 m depth contour (Fulton *et al.* 2006). With consideration of the depth, lack of hard substrate, reduced light and nutrient loading the

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soft sediment communities of the GWF-1 pipeline operational area are considered of relatively low environmental sensitivity and typical of this area of the NWS.

A search using the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) database (Protected Matters Search Tool) (SEWPaC 2012) was carried out encompassing the GWF-1 pipeline operational area. The search identified a total of 68 listed marine species that may occur within, or traverse the area, including eight threatened marine species and 15 migratory species. Of the listed species 20 were cetaceans, including two 'threatened' and seven migratory species. The endangered pygmy blue whale and the vulnerable humpback whale are two whale species that seasonally migrate through the North West Shelf between northern breeding grounds and southern feeding grounds. The other five migratory species and 17 other cetacean species are likely to occur at low densities in the region throughout the year.

Whales

The humpback whale (*Megaptera novaeangliae*) is the most commonly sighted whale in north Western Australian waters. The species has been observed to complete their seasonal northern migration in the Camden Sound area of the west Kimberley (Jenner *et al.* 2001), after feeding in Antarctic waters during the summer months (Bannister and Hedley 2001).

The northern and southern migrations take place from about June to November each year and the peak periods are July and August (northern migration) and October (southern migration) (Jenner et al. 2001). The southward migration of cow/calf pairs is primarily during October (extending into November and December) and during the southbound migration it is likely that most individuals, particularly cow/ calf pairs, stay closer to the coast as compared to the northern migratory path. This was confirmed by recent satellite tracking of southbound female humpback whales in the Kimberley region (Jenner *et al.* 2001). On this route the whales follow a relatively narrow track between the Dampier Archipelago and Montebello Islands. This is known to be inshore from the North Rankin Complex, approximately 30 km from the GWF-1 pipeline operational area. Migrating humpback whales are therefore not expected in the vicinity of the pipeline installation

Pygmy blue whale migration is thought to follow deep oceanic routes (DEWHA 2009) and the most recent tagging confirmed pygmy blue whales general distribution was offshore in water depths over 200 m and commonly over 1000 m (Double *et al.,* 2012). In the NWMR, pygmy blue whales migrate along the 500 m to 1000 m depth contour on the edge of the slope, and are likely to be feeding on ephemeral krill aggregations (DEWHA, 2007). Sea noise loggers set at various locations along the coast of WA have detected an annual northbound and southbound migration of pygmy blue whales past Exmouth and the Montebello Islands (McCauley and Jenner 2010; McCauley and Duncan, 2011). Satellite tracking has confirmed north-bound animals detected off Exmouth and the Montebello Islands between April and August and south-bound animals passing the same areas from October to the end of January, peaking in late November to early December (Double *et al.,* 2012). The GWF-1 pipeline operational area is outside the pygmy blue whale migration routes.

3.3 Socio-economic Environment

A number of Commonwealth (beyond 200 m isobath) and State (within 200 m isobath) managed fisheries occur in the region. The GWF-1 pipeline operational area is situated within State managed fisheries areas, however, none have significant catches beyond the 50 m isobath, with the exception of the North West Slope Trawl Fishery.

State-regulated fishing activity within the GWF-1 pipeline operational area is most likely to be associated with the North Coast Demersal Scalefish Fishery. The fishery consists of several management units targeting a range of species using several gear types (trawl, trap and line). The Pilbara Trawl Fishery lands the largest component of the catch and operates in waters between 50 and 200 m water depth (DoF, 2011). The Pilbara Trawl Fishery is a high intensity fishery divided into two zones (DoF, 2010) and the GWF-1 pipeline operational area is located in the trap fishing area situated between zones 1 and 2 (zones that permit trap and trawl fishing).

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The GWF-1 pipeline operational area is shown to be outside the main shipping routes and the fairways. Whilst the fairways are not mandatory, AMSA strongly recommends commercial vessels remain within the fairway when transiting the region.

3.4 Marine Conservation Reserves

The Western Australian State government is working to establish a comprehensive, adequate and representative network of marine protected areas (MPAs) in the state waters of North Western Australia. The network includes a number of existing State and Commonwealth MPAs and a number of proposed State MPAs that contain environmental assets of high value or sensitivity, from a regional, State or national perspective. These values and sensitivities include habitats or species that are particularly vulnerable or that provide valuable ecological services such as coral reefs, mangroves, seagrass meadows and macroalgae.

There are four State MPAs, four gazetted Commonwealth MPAs and the Ningaloo Coast World Heritage Area (WHA) within the region. The operational area is 40 km from the Montebellow Commonwealth Marine Reserve and approximately 75 km from the jointly managed Montebellow Islands Marine Park / Barrow Island Marine Management Area (West Australian waters). The operational area is also approximately 105 km away from the Dampier Archipelago Marine Park and 125 km away from the Dampier Commonwealth Marine Reserve

4. DESCRIPTION OF THE ACTION

The GWF-1 Pipeline Installation Program will comprise the following activities:

- Pre-lay survey of the pipeline (and umbilical) corridors.
- Installation of buckle initiator structures.
- Installation of 16-inch CRA (corrosion resistant alloy) clad, coated pipeline in two sections.
- Installation of associated fittings and structures including dummy spools, walking anchors.
- As laid survey of the subsea pipeline to determine free spans.
- Free span correction (as required).
- Flood, clean, gauge, and hydrostatic test of the pipeline.
- As-built survey of the laid subsea pipeline and installed structures.

The GWF-1 Pipeline Installation Program will take between 60 and 90 days of activities at site. Table 4-1 provides an overview of the vessels to be used in the pipeline installation program.

Table 4-1: Overview of Vessels to be used for pipeline installation and associated activities on the GWF-1 Project

Vessel	Work Scope
Pre-lay Survey Vessel (PLSV)	Pre-lay survey
G1201 Pipeline Installation Vessel (PIV) Depending on contractor vessel availability the PIV may be substituted for a Multi-Service Vessel (MSV) to undertake partial work scope	G1201 – Debris clearance, Pipe-lay and Structure Installation MSV – Debris clearance, Pipe-lay support activities by way of Flood, Clean Gauge and Test, Survey works and freespan rectification)
Project Support Vessel (PSV)	Project Resupply, setting of pipeline initiation anchors and installation of LBL array, material transport (e.g. pipe and installation aids). Towing of project material barge and monitor FCGT operations at receiving end as necessary
100 m Material Barge	Transport of stinger and buckle initiator structures

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Vessel	Work Scope
Pipe Carrier Vessel (PCV)	Material transport (e.g. pipe and installation aids)
Mother ship	Pipe Transport

5. MAJOR ENVIRONMENTAL HAZARDS AND CONTROLS

Woodside undertook an environmental risk assessment to understand the potential environmental risks associated with GWF-1 Pipeline Installation Program to ensure they are reduced to As Low As Reasonably Practicable (ALARP) and will be of an acceptable level using a method consistent with Woodside standards.

The key environmental hazards and control measures to be applied to the GWF-1 Pipeline Installation Program activities are shown in Appendix A. These are consistent with Woodside corporate and project-specific objectives, standards and criteria. All control measures associated with the hazards will be used to reduce environmental risk to ALARP and will be of an acceptable level.

6. MANAGEMENT APPROACH

The GWF-1 Pipeline Installation Program will be managed in compliance with the EP accepted by NOPSEMA under the Environment Regulations, other relevant environmental legislation and Woodside's Management System (e.g. Woodside Environment Policy).

The objective of the EP is to ensure that potential adverse impacts on the environment associated with the GWF-1 Pipeline Installation Program, during both routine and non-routine operations, are identified, and will be reduced to ALARP and will be of an acceptable level.

The EP details each environmental aspect (identified and assessed in the Environmental Risk Assessment – Section 5 of the EP) specific performance objectives, and identifies the range of controls (available in Appendix A) to be implemented to achieve the performance objectives. It also identifies the specific measurement criteria used to demonstrate that the performance objectives are achieved. The implementation strategy detailed in the EP identifies the roles/responsibilities and training/competency requirements for all personnel (Woodside and its contractors) in relation to implementing controls, managing non-conformance, emergency response and meeting monitoring, auditing, and reporting requirements during the activity. The EP details the types of monitoring and auditing that will be undertaken, the reporting requirements for environmental incidents and reporting on overall compliance of the project with the EP.

7. CONSULTATION

Woodside conducted a stakeholder assessment for the proposed activity to identify relevant and interested stakeholders based on the project location, proposed activities and timing. A consultation fact sheet was sent electronically to all identified stakeholders prior to lodgement of the EP with NOPSEMA for assessment and acceptance.

Woodside received feedback on the proposed activity from a range of stakeholders, including government agencies and commercial fishing representatives. Issues of interest included the location of the project in relation to shipping fairways and commercial fishing areas. Woodside considered this feedback in its development of management measures specific to the pipeline installation project. Woodside will continue to accept feedback from stakeholders during the project.

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9. REFERENCES

Bannister JL, and Hedley SL 2001. *Southern hemisphere Group IV Humpback whales: their status from recent aerial survey.* Memoirs of the Queensland Museum, 47 (2): 587-598.

Bowman Bishaw Gorham, 2000, *Environmental Plan Jansz-1 Exploration Well WA-268-P*. Bowman Bishaw Gorham Pty Ltd, Perth, WA.

Department of Fisheries (DoF). 2010. *A bycatch action plan for the Pilbara fish trawl interim managed fishery.* Fisheries Management Paper No. 244. Department of Fisheries, Perth, WA.

DEWHA 2007. A Characterisation of the Marine Environment of the North-west Marine Region - A summary of an expert workshop convened in Perth, Western Australia, 5-6 September 2007. Prepared by the North-west Marine Bioregional Planning section, Marine and Biodiversity Division, Commonwealth Department of the Environment, Water, Heritage and the Arts. 47 pp.

DEWHA. 2009. *Matters of National Environmental Significance: Significant Impact Guidelines 1.1*, Department of the Environment, Water, Heritage and the Arts, Canberra.

DoF, 2011. *State of the Fisheries and Aquatic Resources Report 2010/2011.* Department of Fisheries, Perth, WA.

Double, M.C., Jenner, K.C.S., Jenner, M.N., Ball, I., Laverick, S., and Gales, N. (2012). Satellite tracking of pygmy blue whales (*Balaenoptera musculus brevicauda*) off Western Australia. Final Report. Australian Marine Mammal Centre, May 2012, unpublished.

Fulton, E., Hatfield, B., Althaus, F. and Sainsbury, K. 2006. Benthic habitat dynamics and models on Australia's North West Shelf. Technical Report No. 11 in *North West Shelf Joint Environmental Management Study.* CSIRO and WA Department of Environment 2006. Available at http://www.cmar.csiro.au/nwsjems/reports/NWSJEMS_TR11.pdf

Jenner KCS, Jenner M-NM and McCabe KA. 2001. *Geographical and Temporal Movements of Humpback Whales in Western Australian Waters*. APPEA Journal 41 (2001): 749-765.

LeProvost, Dames and Moore. 2000. Ningaloo Marine Park (Commonwealth Waters), Literature Review. Prepared for Environment Australia, LeProvost Dames and Moore, Perth, WA.

McCauley R.D. and Duncan A.J. 2011. Sean Noise Logger Deployment, Wheatstone and Onslow, April 2009 to November 2010: Great whales, fish and man-made noise sources. CMST tech. Report R2011-23, Curtin University of Technology.

McCauley, R.D. and Jenner, C. 2010. Migratory patterns and estimated population size of pygmy blue whales (*Balaentoptera musculus brevicauda*) transversing the Western Australian coast based on passive acoustics.

Rainer, SF. 1991. High species diversity in demersal polychaetes of the north-west shelf of Australia. *Ophelia*. Supplement 5. Systematics, Biology and Morphology of World Polychaeta, Proceedings of the 2nd International Polychaete Conference, Copenhagen, 1986.

RPS. 2011. Sediment Quality Surveys: March-April 2011, Greater Western Flank Marine Environmental Baseline Studies. Report to Woodside Energy Ltd.

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SEWPaC. 2012. EPBC Act Protected Matters Report (for GWF1 project area). Created 5/10/12.

SKM, 2006. Marine Survey for Proposed Angel Pipeline Route. Report for Woodside Energy Ltd 26 pp.

Woodside Energy, 2004. Environmental impacts of drill cuttings at North Rankin A and Goodwyn A, Woodside Energy Limited, Perth, WA.

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APPENDIX A: Greater Western Flank Phase 1 Project: Pipeline Installation Program - Performance Objectives, Standards and Measurement Criteria

Source of Risk (Hazard)	Potential Environmental Impact	Control / Mitigation Measures
Installation of Dead Man Anchors (DMA) (one for each of the two pipeline sections).	Localised physical damage to benthic habitats	Survey conducted prior to deployment to verify that there are no areas of environmental sensitivity in the DMA deployment area.
		The anchor will be specially designed to embed efficiently into the type of sediment found in the GWF-1 pipeline operational area.
Installation and operation of positioning transponders.	Physical disturbance to benthic habitats	Recover transponders after use.
		Deploy readily biodegradable sand bags (used for the placing of positioning transponders).
Loss of pipe-lay equipment or materials to the marine environment	Physical disturbance to benthic habitats	Operational procedures will be in-place on board the PIV/MSV vessel for: • deployment and retrieval of towed pipe-lay and geophysical equipment; and • over-the-side lifting (including appropriate crane rigging and load ratings, crane operator and rigger training and competency requirements)
		Pipe-lay equipment and material accidentally dropped to the marine environment is recovered where safe and practicable to do so.
		AMSA/AHO/potentially affected stakeholders will be notified in the event lost equipment is unable to be recovered.
Vessel Movement and Presence at site	Injury or fatality to protected fauna	Interaction between vessels and cetaceans (whales and dolphins) within the operational area will be consistent with EPBC Regulations 2000 – Part 8 Division 8.1 (Regulation 8.04) – Interacting with cetaceans. *Exception: This standard does not apply to vessels operating under limited/constrained manoeuvrability – e.g. PIV in pipe-lay, loading/ back-loading/ close standby cover for over side working, and emergency situations.*
		Compliance with required Notifications of activities affecting cetaceans under the EPBC Regulations
Noise from vessels	Disturbance to marine fauna, particularly whales and marine turtles potentially as physical	Interaction between vessels and cetaceans (whales and dolphins) within the operational area will be consistent with EPBC Regulations 2000 – Part 8 Division 8.1 (Regulation 8.04) – Interacting with cetaceans *Exception: This standard does not apply to vessels operating under limited/constrained*

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Source of Risk (Hazard)	Potential Environmental Impact	Control / Mitigation Measures
	damage or as a behavioural effect.	*manoeuvrability – e.g. PIV in pipe-lay, loading/ back-loading/ close standby cover for over side working, and emergency situations.*
Emissions from fuel and waste combustion	Reduced localised air quality from atmospheric emissions.	Compliance with MARPOL 73/78 Annex VI - as applied in Australia under Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 Regulations for the Prevention of Air Pollution from Ships - Marine Orders – Part 97 (Part IIID Marine Pollution Prevention – Air Pollution) – where applicable to vessel class.
Accidental introduction of invasive marine species from vessel ballast water	Introduction and establishment of invasive marine species and displacement of native marine species.	Adherence the *Australian Ballast Water Management Requirements (DAFF 2011 version 5)*.
Accidental introduction of invasive marine species from hull, internal niches and in-water equipment (biofouling)	Introduction and establishment of invasive marine species and displacement of native marine species.	Adherence to the Woodside Energy Limited Invasive Marine Species Management Plan. • Woodside's IMS risk assessment process will be applied to all vessels and submersible equipment planning to enter and operate within nearshore waters around Australia. Nearshore areas include all waters within 12 nautical miles of land and in all waters less than 50 m deep at LAT.
Routine discharge of sewage, putrescible wastes and bilge water to marine environment	Localised eutrophication of the water column; and localised adverse effect to marine biota.	Sewage, Grey water and Putrescible Waste: Compliance with MARPOL 73/78 - as applied in Australia under Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983); AMSA Marine Orders - Part 96: Marine Pollution Prevention – Sewage, - as required by vessel class.
		Bilge Water: Compliance with MARPOL 73/78 - as applied in Australia under Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983); AMSA Marine Orders - Part 91 Marine Pollution Prevention – Oil, as required by vessel class.
Discharge of Chemical-treated seawater	Localised short term decrease in water quality and toxic effects to marine biota	Undertake all FCGT activities in accordance with Woodside Standard Specification for Flooding, Cleaning, Gauging and Hydrotesting of Offshore Pipelines.
		Woodside Management of Hazardous Substances Procedure: • All chemicals operationally discharged to the marine will be assessed using this procedure. • Chemicals are preferred if they have an OCNS rating of silver or gold in the OCNS Hazardous Quotient (HQ) banding or if they are included in Group E of the Definitive

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Source of Risk (Hazard)	Potential Environmental Impact	Control / Mitigation Measures
		Ranked List of Approved Products.
		Chemicals applied at the lowest practicable concentrations to provide technical effectiveness.
		The hydrotest water from the pipeline will be discharged in accordance with the results and recommendations of the quantitative dispersion assessment
Accidental discharge of hazardous and non hazardous wastes to the marine environment from the vessels	Pollution and contamination of the environment and secondary impacts of marine fauna (e.g. ingestion, entanglement).	Vessel Waste Management Plan (or equivalent) in place detailing wastes generated and disposal requirements.
		No incidents of significant releases of waste materials to the marine environment
Accidental loss of hydrocarbons/chemicals to marine environment from deck spill (topside) loss of containment	Localised biological and ecological impacts on marine biota and water quality	Compliance with MARPOL 73/78 as applied in Australia under the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 - Part IIIB: and Marine Orders - Part 91: Marine Pollution Prevention – Oil), –as applicable to vessel class.
		Storage: Any hydrocarbon storage on deck must be designed and maintained to have at least one barrier (i.e. form of bunding) to contain and prevent deck spills entering the marine environment. This can include containment lips on deck (primary bunding) and/or secondary containment measures (bunding, containment pallet, transport packs, absorbent pad barriers) in place.
		Equipment: Equipment located on deck utilising hydrocarbons (e.g. cranes, winches or other hydraulic equipment) will have as a minimum primary bunding (i.e. deck edge lips or up-stands) to prevent loss of hydrocarbons to the marine environment. *Exceptions: The above requirement does not apply to hydraulic hoses that are located on crane knuckles that protrude outside of the deck boundary and additionally, other Decks where wash ports on the ship's side, which are designed to allow excess sea water to drain quickly from the deck to prevent the sea water free surface effect compromising the stability of the vessel - these ports will be secured closed in fine weather conditions when safe to do so.*
		Equipment: Equipment located on deck utilising hydrocarbons (e.g. cranes, winches or other hydraulic equipment) will be maintained to reduce risk of loss of hydrocarbon containment to the marine environment.
		Spill Response: Spill response bins/kits are maintained and located in close proximity to

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Source of Risk (Hazard)	Potential Environmental Impact	Control / Mitigation Measures
		hydrocarbon storage areas and deck areas for use to contain and recover deck spills.
Accidental loss of hydrocarbons to marine environment – spill during refuelling	Biological and ecological impacts to megafauna, seabirds, plankton, deepwater benthic communities, offshore fish species, and fisheries.	MARPOL 73/78 as applied in Australia under the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 - Part IIIB: and Marine Orders - Part 91: Marine Pollution Prevention – Oil).
		Vessels compliant with Marine Orders Part 30: Prevention of Collisions (Issue 8) and Marine Orders Part 21: Safety of navigation and emergency procedures, Issue 7.
		Operational procedures and equipment will be in-place and implemented on board the vessels for bunkering operations and will be subject to relevant Woodside requirements.
		Spill response bins/kits are maintained and located in close proximity to hydrocarbon storage areas and deck equipment / bunkering areas for use to contain and recover deck spills.
		Implementation of the Shipboard Oil Pollution Emergency Plans (SOPEP) and First Strike Action Plan if hydrocarbon spill occurs.
Accidental loss of hydrocarbons to marine environment – breach of vessel tanks due to collision with another vessel	Biological and ecological impacts to megafauna, seabirds, plankton, deepwater benthic communities, offshore fish species, and fisheries	Compliance with MARPOL 73/78 as applied in Australia under the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 - Part IIIB: and Marine Orders – Part 91: Marine Pollution Prevention – Oil), where applicable to vessel class.
		Vessels compliant with Marine Orders Part 30: Prevention of Collisions (Issue 8) and Marine Orders Part 21: Safety of navigation and emergency procedures, Issue 7.
		Relevant procedures (or equivalent) relating to vessels working in close proximity (e.g. transfer of equipment) will be implemented.
		Implementation of the First Strike Action Plan and Shipboard Oil Pollution Emergency Plans (SOPEP) when a hydrocarbon spill has occurred.
Accidental loss of hydrocarbons to marine environment - leaking subsea infrastructure caused by dropped object	Biological and ecological impacts to megafauna, seabirds, plankton, deepwater benthic communities, offshore fish species, and fisheries.	Over-the-side lifting will be only be undertaken under operational procedures of a suitable lift plan (including appropriate crane rigging, load ratings and identification of live subsea infrastructure), which will take into account risk factors such as location and proximity to GWA facility, subsea infrastructure, weather and sea state, any simultaneous operations.
		No vessel-to-vessel transfer of pipe will be undertaken within the 500 m safety exclusion zone.
		Other marine vessels will be contacted via VHF radio, where required, to prevent disturbance or avoid collision with within the operational area during the PIV's /MSV's activities.

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Source of Risk (Hazard)	Potential Environmental Impact	Control / Mitigation Measures
Disturbance of Other Vessels in the Area	Potential disturbance to third party vessels in transit, during pipe-lay. Exclusion of Fishing in the GWA operational area, including exclusion of long line trolling within 10 km of the area.	Consultation fact sheet distributed to stakeholders identified as operating in the area prior to installation commencement.
		Vessels compliant with Marine Orders Part 30: Prevention of Collisions (Issue 8) and Marine Orders Part 21: Safety of navigation and emergency procedures, Issue 7.
		The Australian Maritime Safety Authority (AMSA) Rescue Coordination Centre (RCC) is notified of vessel movements during the GWF-1 Pipeline Installation program so that AMSA RCC ensures that navigation Auscoast warnings can be issued and kept up to date.
		The Australian Hydrographic Office (AHO) is advised of the GWF-1 Pipeline Installation program details (survey details, location, timing) within three weeks of mobilisation so that AHO can then issue a notice to mariners.
		Other marine vessels will be contacted via VHF radio, where required, to prevent disturbance or avoid collision with within the operational area during the PIV's/MSV's activities.

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