

Vincent Phase 4 and 5 Environment Plan Summary

Woodside Energy Ltd Revision 1 August, 2014 THIS PAGE HAS BEEN INTENTIONALLY LEFT BLANK

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1. INTRODUCTION

Woodside Energy Ltd (Woodside), as Titleholder, under *the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009* (referred to as the Environment Regulations), plans to undertake a combination of development drilling and subsea installation activities for the proposed Vincent Phase 4 and 5 project, hereafter referred to as the proposed Program.

The purpose of the proposed Program is to further develop and produce hydrocarbons from the Vincent oil field as part of the Vincent Field Development Plan. To achieve this, Woodside plans to undertake the proposed activity in two stages, Phase 4 and Phase 5.

This Environment Plan (EP) Summary has been prepared to meet the requirements of Regulations 11(3) and 11(4) under the Environment Regulations, as administered by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). This document summarises the Vincent Phase 4 and 5 Environment Plan, accepted by NOPSEMA under Regulation 10A of the Environment Regulations.

2. LOCATION OF THE ACTIVITY

The proposed Program is located in permit area WA-28-L in offshore Commonwealth waters approximately 50 km north north-west of Exmouth. The closest mainland to the proposed Program is the North West Cape, approximately 40 km south south-east.

The proposed Phase 4 activity is situated adjacent to the DCB manifold (VNB-H1 ST1 well) as shown in **Figure 2-1**, whilst the proposed Phase 5 activities could be undertaken in proximity to either DCA or DCB manifold, dependent on operationally requirements. **Table 2-1** Provides location details for the proposed Program.



Figure 2-1: Location of the Proposed Program

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Activity	Water Depth (Approx. m LAT)	Latitude (GDA94,	Longitude MGA 50)	Production Licence
VNB-H1-ST1	392	21°26'02.29"S	114° 01'59.07" E	WA-28-L
DCA	364	21°26'22.729"S	114° 02'48.307"E	WA-28-L
DCB	392	21°26'1.705"S	114° 01'58.869"E	WA-28-L

Table 2-1: Locations details for the Proposed Program

An Operational Area will be implemented around each well location (500 m radius). The Operational Area defines the spatial boundary of the petroleum activities that will be managed under the EP. Transit to and from an Operational Area by support vessels, installation vessels and drill rigs/ships, and port activities associated with the support vessels, is not within the scope of the EP.

3. DESCRIPTION OF THE ACTIVITY

The proposed Program will be undertaken using the following anticipated project vessels:

- The *Atwood Eagle* semi-submersible drill rig, which is currently scheduled to undertake the drilling of VNB-H1-ST1 (Phase 4). If an alternate drill rig is required, it will meet the same environmental and safety standards as the *Atwood Eagle*;
- A primary installation vessel (PIV) (e.g. the *Nor Australis* or similar vessels that have remotely operated vehicle (ROV) and diving capabilities) may be utilised for the installations of subsea infrastructure and spools; and
- Support vessels.

A specific drill rig for Phase 5 is yet to be selected or contracted but options include a semisubmersible moored drill rig, Dynamic Positioned (DP) drillship or DP drill rig, depending on availability and suitability for the well location (e.g. water depth). All drill rig options are assessed and managed under the EP.

The activity is planned to be undertaken in two phases:

- Phase 4 (VNB-H1-ST1): Planned abandonment of existing well (VNB-H1), re-entry of abandoned well and side track drilling with completion and subsea installation of a refurbished Xmas tree. In the event that the well cannot be re-entered, a new well will be drilled from a new location in close proximity to VNB-H1; and
- Phase 5 (up to two further wells): Drilling may utilise top hole sections of existing wells, but it is anticipated more likely that new wells will be drilled in close proximity to the existing manifold. The wells will then be completed with subsea installation.

The reference drilling fluid case for the Vincent Phase 4 and 5 wells is a water based mud (WBM) drilling fluid system however a non-water based mud (NWBM) drilling fluid system may be required to meet technical requirements of sections of the wells, if identified during detailed well design. Once the wells have been drilled, well completion activities will be undertaken and installation of the subsea Xmas trees.

Commissioning of the wells is planned to be back to the Ngujima-Yin Facility, environmental risks associated with commissioning will therefore managed through the Ngujima-Yin Floating Storage and Offloading Facility Operations EP (V0000AH0500).

3.1 Timing of the Activities

The current schedule of the proposed Program is to commence Phase 4 in Q4 2014 with the pre-lay of the drill rig moorings. Drilling and completions activities are expected to take up to five months to

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complete (including mobilisation, active drilling, demobilisation and contingency). However, timing and duration of all activities may be subject to change due to drill rig/vessel availability, unforeseen circumstances and weather.

Subsea installation is planned immediately after completion of the drilling, subject to availability of subsea vessels, weather and unforeseen circumstances. This work is expected to take up to one week.

Phase 5 is scheduled to be undertaken between 2015 and 2017. Each well is expected to take a similar period of time to drill as the well in Phase 4. The Phase 5 wells may then require subsea installation (possibly including a new well head, Xmas tree and jumper to the manifold), which is expected to take three to four months for each well (subject to vessel availability, weather and unforeseen circumstances.

This EP has risk assessed drilling, completions and subsea installation activities throughout the year (all seasons) to provide operational flexibility due to project schedule changes and vessel/rig availability.

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

4.1 Physical

The proposed Program is located in Commonwealth waters of the North West Shelf (NWS), within the North-West Marine Region. The climate within the region is dry tropical with a hot summer season from October to April and a milder winter season between May and September. Water circulation in the region is dominated by the southward flowing Leeuwin Current and this is the predominant current flow affecting the area of the proposed Program. The Ningaloo Current occurs much nearer to the shore than the Leeuwin Current, flowing along the outside of the Ningaloo Reef and the inner shelf. It is also a seasonal current, flowing mainly during summer and driven by southerly wind stress. In addition to the synoptic-scale current dynamics, tidally driven currents are a significant component of water movement on the NWS.

High resolution geophysical surveying of permit area WA-28-L indicates that the *Operational Area* consists of a relatively flat and featureless seabed with a depth of approximately 390 m. This contrasts with the area to the south of WA-28-L where seabed topography includes an extensive area of mega ripples and canyon features, such as the east/west oriented Enfield Canyon and the generally north/south running Enfield Escarpment. Seabed sediments of the continental slope in the NWS are generally dominated by carbonate silts and muds.

4.2 Biological

The offshore environment of the region contains environmental assets/receptors of high value or sensitivity including habitats or species that are particularly vulnerable or that provide valuable ecological services such as specific Key Ecological Features and marine primary producer (MPP) habitat (coral reefs, mangroves, seagrass meadows and macroalgae). Furthermore, the region is noted for resident, temporary or migratory marine life including *Environment Protection and Biodiversity Conservation Act, 1999* (the EPBC Act) listed species such as marine mammals, turtles and birds. Many sensitive receptor locations are protected as part of Commonwealth and State managed protected areas.

There are no sensitive marine environments within the proposed *Operational Area*. The closest sensitivities are the Ningaloo World Heritage Area, Ningaloo Commonwealth Marine Reserve and Marine Park, and the Gascoyne Commonwealth Marine Reserve.

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Figure 4-1: Established and Proposed Commonwealth and State Marine Protected Areas in Relation to the Proposed Program Area.

No Critical Habitats or Threatened Ecological Communities, as listed under EPBC Act, occur within the proposed *Operational Area*.

Twenty-two cetacean species may occur in the *Operational Area* with three categorised as threatened and migratory and four as migratory. The endangered Blue whale and vulnerable Humpback whale all migrate seasonally both north bound and south bound through the NWS for breeding and feeding. The Southern Right whale also migrates seasonally, sightings in the more northern waters (NWS) are relatively rare; however, they have been recorded as far north as Exmouth. The presence of Southern right whales is considered unlikely and transitory for the *Operational Area*. The *Operational Area* may be visited by other cetacean species but it is likely to be in low numbers, infrequently and of a transitory nature.

There are five species of turtle listed as migratory in the *Operational Area*, however, *the Operational Area* is not considered important habitat for turtles due to the distance offshore (approximately 40 km from Muiron Islands and 40 km north of Ningaloo coast); the deep water location (390 m) and the absence of potential turtle nesting or foraging sites (i.e. no emergent islands, reef habitat of shallow shoals).

The *Operational Area* may be occasionally visited by migratory and oceanic birds but does not contain critical habitats for any species. No roosting or nesting habitat exists within the *Operational Area*.

There are no MPP habitats within the offshore environment of the *Operational Area*. Within the wider region MPP habitats of conservation values include, coral reefs, mangroves and seagrass beds/mangroves.

4.3 Socio-Economic and cultural

There are no known sites of Indigenous or European cultural or heritage significance within the vicinity of the *Operational Area*.

No tourism activities take place specifically within the vicinity of the *Operational Area*. A number of nature-based tourist activities such as fishing, diving/snorkelling and marine fauna watching tours take place in the region. During consultation, the Western Australian Department of Fisheries advised that charter boat fishing activities/interests may exist in or in close proximity to the *Operational Area*.

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There are three Commonwealth and one State fishery located within the Operational area.

The region supports significant commercial shipping activity, the majority of which is associated with the mining, oil and gas industry. The *Operational Area* is located approximately 45 km east of the nearest shipping fairway and 3.5 km from the Ngujima-Yin facility.

The *Operational Area* is located within Defence restricted airspace (Defence Practice Area R854A and B Learmonth).

5. ENVIRONMENTAL IMPACTS AND RISKS

5.1 Risk identification and evaluation

Woodside undertook an environmental risk assessment to identify the potential environmental impacts and risks associated with the proposed Program and identification of the control measures to manage the identified environmental impacts and risks to as low as reasonably practicable (ALARP) and an acceptable level. This risk assessment and evaluation was undertaken using Woodside's Risk Management Framework.

The key steps of Woodside's Risk Management Framework are shown in **Figure 5-1**. A summary of each step and how it is applied to the proposed Program is provided below.



Figure 5-1: Key Steps in Woodside's Risk Management Framework

1. Establish the Context

The objective of a risk assessment is to assess identified risks and apply appropriate control measures to eliminate, control or mitigate the risk to ALARP and to determine if the risk is acceptable.

Hazard identification workshops aligned with NOPSEMA's Hazard Identification Guidance Note (N-04300-GN0107) were undertaken by multidisciplinary teams made up of relevant personnel with sufficient breadth of knowledge, training and experience to reasonably assure that risks and associated impacts were identified and assessed.

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2. Risk Identification

The risk assessment workshop for the proposed Program was used to identify risks with the potential to harm the environment. Risks were identified for both planned (routine and non-routine) and unplanned (accidents/incidents) activities.

3. Risk Analysis

Risk analysis further develops the understanding of a risk by defining the impacts and assessing the appropriate controls. Risk analysis for the proposed Program considered previous risk assessments for the facility, review of relevant studies, review of past performance, external stakeholder consultation feedback and review of the existing environment.

4. Risk Evaluation (Decision Support Framework)

To support the risk assessment process, Woodside applied the UKOOA (1999) Industry Guidelines on a Framework for Risk Related Decision Support (HS006) during the workshops to determine the level of supporting evidence that may be required to draw sound conclusions regarding risk level and whether the risk is acceptable and ALARP.

This is to ensure:

- Activities do not pose an unacceptable environmental risk;
- Appropriate focus is placed on activities where the risk is anticipated to be tolerable and demonstrated to be ALARP; and
- Appropriate effort is applied to the management of risks based on the uncertainty of the risk, the complexity and risk rating.

5. Identification of Control Measures

Woodside applies a hierarchy of control measures when considering Good Practice and Professional Judgement. The hierarchy of control is applied in order of importance as follows; elimination, substitution, engineering control measures, administrative control measures and mitigation of consequences/impacts.

6. Risk Rating Process

The risk rating process is undertaken to assign a level of risk to each impact measured in terms of consequence and likelihood. The assigned risk level is the residual risk (i.e. risk with controls in place) and is therefore undertaken following the identification of the decision type and appropriate control measures.

The environmental risk assessment for the proposed Program identified 23 sources of environmental risk. These risks are divided into two broad categories: planned (routine and non-routine); and unplanned (accidents/incidents) activities.

5.2 Planned (Routine and Non-Routine) Activities

The majority of the sources of environmental risk identified for the proposed Program relate to those activities which are planned and either undertaken on a routine or non-routine basis. These sources of risk include:

- Physical presence of the drill rig and other project vessels;
- Routine noise emissions from operation of the drill rig and vessels;
- Routine atmospheric emissions from fuel combustion and waste incineration;
- Routine discharges to the marine environment, including drill cuttings, drilling fluids completion chemicals, sewage and putrescible wastes;
- Storage, handling and disposal of waste; and
- Chemical selection and use.

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5.3 Unplanned (Accidents/Incidents) Activities

During the risk assessment process a number of potential environmental impacts which may occur from unplanned activities were also identified. These sources of risk range from small scale chemical spills with a low environmental consequence to large scale hydrocarbon spill events with high environmental consequence. These sources of risk include:

- Unplanned venting of gas during drilling;
- Chemical spills;
- Hydrocarbon release during bunkering operations;
- Hydrocarbon release due to loss of well integrity,
- Hydrocarbon release from potential loss of structural integrity of vessels, and
- Hydrocarbon release from a dropped object on to subsea infrastructure.

Generally, the sources of risk from planned activities present a lower environmental consequence compared to the potential impact from unplanned accident or incident events. The EP contains a variety of mitigation and control measures which ensure potential impacts and risks will be reduced to ALARP and will be of an acceptable level. A summary of the key environmental risks and control measures have been presented in **Appendix A**.

6. ONGOING MONITORING OF ENVIRONMENTAL PERFORMANCE

The proposed Program will be managed in compliance with the Vincent Phase 4 and 5 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 identify, mitigate and manage potentially adverse environmental impacts and risks associated with the proposed Program, during both planned and unplanned operations, to ALARP and an acceptable level.

For each environmental aspect (risk), and associated environmental impacts (identified and assessed in the Environmental Risk Assessment of the EP) a specific environmental performance outcome, environmental performance standards and measurement criteria have been developed. The performance standards are control measures (available in **Appendix A**) that will be implemented (consistent with the performance standards) to achieve the environmental performance outcomes. The specific measurement criteria provide the evidence base to demonstrate that the performance standards (control measures) and outcomes are achieved.

The implementation strategy detailed in the Vincent Phase 4 and 5 EP identifies the roles/responsibilities and training/competency requirements for all personnel (Woodside and its contractors) in relation to implementing control measures, managing non-conformance, emergency response and meeting monitoring, auditing, and reporting requirements during the activity.

Woodside and its Contractors undertake a program of periodic monitoring during the proposed Program, starting at mobilisation of each activity and continuing through the duration of each activity until activity completion. This information is collected using appropriate tools and systems, developed based on the environmental performance outcomes, performance standards and measurement criteria in the EP. The tools and systems collect, as a minimum, the data (evidence) referred to in the measurement criteria. The collection of this data (and assessment against the measurement criteria) forms part of the permanent record of compliance maintained by Woodside and the basis for demonstrating that the environmental performance outcomes and standards are met, which is then summarised in a series of routine reporting documents.

Monitoring of environmental performance is undertaken as part of the following:

 Annual Environmental Compliance and Performance Reports which are submitted to NOPSEMA to assess and confirm compliance with the accepted environmental performance objectives, standards and measurement criteria outlined in the EP;

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- Activity based inspections undertaken by Woodside's environment function to review compliance against the Vincent Phase 4 and 5 EP, verify effectiveness of the EP implementation strategy and to review environmental performance;
- Environmental performance is also monitored daily via daily progress reports during the proposed Program; and
- Senior management regularly monitors and reviews environmental performance via a monthly report which detail environmental performance and compliance with Woodside standards.

Woodside employees and Contractors are required to report all environmental incidents and nonconformance with environmental performance outcomes and standards in the EP. Incidents will be reported using an Incident and Hazard Report Form, which includes details of the event, immediate action taken to control the situation, and corrective actions to prevent reoccurrence. An internal computerised database is used for the recording and reporting of these incidents. Incident corrective actions are monitored to ensure they are closed out in a timely manner.

The EP is supported by an assessment of the environmental impacts and risks associated with potential oil spill scenarios and oil spill preparedness and response measures in relation to the risk assessment and the identified oil spill scenarios. A summary of Woodside's response arrangements in the oil pollution emergency plan is provided in Appendix B.

6.1 **Environment Plan Revisions**

Revision of the Vincent Phase 4 and 5 EP will be undertaken in accordance with the requirements outlined in Regulations 17, Regulation 18 and Regulation 19 of the Environment Regulations. Woodside will submit a proposed revision of the Vincent Phase 4 and 5 EP to NOPSEMA including as a result of the following:

- When any significant modification or new stage of the activity that is not provided for in the EP is proposed;
- Before, or as soon as practicable after, the occurrence of any significant new or significant increase in environmental risk or impact not provided for in the EP;
- At least 14 days before the end of each period of five years commencing on the day in which the original and subsequent revisions of the EP is accepted under Regulation 11 of the Environment Regulations; and
- As requested by NOPSEMA.

7. CONSULTATION

Woodside conducted a stakeholder assessment for the proposed Program to identify 'relevant' stakeholders based on the proposed activities, location and timing of the proposed Program. This included location of the facility, timing of the activities and potential environmental and social impacts.

Relevant Stakeholders

For the purposes of this EP and consistent with Section 11A of the Environment Regulations, Woodside considers 'relevant' stakeholders as those that:

- Undertake normal business or lifestyle activities in the vicinity of the activity (or their nominated representative); or
- Have a regulatory role.

Stakeholders relevant to the proposed Program are listed in Table 7-1.

Table 7-1: Relevant Stakeholders Identified for the Proposed Program

Relevant Organisation	Relevance	
Department of Industry	Department of relevant Commonwealth Minister	
Department of Mines and Petroleum	Department of relevant State Minister	

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Relevant Organisation	Relevance
Australian Maritime Safety Authority (maritime safety)	Maritime safety
Australian Fisheries Management Authority	Commercial fishery management
Department of Fisheries	State fishery management
Commonwealth fisheries Southern Bluefin Tuna Fishery Western Tuna and Billfish Fishery North West Slope Trawl Fishery 	Commercial fishery
Western Australian Fisheries - Mackerel Fishery	Commercial fishery
Pearl Producers Association	Commercial fishery
Recfishwest	Recreational fishing
Exmouth Game Fishing Club	Recreational fishing
Exmouth Charter Boat Operators - On Strike Charters - Peak Sportfishing Adventures - Blue Horizon Charters - Ningaloo Pearls - Ningaloo Blue - Ningaloo Fusion Charters - Reel Teaser	Commercial fishing
Department of Defence – Defence Property Services Group	Defence estate management
Australian Hydrographic Office	Maritime safety
Dive Tour Operators	Tourism / Recreational Diving
Australian Maritime Safety Authority (marine pollution)	Marine pollution response (oil spill response)
Department of Transport	Marine pollution response (State oil spill response)
Department of Environment	Matters of National Environmental Significance and Department of Commonwealth Environment Minister
Department of Parks and Wildlife	State environment and wildlife
Australian Customs Service – Border Protection Command	Boarder protection
Department of Broadband, Communication and the Digital Economy	Telecommunications infrastructure
Department of Agriculture, Fisheries and Forestry	Commercial fisheries policy
Commonwealth Fisheries Association	Commercial fishery representation
Western Australian Fishing Industry Council	Commercial fishery representation
Dampier Port Authority	Marine traffic
Exmouth Community Reference Group (Woodside)	Community, government and industry representation on matters relevant to Woodside's potential environmental social and economic impacts on the North West Cape area
WWF	Environmental non-government organisation
WWF Australian Conservation Foundation	Environmental non-government organisation Environmental non-government organisation
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WWF Australian Conservation Foundation Wilderness Society ocument is protected by copyright. No part of this document may be cess (electronic or otherwise) without the specific written consent	Environmental non-government organisation Environmental non-government organisation Environmental non-government organisation e reproduced, adapted, transmitted, or stored in any form by of Woodside. All rights are reserved.

Relevant Organisation	Relevance
International Fund for Animal Welfare	Environmental non-government organisation
Conservation Council of WA	Environmental non-government organisation
Australian Petroleum Production and Exploration Association	Oil and gas industry representation
Australian Marine Oil Spill Centre	Oil spill response – industry contractor
Federal Member for Durack	Relevant Federal Member of Parliament
State Member for North West Central	Relevant State Member of Parliament

A consultation fact sheet was sent electronically to all stakeholders identified through the stakeholder assessment process prior to lodgement of the EP with NOPSEMA for assessment and acceptance. This advice was supported by engagement with potentially affected stakeholders. Consultation activities for the proposed Program build upon Woodside's extensive and ongoing stakeholder consultation for offshore petroleum activities in this area.

Woodside received feedback on the proposed Program from a range of stakeholders, including government agencies and commercial fishing organisations. Issues of interest or concern included the location of the proposed activities across commercial fishing areas. A summary of feedback and Woodside's response is presented in **Appendix C.**

Woodside considered this feedback in its development of control measures specific to the proposed Program.

Woodside has been active in engaging government, community and other stakeholders in relation to its development and exploration activities in the region for over ten years. Woodside will continue to engage and consult with relevant stakeholders throughout the proposed Program by implementing its established approach to stakeholder engagement that includes;

- Exmouth Community Reference Group meetings;
- Direct stakeholder and community engagement providing advice to community stakeholders on progress in execution of activities;
- Provision of updated activity factsheets prior to the commencement of activities; and
- Toll free number provided on activity factsheets.

Feedback received through community engagement and consultation will be captured in Woodside's stakeholder database and actioned where appropriate through the proposed Program Project Manager. Implementation of ongoing engagement and consultation activities for the proposed Program will be undertaken by Woodside Corporate Affairs consistent with Woodside's External Stakeholder Engagement Operating Standard.

8. TITLEHOLDERS NOMINATED LIAISON PERSON

For further information about this activity, please contact:

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APPENDIX A: ENVIRONMENTAL IMPACTS AND RISKS

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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
Planned (routine and non-routine) A	ctivities	
Proximity of drill rig, PIV and other support vessels to third party vessels	Localised, temporary local concern to shipping and commercial fishing.	Compliance with Marine Order 30 (Prevention of Collisions) 2009 and Marine Order 21 (Safety of navigation and emergency procedures) 2012.
(commercial shipping, fishing, recreational fishing charters)		Compliance with Australian Maritime Safety Authority administered marine safety regulations and marine notification requirements.
		Establishment of a 500 m radius safety exclusion zone around the MODU/ PIV, in which only vessels authorised by the MODU/PIV are permitted to enter and operate.
		Consultation Fact Sheet sent to State and Commonwealth fisheries.
Mooring of drill rig, presence of subsea infrastructure including well head and use of ROV, removal and installation of Xmas trees, wet storage (possible) and other minor subsea work	Localised, minor, short-medium term impacts on benthic community/habitat structure. Full recovery expected.	Mooring Analysis Design Report completed and implemented during anchor deployment (consistent with industry best practice) as per Woodside Standards. Wet stored items are logged and retrieved. Limit ROV usage close to or on the seabed.
Generation of noise from vessel and drill rig operations	Localised, minor, temporary disruption to a small proportion of marine fauna and no significant impact on critical habitat or threatened marine fauna.	Compliance with EPBC Regulations 2000 – Part 8 Division 8.1 Interacting with cetaceans: Support vessels will not travel greater than 6 knots within 300 m of a whale (caution zone) and approach closer than 100 m from a whale; and a vessel will not approach closer than 50 m for a dolphin and/or 100 m for a whale (with the exception of animals bow riding).
Atmospheric emissions from fuel combustion and waste incineration	Localised, minor and temporary exceedence above air and/or water quality standards.	Compliance with Marine Order 97 (marine pollution prevention – air pollution), as required by vessel class. Incinerator will be maintained according to the vessels Planned Maintenance System (PMS) and if installed after January 2000 will be MARPOL 73/78.

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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
Routine discharge of sewage, grey water, putrescible wastes, deck, bilge water and cooling water or brine to marine environment from drill rig, PIV and other project vessels	Localised, minor, temporary contamination above background levels, water quality standards, or known effect concentrations.	Compliance with Marine Order 96 (Pollution prevention – sewage), as required by vessel/drill rig class: A valid International Sewage Pollution Prevention (ISPP) Certificate; sewage treatment plant; sewage commuting and disinfecting system; and sewage holding tank.
		Compliance with Marine Order Part 91 (pollution prevention – garbage), as required by vessel/drill rig class: Garbage is passed through a grinder so that it is capable of passing through a screen with no opening wider than 25 mm.
		Compliance with Marine Order 94 (pollution prevention – packaged harmful substances), as required by vessel/drill rig class: no disposal overboard.
		The contractor Waste Management Plan is consistent with Woodside's Drilling and Completions Waste Management Plan.
		Vessel/drill rig sewerage system shall be capable of servicing the full complement of crew on board the vessel as per Woodside's Engineering Standard for Construction Vessels or Rig Equipment Engineering standard: holding tanks shall be sized appropriately to contain all generated waste (black & grey water) for the necessary duration prior to planned & acceptable discharge operations.
		Bilge water contaminated with hydrocarbons must be contained and disposed of onshore, except if the oil content of the effluent without dilution does not exceed 15 ppm or an IMO approved oil/water separator (as required by vessel class) is used to treat the bilge water.
		Woodside Engineering Standard – Rig Equipment. Spill response bins/kits are maintained and located in close proximity to hydrocarbon storage areas and vessel deck equipment / bunkering areas for use to contain and recover deck spills.

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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures	
Routine discharge of drill cuttings (WBM and NWBM) and drilling fluids to theLocalised, minor, temporary decrease in water quality above background	Drill cuttings returned to the drill rig will be processed using SCE equipment prior to discharge.		
marine environment	levels due to minor contamination and increased turbidity.	Cuttings must be discharged below the water line as per Woodside Standards.	
		As per Woodside Standards WBM shall be used as the first preference in all cases; and where WBM cannot meet required specifications, NWBM may be used following a formal written technical NWBM justification process. Overboard disposal of NWBM is not permitted.	
		NWBM cuttings and reservoir cuttings will be treated, if required, to contain on average less than 10% oil by weight prior to discharge as per Woodside Standards.	
		NWBM system set up as per Woodside checklists to ensure appropriate containment and controls in place and audited.	
		Woodside procedure used to assess chemicals (in standard discharge scenarios) which can fall into the following assessment types: no further assessment (good OCNS environmental performance); further assessment required (lower OCNS environmental performance or not OCNS registered); or ALARP justification required (if an environmentally sound alternative cannot be found).	
		Bulk operational discharges conducted under drill rig's PTW system (to operate discharge valves/pumps) or risk assessed using the drill rig contractors risk assessment prompt cards.	
Routine discharge of completion fluids and chemicals (subsea, completion, well bore clean out, cement)	Localised, minor, temporary contamination above background levels, water quality standards, or known effect concentrations.	Woodside procedure used to assess chemicals (as above). Bulk operational discharges conducted under drill rig's PTW system (to operate discharge valves/pumps) or risk assessed using the drill rig contractors risk assessment prompt cards.	
Unplanned (accidents or incidents) Acti	vities		
Hydrocarbon release to the marine environment due to a loss of well integrity	Disruption of a significant portion of the population of protected species. Impacts on critical habitats or activities. No threat to overall population viability. Large scale and long-term effects to marine primary producers . Recovery >10 years or permanent. Localised but long term effect on other	Preventative: Well design and construction is managed and controlled by Woodside's Well Lifecycle Management Process (WLMP). The WLMP consists of six phases of activity which cover work requirements from the outset of individual Basis for Well Design creation to the point at which the well is finally abandoned or suspended and all documentation is closed out. Further information will be provided in the WOMP for each well of the proposed Program which addresses: Basis for Well Design phase; Detailed Design phase, and Well Construction Operations phase (including suspension). The	
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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
	community/habitat structure. Community maintains ecological integrity though an unacceptable change in species composition may occur. Minor long term or significant short term contamination above background and/or national/international water quality standards and/or known biological effect concentrations on scale >2 km. Moderate long term or significant short term contamination above background and/or national/international marine sediment quality standards and/or known biological effect concentrations on scale >2. Slight and temporary (<1 year) localised effect to ecosystems, species and/or habitats in the area for air quality. Significant long term effect on one or more of protected area values.	 performance standards below are reflective of this process. Offshore Petroleum and Greenhouse Gas Storage (Resource Management and Administration) Regulations 2011: Accepted Well Operations Management Plan (WOMP) & application to drill. As per Woodside Standards: All permeable zones penetrated by the well bore, containing hydrocarbons or over-pressured water, shall be isolated from the surface environment by a minimum of two barriers (a single fluid barrier may be implemented during the initial stages of well construction if appropriateness is confirmed by a shallow hazard study). Discrete hydrocarbon zones shall be isolated from each other (to prevent cross flow) by a minimum of one barrier. All normally pressured permeable water-bearing formations shall be isolated from the surface by a minimum of one barrier. Barriers shall be effective over the lifetime of well construction or production. Effectiveness of primary & secondary barriers shall be verified. Cement minimum specifications for cementing conductor, casings and liners to maintain well integrity. As per Woodside procedures: Fluid barrier comprising of drilling fluid of a suitable weight, composition & volume to counter pore pressure & over pressure zones when drilling. Subsea BOP specification & function/pressure testing in accordance with: Original Equipment Management (OEM) Standards. Woodside Standards and procedures. API Standard 53 4th Edition (API RP53). Spill Response: Spill Response Plan. Monitoring/observation of the spill will be undertaken to inform the spill response Plan. Monitoring/observation of the spill will be undertaken to inform the spill response Plan.

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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
		 Containment and recovery. Shoreline assessment. Shoreline protection. Shoreline cleanup. Subsea first response toolkit & capping stack available for use. Mutual Aid MoU (for relief well drilling) is in place. A summary of Woodside's oil spill response arrangements for the proposed Program is provided in Appendix B.
Hydrocarbon release to the marine environment due to a loss of vessel structural integrity (Collision between rig and support/3rd party vessel.)	Localised and short-medium term effect on community/habitat structure of protected species, marine primary producers and other communities and habitats. Full recovery expected. Minor and/or temporary contamination above background levels and/or national/international water quality standards. Short term contamination above background levels and/or national/international marine sediment quality standards. Minor and short term effect on one or more of the protected areas values. Full recovery expected.	 Compliance with Marine Order 30 (Prevention of Collisions) 2009 and Compliance with Marine Order 21 (Safety of navigation and emergency procedures) 2012. Compliance with Australian Maritime Safety Authority administered marine safety regulations and marine notification requirements. As per Woodside requirements: support vessel becomes designated as standby vessel for over the side and moon pool operations within the MODU/PIV area and is under the control of the OIM. maintains safety/exclusion zones by maintaining continuous surveillance through visual, radar, and radio watches, providing warning to approaching vessels, intercepting vessels that enter within the safety/exclusion zone and documenting incursions. Establishment and enforcement of a 500 m safety zone. Send consultation Fact Sheet to state and commonwealth fisheries. A summary of Woodside's oil spill response arrangements for the proposed Program is provided in Amendix P
Hydrocarbon release to the marine environment during bunkering activities	Localised, minor, temporary contamination above background levels and/or standards with localised, minor/negligible and temporary impacts to habitats or populations.	 Compliance with Marine Order 91 (Pollution prevention – oil) As per Woodside Standards: All hoses that have a potential to cause an environmental risk due to damage or failure shall be placed on a hose register that is linked to the MODU's preventative maintenance system. There shall be dry-break couplings and floatation on fuel hoses and procedures to ensure that hose integrity is checked. Save-alls shall be installed around loading stations. There must be an adequate number of appropriately stocked, located and

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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
		 maintained spill kits. All bulk transfer hoses shall be tested for integrity before use. A detailed bunkering plan and procedures will be developed for all vessels that will bunker in Operational Areas. The plans/procedures shall include, but not be limited to: Bunkering capacity, frequency and volumes. Nominal limiting metocean conditions for bunkering operations. Minimum contingency bunker volume required onboard Construction Vessel before operations must cease, both for cyclonic and non-cyclonic operations. The capacity and specification of proposed bunker vessels. The capacity and specification of tugs used to support any mooring/unmooring operations. Emergency procedures in the event of spill, loss of position, mooring system failure etc. Contractor bunkering procedure to be implemented during all bunkering activities, and must be assessed by Woodside as meeting at least the following requirement (controls): Undertaken under the drill rig/PIV PTW system. Bunkering to start during daylight hours (can continue into the night). Requires visual monitoring of gauges, hoses, fittings and the sea surface.
Hydrocarbon release to the marine environment as a result of a dropped object (including anchors) onto subsea infrastructure: wellhead and flowline	Minor disruption or impact on a significant portion of the population of protected species. No threat to overall population viability. Localised but long term effect to marine primary producers.Recovery within 5-10 years. Localised medium term effect on community/habitat structure. Community maintains ecological integrity though an acceptable change in species composition may occur. Minor long term or significant short term	 Drill rig and PIV Safe Work Procedures developed and followed for bulk transfer to prevent objects being dropped. Subsea project items will be lifted over the side of the PIV in a "clear zone" away from live subsea infrastructure, and lowered to within ~10 m of the seafloor. Items will then be moved into place using ROV and PIV movement. Standards for lifted equipment, lifting/ winching gear and devices. Pre-use inspections on lifting/ winching gear and devices. Equipment maintained in accordance with lifting equipment register. As per Woodside Standards: Calibrated real time positioning system to be installed on the drill rig and each of the Anchor Handling Vessels, which displays the relative positions of the drill rig and Anchor Handling Vessels, mooring legs, anchors and positions of all subsea infrastructure via electronic charts supplied by Woodside.

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ormation.

Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures	
	contamination above background and/or national/international water quality standards	Mooring Analysis Report completed and implemented during anchor deployment (consistent with industry best practice - American Petroleum Institute RP 2SK) as per Woodside Standards.	
	Medium contamination above	As per Woodside isolation Standards:	
	background levels and/or national/international marine sediment quality standards Minor and medium term effect on one or more of protected area values. Full recovery expected.	• There must always be two independent, verified and effective barriers between a reservoir (i.e. pipeline contents) and the working environment (i.e. the ocean) for the duration of the work activity (if divers are in the water) and a minimum single proven isolation between a pressure source and the working environment (i.e. the ocean) for all ROV intervention operations.	
		recovery expected.	 A risk assessment is required to be performed for any subsea isolation to determine whether the proposed isolation is appropriate with respect to environmental impacts.
			 Isolations must be tested (proven) prior to the commencement of any subsea installation activities. A detailed set of procedures for putting isolations in place will be developed prior to commencing subsea installation activities.
	Effectiveness of the isolation will be confirmed/proven via field testing.		
		A summary of Woodside's oil spill response arrangements for the proposed Program is provided in Appendix B .	
Unplanned venting of gas during drilling (well kick)	Localised, minor and temporary exceedance over air quality standards.	Woodside will verify relevant contractor procedures align with Woodside standard requirements.	

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Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
Accidental discharge of NWBM or base oil to marine environment from MODU during bulk transfer, failure of slip joint packers or emergency disconnect sequence	Localised, minor, temporary contamination above background water quality levels and/or national/international quality standards and/or known biological effect concentrations outside a 200 m mixing zone. NWBM cuttings discharge from an emergency disconnect will not result in a potential impact greater than localised, minor, temporary contamination above background levels, water quality standards, or known effect concentrations.	 As per Woodside Standards: all hoses that have a potential to cause an environmental risk due to damage or failure shall be placed on a hose register that is linked to the MODU's preventative maintenance system there shall be dry-break couplings and floatation on fuel hoses and procedures to ensure that hose integrity is checked save-alls shall be installed around loading stations adequate/appropriate spill kits all bulk transfer hoses shall be tested for integrity before use NWBM system set up as per Woodside checklists to ensure appropriate containment and controls in place & audited North West European Area (NWEA) Guidelines: Emergency shutdown systems for stopping losses of containment (e.g. burst hoses) Break-away dry-break couplings for oil based mud hoses Constant monitoring of the offloading process Direct radio communications Additional operator will be used to monitor & manage NWBM operations & volumes (with suitable communication equipment). Deck areas on the drill rig are bunded. Mud pits dump valve will be locked closed & operated through the drill rig's PTW. Contractor bunkering procedure to be implemented during all bunkering activities.
Accidental discharge of other hydrocarbons and/or chemicals from deck activities of drill rig, PIV and other project vessels.	Localised, minor, temporary disruption to a small proportion of biological populations with no impact on critical habitat or activity.	Compliance with Marine Order 94 (pollution prevention – packaged harmful substances). Compliance with Marine Order 91 (Marine pollution prevention – oil). Woodside procedure used to assess chemicals (as above). Compliance with Woodside's Environmental Performance Operating Standard. Woodside Engineering Standard – Rig Equipment. Spill response bins/kits are maintained and located in close proximity to hydrocarbon storage areas and vessel deck equipment / bunkering areas for use to contain and recover deck spills.

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Vincent Phase 4 and 5 Environment Plan Summary

Source of Risk (Hazard)	Potential Environmental Impact	Control Mitigation Measures
Accidental loss of solid wastes to the marine environment (excludes sewage, grey water, putrescible waste and bilge water).	Localised, minor, temporary contamination above background levels, water quality standards, or known effect concentrations.	Compliance with Marine Order 95 (Marine pollution prevention – garbage). The Contractor Waste Management Plan is consistent with the Woodside D&C Waste Management Plan Dampier, Broome & Darwin. Equipment and materials dropped to the marine environment are recovered where safe and practicable to do so.
Collision between project vessels or MODU with marine fauna	Localised, minor, temporary disruption to a small proportion of the population and no impact on critical habitat or activity.	Compliance with EPBC Regulations 2000 – Part 8 Division 8.1. Compliance with required notifications of activities affecting cetaceans under the EPBC Regulations.
Dropped objects to the marine environment	Localised, minor, temporary disruption to a small area of the seabed, a small proportion of the benthic population and no impact on critical habitat or activity.	Drill rig and PIV Safe Work Procedures. Equipment and materials dropped to the marine environment are recovered where safe and practicable to do so. Personnel will be trained with regard to the prevention of dropped objects during relevant meetings and the appropriate inductions.

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APPENDIX B: SUMMARY OF RESPONSE ARRANGEMENTS FROM OIL POLLUTION EMERGENCY PLAN

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Woodside's Oil Spill Planning Arrangements

Woodside's Oil Pollution Emergency Plan (OPEP) for the proposed Program consists of the following documents:

Woodside Corporate Oil Spill Contingency Plan

This document outlines the emergency and crisis management incident command structure (ICS) and Woodside's response arrangements to competently respond to and escalate an oil spill event. The document interfaces externally with Commonwealth, State and industry response plans and internally with Woodside's ICS.

The Corporate Oil Spill Contingency Plan describes Woodside's role as a Control agency and details the following support arrangements:

- Master services agreement with Australian Marine Oil Spill Centre (AMOSC) for the supply of experienced personnel and equipment, including a subsea first response toolkit and national dispersant stockpiles;
- Access to Wild Well Control's capping stack, SFRT equipment and experienced personnel for the rapid deployment and installation of a capping stack, where feasible.
- Participating membership with Oil Spill Resources Limited (OSRL), which allows access to OSRL's international holding of response equipment and response capabilities, including incident management expertise and specialist personnel;
- The Woodside and Australian Maritime Safety Authority (AMSA) Memorandum of Understanding (MoU) whereby AMSA, as managers of the National Plan for Maritime Environmental Emergencies, will provide support to Woodside such as response equipment from national stockpiles. The equipment stockpiles are located around Australia in strategic locations such as the ports of Dampier, Darwin and Fremantle.
- Other support services such as 24/7 oil spill trajectory modelling and satellite monitoring services as well as 'on-call' aerial, marine, logistics and waste management support.
- Mutual Aid Agreements with other oil and gas operators in the region for the provision of assistance in an oil spill response.

Exmouth Regional Oil Spill Response Plan and Dampier Regional Oil Spill Response Plan

The Exmouth Regional Oil Spill Response Plan and Dampier Regional Oil Spill Response Plan summarises the regional hydrocarbon types, response resources and response strategies to be employed during an oil spill event. The document includes Ningaloo and Pilbara response guidelines for key regional receptors, which may be potentially impacted from an oil spill.

Vincent Phase 4 & 5 First Strike Plan

The Vincent Phase 4 & 5 First Strike Plan is an activity specific document providing details on the tasks required to mobilise a first strike response for the first 24 – 48 hours of a hydrocarbon spill event. These tasks include key response actions and regulatory notifications. The intent of the document is to provide immediate oil spill response guidance to the Incident Management Team until a full Incident Action Plan specific to the oil spill event is developed.

Woodside's oil spill arrangements are tested on the drill rig within 2 weeks of commencement of drilling each well. Woodside's broader ICS is tested at least every year, whilst exercises involving the various statutory authorities are conducted at least every five years.

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Oil Spill Preparedness and Response Mitigation Assessment for Vincent Phase 4 and 5

Woodside has developed an oil spill preparedness and response position in order to demonstrate that risks and impacts associated with loss of hydrocarbons from the proposed Program would be mitigated and managed to as low as reasonably practicable (ALARP) and would be of an acceptable level.

The following oil spill response strategies were evaluated and subsequently pre-selected for a significant oil spill event (level 2 or 3 under the National Plan) from the proposed Program. Implementation of these response strategies would be re-assessed during a spill event, with consideration of the size of spill, weather conditions and other constraints:

- 1. Monitor and Evaluate To gain an understanding of the spill event, its movement and to direct mitigation activities to the optimal locations, the following operational monitoring programs are available for implementation:
 - o Predictive modelling of hydrocarbons to assess resources at risk;
 - o Surveillance and reconnaissance to detect hydrocarbons and resources at risk;
 - o Monitoring of hydrocarbon presence, properties, behaviour and weathering in water;
 - o Pre-emptive assessment of sensitive receptors at risk; and
 - Monitoring of contaminated resources and the effectiveness of response and clean-up operations.
- 2. Source Control (Well intervention) Woodside's strategy is to minimise the volume of hydrocarbons released from an oil spill event. Woodside plans to deploy the following controls specific to well loss of containment scenarios, if required for the proposed Program:
 - o Subsea dispersant application (includes subsea first response toolkit);
 - Source control (well capping); and
 - Well intervention (relief well drilling).
- 3. Surface Dispersant Application Dispersant application from vessels and aircraft is a principle mitigation control for potential Vincent oil releases. It may be applied to achieve significant reduction in surface oil and therefore prevent or reduce the scale of shoreline contact. Priority would be placed on treating surface oil within a pre-defined zone of application.
- 4. Containment and Recovery Involves the physical containment and mechanical removal of hydrocarbons from the marine environment. Suitable vessels would be drawn from Woodside's integrated fleet, other operators in the region and from the charter market. Open water containment and recovery equipment (e.g. booms and skimmers) would be sourced from Woodside's own equipment, AMSA, AMOSC and OSRL stockpiles.
- 5. Shoreline Protection Shoreline protection equipment would be deployed either from a vessel or from the shore, depending on the prevailing conditions, shoreline type and access. Additional resources would be mobilised depending on the scale of the event to increase the number of shorelines being protected.
- 6. Shoreline Cleanup Woodside has access to equipment stockpiles to support initial response requirements at priority receptors and would supplement resources, depending on the type of cleanup required, through contractors. Some equipment maybe procured locally on the day with additional equipment being sourced within Western Australia, interstate and internationally, commensurate with the scale and progressive nature of shoreline impact.
- Oiled Wildlife Response Staging sites will be established for shoreline or vessel based oiled wildlife response teams. Once recovered to a staging site, wildlife will be transported to the designated oiled wildlife facility for stabilisation and treatment.

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- 8. Waste Management The objectives of Woodside's waste management response are:
 - To mobilise waste storage and transport resources on day one of a potential oil spill event to support containment and recovery and shoreline protection responses; and
 - Arrange for sufficient waste storage, handling, transport and disposal capability to support continuous response operations.

To achieve these objectives, Woodside has access to waste storage in Exmouth and Karratha as well as waste storage equipment from AMOSC, AMSA and OSRL.

Scientific Monitoring

In addition to the above response strategies, a scientific monitoring program (SMP) will be activated following a significant oil spill (defined as a level 2 or 3 spill). The nature and scale of the spill event would dictate the implementation and operational timing of the SMP. Ten targeted scientific monitoring programs may be implemented to address a range of physical-chemical (water and sediment) and biological receptors (species and habitats) including EPBC Act listed species, environmental values associated with Protected Areas and socio-economic values such as fisheries. The SMPs to be activated are as follows:

- Desk-based review and assessment of hydrocarbons in marine waters;
- Assessment of the presence, quantity and character of hydrocarbons in marine sediments;
- · Assessment of impacts and recovery of subtidal and intertidal benthos;
- Assessment of impacts and recovery of mangroves / saltmarsh;
- Assessment of impacts and recovery of seabird and shorebird populations;
- Assessment of impacts and recovery of nesting marine turtle populations;
- Assessment of impacts to pinniped (seal and sea lion) colonies including haul-out site populations;
- Desk-based assessment of impacts to other non-avian marine megafauna;
- Assessment of impacts and recovery of marine fish associated with various habitats; and
- Assessment of physiological impacts to commercially important fish and shellfish species (fish health and seafood quality/safety) and recovery.

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APPENDIX C: SUMMARY OF STAKEHOLDER FEEDBACK AND WOODSIDE'S RESPONSE

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Summary of stakeholder feedback	Woodside assessment of feedback	Woodside response
Requests that movements of the MODU and other support craft are reported to AMSA's RCC for promulgation of Auscoast warmings.	Woodside notes the previous requests for vessel movements to be reported to the Rescue Coordination Centre – Australia (RCC) and AHS.	Woodside to report vessel movements to the RCC and AHS.
Request for activity coordinates to verify whether any of the stakeholders' activities overlap the area.	WEL notes that the MODU location was included on the factsheet. WEL advised that overlapping activities had already been identified and the consultation guidance provided had already been followed.	No further action required
	WEL also noted that the Vincent FPSO had been operating at that location since 2008 and that the Nganhurra had been operating in the same permit since 2006.	
	WEL also provided WA-28-L permit coordinates on 17 April 2014. Stakeholder advised on 1 May 2014 that their search found that there had been no commercial activity in the area over the past few years.	
	Woodside notes AFMA's guidance for the petroleum industry on consultation with fishing operators. <u>http://www.afma.gov.au/managing-our-fisheries/environment-and-sustainability/petroleum-industry-consultation/petroleum-industry-information-for-fishing-operators/</u>	
	consistent with AFMA guidance.	
Stakeholder recommended that Woodside maintain contact with WAFIC, Recfishwest and directly with fishers about proposed activities. Stakeholder provided contacts for notification in the event of an oil spill or pollutant discharge and requested the	Woodside provided advice of the proposed activities to WAFIC, Recfishwest, local Charter boat operators and relevant fishery licence holders.	Compliance with the Woodside Invasive Marine Species Management Plan (IMSMP) (Doc No. A3000AH4345570) during the activity. WEL to provide 6 monthly updates to stakeholder.
collection of baseline data to determine the extent of impact in the event of an oil spill. Stakeholder requested that strategies be included in the EP to mitigate the impact of oil spill on fish spawning grounds and nursery areas. Stakeholder noted that the proposed activity to remove and reinstall a subsea tree on the seabed will	woodside believes that matters raised by stakeholder regarding potential impacts to fisheries, benthic communities, fish and fish habitat are satisfactorily addressed in the EP. Woodside acknowledges stakeholder's advice on invasive marine species.	

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permanently alter the benthic habitat, temporarily increase turbidity and mobilise sediments. Stakeholder requested that strategies to mitigate impacts to benthic habitat and organisms and requested that all oils, hazardous fluids and gases are safely removed prior to accessing wells and flowlines.		
Stakeholder also noted that all vessels undertaking activities in Western Australian waters to undertake measures to minimise the risk of translocating aquatic pests and diseases. Stakeholder also requests vessel owners and operators to immediately report known or suspected introduced aquatic pests or diseases detected in Western Australian waters. Stakeholder requested that all potential impacts to		
fisheries, fish and fish habitat are acknowledged in the EP and strategies for minimisation and mitigation defined.		
this EP every 6 months.		
Stakeholder advised that a minimum of 14 days notification is required should aviation activities be contemplated.	Woodside notes advice from stakeholder.	Woodside to ensure stakeholder is advised two/three weeks prior to activity commencement.

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