Montara Operations Oil Pollution Emergency Plan

MV-70-PLN-G-00001

Rev 5

Facility:	**MV - Montara Venture**
Review Interval:	**60 Months**
Safety Critical:	**Yes**

Approval:				
Rev:	**Date:**	**Owner:**	**Reviewer:**	**Approver:**
		Emergency Response Lead	**OIM - Montara**	**Operations Manager**
0	16-Nov-18	Mark Craig	Helen Astill	Rob Mills
1	28-Feb-19	Wiremu Leef	Helen Astill	David Lamb
2	11-Sep-20	M. Patt	J. Parry	T. Coolican
3	24-Nov-21	H. Astill	J. Parry	N. Colyer
4	30-Jun-22	H. Astill	S. Brown	N. Colyer
5	28-Frb-23	M. Wyatt	J. Parry	N. Colyer

UNCONTROLLED WHEN PRINTED

Please refer to the Jadestone Energy MIS for the latest revision.

Jadestone Energy (Australia) Pty Ltd
The Atrium Building, Level 2, 168 St Georges Terrace
Perth, Western Australia, 6000 I PO Box 7060 Perth WA 6850
PH: +61 8 9486 6600 | www.jadestone-energy.com | ACN: 613 671 819

REVISION HISTORY

Revision	Date	Author / Editor	Amendment
0		Melissa Patt / Wiremu Leef	Document creation.
1		Melissa Patt / Wiremu Leef	Revised in accordance with NOPSEMA comments and resubmitted.
2		Melissa Patt	Revised in accordance with the Montara Annual EP Review - minor editorial edits
3		A. McVicar/L. Muir	Skua-11 Well Kill from the MWHP Appendix A4 added, due to NOPSEMA request
4		A. Gillion / J van Rensburg	Revised in accordance with NOPSEMA Inspection Recommendation 2405-C1-R1. Refer MOC-1020 & update to notifications & password for Tracking Buoy
5		Consultant / J van Rensberg	Submitted along with the current EP

DISTRIBUTION LIST

Controlled Copies: Any hard copy of this document, other than those identified below, are uncontrolled. Please refer to the Jadestone Energy MIS for the latest revision.

		Electronic	Hardcopy
Jadestone			
	Perth Office – General Manager	Y	Y
	Montara Venture	Y	Y
Other			
	Australian Maritime Safety Authority	Y	
	WA Department of Transport	Y	
	NT Environment Protection Agency	Y	
	AMOSC	Y	
	OSRL	Y	

CONTENTS

TABLE OF FIGURES

TABLE OF TABLES

KEY DOCUMENTS

Company-wide:

JADESTONE ENERGY **INCIDENT MANAGEMENT TEAM RESPONSE PLAN (IMTRP)** JS-70-PLN-F-00008	• Risks and Hazards • Incident Management Structure • Incident Management Process • Incident Management Team • Incident initial assessment and orientation • Information management • Stand down and debrief • Administration • Statutory requirements • Defining the spill level • Oil spill response cycle • Termination and recovery • Oiled Wildlife Response • Scientific Monitoring • Waste Management

This document:

MONTARA FIELD OPERATIONS
OIL POLLUTION EMERGENCY PLAN
(OPEP)
MV-70-PLN-G-00001
	• Montara Operations and oil spill risks
	• Resource Requirements
	• Response Strategies:
	  ○ Source Control
	  ○ Operational Monitoring
	  ○ Chemical Dispersant
	  ○ Containment and Recovery
	  ○ Protection and Deflection
	  ○ Shoreline Clean-up
	  ○ Oiled Wildlife Response
	• Operational Performance Standards and Measurement Controls
	• Appendices:
	  - Observation logs
	  - Shoreline Assessment Form
	  - Regulatory Notifications
	  - Incident Management Guidance

QUICK REFERENCE INFORMATION

In the event of an incident where human safety is at significant risk, tasks included in this OPEP may not be implemented, and the International Convention for the Safety of Life at Sea (SOLAS) 1974 may take precedence.

Parameter	Information		Further Information
Facility Name	Montara Operations Facility		Section **Error! Reference source not found.** and Section 1.2 and 3 of EP
Location (Lat/Long and Easting Northing)	Latitude 12°41' S; Longitude 124°32' E		
Title/s (Block/s)	Production Licence areas AC/L7 and AC/L8		N/A
Water Depth	76 to 90 m		Section 1.4 of EP
Worst-case Credible Spill Scenario	**Hydrocarbon Type**	**Worst-case Credible Spill Volume (m^3)**	Section 4
Release of Marine Diesel Oil (MDO) from FPSO or vessel due to vessel collision or dropped object	MDO	906	
Ruptured FPSO cargo tank due to vessel collision	Montara or Skua Crude Oil	11,570	
Loss of Well Control (LOWC) at H6 topside – Surface	Montara or Skua Crude Oil	164,096	
LOWC H6 – Subsea	Montara or Skua Crude Oil	161,761	
Weathering Potential	**Montara Crude** contains a relatively high proportion (~28% by mass) of hydrocarbon compounds that will not evaporate at atmospheric temperatures, persisting in the marine environment. The unweathered mixture has a dynamic viscosity of 3.22 cP (at 40 °C). The pour point of the whole oil (9 °C) ensures that it will remain in a liquid state over the annual temperature range observed in the Timor Sea. The whole oil has low asphaltene content (<0.5%), indicating a low propensity for the mixture to take up water to form water-in-oil emulsion over the weathering cycle. **Skua Oil** contains a relatively high proportion (~24% by mass) of hydrocarbon compounds that will not evaporate at atmospheric		Section 4

Parameter	Information	Further Information
	temperatures. These compounds will persist in the marine environment. The unweathered mixture has a dynamic viscosity of 2.54 cP (at 20 °C). The pour point of the whole oil (12 °C) ensures that it will remain in a liquid state over the annual temperature range observed in the Timor Sea. **MDO** is a mixture of volatile and persistent hydrocarbons with low viscosity. It will spread quickly and thin out to low thickness levels, thereby increasing the rate of evaporation. Up to 60% will generally evaporate over the first two days. Approximately 5% is considered "persistent hydrocarbons", which are unlikely to evaporate and will decay over time. MDO has a strong tendency to entrain into the upper water column (0–10 m) (and consequently reduce evaporative loss) in the presence of moderate winds (> 10 knots) and breaking waves. MDO re-surfaces when the conditions calm. It does not form mousse	
Protection priorities	• Ashmore / Cartier Islands; • Tiwi Islands (Melville and Bathurst); • Joseph Bonaparte Gulf (NT); • Darwin Coast; • Western NT (Kakadu, Coburgh, East Arnhem Island, West Arnhem Island); • Kimberley Coast (North Kimberley Marine Park); and • International waters (Indonesia and Timor-Leste).	Section 5

PART A – REGULATORY

1. PURPOSE

The purpose of this Oil Pollution Emergency Plan (OPEP) is to detail Jadestone Energy's oil pollution preparedness and response arrangements for the Montara Operations Environment Plan GF-70-PR-H-00002 (the EP).

2. OBJECTIVES

The objectives of this OPEP in relation to the unplanned release of hydrocarbons arising from activities within the Montara Facility (Montara) are:

- to safely limit the adverse environmental effects to the marine environment;
- to define the capability requirements for response activities;
- to demonstrate arrangements for sufficient capability to respond in a timely manner and for the duration of the oil pollution incident; and
- to provide guidance to the IMT in relation to spill response implementation.

3. SCOPE

This OPEP applies to oil spill risks associated with operational activities at Montara described in Section 3 of the EP. Oil spill risks associated with drilling activities or the Offtake Tanker are not within the scope of this plan.

Montara is in the East Timor Sea, Australia, approximately 690 km west of Darwin, latitude 12°41' S and longitude 124°32' E, in water depths ranging between approximately 76 m and 90 m (Figure 3-1). The Production Licence areas are AC/L7 and AC/L8.

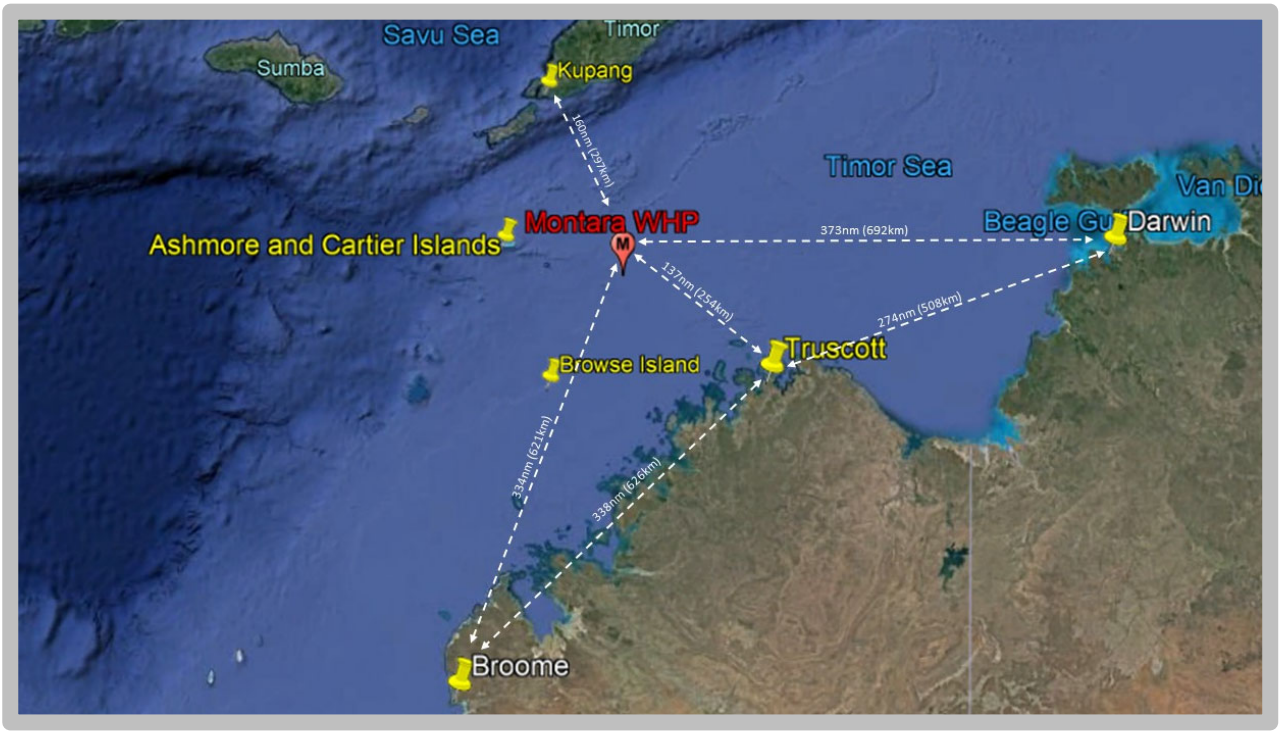


Figure 3-1: Montara Geography

Section 5 of the EP includes a comprehensive description of the existing environment in the operational area and the potential spill trajectory area (as predicted by spill fate modelling). The locations of key environmental sensitive receptors in relation to the Montara Venture Floating production storage and offtake (FPSO) facility are provided in the EP Section 5.

4. SPILL SCENARIOS AND CONTEXT

An environment risk assessment (ERA) was undertaken as part of the EP. Workshops were conducted that identified possible hazards with the potential for routine or non-routine (unplanned) loss of hydrocarbons to the marine environment. Each of these hazards has been assessed with selected control measures to reduce the likelihood of hydrocarbon losses to the marine environment to ALARP.

This OPEP has been prepared for the spill scenarios as summarised in Table 4-1 with a focus on the Level 3 LOWC scenarios. The scenarios modelled represent the worst-case scenarios as defined by the AMSA Guideline*: Technical guideline for preparing contingency plans for marine and coastal facilities* (AMSA, 2015), however Jadestone understands that other scenarios are possible, such as a Level 2 MDO spill, and as such Jadestone has made provisions in spill response to guide decision makers for all types of hydrocarbon spillages at any Level.

4.1 Hydrocarbon Characteristics and Behaviour

During Montara operations, the following hydrocarbons may be unintentionally released to the marine environment: oily water, MDO, hydraulic oils and lubricating fluids, or oil. The following three hydrocarbons are the primary types spilled and therefore associated with this OPEP

- MDO;
- Montara oil; and
- SKUA oil.

4.1.1 MDO

In the marine environment, MDO will behave as follows:

- Spread rapidly to low thickness levels in the direction of the prevailing wind and waves;
- Evaporation is the dominant process contributing to the fate of spilled MDO from the sea surface and will account for 60 to 80% reduction of the net hydrocarbon balance within 48 to 72 hours;
- The evaporation rate of MDO will increase in warmer air and sea temperatures such as those present around the Floating Production and Storage Offloading (FPSO) Vessel; and
- Due to the low specific gravity of MDO, it does not sink and accumulate on the seafloor as pooled or free oil unless adsorption occurs with sediment. However, it is possible for MDO that is dispersed by wave action to form droplets that are small enough be kept in suspension and moved by the currents

ITOPF (2022) categorises MDO as a light Group II hydrocarbon. In the marine environment, a 5% residual of the total quantity of MDO spilt will remain after the volatilisation and solubilisation processes associated with weathering.

4.1.2 Montara Oil

Montara Crude is a medium oil with an API of 35.8, which is categorised as a Group III oil (ITOPF). The Montara Crude has residual components of approximately 27%, which means under certain conditions (i.e. exposure to weathering) it can solidify into small waxy flakes. The mixture is composed of hydrocarbons that have a

wide range of boiling points and volatilities at atmospheric temperatures, and which will begin to evaporate at different rates on exposure to the atmosphere. Evaporation rates will increase with temperature, but in general about 12.9% of the oil mass should evaporate within the first 12 hours (Boiling Point (BP) < 180 °C); a further 15.4% should evaporate within the first 24 hours (180 °C < BP < 265 °C); and a further 43.6% should evaporate over several days (265 °C < BP < 380 °C).

4.1.3 SKUA Crude Oil

SKUA Crude oil is a medium oil with an API of 41.9°, which is categorised as a Group II oil (ITOPF). The SKUA Crude has residual components of approximately 24%, which means under certain conditions (i.e. exposure to weathering) it can solidify into small waxy flakes. The mixture is composed of hydrocarbons that have a wide range of boiling points and volatilities at atmospheric temperatures, and which will begin to evaporate at different rates on exposure to the atmosphere. Evaporation rates will increase with temperature, but in general about 26.1% of the oil mass should evaporate within the first 12 hours (BP < 180 °C); a further 20.8% should evaporate within the first 24 hours (180 °C < BP < 265 °C); and a further 29.4% should evaporate over several days (265 °C < BP < 380 °C).

Table 4-1: Identified Scenarios for Hydrocarbon Releases to the Marine Environment

Hydrocarbon Type	Source / Cause	Maximum Potential Volume (m^3)	Release Duration
MDO	Release of MDO from FPSO or vessel due to vessel collision or dropped object	906	Instantaneous
Montara Crude Oil	Ruptured FPSO cargo tank due to vessel collision	11,570	5 hours
Montara Crude Oil	LOWC – Surface	164,096	77 days
Montara Crude Oil	LOWC – Subsea	161,761	77 days

5. PREDICTED SPILL TRAJECTORY AREA, SENSITIVITIES AND PROTECTION PRIORITIES

Results from hydrocarbon spill modelling were compared against the location of key sensitive receptors with high conservation valued habitat or species or important socio-economic / heritage value within the Environment that May be Affected (EMBA). Section 4.7.4 of the Montara Operations EP outlines the criteria for selecting protection priorities.

Shoreline locations that were identified as priority protection areas based on modelling thresholds described in the Montara Operations EP are shown in Figure 5-.1:

- Ashmore / Cartier Islands;
- Tiwi Islands (Melville and Bathurst);
- Joseph Bonaparte Gulf (NT);
- Darwin Coast;
- Western NT (Kakadu, Coburgh, East Arnhem Island, West Arnhem Island);
- Kimberley Coast (North Kimberley Marine Park); and
- International waters (Indonesia and Timor-Leste).

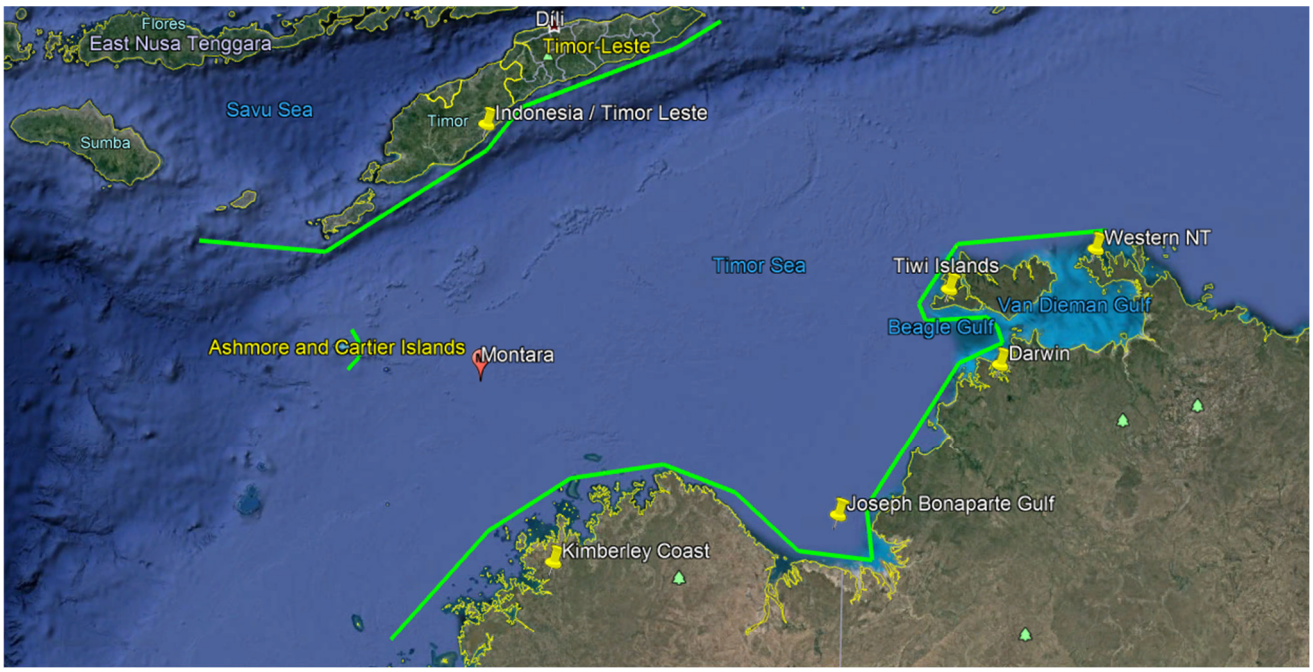


Figure 5-.1: General Location of Protection Priorities Used in Spill Modelling

The response strategies identified in this OPEP will be adopted in the IAP process as required to protect the environmental values of these areas.

Refer Section 8.7 of the Montara Operations EP for spill modelling summary including impact descriptions of sensitive locations from surface oil, entrained and dissolved aromatic threshold concentrations. Section 5 of the Montara EP describes the existing environment at the operational area and within the potential spill trajectory area and identifies the protected areas and fauna that may be impacted by a spill.

6. APPLICABILITY OF RESPONSE STRATEGIES

The response strategies outlined in this OPEP have been developed by Jadestone utilising risk assessments to identify credible worst-case spill scenarios, expected/calculated release rates, known information of hydrocarbon types and behaviour, and expected partitioning of the hydrocarbon within the marine environment with an estimate of the volume of persistent oil.

This information has been modelled to give a theoretical zone of spread that is used to identify potential sensitive receptors and response strategies required to reduce the consequences of a spill to ALARP. The response strategies are assessed using a NEBA process so the most effective response strategies with the lowest environmental consequences can be identified, documented and prepared for.

Section 7.9.1 in the Montara Operations EP describes the decision to adopt or omit a spill response strategy, and the potential environmental benefit of each strategy. An ALARP discussion regarding each oil spill response strategy is provided in the Montara Operations EP (Section 8.7).

Table 6-1 shows the operational considerations for adopted strategies and applicability to the three potential oil types that could be spilled, and operational considerations for Incident Action Plans (IAPs).

The response strategies described in Sections 8 to 14 contain both a description of the response strategy and decision-making criteria and guidance for implementation of the response strategy. Action Plans and mobilisation of resources to respond to the spill is presented in Part B of this OPEP.

Appendix A6 (Incident Management Guidance) of this document provides a summary of Jadestone Energy's Incident Management Team and guidance on the incident response and management. The response and management is fully detailed in Jadestone's Incident Management Team Response Plan (JS-70-PLN-F-00008).

Table 6-1: Applicability of Oil Spill Response Strategies

Strategy	Tactic	Acceptability / Applicability			Operational Considerations
		SKUA Crude	Montara Crude	MDO	
Source Control	Refuelling: watch alert	?	?	ü	Suitable for spillage during refuelling activities
	Bunded areas around machinery and engines	ü	ü	ü	Suitable for spills that may arise due to stored hydrocarbons, and from spills arising from machinery and equipment onboard the vessels or platform. Bunded areas will minimise the volume of hydrocarbons escaping to marine waters.
	Pipeline isolation and repair	ü	ü	?	Suitable for subsea infrastructure failure e.g. pipelines
	Securing cargo / trimming	ü	ü	ü	In the event the FPSO or a vessel tank is ruptured, cargo of the affected tank is to be secured via transfer to another storage area on-board the vessel, transfer to another vessel, or through pumping in water to affected tank to create a water cushion (tank water bottom). Trimming the vessel may also be used to avoid further damage to intact tanks. These actions will minimise the volume of fuel spilt.
	Relief Well	ü	ü	?	Suitable for a LOWC scenario
	Capping Stack	?	?	?	Not suitable due to the connection of the top of the Christmas Tree not being compatible with a capping stack or jack-up rigs.
Subsea Dispersant Application	Subsea First Response Toolkit (SFRT)	ü	ü	?	**Montara and Skua Crude**: Suitable for a LOWC scenario to clear debris and apply subsea dispersant. Subsea dispersant injection typically uses smaller volumes of dispersant to treat the oil than surface dispersants and is not constrained to daylight hours. Application is also less affected by adverse metocean conditions.

Strategy	Tactic	Acceptability / Applicability			Operational Considerations
		SKUA Crude	Montara Crude	MDO	
					Application must be accompanied with subsea dispersant effectiveness monitoring to determine efficacy and any modifications that may be required to application methods or Dispersant to Oil application rates. **MDO**: Not applicable
Operational Monitoring	Aerial, Vessel, Tracking Buoys, Trajectory Modelling, Fluorometry, SCAT	ü	ü	ü	**All hydrocarbons:** Surveillance actions are used to monitor and evaluate the dispersion of the released hydrocarbon, and to identify and report on any potential impacts to flora and fauna that may occur while the spill disperses. This strategy has several tactics (e.g. tracking buoys, aerial surveillance, shoreline assessment) and is scalable according to the nature and scale of a spill. There are clear benefits in maintaining situational awareness throughout the duration of a spill event and little or no environmental impact associated with its implementation. Operational monitoring results can also be used to assist in escalating or de-escalating response strategies as required.
Surface Chemical Dispersion	Aerial and vessel application and subsea	ü	ü	?	**Montara and Skua Crude**: PTTEP AA commissioned dispersant testing on Montara Crude to assess the efficacy of Dasic Slickgone NS (and Nalco Corexit 9500A) dispersant in laboratory conditions representative of winter and summer seasons. The results indicated that dispersant efficacy was a minimum of 73% at 12 hours and remained at a minimum of 68% for summer and winter within 24 hours. After 24 hours the efficacy decreased due to the weathering (increased pour point and viscosity) of the oil (Leeder, 2013). The summer and winter seasons were tested for efficacy as they were representative of the minimum and maximum conditions (water, air temperature and wind speed) in the Timor Sea. These results indicated that dispersants may be effective at reducing surface hydrocarbons, and therefore have the potential to reduce shoreline accumulation and impacts to shoreline receptors, including wildlife. Surface chemical dispersants are most effective on hydrocarbons that are at a thickness of 50-100 g/m^2 on the sea surface. Thin layers of spilled hydrocarbons should not be treated with dispersant (EMSA, 2010) as spraying thin sheens can result in an overdose of dispersant.

Strategy	Tactic	Acceptability / Applicability			Operational Considerations
		SKUA Crude	Montara Crude	MDO	
					MDO: Not suitable for MDO as it is not a persistent hydrocarbon and has high natural dispersion rates in the marine environment. Chemical dispersant application is not recommended as a beneficial option for MDO as it has a low probability of increasing the dispersal rate of the spill while introducing more chemicals to the marine environment.
Containment and Recovery	Booms and skimming	ü	ü	?	**Montara and Skua Crude:** Applicable for Montara and Skua Crude as they are more persistent hydrocarbons and have a relatively slow rate of weathering. The drawbacks of this strategy include production of significant volumes of waste due to the collection of water with floating oil, however this can be mitigated to some extent if decanting is permitted. If metocean conditions are favourable, this strategy would result in the removal of floating hydrocarbons from the environment. **MDO**: Given the fast-spreading nature of MDO, and the expected moderate to high sea states of the area causing the slick to break up and disperse, this response is not considered to be effective in reducing the net environmental impacts of an MDO spill. The ability to contain and recover spreading MDO on the ocean water surface is extremely limited due the very low viscosity of the fuel and the inability to corral the hydrocarbon to a sufficient thickness for skimmers to be effective at removal.
Nearshore and Shoreline Protection and Deflection	Deflection and protection booms	ü	ü	?	**Montara and Skua Crude**: Deployment will be considered under an Operational NEBA if post-spill operational monitoring data predicts contact with sensitive shorelines. Operational NEBA shall consider if resources can be deployed effectively, safely and will not result in more harm than if the product was left to degrade naturally. Given tidal influences, lack of access, lack of anchoring points and subsequent distance for effective placement, this strategy would be unsuitable in many remote locations. This is not considered to be a primary response strategy. If selected, preparations for this strategy should be made as soon as predictions indicate a possible shoreline impact. Department of Transport (DoT) Incident Controller (IC) (as Control Agency) approval is required before commencing protect and deflect activities in State waters.

Strategy	Tactic	Acceptability / Applicability			Operational Considerations
		SKUA Crude	Montara Crude	MDO	
					MDO: Modelling indicates no shoreline accumulation above moderate shoreline accumulation thresholds (>100 g/m^2).
Shoreline Clean-up	Physical removal, surf washing, rock flushing, low pressure flushing, bioremediation, natural dispersion and remediation	ü	ü	?	**Montara and Skua Crude**: Intrusive response that requires careful site-specific planning to reduce secondary impacts of physical disturbance and secondary contamination to intertidal and shoreline habitats. The majority of the affected coastline is tidal wetlands and flats, and offshore islands with limited access. Flushing may be considered if the oil enters high priority/slow recovery habitats such as mangroves and access is feasible without inflicting more damage onto the environment. Natural dispersion will occur as the hydrocarbon is remobilised from rock shelves and hard substrates, while residual oil will biodegrade. Due to these disturbances, this response has potential to cause more harm than light oiling, so must be carefully considered under a shoreline assessment and Operational NEBA. If selected, preparations for this strategy should be made as soon as predictions indicate a possible shoreline impact. DoT IC (as Control Agency) approval is required before commencing clean-up activities in State waters. **MDO**: Modelling indicates no shoreline accumulation above moderate shoreline accumulation thresholds (>100 g/m^2).
Oiled Wildlife Response	Reconnaissance, IAP OWR subplan development, hazing, rescue, rehabilitation, release, monitoring.	ü	ü	ü	**All hydrocarbons**: Applicable for marine animals that come close to the spill when on the water and shorelines. Targeted wildlife surveillance/reconnaissance with planning taking into consideration the time of year and key biological activities such as breeding, mating, nesting, hatching or migrating.
Scientific Monitoring (See Incident Management Team	Activation of SMP	ü	ü	ü	**All hydrocarbons**: Suitable for marine environment contacted by hydrocarbons either floating, dissolved or entrained.

Strategy	Tactic	Acceptability / Applicability			Operational Considerations
		SKUA Crude	Montara Crude	MDO	
Response Plan (JS-70-PLN-F-00008)					

6.1 Operational NEBA

Following implementation of the initial (first strike) response, the information in Table 6-1 will aid in the development of the initial Operational NEBA. The Action Plan tables in Section 16 include considerations to help complete the Operational NEBA.

It should be noted that the initial Operational NEBA may be based on limited information; however, the overall response effort should not be delayed due to a lack of some information. The Operational NEBA can always be revised when more information is provided to the Planning Lead.

The Planning Lead is responsible for completing the Operational NEBA and to determine if outputs from the Strategic NEBA are still appropriate. The Operational NEBA should incorporate post-spill trajectory modelling data, surveillance data, operational monitoring data and should be incorporated into the IAP.

6.2 Response Resource Planning

Spill response planning to identify a suitable combination of response strategies involves estimating required resources and an assessment of the capability required to support the response. Capability to support the minimum resources required has been planned for and is presented in Table 7-1.

Spill modelling predicts contact with international shorelines. In addition, the remoteness and nature of the shorelines contacted in Australia places a priority on offshore response strategies that reduce the volume of oil to shore. The primary response strategies will be:

- Source Control (relief well) will reduce the length of time the oil is released into the marine environment. Subsea dispersant application will reduce the amount of hydrocarbons reaching the surface and reaching priority receptors;
- Operational monitoring is the first response strategy implemented to enable Jadestone to gain and maintain situational awareness;
- Surface chemical dispersant application implemented because of the predicted benefit demonstrated through spill fate modelling; and
- Containment and recovery operations complement the dispersant strategy by being able to target areas of floating oil that have not dispersed.
- Oiled Wildlife Response including rapidly initiating wildlife surveillance/ reconnaissance to ascertain the type of wildlife impacted and the magnitude of impact in order to assist with the development of appropriate response strategies.
- Scientific Monitoring enables the detection and quantification of environmental impact and recovery to sensitive receptors from an oil spill.

Spill response planning assumptions take into consideration:

- The weathering properties of Montara and SKUA oil are well understood, however this does not negate the influence of real time variables on the rate of evaporation and dispersion;
- Review of the response operations for the Montara 2009 spill event; and
- Oil properties as described in Section 4.1 and Appendix C of the IMT Response Plan.

An overview of the equipment and dispersant available to Jadestone from national and international stocks is provided in Table 6-2.

Table 6-2: Oil Spill Response Equipment

Agency	Stockpile Locations	Equipment
Jadestone	• Montara FPSO • Darwin Supply Base • Supply vessel	Computerised Management Maintenance System (CMMS) provides up-to-date equipment lists for the various stockpile locations
AMOSC	• Broome • Exmouth • Fremantle • Geelong • Industry Mutual Aid register	AMOSC equipment and dispersant lists are available via the Member Login webpage: • AMOSC website: https://amosc.com.au/member-login/ AMOSC can arrange for transport of their equipment and dispersant to Darwin Forward Operating Base (FOB).
AMSA	• ACT • Adelaide • Brisbane • Dampier • Darwin • Devonport • Fremantle • Gladstone • Horn Island • Karratha • Melbourne • Sydney • Townsville	AMSA equipment and dispersant lists are available on the AMSA website via the following links: • Equipment: https://amsa-forms.nogginoca.com/public/equipment.html?loc=%2Fapi%2Fv1%2Fasset%2F2616201 • Dispersant: https://amsa-forms.nogginoca.com/public/dispersant.html?loc=%2Fapi%2Fv1%2Fasset%2F2544502 • Fixed Wing Aircraft: https://amsa-forms.nogginoca.com/public/aircraft-avilability.html
OSRL	• Global	OSRL equipment and dispersant lists are available on the OSRL website via the following link: • OSRL website: https://www.oilspillresponse.com/activate-us/equipment-stockpile-status-report/
Waste Management Contractor	• Darwin • Broome • Port Hedland • Karratha • Perth	Waste management contractor's waste management equipment are summarised in its Waste Management Plan.

7. MONTARA WORST-CASE OIL SPILL SCENARIO RESPONSE NEEDS ASSESSMENT

The worst-case spill scenario for Montara Operations is estimated as a surface Loss of Well Control with a discharge volume of 164,096 m^3 of Montara Crude over 77 days (Refer to Section 4). Table 7-1 assumes all response strategies may be deployed simultaneously. However, in a real spill event, deployment of response strategies will be based on an operational NEBA, and consequently it is unlikely that all response strategies would be deployed at the same time. This needs assessment is provided for capability assessment purposes only, to ensure adequate resources are available for response strategy implementation.

The personnel numbers in Table 7-1 represent the operational requirements and include allowance for an additional 50% of personnel to cover shift changes and manage responder fatigue. Trained response personnel would be delegated to field team leader or supervisor tasks, whereas team members and crews would be sourced from a combination of the following:

- Ad-hoc training for labour-hire personnel for specific response strategy needs on a just-in-time basis; and
- Where skilled personnel are required (e.g. for vessel crews to support containment and recovery), team members would be sourced from marine service provider contracts but work under the guidance of trained team leaders/supervisors.

Table 7-1: Worst-case Oil Spill Scenario Response Needs Assessment

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
Incident Management Team (IMT)									
IMT personnel	Trained personnel	38	38	38	21	8	-	9	9
IMT personnel for WA DoT (as per IGN)	Trained personnel	11	11	11	3	-	-	-	8
Source Control									

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
Personnel – engineers, source control specialists	-	-	-	-	2	-	-	-	38 - Wild Well Control and Oceaneering contracts
Subsea Dispersant Injection (SSDI)	Subsea First Response Toolkit (SFRT)	1 toolkit	1 toolkit	1 toolkit	-	AMOSC – via SFRT Agreement	-	-	-
	Dispersant	None	84 m^3	1,389 m^3	-	500 m^3 available	-	Up to 5,000 m^3 available	
	Deployment vessel	None	1 vessel	1 vessel	-	-	-	-	Vessel Broker- via Subscription
	ROV	None	2 ROVs	2 ROVs	-	-	-	-	ROV – Jadestone Contracted Providers
Operational Monitoring									
Satellite tracking buoys	Buoys	2 buoys	4 buoys	4 buoys	2 buoys Montara FPSO	2 buoys	-	-	-

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
					3 buoys Darwin				
Oil Spill Trajectory Modelling	Spill Model	7 trajectory and weathering models	7 trajectory and weathering models	7 trajectory and weathering models per week	-	RPS via AMOSC Master Services Agreement (MSA)	-	-	-
Aerial surveillance	Aircraft	1 aircraft	1 aircraft	1 aircraft	-	-	-	-	1 aircraft – Jadestone aviation contract
	Aerial observers	2 observers	2 observers	2 observers	-	1 observer	1 observer	-	-
	Flight crew	1 crew	1 crew	1 crew	-	-	-	-	1 flight crew - Jadestone aviation contract
Vessel surveillance	Vessels	1 vessel	1 vessel	1 vessel	-	-	-	-	1 vessel via Jadestone marine contracts
	Observer	1 observer	1 observer	1 observer	-	-	-	-	-

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
Fluorometers	Towable fluorometers	5 fluorometers	5 fluorometers	5 fluorometers	-	-	-	7 x C3 fluorometers	-
Unmanned Aerial Vehicles (UAVs)	Short range UAVs with cameras/video	2 UAVs	2 UAVs	2 UAVs	-	2 x pilots and UAVs	-	2 x pilots and UAVs (3rd party, best endeavours)	-
Shoreline and coastal habitat assessment	Trained team leaders and team members[1] (One team consists of 1 team lead and 2 team members)	No contact predicted	2 team leaders, 4 team members (total 6 people)	5 team leaders and 10 team members (total 15 people)	-	-	-	5 team leaders	10 people from Jadestone labour hire contracts
Surface Chemical Dispersant									
Vessel based surface application	Spray vessel	4 vessels	4 vessels	4 vessels	1 OSV	-	-	-	4 vessels via Jadestone marine contracts

[1] Team members may be sourced from contracted labour hire company and provided training prior to being deployed. Team members will work under the guidance of trained Team Leads.

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
	Spray systems	8 - 2 systems per vessel (4 vessels)	8 - 2 systems per vessel (4 vessels)	8 - 2 systems per vessel (4 vessels)	1 Afedo 2 roof mounted systems	8 spray systems	-	-	-
	Trained personnel - 1 per vessel	4 trained personnel	4 trained personnel	4 trained personnel	-	-	2 trained personnel	2 trained personnel	-
Aerial surface application	Fixed Wing Aerial Dispersant aircraft	5 spray aircraft	5 spray aircraft	5 spray aircraft	-	5 spray aircraft	-	-	-
	Hercules	1 x Hercules	1 x Hercules	1 x Hercules	-	-	-	1 x Hercules	-
	Dispersant (volume required = 4,482 m3)	361 m3	551 m3	3,570 m3	15 m3	511 m3	-	377 m3 5,000 m3 (Global Dispersant Stockpile (GDS)	AMSA 355 m3
	Air attack supervisor (AAS)	1 aircraft 1 AAS	1 aircraft 1 AAS	1 aircraft 1 AAS	-	1 AAS (via AMOSC/AMSA)	-	-	-
	Search and Rescue	1 aircraft and crew	1 aircraft and crew	1 aircraft and crew	-	-	-	-	Contract with aviation

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
									services provider
Containment and Recovery									
	Vessels	15 vessels	27 vessels	27 vessels	-	-	-	-	Jadestone marine contracts
	Containment and recovery system	15 systems	27 systems	27 systems	2 systems	20 systems	-	-	5 systems
	Trained spill responders (team leaders) – 1 vessel master, 1 supervisor	15 vessel masters 15 supervisors	27 vessel masters 27 supervisors	27 vessel masters 27 supervisors	-	-	27 supervisors	-	Vessel contracted: 27 vessel masters
	Containment and recovery deployment crew – 4 members per team	60 deployment crew	108 deployment crew	108 deployment crew	-	-	-	-	Vessel contracted: 108 deployment crew
	Waste storage	600 m^3/day	-	-	31,000 m^3 oily waste water into	IBCs, bladders, inflatable	-	IBCs, bladders, inflatable	Waste Service Provider –

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
					Montara FPSO cargo tanks, empty IBCs	storage bags of varying capacity		storage bags of varying capacity	300 m^3 within 48 hours, building over first week
Protection and Deflection									
	Shoreline protection package – Consists of nearshore booms and ancillary equipment	NC	10 packages	10 packages	-	8 packages via AMOSC MSA (including access to AMSA equipment)	-	-	2 packages via mutual aid
	Vessels, including shallow draft vessels and crew	NC	10 vessels	10 vessels	-	-	-	-	10 vessels via Jadestone marine contracts
	Trained spill responders (team leaders) – 2 leads per team	NC	20 trained team leads	20 trained team leads	-		5 trained team leads	15 trained team leads	-

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
	Protection and deflection team members – 5 members per team	NC	50 team members	50 team members	-	-	-	-	50 people from Jadestone labour hire contracts
Shoreline Clean-up									
	Trained spill responders (team leader) - 1 per team	NC	15 team leads	15 team leads	-		5 trained team leads	10 trained team leads	-
	Clean-up team members – 10 members per team	NC	150 team members	150 team members	-	-	-	-	150 people from Jadestone labour hire contracts
	Clean-up equipment (hand tools, shoreline flushing equipment, decontamination equipment)	NC	15 packages (make-up will be dependent upon location contacted)	15 packages (make-up will be dependent upon location contacted)	-	15 packages	-	-	-

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
	Waste storage	NC	Waste storage bins, skips, containers, bags	Waste storage bins, skips, containers, bags	-	-	-	-	Waste Management Contractor
Oiled Wildlife Response									
	Trained OWR responders	Sourced as per WA Oiled Wildlife Plan arrangements (Refer to Montara Operations OPEP [MV-70-PLN-G-00001])							
	OWR equipment	-	-	-	-	AMOSC – Refer to Montara Operations OPEP AMSA – 4 OWR containers / washing facilities	-	Refer to Montara Operations OPEP	DoT – 1 OWR container/ washing facility
Scientific Monitoring									
	Vessels – monitoring platform (Suitable vessels for on-water	4 vessels	4 vessels	Dependent on the extent of the area	-	-	-	-	4 vessels via Jadestone

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
	monitoring & transfer of personnel to islands/ remote areas)			impacted, the number of SMPs activated, and the monitoring sites determined					marine contracts
	Aircraft – monitoring platforms (Suitable air platforms for reconnaissance)	1 aircraft and crew	1 aircraft and crew		-	-	-	-	1 aircraft – Jadestone aviation contract
	Monitoring personnel	-	-	-	-	-	-	-	-
	Monitoring equipment	Scientific monitoring equipment as detailed in the relevant SMPs					-	-	-
Response need (personnel)					26	9	40	41	373
Response need (personnel) including + 50% for shift changes and fatigue management					39	14	60	62	560

Response Strategy and Tactic	Capability	Response Need Requirement			Capability Providers and Sources				
		Week 1	Week 2	Week 3 onwards	Jadestone	AMOSC MSA (equipment) + AMOSC Personnel	AMOSC Industry Core Group	OSRL	Mutual aid, National Response Team (NRT), Contractors and Service Providers
Total personnel available					40	16[2]	84[3]	18 + 80[4]	As per contracts

[2] As per AMOSC training and competency matrix. Includes technical, incident management and operational advice and assistance available under AMOSPlan. February 2023 AMOSC report indicated 15 AMOSC Staff were available (AMOSC members website).

[3] Target to maintain at least 84 members (Ref.: AMOSC Core Group Program and Policies). February 2023 Core Group report indicated an average of 33 personnel were available (AMOSC members website).

[4] As per OSRL training and competency matrix. 18 responders guaranteed; 80 responders may be approved under best endeavours available under OSRL SLA. June 2022 OSRL audit confirmed exceedance of these numbers globally.

Personnel required to support the IMT functions and response strategies are grouped according to source and skill base.

- The Jadestone group are those who are sourced from Jadestone directly.
- AMOSC Staff and AMOSC Core Group members are specifically trained in oil spill response and are identified as those who fulfil team leader roles and who can train team members if required.
- National Response team (NRT) include trained personnel from AMSA and State/Territory response teams.
- OSRL trained oil spill responders.
- Mutual Aid, NRT, contractors, service providers group is made up of industry members, i.e. staff of other operators; NRT personnel (accessed via AMSA or State/Territory HMAs), contract personnel; or service providers who can fulfil team member roles and don't necessarily have oil spill response training, for example labour hire.

8. SOURCE CONTROL STRATEGY

The initial and highest priority response to an oil spill incident is to prevent or limit further oil loss into the marine environment, if safe to do so. In most circumstances, the net benefit of source control outweighs impacts of further oil being released into the marine environment. However, further risks may arise due to increased vessels and rigs and the associated increased health and safety risks for the team involved in the response.

8.1 Initiation and Termination Criteria

Source	Initiation criteria	Termination criteria
Vessel release	Spill observed.	Release of oil ceased, spilled oil that has been contained is cleaned up and disposed of.
Hydrocarbon storage, subsea flowline or fuel tank rupture		

8.2 Tactics

Source Control response plans, to cover the spill scenarios identified, are provided for:

- Vessel, FPSO and topside releases - minor spills with small volumes of hydrocarbons such as bilge/oily wastewater, hydraulic fluids, or MDO;
- Vessel release - Fuel tank release from vessel collision (MDO);
- FPSO release -oil release from storage tank resulting from vessel collision with FPSO or fuel tank release (MDO); and
- Subsea flowline rupture – release of oil.

The IMT Team will gather surveillance information from those involved in preventing further release of hydrocarbons to the marine environment and ensure that the appropriate source control actions are being undertaken.

8.3 Tasks for Vessel, FPSO and Topside Minor Releases

In the event of a refuelling incident such as pipe rupture, coupling failure or tank overfilling, the pump will be stopped upon detection of the leak. The hydrocarbon remaining in the transfer line may escape to the environment as well as any hydrocarbon released prior to the transfer operation being stopped. For MDO refuelling this has been estimated at a maximum volume of 5 m^3 (representing a 60 m^3/hr pump rate and a release duration of up to 5 mins) as bunkers are taken with a watchman on deck of the supply vessel and a pump stop at the bunker station. For a rupture to the import/export hose the worst-case release volume is estimated at 3,500 m^3 of oil. For a subsea pipeline release the worst-case release volume is estimated at 1,700 m^3.

If a rupture or leak occurs in the topside processing equipment or subsea flowlines, the wellhead and topside valves will automatically close and production will cease in accordance with the Montara Performance Standards Report (MV-70-REP-F-00002). Shut off valves are regularly serviced and tested to ensure they will work properly if required. Released oil will be captured in the FPSO's bunds, which have closed drainage systems that deliver drainage water (which may contain hydrocarbon contamination) to a designated storage tank. The support vessels also have closed drainage systems for capture of on- board leaks.

The spilt hydrocarbons contained on-board support vessels will be controlled and cleaned up in accordance with each vessels Shipboard Oil Pollution Emergency Plan (SOPEP), which is compliant with MARPOL 73/78 Annex 1- Prevention of Pollution by Oil under the Protection of the Sea (*Prevention of Pollution from Ships) Act 1983*. The mitigation measures within each SOPEP include:

- Pumping operations ceased immediately following the spill;
- Valve/s closed;
- System receiving product is immediately shut down following a spill;
- Drainage network is closed as soon as practicable following the spill to prevent discharge/spillage to the ocean;
- Make necessary repairs to pipe to prevent further leakage;
- Use spill kit to clean-up spills on platform and/or vessel; and
- Store any clean up waste in bunded area for onshore disposal.

Areas used for the permanent or temporary storage of bulk fuels and/or chemicals are either fully bunded by sealing deck drains or secondary containment is provided to prevent accidental discharges to the ocean. Bunding is also located beneath the refuelling hose connections, operational equipment, and fuel tanks on the supply vessel.

In the event hydrocarbon is spilt onto the decks of the vessel/ platform, the relevant SOPEP, or Jadestone's Montara Incident Response Plan (MV-70-PLN-F-00001) in the case of the FPSO, will be implemented. Sorbent materials are used from spill kits on-board the vessel/platform to mop up hydrocarbon on deck. Soiled sorbent materials are bagged and disposed to shore. Before washing down the deck after excess oil has been cleaned up, the OIM/ Vessel Master will confirm that the drainage network is closed and will not discharge to the ocean.

Section 8 of the EP describes the environmental risks and management for unplanned events associated with the operational activities.

8.4 Tasks for Hydrocarbon Storage or Fuel Tank Rupture

This source control plan covers vessel collision scenarios that may result in the release of all or part of a storage tank or fuel tank contents, releasing hydrocarbons to the marine environment. The hydrocarbon type could be:

- MDO from a support vessel or FPSO (903 m^3); and
- Montara Crude Oil from the FPSO (11,570 m^3).

In the event hydrocarbon is released from the FPSO or support vessel due to vessel collision, the following activities are to be immediately implemented (subject to safety considerations of all on-board at the time of incident response):

- Reduce the head of cargo by dropping or pumping the tank contents into an empty or slack tank;
- Consider pumping water into the leaking tank to create a water cushion to prevent further cargo loss;
- If the affected tank is not easily identified, reduce the level of the cargo in the tanks in the vicinity of the suspected area if stability of the vessel will not be compromised;
- Attempt repair and plugging of hole or rupture;
- Evaluate the transfer of cargo to other vessels; and/or
- Trimming or lightening the vessel to avoid further damage to intact tanks.

Unplanned release of hydrocarbons from the FPSO or support vessels to the marine environment is managed by the Vessel Master in accordance with MARPOL 73/78 Annex 1- Prevention of Pollution by Oil under the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*.

8.5 Subsea Dispersant Application Strategy

Subsea dispersant application aims to disperse hydrocarbons close to the release point and minimise the amount of hydrocarbons reaching the sea surface. This technique helps to break up the oil droplets so that they are dispersed, diluted and biodegraded more rapidly in the water column, reducing the amount of surface hydrocarbons drifting towards sensitive receptors. An additional benefit of this technique is that it can successfully reduce volatile organic compounds from reaching the surface close to the release site, which is beneficial to the health and safety of personnel involved in any source control operations.

Chemical dispersants listed as approved in the National Plan for Maritime Environmental Emergencies Register of Oil Spill Control Agents (OSCA) are to be prioritised for use. Chemical dispersants not listed as approved on the OSCA register are to be assessed for acceptability using Jadestone's Chemical Selection Evaluation and Approval Procedure (JS-70-PR-I-00033) prior to application, and only used if evaluated to be an acceptable level of risk.

Through its membership with AMOSC, Jadestone has access to the Subsea First Response Toolkit (SFRT) which includes manifolds, jumpers, wands and a dedicated dispersant stockpile. Jadestone can access a suitable vessel for transportation of the subsea dispersant injection system and ancillary equipment including ROVs through the contracted vessel broker.

Coiled tubing is not required for subsea dispersant injection at depths <150 m.

It is assumed the dispersant to oil ratio (DOR) would commence at 1:100 and would be modified based on the results of the effectiveness monitoring. Research conducted by Brandvik et al., 2014 indicated that DORs of 1:50, 1:100 may be sufficient to cause substantial additional dispersion, particularly if the dispersant is injected close to the nozzle. To achieve a DOR of 1:100, IPIECA & IOGP 2015 recommend for a flow rate of 20,000 bbl./day, a dispersant pump rate of 22L/min is required.

Scaling this down, this equates to **~28m^3/day** of dispersant required to treat a release of 17,000 bbl/day, however, this volume will reduce over time as the reservoir depletes.

8.5.1 Initiation and Termination Criteria

Tactic	Initiation Criteria	Termination Criteria
Mobilise Subsea First Response Toolkit	Immediately when a subsea Level 3 spill incident is confirmed	When there is no net environmental benefit of continuing dispersant application
Mobilise vessel and ancillary equipment	Immediately when a subsea Level 3 spill incident is confirmed	When there is no net environmental benefit of continuing dispersant application

8.5.2 Tactics

The following tactics are included for subsea dispersant operations:

- Subsea First Response Toolkit; and
- Vessel and ancillary equipment

The Source Control Action Plan (Section 16.4) is activated at the initial stage of the incident so that resources can be mobilised and ready for use. As the incident progresses, chemical dispersant use is continually reassessed through the NEBA and IAP processes.

Subsea First Response Toolkit

The subsea first response toolkit (SFRT) was built by Oceaneering and resides in Jandakot, Western Australia. The SFRT comprises:

- Debris clearance equipment;
- BOP intervention equipment;
- Dispersant equipment (pumps, flying leads, coiled tubing head, dispersant wands); and
- Ancillary tools.

Supporting this there is 500 m^3 of Dasic Slickgone NS dispersant which is dedicated to SFRT and resides in Fremantle. This stockpile is managed by AMOSC.

If the SFRT is required, notification and activation is made through AMOSC. The SFRT and dispersant would be transported via road from Jandakot and Fremantle to Darwin (10 hours to arrange and 7 days to transport). A suitable vessel would be acquired by Jadestone during this timeframe and arrive in Darwin (within 9 days of the call out). Once the equipment is loaded, the vessel will mobilise to site and be ready to commence operations by day 11-12 from call out. Specialist personnel to deploy the SFRT will be provided via Jadestone's contract with Oceaneering and will be available in Darwin within 72 hours (3 days) (Refer to Section 16.4).

Vessels and Ancillaries

The SFRT does not include vessels or ROV equipment. The SFRT requires a suitable construction class vessel for deployment. It is expected that this class of vessel would be available from the Singapore region and could transit and be available for onloading of the SFRT in Darwin by day 7. Vessel availability shall be monitored monthly via Jadestone's contracted vessel broker.

ROVs would be supplied from Vertech under existing contractual arrangements.

Subsea Dispersant Effectiveness Monitoring

Subsea dispersant effectiveness monitoring is required as part of this response strategy. Prior to any application of subsea dispersants, initial monitoring should be conducted at the release point to determine the nature of the release, characterise the properties and behaviour of the oil and estimate the oil and gas flow rates. This information will inform the initial choice of dispersant injection methods (e.g. number of nozzles, nozzle sizes) and application rates.

Subsea dispersant monitoring will include monitoring 'phases', as per the Industry Recommended Subsea Dispersant Monitoring Plan (API 2013). Results from the monitoring will feed into the operational NEBA assessment used for decision-making regarding the continuation or termination of subsea dispersant use.

8.5.3 Chemical dispersant stocks

Refer to Section 10.4 for information relating to dispersant stockpiles.

8.5.4 Resource Rational for Chemical Dispersant Application

Calculations - Volume of oil to be treated

- Assume 100% available to be dispersed due to location of wands next to well head.

Calculations - Volume of dispersant required

- For planning purposes, a DOR of 1:100 is used because it is a broadly accepted ratio and can be adjusted depending on effectiveness

Assumptions – SFRT operations

Once operational, subsea dispersant operations can continue 24 hours per day / 7 days per week as it is not constrained by daylight hours, as with most other response operations. However, extreme weather events such as a cyclone would require the subsea dispersant vessel and supply shuttle vessels to cease operations and transit to a safe location.

8.5.5 Dispersant budget

The total amount of dispersant required for subsea application is 1,473 m^3 which can be achieved using the dispersant stock available in Australia and the OSRL GDS (Table 10-2). The assumptions above have been factored into these calculations. It is also assumed that once subsea dispersant application commences, surface dispersant application would be scaled down, or ceased, depending upon the results of subsea dispersant effectiveness monitoring.

A dispersant budget has been prepared taking into account the daily / weekly application requirements, daily volume of dispersant arriving in Darwin and balance on hand after each day. It also accounts for the depletion of the reservoir over the duration of the release. See Table 8-1 for these details.

Jadestone will review the dispersant application plan daily and modify according to the NEBA and operational feedback.

National logistics arrangements for mobilisation of dispersants to deployment locations within the required timeframes have been confirmed.

Table 8-1: Subsea dispersant delivery budget

Week	Day	Max. volume of dispersant applied subsea (m^3)	Arrival of dispersant in Darwin (m^3)	Balance on hand (m^3)
1	1	0	0	0
	2	0	0	0
	3	0	0	0
	4	0	0	0
	5	0	500	500
	6	0	90	590
	7	0	90	680
2	8	0	80	760
	9	0	80	840
	10	0	80	920
	11	0	80	1,000
	12*	28	80	1,052
	13	28	80	1,104
	14	28	80	1,156

Week	Day	Max. volume of dispersant applied subsea (m^3)	Arrival of dispersant in Darwin (m^3)	Balance on hand (m^3)
3		175	Access to 5,000 m^3 of Global Dispersant stockpile to meet remaining need of 1,389 m^3 Dispersant delivery and supply will be continually assessed and administered as required.	
4		175		
5		167		
6		167		
7		141		
8		141		
9		141		
10		141		
11		141		

* subsea dispersant injection commences

8.6 Relief Well

Relief wells are a proven strategy to successfully intercept and kill a well blow out, so that plug and abandonment activities can be safely performed. This technique requires personnel with demonstrated experience in relief well planning and drilling.

8.6.1 Initiation and Termination Criteria

Tactic	Initiation Criteria	Termination Criteria
Mobilise relief well	Immediately when a subsea Level 2/3 spill incident is confirmed	When relief well drilling is complete and well is successfully killed

8.6.2 Tactics

The following tactics are included for relief well operations:

- Mobilise relief well

The Source Control Action Plan (Section 16.4) is activated at the initial stage of the incident so that resources can be mobilised and ready for use.

8.6.3 Relief well

In order to kill a failed well and make it safe, a suitable Mobile Offshore Drilling Unit (MODU) is required to transit to the well location and intercept the well. It is estimated that a relief well could reach the well location within 23 days and complete the relief well installation and well kill operations within 77 days.

Jadestone will prepare a Source Control Plan within one month prior to the commencement of drilling operations which provides details of reservoir and wellbore data, reservoir and wellbore geometry, kills weights and pumping rates and equipment requirements. This information will be used to finalise a detailed relief well plan should an incident occur.

To help facilitate securing a suitable rig in the shortest timeframe possible, Jadestone is a signatory to the APPEA MOU for mutual assistance to facilitate and expedite the mobilisation of a relief well and monitor

external drilling programs to gauge MODU availability throughout the life of the EP. The MoU commits the signatories to share rigs, equipment, personnel and services to assist another operator in need. When selecting a suitable rig, the MODU's Safety Case should be considered, therefore Jadestone will continue to monitor the status of Registered Operators with approved Safety Case rigs.

To ensure personnel with specialist technical knowledge and experience are engaged throughout the relief well operations, Jadestone will maintain a Contract and Equipment Access Agreement with Wild Well Control (WCC) throughout the life of the EP.

9. OPERATIONAL MONITORING STRATEGY

A combination of methods have been identified as appropriate to characterise the released hydrocarbon, estimate the extent of the spill, measure oil volume and concentration on or in the water and locate oil along shorelines.

Understanding the behaviour and likely trajectory of an oil spill is critical to evaluate the appropriate response strategy. In some situations, after operational monitoring activities have been employed, leaving the oil to naturally dissipate and degrade may be considered the most appropriate option if any further response is a risk to increasing the environmental impact, or presents a significant safety risk.

9.1 Common Operating Picture (COP)

The ability of the IMT to manage and coordinate response operations will be heavily reliant on being able to compile and effectively manage all of the information and data provided as part of the operational monitoring strategy. To achieve this a Common Operating Picture (COP) will be utilised, consisting primarily of geographical and geospatial information.

9.2 Operational Monitoring Plan

The IMT will coordinate the operational monitoring requirements, and ensure that all monitoring activities are conducted safely and effectively.

9.3 Initiation and Termination Criteria

Tactic	Initiation Criteria	Termination Criteria
Tracking buoys	Immediately once an oil spill is confirmed	Tracking buoy no longer required to inform common operating picture.
Vessel surveillance	Immediately once Level 2/3 oil spill is confirmed	Vessel surveillance reports no longer required to inform common operating picture
Aerial surveillance	Immediately once Level 2/3 oil spill is confirmed	IAP no longer requires aerial surveillance to inform common operating picture; and Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
Oil Spill Trajectory Modelling (OSTM)	Immediately once Level 2/3 oil spill is confirmed	Modelling no longer required to inform common operating picture; and Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
Fluorometry	Dispersant application has occurred	Dispersant application no longer being undertaken; and Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
Shoreline and coastal habitat assessment	Immediately once Level 2/3 oil spill is confirmed	When all shoreline segments have reached status of no further action be taken (NFA); and

Tactic	Initiation Criteria	Termination Criteria
		Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
UAV deployment	OSTM predicts shoreline impact to inaccessible area not able to be covered by aerial or vessel surveillance tasks	UAV surveillance no longer required to inform common operating picture

9.4 Tactics

The following tactics are sufficient for supplying all required information to inform response decisions to reduce impacts resulting from the worst-case potential spill, from Montara Operations activities, to ALARP:

- Tracking buoys;
- Vessel surveillance;
- Aerial surveillance;
- Spill fate modelling;
- Satellite imagery;
- Fluorometry; and
- Shoreline and coastal habitat assessment using Shoreline Clean-up Assessment Technique (SCAT) surveys; and
- UAVs.

9.4.1 Tracking Buoy Deployment

Satellite tracking buoy deployment is to be initiated within one hour of IMT being convened and placed within or as close as is safely allowable to the plume to follow the movement of a surface spill in the marine environment.

Note: Buoys are not to be dropped from a height of greater than 15 m to water surface.

Satellite tracking buoys can be deployed directly from the facility (below 15 m) or mobilised via available support vessels as directed by the OIM.

The time taken to deploy the tracking buoys will depend on the location they are sourced from and transit time for the vessels to deploy or retrieve. After initial deployment additional buoys will be deployed on a regular basis as determined by the IMT so as to best support the building and maintenance of situational awareness.

Tracker buoys are deployed under the direction from the IMT Leader, by following the appropriate standard operating procedure (SOP). Once deployed it is essential that confirmation of a successful deployment is provided back to the IMT.

Deployed buoys will be tracked online by the IMT and spill fate modelling service provider. On completion of spill monitoring using tracking buoys, the buoys are to be retrieved by vessel.

Normal procedure will be for the deployment of a single tracking buoy on Day 1 and the second approximately 24 hours later. On being deployed all buoys will be checked to be operational through the online website. All buoy data will be used to assist with understanding the local metocean conditions. Additional buoys will be sourced as part of the response, however if required buoys can be collected and redeployed.

9.4.2 Vessel Surveillance

Direct observations from the FPSO and field support vessels or other vessels can be used to assess the location and visible extent of the spill from hydrocarbon incidents, to verify modelling predictions and trajectories, and to support other response strategies.

Note: Vessel-based surveillance is only effective if sea state conditions are calm and the spill is observable.

A decision on the suitability of the metocean conditions will be made (OIM/Vessel Master/IMT) and direction provided to available vessels. Vessel surveillance is to be instructed by the OIM (Level 1) or IMT (Level 2 or 3). Vessel surveillance observations will be used by the IMT in conjunction with all other operational monitoring information (Level 2 or 3) to confirm location and extent of the spill, which will in turn assist with the development of appropriate response strategies.

The nearest support vessel to the release location will be mobilised upon notification of incident. Vessels currently on hire to Jadestone will be initially selected for vessel surveillance duties with other vessels provided from Jadestone's contracted vessel providers.

Reporting requirements will be as follows:

- Information to be provided to the OIM (Level 1) or IMT (Level 2 or 3);
- Essential information to be reported will include:
- Spill location (Latitude & Longitude);
- Length and width;
- Visual appearance of the slick (colours, emulsification etc);
- Associated weather conditions in vicinity of the spill (wind speed/direction, sea state, swell);
- Any marine fauna or other activities observed; and
- Photographic images.

All information is to be compiled into a Vessel Surveillance Log (refer Appendix A1.) which will be sent to the OIM/IMT within an hour of the observations being taken.

9.4.3 Aerial Surveillance

Direct observations from aircraft can be used to assess the location, estimated volume and visible extent of the spill from hydrocarbon incidents, in order to verify modelling predictions and trajectories, and to support other response strategies.

Trained Aerial Observers will be sourced through the AMOSPlan arrangements and deployed to the response location, however, should a delay in their arrival be anticipated, a surveillance flight will be conducted utilising available aircraft crew.

A decision on the suitability of the meteorological conditions will be made by the aircraft captain, who will relay this decision to either the OIM (Level 1) or IMT (Level 2 or 3) to receive appropriate tasking. Aerial surveillance observations will be used by the IMT in conjunction with all other operational monitoring information (Level 2 or 3) to confirm location and extent of the spill, which will assist with the development of appropriate response strategies or modification to existing strategies.

Note: Specific meteorological limits will vary depending on the type of aircraft being flown.

Reporting requirements will be as follows:

- Information to be provided to the OIM (Level 1) or IMT (Level 2 or 3);
- Essential information to be reported will include:

- Spill location (Latitude & Longitude);
- Length and width;
- Visual appearance of the slick (colours, emulsification etc) using the Bonn Oil Appearance Code (refer to https://www.bonnagreement.org/publications) ;
- Associated weather conditions in vicinity of the spill (wind speed/direction, sea state, swell);
- Any marine fauna or other activities observed; and

- Photographic images.

All information is to be compiled into an Aerial Surveillance Log (refer Appendix A1.) which will be sent to the OIM/IMT within an hour of the aircraft returning to its operating base. Where possible, a verbal report via radio/telephone en route providing relevant information should be considered if the aircraft has long transits from the spill location to base.

Flight Schedules are to be developed in support of response operations. The frequency of flights will be sufficient to ensure the information collected during each flight (i.e. observer log and spill mapping) meets the information needs of the IMT to validate spill location, dispersion and the information needs of fate modelling.

Note: Flights will only take place during daylight under visual flight rules (VFR).

A recording of the spill extent is made by outlining the approximate two-dimensional extent of the slick(s) on a map template, including GPS coordinates of extent, the time observations were made, and date noted on the map template. Photographic images are to be taken of the slick and sent to the IMT.

The trained Aerial Observer or the IMT will make estimations of thickness based on visual sighting or the photographic images respectively. Thickness estimates are to be based on the Bonn Agreement Oil Appearance Code (https://www.bonnagreement.org/publications).

Photographic or video records taken by the Aerial Observers for each fauna sighting and the location and details of each sighting are recorded with a cross-reference to photographic imagery captured. The Aerial Surveillance Marine Fauna Sighting Record Sheet is provided in Appendix A1.

9.4.4 Oil Spill Trajectory Modelling

OSTM provides a simulated trajectory of the spill based on historic and actual metocean data. This modelling will be provided in the form of a geospatial information system (GIS) format so that it can be easily integrated into the COP.

OSTM will be provided by RPS via AMOSC. The IMT will contact AMOSC and confirm request of modelling services in Perth, WA. OSTM will start within two hours of submission of the request.

On a daily basis, RPS will provide three-day forecast outputs to Jadestone. More frequent updates can be provided if weather conditions are highly variable or change suddenly. Data from aerial surveillance is to be provided to RPS who are contracted to undertake modelling to verify and adjust fate predictions of the spill and improve predictive accuracy.

9.4.5 Satellite Imagery

Satellite imagery uses Synthetic Aperture Radar (SAR) to detect oil spills by emitting a radar pulse and measuring the ‘backscatter’ from the earth. It is a cost effective and proficient surveillance technique, as it is not reliant on daylight, cloud cover and can survey large areas of ocean in a single satellite pass. It is a

useful surveillance tactic to help quantify data received from other optical-based surveillance tactics (e.g. aerial and vessel surveillance).

Satellite imagery can be obtained through AMOSC via AMOSPlan arrangements. OSRL also provides access to this service. Satellite data is available within 24 hours, then every 6 to 24 hours thereafter depending on satellite positions.

9.4.6 Fluorometry

Fluorometry surveys are used to inform the presence of oil in water near sensitivities. Surveys will be run across the expected plume extent, as well as vertically through the water column. This allows a far greater area of coverage than discrete sampling, aiding in the detection and delineation of entrained oil.

This will allow continuous monitoring of entrained oil covering a large area and will provide near real-time three-dimensional data on the distribution of entrained oil to enable decision making within the IMT. Similarly, other sources of monitoring data (e.g. spill fate modelling) can be used in near real-time to inform the path of the sub surface glider.

In the event that sub surface fluorometers are unavailable or cannot cover the required scale of operation, towed fluorometers towed behind vessels will be used as an alternative or complementary approach. Sub surface gliders with fluorometer sensors for the monitoring of entrained oil will be deployed through Jadestone's monitoring service provider or CSIRO following an oil spill. If required, within 24 hours 5 fluorometers will be mobilised to support monitoring of chemical dispersant program.

9.4.7 Shoreline and Coastal Habitat Assessment

Shorelines are highly variable and some (i.e. non-rocky shores and medium- to high-energy shorelines) can be quite dynamic. To assist in determining which clean-up methods are most appropriate for those areas exposed to hydrocarbons, it is necessary to obtain information about shoreline character (topography, complexity, exposure etc.), source oil characteristics and distribution, and shoreline processes and redistribution of any oil.

Shoreline clean-up assessment technique (SCAT) surveys provide a mechanism by which to record shoreline exposure to stranded oil (see Appendix A2 for shoreline assessment forms). The outcome of SCAT surveys is to provide a rapid assessment of:

- Shoreline character;
- Distribution of coastal habitat/fauna;
- Level of oil contamination and oil characteristics (if oil present); and
- Any constraints to responding to shoreline (e.g. access and safety constraints).

The information collected through SCAT surveys is used to inform appropriate shoreline response strategies, in particular termination criteria for response actions.

A shoreline assessment comprises the following tasks:

- Assessment of shoreline character, habitats and fauna including:
    - shoreline structured biotic habitats;
    - distribution of fauna;
    - shoreline energy and processes;
    - shoreline substrate;

- shoreline form; and
- access/ safety constraints.

- Assessment of shoreline oiling (if present):
  - surface distribution and cover;
  - subsurface distribution;
  - oil type, thickness, concentration and physical character; and
  - sampling of oil for laboratory analysis.

9.5 Resource Rationale for Operational Monitoring

Aerial surveillance, tracking buoys and oil spill trajectory modelling are the primary operational monitoring tactics used to determine the extent of the spill. They are designed to provide real time observational data for the IMT and to validate response planning. Resources allocated for these tasks are sufficient to provide observations and predictions to the IMT within a reasonable timeframe. Vessel surveillance, UAVs and fluorometry are secondary tactics which can be used to complement the information gathered through the primary tactics.

SCAT is made up of 3 members per team and are assumed to be able to cover at least 10 km per day. This distance may be more, especially if UAVs are employed to cover shorelines that have access limitations. Jadestone has used the OSTM data for shoreline accumulation to plan worst-case shoreline and habitat assessment personnel requirements. In this case, the Kimberley Coast presents the greatest resource requirement of 15 personnel (5 teams of 3 members each) and Ashmore/ Cartier presents the minimum contact time, presented in Table 9-1.

In preparing for this capability, Jadestone will be able to meet lesser shoreline assessment requirements for other locations.

Table 9-1: Resource Rationale for Shoreline Assessment Personnel

Receptor	Minimum time to shoreline oil at >100 g/m^2 (days)	Oiled shoreline at concentrations >100 g/m^2 in worst replicate simulation (km)	Number of SCAT teams required
Ashmore / Cartier	10	26	2
Tiwi Islands (Melville and Bathurst)	15	142	4
Darwin Coast	16	100	3
Western NT (Kakadu, Coburgh, East Arnhem Is, West Arnhem Is);	16	190	4
Joseph Bonaparte Gulf (NT)	15	294	4
Indonesia	22	640	TBA
Timor Leste	21	180	TBA
Kimberley Coast (North Kimberley Marine Park)	9	1,500	5

Note: SCAT numbers are not cumulative as spill will not contact all receptors modelled. Number required would be based on direction of spill and timeframes to contact.

10. SURFACE CHEMICAL DISPERSION STRATEGY

Evidence from the Montara Crude spill in 2009 from AMSA reported that 'based on experienced personnel during the response the use of dispersant was highly effective in assisting the natural process of biodegradation and minimising the risk of oil impacts on reefs and shorelines' (Refer Appendix A3 of the OPEP). If there is a weather condition that prevents the application of dispersant (which is unusual for the environment around the Montara facility), this in itself, aids with natural dispersion.

Dispersants are chemicals sprayed onto oil spills from aircraft or vessels to accelerate the process of natural dispersion. They are designed to separate the oil particles on surface waters and help dispersion in the water column (as small droplets) to speed up the process of natural biodegradation. Chemical dispersants can be used to:

- Decrease floating oil;
- Reduce the impact to shorelines; and
- Reduce the quantity of waste created.

For the WCS surface release, Jadestone will apply surface chemical dispersants as soon as practically possible to maximise the application of dispersant to the freshest oil (<24 hours old). Dispersant is most effective on oil that is of a thickness between 50 g/m^2 and 100 g/m^2. At application to predicted thickness of 100 g/m^{2,} modelling indicates that the volume of oil ashore worst-case is reduced by 40%, therefore, for planning purposes, Jadestone has conservatively used the dispersant efficacy rate to be 40%.

However, for dispersant planning purposes, Jadestone has the ability to deliver chemical dispersants to any threshold and has targeted visible oil closest to the source. The dispersant budget has accounted for this option which shows that Jadestone are able to exceed and deliver the maximum volume of dispersant required from Day 5 onwards.

Jadestone will monitor the effectiveness of dispersant application to assess whether to continue planned volumes through the NEBA process. For a subsea release, Jadestone will initially mobilise the surface dispersant capability as required until the AMOSC SFRT is operational.

Chemical dispersants can decrease the risk of oil impact to shorelines but can increase the risk to pelagic wildlife through entrained oil. NEBA will be used to assist in assessing the exchange of one risk to another. The Planning Team will be required to complete the Risk Assessment step in the IAP process and consider:

- Is it safe to conduct chemical dispersant operations?
- Is the oil dispersible? (existing understanding of Montara Crude)
- Is the environment suitable for chemical dispersant operations? (water depth, weather)
- Does the oil texture allow for chemical dispersant operations? (thickness, appearance)
- Are the resources available for deployment?
- Is the mobilisation time within the Window of Opportunity?
- Has the approval for chemical dispersant spraying been granted by the appropriate authorities?
- The geographic constraints listed in Section 10.7.

10.1 Initiation and Termination Criteria

Table 10-1: Initiation and Termination Criteria Surface Chemical Dispersant Tactics

Tactic	Initiation criteria	Termination criteria
Mobilising dispersant	Immediately when Level 2 or 3 spill incident is confirmed.	When there is no net environmental benefit of continuing dispersant application; and Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
Aerial application of dispersant	Immediately when a Level 2 or 3 spill incident is confirmed	When there is no net environmental benefit of continuing dispersant application; and Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
Vessel based application of dispersant	Immediately when Level 2 or 3 spill incident is confirmed	When there is no net environmental benefit of continuing dispersant application; and Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response
Dispersant efficacy testing	Assessment commences immediately when Level 2 or 3 spill incident is confirmed	When dispersant is no longer being applied.

10.2 Chemical Dispersant Action Plan

The following tactics are considered for surface chemical dispersant operations are:

- Aerial application of dispersant; and
- Vessel based application of dispersant.

The Surface Chemical Dispersion Action Plan (Section 16.6) is activated at the initial stage of the incident so that resources can be mobilised and ready for use. As the incident progresses, chemical dispersant use is continually reassessed through the NEBA and IAP processes.

10.3 Dispersant Selection

Chemical dispersants listed as approved in the National Plan for Maritime Environmental Emergencies Register of Oil Spill Control Agents (OSCA) are to be prioritised for use. Chemical dispersants not listed as approved on the OSCA register are to be assessed for acceptability using Jadestone's Chemical Selection Evaluation and Approval Procedure (JS-70-PR-I-00033) prior to application, and only used if evaluated to be an acceptable level of risk.

PTTEP AA commissioned dispersant testing on Montara Crude to assess the efficacy of Dasic Slickgone NS (and Nalco Corexit 9500A) dispersant in conditions representative of winter and summer seasons, the results indicated that dispersant efficacy is a minimum of 73% at 12 hours and remains a minimum of 68% for summer and winter within 24 hours. After 24 hours the efficacy decreases due to the weathering (increased pour point and viscosity) of the oil (Leeder, 2013). The summer and winter seasons were tested for efficacy as they were representative of the minimum and maximum conditions (water, air temperature and wind speed) in the Timor Sea.

10.4 Tasks for Mobilising Chemical Dispersants

Access to the National Plan stockpiles is via AMOSC and AMSA. Jadestone will additionally access the Global Dispersant Stockpile via the OSRL membership. The IMT will request the delivery of chemical dispersant stocks to Darwin Port (vessel-based application) and Darwin airport (Aerial Dispersant application) from AMOSC, OSRL and AMSA stockpiles.

There are sufficient dispersant stocks in Australia and globally to sustain the response at the required application rates for ongoing operations as per the dispersant budget (refer to Table 10-3). The OSRL SLA stock will be delivered to Darwin from Day 4 and the GDS will begin arriving from Day 5.

AMSA will provide all resources available through the National Plan in support of a Jadestone spill response, which includes all logistical services to transport chemical dispersants from National Plan stockpiles to Darwin. All stockpiles are deliverable to any other stockpile location in Australia within 48 hours.

Table 10-2: Chemical Dispersant Inventory as at December 2022

Owner	Stockpile Locations	Dispersant Volume (m^3)	Dispersant Type[5]	Total Volume (m^3)
Jadestone	Darwin Supply Base	11	Slick Gone NS	11
AMSA	Adelaide	10	Slick Gone EW	355
		10	Slick Gone EW	
	Brisbane	10	Slick Gone NS	
		10	Slick Gone EW	
	Karratha	10	Slick Gone NS	
		10	Slick Gone EW	
	Darwin	10	Slickgone NS	
		10	Slick Gone EW	
	Devonport	10	Slick Gone NS	
		10	Slick Gone EW	
	Fremantle	52	Slickgone EW	
		48	Slick Gone NS	
	Horn Island	10	Slick Gone NS	
	Melbourne	10	Slick Gone NS	
		10	Slick Gone EW	

[5] All dispersants listed above are on the AMSA Oil Spill Control Agents (OSCA) list. Corexit EC9527A and Ardrox 6120 are in Transitional Acceptance, meaning that they are deemed to be OSCA registered on the basis that they have met previous acceptance requirements and are available for use for National Plan responses until used or disposed of.

Owner	Stockpile Locations	Dispersant Volume (m^3)	Dispersant Type[5]	Total Volume (m^3)
	Sydney	45	Slick Gone NS	
		55	Slick Gone EW	
	Townsville	15	Slick Gone NS	
		10	Slick Gone EW	
AMOSC	Broome	14	Ardox 6120	511
	Exmouth	75	Slick Gone NS	
	Fremantle	8	Slick Gone NS	
		27	Corexit 9500	
		500 (SFRT stockpile[6] - 50%)	Slick Gone NS	
	Geelong	75	Slick Gone NS	
		62	Corexit 9500	
OSRL (Jadestone has access to 50% of SLA stocks)	Various: • Singapore • Southampton (UK) • Bahrain • Fort Lauderdale (USA)	753 (50% = 377)	Slick Gone NS Slick Gone EW Slickgone LTSW Finasol OSR 52 Corexit 9500 Corexit 9527	377
TOTAL (access agreements in place)				**1,258**
OSRL Global Dispersant Stockpile (GDS) (Jadestone to request access to GDS at the time of an event)	Various: • Singapore • Southampton (UK) • Vatry (France) • Cape Town (South Africa) • Fort Lauderdale (USA) • Rio de Janeiro (Brazil)	5,000	Slick Gone NS Finasol OSR 52 Corexit 9500	5,000
TOTAL (including additional ORSL 50% SLA and GDS stocks)				**6,258**

[6] As per the AMOSPlan, there is a provision made by the SFRT Steering Committee to provide up to 250 m^3 of dispersant into a surface spill response, given certain provisions are met in the first instance by AMOSC (AMOSC, 2021).

10.5 Tasks for Aerial Application of Chemical Dispersants

Fixed Wing Aerial Dispersant Capability (FWADC) – notification and activation are made through AMOSC (on behalf of industry) who will liaise directly with AMSA with respect to the activation of the contract and associated aircraft. In addition, where necessary, Jadestone will utilise deployment of aircraft from designated airfields (e.g. Darwin/North Kimberley Airbase) and arrange for pilots.

When triggered, the FWADC provides the following:

- Air Tractor AT802;
- Pilot;
- Aerotech First Response Liaison Officer;
- Air Attack Supervisor;
- Aircraft Loading Officer; and
- Transportation for all personnel to the nominated location.

An Air Attack Supervisor platform (helicopter or fixed wing) will be supplied by Jadestone when acting as the Control Agency. Aerotech First Response also have the capability to source this capability, if required.

Arrival time of the aircraft will depend on flight time and will include a four-hour lead time for 'wheels up' from initial request. Aerial chemical dispersant application will commence within 3 days (using worst case response time) of initial AMSA and OSRL notification (daylight and weather condition dependent).

OSRL shall be activated and have the capability to send a Hercules C-130 or Boeing 727 aircraft to apply chemical dispersants. The Hercules C-130 is made ready in 6 hours which includes fuelling and if required, dispersant loading. The flight time from Senai, Malaysia to Darwin is 8 hours, with 1 technical stop at Bali/Makassar. This includes dispersant fully loaded on the plane. The flight time could be reduced to 7 hours with dispersant at half capacity.

The Boeing 727 has a 4-hour mobilisation time. The flight time from the United Kingdom to Darwin is 40 hours, with one overnight stop in Dubai .

Jadestone Energy plan to mobilise one of the OSRL aircraft to Darwin without dispersant and use stock in Darwin to supply the aircraft until the OSRL stockpile is approved to arrive.

For OSRL, Jadestone will:

- Apply for permit to spray and low-level flying;
- Provide aircrew with accommodation and transport to/from airport; and
- Ensure immigration clearance for the aircrew is completed after initial 72 hours in country.

Aerial chemical dispersant application will commence within 3 days (using worst-case response time) of initial AMSA and OSRL notification (daylight and weather condition dependent).

AMOSC, with support from the IMT, is to develop an "Air Operations Plan" in accordance with the Aerial Operational Plan For Marine Oil Spills Off The Northern Coastline which is to be submitted to AMSA prior to commencement of any National Plan Fixed Wing Aerial Dispersant Contract (FWADC) aircraft operations.

10.6 Vessel-Based Application of Chemical Dispersant

Vessel based chemical dispersant application initiated within 6 hours of spill notification. Vessel equipped with dispersant application equipment to arrive at the spill location within 42-84 hours of Chemical Dispersant Action Plan (Section 16.6) being activated. Jadestone uses a contracted offshore support vessel

(OSV) as the Montara operations supply vessel, which can be equipped with spill response gear (11m^3 of dispersant and spray arms). The key steps in mobilising this response are:

- Jadestone mobilises an additional 3 x suitable vessels through existing contracts to carry vessel-based dispersant equipment;
- Mobilise supply vessels to Darwin Port to receive dispersant, load and ship to the dispersant spray vessels at the spill location; and
- Maintain chemical dispersant supplies to dispersant application vessels at spill location until dispersant application terminated.

Spraying systems deliver chemical dispersant uniformly to the floating oil to maximise dispersant/oil mixing and minimise wind drift. As such, if mixing is evident in sea surface waters, this will improve the effectiveness of chemical dispersant applied to floating oil. Where sea surface conditions are calm, agitation of the sea surface will be undertaken by vessels to create mixing. Where this is not successful, a reduction in oil/water mixing will result and containment and recovery operations are to be implemented instead.

Vessel based dispersant operations require two afedo spray systems per vessel. Spray arms need to be secured to vessel by welding or chains as determined by the vessel master. One spray system consumes approximately 500L/hr of dispersant meaning that for four vessels spraying for eight hours per day (daylight 10 hours operation to include travel to site), with two spray systems per vessel, and dilution of dispersant as applied means 4 m^3 of dispersant per vessel/ per day will be required.

One Responder trained in vessel-based dispersant application is to be dispatched to each vessel to oversee operations (Team Leader).

The effectiveness of the vessel based chemical dispersion strategy is communicated to the IMT via the Team Lead on-board each vessel. The Operations Lead is responsible for terminating application when chemical dispersants are no longer effective.

10.7 Chemical Dispersant Application Area and Timing

All chemical dispersant operations will occur during daylight hours only.

At no time, can chemical dispersant be applied:

- In waters shallower than 20 m (LAT);
- Within exclusion zones for offshore facilities;
- Within a Marine Park boundary or its buffer; and/or
- Within WA State Waters unless approved by the State Marine Pollution Coordinator (SMPC).

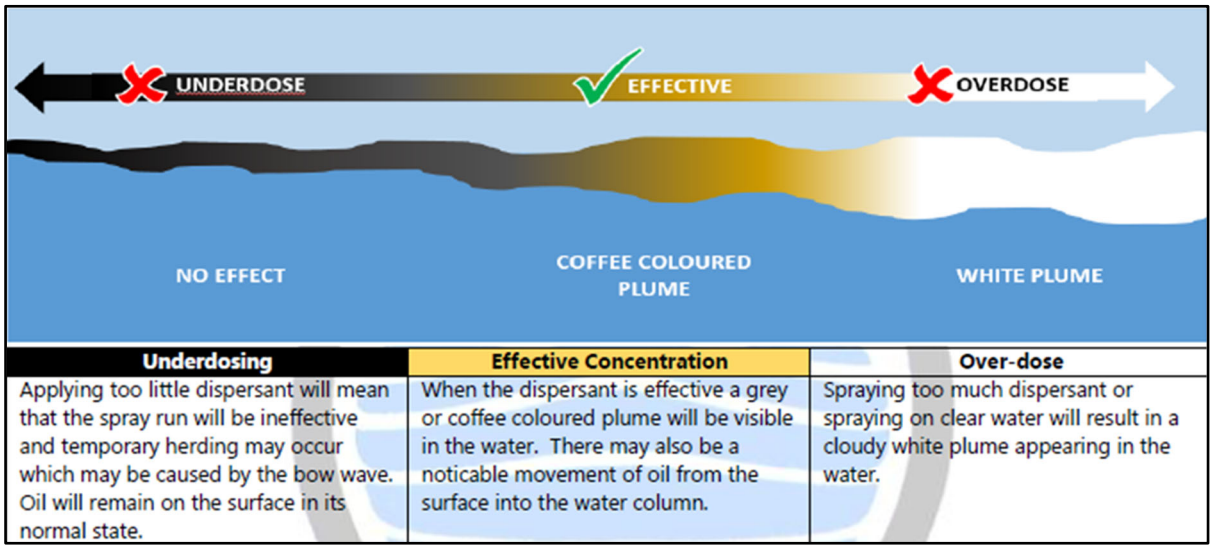
During ongoing operations, if the currents are directed toward the shallow parts of the coast, the application area must be far enough away to allow for sufficient chemical dispersal before contact with the 20 m contour. This is to be evaluated through RPS modelling requests for chemical dispersion characteristics throughout the application operation. The WA SMPC will be notified of dispersant operations and predicted application area by the Planning Team Lead so that an assessment of movement of dispersed oil into WA State Waters can be made.

Small breakaway patches of oil identified by surveillance operations are ideally treated by vessel-based chemical dispersant systems, whereas the larger slicks of oil are more suitably targeted by the aerial application systems.

10.8 Dispersant Effectiveness Monitoring

Chemical dispersant effectiveness is shown in Figure 10-1. The effectiveness of the aerial based chemical dispersion strategy is communicated to the IMT via the Air-Attack Supervisors, who are supplied by AMSA through the FWADC. Air-Attack Supervisors will advise the IMT if chemical dispersant application operations are to be terminated.

Ongoing chemical dispersant application is to be determined using the IAP process which involves a NEBA assessment, through the visual monitoring of the effectiveness of chemical dispersant applied, oil characteristics, predicted fate of the plume (updated daily), environmental conditions (sea state and weather) and surrounding environmental/ social/ cultural sensitivities. The NEBA will be re-evaluated daily during an incident to assess varying net benefits and impacts. Chemical dispersants are only to be applied if there is net benefit to the highest-ranking priority resources.



Underdosing	Effective Concentration	Over-dose
Applying too little dispersant will mean that the spray run will be ineffective and temporary herding may occur which may be caused by the bow wave. Oil will remain on the surface in its normal state.	When the dispersant is effective a grey or coffee coloured plume will be visible in the water. There may also be a noticable movement of oil from the surface into the water column.	Spraying too much dispersant or spraying on clear water will result in a cloudy white plume appearing in the water.

Figure 10-1: Effective and Ineffective Dispersant Application

10.9 Use of Dispersant in WA State Waters

During a response to either a shipping or offshore petroleum activity marine hydrocarbon pollution incident in State waters, regardless of source, the use of dispersants requires the written consent of the HMA. Where the application of dispersant in adjacent waters could impact State waters, the DoT requests early notification. This notification is to be provided to DoT through the HMA (or State Marine Pollution Controller (SMPC) if activated).

In seeking the consent of the HMA/SMPC to use dispersants in State waters, the Incident Commander is expected to have had the option assessed by a panel formed within the IMT. This panel should be chaired by the Incident Controller and include the participation of the State Environmental Scientific Coordinator (ESC). The involvement of the CSIRO or other subject matter experts on the panel should also be considered. In formulating its position on the potential use of dispersants, the panel is to use the decision-making process outlined in the AMSA Protocol for Obtaining Approval for the Application of Oil Spill Control Agents to Oil at Sea or on Shorelines. This process must be documented, and a record retained within the IMT.

The HMA/SMPC will confirm the recommendation of the ESC, who may grant or refuse consent for the use of dispersants in State waters. In granting consent, the HMA/SMPC may attach conditions to the consent.

It should be noted that the consent can be removed by the HMA/SMPC at any time. It should also be noted that other restrictions on dispersant use may still apply, such as:

- The dispersants must be listed on the National Oil Spill Control Agent Register administered by AMSA and consistent with the Protocol for Obtaining Approval for the Application of Oil Spill Control Agents to Oil at Sea or on Shorelines (March 2013)
- Once consent is provided, the DoT Incident Controller will direct the actual use of the dispersant in accordance with the operational situation at the time
- Consent may be specific to geographic boundaries, times or weather conditions.

10.10 Resource Rationale for Chemical Dispersant Application

An estimation of the resources required for the chemical dispersant strategy was undertaken and the analysis provided below.

10.10.1 **Calculations** - Volume of oil to be treated

Based on the weathering properties of Montara and Skua Crude[7] being in the range of 13% to 26% (respectively) in the first 12 hours and 28% to 47% (respectively) in the first 24 hours, the amount of oil available to be dispersed is conservatively considered to be **70%** of the total daily available volume.

10.10.2 **Calculations** - Volume of dispersant required

- The Dispersant to Oil Ratio (DOR) can range from 1:10 through to 1:50 or even less depending on the oil and dispersant types; and
- For planning purposes, a DOR of 1:25 is used because it is an accepted ratio to start with and can be adjusted depending on effectiveness.

10.10.3 **Assumptions** - Fixed wing aerial dispersant (Air Tractor) operations

- Operations will be conducted out of Darwin and/or North Kimberley Airbase to the Montara facility. Based on standard aircraft endurance of 4 hours;
- All dispersant required will be mobilised to Darwin and/or North Kimberley Airbase in support of ALL aerial dispersant operations
- Two hours (approximately) required to complete each flight operation (dispersant loading/aircraft refuelling/transit to-from spill location);
- Operations to be conducted during daylight hours only – therefore based on an estimated 10 hours daylight each aircraft will conduct approximately two sorties each day; and
- Various aircraft types are included under the provision of the FWADC. For planning purposes, a minimum payload of 3,000 litres (3 m^3) will be used with respect to aircraft to be mobilised in support of the response.

10.10.4 **Assumptions** - Hercules aerial dispersant operations

- Hercules aircraft will be mobilised to Darwin on activation (note: only one aircraft is available from OSRL under the SLA);

[7] Refer sections 4.1.2 & 4.1.3 – Hydrocarbon Characteristics and Behaviour

- First sortie to be conducted on Day 3;
- All dispersant required will be mobilised to Darwin in support of ALL aerial dispersant operations;
- Operations will be conducted out of Darwin, directly to the Montara facility; and
- Hercules dispersant operations to be conducted during daylight hours only – based on an estimated 10 hours daylight each aircraft will conduct approximately two sorties each day; and
- Hercules C-130 aircraft has a payload of 13 m^3, although 12 m^3 is typically loaded (and is used for these planning purposes) due to safety considerations.

10.10.5 **Assumptions** – Boeing 727 aerial dispersant operations

- Boeing 727 aircraft will be mobilised to Darwin on activation (note: only one aircraft is available from OSRL under the SLA);
- All dispersant required will be mobilised to Darwin in support of ALL aerial dispersant operations;
- Operations will be conducted out of Darwin, directly to the Montara facility;
- 727 dispersant operations to be conducted during daylight hours only – based on an estimated 10 hours daylight each aircraft will conduct approximately two sorties each day; and
- 727 has a payload capacity of 15 m^3.

10.10.6 **Assumptions** - Vessel based dispersant operations

- Vessels fitted with two spray systems = 1,000 L/hr spray rate (dispersant diluted with sea water);
- Dispersant operations to be conducted during daylight hours only – based on an estimated 8 hrs spraying = 8, 000 L/vessel (sea water and dispersant); and
- Vessels will require 8 m^3 dispersant each/day, therefore = 32 m^3/day of dispersant is required for four vessels.

10.10.7 Dispersant budget

The total amount of dispersant required over 77 days is 4,595 m^3 which can be achieved using the dispersant stock available in Australia and the OSRL GDS (Error! Reference source not found.). A combination of delivery systems was assessed and the optimum to meet the need most efficiently was by utilising:

- Five FWADC air tractors;
- the OSRL Hercules aircraft; and
- Four vessels.

This allows Jadestone the ability to meet and exceed the daily dispersant requirement from Day 5. Daily dispersant volumes required range from 73 m^3 for the first 2 weeks to 59 m^3 midway to 42 m^3 by Day 77. Jadestone will review the dispersant application plan daily and modify according to the NEBA and operational feedback.

The FWADC aircraft and vessels are considered the primary platform for dispersant application operations because of the ability to treat specific areas of oil with dispersant at the required dosage and droplet size. The Hercules is valuable in the first weeks of the spill when Jadestone are ramping up to meet the required delivery amount and for the spill area close to the source.

A dispersant budget has been prepared taking into account the daily application requirements, daily volume of dispersant arriving in Darwin, cumulative totals and balance on hand after each day. See **Table 10-3** for these details. It is clear that dispersant stockpiles are sufficient and are not the limiting factor for dispersant operations.

Table 10-3: Dispersant delivery budget

Week	Day	Max. volume of dispersant required for volume of oil released (m^3)	Arrival of dispersant in Darwin (m^3)	Aerial application (m^3)	Vessel application (m^3)	Balance on hand (m^3)
1	1	73	42	0	0	42
	2	73	105	0	4	143
	3	73	351	44	8	442
	4	73	91	50	7	476
	5	73	91	56	16	495
	6	73	90	56	32	497
	7	73	90	56	32	499
2	8	73	80	56	32	491
	9	73	80	56	32	483
	10	73	80	43	32	488
	11	73	80	43	32	493
	12	73	80	43	32	498
	13	73	80	43	32	503
	14	72	80	43	32	508
3		503	Access to 5,000 m^3 of GDS stockpile to meet remaining need of 3,570 m^3 Dispersant delivery and supply will be continually assessed and administered as required			
4		478				
5		447				
6		419				
7		394				
8		365				
9		341				
10		321				
11		302				

11. CONTAINMENT AND RECOVERY STRATEGY

Booms and skimming equipment can be used to create physical barriers on the water surface to contain and recover the oil spill where information and predictive spill fate modelling indicate a likely threat to environmental, social and cultural sensitivities. Effective Containment and Recovery provides significant environmental benefit by removing floating oil and thereby decreasing the likelihood of oiling wildlife and reducing the amount of oil reaching shorelines.

Jadestone containment and recovery planning is to be a primary response around the source (with dispersant application) and a secondary response targeting priority receptors.

Containment is the name for using booms (inflatable or solid) to corral oil usually in the offshore environment near the hydrocarbon source. Once contained, an attempt to recover the hydrocarbons from the surface waters can be undertaken. The response is only feasible in certain conditions that include:

- Weather and sea state: containment and recovery equipment is only effective in calm conditions. Effectiveness is variable depending on equipment type, but is generally only considered effective below 20 knots of wind, wave heights less than 1.5 m and currents less than 2 knots (Stevens & Aurand, 2008);
- Based on discussions with RPS, the normal weather/sea conditions in the vicinity of Montara (100 nm) outside of cyclones will not normally exceed conditions that will directly impact vessel operations based on “safety” concerns;
- Adequate surface thickness of hydrocarbons: containment and recovery is more effective when a sufficient oil thickness can be achieved by the containment booms (minimum of 50 g/m^2, with optimal recovery occurring at > 100 g/m^2), which is often limited to Group 3 and 4 (ITOPF) hydrocarbons; and
- Suitable oil type and characteristics: containment of fresh, volatile oil should not be attempted due to its low flash point. No attempt should be made until the safety of the area has been established. Containment of lighter oils such as MDO is often not viable because they evaporate and dissipate quickly.

If this option is deemed suitable through assessments and situational awareness (NEBA, trajectory to sensitivities, weather, seas state, oil type), significant logistical support will be required that will include suitable vessels, experienced crew, booms and skimmers, pumps, on-board storage for recovered oil and aircraft to direct the vessel to the areas with the thickest floating oil. In addition to logistical support requirements, containment activities are inherently inefficient due to the spreading characteristics of oil on water.

11.1 Initiation and Termination Criteria

Tactic	Initiation criteria	Termination criteria
Offshore containment and recovery	Immediately when Level 2 or 3 spill incident is confirmed	When boom encounter rate (BER) is less than 10 m^3 per hour
Offshore waste storage and collection	When offshore containment and recovery is initiated.	When all oily waste water temporarily stored offshore has been transferred to intermediate waste storage on land.

11.2 Tactics

- Offshore containment and recovery; and
- Offshore waste storage and collection.

11.2.1 Containment and Recovery

In the initial response, Jadestone will mobilise offshore booms and hydraulic power pack equipment from AMSA Darwin/Dampier, then from AMOSC in Fremantle/Exmouth. This provides the shortest timeframe for implementation. Requirements for additional resources will be assessed during the spill. If conditions and equipment are proving successful, then further activity will be implemented with vessels on contract to Jadestone using booms and pumping equipment from AMOSC and (AMSA) National Plan equipment, and personnel from the AMOSC core group, OSRL and National Team personnel through AMSA and State Response Team personnel through WA DoT.

Each vessel conducting containment and recovery is to have a team of trained Oil Spill Responders (Team leaders will include 1 Vessel Master, 1 Supervisor; Team Members will include 4 trained deployment crew) who will be tasked with managing operations and implementing in a safe and responsible method. The Team Supervisor has the responsibility of evaluating the effectiveness of the containment and recovery operations and communicating the information to the IMT. The IMT has the authority to demobilise or stand vessels off in the event of ineffective operations.

11.2.2 Offshore Waste Storage and Collection

Activation of the Jadestone waste management contract will enable waste to be collected, stored and disposed. Waste management is discussed in the IMTRP.

Assuming favourable conditions, containment and recovery vessels operating offshore will collect floating oil using booms and skimmers. Skimmers will pump collected oily water to IBCs or Iso-containers, where oily water will be allowed to settle such that the water phase will be suitable for over board discharge (decanting) back into the collected oil behind the boom (to prevent secondary impacts of low concentration oil in water) (Refer to Section 11.2.3).

Oily waste water recovered through skimming is estimated to be 40 m3 per team per day. Decanting into boomed areas has the potential to reduce the volume of waste water collected. Jadestone's waste management contractor has sufficient IBC and Iso-containers in Northern Australia to contain offshore oily waste water for the first few days of the response. The waste management contractor can mobilise a 300 m3 capacity of offshore storage to Darwin within 24-48 hours' notice, for loading on to containment and recovery vessels. This volume will sustain the initial containment and recovery operation until additional vessels are acquired and additional temporary storage is sourced from the waste management contractor's Southern Australia locations. Temporary storage is also available to Jadestone through its membership with AMOSC and OSRL, who have multiple bladder vessels and inflatable storage bags which vary in capacity (individually) from 25 m^3 to 500 m^3.

Oily waste water may be collected by vessels transiting the operational area and/or transferred to the Montara Venture FPSO, which can accommodate up to 31,000 m3 of oily waste water into its cargo system. This volume could be greater, depending on tank availability and volume of crude onboard but is sufficient to accommodate up to 4-5 weeks' worth of predicted recovered oil volumes.

In addition, there is an ability to let the oily waste water to settle in the cargo tanks, enabling the water to separate out from the crude. The decanting of this separated water will be discussed with the relevant regulatory authority at the time of the incident but would enable additional volumes of oily waste water to be treated and reduce volumes needing to be offloaded for transit, treatment and disposal.

If decanting is not permitted, support vessels will periodically offtake oily waste water from Montara FPSO for transit back to onshore facilities in Darwin. Jadestone's waste management contractor has the ability to source multiple tankers within 24-48 hours to transport waste to an approved waste management facility for treatment and reuse or disposal. 1,080 m^3 of oily water is estimated to be the worst-case average to be recovered per day using 27 containment and recovery systems. This would be significantly reduced in volume if decanting is permitted.

11.2.3 WA DoT Requirements for Offshore Decanting of Waste Water

During offshore containment and recovery operations there is generally a large amount of water that is collected with the oil. This water can be decanted back into a boomed area to reduce waste and create more valuable storage area. The reduction of overall waste in some circumstances can create an environmental benefit which outweighs the minimal impact caused by the release of water with very low concentrations of oil.

Under the POWBONS Act; s. 8 allows for decanting for combating specific pollution incidents. Additionally, Annex 1 of MARPOL (Regulation 9) allows for decanting for combating specific pollution events to minimize the damage from pollution. Under both MARPOL and POWBONS decanting must be approved by the government in whose jurisdiction the discharge will occur. In WA State waters this is DoT (as the Hazard Management Agency under the *Emergency Management Act 2005*) and in Commonwealth waters this is the Australian Maritime Safety Authority (AMSA).

To minimise the potential for recovered oil being released while the water is decanted, the following practices are recommended (IPIECA/IOGP, 2016):

- The temporary storage device should, prior to use, be checked to ensure that it is not contaminated with residues from any products or substances that may previously have been stored in that device, to ensure no unauthorised discharges occur;
- Appropriate settling time should be allowed to enable gravity separation to occur prior to decanting and discharge of the free water;
- Where possible, employ the use of internal baffles in the temporary storage device to help speed up the separation and prevent re-mixing of the oil and water;
- Free water should be discharged either into a secondary storage container (if available) or within the apex of containment booms in the path of the recovery device (so that any accidentally discharged oil can be contained and recovered);
- Visual monitoring should be undertaken at the discharge point whilst decanting to ensure that only water is released. If possible, the oil/water interface in the storage container should be monitored to ensure that the discharge hose is only drawing from the layer of free water at the bottom; and
- Dependent upon the environmental and socio-economic sensitivity of the area affected by the spill, and any other response activities that are taking place, it may be useful to identify an appropriate area for carrying out decanting operations.

11.3 Resource Rationale for Containment and Recovery

Containment and recovery operations are recognised to have low recovery rates when compared against estimated total spill volumes. The Macondo incident in 2009 had an estimated containment and recovery rate of approximately 4% of the total volume of oil spilled, and the MV Erika oil tanker spill in 1999 had an estimated containment and recovery rate of 6% (IPIECA, 2015). The Montara well blowout of 2009 had a

higher recovery rate due to calm metocean conditions. Approximately 10% of the total oil spilled was estimated to be contained and recovered (Montara Commission of Enquiry, 2010) and with only two units in operation throughout the duration of the response (AMSA, 2010). For planning purposes, the amount of oil that could possibly be recovered by containment and recovery was assumed as 10% of the worst-case LOWC spill volume (after 35% evaporation, decay and entrainment within 24 hours and at 10 m/s wind conditions).

Boom encounter rate (BER) is a concept used in response planning to estimate the amount of oil that may be encountered by booming arrays and contained ready for recovery by skimmers. The formula for estimating BER is described in the AMSA Technical Guideline for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities (AMSA, 2015). The BER has been used to inform containment and recovery planning for this OPEP.

11.3.1 Amount of oil available to recover

From Week 3, the amount of oil released in a LOWC decreases by a third and continues to decrease steadily (Table 11-1). Jadestone will exceed the number of vessels required from Week 3 onwards and this allows for recovery of excess oil from Weeks 1 and 2 and targeting of operations onto priority receptors if required.

Table 11-1: Containment and Recovery Plan Calculation

Week	Oil available to recover (following evaporation, decay and entrainment)	Amount of oil that could be recovered (assuming 10% recovery rate)	C&R Systems needed (assume 1 system = 40 m^3 per day recovered)	C&R systems Jadestone can access
1	11,702	1,170	29	15
2	11,675	1,167	29	27
3	11,484	1,148	28	27
4	10,965	1,096	27	27
5	10,223	1,022	25	27
6	9,582	958	23	27
7	9,036	903	22	27
8	8,385	838	20	27
9	7,789	778	19	27
10	7,297	729	18	27
11	6,961	696	17	27

Note: weekly C&R calculations done by volume/7 days/40m ^{3} per day recovered = number of systems required

11.3.2 Containment of oil

Containment calculations have been made using the AMSA Boom Encounter Rate formula:

$$\mathbf{BER} = (\mathbf{400} \times \mathbf{0.3}) \times \mathbf{V} \times \mathbf{T}$$

Where:

- BER is the boom encounter rate (BER);
- LB is the length of boom deployed;
- 0.3 represents the opening of boom array (also called the swathe) and is considered to be 30% of the total boom length;
- V is the velocity of the vessel and is assumed for planning purposes to be 0.7 knot (1,852 m/hr); and
- T is the average thickness of oil (mm) from indicative planning targets table. Assuming 50 g/m^2 (0.047).

Therefore:

- BER = (400 x 0.3) x 0.7 x 0.047 = 4 m^3;
- 4 m^3 is the amount of oil 1 system can encounter in 1 hour @ 50 g/m^2; and
- For planning purposes one "Containment & Recovery" system equates to over a 10-hour day:
- Two x vessels with 400m offshore boom, 1 x offshore skimmer @ min. 40 m^3/day.

11.3.3 Resources

After analysis of the impact of increasing capability, Jadestone has the ability to mobilise up to 15 vessels within Week 1, and 27 from Week 2 onwards. This enables Jadestone to meet then exceed the required number of vessels from Week 4 which allows for extra recovery to account for any persistent floating hydrocarbons remaining from Weeks 1 and 2. After Week 4, Jadestone will reassess as there is a decreasing need from Week 5 onwards. However, if the trajectory modelling indicates that shoreline contact will occur, a proportion of containment and recovery vessels can be directed towards protecting those shorelines and priority receptors.

The vessels and crew are accessed from a combination of companies that Jadestone currently holds MSA's with, call-off contracts and in consultation with Jadestone's approved marine broker.

It is considered disproportional to purchase and maintain equipment to be on standby when there is access to sufficient vessels and equipment through Jadestone's existing service providers.

Active booming systems are deployed to allow containment and recovery operations without the need for an additional skimming system (where deployed). This allows for greater effectiveness and continued skimming operations. Active booming systems are available through AMOSC and OSRL and would be prioritised for mobilisation. Rapid sweep systems are also deployed, which allow containment and recovery operations to be undertaken at speeds of up to 3 knots. This allows for greater encounter rates and surface coverage.

For planning purposes, the vessel speed of 0.7 knots was chosen as this allows for more manoeuvrability and targeting of oil windrows.

In support of containment and recovery operations it is intended to establish a Logistics Base in Darwin utilising support provided by the current contracted Jadestone logistics support service provider.

12. PROTECTION AND DEFLECTION STRATEGY

This strategy involves a combination of nearshore booming using vessel-based operations ('nearshore operations') while the spill remains on a predicted shoreline impact trajectory, and the placement of shoreline boom to:

- Protect sensitive shorelines;
- Deflect the oil back to ocean or to easier locations for shoreline clean-up;
- Reduce the volume of oil impacting sensitive shoreline habitats to ALARP; and
- Align the response strategy with NEBA.

In all areas, the primary shoreline priority receptors are mangrove environments and identified turtle nesting beaches during nesting and hatching seasons. The effectiveness of a protection and deflection response will be dependent on sea, current and wind conditions. Much of the potential deployment locations are characterised with large tidal movements (>10 m), which would result in tidal currents exceeding boom capabilities. Protection booms will only be installed in areas where the tidal currents are below 0.75 knots.

Operational monitoring data will provide important information for response decision making. If a tangible, positive outcome is demonstrated, and if health and safety risks are not disproportionate to the environmental benefit achieved in mobilising the response, a protect and deflect operation may be possible. Jadestone have provided guidance within this OPEP in the event the IMT is required to mobilise equipment and personnel to potentially contacted shorelines, prior to that identified in the oil spill modelling.

12.1 Initiation and Termination Criteria

Tactic	Initiation criteria	Termination criteria
Nearshore booming	When OSTM indicates shoreline accumulation may exceed the >100 g/m^2 threshold	When shoreline receptors no longer able to be protected by nearshore booming.

12.2 Tactics

Given the remoteness and nature of the shorelines potentially contacted, Jadestone has prepared a protection and deflection response that caters for the priority receptors and can move to other locations as required. Deployment is subject to safety concerns of operations in high tidal influence and shallow waters; and possible grounding issues of small vessels, so must therefore be assessed under a NEBA (see IMTRP Appendix A Section 5.4).

The locations for initial nearshore protection and deflection operations will be evaluated by the IMT through observations and modelling during the incident response. Locations identified for potential shoreline impact are to be cross-referenced with the shoreline sensitivity and feature mapping data available through the DoT Oil Spill Response Atlas (OSRA).

As deflection and protection operations will occur in State / Territory Waters, the SMPC / HMA will direct the response operations to locations identified in this OPEP or as determined by real time data and State / Territory priority receptors.

If deployment of protection and deflection booms is considered feasible and effective, inspections and maintenance of the booms are to be timed based on tidal cycles and are to be undertaken by response personnel to ensure locations and formations are maintained so that they remain effective in achieving objectives.

The range of protection and deflection methods include nearshore booms (beach guardian, zoom boom, short curtain boom and sorbent boom) anchored close to the identified priority receptor areas, or open water booms (deep curtain ocean boom) placed at significant distances from shorelines to deflect the open water pathway of the oil to force the oil to miss the predicted shoreline requiring protection.

Operational monitoring and the Incident Action Planning will guide the response to prioritise protection of sensitive key features. The protection and deflection response is to be scaled to be commensurate to the risk posed by an actual incident. The results of spill fate modelling will provide the accumulated oil information which will enable calculation of the required amount of protection and deflection equipment.

Initial deployment of equipment and personnel is to be from the AMOSC stockpiles and Core Group. Depending on actual conditions and possible responses to the reduce impacts to ALARP, further deployments of resources can be implemented through OSRL and the AMSA National Plan shoreline response equipment stockpiles.

While equipment and personnel mobilisation is occurring, the operational monitoring is being obtained and the results are available within two hours of activation. The most up-to-date information will then be communicated to the protection and deflection teams to guide the selection of the operational locations.

The SMPC / HMA will advise on priority receptors aided by the oil spill trajectory modelling to locations with the most likely impact. Deployment locations will be selected from the closest facilities to where priority receptors are identified.

The effectiveness of the protection and deflection strategy to achieve performance objectives against the IAP objectives is to be communicated to the IMT by a nominated Shoreline Response Team Leader. The IMT has the responsibility to extend or terminate the response in consultation with the SMPC / HMA.

A Browse Island Oil Spill Incident Management Guide (INPEX, 2018) and a Kimberley Shoreline Response (AMOSC, 2019b) have been prepared to assist in the planning and safe execution of an oil spill response at Browse Island and the Kimberley coast (or other remote shorelines). Jadestone will review these plans at the time of a spill, to assist in the preparation of an appropriate shoreline response plan and capability to match the need for other remote shorelines. This will be undertaken in consultation with OSRL and State / Territory, considering the practicalities, likely success and risks associated with a shoreline operation in remote locations.

12.3 Priority Receptors

In locations along the Kimberley coast, access to shorelines is typically restricted to boat and long-distance steam times from launching, so it will be very difficult to get to suitable locations to install protection booms. For these areas the removal of oil using offshore Containment and Recovery, together with the application of dispersants, is the key strategy for preventing shoreline impacts.

In some offshore locations the water may be sufficiently calm to install fixed booms in deep water to assist in the protection of high sensitive areas where shoreline clean-up may be very difficult to effectively achieve. This will be considered to protect large mangrove stands that are difficult to access, however, the large tidal range will result in high velocity water and may exceed the operating parameters of booms.

The minimum time for oil contact at a priority receptors is 9 days at 100 g/m^2 with most areas on a scale of more than 2 weeks. This provides time for pre-assessment of shoreline areas for which oil may contact, noting sensitive receptor locations, fauna presence (e.g. nesting turtles and birds) and morphology of shorelines/creek systems. These aspects change seasonally, and a pre-assessment window provides the ability for up to date information to be considered when formulating a specific plan for shoreline protection.

12.4 Resource Rationale for Protection and Deflection

OSTM outputs assisted in identifying priority receptors and to help determine the number of shoreline protection and deflection operations required for each location. The resource rationale presented in Table 12-1 is for capability analysis only and would be revisited should a spill occur.

Error! Reference source not found. presents resourcing requirements using the stochastic modelling results for shoreline accumulation >100 g/m². It should be noted that not all of the receptors listed in **Error! Reference source not found.** may be contacted by one single spill. These results are presenting the range of possible worst-case timeframes for accumulation and length contacted based on all runs that make up the stochastic model. Jadestone will use initial operational monitoring data (e.g. trajectory modelling and aerial surveillance) to determine where resources should be allocated. This may include directing resources to conduct shoreline assessment at locations not identified as protection priority areas, to determine if protection and clean-up activities may be required at these receptors.

For planning purposes, **one protection and deflection operation** consist of:

- Boom (shore sealing, self-inflating and solid flotation);
- Ancillary equipment and vessels (if required);
- 2 trained oil spill team leaders; and
- 5 personnel / labour hire to deploy the booms.

Jadestone has access to the required resources via AMOSC, AMSA and OSRL (refer to

Table 6-2 and Table 7-1).

Table 12-1: Shoreline protection resource requirements for priority receptors based on stochastic modelling

Priority receptor	Minimum time to shoreline accumulation >100 g/m^2 (Days)	Length (km) of shoreline accumulation ≥ 100 g/m^2	Number of shoreline protection and deflection operations recommended
Ashmore Cartier	10	26	1
Tiwi Islands (Melville and Bathurst)	15	142	2
Darwin Coast	16	100	2
Western NT (Kakadu, Coburgh, East Arnhem Is, West Arnhem Is)	16	190	4
Joseph Bonaparte Gulf (NT)	15	294	4
Indonesia	22	640	TBD
Timor Leste	21	180	TBD
Kimberley Coast	9	1,500	4

13. SHORELINE CLEAN-UP STRATEGY

Shoreline clean-up in State / Territory Waters is managed by the SMPC and HMA, respectively. Jadestone will undertake first-strike activations as required. The SMPC / HMA will direct resources provided by Jadestone for the purposes of shoreline clean-up. Jadestone, in combination with the mutual aid arrangements of the AMOSPlan are to provide all necessary equipment and personnel.

The information obtained from operational monitoring (refer to Section 9), will be used to identify possible impact areas, and by the IMT in the development of the operational NEBA. The operational NEBA will assess if the shoreline clean-up activities will be beneficial in accelerating the return of shorelines to baseline conditions.

Around 5,102 km of shoreline was surveyed, analysed and mapped to provide spatial and quantitative characterisation of vulnerable coastal ecological features between Darwin (NT) and Broome (WA) (UniQuest, 2010). Table 13-1 summarises the shoreline between Broome and Darwin, which is the area the worst-case spill scenario for Montara may contact on mainland Australia.

Mangroves grow along 63% of the surveyed shoreline, covering over 3,200 km. Saltmarsh occurs on more than 1,200 km of coastline or 23.8% survey region and the coastline is rocky for 2,763 km of shoreline. For the total shoreline surveyed, 9,441 km^2 of tidal wetland were observed. This is calculated as 1.85 km^2 of tidal wetland for every kilometre of shoreline within the Montara loss of well control region (Darwin to Broome).

Table 13-1: Summary of coastal characteristics from Darwin (NT) to Broome (WA).

		km	% of shoreline
Physical characteristics	Rocky	2,762.8	54.2
	Beach	1,663.7	32.6
	Flat	2,185.5	42.8
	Dune	1,536.9	30.1
	Other wetland	15.9	0.3
Vegetated habitat type	Mangrove	3,214.1	63.0
	Saltmarsh	1,215.4	23.8
	Fringing coral	350.9	6.9
	Seagrass verge	11.5	0.2
	Coastal Woodland	3,886.6	76.2
State of erosion and deposition	Deposition	548.8	10.8
	Erosion	544.7	10.7
	Stable	3,576.7	70.1
Tidal wetlands	Mangrove	3,214.1	63.0
	Saltmarsh	1,215.4	23.8
	Sand and mud flats	1,379.2	27.0
	Salt flat	1,396.8	27.4

Source: Shoreline Ecological Assessment Aerial and Ground Surveys, 9-19 November 2009. UniQuest Pty Ltd 2010.

Note: percentages do not add to 100 as categories overlap in some locations.

13.1 Initiation and Termination Criteria

Tactic	Initiation criteria	Termination criteria
NEBA of shoreline response strategies	When SCAT surveys recommend shoreline clean-up activities.	When SCAT surveys recommend no further action be taken (NFA).
Shoreline clean-up and waste management	When NEBA of shoreline strategies recommends shoreline clean-up activities.	When SCAT surveys recommend no further action be taken (NFA). Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the response.

13.2 Tactics

Jadestone will:

- Undertake a NEBA of shoreline response strategies utilising findings from SCAT surveys, and
- Implement shoreline clean-up and waste management.

For planning purposes, Jadestone uses a minimum threshold of 100 g/m^2 (concentration of accumulated hydrocarbons on shorelines) to determine the lower limit for effective clean-up operations.

Once SCAT surveys of key shorelines have been completed (Refer to Section 9.4.7), the results would help inform an operational NEBA and suitable response tactics for that location. Response strategies may include manual bagging of stranded oil where access can be gained, surf washing where wave action and sandy beaches are accessible by machinery, tilling and turning the sand to aid bioremediation where wave action is not strong enough to drive surf washing, rock flushing with high volume low pressure sea water, or leaving the weathered oil in-situ to breakdown where access for man or machinery is not possible.

Shoreline habitats in the region predominantly comprise of high relief rocky shoreline, sandy beaches, inter-tidal reefs, and mudflats/mangrove habitats. Macroalgal and seagrass beds will be avoided when assessing shoreline clean-up response strategies and the less intrusive options of natural attenuation and bioremediation will be preferred.

Information on shoreline type obtained from SCAT surveys will contribute toward the NEBA process. Each likely shoreline impact will be evaluated through observations and modelling, and shoreline response teams will be deployed and positioned as per those observations. Through information gathered and assessed by the IMT and SMPC / HMA, the movement of floating oil towards shorelines is to be identified and clean-up tactics implemented to reduce the consequences to shoreline habitats to ALARP. A summary of shoreline clean-up techniques is provided in Table 13-2.

Intrusive shoreline clean-up techniques have the potential to damage sensitive shorelines. Given that the majority of the mainland shoreline contacted consists of tidal mangroves and saltmarshes, the appropriateness of clean-up will be determined as opposed to natural attenuation. Selection of the shoreline clean-up methods and controls to prevent further damage from the clean-up activities are to be undertaken in consultation with the SMPC / HMA and selected based on NEBA.

Jadestone will have an agreed process which allows for stakeholder input into the clean-up endpoints as per the National Plan: Response, Assessment and Termination of Cleaning for Oil Contaminated Foreshores (AMSA, 2022a). The degree of damage from shoreline clean-up activities is to be managed to ALARP, taking into account net environmental benefit of the clean-up activity.

Table 13-2: Shoreline clean-up techniques

Method	Description
Mechanical clean-up	Mechanical clean-up techniques may utilise several equipment types. It is best to use equipment in the way for which it was designed. Front end loaders, bulldozers and elevating scrapers can all be used to rework beach sediment (e.g. cobble, pebble, and boulder) or to push such sediments into the shoreline for cleaning by waves. Note: Vehicles should not be allowed to pass over oiled sediment since this tends to result in the burial of oil into sediment.
Manual clean-up	Manual clean-up is the preferred option for cleaning inaccessible shorelines or those where mechanical clean- up is undesirable. Manual clean-up is slower than mechanical clean-up but generally results in the removal of much less sediment. Hence disposal requirements are reduced. Equipment is usually basic and consists of wheelbarrows, rakes, buckets, shovels, plastic bags (industrial strength) or other temporary storage. The requirements for manual beach clean-up are highly variable but generally a 10-person team, plus 1 supervisor is required to recover $10m^3$ of oil in one day.
Low pressure flushing	Low pressure flushing can be used, with care, to remove surface oils from most beach type surfaces. It is important that refloated oil is collected in booms or other containment devices and recovered using skimmers or sorbents. Generally low pressure flushing does not result in the emulsification of oils and so sorbents may be used. It is preferable to check the condition of refloated oil and choose a suitable skimming device and pump. It is important also that refloated oil does not pass over clean sediment.
High pressure flushing	High-pressure washing is to be used only on artificial surfaces such as wharves, jetties etc. This method tends to emulsify oil and consequently the use of sorbents to collect refloated oil is not recommended. Oil, which is removed from surfaces, can be collected within light inshore booms or onshore using Shore Guardian or a similar boom. Oil can be recovered using vacuum systems or skimmers. Material and labour requirements are highly variable and will depend on the extent of oiling, the speed with which cleaning is expected to proceed, the type of substrate and the ease with which containment can be achieved.
Enhanced bioremediation (sediment reworking)	Machinery is used to breakup large paddies of stranded oil on beaches and to till and turn the oiled sands to aerate the sandy sediment and enhance the biological breakdown of the oil. This can be applied to oil that has deposited on sands above the normal high-tide area, typically during large storms, and there is little likelihood of the water reaching the stranded deposits.
Monitoring of natural attenuation and bioremediation	By implementing shoreline clean-up methods described above, the amount of oil remaining stranded on shorelines will be reduced to ALARP; the remaining oil will be very difficult to access or remove and the activity is no longer preferred under NEBA when compared to the impacts of the intrusive clean-up methods. In addition, and assessed under NEBA, some areas of coastline will not be subjected to any clean-up methods due to access issues or possible impacts from the clean-up activities. It's at this point that monitoring of natural attenuation and bioremediation become the selected clean-up methods under a NEBA assessment. These areas will be monitored until no visible oil is remaining in the impacted area.

Method	Description
Supplementary equipment	
Sorbents	Two types of sorbent materials can be used; (1) loose, powdered or granular sorbents, or (2) solid, pads, rolls or sheets. Each of these may be either of synthetic or natural fibre. As a general rule, loose sorbent materials are not used because they are difficult to recover. However, there are occasions when this is not considered to be a problem, such as in high-energy areas where oily sorbent materials can be expected to be washed from surfaces and dissipated to sea. Of course, oil too is likely to be washed off such shorelines, to dissipate. Solid sorbents may be used in the form of sorbent booms to recover light oil films or as pads or rolls to absorb free oil from the surface of sediments in cases where vacuum systems cannot gain access or where oil is too fluid for manual recovery.
Vacuum systems	Vacuum systems may be portable hand operated systems or vacuum trucks. Vacuum systems tend to pick up large volumes of water with the oil and so it is preferable to use them on oil pooled on the sediment surface or to remove oil from containers or dams in which the water has been decanted. One method to minimise the amount of water removed from the beach is to use light, portable vacuum systems to deposit oil-water into temporary storage containers on the beach, allow settling time and to decant the water. Large units can then be used to collect the oil from these containers and transport oil to storage sites. Vacuum systems can also be used in association with deflection booms to recover oil from the sea surface. It is advisable in this case to fit the hose with a broad Manta Ray head.

13.3 Resource Rationale for Shoreline Clean-Up

The combination of machinery for mechanical removal of oil (bulldozers/ scrapers/ front end loaders) and personnel requirements have been considered for each priority receptors area based on opportunities for use and sensitivity of shoreline (i.e. may not be used for small offshore islands or for remote rocky or mangrove lined shorelines). Therefore, it is the opportunity for use rather than the availability of machinery and personnel which is considered the limiting factor.

Operational Constraints
• Access to remote islands; • Biosecurity issues associated with moving people and equipment between remote islands and the mainland; • Access to sites (habitat, terrain, distance from the mainland, landing/mooring sites for shallow draft vessels); • Transport of equipment to remote sites from vessels; • Crew rotation requirement; • Duration of response; • Weather and sea-state; and • Hazardous wildlife.

Analysis of the worst replicate simulation for the greatest number of shoreline clean-up responders required, and highest probability for shoreline contact has been used to inform the personnel and waste requirements for shoreline clean-up. It is assumed that planning for the greatest number of teams will meet the requirements of all shoreline contact. Jadestone has planned for one trained Team Lead and 10 personnel in each shoreline clean-up team and assume that each team can recover 10 m^3 per day. This will vary with specific real-time shoreline contact volume and extent. Tiwi Islands presents the greatest requirement for shoreline clean-up teams (15 teams) as presented in Table 13-3.

A Browse Island Oil Spill Incident Management Guide (INPEX, 2018) and Kimberley Shoreline Response Plan (AMOSC, 2019b) have been prepared to assist in the planning and safe execution of an oil spill response at Browse Island (or other remote shorelines). Jadestone would review the INPEX guide and Kimberley Shoreline Response Plan at the time of a spill, to assist in the preparation of an appropriate shoreline response plan and capability to match the need for remote shorelines. This will be undertaken in consultation with OSRL and WA DoT, considering the practicalities, likely success and risks associated with a shoreline operation in remote locations.

13.4 Priority receptor

Table 13-3: Resource Rationale for Shoreline Clean-up Personnel

Receptor	Minimum time to shoreline in worst replicate simulation ≥ 100 g/m^2 (days)	Accumulated oil on shoreline in worst replicate simulation (m^3)	Maximum daily average oil ashore (m^3)	Number of shoreline clean-up teams required (1 team per 10 m^3/day)	Potential waste generated per day (worst replicate simulation bulking factor of 10) (m^3)
Ashmore and Cartier Island	10	1,051	11	n/a	n/a
Tiwi Islands	15	12,680	140	15	1,400
Darwin Coast	16	3,342	38	4	380
Western NT	16	8,047	90	10	900
Joseph Bonaparte Gulf (NT)	15	7,481	83	10	830
Indonesia	22	4,522	54	n/a	n/a
Timor Leste	21	940	11	n/a	n/a
Kimberley Coast	9	5,709	59	6	590

13.4.1 Ashmore Reef and Cartier Island

Shoreline clean-up is not an option for Ashmore Reef or Cartier Island. Cartier Island and the surrounding marine area within a 10 km radius was a gazetted Defence Practice Area up to 20 July 2011. Although no longer used, there is a substantial risk that Unexploded Ordnances (UXO) remain in the area. Landing or anchoring anywhere within the Cartier Island Commonwealth Marine Reserve is strictly prohibited. Ashmore Reef comprises of a shelf-edge reef system with small islands and associated sandbars within the reef rim. Ashmore Reef Ramsar site is located within the boundary of the Marine Park. Shoreline clean-up activities would result in more damage to the environmental values than the oil. Focus for protection is offshore strategies and scientific monitoring.

Ashmore and Cartier Island also present environmental and safety constraints for shoreline clean-up activities including:

- Remote location presenting logistics challenges and safety concerns for landing vessels, people and equipment;

- Small sand islands within a submerged and emergent reef system presenting challenges for personnel to work with suitable facilities and waste storage;
- Landing and undertaking shoreline clean-up activities is likely to result in damage of any turtle and bird nesting sites that may be present; and
- The sands of Cartier Island were found to be highly mobile during campaigns in 1986 to clear the site of UXO.

13.4.2 Tiwi Islands (Melville and Bathurst)

Contact times (15 days) allow for comprehensive planning to be undertaken and the required capability to be sourced. Modelling indicates that approximately 142 kms across 5 separate locations on the eastern side of Bathurst and Melville Islands will have shoreline loading of 100 g/m^3 or above. Of this, approximately 90% is beaches and shoreline clean-up is viable, with consideration to turtle nesting. Considerations for planning for shoreline clean-up are:

- Clean-up operations are to be conducted in five locations;
- Maximum daily oil ashore is calculated at approximately 147 m^3 per day from Day 15;
- 140 m^3 over five locations is approximately 28 m^3 per day, would require three clean-up teams per site to meet maximum daily oil volumes; and
- A total of 15 teams will be required (three teams per site).

13.4.3 Darwin Coast

This area has large areas of tidal wetlands and very high tidal ranges. Modelling indicates that approximately 100 kms will have shoreline accumulation ≥ 100 g/m^2, concentrated on the Vernon Islands. Of this, approximately 12% is beaches and the majority is mangroves and tidal flats.

- Clean-up operations are to be conducted in three locations;
- Maximum average daily oil ashore is calculated at approximately 38 m^3 per day from Day 16;
- 38 m^3 over three locations is approximately 13m^3 per day; and
- A total of four teams will be required (one team per site and an additional team available to support the three sites depending on level of contact).

13.4.4 Western NT

This area has large areas of tidal wetlands and very high tidal ranges. Modelling indicates that approximately 190 kms will have shoreline accumulation ≥ 100 g/m^2, concentrated on the Coburg Peninsula, West Arnhem Land and Kakadu Coast. Of this, approximately 12% is beaches and the majority is mangroves and tidal flats.

- Clean-up operations are to be conducted in three locations;
- Maximum average daily oil ashore is calculated at approximately 90 m^3 per day from Day 16;
- 90 m^3 over three locations is approximately 30 m^3 per day; and
- A total of 10 teams will be required (Three teams per site and an additional team available to support the three sites depending on level of contact).

13.4.5 Joseph Bonaparte Gulf (NT)

This area has large areas of tidal wetlands and very high tidal ranges. Modelling indicates that approximately 294 kms will have shoreline accumulation ≥ 100 g/m^2, concentrated on the north-eastern side. Of this, approximately 10% is beaches and the majority is tidal wetlands.

- Clean-up operations are to be conducted in three locations;
- Maximum average daily oil ashore is calculated at approximately 83 m^3 per day from Day 15;
- 83 m^3 over six locations is approximately 13 m^3 per day; and
- A total of 10 teams will be required (one team per site and an additional four teams available to support the six sites depending on level of contact).

13.4.6 Indonesia and Timor Leste

Although not within the bounds for acceptance of activities in Commonwealth Waters, a response to International shorelines has been considered to ensure that sufficient capability is available for a LOWC. Jadestone will be responsible for activating and overseeing capability engaged to manage shoreline response activities on international shorelines through the arrangements detailed in the OSR Arrangements. OSRL has been engaged as a response agency and will be mobilised to provide SCAT surveys and shoreline response activities within this timeframe in consultation with the appropriate authorities.

Oil spill modelling predicts shortest time to shoreline accumulation on Indonesian Islands and West Timor as 21 days.

Assuming a worst-case shoreline contact of approximately 5,462 m^3, the capability required to respond to an event of this nature and scale will depend on the shoreline clean-up tactics recommended by the SCAT teams guiding shoreline response activities.

OSRL has the capability required to respond to a spill event of this nature and scale as demonstrated through their online equipment resource lists. Jadestone has signed an APAC Associate Agreement with OSRL to hire oil spill response equipment, vessels and vehicles, as well as to engage dedicated response personnel. Personnel are on standby and available 24/7 with equipment and logistics support to initiate, mobilise and sustain a response comprising of up to 18 fully trained and competent response personnel.

Typical initial roles of the team may include, but are not limited to the following tasks:

- Technical advice and incident management coaching within the command centre;
- Development of an Incident Management Plan;
- In country logistics planning and support for inbound equipment;
- Impact assessment and advice on response strategy selection;
- SCAT and aerial surveillance; and
- Tactical response planning.

OSRL maintains a minimum pool of 80 dedicated response staff which Jadestone can access for an international response.

13.4.7 Kimberley Coast

This area has large areas of tidal wetlands, coastal coves, offshore islands and very high tidal ranges. Modelling indicates that approximately 1,500 kms will have shoreline accumulation ≥ 100 g/m^2, concentrated on the offshore islands. The offshore islands create a natural barrier and prevent intrusion into the coastal rivers and estuaries. Of this, approximately 15% is beaches which may be available for shoreline clean-up.

- There is no clearly defined locations across the receptor for clean-up operations to be conducted;
- Maximum average daily oil ashore is calculated at approximately 59 m^3 per day from Day 9;
- Clean-up operations will be sea based and therefore mobile;

- 59 m^3 would require therefore a minimum of six clean-up teams to meet maximum daily oil volumes which can be deployed as required; and
- A total of 6 teams will be required.

14. OILED WILDLIFE RESPONSE

The Department of Climate Change, Energy, and the Environment and Water (DCCEEW) are the designated Jurisdictional Authority for spills in Commonwealth waters, and Jadestone will act as the Control Agency and will be responsible for the wildlife response for a petroleum activity spill associated with Montara Operations activities.

If a spill occurs in WA State waters or enters State waters, DBCA is the Jurisdictional Authority for wildlife, and for Level 2/3 spills, will also lead the oiled wildlife response under the control of the Department of Transport (DoT).

DBCA is the State Government agency responsible for administering the *Biodiversity Conservation Act 2016* (BC Act), which has provisions for authorising activities that affect wildlife. DBCA will activate the WAOWRP (DBCA, 2022a) where medium or high wildlife impact is noted or anticipated as per the WAOWRP (DBCA, 2022b) Guide for Rating the Wildlife Impact of an Oil Spill (Table 14-1).

For Level 1 spills (as defined in Appendix A6) within or that enter WA State waters, Jadestone will be the Control Agency, including for wildlife response (assuming the wildlife impact is low, as per Table 14-1). It is however also an expectation that for Level 2/3 petroleum activity spills, Jadestone will conduct the initial first-strike response actions for wildlife and continue to manage those operations until DBCA is activated as the lead agency for wildlife response and formal handover occurs. Following formal handover, Jadestone will function as a support organisation for the OWR and will be expected to continue to provide planning and resources as required.

The key plan for OWR in WA is the WA Oiled Wildlife Response Plan (WAOWRP) (DBCA, 2022a) and the accompanying WA Oiled Wildlife Response Manual (WA OWR Manual) (DBCA, 2022b). The WAOWRP establishes the framework for preparing and responding to potential or actual wildlife impacts during a spill and sets out the management arrangements for implementing an OWR in conjunction with the State Hazard: SHP-MEE.

The NT IMT is the Control Agency, and the Department of Environment, Parks and Water Security (DEPWS) is the Jurisdictional Authority for oiled wildlife response within NT waters.

For Level 1 spills in Territory waters, Jadestone will be the Control Agency, including for wildlife response. It is however also an expectation that for Level 2/3 petroleum activity spills, where the NT IMT is the Control Agency, Jadestone will conduct the initial first-strike response actions for wildlife and then continue to manage the on-going response as a support organisation under the NT IMT.

The NT Government does not currently have an OWR plan in effect, although an NT OWR Plan was prepared (AMOSC, 2019a) on behalf of Member Titleholders Inpex, ConocoPhillips and Shell Australia.

The WA OWR Manual will be used by Jadestone as the resource for all procedures and processes, regardless of the location of the spill.

Table 14-1: WAOWRP Guide for Rating the Wildlife Impact of an Oil Spill (DBCA, 2022a)

Wildlife Impact Rating	Low	Medium	High
What is the likely duration of the wildlife response?	< 3 days	3 – 10 days	> 10 days
What is the likely total intake of animals?	<10	11 - 25	>25
What is the likely daily intake of animals?	0-2	2 - 5	>5

Wildlife Impact Rating	Low	Medium	High
Are threatened species, or species protected by treaty, likely to be impacted, either directly or by pollution of habitat or breeding areas?	No	Yes - possible	Yes- likely
Is there likely to be a requirement for building primary care facility for treatment, cleaning and rehabilitation?	No	Yes - possible	Yes - likely

14.1 Initiation and Termination Criteria

Table 14-2: Initiation and Termination Criteria

Tactic	Initiation criteria	Termination criteria
Wildlife reconnaissance Wildlife first response Mobilisation of resources	When operational monitoring shows that wildlife have been oiled or at imminent risk of oiling	There are no oiled wildlife; Oiled wildlife have been successfully rehabilitated and released; and when agreement is reached with Jurisdictional Authorities and stakeholders to terminate the incident response

14.2 Wildlife Priority Protection Areas

French-McCay et al. (2002), based on a review of existing literature at the time, determined lethal thresholds for floating and shoreline oil for the external coating of wildlife to be ≥10 g/m^2 for floating, and ≥100 g/m^2 for shoreline accumulation. It should however be noted that toxicity thresholds for wildlife are likely to be highly variable due to differences in species sensitivity, type of hydrocarbon, type of exposure (ingestion or external oiling), life-stage, and on-water versus land habitat.

For planning purposes, determination of wildlife priority protection areas is based on stochastic modelling of the worst-case spill scenarios at ≥10 g/m^2 for floating, and ≥100 g/m^2 for shoreline accumulation (acknowledging that impacts to wildlife may occur at lower concentrations), the known presence of wildlife, and in consideration of the following:

- Presence of high densities of wildlife, threatened species, and/or endemic species with high site fidelity
- Greatest probability and level of contact from floating oil and/or shoreline accumulation
- Shortest timeframe to contact.

The wildlife priority protection areas for the Montara operations align with the priority protection areas for spill response described in Section 5 and 7 and Appendix J of the Montara Operations EP.

14.3 Magnitude of Wildlife Impact and Oiled Wildlife Response

Using the WAOWRP (DBCA, 2022a) *Guide for Rating the Wildlife Impact of an Oil Spill* (Table 14-1), and stochastic modelling for the worst-case spill scenarios (Section 8.6 of the EP), it is predicted that high wildlife impacts may occur.

During the initial first-strike the focus of the OWR by Jadestone will be on wildlife reconnaissance, determining the magnitude of wildlife impact (which will likely change over time), and the mobilisation of resources. To mobilise OWR resources Jadestone will need to activate OWR arrangements with AMOSC and

OSRL (depending on the magnitude of impact). Upon activation and formal handover to DBCA, Jadestone will function as a support organisation for the OWR and will continue to provide planning and resources as required.

Further information describing oiled wildlife response arrangements is provided at Appendix A of the Incident Management Team Response Plan (JS-70-PLN-F-00008).

15. CONTROLS

Environmental performance outcomes (EPOs) of the response strategies, control measures, performance standards presented in **Table 15-1** are:

- Reduce oil volumes from reaching the shoreline to as low as reasonably practicable; and
- Reduce impacts to marine and coastal fauna through the implementation of the WA Oiled Wildlife Response Plan and WA OWR Manual; or Northern Territory Oiled Wildlife Response Plan.

Table 15-1: Operational Performance Standards and Measurement Criteria

Response Elements	Control Measures	Performance Standards	Measurement Criteria
Notifications and Activations	Activate external resources	Verbal notification/activation of external resources as per Appendix A5	Incident Log
	Conduct external notifications	External notifications and regulatory reporting conducted as per Appendix 5	Incident log
Overall spill response	Spill response activities selected on basis of a Net Environmental Benefit Analysis (NEBA) (Incident Management Team Response Plan JS-70-PLN-F-00008)	NEBA undertaken every operational period and considered in development of following period Incident Action Plan	Incident log
	Montara Operations (MV-70-PLN-G-00001) provides for NEBA, notifications and consultation	OPEP activated as per OPEP notification tables (Sections 16.1 or 16.2 and 16.3– as relevant)	Incident log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
	requirements to ensure net environmental benefit from response		
	Jadestone Energy Incident Management Team Response Plan (JS-70-PLN-F-00008) procedure details IMT Core team members, resource pool and responsibilities	Jadestone IMT comply with Jadestone Energy Incident Management Team Response Plan (JS-70-PLN-F-00008)	Incident log
	Vessels comply with MARPOL and protected area sewage disposal requirements	Vessel sewage disposal will meet MARPOL Annex IV requirements. If vessel activities occur within protected areas, discharges will meet marine park management plan requirements and the DoT sewage strategy[8]	Vessel checklist or other confirmation from vessel master that requirements will be met
	Vessels comply with MARPOL requirements for	Vessel oily water disposal will meet MARPOL Annex I requirements.	

[8] http://www.transport.wa.gov.au/mediaFiles/marine/MAC-IS-SewageStrategy.pdf

Response Elements	Control Measures	Performance Standards	Measurement Criteria
	oily water (bilge) discharges		
	Consultation undertaken in accordance with Jadestone Energy Consultation of Relevant Persons Procedure (JS-70-PR-I-00034) prior to deployment in populated areas	Consultation is undertaken with relevant stakeholders prior to deployment of resources to townships and marine/coastal areas.	Consultation records
	Localised Risk Management Assessment undertaken to minimise potential impacts on populated areas	A Risk Management Assessment is undertaken prior to large scale deployment of resources to populated areas	Risk Management Assessment
Source Control Action Plan	Shipboard Oil Pollution Emergency Plan (SOPEP)	SOPEP activated within 60 minutes of spill incident	Incident log
	Montara Incident Response Plan (MV-70-PLN-F-00001)	Montara Incident Response Plan activated within 60 minutes of IMT being convened	Incident log
	Blowout Contingency Plan	Blowout Contingency Plan activated within 6 hours of LOWC incident	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
	LOWC Control Action Plan	LOWC Control Action Plan activated within 6 hours of LOWC incident	Incident Log
	LOWC notification	Complete notification and activation of AMOSC, Well Control Specialists and relevant others within 2 hours of IMT being convened	Incident Log
	SFRT activation (if applicable)	SFRT equipment and vessel in Darwin within 9 days of activation SFRT equipment infield within 11 - 12 days of activation	Incident Log
	Relief Well	Commence drill rig contracting within 24 hours of activation	Incident Log
		Rig infield within 23 days of activation	Incident Log
		Finalise relief well plan within 23 days of spill	Incident Log
		Commence drilling relief well within 24 days of spill	Incident Log
		Finalise relief well kill plan within 50 days of spill	Incident Log
		Commence kill operations within 51 days of spill	Incident Log
	Survey and Planning	Commence site survey to inform source control options within 11- 12 days of activation	Incident Log
	Well Debris Removal (if applicable)	Develop debris removal plan within 12 days of activation	Incident Log
		Commence debris removal within 13 days of activation (using SFRT) and 21 days for heavy debris removal (WWC)	Incident Log
	SSDI	Commence subsea dispersant injection within 11 - 12 days of spill notification using SFRT	Incident log
Operational monitoring	Operational Monitoring Plan	Activate Operational Monitoring Action Plan within 60 minutes of IMT being convened	Incident Log
	Vessel Surveillance	Vessel Surveillance initiated within 24 hours following request from IMT.	Incident log
		Observation reports submitted to IMT within 60 mins of completing surveillance	Incident log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
	Aerial Surveillance	Aerial Surveillance initiated within 6 hours following request from IMT.	Incident log
		Two passes per day of spill area by observation aircraft provided from Day 1 of response	Incident log
		Trained Aerial Observers supplied within 48 hours of response.	Incident log
		Flight schedules are maintained throughout response.	Incident Action Plan
		Observers completed aerial surveillance observer log following completion of flight.	Aerial Observer Logs
		Aerial surveillance continues until termination criteria are met.	Incident log
	Tracking Buoys	Tracking buoys deployment to be initiated within one hour of IMT being convened, subject to vessel availability and weather conditions	Incident log
		Tracking buoys utilised until termination criteria met.	Incident log
	Satellite Imagery	Satellite imagery requested within 6 hours of IMT being convened	Incident Log
		Satellite imagery delivered to IMT within 24 hours of request to service provider	Incident Log
		Satellite imagery continues until termination criteria are met.	Incident Log
	Oil Spill Modelling	Oil Spill modelling activated within 4 hours of IMT being convened for a Level 2/3 spill notification.	Incident Log
		Modelling delivered to IMT within 4 hours of request to service provider.	Incident Log
		Modelling continues until termination criteria are met.	Incident Log
	Fluorometry	Jadestone will conduct in-field efficacy testing in accordance with the Special Monitoring of Applied Response Technologies (SMART) monitoring protocol (NOAA, 2006)	Incident Log
		Visual monitoring surveys of dispersant effectiveness conducted from initial dispersant application	Incident Log
		Fluorometry surveys mobilised within 2 days of initiation.	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
		Daily report including fluorometry results provided to IMT within 24 hours of completing daily survey.	Incident Log
	SCAT	Commence deployment of SCAT teams within 48 hours of becoming aware of potential impacts to shorelines	Incident Log
		Completed SCAT surveys are delivered to IMT within two hours of the Survey Team returning to its operating base	Incident Log
		SCAT surveys undertaken daily at priority locations	Incident Log
Surface Chemical Dispersion	Chemical Dispersion Action Plan (Surface)	NEBA undertaken within 2-4 hours of IMT convened and daily thereafter to determine if chemical dispersion will have a net environmental benefit. NEBA is to be included in development of following period Incident Action Plan	Incident Log
		Activate Chemical Dispersant Action Plan within one hour of NEBA demonstrating that dispersant application is likely to result in a net environmental benefit	Incident Log
		A pre-deployment operational assessment of dispersant application location, dosage and equipment use is undertaken	Incident Log/ IAP
		The NEBA for dispersant application will consider the following inputs: • Trajectory of spill and sensitive receptors within EMBA • Dispersant efficacy testing • Forecast spill modelling of naturally and chemically dispersed oil • Ecotoxicity data (species protection trigger levels) for dispersed oil (including chemically dispersed oil) (once available) • Consultation with the SMPC	Incident Log
		All surface chemical dispersant operations will occur during daylight hours only. At no time can chemical dispersant be applied: • In waters shallower than 20 m; • Within exclusion zones for offshore facilities;	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
		• Within a Marine Park boundary or its buffer; and/or • Within WA State Waters unless approved by the SMPC.	
		Develop a Surface Dispersant Application Plan (IAP Sub-Plan) within 12 hours of NEBA confirming an overall environmental benefit	Incident Log
		Commence mobilisation of resources (equipment, stock, platforms) to support dispersant operations within 4 hours of Chemical Dispersant Action Plan being activated Aerial chemical dispersant application will be available for operation within 18 hours of initial AMOSC notification (daylight and weather condition dependent)	Incident Log
		If dispersant application is approved by the Incident Commander, a test spray will be conducted to assess dispersant effectiveness	Incident Log
		Commence vessel chemical dispersant application within 42-84 hours of Chemical Dispersant Action Plan being activated	Incident Log
		Each vessel shall have one person who has been trained in the operation of vessel-based dispersant systems and monitoring dispersant effectiveness Prioritise the mobilisation and application of dispersants Dasic Slickgone NS and Corexit 9500 prior to other dispersant types Chemical dispersant applied in consultation with relevant statutory agencies and SMPC	Incident Log
		AMOSC, in consultation with IMT to complete an Air Operations Plan and submit to AMSA within 12 hours of initial activation to enable activation of the FWADC	Incident Log Air Operations Plan
		The effectiveness of the aerial based chemical dispersion strategy is communicated to the Operations Lead via the Air-Attack Supervisors	Incident Log
		Response to continue until NEBA demonstrates no environmental benefit to use chemical dispersants.	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
Shoreline Protection and Deflection	Shoreline Protection and Deflection Action Plan	NEBA undertaken within 2-4 hours of IMT being convened (and impacts to shorelines are likely) and daily thereafter to determine if Protection and Deflection will have a net environmental benefit. NEBA is to be included in development of following period Incident Action Plan	Incident Log
		Activate Protection and Deflection Action Plan within one hour of NEBA demonstrating that protection and deflection is likely to result in a net environmental benefit	Incident Log
		IMT to confirm priority receptors in consultation with the Control Agency	Incident Log
		Develop a P&D Plan (IAP Sub-Plan) (if required) within 12 hours of NEBA confirming an overall environmental benefit	Incident Log
		Obtain regulatory approvals to access locations for P&D operations within 3 days of spill or 48 hours prior to estimated shoreline contact	Incident Log
		Commence deployment of personnel, equipment and vessels within 24 hours of completion of Protection and Deflection Plan (IAP Sub-Plan)	Incident Log
		Use shallow draft vessels for shoreline and nearshore operations to reduce seabed disturbances	Incident Log
		Establish demarcation zones for vessel, boom and skimmer usage	Incident Log
		Nearshore booming and skimming operations conducted during daylight hours only to minimise impacts from light emissions	Incident Log
Offshore Containment and Recovery (C&R)	Containment and Recovery Action Plan	NEBA undertaken within 2-4 hours of IMT being convened and daily thereafter to determine if containment and recovery will have a net environmental benefit. NEBA is to be included in development of following period Incident Action Plan	Incident Log
		Activate Containment and recovery Action Plan within one hour of NEBA demonstrating that containment and recovery is likely to result in a net environmental benefit	Incident Log
		Develop a Containment and Recovery Plan (IAP Sub-Plan) within 12 hours of NEBA confirming an overall environmental benefit	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
		Commence mobilisation of personnel, equipment and vessels within six hours of Containment and Recovery Action Plan being activated	Incident Log
		Commence C&R operations within 24-36 hours of Containment and Recovery Action Plan being activated	Incident Log
		Containment and recovery operations to be managed by a minimum of two trained Oil Spill Responders (per system)	Incident Log
		Review waste management options for C&R within 24 hours of Containment and Recovery Action Plan being activated	Incident Log
		Obtain approvals from relevant Jurisdictional Authority prior to commencing decanting operations	Incident Log
		Oily water collected during offshore containment and recovery to be decanted (if approved) behind boom	Incident Log
		Vessels to maintain minimal lighting required for safety and navigation requirements	Incident Log
		Response vessels compliant with EPBC Act Regulation 8 (cetacean interactions) (Montara Marine Facility Operating Manual MV-90-PR-H-00001, Aviation Procedure JS-83-PR-G-00010)	Incident Log
		Offshore equipment wash-down confined to hotzone	Incident Log
Shoreline Clean-up	Shoreline Clean-up Action Plan	NEBA undertaken within 2-4 hours of IMT being convened (and impacts to shorelines are likely) and daily thereafter to determine if Shoreline Clean-up will have a net environmental benefit. NEBA is to be included in development of following period Incident Action Plan	Incident Log
		Activate Shoreline Clean-up Action Plan within one hour of NEBA demonstrating that clean-up is likely to result in a net environmental benefit	Incident Log
		IMT to confirm priority receptors in consultation with the Control Agency (if not Jadestone)	Incident Log
		Develop a Shoreline Clean-up Plan within 12 hours of NEBA confirming an overall environmental benefit	Incident Log
		Obtain regulatory approvals to access land within 3 days of spill or 48 hours prior to estimated contact with shoreline	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
		Commence deployment of personnel, equipment and vessels within 24 hours of completion of Shoreline Clean-up Plan (IAP Sub-Plan)	Incident Log
		Shoreline Team Lead to consult with SCAT Team and confirm shorelines for appropriate clean-up techniques prior to undertaking clean-up	Incident Log
		Selection of the shoreline clean-up technique appropriate to shoreline type is to be undertaken in consultation with the Control Agency and selected based on SCAT surveys and NEBA	Incident Log
		Shoreline clean-up team members are briefed by shoreline team leads on how to implement the shoreline clean-up techniques including how to prevent damage to shoreline habitat and surrounding laydown/staging areas	Operational Orders
		Clean-up activities in sensitive environments shall be conducted in front of the primary dune and crews will not access behind the primary dune	Incident Log
		Temporary waste storage on remote beaches should be located at the bottom of the primary dune and above the Highest Astronomical Tide (HAT) mark	Incident Log
		Clean-up strategies will be implemented under the direction of the SMPC / HMA (where relevant)	Incident Log
		A shoreline/ nearshore habitat/ bathymetry assessment is conducted prior to nearshore activities	Incident Log
		Demarcation zones to be established for shoreline operations involving vehicle and personnel movement considering vegetation, bird nesting/roosting areas and turtle nesting timeframes	Incident Log
		Operational restriction of vehicle and personnel movement to limit erosion, compaction and disturbance to birdlife	Incident Log
		Access plans for shoreline operations will prioritise use of existing roads and tracks	Incident Log
		Terrestrial vehicle and equipment deployment via landing barges where there is no existing track access	Incident Log
		A Specialist Advisor is consulted if shoreline operations overlap with areas of cultural or heritage significance.	Incident Log
		Vehicles and equipment are verified as clean and invasive species free prior to deployment to site	Incident Log

Response Elements	Control Measures	Performance Standards	Measurement Criteria
		Onshore equipment wash-down occurs in a decontamination area	Incident Log
		Booms are used for containment of shoreline flushing liquids if contaminated flushing has potential to cause secondary impacts in excess of oil dispersion into ocean	Incident Log
		Shoreline team leads shall verify clean-up effectiveness and conduct final evaluations in consultation with SCAT Teams	Incident Log
Oiled Wildlife Response (OWR)	Oiled Wildlife Response Action Plan	Initiate OWR first strike plan within 12 hours of IMT being convened	Incident log
		OWR undertaken in accordance with the WA Oiled Wildlife Response Plan and the WA Oiled Wildlife Response Manual	Incident log
		Establish OWR structure within IMT within 24 hours of OWR risk being identified	Incident Log
		Commence mobilisation of OWR resources within 48 hours of OWR risk being identified	Incident Log
		Prepare IAP oiled wildlife response sub-plan within 12 hours of wildlife reconnaissance confirming potential or realised impacts to wildlife	Incident Log
Waste Management	Waste Management Plan	Activate Waste Management Plan within 12 hours of IMT identifying waste management requirements for any response strategy	Incident Log
		Request to stand up Waste Contractor to arrange waste pickup and transport undertaken immediately following assessment of need for waste management in the response.	Incident Log
		The IAP process is to be used to determine the required level of response and the quantities and types of equipment required.	Incident Log
		All waste associated with oiled wildlife response disposed of in accordance with the WAOWRP	Incident Log
		DoT OSCP 2015 Waste Management Sub-Plan Guidance / Territory Waste Management Plan considered as part of the Waste Management Plan – Oil Spill Response Support (JS-70-PR-I-00037)	IAP

Response Elements	Control Measures	Performance Standards	Measurement Criteria
		All waste associated with oil spill response activity transported and disposed of in accordance with Environmental Protection (Controlled Waste) Regulations 2004, EP Act 1986 and associated regulations	Waste tracking records
		Compliance with local government municipal waste requirements	Waste consignment records
		Offshore inductions include municipal waste requirements (how to manage domestic waste)	Incident log
		Reduce/ Reuse/ Recycle assessment of collected waste conducted by waste contractor	Waste contractor records
		The Waste Management Operations Team Leader shall communicate daily reports to the Logistics Team Leader to inform of required resources and response effectiveness.	Incident log
		The Logistics Lead shall monitor and record the response to demonstrate all waste management legislative requirements are met.	Incident log
		Demobilisation of the Waste Management Plan will be guided by IAP.	Incident Log
		Waste contractor shall track all wastes from point of generation (Warm-zones and Marinas) to final destination.	Waste contractor records
Scientific Monitoring	Scientific Monitoring Plan (GF-70-PR-I-00035)	Initiation criteria of SMPs will be reviewed during the preparation of the initial Incident Action Plan (IAPs) and subsequent IAPs; and if any initiation criteria are met, relevant SMPs will be activated.	Incident Log
		If any SMPs are activated, the subsequent activation of monitoring service provider is to follow the process outlined in the Jadestone SMP Implementation Plan	Incident Log
		Maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of monitoring	Contract with Monitoring

Response Elements	Control Measures	Performance Standards	Measurement Criteria
			Service Provider/s
		Six-monthly capability reports from Monitoring Service Provider to demonstrate suitable resources are available throughout the activity	Audit Manual (JS-90-PR-G-00003)
		Participation in a Jadestone annual exercise for a spill response scenario by the Environmental service provider is undertaken	Audit Manual (JS-90-PR-G-00003) Emergency exercise evaluation report Audit Manual (JS-90-PR-G-00003) Notification of membership Contract with external environmental consultancy
		Planning Team Lead has the competency to undertake coordination role with environmental service provider	Skills matrix and annual audit of Competency and Training Management system.

Response Elements	Control Measures	Performance Standards	Measurement Criteria
Activation of IMT	Competency and Training Management System [JS-60-PR-Q-00014]	IMT members are competent to undertake IMT roles as defined by the Competency and Training Management System	Skills matrix and annual audit of Competency and Training Management system.
	Incident Management Team Response Plan [JS-70-PLN-F-0008]	Rostered IMT members are at the Incident Control Centre (ICC) or alternative location no less than 2 hours after receiving the activation notification or as decided by the IMT Leader	Incident Log

PART B – RESPONSE

16. INITIAL INCIDENT ACTON PLANS

In the event of a spill:

- Define the spill level (as per Appendix A of the Jadestone Incident Management Team Response Plan (IMTRP) (JS-70-PLN-F-00008))

Activate Incident Action Plan for the first 48-hour operational period:

- Section **Error! Reference source not found.** for Level 1 spills; or
- Section **Error! Reference source not found.** for Level 2/3 spills.

16.1 Level 1 Incident Action Plan

LEVEL 1 SPILL INITIAL INCIDENT ACTION PLAN	**Operational Period: First 48 Hours**
Objectives for operational period	1. Gain control of the spill source (stop or minimise further loss) 2. Build and maintain situational awareness
Protection Priorities:	**Spill Response Strategies:**
• N/A	1. Source Control 2. Operational monitoring

LEVEL 1 SPILL: IAP		**Operational Period: First 48 Hours**		
Timeframe (Within)	**Strategies**	**Tactics (what is to be done)**	**Task guidance (ref.)**	
			Appendix A IMTRP	**OPEP**
30 mins	Activate the Notifications	Verbal and written notifications	**Section 4.2**	**Appendix A5**
60 mins	Activate **Source Control** – FPSO release	Shipboard Oil Pollution Emergency Plan (SOPEP	-	**Section 8**
		Montara Incident Response Plan (MV-70-PLN-F-00001)		
		Isolate hydrocarbon leak source/shut down equipment as per normal operating practice		
60 mins	Activate **Source Control** – hydrocarbon storage or fuel tank rupture	Montara Incident Response Plan (MV-70-PLN-F-00001)		**Section 8**

LEVEL 1 SPILL: IAP		Operational Period: First 48 Hours		
Timeframe (Within)	**Strategies**	**Tactics (what is to be done)**	**Task guidance (ref.)**	
			Appendix A IMTRP	**OPEP**
		Isolate hydrocarbon leak source/shut down equipment as per normal operating practice		
60 mins	Activate **Operational Monitoring** to confirm floating oil location and extent, and to confirm spill level and inform development of IAP.	Deploy tracking buoys Conduct visual surveillance Report weather information to IMT Determine extent of spill (volume, size, movement)		**Table 16.5**

16.2 Level 2/3 – Initial Incident Action Plan

LEVEL 2 SPILL INITIAL INCIDENT ACTION PLAN	Operational period: First 48 Hours
Objectives for operational period	1. Gain control of spill source (stop or minimise further loss) 2. Build and maintain situational awareness 3. Prevent or minimise oiling of Protection Priorities
Protection Priorities:	**Spill Response Strategies:**
• Ashmore & Cartier Islands • Tiwi Islands • Joseph Bonaparte Gulf • Darwin Coast • Kimberley Coast • Western NT • Indonesia • Timor Leste	1. Source control 2. Operational Monitoring 3. Chemical Dispersion 4. Containment and Recovery 5. Protection and Deflection 6. Shoreline Clean-up 7. Oiled Wildlife Response 8. Scientific Monitoring

LEVEL 2/3 SPILL: INITIAL IAP		Operational period: First 48 Hours		
Timeframe (Within)	**Strategies**	**Tactics (what is to be done)**	**Task guidance (ref.)**	
			IMTRP	**OPEP**
30 mins	Activate the **Notifications**	Verbal and written notifications	**Appendix A IMTRP (Section 4.2)**	**Appendix A5**

LEVEL 2/3 SPILL: INITIAL IAP		Operational period: First 48 Hours		
Timeframe (Within)	**Strategies**	**Tactics (what is to be done)**	**Task guidance (ref.)**	
			IMTRP	**OPEP**
60 mins	Activate **Source Control** – FPSO release	Shipboard Oil Pollution Emergency Plan (SOPEP)	-	**Section 8**
		Montara Incident Response Plan (MV-70-PLN-F-00001)		
		Isolate hydrocarbon leak source/shut down equipment as per normal operating practice.		
60 mins	Activate **Source Control** – hydrocarbon storage or fuel tank rupture	Montara Incident Response Plan (MV-70-PLN-F-00001)	-	**Section 8**
		Isolate hydrocarbon leak source/shut down equipment as per normal operating practice.		
60 mins	Activate **Source Control** – Loss of well control	Isolate hydrocarbon leak source/shut down equipment as per normal operating practice.	-	Table 16.4 / LOWC Source Control Plan
Within 60 mins of IMT being convened	Activate **Operational Monitoring** Action Plan	Deployment of resources to build and maintain situational awareness	-	Table 16.5
Within 1 hour of NEBA demonstrating that chemical dispersion is likely to result in a net environmental benefit	Activate **Chemical Dispersion** Action Plan	Mobilisation and deployment of vessel/aerial dispersant equipment, dispersant stockpiles and resources to reduce the impact of the oil on the priority receptors	-	Table 16.6
Within 1 hour of NEBA demonstrating that containment and	Activate **Containment and Recovery** Action Plan	Mobilisation and deployment of vessels, personnel and equipment to	-	Table 16.7

LEVEL 2/3 SPILL: INITIAL IAP		Operational period: First 48 Hours		
Timeframe (Within)	**Strategies**	**Tactics (what is to be done)**	**Task guidance (ref.)**	
			IMTRP	**OPEP**
recovery is likely to result in a net environmental benefit		reduce volume of oil impacting priority receptors		
Within 1 hour of NEBA demonstrating that protection and deflection is likely to result in a net environmental benefit	Activate the nearshore **Protection and Deflection Strategy** Action Plan	Booming configurations to protect sensitivities or deflect oil away from sensitivities	-	Table 16.8
12 hours	Activate **Scientific Monitoring** Plan	Scientific monitoring plans to be conducted throughout spill response activities as directed by ongoing IAPs.	Appendix A- Section 8	-
Within 1 hour of NEBA demonstrating that shoreline clean-up is likely to result in a net environmental benefit	Activate the **Shoreline Clean-Up Strategy** Action Plan	Shoreline assessment and selection of suitable clean-up techniques. Deployment of personnel and resources to clean-up impact locations	-	Table 16.8
24 hours	Activate the **Oiled Wildlife Response** Action Plan	Mobilisation of support and resources to manage and coordinate oiled wildlife response operations	-	Table 16.10
12 hours	Activate the **Waste Management Plan** to prepare for managing waste, and safe treatment and disposal of oily contaminated materials	Activation of initial waste collection, storage, and transport options.	Appendix A - Section 9	

LEVEL 2/3 SPILL: INITIAL IAP		Operational period: First 48 Hours		
Timeframe (Within)	**Strategies**	**Tactics (what is to be done)**	**Task guidance (ref.)**	
			IMTRP	**OPEP**
As the situation dictates	Commence **transition to pro-active incident management** by completing the IAP process.	Develop IAPs for subsequent operational periods. Document 'Performance Objectives' and 'Measurement Criteria' against actions in IAPs, and feed performance data into the development of subsequent IAPs. Manage the response documentation and records to ensure sufficient information is available to post-incident cost recovery and litigation processes. Transition to Incident Management Team Response Plan (JS-70-PLN-F-00008).	Section 6	-

16.3 Notification and Activation

ACTION PLAN: INITIAL NOTIFICATIONS & ACTIVATIONS				
Aim: To provide early notification (and activation if required) to essential support organisations				
Task		**Actions**	**Resources**	**Timeframe**
1. Contact and provide incident information to support and regulatory organisations Responsible Person: IMT Leader to delegate task				
Note: • Notification and/or activation of these support organisations is to be clearly annotated in the IMT Incident Log, additionally, all associated contracts/forms are to be filed. • To reduce confusion, IMT (Log or Ops) is to assume **PRIMARY** point of contact with AMOSC and OSRL (+ AMSA if resources are required)				
INITIAL RESPONSE ACTIO NS	**Initial Response (Support Organisations)** IMT Leader to direct designated IMT staff to conduct "initial" notifications to relevant support organisations.	**Australian Marine Oil Spill Centre (AMOSC)** Verbal Call AMOSC Duty Officer and provide initial incident notification. An initial call should be completed as soon as possible so that AMOSC can start their own internal preparations for activation. This initial call can be followed up once more information is known and a decision has been made as to what spill response equipment / personnel are going to be required. Signed Contract Note After verbal notification AMOSC will email a copy of Contract Note which will formalise activation. The CN must be signed by an authorised member of staff and returned to AMOSC. **Note**: may also include requirement to access SFRT (see Source Control)	Refer IMT Contact List JADESTONE call out authority: • Country Manager (Australia); • Operations Manager (Australia); • Finance Manager (Australia); • Maintenance Integrity & Engineering Manager; and • Incident Management Team (IMT) Leader.	ASAP (< 60mins)
		Oil Spill Response Ltd (OSRL) Verbal	Refer IMT Contact List	ASAP (< 60 mins)

ACTION PLAN: INITIAL NOTIFICATIONS & ACTIVATIONS				
Aim: To provide early notification (and activation if required) to essential support organisations				
Task		**Actions**	**Resources**	**Timeframe**
		Call OSRL Duty Manager and provide initial incident notification Call is to be followed up with the OSRL Notification form and signed Mobilisation Authorisation form which are to be sent to OSRL once signed by an authorised member of staff.	JADESTONE authorised signatories	
		Australian Marine Safety Authority (AMSA) Verbal Call AMSA and provide initial incident notification. An initial call should be completed as soon as possible for two reasons: • Incident notification; and • So that JSE can request mobilisation of AMSA resources as quickly as possible. This initial call is to be followed up with a written POLREP	Refer IMT Contact List	ASAP (< 60 mins)
		Wild Well Control (WWC) Verbal If access to source control equipment / personnel for LOWC is required WWC Emergency Mobilisation Authorisation Form After verbal notification JADESTONE to complete and sign the WWC Emergency Mobilisation Authorisation Form and submit it via email to the WWC	Refer IMT Contact List Jadestone IMT Leader	ASAP (< 60 mins)
ONGOING RESPONSE ACTIONS	**Notification of Regulatory Organisations** IMT Leader to direct IMT staff to complete required	Complete verbal and written notifications to the following organisations listed in Appendix A5 – Regulatory Notifications	Appendix A5 – Regulatory Notifications	To be commenced as soon as practicable,

ACTION PLAN: INITIAL NOTIFICATIONS & ACTIVATIONS				
Aim: To provide early notification (and activation if required) to essential support organisations				
Task		**Actions**	**Resources**	**Timeframe**
	regulatory/compliance notifications.			and no later than 2 hours of IMT being convened
	Secondary Response (Support Organisations) IMT Leader to direct designated IMT staff to conduct notification/activation of secondary support organisations	**Scientific Monitoring Program** Call to be made to scientific monitoring service provider providing them with information relating to the incident and intention with respect to activation of the SMP. Call is to be followed up with written confirmation **Waste Management Contractor (Oil Spill Response Waste Management Plan)**	Refer IMT Contact List 24hr Contact details Contract details as per Jadestone Incident Management Contact List	Scientific monitoring service provider: contact within 6 hours of IMT being convened Waste management contractor: within 12 hours of spill notification

16.4 Source Control Action Plan

The following actions apply only to a LOWC spill. Source control actions related to other credible scenarios will be managed in accordance with the facility/vessel SOPEP and Jadestone IRPs as described in Section 8.

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
1. Commence initial response actions Responsible Person: OIM /IMT Leader (to delegate)			

INITIAL RESPONSE ACTIONS	The following actions will be undertaken as an initial response to <u>any source</u> control incident:
	• Vessel spills:
	  ○ Vessel to undertake initial response actions as per their SOPEP.
	• Facility spills:
	  ○ Implement Montara Incident Response Plan (MV-70-PLN-F-00001)
	Considerations:
	• For spills involving pumping operations, cease pumping immediately and activate Emergency Shutdown Devices;
	• Isolate spill (if possible) and prevent spill to the marine environment;
	• Recover spilt hydrocarbons on Facility using spill kits;
	• Isolate and repair damaged equipment.
		Shipboard Oil Pollution Emergency Plan (SOPEP)
		
		Montara Incident Response Plan (MV-70-PLN-F-00001)
			Immediately

2. LOWC Incident Only Source control actions relating to other credible scenarios such as surface release from breach of support vessel fuel tank or bunkering / refuelling will be managed in accordance with the facility / vessel IRP / SOPEP.			
INITIAL RESPONSE ACTIONS	The following actions will be undertaken as an initial response to a LOWC incident resulting in a Level 3 spill:	**Personnel**	ASAP:

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
	• Initiate first response actions as per the Source Control Plan; and • Notify / mobilise specialist personnel: ○ AMOSC / Oceaneering Australia; ○ Wild Well Control (WWC); and ○ Others (OSRL, consultants etc as required)	Specialist personnel (i.e. from WWC, AMOSC / Oceaneering Australia etc) **Forms and Guidance** AMOSC General and SFRT Service Contracts Oceaneering Australia Master Contract WWC Master Service Agreement and Equipment Access Agreement Source Control Plan Notification / activation forms **Deliverables** Completed Drilling and Production Incident Data Checklist Completed Technical Data Archive Checklist Completed Personnel Debriefing Checklist	Notifications within 2 hours of IMT being convened Initial source control response actions within 12-24 hours
3. Mobilise source control resources (as appropriate – subsea LOWC) Responsible Person: Operations Lead			
INITIAL RESPONSE ACTIONS	FOR SUBSEA LOSS OF WELL CONTROL ONLY Mobilise AMOSC Subsea First Response Toolkit (SFRT) (for subsea LOWC): 1. Activate SFRT mobilisation with AMOSC (~2 hours) ○ Jadestone provides AMOSC with proof of insurance and a copy of its Operations, Training and Advice (OTA) Agreement in place with Oceaneering ○ Execute SFRT Contract Note between AMOSC and Jadestone 2. Contract suitable construction class vessel capable of deploying SFRT equipment (allow 9 days for vessel readiness in Darwin);	**Requirements** AMOSC SFRT equipment (Jandakot) and Dispersant (Fremantle) 1 x construction class vessel to deploy SFRT equipment 1 x vessel for ROV tooling 2 x ROVs	Commence activation of SFRT and contracting a vessel within 24 hours of spill notification SFRT equipment and vessel in Darwin within 9 days

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
	3. Arrange road freight of SFRT equipment from Jandakot to Darwin (10 hours to arrange, 7 days to transport); 4. Arrange road freight of initial AMOSC SRFT dispersant from Hamilton Hill followed by ongoing supply; 5. Arrange load out of SFRT equipment and dispersant onto vessel in Darwin (8 hours); 6. Transit to field (36 hours); and 7. Mobilise trained personnel from Oceaneering Australia (Jandakot) (available in Darwin within 72 hours).	Jadestone contracted logistics provider (Road Transport) Toll Logistics (Darwin Supply Base) **Personnel** Oceaneering Australia personnel Construction class vessel crews ROV vessel crews Jadestone/Toll Logistics staff **Forms and Guidance** AMOSC SFRT Contract Note AMOSC SFRT Mobilisation Procedure Oceaneering Australia procedures	Vessel loaded and commence transit, Equipment infield within 11-12 days of spill notification
3. Commence survey and planning Responsible Person: Site Survey Unit Leader			
ONGOING RESPONSE ACTIONS	Undertake site survey to inform source control options: • Deploy ROVs to inspect well site; • Test surface air quality; • Map debris field; • Determine wellhead and blow out preventer (BOP) damage, subsea structure integrity and wellhead inclination; • Determine source(s) of hydrocarbon release and geometry of release point(s); and • Provide continuous ROV video and data feed to support facilities (intervention vessels, EMT etc.).	**Equipment** AMOSC SFRT survey equipment ROVs SFRT construction class vessels **Personnel** Site Survey Unit (WWC / Oceaneering Australia) **Forms and Guidance** Source Control Plan	Commence within 11 – 12 days of spill notification

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
		Site Survey Unit Source Control Response Decision Tree Site Survey Unit Leader Checklist Site Survey Procedure Well Control Data Sheet Site Survey Data checklist Oceaneering Australia procedures **Deliverables** Air quality results Infrastructure status reports Debris maps ROV video and data feed Completed Well Control Data Sheets Completed Site Survey Data checklists	
4. Undertake well debris removal (if applicable) Responsible Person: Debris Removal Unit Leader			
ONGOING RESPONSE ACTIONS	A. Develop a debris removal plan.	**Personnel** Debris Removal Unit (WWC / Oceaneering Australia) **Deliverables** Debris Removal Plan	Commence within 12 days of spill
	B. Commence debris removal: a) Cut and remove choke and kill lines;	**Equipment** AMOSC SFRT debris removal equipment	Commence light debris removal within 13 days

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
	b) Install rigging on riser, cut and remove riser sections; c) Install rigging on lower marine riser package (LMRP) / BOP, unlatch and remove connectors; d) Clear all other debris that could impede well control operations; e) Identify the chain of custody for any debris recovered; and f) Identify and maintain a "wet store" area.	WWC debris removal equipment: SFRT construction class vessels **Personnel** Debris Removal Unit (WWC / Oceaneering Australia) Drill rig contractor / Construction class vessel crews **Forms and Guidance** Source Control Plan Oceaneering Australia procedures **Deliverables** Daily Operations Report	of spill notification using AMOSC SFRT equipment Commence heavy debris removal within 21 days of spill notification using WWC equipment
5. Commence subsurface dispersant injection (SSDI) (if applicable) Responsible Person: Subsea Dispersant Unit Leader			
ONGOING RESPONSE ACTIONS	1. Commence subsurface dispersant injection (SSDI): a) Develop dispersant application and monitoring plan to include detail on rates, injection location(s) and monitoring requirements; b) Commence subsea dispersant injection (ongoing); c) Conduct monitoring (ongoing); and d) Replenish dispersant stocks (ongoing). 2. Conduct daily re-evaluation of subsea dispersant effectiveness monitoring data to determine efficacy of response strategy and include the results in the operational NEBA and IAP. Modify dispersant delivery rates and/or application method according to monitoring data (if applicable).	**Equipment** AMOSC SFRT dispersant injection equipment Dispersant ROVs SFRT construction class vessels **Personnel** Subsea Dispersant Unit (Oceaneering Australia) Construction class vessel crews	Commence within 11 - 12 days of spill notification using AMOSC SFRT equipment

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
		Forms and Guidance Oceaneering procedures Subsea Dispersant System Installation and Operation Manual Source Control Plan Subsea Dispersant Unit Leader Checklist Dispersant System Deployment Procedure Subsea dispersant effectiveness monitoring data NEBA	
6. Drill a relief well Responsible Person: Relief Well Group Leader			
INITIAL RESPONSE ACTIO NS	1. Mobilise a drill rig, support vessels and equipment for relief well drilling (for surface and subsea LOWC): 2. Source and contract a drill rig and support vessels to drill the well(s); ○ Available to Jadestone via the AMOSPlan. Additionally, Jadestone monitors the availability of suitable drill rigs and support vessels during drilling campaigns and has signed the APPEA MOU for mutual assistance for relief well drilling. 3. Source and mobilise associated drilling consumables.	**Equipment** Drill rig Support vessels Wellhead and casing Kill fluid, cement and other bulk supplies Ranging equipment Drilling assemblies and steering tools **Personnel** Relief Well Group **Forms and Guidance** Source Control Plan	Commence contracting drill rig within 24 hours of spill notification Estimated to have rig infield within 23 days of spill notification

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
		Well Specific Addendum	
	1. Finalise Relief Well Plan: a) Determine if impacted rig may be used for relief rig; b) Determine number of relief wells to be drilled; c) Update information on reservoir and wellbore geometry; d) Confirm available resources (i.e. rig, tubular goods, pumping fluids etc); e) Finalise surface location and rig move plan; f) Confirm any permit requirements and obtain (if applicable); and g) Issue Relief Well Drilling Program.	**Personnel** Relief Well Group (WWC / direction drilling contractor / drill rig contractor / other third parties) **Forms and Guidance** Source Control Plan Well Specific Addendum Preliminary Relief Well Plan **Deliverables** Relief Well Drilling Program Completed Information Needed for Preliminary Relief Well Planning and Dynamic Kill Strategy Checklists	Commence development within 48 hours of spill Plan finalised prior to drilling into reservoir
	1. Drill a relief well: ○ Mooring and rig positioning; and ○ Drill relief well.	**Equipment** Drill rig Support vessels Wellhead and casing Kill fluid, cement and other bulk supplies Ranging equipment Drilling assemblies and steering tools **Personnel**	Commence drilling relief well activities within 24 days of spill

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
		Relief Well Group (WWC / direction drilling contractor / drill rig contractor / other third parties) Drill rig and support vessel crews **Forms and Guidance** Relief Well Drilling Program Source Control Plan Relief Well Group Relief Well Group Leader Checklist Relief Well **Deliverables** Daily Operations Report Well Construction Report	
7. Complete well kill Responsible Person: Well Kill Unit Leader			
	1. Finalise Relief Well Kill Plan: a) Review reservoir and wellbore data; b) Review kill weights and pumping rates; c) Assess options for well kill using capping stack (if applicable); d) Finalise the Well Kill Plan; and e) Finalise equipment and consumable requirements.	**Personnel** Well Kill Unit (WWC) **Forms and Guidance** Source Control Plan Well Specific Addendum Preliminary Relief Well Kill Plan **Deliverables** Relief Well Kill Plan	Commence within 7 days of spill notification

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
		Capping Stack Kill Plan (if applicable) Completed Information Needed for Preliminary Relief Well Planning and Dynamic Kill Strategy Checklists	
	A. Conduct kill operations: i) Well kill.	**Equipment** Drill rig Support vessels Capping stack construction class vessel (if applicable) Pumping vessel / equipment (if applicable) Kill fluid **Personnel** Well Kill Unit (WWC / drill rig contractor / other third parties) Drill rig and support vessel crews Construction class vessel crew (if applicable) **Forms and Guidance** Relief Well Kill Plan Capping Stack Kill Plan (if applicable) Source Control Plan **Deliverables** Daily Operations Report Well Construction Report	Commence within 51 days of spill notification for relief well kill

ACTION PLAN: SOURCE CONTROL			
Task		**Resources**	**Timeframe**
8. Decontaminate and demobilise Responsible Person: Decontamination and Demobilisation Unit Leader			
	1. Develop decontamination and demobilisation plan. 2. Undertake decontamination activities: ○ Offshore decontamination of drill rig / facility / support vessels; ○ Final decontamination at shipyards where required; and ○ Hazardous waste disposal. 3. Demobilise drill rig / construction class vessels / support vessels / equipment / personnel as applicable.	**Equipment** Decontamination equipment **Personnel** Decontamination and Demobilisation Unit (WWC) Decontamination contractors Waste contractors **Forms and Guidance** Source Control Plan Decontamination and Demobilisation Unit Decontamination and Demobilisation Unit Leader Checklist Decontamination and Demobilisation Plan **Deliverables** Waste and decontamination records	Ongoing throughout and after response until all equipment is decontaminated and demobilised

16.5 Operational Monitoring Plan

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
1. Deployment of satellite tracking buoy (TB) Responsible Person: OIM / IMT (Planning)				
INITIAL RESPONSE ACTIONS	**Deploy and access tracking buoy information** OIM to direct crew to deploy buoy from the facility or a vessel as close as is safe to the leading edge of the spill.	1. OIM (or Rep) to report to IMT as soon as TB has been deployed 2. OIM (or Rep) to provide IMT with current weather conditions at Montara (wind, sea state, current direction) – IMT to log information and add to COP 3. IMT to confirm deployment via TB website using associated login information (ensure IMT Leader is briefed). Refer IMT OneNote for login details for Tracker Buoys. 4. IMT to ensure TB location is added to the COP 5. IMT to ensure deployment of TB is captured in Incident Log **Note:** Buoys are not to be dropped from a height of greater than 10m to water surface.	Satellite tracking buoys - FPSO Support vessel if available	Deploy within 1 hours of IMT being convened (subject to vessel availability and weather conditions) and continually track thereafter
ONGOING ACTIONS	**Deployment of additional tracking buoy** OIM/Vessel Masters to liaise with IMT with respect to the continued deployment of TB.	1. As part the ongoing response the IAP is to include guidance to the OIM (of vessels) with respect to the continued deployment of available TB in support of operational monitoring of the spill 2. Deployed TB are to be continually monitored by the IMT (Planning) and added to the COP as a regular action 3. Deployment of the TB's is to be captured in Incident Log	Incident Action Plan (IAP)	As detailed within the IAP
2. Commencement of aerial surveillance operations (for Level 2 / 3 spills) Responsible Person: OIM / IMT				

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
INITIAL RESPONSE ACTIONS	**Activation of initial aerial surveillance flights** Source and mobilise available aircraft to commence aerial surveillance of the spill	1. IMT (Log) to contact aviation provider to confirm availability of a helicopter to conduct an initial surveillance flights in vicinity of the spill a. Confirm time flight can depart (or be re-tasked) b. Confirm crew composition – likely a trained observer will not be available. Flight can be conducted using a standard crew and should be flown as soon as practicable. 2. IMT (Plan or Ops) to contact AMOSC (requesting assistance with sourcing trained observers) 3. IMT (Ops) to liaise with the OIM regarding approval to commence surveillance flight in vicinity of the facility 4. IMT (Log/Ops) – once aircraft and crew have been confirmed, IMT Leader is to be updated. 5. IMT (Ops) ensure flight details are captured in the incident log (all details pertaining to the flight) 6. IMT (Ops) to assume primary coordination for flight. Provide aviation provider with tasking information 7. IMT (Ops) to contact aviation provider and confirm that all safety requirements have been met. Capture in incident log. 8. IMT (Ops) to monitor flight with aviation provider ensuring that the IMT are briefed regularly. Once complete ensure that all relevant information is provided back to the IMT so that it can be assessed, included into the COP and further flights determined. 9. All information should be entered into an Aerial Surveillance Observation Log (refer Appendix A1) which will be sent to the OIM/IMT within an hour of the aircraft returning to its operating base. Where possible, a verbal	**Equipment** Helicopters Jadestone aviation contract - fixed wing aircraft **Personnel** 1 x Trained Aerial Observer (sourced from AMOSC, AMSA or OSRL). **Note:** Initial reconnaissance may be completed by an untrained observer while waiting for trained observers to arrive. **Forms and Guidance** Aerial Surveillance Tasking Form Aerial Surveillance Observation Log (refer Appendix A1) Aerial Surveillance Marine Fauna Sighting Record Sheet (refer Appendix A1) **Deliverables**	Initiation within 6 hours of request from IMT (At least 1 aircraft available at airbase within 24 hours of mobilisation request) Trained aerial observers within 48 hours of notification

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
		report via radio/telephone en-route providing relevant information should be considered if the aircraft has long transits from the spill location to base. 10. Aerial Observers shall note fauna sightings in the Aerial Surveillance Marine Fauna Sighting Record Sheet. The location and details of each sighting should be recorded with a cross-reference to photographic imagery captured. The Aerial Surveillance Marine Fauna Sighting Record Sheet is provided in Appendix A1.	Completed Aerial and Fauna Surveillance Forms Photographs / video footage	
ONGOING RESPONSE ACTIONS	**Ongoing coordination of aerial surveillance flights** Development and coordination of surveillance flights **Note:** Coordination of aviation operations is essential. Therefore, flight-schedule is to cover ALL planned aviation operations on a daily basis.	IMT (Ops) to develop a flight schedule for ongoing surveillance as required: 1. Source fixed wing aircraft from Jadestone aviation contractor to commence aerial surveillance operations from Day 2 **Note:** A second fixed wing aircraft will be requested from Jadestone aviation contractor to support aerial dispersant operations from Day 3 2. Develop aerial surveillance flight schedule which includes the following operations: a. Aerial surveillance utilising helicopters - Day 1 & 2 b. Aerial surveillance using fixed wing from Darwin – Day 2 onwards c. Aerial dispersant operations from Darwin (Air Tractor and Hercules) d. Aerial Spotter flights in support of the dispersant application (if required) 3. The frequency of flights will be sufficient to ensure that the information collected during each flight (i.e. observer log and spill mapping) meets the information needs to validate dispersion of the spill and supports ongoing response operations	Incident Action Plan (IAP)	As per operational period

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
		4. Flight schedule is to ensure that ALL aircraft operations are conducted safely and support "other" response operations where necessary 5. Aerial surveillance to continue daily until termination criteria are met		
3. Commence satellite imagery acquisition (for Level 2/3) Responsible Person: IMT (Planning)				
INITIAL RESPONSE ACTIONS	**Provision of satellite imagery to the IMT** Mobilise KSAT (through AMOSC) to produce daily satellite images	1. IMT (Planning) to notify AMOSC Duty Officer to request initiation of satellite services via KSAT (OSRL subscription available as a secondary option) and provision of daily imagery 2. IMT (Planning) to combine satellite data with optical imagery (e.g. aerial surveillance, vessel-based observations) to mitigate issues these optical imagery results may present with angle of insolation, thick cloud cover and night **Ongoing Response Actions** 3. Request satellite imagery be provided daily throughout the duration of the response until termination criteria are met. Integrate data into COP. Receipt of all daily imagery is to be captured in the incident log. Note: Satellite data imagery will depend on satellite availability and location in orbit	AMOSC Activation to be completed Contract note executed Mobilisation of AMOSC resources needs to be coordinated across all response strategies where support is required. **Deliverables** Daily satellite images	Request within 6 hours of IMT being convened Satellite imagery delivered to IMT within 24 hours of request to service provider Daily data acquisition
4. Oil spill trajectory modelling (OSTM) Responsible Person: IMT (Planning)				
INITIAL RESPONSE ACTIONS	**Provision of OSTM to the IMT**	1. IMT (Plan) to contact AMOSC and arrange for oil spill trajectory modelling to be provided. Will require completion of the RPS spill modelling request form	AMOSC Activation to be completed Contract note executed	Oil Spill modelling activated within 4 hours of IMT being convened for a

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
	Mobilise RPS via AMOSC to produce three day forecast model outputs.	2. IMT (Plan) update incident log with request for OSTM and estimated time of delivery. 3. Provide RPS with data from aerial surveillance so that they can verify and adjust fate predictions of the spill and improve predictive accuracy. **Ongoing Response Actions** 4. IMT (Plan) to request ongoing OSTM to be provided on a daily basis. To ensure that COP is updated when provided. Receipt of all daily OSTM is to be captured in the incident log. 5. OSTM to continue daily until termination criteria are met	**Forms and Guidance** RPS trajectory modelling request form in One Note **Deliverables** OSTM three day forecast outputs daily	Level 2/3 spill notification OSTM to commence within approximately three hours of request submission Repeat as required
5. Vessel surveillance Responsible Person: OIM or IMT (Operations & Logistics)				
INITIAL RESPONSE ACTIONS	**Mobilisation of vessels to conduct surveillance** Source and mobilise available vessels to commence surveillance of the spill	1. IMT (Ops & Log) to source available vessels to commence surveillance of the spill a) Contracted vessels b) Vessels of opportunity 2. IMT to liaise with OIM with respect to vessels operating in and around the facility 3. Vessels to be tasked to gather the following information about the spill: a) Location (latitude and longitude); b) Size and volume; c) Direction of movement; d) Visual appearance of the slick (colours, emulsification etc);	**Deliverables** Completed Vessel Surveillance Observation Log and Marine Fauna Sighting Record Sheet (refer Appendix A1) Photographs / video footage	Vessel surveillance initiated within 24 hours of request from IMT Vessel surveillance reports submitted to IMT within 60 mins of completing surveillance

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
		e) Associated weather conditions in vicinity of the spill (wind speed/direction, sea state, swell); f) Any marine fauna or other activities observed; and g) Photographic images. 4. Vessel Master to provide information back to the IMT within 60 mins of completing surveillance: a) Complete Vessel Surveillance Observation Log b) Email completed logs to the IC within an hour of completion. Include photographs and GPS data where available.		
6. Fluorometry Responsible Person: IMT (Planning & Logistics)				
	Mobilise fluorometry via scientific service provider and CSIRO	1. IMT (Plan) to activate scientific services. To confirm what logistical requirements will be required to support. 2. IMT (Logistics) to discuss with Planning requirements. Action as required. 3. IMT (Plan) discuss need for additional fluorometers (multiple towed fluorometers are available from CSIRO) 4. Scientific service provider to provide daily fluorometry results to IMT	**Personnel** 1 x person trained to interpret data 5 x fluorometers **Logistics** Specific requirements to be discussed and confirmed with CSIRO	Mobilised within 2 days of spill notification Fluorometry results provided to IMT within 24 hours of completion of daily survey
7. Shoreline and Coastal Habitat Assessment Responsible Person: IMT (Planning & Logistics)				

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
	Mobilisation of personnel to conduct Shoreline and Coastal Habitat Assessment Surveys Source and mobilise available personnel and equipment to commence shoreline and coastal habitat assessment	1. IMT (Log) to contact AMOSC and OSRL to confirm availability of personnel to conduct assessment surveys 2. IMT (Plan or Ops) to contact vessel and equipment providers to support assessment surveys 3. IMT (Ops) to arrange all safety requirements for shoreline assessment survey deployment. Capture in incident log. 4. IMT (Plan) to identify priority locations to deploy shoreline assessment survey teams by consulting the NEBA (e.g. location of priority receptors, seasonal presence) and existing operational monitoring data that will help confirm locations that will be/have been contacted by hydrocarbons. 5. IMT (Ops) to mobilise Survey Teams to commence assessment surveys prior to shoreline contact to obtain pre-contact data, where possible **Note:** Unmanned Aerial Vehicles (UAVs) may be necessary for some sensitive environments and where personnel safety is at risk (e.g. UXO's at Cartier Island, dangerous fauna in remote locations)	**Equipment** Vessels Aircraft Aerial survey equipment (e.g. UAVs) All-terrain vehicles **Personnel** Trained Personnel (sourced from AMOSC and/or OSRL). **Forms and Guidance** Shoreline Assessment Form (refer to Appendix A2) **Deliverables** Completed Shoreline Assessment Survey Form Photographs / video footage	Commence deployment of SCAT Teams within 48 hours of becoming aware of potential impacts to shorelines
	Commence Shoreline and Coastal Habitat Assessment Surveys	1. Undertake shoreline assessment (SCAT) ground / aerial survey (depending on access). Refer to the Shoreline Assessment Manual (NOAA, 2013) and A Guide to Shoreline Assessment (SCAT) Surveys (IPIECA, 2016) for guidance. A copy of the WA DoT Shoreline Assessment Form is available in Appendix A2. ○ Undertake pre-impact survey to obtain baseline information, where possible	**Equipment** Camera GPS Spades Tape measures Sampling equipment	

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
		○ Undertake post-impact survey to confirm: i) Levels of oil stranding; ii) Actual impacts to environmental sensitivities; iii) Priorities for clean-up; iv) Resources required to implement a clean-up operation; v) Appropriate cleaning methods according to shoreline conditions and oil loading, i.e.: (1) Natural recovery with monitoring; (2) Beach pre-cleaning; (3) Low pressure flushing; (4) Manual oil/sediment removal; and (5) Vacuum pumping. vi) Safe access locations. 2. Undertake routine surveys during shoreline clean-up operation to assess effectiveness of response. 3. IMT (Ops) to monitor assessment survey operations ensuring that the IMT are briefed regularly. Once initial surveys are complete ensure that all relevant information is provided back to the IMT so that it can be assessed, included into the COP and further surveys determined. 4. IMT to update IAP with survey information, as appropriate. 5. All information should be entered into a Shoreline Assessment Form (refer Appendix A2) which will be sent to the IMT within two hours of the Survey Team returning to its operating base.	Vehicles (as required) Aerial survey equipment (e.g. Unmanned Aerial Vehicles (UAVs)) **Personnel** Trained Shoreline Assessment Team Leads (one per team) Team members (2 per team) **Forms / Guidance** Shoreline Assessment Form (Appendix A2) NOAA / IPIECA guidelines and forms Shoreline Clean-up Techniques (Table 13-2) **Deliverables** Shoreline assessment survey reports Lab reports	

ACTION PLAN: MONITOR AND EVALUATE				
Aim: To build and maintain the most accurate picture regarding the spill and oil lost into the marine environment in the most effective and efficient manner				
Task		**Actions**	**Resources**	**Timeframe**
		Ongoing Response Actions 1. IMT (Plan) to arrange for ongoing Shoreline and Coastal Habitat Assessment Surveys for priority locations to be provided on a daily basis. To ensure that COP is updated when provided. Receipt of all daily Survey Forms are to be captured in the Incident Log.		

16.6 Chemical Dispersant Action Plan (Surface)

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
1. **Mobilise dispersant resources** Responsible Person: IMT (Logistics and Operations)				
Aim: To mobilise equipment and resources in support of dispersant operations				
INITIAL RESPONSE ACTIONS	**Conduct NEBA**	Conduct operational NEBA to determine if dispersant application is likely to result in a net environmental benefit. Considerations may include: • Will the spill thickness be favourable for dispersant application? • Is the product too weathered for dispersants to be effective? • What Dispersant-to-Oil Ratio (DOR) is required for this strategy to be effective on this product?	Operational NEBA form Planning Lead	Within 2-4 hours of IMT being convened Daily NEBA re-evaluation

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
		• What are the metocean conditions and how would this affect the DOR? • What dispersant types are most effective on the particular product spilt? • Will spraying adversely affect any sub-surface receptors? The initial operational NEBA for dispersant application shall consider the following inputs: • Trajectory of spill and sensitive receptors within EMBA • Forecast spill modelling of naturally and chemically dispersed oil • Ecotoxicity data (species protection trigger levels) for dispersed oil (including chemically dispersed oil) (once available) • Consultation with the SMP **Ongoing Actions** Daily re-evaluation of NEBA to assess varying net benefits and impacts of continuing to apply dispersants and consideration of application rates, dilution rates and dispersant effectiveness. Dispersants should continue to be used until operational NEBA demonstrates net benefit is no longer being achieved through application.		
	Develop Surface Dispersant Plan	1. If NEBA indicates that there is an overall environmental benefit develop a Surface Dispersant Plan (IAP sub-plan) to include the following data: ○ Operational zones for application; ○ Exclusion zones; ○ Locations to deploy personnel and equipment; ○ Frequency of application (sorties/day); ○ List of resources (personnel and equipment) required; ○ Logistics involved in deploying equipment and personnel;	**Personnel** Planning Lead / AMOSC to assist with development of Surface Dispersant Plan (IAP sub-plan)	Develop a plan, if required, within 12 hours of NEBA confirming an overall environmental benefit

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
		○ Timeframes to undertake deployment; ○ Effectiveness monitoring; and ○ Health and Safety constraints. **Note:** All surface chemical dispersant operations will occur during daylight hours only. 2. Dispersants Dasic Slickgone NS and Corexit 9500 shall be mobilised and applied prior to other dispersant types. If additional dispersant types are likely to be required, IMT shall prioritise the use of dispersants using the following criteria: ○ Dispersant type listed as approved in the National Plan for Maritime Environmental Emergencies Register of Oil Spill Control Agents (OSCA); and ○ Jadestone's Chemical Selection Evaluation and Approval Procedure (JS-70-PR-I-00033).	**Deliverables** Surface Dispersant Plan (IAP sub-plan)	
INITIAL RESPONSE ACTIONS	**Mobilise resources to support dispersant operations** Commence mobilisation of ALL required resources to Darwin to support vessel/aerial dispersant operations	AMOSC Resources 1. Contact AMOSC Duty Officer (once notification/activation has been completed) and discuss the following support: a) Access to and mobilisation of ALL AMOSC dispersant stocks and associated equipment into Darwin (AMOSC will arrange through their contracted transport provider); b) Activation of the Fixed Wing Aerial Dispersant Capability (FWADC) from AMSA (AMOSC will activate this on behalf of Jadestone and assume operational control); and a) Provision of trained spill responders to support operations (AMOSC Staff and Core Group). Each vessel shall require one person who has been trained in the operation of vessel-based dispersant systems and monitoring dispersant effectiveness. 2. Ensure that all actions/details are captured in the Resource tracking and Incident log 3. Ensure wider IMT are briefed on actions	AMOSC Activation to be completed Contract note executed Mobilisation of resources needs to be coordinated across all **PRIMARY** response	Within 4 hours of spill notification

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
		Ongoing Response Actions Following initial activation/mobilisation of support as detail above: 4. Contact AMOSC Duty officer and request update on all requested actions. 5. Ensure that ALL logs are updated based on revised information See "Commence vessel dispersant operations" below for ongoing operational guidance	strategies where support is required. Dispersant Stocks – **Refer to Table 10-2**	
INITIAL RESPONSE ACTIONS		AMSA Resources (via AMOSC) 1. Contact AMSA and request mobilisation of dispersant stocks from ALL locations into Darwin (will likely require Jadestone to make transport arrangements) 2. Request AMOSC assistance with mobilisation of Air Attack Supervisors into Darwin (AMSA has responsibility for sourcing a suitable aircraft for Air Attack Supervisor. Jadestone to arrange logistical support if required) 3. Ensure that all actions/details are captured in the Resource tracking and Incident log 4. Ensure wider IMT are briefed on actions **Ongoing Response Actions** Following initial activation/mobilisation of support as detail above: 5. Contact AMOSC Duty officer and request update on all requested actions. 6. Ensure that ALL logs are updated based on revised information Note: Aircraft requiring two pilots are not suitable for air attack operations as the Air Attack Supervisor function needs to be conducted from the co-pilot's seat.	AMSA Initial notification to be competed FWADC Aerial Operation Plan for Oil Spills off the Northern Coastline of Australia FWADC Aerial Operation Plan for Oil Spills Off The	Within 4 hours of spill notification

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
			Western Australian Coastline (Air Ops Plan Template) Mobilisation of AMSA resources needs to be coordinated across all **PRIMARY** response strategies where support is required **Dispersant Stocks – Refer to Table 10-2**	
		<u>OSRL Resources</u> 1. Contact OSRL Duty Manager to commence mobilisation of the following support:	<u>OSRL</u> Activation to be competed	Within 4 hours of spill notification

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
		a) Dispersant stocks (as per SLA and GDS) into Darwin b) Hercules aircraft or Boeing 727 into Australia (Darwin) 2. Ensure that all actions/details are captured in the Resource tracking and Incident log 3. Ensure wider IMT are briefed on actions **Ongoing Response Actions** Following initial activation/mobilisation of support as detail above: 4. Contact OSRL Duty officer and request update on all requested actions. 5. Ensure that ALL logs are updated based on revised information	Contract requirements complete Mobilisation of OSRL resources needs to be coordinated across all **PRIMARY** response strategies where support is required	
INITIAL RESPONSE ACTIONS	**Mobilise vessels and aircraft to support dispersant operations**	Aerial dispersant mobilisation 1. AMOSC, in consultation with the IMT prepare an Air Operations Plan in accordance with the respective Aerial Dispersant Operations Plan and submit to AMSA prior to commencement of any FWADC aircraft operations 2. Confirm progress of FWADC activation from AMSA following activation by AMOSC 3. Ensure in-field efficacy testing is conducted in accordance with the Special Monitoring of Applied Response Technologies (SMART) monitoring protocol (NOAA, 2006)	FWADC Aerial Operation Plan for Oil Spills off the Northern Coastline of Australia FWADC Aerial Operation	Air Operations Plan submitted to AMSA within 12 hours of initial activation

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
			Plan for Oil Spills Off The Western Australian Coastline	
		<u>Vessel dispersant mobilisation</u> IMT (Ops) to complete following actions: 1. Contact OSV - confirm location and ETA to Darwin a) Test and prepare dispersant application system en route. b) Tasking to be provided prior to arriving on location 2. Liaise with IMT (Log) to commence sourcing of additional vessels into Darwin to support dispersant operations. **3.** Ensure in-field efficacy testing is conducted in accordance with the Special Monitoring of Applied Response Technologies (SMART) monitoring protocol (NOAA, 2006) **Ongoing Response Actions** 4. Arrange for vessels to be loaded with equipment, dispersant and trained spill responders from AMOSC once alongside Darwin. 5. All vessels to be designated with operational zones to conduct dispersant operations 6. Aerial surveillance sorties to provide vessels with updated locations for spills within operational zones.	**Dispersant Stocks** – **Refer to Table 10-2** See Commence Vessel Dispersant Operations below	Commence mobilisation within 6 hours of spill notification Commence initial vessel dispersant application within 42-84 hours of

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
			Incident Action Plan (IAP) – to detail tasking for vessel dispersant operations	Chemical Dispersant Action Plan (Section 16.6) being activated (daylight and weather condition dependent)
Ongoing Actions	**Activate Darwin logistic support arrangements**	<u>Logistics Yard (Darwin) activation</u> 1. Contact Logistics Yard (Darwin) and standup staff/facilities to support resource mobilisation. Provide relevant information regarding estimated arrival times/dates into Darwin once confirmed with service providers 2. Confirm all arrangements with respect to loading equipment/dispersant and embarking spill response personnel aboard vessels alongside Darwin. **Note:** ALL other response equipment required will be coordinated from the Logistics Yard (Darwin) throughout the response.	**Logistics Yard (Darwin)**	Within 6 hours of spill notification
2. Commence vessel dispersant operations Responsible Person: IMT (Operations and Logistics)				
Ongoing Actions	**Conduct of vessel dispersant operations** Following initial activation/mobilisation	<u>Ongoing vessel dispersant operations</u> 1. Confirm build-up of dispersant stocks at Toll Yard in accordance with the Dispersant Mobilisation Plan.	**Incident Action Plan (IAP)** – Task Assignment	Ongoing from next Operational Period

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
	of required resources ongoing operations are to be commenced in support of the response	2. Coordinate arrival and availability of vessels as they arrive in Darwin in accordance with Dispersant Mobilisation Plan. 3. Arrange and coordinate transport arrangements to mobilise dispersant and equipment to Darwin port 4. Ensure additional dispersant vessels (once operationally ready) become available from Darwin are to be included in the IAP for each operational period. **Note:** Clear guidance to be provided in IAP with respect to: • Vessel will be "operationally ready" once dispersant/equipment loaded and trained spill responders are embarked. • Focus on application to windrows / spots of surface slick which threaten priority environmental sensitivities. • Conduct of visual monitoring to assess effectiveness • Completion of dispersant application logs • Daily reporting back to IMT on conduct of operations	to be developed and disseminated in order to commence vessel dispersant operations **Dispersant Stocks** – Refer to Table 10-2	
3. Commence aerial dispersant application Responsible Person: IMT (Operations and Logistics)				
Ongoing Actions	**Conduct of aerial dispersant operations** Following initial activation/mobilisation of required resources ongoing operations are to be conducted in	<u>Aerial dispersant operations commencement</u> a) Confirm status of Air Operations Plan implementation in consultation with AMOSC. b) Liaise with Western Australian Department of Transport prior to commencing aerial dispersant application in Commonwealth waters that could impact upon State waters c) Upon agreement of suitability of Air Operations Plan from AMOSC commence aerial dispersant application	**Air Operations Plan** – to be implemented for Darwin	Commence air operations and dispersant application within 3 days

ACTION PLAN: DISPERSANT APPLICATION				
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.				
Task		**Actions**	**Resources**	**Timeframe**
	support of the response	d) Air Attack Supervisors to ensure IMT Operations Lead is informed on effectiveness of surface aerial dispersant application e) Confirm build-up of dispersant stocks at Toll Yard in accordance with the Dispersant Mobilisation Plan. f) Coordinate arrival and availability of additional aircraft as they arrive in Darwin in accordance with Dispersant Mobilisation Plan. g) Arrange and coordinate transport services to mobilise dispersant to Darwin airport h) Support development of flight schedule (see Operational Monitoring Plan) to ensure inclusion of aerial dispersant operations and deconfliction from other planned operations (operational zones allocated). i) Support ongoing coordination of aviation operations as response continues. **Note:** Air Operations Plan and IAP must ensure the following restrictions are adhered to for dispersant application: • No application in waters shallower than 20 m; and • No application within exclusion zones for offshore facilities; and • No application within an Australian Marine Park boundary or its buffer; and/or • No application within WA State waters unless approved by the SMPC. Clear guidance to be provided in IAP with respect to: • Focus on application to windrows / spots of surface slick which threaten priority environmental sensitivities. • Conduct of visual monitoring to assess effectiveness after sorties • Completion of dispersant application logs	**Incident Action Plan (IAP)** – Task Assignment to be developed and disseminated to commence vessel dispersant operations **Daily Flight Schedule** – for all aviation operations **Dispersant Stocks** – Refer to Table 10-2	of spill notification

ACTION PLAN: DISPERSANT APPLICATION			
NOTE: WA DoT must approve of dispersant application prior to commencement in WA state waters. Also notify WA DoT if any dispersant applied in Commonwealth waters are likely to enter WA waters.			
Task	**Actions**	**Resources**	**Timeframe**
	• Daily reporting back to IMT on conduct of operations		

16.7 Containment and Recovery Action Plan

ACTION PLAN: CONTAINMENT AND RECOVERY				
Task		**Actions**	**Resources**	**Timeframe**
1. Mobilise containment and recovery resources Responsible Person: IMT (Logistics and Operations)				
Aim: To mobilise equipment and resources to Darwin in support of containment and recovery operations				
INITIAL RESPONSE ACTIONS	**Conduct NEBA**	Conduct operational NEBA to determine if C&R is likely to result in a net environmental benefit. Operational NEBA considerations: • Are metocean conditions favourable for the available equipment? • Will the spill thickness be adequate for recovery? • Is decanting permitted? If not, how will waste volumes be managed? **Ongoing Actions** Daily re-evaluation of NEBA to assess varying net benefits and impacts of continuing to conduct C&R activities	Operational NEBA form Planning Lead	Within 2-4 hours of IMT being convened Daily NEBA re-evaluation
	Develop Containment and Recovery Plan	If NEBA indicates that there is an overall environmental benefit develop a Containment and Recovery Plan (IAP sub-plan) to include the following data: • Operational zones; • Locations to deploy personnel and equipment; • List of resources (personnel and equipment) required; • Logistics involved in deploying equipment and personnel; • Timeframes to undertake deployment; • Health and Safety constraints.	**Personnel** Planning Lead / AMOSC to assist with development of Containment and Recovery Plan (IAP sub-plan)	Develop a plan, if required, within 12 hours of NEBA confirming an overall environmental benefit

ACTION PLAN: CONTAINMENT AND RECOVERY				
Task		**Actions**	**Resources**	**Timeframe**
			Deliverables Containment and Recovery Plan (IAP sub-plan)	
	Mobilise containment and recovery resources IMT to commence mobilisation of C&R resources into Darwin	1. Contact Darwin Supply Base and arrange for mobilisation of C&R equipment to Darwin port. AMOSC/AMSA Resources 2. Liaise with AMOSC / AMSA to commence mobilisation of containment and recovery equipment and personnel into Darwin. 3. Ensure each vessel has a minimum of two trained personnel onboard who are responsible for controlling operations, ensuring they are implemented safely and effectively **Note:** Ensure ALL equipment mobilisation is coordinated noting need for AMOSC/AMSA equipment in support of other response strategies 4. Commence mobilisation of vessels to support C&R operations into Darwin. a) Service providers will provide vessels under current Master Service Agreements (MSA) b) Additional vessels to be sourced through Jadestone approved broker 5. Mobilise waste management contractor and request all available IBCs and Iso-containers be sent to Darwin 6. Coordinate and activate arrangements to support loading and embarkation of equipment/personnel from Darwin port 7. Ensure that all actions/details are captured in the Resource tracking and Incident log 8. Ensure wider IMT are briefed on actions	**Equipment** Vessels Booms, skimmers, ancillary equipment Waste storage **Personnel** Trained Personnel (sourced from AMOSC, AMSA and/or OSRL) – 2 per vessel **Forms and Guidance** Vessel Mobilisation	Commence mobilisation within 12 hours of spill notification

ACTION PLAN: CONTAINMENT AND RECOVERY				
Task		**Actions**	**Resources**	**Timeframe**
			Guide – to be used to support sourcing of vessels into Darwin	
ONGOING RESPONSE OPERATIONS	**Commence containment and recovery operations** Following initial activation/mobilisation of required resources ongoing operations are to be commenced in support of the response	Containment and Recovery operations commencement IMT (Log): 1. Confirm build-up of C&R resources in Darwin (Toll Yard and Port). 2. Coordinate arrival and availability of vessels in Darwin. 3. Arrange and coordinate transport arrangements to mobilise equipment and personnel to Darwin port IMT (Ops and Plan) 4. Ensure additional vessels (once operationally ready) become available from Darwin are included in the IAP for each operational period. 5. Coordinate operational surveillance support to vessels to ensure they are being directed to priority locations 6. Assess daily operational surveillance information to drive future operational guidance 7. Coordinate vessel operations to support management of oily/water waste recovered by vessels 8. Support development and promulgation of the IAP to meet operational requirements 9. Coordinate daily operations in support of ongoing response. 10. Ensure that all actions/details are captured in the Resource tracking and Incident log 11. Ensure wider IMT are briefed on actions on a daily basis **Note:** Clear guidance to be provided in IAP with respect to:	**Equipment** Vessels Booms, skimmers, ancillary equipment **Personnel** Trained Personnel (sourced from AMOSC, AMSA and/or OSRL) – 2 per vessel **Incident Action Plan (IAP)** – Task Assignment to be developed	Commence C&R operations within 24-36 hours of Containment and Recovery Action Plan (this plan) being activated

ACTION PLAN: CONTAINMENT AND RECOVERY				
Task		**Actions**	**Resources**	**Timeframe**
		• Vessel movements to/from port as required to assist with resupply/waste management/operational maintenance • Vessel will be "operationally ready" once equipment loaded and trained spill responders are embarked. • Operations to be conducted in operational zones beyond dispersant operations and in areas which threaten priority environmental sensitivities. • Daily reporting requirements back to IMT on conduct of operations and operational status	and disseminated in order to commence containment and recovery operations	
	Manage waste from containment and recovery operations	<u>IMT to assess viability of following options:</u> 1. Option 1 (Preferred option): Subject to approvals from the relevant Jurisdictional Authority (refer to Section 11.2.3) and weather permitting, decant oil from water in tanks onboard the recovery vessels and discharge the water component overboard within the apex of the containment booms. 2. Option 2: Transfer oily-water waste to slops tanks onboard the Montara Operations FPSO or other recovery vessels for storage and possible treatment. **Note:** Environmental approvals must be obtained prior to liquid waste discharge to the environment. Records are to be retained of volumes discharged. 3. Manage solid waste generated: o Can be temporarily stored on-board the support vessel or facility for transfer to mainland for disposal by a licensed contractor. 4. Ensure washdown of offshore equipment is conducted in hot zone's only	**Waste Management Plan** **IMT support** – to be provided by waste management contractor **Waste Management** – controlled waste tracking to be managed throughout	Review options within 48 hours of IMT being convened

16.8 Protection and Deflection Action Plan

ACTION PLAN: PROTECTION AND DEFLECTION				
Task		**Actions**	**Resources**	**Timeframe**
1. Engage with relevant stakeholders and develop plan to conduct protection and deflection operations Responsible Person: IMT (Planning)				
ONGOING RESPONSE ACTIONS	**Commence stakeholder engagement**	1. Notify WA DoT / NT DEPWS if there are likely to be any impacts on state / territory waters. Refer to IMTRP for detail on regulatory notifications. **Note:** All protection and deflection activities will be conducted within state / territory waters (includes waters around islands) and fall under the remit of WA DoT's IMT and associated IAP's. . Priority receptors and strategies will be confirmed/implemented under the direction of the Control Agency. Refer to IMTRP for further information on cross jurisdictional arrangements and arrangements with NT's DEPWS.	**Personnel** WA DoT IMT / NT IMT **Forms and Guidance** WA DoT Offshore Petroleum Industry Guidance Note - Marine Oil Pollution: Response and Consultation Arrangements (WA DoT, 2020)	Within 2 hours of becoming aware of potential impacts to state / territory waters
NOTE: All protection and deflection activities in the following steps are indicative only – at the direction of the state / territory IMT who will be the Control Agency for the spill in State /Territory waters				
	Conduct SCAT	2. Conduct an initial shoreline assessment (i.e. SCAT) (ground / aerial survey depending on access)	Refer to Section 9.4.7 for detail.	Commence deployment of SCAT Teams within 48 hours of becoming aware of impacts to shorelines
	Conduct NEBA	3. Using the latest results of operational monitoring activities, conduct operational NEBA to determine if protection and deflection is likely to result in a net environmental benefit. Operational NEBA considerations:	Operational NEBA form Environment Unit Lead	Within 2-4 hours of IMT being convened (and impacts to shorelines are likely) Daily NEBA re-evaluation

ACTION PLAN: PROTECTION AND DEFLECTION				
Task		**Actions**	**Resources**	**Timeframe**
		• Are conditions (e.g. tides, current, sea state) favourable for this strategy to be effective in open ocean environments immediately surrounding the emergent sensitivities (reefs)? • Will access to the shallow intertidal areas on top of emergent sensitivities be safe and feasible? • Can the IMT access suitable shallow draft vessels to safely establish booming arrangements (e.g. does vessel have ability to transfer anchors and booms; does it have adequate tie-points?). • Is there potential that submerged receptors could be damaged from potential anchor drag? **Ongoing Actions** Daily re-evaluation of NEBA to assess varying net benefits and impacts of continuing to conduct protection and deflection activities		
	Develop Protection & Deflection Plan	4. If NEBA indicates that there is an overall environmental benefit of applying this strategy, develop a Protection and Deflection Plan (IAP sub-plan) to include the following data: a) Priority near-shore and shoreline areas for protection (liaise with SMPC to confirm priority locations and consult latest operational monitoring data, including SCAT surveys); b) Locations to deploy protection and deflection equipment; c) Method of deployment for each location i.e., exclusion, diversion, river, shore-line sealing booing etc) d) List of resources (personnel and equipment) required; e) Timeframes to undertake deployment; f) Access / egress locations from land or sea;	**Personnel** Environmental Advisor / OSRL / AMOSC to assist with state / territory IMT with development of Protection and Deflection Plan (IAP sub-plan) **Deliverables** Protection and Deflection Plan (IAP sub-plan)	Develop a plan, if required, within 12 hours of NEBA confirming an overall environmental benefit

ACTION PLAN: PROTECTION AND DEFLECTION				
Task		**Actions**	**Resources**	**Timeframe**
		g) Frequency of boom inspections and maintenance (noting tidal cycles). **Note**: Refer to the Kimberley Shoreline Response Plan (AMOSC, 2019b) when developing IAP sub-plan to assist in determining suitable tactics and capability. Consult OSRL/AMOSC and State/Territory, considering the practicalities, likely success and risks associated with a shoreline operations in remote locations.		
		5. Obtain approvals to access the following areas if response activities are required within: a) World Heritage Areas (from DAWE); b) Commonwealth reserves including AMPs (from DAWE / Parks Australia); c) State/Territory reserves (from WA DBCA / NT DEPWS); d) Aboriginal heritage areas (from WA Department of Aboriginal Affairs / NT Aboriginal Areas Protection Authority); and e) International waters (from DFAT). 6. Refer IMTRP Arrangements for regulatory notification and reporting requirements.	**Deliverables** Copy of access approvals	Within 3 days of spill or 48 hours prior to estimated contact with shoreline environment
2. Mobilise protection and deflection resources Responsible Person: IMT (Logistics and Operations)				
	Mobilisation of resources to support operations	1. Commence mobilising protection and deflection equipment in readiness for potential use.	**Equipment** Booming systems Sorbent materials PPE	Commence deployment within 24 hours of completion of Protection and Deflection Plan (IAP sub-plan)

ACTION PLAN: PROTECTION AND DEFLECTION				
Task		**Actions**	**Resources**	**Timeframe**
		2. Mobilise support vessels with capabilities to deploy protection and deflection teams and equipment to remote locations via: a) Vessel deployment; and b) Land-side deployment.	**Equipment** <u>Vessels:</u> Flat bottomed or vessels with tenders Capable of accommodating vessel crew plus 12 additional personnel and equipment Capable of deploying booms in waterways and shallow seas **Personnel** <u>Per vessel:</u> Vessel crew 2 x Trained operator / Team Leader(s) (AMOSC, AMSA, OSRL) 5 x Labourers	Commence deployment within 24 hours of completion and Protection and Defection Plan (IAP sub-plan)
3. Commence protection and deflection operations Responsible Person: IMT (Operations)				
	Conduct Protection and Deflection operations	1. Commence on-site protection and deflection activities as per the P&D Plan (IAP sub-plan) 2. Nominated Shoreline Response Team Leader to report back on effectiveness to IMT Leader	**Equipment** Booming systems Sorbent materials PPE Vessels **Personnel** Per vessel:	Commence deployment of personnel, equipment and vessels within 24 hours of completion of Protection and Deflection Plan

ACTION PLAN: PROTECTION AND DEFLECTION				
Task		**Actions**	**Resources**	**Timeframe**
			Vessel crew 2 x Trained operator / Team Leader(s) (AMOSC, AMSA, OSRL) 5 x Labourers **Deliverables** Records of equipment used, and personnel employed	

16.9 Shoreline Clean-up Action Plan

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
1. Engage with relevant stakeholders and develop plan to conduct shoreline clean-up if appropriate Responsible Person: IMT (Planning)				
ONGOING RESPONSE ACTIONS	**Commence stakeholder engagement**	1. Notify WA DoT / NT DEPWS if there are likely to be any impacts on state / territory waters / territory. Notify Parks Australia if there are likely to be any impacts to Australian Marine Parks. Refer to IMTRP for detail on regulatory notifications. **Notes:** • All shoreline clean-up operations conducted within WA state waters (includes waters around islands) fall under the remit of WA DoT's IMT and associated IAP's. Priority receptors and clean-up strategies will be confirmed/implemented under the direction of the Control Agency. • Refer to IMTRP for further information on cross jurisdictional arrangements and arrangements with NT's DEPWS . • Ashmore Reef Marine Park and Cartier Island Marine Park are assigned IUCN category 1a Sanctuary Zoning and are afforded the highest level of protection. Shoreline clean-up tactics and applicability must be discussed in consultation with Parks Australia whilst preparing an Operational NEBA for these priority receptors.	**Personnel** WA DoT IMT / NT IMT **Forms and Guidance** WA DoT Offshore Petroleum Industry Guidance Note - Marine Oil Pollution: Response and Consultation Arrangements (WA DoT, 2020)	Within 2-4 hours of IMT being convened (and impacts to shorelines are likely)
NOTE: All shoreline clean-up operations in the following steps are indicative only – at the direction of the State / Territory IMT who will be the Control Agency for the spill in State / Territory waters				
	Conduct shoreline assessment	2. Conduct an initial shoreline assessment (i.e. SCAT) (ground / aerial survey depending on access): **Note:** Unmanned Aerial Vehicles (UAVs) may be necessary for some sensitive environments and where personnel safety is at risk (e.g. UXO's at Cartier Island, dangerous fauna in remote locations)	Refer to Section 9.4.7	Commence deployment of SCAT Teams within 48 hours of becoming aware

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
				of impacts to state / territory waters
	Conduct NEBA	3. Using the latest results of operational monitoring activities, (with a focus on SCAT surveys), conduct operational NEBA to determine if shoreline clean-up is likely to result in a net environmental benefit. Operational NEBA considerations: • What volumes and/or concentrations of hydrocarbons are present or expected on the shoreline and what would be the impact to leave the product to weather naturally? • Will access to remote shorelines be safe and feasible? • Will responders disturb sensitive nesting species? • Would it reduce overall impacts to send small teams of clean-up personnel? **Ongoing Actions** 4. Daily re-evaluation of NEBA to assess varying net benefits and impacts of continuing to conduct shoreline clean-up activities **Note:** Shoreline clean-up tactics and applicability must be discussed in consultation with Parks Australia whilst preparing the Operational NEBA for Ashmore Reef Marine Park and Cartier Island Marine Park. These Marine Parks have an IUCN category 1a Sanctuary Zoning and are afforded the highest level of protection. Therefore, clean-up tactics should consider the ability to remediate impacted areas to the zone objectives of these Marine Parks[9].	Operational NEBA form Environment Unit Lead	Conduct within 2 hours of becoming aware of potential impacts to state / territory waters

[9] The zone objective of Ashmore Reef Marine Park and Cartier Island Marine Park is that they are '*managed to conserve ecosystems, habitats and native species in as natural and undisturbed a state as possible*'.

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
	Develop Shoreline Clean-up plan	5. If NEBA indicates that there is an overall environmental benefit develop a Shoreline Clean-up Plan (IAP sub-plan) to include the following information: a) Priority near-shore and shoreline areas for protection (liaise with SMPC to confirm priority locations and consult latest operational monitoring data, including SCAT surveys); b) Locations to deploy protection and deflection equipment; c) Method of deployment for each location ie, exclusion, diversion, river, shore-line sealing booing etc) d) Frequency of clean-up (to minimise impacts to geomorphology, receptors) e) List of resources (personnel and equipment) required; f) Logistics involved in deploying equipment and personnel (i.e. vessel-based accommodation, use of barges, landing craft and helicopters in remote environments); g) Timeframes to undertake deployment; h) Health and Safety constraints; i) Access / egress locations from land or sea; and j) Waste management (see note below). **<u>Plan shall address the following:</u>** • Clean-up activities in sensitive environments shall be conducted in front of the primary dune and crews will not access behind the primary dune • Temporary waste storage on remote beaches should be located at the bottom of the primary dune and above the Highest Astronomical Tide (HAT) mark • Demarcation zones to be established for shoreline operations involving vehicle and personnel movement considering vegetation, bird nesting/roosting areas and turtle nesting timeframes	**Personnel** Environmental Advisor / AMOSC to assist with state / territory IMT with development of Shoreline Clean-up Plan (IAP sub-plan) **Deliverables** Shoreline Clean-up Plan (IAP sub-plan)	Develop a plan, if required, within 12 hours of NEBA confirming an overall environmental benefit

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
		• Access plans for shoreline operations will prioritise use of existing roads and tracks • Terrestrial vehicle and equipment deployment via landing barges where there are no existing track access • Vehicles and equipment are verified as clean and invasive species free prior to deployment to site • A Specialist Advisor is consulted if shoreline operations overlap with areas of cultural or heritage significance • Onshore equipment wash-down occurs in a decontamination area **Note**: Refer to the Kimberley Shoreline Response (AMOSC, 2019b) when developing IAP sub-plan to assist in determining suitable tactics and capability. Consult OSRL/AMOSC and State/Territory, considering the practicalities, likely success and risks associated with a shoreline operations in remote locations.		
		6. Obtain approvals to access the following areas if response activities are required within: a) World Heritage Areas (from DAWE); b) Commonwealth reserves including AMPs (from DAWE / Parks Australia); c) State reserves (from WA DBCA / NT DEPWS); d) Aboriginal heritage areas (from WA DAA / NT APAA); and e) International waters (from DFAT). 7. Refer IMTRP for regulatory notification and reporting requirements.	**Deliverables** Copy of access approvals	Within 3 days of spill or 48 hours prior to estimated contact with shoreline environment
2. Mobilise shoreline clean-up resources Responsible Person: IMT (Logistics and Operations)				

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
	Mobilisation of all required resources	1. Commence mobilising shoreline clean-up equipment in readiness for potential use.	**Equipment** Manual equipment (i.e. shovels, rakes, buckets, wheelbarrows etc) Mechanical equipment (i.e. tiller, skid steer etc) Sorbent materials Decontamination kit Access vehicles (if required) (i.e. quad bikes, 4WD's etc) Personnel facilities (i.e. PPE, food, water, temporary accommodation, communications network, amenities etc) Waste storage (i.e. portable tanks, IBC's, plastic bags, skip bins etc) and transport **Forms and Guidance** Shoreline Clean-up Plan (IAP sub-plan)	Commence deployment within 24 hours of completion of Shoreline Clean-up Plan
		2. Commence mobilising shoreline clean-up crews: ○ Clean-up teams to consist of 10 responders, including one trained Shoreline Responder to act as Team Lead 3. Contact labour hire agencies in Darwin to source labour hire personnel.	**Personnel** Trained Shoreline Responder Team Leads (one per team) Labourers (9 per team)	Commence deployment within 24 hours of completion of

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
			Forms and Guidance Shoreline Clean-up Plan (IAP sub-plan)	Shoreline Clean-up Plan
		4. Mobilise vessels with capabilities to deploy shoreline clean-up teams and equipment to remote locations.	**Equipment** <u>Vessels:</u> Flat bottomed or vessels with tenders Capable of accommodating vessel crew plus a minimum of 10 additional personnel and equipment Helicopters **Personnel** Vessel crew Clean-up team as stated above **Forms and Guidance** Shoreline Clean-up Plan	Commence deployment within 24 hours of completion of Shoreline Clean-up Plan
3. Coordinate shoreline monitoring Responsible Person: IMT (Operations)				
	Prepare to commence Shoreline Clean-up operations	1. Shoreline Team Lead to liaise with SCAT Team to confirm suitable clean-up techniques for surveyed shorelines prior to undertaking clean-up activities 2. Shoreline Team Lead and IMT (Plan) to liaise with SMPC / HMA to confirm shoreline clean-up techniques based on NEBA and SCAT surveys	**Equipment** Camera GPS Spades Tape measures	

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
		3. Shoreline clean-up team members are briefed by Shoreline Team Leads on how to implement the shoreline clean-up techniques including how to prevent damage to shoreline habitat and surrounding laydown/staging areas 4. Shoreline Team Leads shall verify clean-up effectiveness and conduct final evaluations in conjunction with SCAT Teams. **Note:** Clean-up activities shall be implemented under the direction of the SMPC / HMA (Refer to IMTRP for further information on cross jurisdictional arrangements)	Sampling equipment Vehicles (as required) Aerial survey equipment (e.g. Unmanned Aerial Vehicles (UAVs)) **Personnel** Trained Shoreline Responder Team Leads (one per team) Labourers (9 per team) **Forms / Guidance** WA DoT Shoreline Assessment Form - Appendix A2. Shoreline Assessment Manual (NOAA, 2013) A Guide to Shoreline Assessment (SCAT) Surveys (IPIECA, 2016) **Deliverables** Shoreline assessment survey reports Lab reports	
4. Set up shoreline clean-up operations Responsible Person: IMT (Operations)				
	Complete preparations	1. Establish base:	**Equipment**	Commence deployment

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
	for Shoreline Clean-up operations	a) Set up shelter, communications, amenities, food, water etc; b) Organise equipment and PPE; c) Deliver inductions and training to all personnel as appropriate; d) Define pathways for access / egress to minimise damage to the environment.	As per Shoreline Clean-up Plan (IAP sub-plan) **Personnel** Shoreline clean-up assessment team Government specialists Labour hire **Forms and Guidance** Shoreline Clean-up Plan (IAP sub-plan) **Deliverables** Induction records	within 24 hours of completion of Shoreline Clean-up Plan
5. Commence shoreline clean-up operations Responsible Person: IMT (Operations)				
	Implement plan and conduct Shoreline Clean-up operations	1. Commence shoreline clean-up activities as per the Shoreline Clean-up Plan (IAP sub-plan) ensuring that the following will occur: a) Adequate supervision of teams; b) Minimise damage to flora and fauna; c) Schedule oil removal activities for cooler times of the day when it is more solid / waxy to minimise the amount of waste that is generated; d) Site is set up suitably to minimise secondary contamination; and e) Correct waste management is implemented.	**Personnel** Shoreline clean-up leaders and crews WA DoT specialists / NT DEPWS specialists Labour hire	Commence deployment within 24 hours of completion of Shoreline Clean-up Plan

ACTION PLAN: SHORELINE CLEAN-UP				
Task		**Actions**	**Resources**	**Timeframe**
		2. Monitor the following parameters during implementation to assess effectiveness: a) Ongoing shoreline monitoring; b) Ongoing availability on sufficient resources (personnel and equipment); and c) Waste management (ie predicted volumes, minimisation, temporary storage, transport and waste disposal). d) Report back on effectiveness to IMT Leader.	**Deliverables** Progress reports Records of equipment used, and personnel employed Records of waste generated Waste disposal receipts	Ongoing until termination of response

16.10 Oiled Wildlife Plan

ACTION PLAN: OILED WILDLIFE RESPONSE				
Task		**Actions**	**Resources**	**Timeframe**
1. First strike (0-48 hours): situational awareness, notifications and activation of Wildlife Division Responsible Person: IMT (Planning and Operations), Wildlife Division Co-ordinator, Oiled Wildlife Advisor				
INITIAL RESPONSE ACTIONS	**Situational Awareness**	1. Personnel conducting operational monitoring activities shall report wildlife sighting in or near the spill trajectory (including those contacted with hydrocarbons or at risk of contact) and report them to the IMT	**Personnel** Operational monitoring personnel	<2 hours of becoming aware of potential impacts to wildlife
	Complete initial notifications	2. If wildlife has been contacted by oil or are at risk of contact: ○ In Territory waters notify DEPWS (Pollution Response Hotline, Environmental Operations) ○ In State waters, DoT ○ In State waters, notify the DBCA State Duty Officer (who will then activate the DBCA OWA) ○ Notify DCCEEW if there is a risk of death or injury to a protected species (including Matters of National Environmental Significance [MNES]).	**Forms and Guidance** Refer to IMTRP for detail on regulatory notifications	<2 hours of becoming aware of potential impacts to wildlife
	Activate OWR capability	3. If wildlife are sighted and are at risk of oiling or have been oiled, initiate wildlife response by notifying AMOSC Duty Manager. 4. Activate the oiled wildlife response sub-division within the Operations Division with the support of the IMT Leader.	**Personnel** OWA from Jadestone or AMOSC WA DBCA OWA (if in WA State waters) Under the WAOWRP arrangement, DBCA and AMOSC may	< 24 hours of becoming aware of potential impacts to wildlife

ACTION PLAN: OILED WILDLIFE RESPONSE				
Task		**Actions**	**Resources**	**Timeframe**
			request assistance from each other if their internal pool of trained personnel or expertise for wildlife response has been exhausted. **Forms and Guidance** WAOWRP and WA OWR Manual NT OWRP Kimberley OWRP (in draft)	
	Determine if targeted wildlife reconnaissance (beyond operational monitoring) is required (situation dependent)	5. Determine requirement for targeted wildlife reconnaissance and associated personnel and equipment requirements. **Note:** Any interactions involving nationally listed threatened fauna may require approval from DCCEEW as interactions with such species is controlled by the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* and the Environment Protection and Biodiversity Conservation Regulations 2000. In WA State waters, preventative actions involving wildlife constitute fauna "disturbance" under the *Biodiversity Conservation Act 2016* and require authorisation through DBCA unless	**Forms and guidance** WA OWR Manual: • P1 OWR Procedure: Phase 1 Wildlife Reconnaissance • G-1: OWR Strategies by Fauna Group	<48 hours of becoming aware of potential impacts to wildlife

ACTION PLAN: OILED WILDLIFE RESPONSE				
Task		**Actions**	**Resources**	**Timeframe**
		undertaken by licensed personnel. No action specifically targeted at wildlife should occur without this authority.	• F1-1 Oiled Wildlife Reconnaissance: Observation Record	
	Determine If the establishment of an OWR field station is required (situation dependent)	6. Determine if the establishment of an OWR field station is required and associated personnel and equipment requirements.	**Forms and guidance** WA OWR Manual: • P4 OWR Procedure: Phase 4 Wildlife Field Processing WAOWRP: • Appendix A - Equipment	<48 hours of becoming aware of impacts to wildlife
ONGOING RESPONSE ACTIONS	**Mobilisation of all required resources**	7. Commence mobilising required resources	**Personnel** Logistics OWAs to assist **Forms and Guidance** WAOWRP and WA OWR Manual	Ongoing
2. IAP Wildlife Subplan Responsible Person: Oiled Wildlife Advisor and Wildlife Division Co-ordinator				

ACTION PLAN: OILED WILDLIFE RESPONSE				
Task		**Actions**	**Resources**	**Timeframe**
ONGOING RESPONSE ACTIONS	**Prepare IAP Wildlife Subplan**	1. Initial IAP Wildlife Subplan should: ○ Assess the situation and determine the level of wildlife impact (low / medium / high) ○ The DBCA OWA and AMOSC OWA should be consulted when determining the initial magnitude of impact ○ Determine if there are spill activities / tactics that may benefit or adversely impact the OWR ○ Determine wildlife response priorities ○ Determine if any deterrence / hazing measures may be applicable (i.e. likely to result in a net benefit) followed by the development of a Preventative Actions Plan ○ Anticipate number of oiled wildlife requiring rescue and development of a Capture Plan Bridge to the operational phases, procedures and guidelines in the WA OWR Manual and relevant to the scale of the OWR	**Personnel** OWAs to assist **Forms and Guidance** WAOWRP and WA OWR Manual **Deliverables** IAP Wildlife Subplan	Ongoing every 24 hours thereafter or as required
	Determine resource requirements	2. Determine number of Oiled Wildlife Responders and IMT Wildlife related positions required based on the likely number of oiled wildlife and arrange access to resources via AMOSC and DBCA. 3. Based on the IAP Wildlife subplan, develop a list of equipment and personnel required to implement the plan and provide a list to Logistics	**Guidance** WAOWRP and WA OWR Manual	Ongoing every 24 hours thereafter or as required
3. Mobilisation of wildlife resources Responsible Person: Wildlife Division Co-ordinator / Logistics				
ONGOING RESPONSE ACTIONS	**Mobilisation of required resources to support OWR operations**	4. Commence mobilisation of equipment (including adequate PPE) and personnel to required location/s.		Ongoing

17. REFERENCES

American Petroleum Institute (API) (2013) Industry Recommended Subsea Dispersant Monitoring Plan. API Technical Note 1152.

Australian Marine Oil Spill Centre (AMOSC) (2019a), Northern Territory Oiled Wildlife Response Plan, version 2.0, February 2019

AMOSC (2019b). Kimberley Shoreline Response Plan.

Australian Marine Oil Spill Centre (AMOSC). 2021. AMOSPlan: Australian Industry Cooperative Oil Spill Response Arrangements. Accessed 19th February 2023 at https://amosc.com.au/wp-content/uploads/2021/10/amosplan-2021.pdf

Australian Maritime Safety Authority (AMSA) (2010). Response to the Montara wellhead platform incident, Report of the incident analysis team March 2010. Accessed 20th February 2023 at https://www.amsa.gov.au/marine-environment/incidents-and-exercises/response-montara-wellhead-platform-incident

AMSA (2015) Technical Guideline for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities Australian Maritime Safety Authority, January 2015

Australian Maritime Safety Authority (AMSA). 2017. National Plan Guidance: Management and Disposal of Oil Spill Debris (NP-GUI-015). Accessed 19th February 2023 at https://www.amsa.gov.au/sites/default/files/2017-06-np-gui015-management-disposal-oil-spill-debris.pdf

Australian Maritime Safety Authority (AMSA). 2020. National Plan for Maritime Environmental Emergencies. Accessed 19th February 2023 at https://www.amsa.gov.au/marine-environment/national-plan-maritime-environmental-emergencies/national-plan-maritime

Australian Maritime Safety Authority (AMSA). 2022a. National Plan Guidance: Response, Assessment and Termination of Cleaning for Oil Contaminated Foreshores (NP-GUI-025). Accessed 15th February 2023 at https://www.amsa.gov.au/sites/default/files/np-gui-025-response-assessment-and-termination-of-cleaning-for-oil-contaminated-foreshores.pdf

AMSA (2022b). National Plan: Incident Management System Policy. NP-POL-003. Accessed 19th February 2023 - https://www.amsa.gov.au/marine-environment/national-plan-maritime-environmental-emergencies/np-pol-003-national-plan

Australian Maritime Safety Authority (AMSA). No date. National Plan Guidance: Coordination of Cross-Border Incidents (NP-GUI-023). Accessed 19th February 2023 at https://www.amsa.gov.au/file/403/download?token=HWCCMdn3

Australian Maritime Safety Authority (AMSA). No date. National Plan Oil Spill Control Agent Register. Accessed 19th February 2023 at https://www.amsa.gov.au/marine-environment/pollution-response/register-oil-spill-control-agents

Bonn Agreement Oil Appearance Code (2005). The Bonn Agreement. Accessed 19th February 2023 - https://www.bonnagreement.org/publications

Brandvik, P. J., Johansen, Ø., Farooq, O., Angell, G. and Leirvik, F. (2014). Subsurface oil releases - Experimental study of droplet distributions and different dispersant injection techniques Version 2. A scaled experimental approach using the SINTEF Tower basin. SINTEF report no. A26122. Trondheim, Norway. Accessed 19 February 2023 at http://www.oilspillprevention.org/~/media/Oil-Spill-Prevention/spillprevention/r-and-d/dispersants/sintef-api-d3-phase-i-effectiveness-repo.pdf

Department of Biodiversity, Conservation and Attractions (DBCA) (2022a). Western Australian Oiled Wildlife Response Plan (WA OWRP) for Maritime Environmental Emergencies. Accessed 19th February 2023 at

https://www.dpaw.wa.gov.au/management/marine/marine-wildlife/marine-wildlife-response?showall=&start=2

DBCA (2022b). Western Australian Oiled Wildlife Response Manual. Accessed 19th February 2023 at https://www.dpaw.wa.gov.au/management/marine/marine-wildlife/marine-wildlife-response?showall=&start=2

International Petroleum Industry Environmental Conservation Association (IPIECA) and International Association of Oil and Gas Producers (IOGP). (2015). Dispersants: subsea application - Good practice guidelines for incident management and emergency response personnel. Accessed 19th February 2023 at https://www.ipieca.org/resources/good-practice/dispersants-subsea-application/

Inpex (2018). Browse Island Oil Spill Incident Management Guide.

International Petroleum Industry Environmental Conservation Association (IPIECA) (2015). At-sea containment and recovery; Good practice guidelines for incident management and emergency response personnel. IPIECA-IOGP Report 522.

IPIECA and International Association of Oil and Gas Producers (IOGP). (2016). The Use of Decanting During Offshore Oil Spill Recovery Operations. Accessed 20th February 2023 - https://www.ipieca.org/resources/awareness-briefing/the-use-of-decanting-during-offshore-oil-spill-recovery-operations/

ITOPF (2022). ITOPF Members Handbook (2022/23). Prepared by the International Tanker Owners Pollution Federation Ltd. https://www.itopf.org/news-events/news/itopf-handbook-2022-just-published/

Montara Commission of Enquiry (2010), Report of the Montara Commission of Enquiry, June 2010, Commonwealth of Australia 2010. Accessed 20th February 2023 - https://www.industry.gov.au/sites/default/files/2018-11/montara-commission-of-inquiry-report-june-2010.pdf

National Oceanic Atmospheric Administration (NOAA), US Coastguard, US Environmental Protection Agency (2006). Special Monitoring of Applied Response Technologies (SMART) monitoring protocol, Accessed 20th February 2023 - https://response.restoration.noaa.gov/sites/default/files/SMART_protocol.pdf.

NOAA. (2013). Shoreline Assessment Manual. Accessed 20th February 2023 at https://response.restoration.noaa.gov/sites/default/files/manual_shore_assess_aug2013.pdf

National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA). (2021). Guidance Note: Oil Pollution Risk Management. Accessed 20th February 2023 at https://www.nopsema.gov.au/sites/default/files/documents/2021-03/A382148.pdf

Northern Territory Government. (2014). Northern Territory Oil Spill Contingency Plan. Accessed 20th February 2023 - https://dipl.nt.gov.au/__data/assets/pdf_file/0006/165462/northern-territory-oil-spill-contingency-plan.pdf

State Emergency Management Committee (SMEC), (2022). State Emergency Management Plan. A Strategic Framework for Emergency Management in Western Australia. Accessed 20th February 2023 - https://www.wa.gov.au/government/publications/state-emergency-management-strategic-framework-emergency-management-western-australia

UniQuest Pty Ltd. 2010. Shoreline Ecological Assessment Aerial and Ground Surveys 7-19 November 2009.

Western Australian Department of Transport (DoT). 2020. Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements. Accessed 20th February 2023 - https://www.transport.wa.gov.au/mediaFiles/marine/MAC_P_Westplan_MOP_OffshorePetroleumIndGuidance.pdf

Western Australian (WA) Department of Transport (DoT) (2015). Oil Spill Contingency Plan. Prepared by the WA Department of Transport, January 2015.

WA DoT. (2021). State Hazard Plan – Marine Environmental Emergencies (MEE). Department of Transport, Perth, Western Australia. Accessed 1st February 2022 - https://www.transport.wa.gov.au/mediaFiles/marine/MAC_P_StateHazardPlanMaritimeEnviroEmergMEE.pdf

18. ABBREVIATIONS

Term	Definition
AIIMS	Australian Inter-Service Incident Management System
ALARP	As Low As Reasonably Practicable
AMOSC	Australian Marine Oil Spill Centre
AMOSPlan	A voluntary oil industry mutual aid plan intended to supplement the National Plan, administered by Australian Institute of Petroleum through AMOSC
AMSA	Australian Maritime Safety Authority
Approved Dispersant	Means dispersant approved by the National Plan
ATV	All-Terrain Vehicles
DBCA	Department of Biodiversity Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPIRD	Department of Primary Industries and Regional Development
DoF	Department of Fisheries
DoT	Department of Transport
EMBA	Environment that May be Affected
EP	Environment Plan
FPSO	Floating Production, Storage, and Offtake Vessel
FWADC	Fixed Wing Aerial Dispersant Contract
GIS	Geographic Information System
HAT	Highest Astronomical Tide
HMA	Hazard Management Agency
IAP	Incident Action Plan
IBC	Intermediate Bulk Container
IMO	International Maritime Organisation
IMT	Incident Management Team
ITOPF	International Tanker Owners Pollution Federation
JSA	Job Safety Analysis
JSE	Jadestone Energy
NEBA	Net Environmental Benefit Assessment
NOPSEMA	National Offshore Petroleum Safety and Environment Management Authority
NRT	National Response Team
OIM	Offshore Installation Manager
OIW	Oil in Water

Term	Definition
OPEP	Oil Pollution Emergency Plan
OSRA	Oil Spill Response Atlas
OSTM	Oil Spill Trajectory Model
OWR	Oiled Wildlife Response
OWRP	Oiled Wildlife Response Plan
POLREP	Pollution Report
PPE	Personal Protective Equipment
RCC	Rescue Coordination Centre (AMSA)
SCAT	Shoreline Clean-up Assessment Techniques
SITREP	Situation Report
SMP	Scientific Monitoring Program
SOPEP	Ship Onboard Pollution Emergency Plan

19. APPENDICES

- A1. Observation Logs (vessel, aerial, shoreline)
- A2. Shoreline Assessment Form
- A3. Effectiveness of dispersant operations
- A4. Skua-11 Well Kill from the MWHP
- A5. Regulatory Notifications
- A6. Incident Management Guidance

APPENDIX A1 – Observation Logs

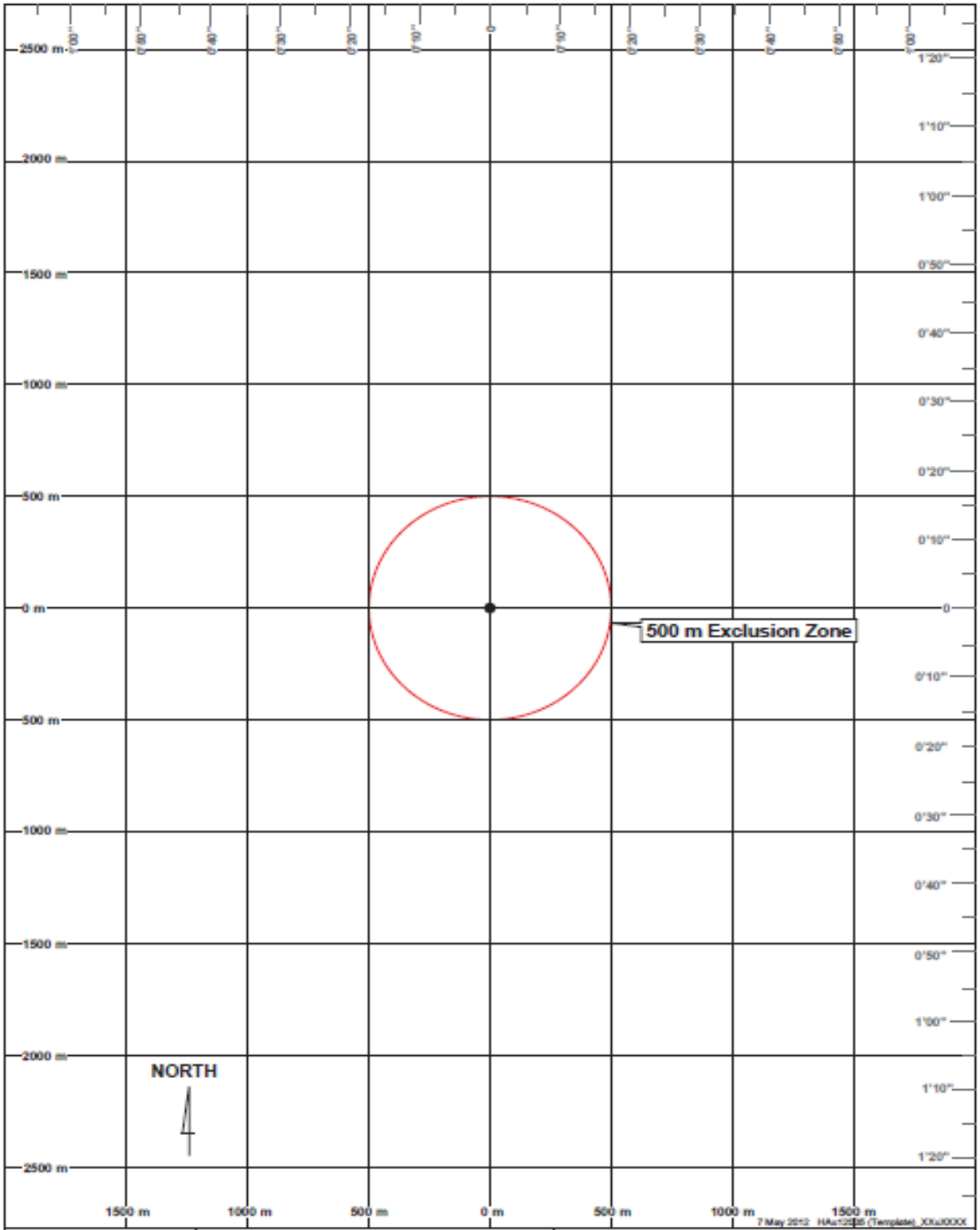
VESSEL OBSERVATION LOG											
Survey Details											
Date	Start time	End Time	Observers								
Incident			Area of Survey								
Vessel type	Call sign										
Weather Conditions											
Wind speed (knots)			Wind direction								
Cloud cover (%)			Visibility								
Time high water			Current direction								
Time low water			Current speed (nM)								
Slick Details											
Slick grid parameters by lat/long			Slick grid parameters (vessel speed)			Slick grid dimensions					
Length Axis	Width Axis		Length Axis			Width Axis	Length		nm		
Start Latitude	Start Latitude		Time (seconds)				Width		nm		
Start Longitude	Start Longitude						Length		nm		
End Latitude	End Latitude		Vessel Speed (kts)				Width		nm		
End Longitude	End Longitude						Grid area		km^2		
Code	**Colour**	**%age cover observed**	**Total grid area**		**Area per oil code**		**Factor**		**Oil volume**		
1	Silver			km^2		km^2	40-300 L/km^2			L	
2	Iridescent (rainbow)			km^2		km^2	300-5,000 L/km^2			L	
3	Discontinuous true oil colour (Brown to black)			km^2		km^2	5,000-50,000 L/km^2			L	
4	Continuous true oil			km^2		km^2	50,000-200,000 L/km^2			L	

	colour (Brown to black)									
5	Brown / orange				km²			km²	>200,000 L/km²		L

VESSEL OBSERVATION LOG										
Survey Details										
Date	Start time	End Time	Observers							
Incident			Area of Survey							
Aircraft type	Call sign		Average Altitude			Remote sensing used				
Weather Conditions										
Wind speed (knots)			Wind direction							
Cloud base (feet)			Visibility							
Time high water			Current direction							
Time low water			Current speed (nM)							
Slick Details										
Slick grid parameters by lat/long			Slick grid parameters (air speed)			Slick grid dimensions				
Length Axis	Width Axis		Length Axis			Width Axis	Length		m	
Start Latitude	Start Latitude		Time (seconds)			Time (seconds)	Width		m	
Start Longitude	Start Longitude						Length		m	
End Latitude	End Latitude		Air Speed (knots)			Air Speed (knots)	Width		m	
End Longitude	End Longitude						Grid area		km²	
Code	**Colour**	**%age cover observed**	**Total grid area**		**Area per oil code**		**Factor**		**Oil volume**	
1	Silver			km²		km²	40-300 L/km²			L
2	Iridescent (rainbow)			km²		km²	300-5,000 L/km²			L
3	Discontinuous true oil			km²		km²	5,000-50,000 L/km²			L

	colour (Brown to black)									
4	Continuous true oil colour (Brown to black)			km^2		km^2	50,000-200,000 L/km^2		L	
5	Brown / orange			km^2		km^2	>200,000 L/km^2		L	

AERIAL SURVEILLANCE SURFACE SLICK MONITORING TEMPLATE



	NAME:	VESSEL / AIRCRAFT:
	DATE / HOUR:	OTHER REFERENCE:

AERIAL SURVIELLANCE MARINE FAUNA SIGHTING RECORD SHEET

Resource	Type/species	Number	Location	Behaviour / Comments
Cetaceans				
Turtles				
Dugongs				
Sharks				
Sea snakes				
Seabirds				
Vessels				
Other Details for each observation location				
Ambient conditions at each location	Date		Photographic record	Date and Time of each
	Time			Photo/video clip number
	Weather Conditions			Brief description
	Visibility (atmospheric)			
	Water turbidity			

MARINE MEGAFAUNA ASSESSMENT SURVEYS

Triggers

1. Observed proximity of marine megafauna to oil slick or response operations combined with suggestion of significant harm (i.e. not an isolated incident), or
2. Observed incident of harm attributable to oil or the response.

Objectives

1. To quantify the presence of megafauna in the response area (i.e. near the oil slick, response vessels or aircraft) or wider region in order to determine the level of potential exposure to oil.
2. To observe and if possible quantify exposure of megafauna to surface oil or to the response.
3. To detect and quantify lethal effects.
4. Observe and to assess the significance of sub-lethal effects (e.g. avoidance behaviour) of this exposure or interactions.

Data Collection and Management

Data to be recorded from aerial megafauna surveys is outlined in the table below.

Resource	Species	Numbers observed	Location	Behaviour/Comment
Cetaceans		Adult: Juvenile: Calf:	Lat: Long:	Direction of movement Proximity to oil Proximity to vessels Identify marks Aversion or other behaviour Carcases
Birds			Lat: Long:	Direction of movement Proximity to oil Proximity to vessels Identify marks Aversion or other behaviour Carcases
Other Details for each Observation Location				
Ambient Conditions at Each Location	Date		Photographic/Video Record	Date and time of each
	Time			Photo/video clip number
	Weathering conditions			Brief description
	Visibility			GPS link

Methodology

It is proposed that observations are made during dedicated monitoring flights supported where necessary by ground (vessel-based) surveys. Flights would normally be dedicated to the monitoring of only one fauna group, but multi-objective flights may be required.

Observers must have relevant skills and expertise in the identification of the subject fauna and in interpreting their behaviour. Aircraft must have adequate downward visual capability.

A photographic or video record should be taken of each sighting and precise locations recorded on GPS.

A detailed methodology must be developed prior to commissioning this study. The scope and design of the detailed must include the following:

- State objectives;
- Reflect the level and distribution of observed or anticipated exposure and effects i.e.;

  - Geographic distribution

  - Study duration
- Stipulate replicate sampling, statistical analyses, and scientific rigour;
- Stipulate the expected flight frequency; and
- Indicate comparison to be made between impacted and unimpacted (control) habitats/biota, before and after spill observations.

The plane should follow line transects which are surveyed in passing mode (e.g. the plane did not deviate from the flight path.

Pre-implementation Actions

- Identify personnel or agencies with skills to design and undertake scientific monitoring of cetaceans, dugongs, birds, turtles;
- Undertake detailed study including design, budget, schedule and resource requirements;
- Identify and assign responsibilities for management of the study; and
- Secure identified resources.

Resource Requirements Checklist

¨ Aircraft

¨ Species identification manuals

¨ Aerial camera (still and video). Video to be GPS linked

¨ Expert megafauna observers

Supporting Documents

AFMA Protected Species Identification Guide: http://www.afma.gov.au/wp-content/uploads/2010/06/id_guide.pdf

SHORELINE OBSERVATION LOG								
Survey Details								
Incident	Date	Start time	End Time	Observers				
Area of Survey								
Start GPS: LAT____deg.____LONG__deg.____min			End GPS: LAT____deg.____LONG__deg.____min					
Aircraft type	Call sign		Average Altitude		Remote sensing used (if any)			
Weather Conditions								
Sun/Cloud/Rain/Windy		Visibility			Tide Height L/M/H			
Time high water		Time low water			Other			
Shoreline Type - Select only ONE primary (P) and ANY secondary (S) types present								
	Rocky Cliffs		Boulder and cobble beaches		Sheltered tidal flats			
	Exposed artificial structures		Riprap		Mixed sand and gravel beaches			
	Inter-tidal platforms		Exposed tidal flats		Fine-Medium sand grained beaches			
	Mangroves		Sheltered rocky shores		Other			
	Wetlands		Sheltered artificial structures					
Operational Features (tick appropriate box)								
	Direct backshore access		Alongshore access		Suitable backshore staging			
Other								

APPENDIX A2 – Shoreline Assessment Form

Department of Transport

Shoreline Assessment Form

This form should be submitted to the Shoreline Division Coordinator (SC). A summary of the information will be forwarded by the SC to the Operations Officer, Planning Officer and Management Support Unit.

Purpose

This form is for shoreline responders who are required to complete a shoreline assessment.

It is recommended that such responders have completed oiled shoreline training as a minimum. This form is not intended to be used in isolation.

Purpose

Human health and safety is **always** the number one priority in any incident.

Priorities

Protection priorities under Australia's National Plan to Combat Pollution of the Sea by Oil and other Noxious and Hazardous Substances (The National Plan) are:

- Human health and safety
- Habitat and cultural resources
- Rare and/or endangered flora and fauna
- Commercial resources
- Recreational and amenity areas

Complete

- Take Five and
- Job Safety Analysis (JSA)

Prior to and as part of your operations

What is a shoreline assessment?

A shoreline assessment:

- Is a simple and comprehensive survey of a shoreline
- Provides data to enable decision making for shoreline protection, clean-up and monitoring and
- Employs a systematic approach using standardised terminology

What information needs to be gathered?

Purpose

- Shoreline description
  - Shoreline type, substrate and energy
  - Biological character of shoreline
- Oil description
- Oil location, character and behaviour

Additional information that may be required:

- Access
- Site hazards and constraints
- Sensitive areas
- Features/landmarks
- Potential sites for
  - Decontamination/waste
  - Helicopter landing

Dividing the shoreline

Sectors

Where there is a geographical barrier and restricted access between two areas, they will be split into separate sectors. Different sectors may have separate field command centres, catering, ablutions, decontamination, etc. Sectors will be further spilt into segments.

Segments

A segment is a piece of shoreline that's a workable size for a team and could be defined based on:

- Shoreline type
- Substrate type
- Access points
- Features e.g. breakwater
- Jurisdiction e.g. shire boundaries
- Presence of particular flora and/or fauna
- Distance e.g. every 50m

Item Category	Item	Check
Recording	Camera	☐
Navigation	Maps and charts	☐
	GPS	☐
	Compass	☐
Communication	Mobile phone	☐
	Radio	☐
	Confirm phone/radio coverage	☐
Personal	First aid kit	☐
	Hat	☐
	Sun-cream	☐
	Drinking water	☐
	Rubber boots (non-slip)	☐
	Wet weather gear	☐
Documentation	Field booklet	☐
	Shoreline assessment forms	☐
	JSA forms	☐
	Log	☐
Other	Tape measure	☐
	Shovel	☐
	Sampling kit	☐

Ensure you advise command of your planned operation and establish reporting expectations for while you are in the field.

Objective ID: A8525747 Page 1 of 4

Shoreline descriptors:

Shoreline Type	Abbr.		Note
Cliff	Cl		Height and slope
Platform	Pl		Height relative to tide
Reef	Re		Reef is an intertidal platform
Beach	Be		
Dune	Du		
Flats	Fl		
Artificial	A		e.g. wharf, sea wall
Shoreline substrate	**Abbr.**	**Size**	**Note**
Bedrock or rock	R		
Boulder	B	Larger than head	
Cobble	C	Fist to head size	
Pebble	P	Pen diameter to fist size	
Gravel	G	2-4mm diameter	
Mud/silt/clay	M	Less than 0.6mm	Mix with water, if it goes cloudy = mud, if it sinks = sand
Earth	E		Usually cliffs only
Shellgrit	Sh		Usually with sand (i.e. Sh/S)
Coral	Co		Dead coral, i.e. coral rubble *(if corals are live, record as coral in both substrate type and biological character)*
Artificial	A		e.g. rip-rap

Note: S/B would indicate boulders and sand in equal amounts. S(B) would indicate sand was the dominant substrate.

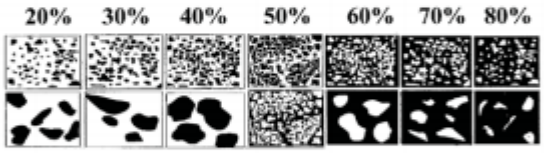
Biological character

This is flora and fauna living on the shoreline. Document this and indicate location on sketch map.

Oil description/character

- **Colour**
- **Viscosity: Solid** *(doesn't flow)*, **Viscous** *(flow slowly)*, **Fluid** *(flows easily)*
- **Stickiness: Very sticky** *(can't be wiped/washed off)*, **Sticky** *(partly removed by wiping/washing)*, **Non sticky** *(wipes of easily)*

Percentage oil cover

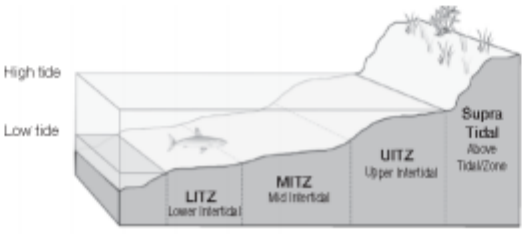


Oil thickness

Name	Abbr.	Thickness	Description
Pooled	Po	Can be measured in mm or cms	Pooled fresh or emulsified oil
Cover	Co	Over 1mm	Coverage of oil of measurable thickness but not pooled
Coat	Ct	Less than 1mm	This coach of oil that masks colour of substrate and can be scratched off with fingernail.
Stain	St	Less than 1mm	Very thin stain of oil which cannot be scratched off substrate with fingernail
Film or sheen	Fi or Shn	Extremely thin film or sheen	Substrate can usually be seen through oil. Can be described as brown, rainbow or silver.
Tar balls	Tb	Variety of sizes	Ball or clumps of weathered oil.

- To describe thickness of subsurface oil:
  - Depth = distance from substrate surface to top of buried layer
  - Thickness of lens = distance between top and bottom of buried layer

Shoreline tidal zones



Objective ID: A8525747 Page 2 of 4

Incident		**Ref No.**	
REPORTING DETAILS			
Assessment Team Leader		**Position/ Organisation**	
Team Members (name/org)			
Date Completed		**Time Completed**	
Reporting to		**Position/ Organisation**	
Date Received		**Time Received**	
LOCATION DETAILS			
Sector		**Segment**	
Name of Beach/Location		**Description (e.g. slope)**	
Topography/ Other Map		**Map Reference**	
Access Via	☐ Foot Only ☐ Road ☐ 4WD ☐ Boat ☐ Helicopter ☐ Gator/OUV		
Hazards			
TIMING			
First Assessment	☐ Yes ☐ No	**Last Assessment**	☐ Yes ☐ No
Timing	☐ Pre Impact ☐ Post Impact Before Clean-Up ☐ Post Impact After Clean-Up		
Time Since	Impact (days/hrs.):	Last Clean-up (days/hrs.):	

ASSESSMENT				
Parameter	**LITZ**	**MITZ**	**UITZ**	**Supratidal**
Shoreline Description				
Shoreline type				
Substrate type				
Length of shoreline				
Width of shoreline				
Biological character				
Oil Distribution and Character				
Oil band length				
Oil band width				
% cover in band				
Surface oil thickness				
Oil appearance/character				
Depth of buried oil (from surface)				
Description of buried oil				
Other				
Un oiled debris				
Oiled debris				

Objective ID: A8525747 LO01 Page 3 of 4

Sketch Map

Please include North point and scale

Notes

APPENDIX A3 – Effectiveness of Dispersant Operations

In support of the Jadestone Montara EP/OPEP submission, the following information is provided to support the use and effectiveness of dispersant in the event of a spill from the Montara field.

Noting the unique circumstances associated with the Montara, in that a large-scale oil spill response operation led by AMSA was undertaken in 2009 there is evidence in support of the use of dispersant.

In 2010 AMSA released a report into the incident:

"The Response to the Montara Wellhead Platform Incident Report of the Incident Analysis Team - March 2010" *https://www.amsa.gov.au/marine-environment/incidents-and-exercises/response-montara-wellhead-platform-incident*

The report provided favourable feedback relating to the dispersant operations undertaken (see extract below):

Dispersant spraying operations commenced on 23 August 2009 and continued until 1 November 2009:

- the Hercules C-130 sprayed a total of 12,000 litres of dispersant on 23 and 24 August;
- aircraft contracted to AMSA as part of Australia's Fixed Wing Aerial Dispersant Capability continued spraying operations based out of Truscott-Mungalalu aerodrome from 25 August until 2 September, spraying 32,000 litres of dispersant; and,
- vessel spraying operations were carried out from 30 August to 1 November, with 118,000 litres of dispersant sprayed.

Courtesy Mark Hamilton photography

Based on comments provided to the IAT, observations made by experienced personnel during the response indicated that the use of dispersant was highly effective in assisting the natural process of biodegradation and minimising the risk of oil impacts on reefs or shorelines. The six types of dispersant used, Slickgone NS, Slickgone LTSW, Ardrox 6120, Tergo R40, Corexit 9500 and Corexit 9527 were all prior approved for use within Australian waters, having passed laboratory acute toxicity testing requirements applied under the National Plan arrangements.

An additional factor that supports the use of dispersant relates directly to sea state. The following extract is from the IPIECA – Dispersants surface application (Good Practice Guide) - http://www.ipieca.org/resources/good-practice/dispersants-surface-application/

The information discusses the limitations caused by prevailing conditions. A key point of information is the following:

"Rapid dispersion of dispersant-treated oil begins at a wind speed of approximately 7 knots (3m/s, a light gentle breeze) with wave heights of 0.2-0.3 metres."

Limitations caused by prevailing conditions

Sea state

The prevailing sea conditions have a great influence on the effectiveness of response techniques.

The effectiveness of booms used to corral floating oil prior to recovery with skimmers or ignition in controlled in-situ burning is greatly reduced in rougher seas. Booms can be overwhelmed by waves, related to the size (draft and freeboard) of the boom as well as its buoyancy and ability to respond to, or ride on, waves. Even large sea booms can become ineffective at wave heights of approximately 1.4 to 1.8 metres and wind speeds in excess of around 20 knots. Many skimmers are limited by sea state, with some types becoming increasingly ineffective at wave heights greater than 0.6 to 1 metres.

Rapid dispersion of dispersant-treated oil begins at a wind speed of approximately 7 knots (3 m/s, a light to gentle breeze) with wave heights of 0.2 to 0.3 metres. However, dispersants can be sprayed onto floating oil in flat calm conditions, and dispersion will begin when appropriate sea conditions occur. Gale-force winds with speeds greater than 35 knots (18 m/s) and wave heights of 5 metres are generally the upper limits for spraying dispersant from aircraft, although dispersants have been applied from aircraft in winds greater than 50 knots (ESGOSS, 1994). Also, targeting the dispersant becomes challenging in high winds, and floating oil will be over-washed or temporarily submerged in rough seas. The limiting conditions for spraying dispersants from ships will be less for the same reasons.

Extremely rough sea conditions may prevent any at-sea oil spill response. However, these conditions can cause extensive natural dispersion of lighter spilled oils.

Based on the historic wind conditions used in determining the OSTM, it is also highly likely that the prevailing sea state will greatly enhance dispersant operations.

<u>Wind Conditions – from Jadestone OSTM</u>

Summer approximately 74% @ 4m/s up to 12-14m/s (20+knots) = Beaufort Scale 5

Transition approximately 50% @ 6-8 m/s (12+knots) = Beaufort Scale 4

Winter approximately 80% @ 4m/s up to 10-14 m/s (20+knots) = Beaufort Scale 5

(See Beaufort Scale descriptions below)

		Wind Speed	Wave height			
3	Gentle breeze	7–10 knots 8–12 mph 12–19 km/h 3.4–5.5 m/s	2–4 ft 0.6–1.2 m	Large wavelets; crests begin to break; foam of glassy appearance; perhaps scattered white horses	Leaves and small twigs in constant motion; light flags extended.	
4	Moderate breeze	11–16 knots 13–18 mph 20–28 km/h 5.5–7.9 m/s	3.5–6 ft 1–2 m	Small waves becoming longer; fairly frequent white horses	Raises dust and loose paper; small branches moved.	
5	Fresh breeze	17–21 knots 19–24 mph 29–38 km/h 8–10.7 m/s	6–10 ft 2–3 m	Moderate waves taking a more pronounced long form; many white horses are formed; chance of some spray	Small trees in leaf begin to sway; crested wavelets form on inland waters.	

APPENDIX A4 – Skua-11 Well Kill from the MWHP

From: Ally McVicar (SDE)

To: Note to File

Date: 12th Oct 2021

Summary: Following well integrity issues on Skua-11 a kill from the Montara WHP was evaluated along with the equipment required on request by NOPSEMA. A more detailed look at the equipment required was made prior to the V107 moving over the Skua wellheads. This information will be added as an appendix to the Montara Field OPEP to be picked up as required.

1. REFERENCES

Ref. No	Document Title	Document Number/ Link
01	Skua-11 Well Kill Modelling	SLB Summary
02	Pressure Dynamics Quote	Quote
03	Pressure Drop Calculation	Line Pressure Drop
04	NOPSEMA letter – Well Kill	RFFWI

2. BACKGROUND

Following a request from the regulator a model to determine if the well subsea well Skua-11 could be killed from the wellhead platform was undertaken. SLB modelled this using DRILLBENCH [Ref. 1] and showed that it was feasible to displace the flowline if a rate of 8bpm could be achieved.

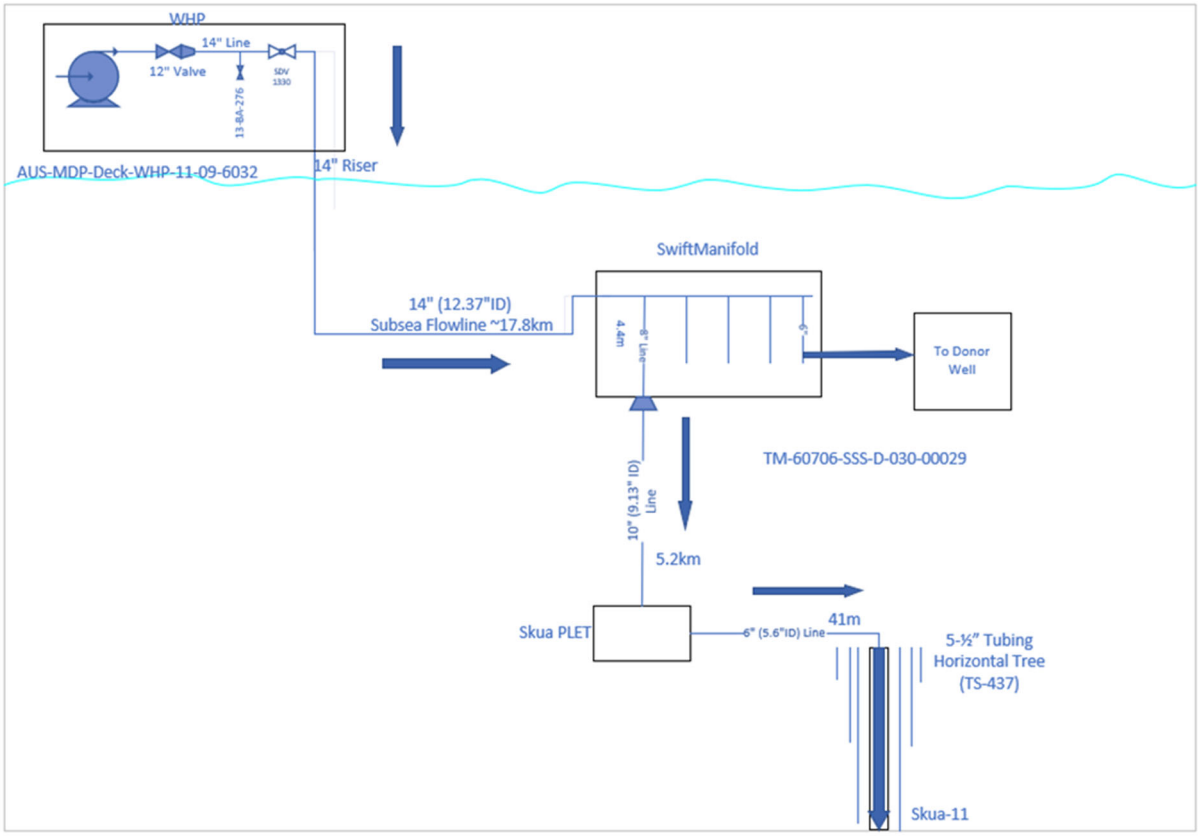


Figure 2. Skua-11 Flowline Kill

The operational objectives would be as follows:

- Bullhead KWF to Skua-11 from the Montara WHP ~24hrs
    - Initially deliver 13440bbls (1.3 x line volume) to clear the 14” flowline line to a donor well, displacing to seawater was sufficient.
    - Place 3200bbls of 1.08sg Brine at the Skua-11 wellhead to bullhead and kill the well.
        - 2 x subsea line (1390bbl)
        - 2 x well volume (213bbl)

The SLB model, [Ref. 1], made conservative assumptions on the injectivity index of the reservoir, however showed that it was achievable with a HT-400 style pump at ~8bpm and 2700psi delivery pressure.

The pressure seen at the wellhead to displace and bullhead the well is greater than the pressure seen to induce a leak path to the seabed ~60bar (880psi). With the conservative reservoir assumptions used it is possible that pumped fluid may also exit the well to seabed until the well is displaced to Brine and shut in. The amount of produced fluid pumped to Skua-11 has been reduced by displacing the flowline to a donor well with well integrity.

An estimation of the line content between the SWIFT manifold and Skua-11 was taken using the drill bench modelling, Figure 2.

Table 19-1. 5km Swift Manifold to Skua-11 Flowline Contents

Flowline	Total Volume	Estimated Contents
10” Swift to Skua PLET	219.93m3	55% Water (121m3) 15% Oil (33m3) 30% Gas (66m3 equivalent)
6” PLET to Skua-11	0.66m3	55% Water (0.4m3) 15% Oil (.1m3) 30% Gas (0.16m3 equivalent)

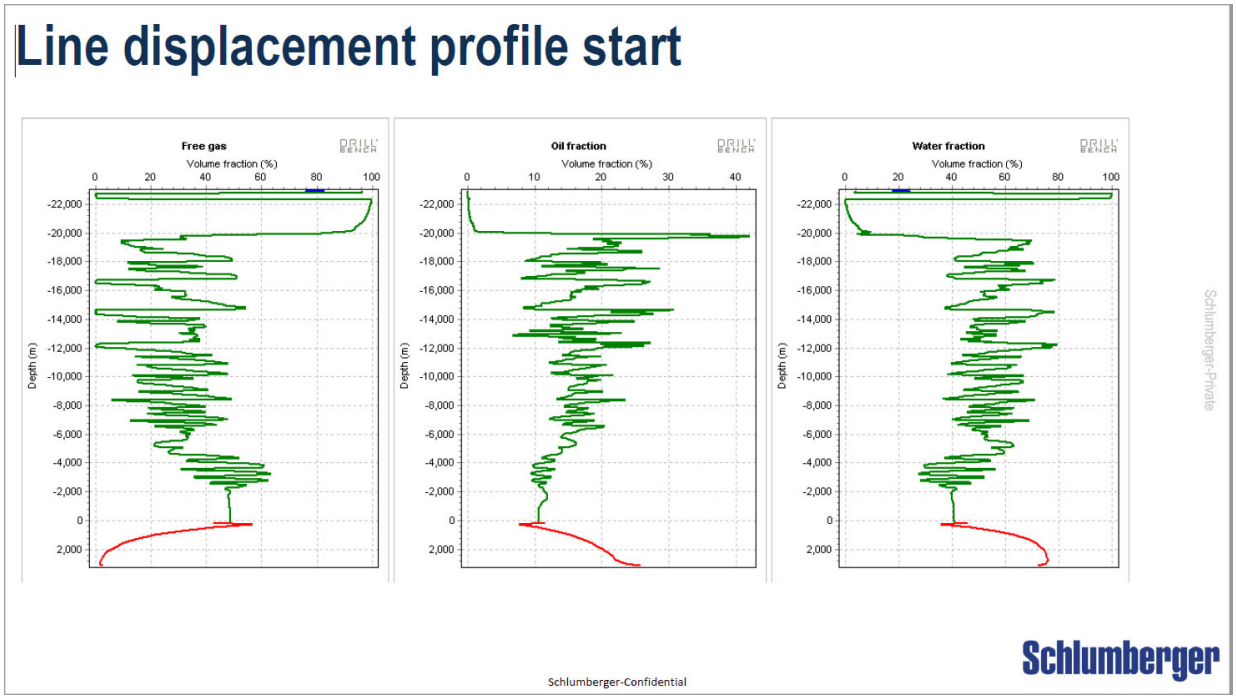


Figure 3. Flowline Contents Model

Kill Equipment

- HT-400 Pump on hire to Jadestone
- Tie-in from Pump to 12” Valve at platform in progress.
- Brine Tanks – available from Fergusons or equivalent
- Deck plan and equipment placement plan in progress w/ 9Te crane on WHP.
- Crane fuel bunkers to be used and supplemented with IBC’s.
- 12” valve sourced and will be used to tie-into to the flowline at the platform, rated to 248 bar (3645psi). PO issued and structural engineering commenced.
- Flowline rated to 280bar (4116 psi) 248 bar.
- Contract in place with Baker Hughes Fluids for concentrated Brine delivery and will be diluted with seawater to reach required kill weight.

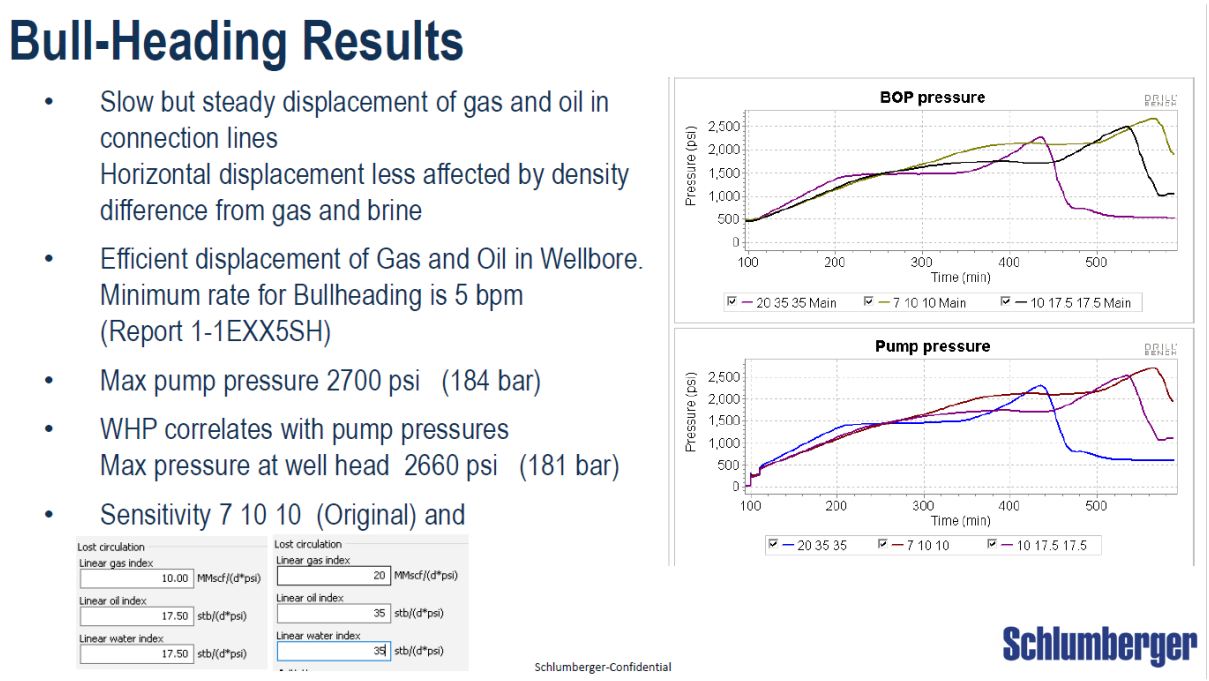


Figure 4. SLB Kill Modelling Bullhead of well.

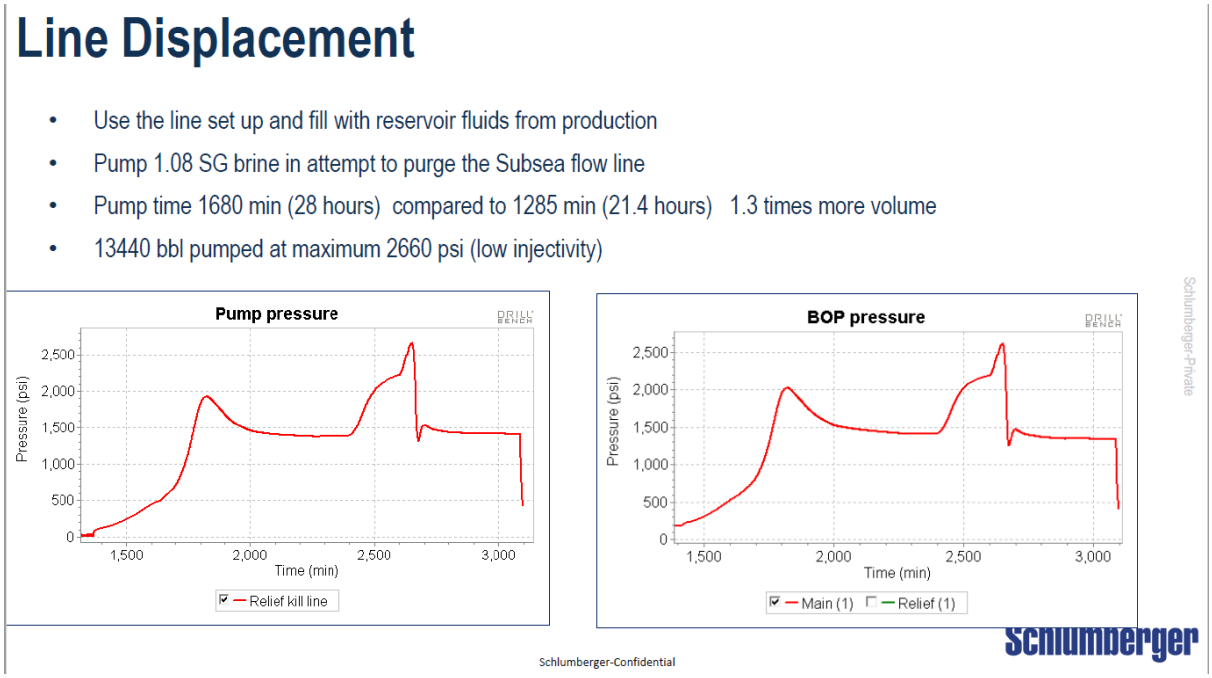


Figure 5. SLB Kill modelling, displacement of flowline

3. RIG UP SCENARIOS

Following this assessment provided to NOPSEMA, a deeper look at the two scenarios to rig up to the wellhead platform were assessed:

A. Pumping from the Valaris 107 (the infield jackup over the Montara WHP drilling Montara H6).
B. Pumping from a skid sourced for the platform.

A 350mm Blank Flange in the well bay was chosen as the best tie-in point to the 14" Flowline. It had been left for the future installation of pig receiver. The operations team have sourced a 12" Valve (248bar/3600psi rating) and are in the process of engineering a reducing spool piece with adequate support.

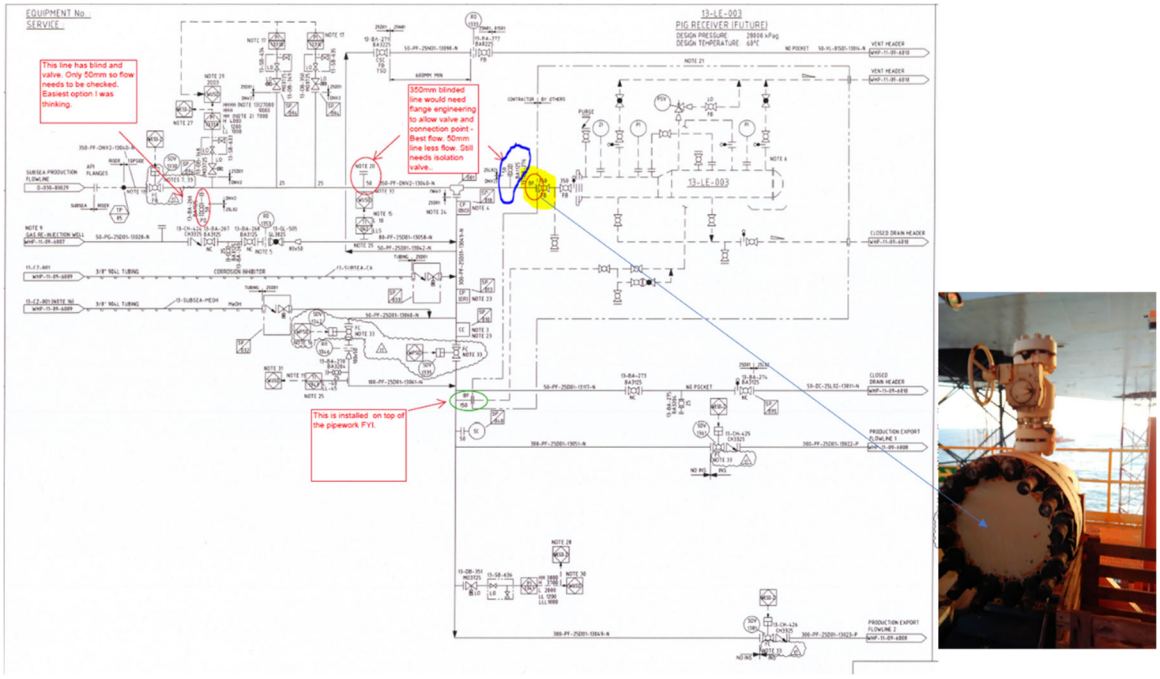


Figure 6. PID w/ Blank Flange Highlighted

A basic pressure drop calculation was performed, [Ref. 3] to determine the minimum line ID from the source pump to the flowline. Using Scenario A as a worst-case (being longer) different pipe ID's were modelled at 10 and 20bpm. A 2" ID line showed a significant increase in pressure drop (at 20bar vs 3-5bar), therefore 3" ID lines are the minimum that could be used with 4"+ preferable.

Table 19-2. Delivery Pressure Drop vs Line ID.

HOSE ID		Delta P		Flow rate
"	m	Bar	psi	kg/h
2	0.0508	20	294	96,000
3	0.0762	5	73.5	96,000
4	0.1016	3.5	51.45	96,000
5	0.127	3.06	44.982	96,000
6	0.1524	2.9	42.63	96,000
2	0.0508	73	1073.1	192,000
3	0.0762	15	220.5	192,000
4	0.1016	7.6	111.72	192,000
5	0.127	6.3	92.61	192,000

HOSE ID		Delta P		Flow rate
"	m	Bar	psi	kg/h
6	0.1524	5.8	85.26	192,000

A Y-Piece to tie into the 12” valve was proposed to maximise the volume and allow for a drain line to the close drain header. It is recommended that the “Blind Flange” sections of the Y-piece are left blank to allow available hose couplings to be welded on depending on hose availability.

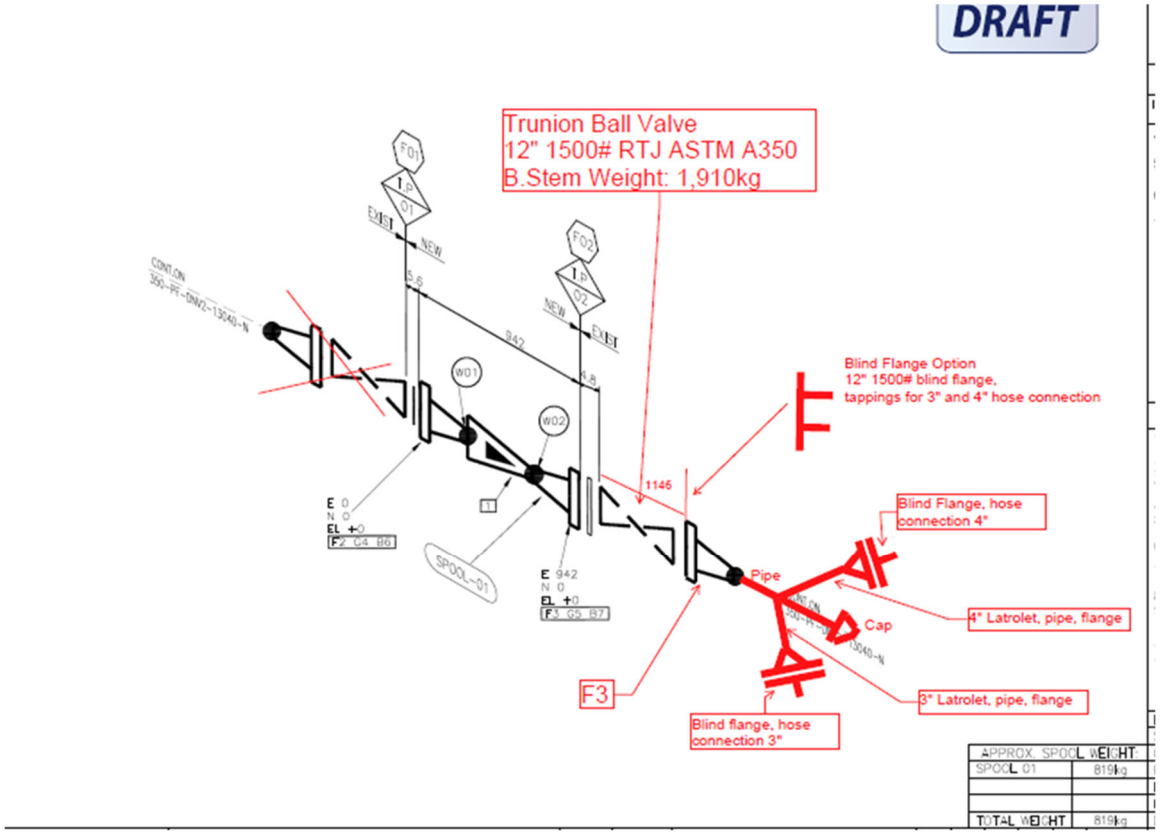
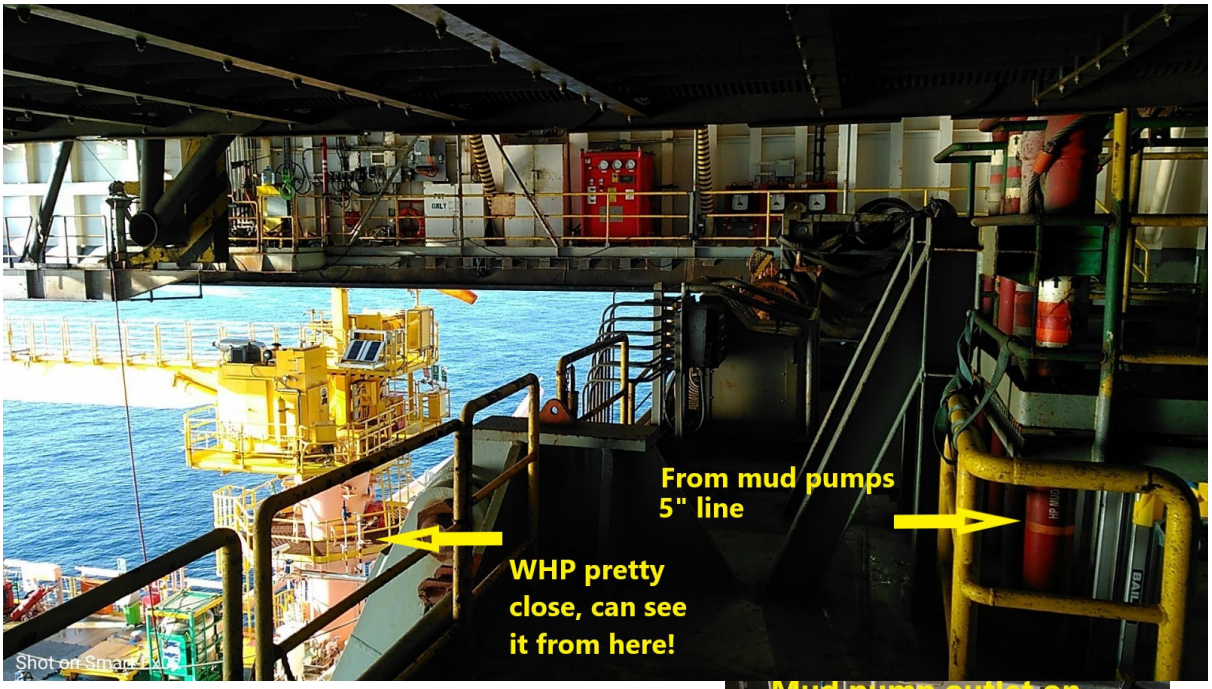


Figure 7. Legioneering 12" valve and Y-Piece

4. SCENARIO A – PUMP FROM THE V107 OVER THE MONTARA WHP

The rig pumps on the V107 are rated to pressure (5000pi max) and are designed to deliver a consistent rate for significant time periods. In a source control situation, it is these that are used to kill a well as the primary option, rather than the cement unit.

Below the cantilever deck the V107 has an alternative point to tie-in to the mud pumps, eliminating the need to pump to the rig floor and back down. The 3 x W-2215 mud pumps are manifolded with a 6” FIG 1004 hose connection, pictures below show tie-in.



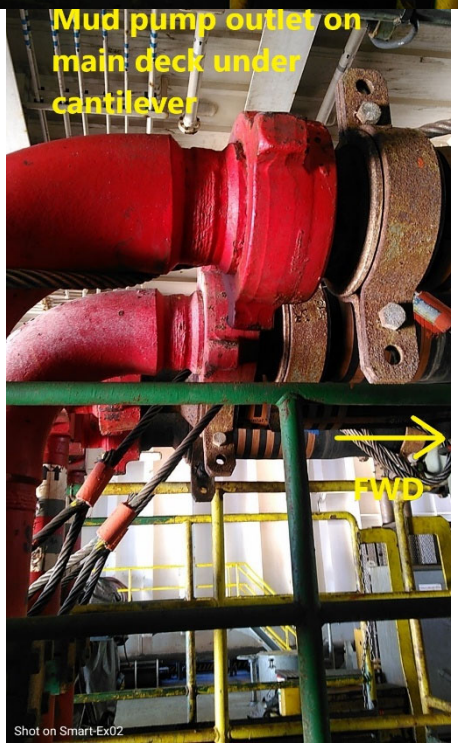


Table 19-3. W2215 Mud Pump Specs (V107)

W-2215 Triplex Piston Model – Continuous Duty Performance Data Stroke, in (mm): 15 (381.0) Gear Ratio: 4.82 Rated hp (kW): 2200 (1641) @ 110 Spm								
PUMP SPEED (Spm)			110	100	90	80	70	60
MAXIMUM INPUT HP (kW) rating[1]			2200 (1641)	2000 (1491)	1800 (1342)	1600 (1193)	1400 (1044)	1200 (895)
LINER SIZE in (mm)	MAX DISCHARGE PRESSURE psi (kg/cm²)[3]	VOLUME/ STROKE gal (l) per revolution	OUTPUT gal(l)/min[2]					
9 (228.6)[3]	2489 (175.0)	12.393 (46.907)	1363 (5160)	1239 (4691)	1115 (4222)	991 (3753)	868 (3284)	744 (2815)
8-1/2 (215.9)[3]	2791 (196.2)	11.054 (41.840)	1216 (4603)	1105 (4184)	995 (3766)	884 (3348)	774 (2929)	663 (2511)
8 (203.2)	3151 (221.5)	9.792 (37.063)	1077 (4077)	979 (3707)	881 (3336)	783 (2965)	685 (2595)	588 (2224)
7-1/2 (190.5)	3585 (252.0)	8.606 (32.575)	947 (3584)	861 (3258)	775 (2932)	688 (2606)	602 (2280)	516 (1955)
7 (177.8)	4115 (289.3)	7.497 (28.376)	825 (3122)	750 (2838)	675 (2554)	600 (2270)	525 (1986)	450 (1703)
6-1/2 (165.1)	4773 (335.6)	6.464 (24.467)	711 (2692)	646 (2447)	582 (2202)	517 (1958)	452 (1713)	388 (1468)
6 (152.4)	5601 (393.8)	5.508 (20.848)	606 (2293)	551 (2085)	496 (1876)	441 (1668)	386 (1459)	330 (1251)
5-1/2 (139.7)	6666 (468.7)	4.628 (17.518)	509 (1927)	463 (1752)	417 (1577)	370 (1402)	324 (1226)	278 (1051)
5 (127.0)	7500 (527.3)	3.825 (14.478)	421 (1593)	382 (1448)	344 (1303)	306 (1158)	268 (1014)	229 (869)

[1]Based on 90% mechanical efficiency [2]Based on 100% volumetric efficiency [3]Requires special retention system; liner is induction-hardened, therefore liner life is reduced
All specifications are subject to change. Information important to a particular application should be verified by Cameron.

With this tie-in the mud pumps would be isolated from the rig floor drill pipe pressure gauge. A well test 'data header' with remote gauges back to the drill floor could provide this feedback loop. An initial P+ID is shown below for this rig up, it is clearly understood that alternative options may be required depending on equipment availability but that well test equipment with a 3-4" ID minimum would be preferred.

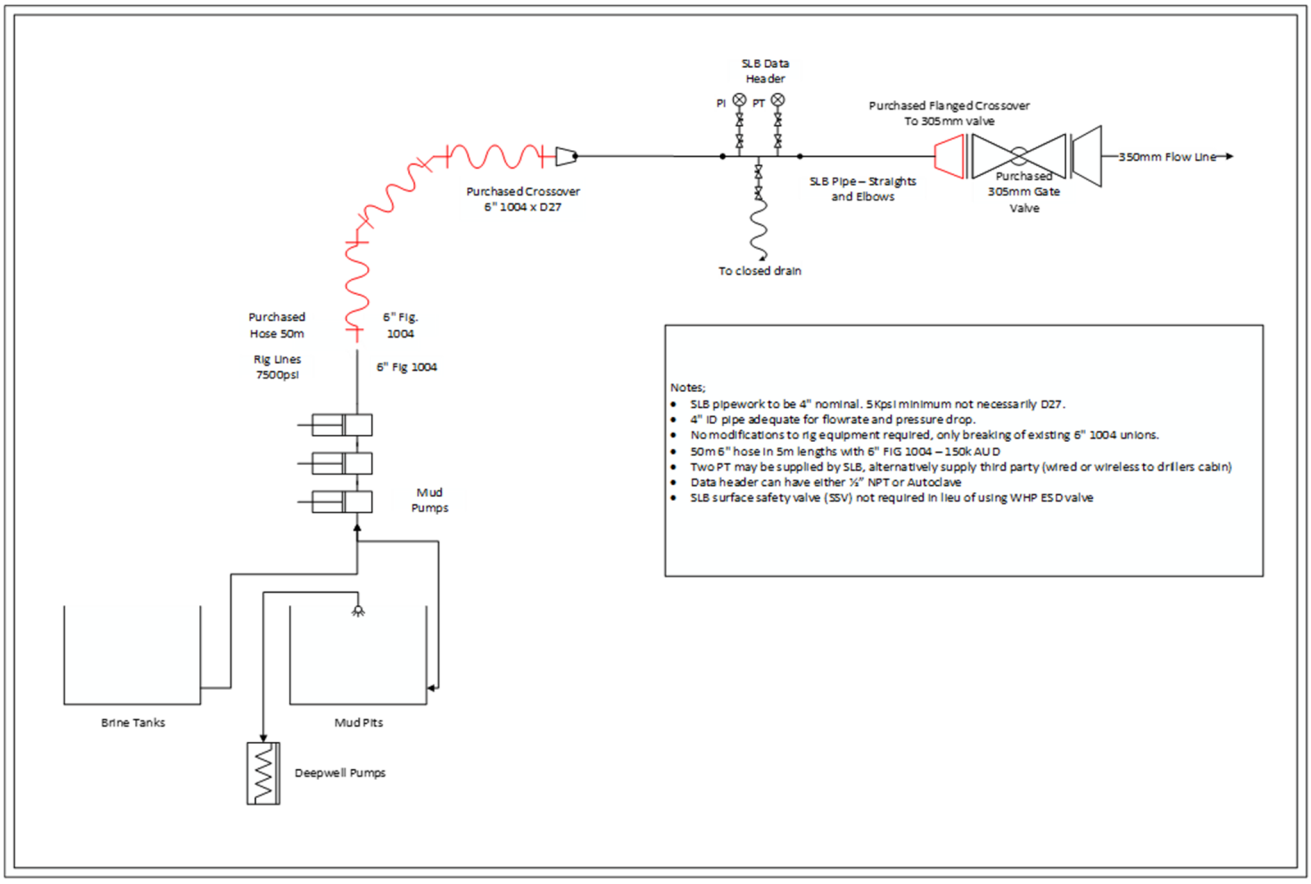


Figure 8. V107 to WHP rig up

Sourcing well test hard pipework is contingent on availability with other operators. If required at last minute it may be necessary to use a 4" ID HIGH-PRESSURE MUD HOSE or equivalent. In this case crossovers to the well test data header would be considered a bottle neck.

Long Lead Items for Scenario A.

Item	Description	Purpose	Lead Time	Cost
1.	5 x 10m 6" API 7K Hose w/ FIG 1004 Hammer Union	Tie into Rig pumps on V107	8 weeks	135,925AUD + GST
2.	Well Test Data Header	Pressure Feedback to Rig Floor		
3.	4" Well Test Hard Piping	Run from 6" Hose to WHP tiein	Subject to availability in country on the day	
4.	4" Hoses	Run from 6" Hose to WHP tiein		
5.	x-over from 6" Fig 1004 to 4" pipe/hose	-		
6.	x-over from 4" pipe/hose to 12" Valve	-	Legioneering ongoing	

5. SCENARIO B PUMPING FROM A SKID SOURCED FOR THE PLATFORM.

At present there are no pumps available on the WHP (the potential to pump from the FPSO has not been evaluated), limited deck space and no accommodation. The WHP crane is reported to be able to lift 7-9te.

Key Assumptions to Perform this work

- A vessel stationed at the WHP is a given
- Vessel requirements to confirm are;
  - 4000bl brine tank capacity
  - Can pump SW to the WHP at 8-10bpm
  - Ability to pump continuously to the WHP for 48hrs (includes 24hr contingency).
  - DP3 station keeping
  - Berths available for a 4 person crew
- 24 operations are possible, using the Billy Pew (or equivalent) and berthing on the vessel
- Pumping at 8bpm is lowest flowrate.
- 80bbl minimum Buffer Tank spotted on platform (MWHP deck loads to be confirmed) to provide 10min trouble shooting time whilst pumping.
- A pump w/ minimum of 5000psi rating, 8-10bpm with SW and 24hr pump capacity can be spotted to the platform.

Halliburton could provide 2 different types of pumps, the HT-400 single skid is the only one that can be spotted on the platform and HAL have recommended that 2 were placed to ensure fluid deliverability. Pump curve supports need for 2 x pumps to deliver rates.

Single Skid

- Qty 2 available (1 currently being used on Stag Platform).
- 12.6 MT but pump section can be separated to reduce weight < 10 MT.
- Recommended to have 2 on hire given volume and duration.
- Caterpillar 3406, 490 BHP
- Fitted with 4.5” Fluid End
- Max pressure 11,200 psi and Max rate 10.8 bpm. (Mutually exclusive)
- From graph can deliver 3000psi around 4-5bpm.

Dimensions:

HT-400™ PUMP SKID UNIT	
Length	6,461 mm
Width	1,960 mm
Height	3,302 mm
Weight	12,500 kg

Performance Curve:

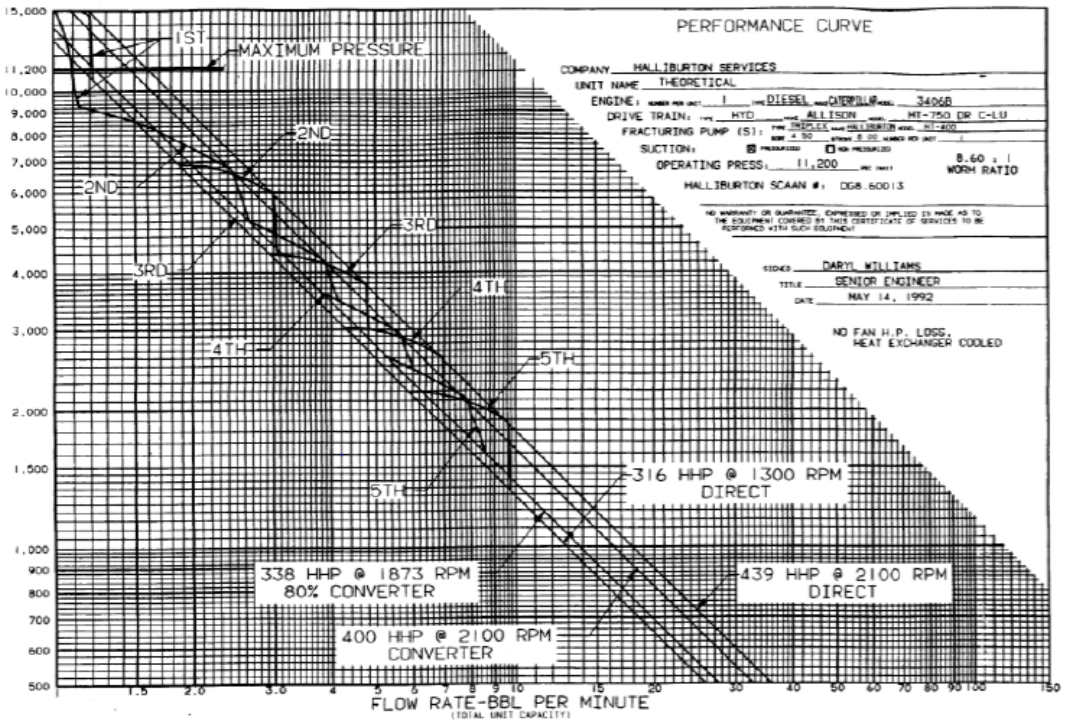


Figure 9. HT400 Pump curve

- High Horsepower Skids (Panther)
  - Qty 4 available
  - Engine section = 16.0 MT
  - Too heavy for WHP, could be used from a vessel to pump SW to the platform.
  - 3 piece skid design
  - Caterpillar C32, 800 BHP
  - Fitted with 4.5” Fluid End
  - Max pressure 11,200 psi and Max rate 10.8 bpm. (Mutually Exclusive)
  - From graph ~ 3000psi @8bpm

Dimensions:

HT-400™ PANTHER SKID UNIT	
Power Section Length	4,267 mm
Pump Section Length	2,990 mm
Overall Length c/w Support Frame	8,142 mm
Width	2,438 mm
Height	2,590 mm
Power Section Weight	15,914 kgs
Pump Section Weight	5,569 kgs
Support Frame Weight	4,126 kgs
Total	25,609 kg

Performance Curve:

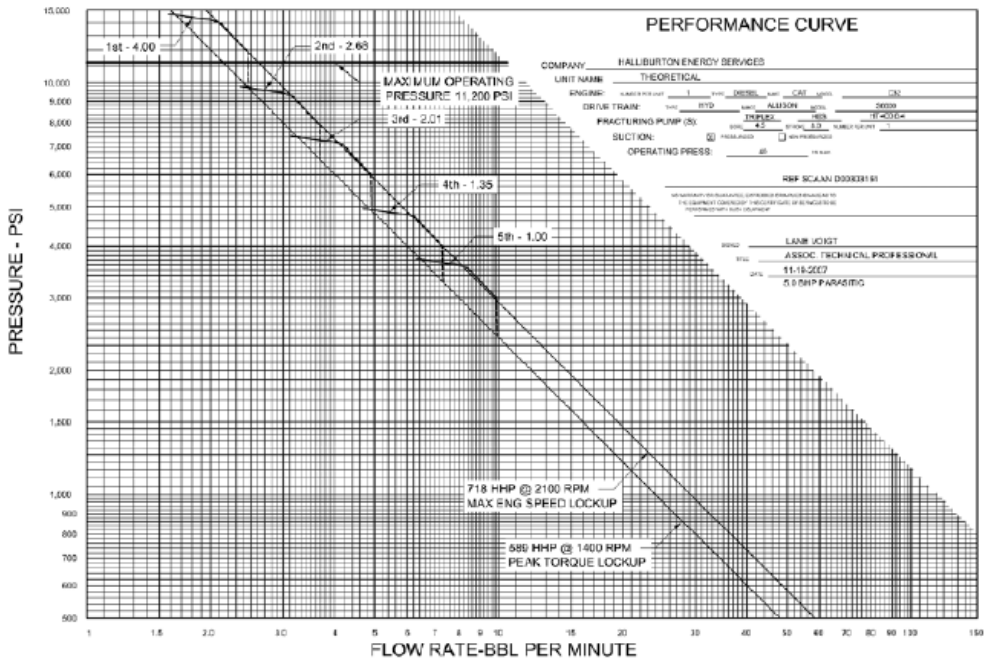


Figure 10. Panther Pump Curve

A quote was received from Pressure Dynamics for an API 7k rated high pressure hose assembly. This would consist of 5 x 10m sections with Fig 1004 Hammer Unions allowing the hose to be manhandled on the WHP to run from the helideck to the well bay and tie-in to the Y-piece and flowline, taking 6 weeks to manufacture and would cost ~150kAUD, [Ref. 2]. A low-pressure hose would also be needed to deliver SW and brine from the boat to the deck. It is assumed that this would be more readily available.

APPENDIX A5 – Regulatory Notifications

Agency / Authority	Notification Type & Timing	Legislation / Guidance	Reporting Requirements	Responsibility	Forms
NOPSEMA Reportable Incidents					
NOPSEMA (Incident Notification Office)	Verbal notification within **2 hours** Written report as soon as practicable, but no later than 3 days	*Petroleum & Greenhouse Gas Storage Act 2006* Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009 (as amended 2020)	A spill associated with the activity that has the potential to cause moderate to significant environmental damage[10]	Jadestone IMT Planning Lead	Incident reporting requirements: https://www.nopsema.gov.au/environmental-management/notification-and-reporting/
National Offshore Petroleum Titles Administrator (NOPTA) (Titles Administrator)	Written report to NOPTA within 7 days of the initial report being submitted to NOPSEMA	Guidance Note (N-03000-GN0926) Notification and Reporting of Environmental Incidents	Spill in Commonwealth waters that is reportable to NOPSEMA	Jadestone IMT Planning Lead	Provide same written report as provided to NOPSEMA
Level 1-3 Spills					
AMSA (Rescue Coordination Centre (RCC))	Verbal notification without delay to include: • name of ship/s involved • time, type and location of incident • quantity and type of harmful substance	National Plan for Maritime Environmental Emergencies	• All slicks trailing from a vessel • All spills to the marine environment • All spills where National Plan equipment is used in a response	Vessel Master	Incident reporting requirements: https://www.amsa.gov.au/marine-environment/marine-pollution/mandatory-marpol-pollution-reporting

[10] A reportable incident is defined by the OPGGS (E) Regulations as 'an incident relating to the activity that has caused, or has the potential to cause, moderate to significant environmental damage'. For the purpose of determining whether an incident is a reportable incident, the Titleholder considers any incident that causes, or has the potential to cause, a consequence severity rating of 3 or greater to be a reportable incident.

Agency / Authority	Notification Type & Timing	Legislation / Guidance	Reporting Requirements	Responsibility	Forms
	• assistance and salvage measures • any other relevant information Written POLREP form, within 24 hours of request from AMSA				Online POLREP - https://amsa-forms.nogginoca.com/public/
Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Director of Monitoring & Audit)	Email notification as soon as practicable	*Environment Protection and Biodiversity Conservation Act 1999*	If Matters of National Environmental Significance (MNES) are considered at risk from a spill or response strategy, or where there is death or injury to a protected species	Jadestone IMT Planning Lead	N/A
Parks Australia (24 hour Marine Compliance Officer)	Verbal notification as soon as practicable	*Environment Protection and Biodiversity Conservation Act 1999*	All actual or impending spills which occur within a marine park or are likely to impact on an Australian marine park	Jadestone IMT Planning Lead	Not applicable, however the following information should be provided: • Titleholder's details • Time and location of the incident (including name of marine park likely to be affected) • Proposed OPEP response arrangements • Confirmation of providing access to relevant monitoring and evaluation reports when available

Agency / Authority	Notification Type & Timing	Legislation / Guidance	Reporting Requirements	Responsibility	Forms
					• Details of the relevant IMT contact person.
Australian Fisheries Management Authority (AFMA)	Verbal phone call notification within 8 hours		• Fisheries within the environment that may be affected (EMBA) • Consider a courtesy call if not in exposure zone	Jadestone IMT Planning Lead	N/A
Northern Territory Waters					
NT Pollution Response Hotline and NT Commissioner of Police	Verbal notification Follow up with POLREP as soon as practicable after verbal notification	As per Territory legislation (i.e. *NT Emergency Management Act 2013, Marine Pollution Act 1999*)	All actual or impending spills in NT waters, regardless of source or quantity Notify if spill has the potential to impact wildlife in Territory waters (to activate the Oiled Wildlife Coordinator)	Jadestone IMT Planning Lead	https://nt.gov.au/environment/environment-protection-recycling-waste/report-pollution
NT Department of Primary Industry and Fisheries (DPIF)	Verbal notification, timing not specified	Not applicable	Fisheries within the EMBA Consider a courtesy call if not in exposure zone	Jadestone IMT Planning Lead	Not applicable
Western Australia Waters					
WA Department of Transport (WA DoT) (Maritime Environmental Emergency Response (MEER) Duty Officer)	Verbal notification within two hours Follow up with Pollution Report as soon as practicable after verbal notification If requested, submit Situation Report within 24 hours of request	Emergency Management Regulations 2006 State Hazard Plan: Maritime Environmental Emergencies Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and	Notify of actual or impending Marine Pollution Incidents (MOP) that are in, or may impact, State waters. Emergency Management Regulations 2006 define MOP as an actual or impending spillage, release or escape of oil or an oily mixture that is capable of causing loss of life, injury to a person or damage to the health	Jadestone IMT Planning Lead	WA DoT POLREP: https://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-PollutionReport.pdf WA DoT SITREP: https://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-SituationReport.pdf

Agency / Authority	Notification Type & Timing	Legislation / Guidance	Reporting Requirements	Responsibility	Forms
		Consultation Arrangements	of a person, property or the environment.		
Department of Biodiversity Conservation and Attractions (State Duty Officer)	Verbal notification within 2 hours	Western Australian Oiled Wildlife Response Plan	Notify if spill has the potential to impact or has impacted wildlife in State waters (to activate the Oiled Wildlife Advisor)	Jadestone IMT Planning Lead	N/A
Department of Primary Industry and Regional Development (DPIRD) Fisheries	Verbal phone call notification within 8 hours		Fisheries within the EMBA Consider a courtesy call if not in exposure zone	Jadestone IMT Planning Lead	N/A
Department of Water and Environmental Regulation (DEWR) Pollution Watch Hotline	Next working day		Courtesy call to advise of pollution incident	Jadestone IMT Planning Lead	N/A
If spill is heading to international waters					
Department for Foreign Affairs and Trade (DFAT) (24-hour consular emergency centre)	Verbal phone call notification within 8 hours, if the spill is likely to extend into international waters Follow up with email outlining details of incident	Not applicable	Notify DFAT that a spill has occurred and is likely to extend into international waters Inform DFAT of predicted impacts to ecological and socio-economic receptors (e.g. fisheries) and the measures being undertaken to manage the spill NOPSEMA, DISR and DFAT will form an inter-agency panel; the Australian Government Control Crisis Centre	Jadestone IMT Planning Lead	Email details of incident to sea.law@dfat.gov.au

APPENDIX A6 - Incident Management Guidance

The purpose of this section is to provide guidance on the implementation and management of emergency response at Jadestone Energy with respect to the Montara facility. This section summaries the key aspects of the Incident Management Team Response Plan (IMTRP) (JS-70-PLN-F-00008). For further details of Jadestone incident management team, refer to the IMTRP.

1. Purpose

The purpose of the Incident Management Team Response Plan (IMTRP) is to provide Jadestone Energy (Eagle) Pty Ltd, (Jadestone) organisation with the necessary information to respond to incidents affecting operations or business interruptions.

2. Scope

The scope of the IMTRP covers incidents involving facilities, offices or sites operated by Jadestone and where Jadestone has responsibility for organising incident and/or emergency response. It outlines incident activation procedures, incident management structures, communication arrangements, emergency response roster arrangements, information management procedures during incidents and IMT training and competency requirements.

3. Principles

Jadestone aligns with Australian Inter-Service Incident Management System (AIIMS) arrangements and uses five fundamental principles to guide and test the organisations incident management systems against:

- **Flexibility** – ensuring that the system can be applied across the full spectrum of incidents and hazards associated with Jadestone operations and activities;
- **Management by objectives** – the clear determination and communication of desired outcomes (objectives) to ensure that all parts of the incident management system understand the direction being taken;
- **Functional management** – the ability to delegate defined tasks across to groups able to effectively undertake actions in support of achieving objectives;
- **Unity of command** – the principle of management where there is a single Incident Controller providing direction and coordinating all actions; and
- **Span of control** – management of the number of individuals/groups within the structure that can be effectively supervised by one person.

Risk Management, Crisis and Incident Management and Business Continuity Management are a seamless continuum. Within Jadestone a high level of planning, preparation and practice is maintained through:

- **procedures** and **guidance** to manage and coordinate incidents;
- implementation and use of **incident response systems**;
- **training** and **management of competencies** across all elements of incident response;
- **drills** and **exercises** to test procedures / systems and to maintain competency; and
- **audits** and **inspections** of systems and capabilities.

Continuous improvement is also a vital part of the organisations incident management system. All opportunities to identify, capture and effectively "learn" from lessons are recommended and there is a continual drive to improve our ability to prepare for, respond to and recover from any incident that is experienced.

4. Define the spill level

Jadestone uses a tiered response framework which classifies incidents based on the significance of the consequences, the risks involved and potential for escalation. The significance of the incident determines the level of response that is activated.

Incident response personnel are trained to respond according to the characteristics of the response level. Table A6-1 provides an overview of the characteristics and escalation criteria for each level and how each level aligns to the incident levels in the National Plan for Environmental Emergencies (AMSA 2020).

Following an oil spill incident, it is important to assess the nature and potential of spill to respond appropriately. The Offshore Installation Manager (OIM) or Vessel Master, is required to make the initial assessment of the spill, which should then be confirmed with the IMT Leader. If the Incident Management Team is activated, the IMT Leader is responsible for ongoing re-assessment of spill level.

In the event of a spill occurring where an effective response is considered beyond the capabilities within a level, the response will be escalated immediately to the next level. The decision to escalate a response to a higher level (as defined in Table A6-1) will be made by the responsible Control Agency. If the response level is undetermined, then a worst-case scenario should be assumed when activating resources, as it is always possible to scale down the response effort.

The level of the oil spill incident is to be recorded in the IMT Incident Log following activation.

Table A6-1 below is to be used by the OIM and IMT Leader when determining the level of the oil spill incident.

Table A6-1: Spill Level Assessment

Characteristic	Incident management response level		
	Level 1	**Level 2**	**Level 3**
General description and escalation criteria	An incident which will not have an adverse effect on the public or the environment which can be controlled using resources normally available at the facility or vessel concerned without the need to mobilise the Jadestone IMT or other external assistance.	An incident that cannot be controlled using facility resources alone and requires external support and resources to combat the situation OR An incident that can be controlled by the facility but which may have an adverse effect on the public or the environment.	An incident which has a wide-ranging impact on Jadestone and may require the mobilisation of external State/Territory, National or International resources to bring the situation under control.
AMSA National Plan levels and escalation criteria	Level 1 Generally able to be resolved by Responsible Party through the	Level 2 Typically, more complex in size, duration, resource management and risk than	Level 3 Characterised by a high degree of complexity, require strategic

Characteristic	Incident management response level		
	Level 1	**Level 2**	**Level 3**
	application of local or initial response resources (first strike response)	Level 1 incidents. May require deployment of resources beyond the first strike response	leadership and response coordination. May require national and international response resources
Resources at risk			
Human	Potential for serious injuries	Potential for loss of life	Potential for multiple loss of life
Environment	Isolated impacts or with natural recovery expected within weeks.	Significant impacts and recovery may take months. Monitoring and remediation may be required.	Significant area and recovery may take months or years. Monitoring and remediation will be required.
Wildlife	Individuals of a small number of fauna species affected	Groups of fauna species or multiple numbers of individuals affected	Large numbers of fauna (individuals and species) affected
Economy	Business level disruption	Business failure	Disruption to a sector
Social	Reduced services	Ongoing reduced services	Reduced quality of life
Infrastructure	Short term failure Non-safety/operational critical failure	Medium term failure Potentially safety/operational critical failure	Severe impairment Safety/operational critical system failure
Public affairs	Local and regional media coverage	National media coverage	International media coverage

5. Interface with External Plans

Jadestone oil spill response arrangements have been developed to meet all relevant requirements of the OPGGS (E) Regulations. It is consistent with the national system for oil pollution preparedness and response; the National Plan for Maritime Environmental Emergencies managed by the Australian Maritime Safety Authority (AMSA, 2020); and the WA Department of Transport (WA DoT) Industry Guidance Note (2020) for offshore oil spill response and consultation.

Table A6-2 summarises regulatory involvement in spill scenarios from Jadestone Facilities.

Table A6- 2: Jurisdictional and Control Agencies for Hydrocarbon Spills for Commonwealth & International Waters

Jurisdictional boundary	Spill source	Hazard Management Agency	Jurisdictional authority	Control agency		Relevant documentation
				Level 1	Level 2/3	
Commonwealth waters (three to 200 nautical miles from territorial/state sea baseline)	Vessel[11]	N/A	AMSA	AMSA		Vessel Ship Oil Pollution Emergency Plan National Plan
	Petroleum activities[12]	N/A	NOPSEMA	Jadestone		Activity OPEP
International waters	Vessel	Relevant foreign authority		Jadestone will liaise with the Australian Government Department of Foreign Affairs and Trade (DFAT) in the event that an oil spill may enter international waters. Jadestone will work with DFAT and the respective governments to support response operations.		
	Petroleum activities					

Information from the following external documents have been used or referred to within this document:

- AMOSPlan – Australian Industry Cooperative Spill Response Arrangements
- National Plan – National Marine for Maritime Environmental Emergencies
- State Hazard Plan – Western Australia State Hazard Plan: Maritime Environmental Emergencies
- WAOWRP – Western Australia Oiled Wildlife Response Plan
- WA OWR Manual – Western Australia Oiled Wildlife Response Manual
- NT Government – Territory Emergency Plan
- NTOWRP – Northern Territory Oiled Wildlife Response Plan

5.1 AMOSPlan

The AMOSPlan is a voluntary mutual aid plan which is administered and funded by the oil industry through AMOSC. The principle of the AMOSPlan is that, to assist in a local response to an incident, individual company resources are available under co-operative arrangements through the AMOSC hiring agreements. Jadestone is a participating company of AMOSC and as such has access to AMOSC's Level 2 and 3 oil spill recovery and response equipment, dispersant and technical (human) capabilities, as outlined in the AMOSPlan. AMOSC

[11] Vessels are defined by Australian Government Coordination Arrangements for Maritime Environmental Emergencies (AMSA, 2017) as a seismic vessel, supply or support vessel, or offtake tanker.

[12] Includes a 'Facility', such as a fixed platform, FPSO/FSO, MODU, subsea infrastructure, or a construction, decommissioning and pipelaying vessel. As defined by Schedule 3, Part 1, Clause 4 of the OPGGSA 2006.

manages a core group of personnel for oil spill response that can be made available for Jadestone requirements, as outlined in Jadestone's Master Service Contract with AMOSC.

5.2 National Plan

AMSA manages the National Plan for Maritime Environmental Emergencies (National Plan), Australia's key maritime emergency contingency and response plan. All resources under the National Plan are available to Jadestone through request to AMSA.

For any oil pollution event, Jadestone Energy agrees to notify AMSA immediately in the interests of facilitating the most efficient and effective response to the incident. In the instance of vessel sourced marine oil pollution events:

- AMSA is the designated Control Agency for oil spills from vessels within the Commonwealth jurisdiction. Upon notification of an incident involving a ship, AMSA will assume control of the incident and respond in accordance with the National Plan;
- The National Plan and its supporting documents provide direction for the operational management and response of ship-sourced incidents; and
- AMSA is to be notified immediately of all ship-sourced incidents through RCC Australia.

Jadestone acknowledges that in addition to marine pollution incidents, AMSA has specific national interest responsibilities regarding the management of maritime casualties (as defined within the National Plan for Maritime Environmental Emergencies and International Convention on the High Seas in Cases of Oil Pollution Casualties) and specifically regarding the application of the *Protection of the Sea (Powers of Intervention) Act 1981*. AMSA and Jadestone Energy agree to work cooperatively to manage maritime casualty incidents in accordance with the arrangements within the National Plan for Maritime Environmental Emergencies.

AMSA will coordinate the resources of the National Plan for Maritime Environmental Emergencies on the formal request of the IMT Leader. Jadestone agrees to provide all available support to AMSA in AMSA's performance of its Control Agency responsibilities.

The National Plan Incident Management System Policy NP-POL-003 (AMSA, 2022b) describes the incident management system which is applied by AMSA, State / Territory Control Agencies and the offshore industry Australia wide for all marine oil spill response incidents and implemented through the National Plan for Maritime Environmental Emergencies. The Jadestone Incident Management System is based on AIIMS which is consistent with the AMSA system.

5.3 WA DoT & State Hazard Plan

The State Emergency Management Plan (SMEC, 2022) enables the Western Australian Government to prevent, prepare for, respond to and recover from hazards as listed in the *Emergency Management Act 2005 (WA)* and prescribed in the Emergency Management Regulations 2006 (the EM Regulations).

The State Emergency Management Committee (SEMC) is the body with overall responsibility for emergency planning. SEMC is responsible for the development and review of several emergency plans for the Department of Transport.

These include:

- *State Hazard Plan: Maritime Environmental Emergencies (MEE).*

Other State Hazard Plans include:

- *State Hazard Plan: Persons lost or in distress requiring a Search and Rescue response (Search and Rescue Emergency)*

The State Hazard Plan - MEE covers:

- Prevention and mitigation responsibilities and strategies .
- Responsibilities for preparedness and planning arrangements.
- Responsibilities and arrangements for responding to maritime emergencies.
- Information on recovery arrangements.

Copies of the WA State Hazard Plans can be found at: https://www.transport.wa.gov.au/imarine/state-hazard-plan.asp

Table A6-3 Western Australian DoT Response Requirements

Jurisdictional boundary	Spill source	Hazard Management Agency	Jurisdictional authority	Control agency	
				Level 1	Level 2/3
Western Australian	Vessel	WA DoT	WA DoT	WA DoT	WA DoT
	Petroleum activities	WA DoT	WA DoT	Jadestone	WA DoT

If a Level 2/3 spill arises within, or has potential to enter Western Australian (WA) State waters, the HMA will nominate the role of the State Maritime Pollution Coordinator (SMPC) to certain DoT positions (as prescribed in Section 1.3 of the State Hazard Plan -MEE (DoT, 2021)) and DoT will take on the role as a Controlling Agency. The SMPC provides strategic management of the incident response on behalf of the HMA.

If a spill occurs within, or has the potential to impact State waters, Jadestone Energy will notify the DoT Maritime Environmental Emergency Response (MEER) unit as soon as reasonably practicable (within 2 hours of becoming aware of the incident occurring). On notification, the SMPC will activate their Maritime Environmental Emergency Coordination Centre (MEECC) and the DoT Incident Management Team (IMT). Jadestone will work in partnership with DoT during such instances, as outlined within the DoT's *Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements* (WA DoT, 2020).

For Level 2/3 spills that cross from Commonwealth waters to State waters, there will be two Controlling Agencies. Jadestone will retain Control Agency responsibility for Commonwealth waters, whilst DoT will assume Control Agency responsibility for the portion of the response in State waters. For a cross-jurisdictional response, there will be a Lead IMT (DoT or Jadestone) for each spill response activity. Appendix 2 within Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (July 2020) provides guidance on the allocation of a Lead IMT to response activities for a cross jurisdictional spill. Figure A6-1 shows the cross jurisdictional arrangements and Control Agency structure for a Facility spill entering State waters.

To facilitate effective coordination between the two Controlling Agencies and their respective IMT's during a cross-jurisdictional response, a Joint Strategic Coordination Committee (JSCC) will be established. The JSCC will be jointly chaired by the SMPC and Jadestone's nominated senior representative and will comprise of individuals deemed necessary by the chairs to ensure an effective coordinated response across both jurisdictions. Additional detail on the JSCC's key functions are outlined in Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (July 2020).

Jadestone will conduct initial response actions in State waters as necessary in accordance with this OPEP, and continue to manage those operations until formal handover of incident control is completed. Appendix 1 in DoT's *Offshore Petroleum Industry Guidance Note* (WA DoT, 2020) provides a checklist for formal handover. Beyond formal handover, the Jadestone will continue to provide all necessary resources, including personnel and equipment, to assist the DoT in performing duties as the Control Agency. The required roles and responsibilities of these positions are outlined in Table A6-9.

As a minimum, the Deputy Planning Officer and Deputy Logistics Officer supporting the WA DoT IMT will be filled by Jadestone IMT personnel familiar with relevant Jadestone systems and processes and trained as per role specific training and competency requirements outlined in Table A6-11.

Two DoT personnel will be provided from DoT's command structure into Jadestone's GCT/ IMT as GCT/ Media Liaison Officers. The roles and responsibilities of these roles are outlined in Table A6-10.

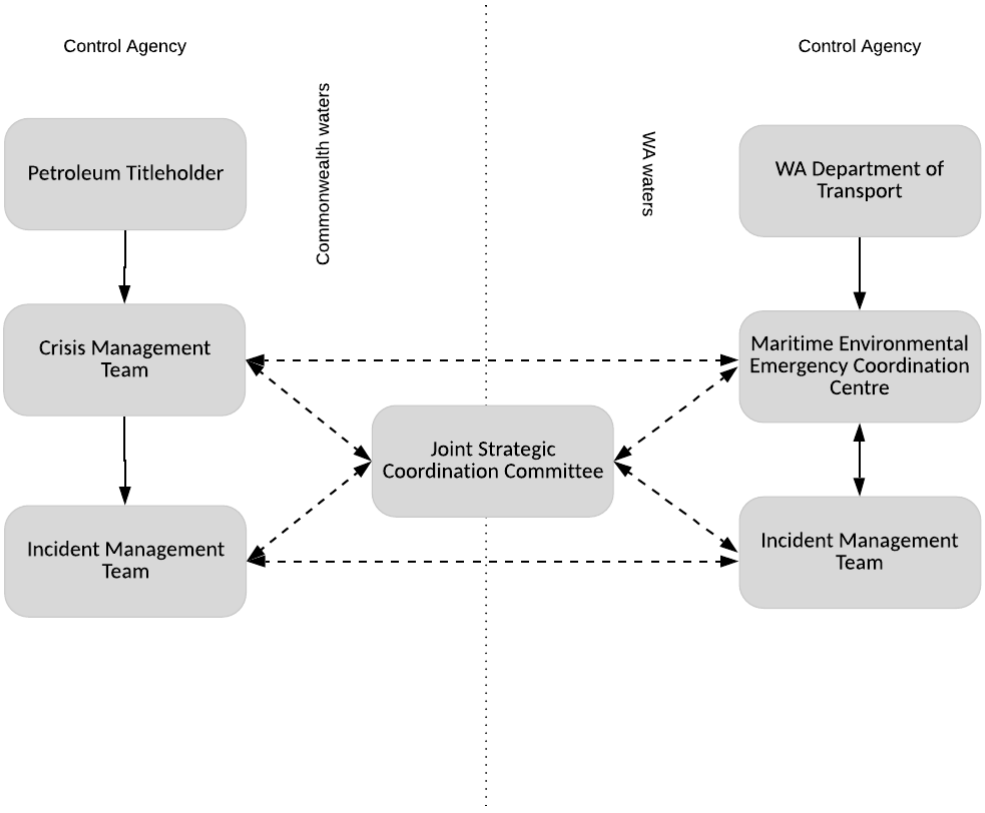


Figure A6- 1: Cross Jurisdictional Control Agency Arrangements (WA waters)

5.4 Western Australia Oiled Wildlife Plan (WAOWRP)

This plan establishes the framework for responding to potential or actual wildlife impacts in WA waters, within the framework of an overall maritime environmental emergency. It outlines risk reduction strategies, preparedness for, response to and initiation of recovery arrangements for wildlife impacts during a marine oil pollution incident.

5.5 Western Australia Oiled Wildlife Manual (WA OWR Manual)

The WA OWR Manual is a companion document to the Western Australia Oiled Wildlife Response Plan for Maritime Environmental Emergencies, designed to standardise operating procedures, protocols and processes for wildlife response.

5.6 NT Government – Territory Emergency Plan

The NT Government emergency plan outlines and describes the NT governments approach to ALL emergency and recovery operations, the governance and coordination arrangements and roles and responsibilities of relevant NT agencies. The plan is supported by regional, local and hazard-specific plans and functional sub-groups. The primary objectives of the plan are to:

- describe the principles for emergency management, response and recovery operations in the Northern Territory;
- establish the Northern Territory Emergency Management arrangements;
- identify control and coordination roles and responsibilities related to the functions in emergency response and recovery operations; and
- identify, in relation to each different form of hazard, the lead Northern Territory Government agency responsible for controlling a response to an emergency event.

More specific information relating to the plan can be found at:

https://pfes.nt.gov.au/sites/default/files/uploads/files/2022/NT%20Emergency%20Service_Territory_Emergency_Plan_122022.pdf

If a Level 2/3 spill arises which has potential to enter Territory waters, Jadestone must notify the NT Pollution Hotline and the NT Pollution Hotline and the NT Commissioner of Police in their role as the Territory Emergency Controller (TEC)[13].

Upon notification, the TEC will appoint an NT Incident Controller (NT IC), who in turn will call on competent personnel to form an IMT appropriate to the scale of the incident. This may include the NT IC calling upon support from the National Response Team.

For all Level 2/3 spills from vessel/petroleum activities that enter NT waters, the NT IC will assume the role of Control Agency. An NT IMT will be established in Darwin, made up of staff from across NT Government. The NT IMT will be supported by existing NT emergency response arrangements, as defined in the *NT*

[13] At the time of writing (February 2023), the NT OSCP Steering Committee has not allocated roles under the NT OSCP across the NT Government; The revised NT OSCP, once endorsed, will be a sub-plan under the 'all-hazards' Territory Emergency Plan, which will align with the Territory emergency management arrangements and the National Plan. Until such time as the NT OSCP is endorsed, and a HMA is appointed by the TEMC, the emergency decision making authority remains with the Commissioner of Police, as the Territory Emergency Controller (TEC), under the Territory Emergency Management Plan (TEMP).

Emergency Management Act 2013, through the Territory Emergency Management Committee (TEMC) and the NT Government Functional Groups.

The NT IC, with advice from NT Environment, Scientific and Technical advisors, will work with the Jadestone IMT to agree protection priorities and determine the most appropriate response in NT waters. Jadestone will provide support to the NT IMT from the Jadestone IMT. The Jadestone IMT will provide support, including drafting of operational taskings or Incident Action Plans (IAPs), to the NT IC for approval prior to their release/implementation.

At the request of the NT IC, Jadestone will be required to provide all necessary resources, including personnel and equipment, to assist the NT IMT in performing its duties as the Control Agency for NT waters and shorelines. This may include the provision of personnel to:

- Work within the NT IMT located in Darwin; and
- To assist response activities such as shoreline protection, clean-up and oiled wildlife response.

To facilitate coordination between the NT IMT and Jadestone IMT during a response, the NT IMT and Jadestone Forward Operating Base (FOB) will be established to ensure alignment of objectives and provide a mechanism for de-conflicting priorities and resourcing requests directly between the Jadestone IMT in Perth and NT IMT in Darwin.

The NT Government and relevant Control Agency plans to utilise the Northern Territory Oiled Wildlife Response Plan (AMOSC, 2019a) as the basis for the determination of protection priorities and shoreline response planning.

6. Risks

The Jadestone incident management process is based around the organisation being able to understand and respond to all hazards, natural and human-induced incidents, including those which may not have been experienced by the organisation. Hazards and safeguards are identified and recorded within respective risk registers. Potential causes and preventative measures are identified for each hazard; qualitative assessments of the consequences and likelihood are undertaken, and detection, protection, mitigation and recovery systems are defined.

In addition, the risk management process will also define and describe the following:

- Major Accident Events (MAE);
- Safety Critical Elements (SCE); and
- Performance Standards (PS).

7. Incident Management Structure

Jadestone utilizes a tiered incident response structure to deal with and manage “incidents” associated with each of the organisation’s risks. This structure is activated progressively, from business as usual, facility-based Incident Response Team (IRT), shore-based Incident Management Team (IMT), then if required to the corporate Group Crisis Team (CGT).

The incident management process and structure support all of Jadestone’s activities and provides guidance to the IMT when activated. Figure A6-2 illustrates this structure and the primary areas of focus at each level.

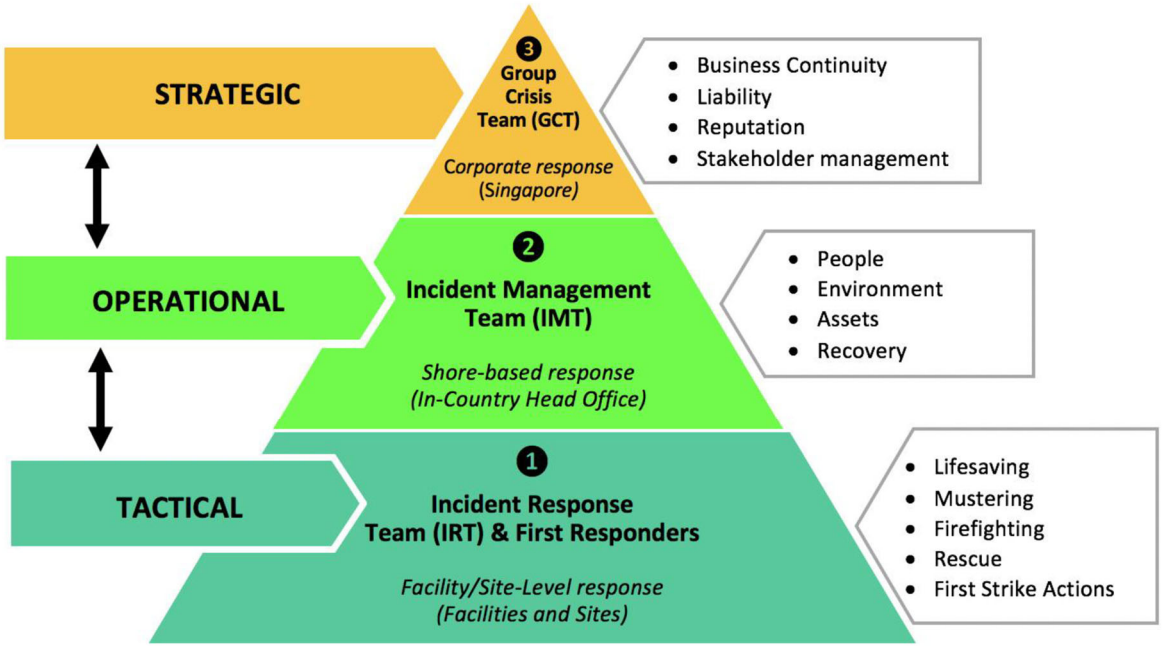


Figure A6-2 : Jadestone Incident Response Structure

The Jadestone incident response structure is based on the Australasian Inter-Service Incident Management System (AIIMS), which consists of a standard management hierarchy and procedures for managing incidents of any size. The use of AIIMS principles drives consistent response operations through a set of common terminology, procedures and processes to:

- Organise personnel and skills necessary for a safe, secure and compliant response;
- Allow personnel from a wide variety of agencies to meld rapidly into a common management structure; and
- Provide a unified, centrally authorised emergency organisation.

7.1 Incident Response Team– Tactical Level

The Incident Response Team (IRT) and First Responders function at the tactical level and are responsible for the provision of immediate response to incidents in order to preserve safety of life, minimise damage (where possible) to the environment and protect property or assets.

Each facility/site/office will have a tactical level capability responsible for dealing with any emergency or hazard that may be foreseen as a function of its operations and to provide basic first aid and account for personnel. In addition, communicating of information will be a key requirement from the tactical level upwards to ensure that all levels within the are able to build and maintain situational awareness and provide guidance and/or support as necessary.

Offshore Facility emergencies and incidents will be managed and coordinated by an On-Scene Commander (OSC); usually supported by an Incident Controller (IC) – *specific details relating to the Incident Response Team (IRT) is contained within respective facility response procedures or plans.*

7.2 Incident Management Team – Operational Level

An operational level response, and an IMT will generally be required for the following:

- To provide additional support to an IRT (facility or site) during an incident; or
- To develop and implement response actions/plans when an incident escalates to a level that the IRT can no longer effectively manage or coordinate response activities (example: Level 2/3 oil spill incident).

The IMT is led by the IMT Leader, who will lead the IMT to address the organisations "key priorities". The IMT is responsible for coordinating operational advice and functional support to the IRT and early liaison/notification of the Group Crisis Team (GCT) and external authorities if required.

The IMT will develop and implement operational plans to mitigate or respond to the incident and provide technical and logistic support as required.

7.3 Group Crisis Team – Strategic Level

Strategic level responses support the management of significant events that threaten the organisation and its stakeholders. At Jadestone these types of incidents will be managed by the Group Crisis Team (GCT); whose primary objectives will be to:

- Develop strategies and plans to manage reputation, operability, licence to operate, liabilities and/or potential financial loss;
- Provide technical, operational and communications advice to the in-country IMT and ensure it is adequately resourced;
- Identify, monitor, prioritise and manage domestic and global issues, gaining a deep understanding of perceptions and expectations of response and behaviour;
- Liaise and interface with high level government agencies including host country government authorities and elected/appointed political leaders; and
- Review and approve external and internal engagement strategies/plans and statements at global and country levels.

8. Incident Management

Effective incident management requires the ability to establish command and control, gain and maintain situational awareness and then develop, implement and monitor response activities either in support of a Jadestone facility/site or directly.

The Jadestone incident management system defines and standardises the organisational processes and structures to enable transition from reactive to proactive and ensure integration of the organisation and all other stakeholders while promoting successful incident management and coordination.

The IMT Leader will decide whether a full or partial mobilisation is required depending on the nature of the incident and the level of support required by the OSC during the initial period of the incident. The standard Jadestone incident management organisational structure is shown in Figure A6-3.

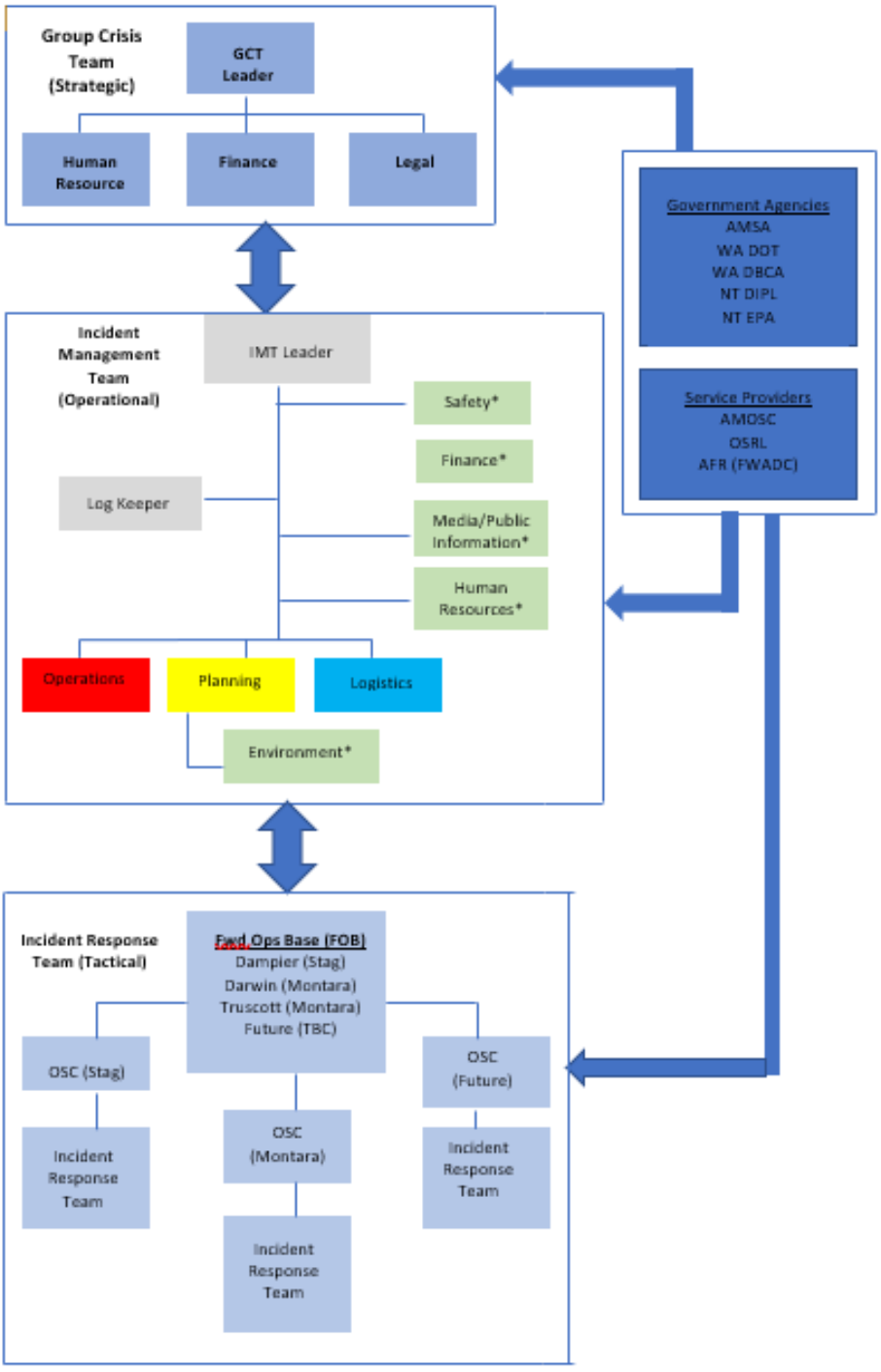
In support of response operations, an Incident Control Centre (ICC) will be established within the Jadestone Offices in Perth. The ICC will have adequate facilities for the IMT to function and coordinate response

operations. The main conference room shall be the ICC with meeting rooms used as breakout for backup as required.

Jadestone utilises an electronic platform to provide all IMT personnel with universal access to key emergency management documents that may be required in the event of a spill (e.g. IMTRP, OPEPs, ICS forms). This system is also directly linked to Jadestone's Electronic Document Management System (EDMS).

Jadestone will also consider the activation of regional operational centre or a Forward Operations Base (FOB) to assist with oil spill response. The location of a regional operational centre or FOB will depend upon the nature, direction and extent of any spill. The preferred regional operational centre or FOB would be Darwin as it has an excellent port, and ready access to airport and medical facilities, however Broome and potentially North Kimberley Airbase could be used as regional centres or FOBs.

In accordance with the Jadestone IMT structure, the FOB will be subordinate to the IMT Operations function, and will be responsible for the coordination of personnel, resources, material, equipment and localised activities as directed by the IMT.



***Note: Key support functions to the IMT (Environment, Safety, HR, Finance and Public Information) are activated if required and coordinated by a suitable qualified/competent lead or outsourced to a third-party provider**

Figure A6-3: Jadestone Incident Management Structure

8.1 IMT Activation Process

The notification and activation of IMT members is by direct telephone call to the individual, following declaration by the IMT Leader. The IMT Leader will specify the location and the time at which the team is to convene. The activation process is illustrated in Figure A6-4.

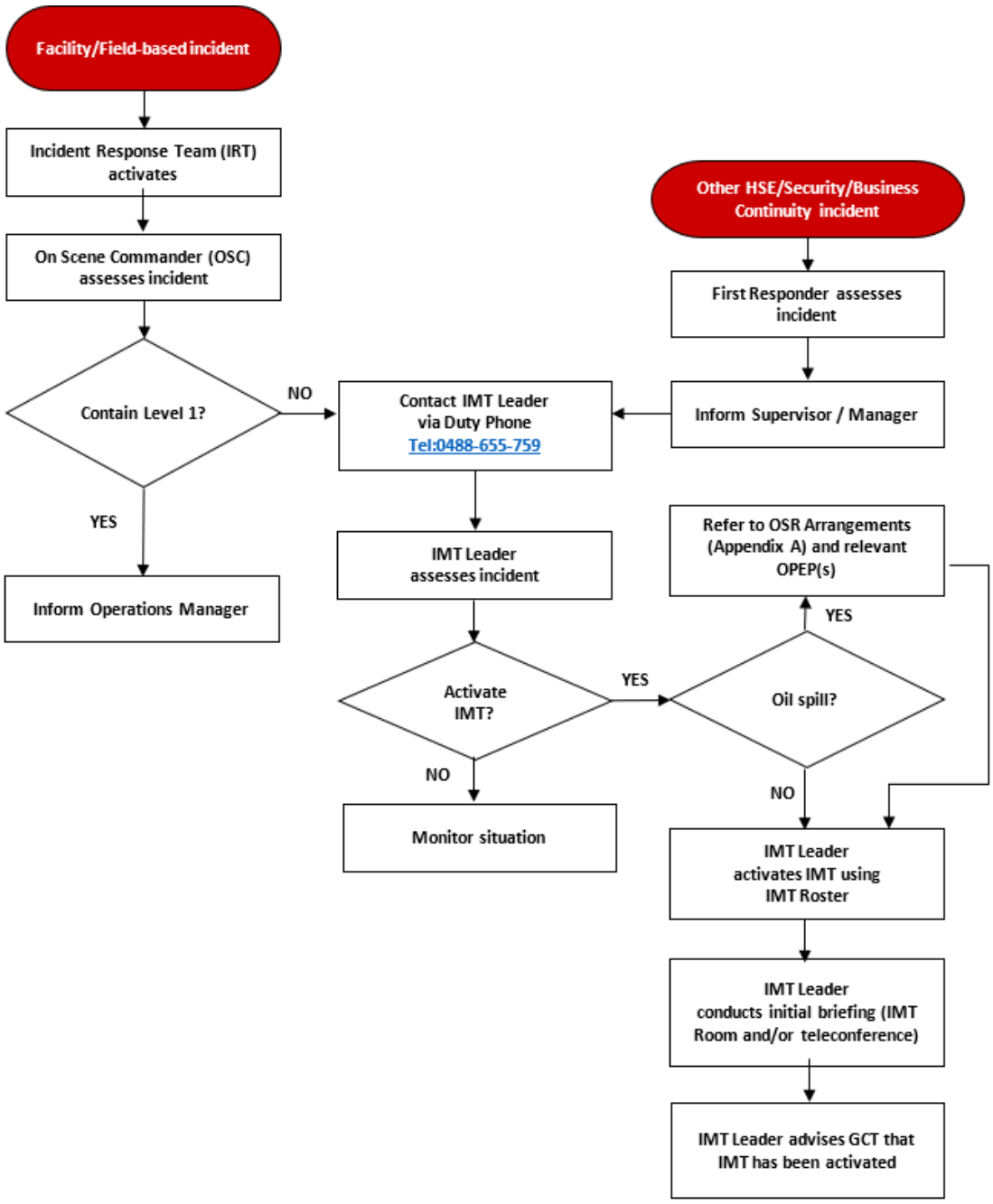


Figure A6-4: Incident activation process

8.2 Forward Operating Base (FOB)

In the event of a major incident, it is intended that facilities to support the Command & Control of response operations will be required in designated locations relevant to the respective Jadestone operation or location of the incident. Depending on the nature and scale of the incident, a Forward Operating Base (FOB) can be established in close proximity to the incident. The generic structure for the establishment of an FOB will be as shown in Figure A6-5.

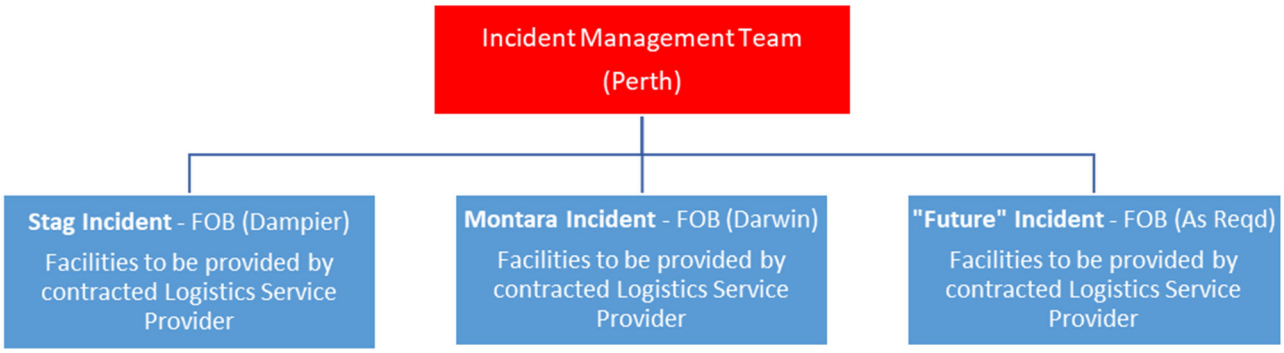


Figure A6-5: Guidance on the establishment of an FOB for an incident

The following facilities and services will be required to support the establishment of the FOB:

Forward Operating Base Supported by the Jadestone contracted logistic service provider (Darwin / Dampier)	• Conference room facilities for briefings/meetings • Telephone/Video conference capability • Communication facilities (radio/sat phone) • Break-out room facilities • Provision of internet/Wi-Fi access • Ability to access Jadestone IMS • Catering and domestic services • Access to logistical lay-down area • Access to marine/port service providers

In accordance with the Jadestone IMT structure, the FOB will be subordinate to the IMT Operations function, and will be responsible for the coordination of personnel, resources, material, equipment and localised activities as directed by the IMT.

A dedicated communication strategy in support of response operations will also be developed to support the functionality of the FOB.

FOB Integration with State / Territory – Depending on the nature of the incident, the FOB may be co-located with a State / Territory FOB activated in response to the incident. Information with respect to cross-jurisdictional arrangements are provided in the IMTRP Appendix A**.**

Personnel requirements to support the functionality of the FOB will be determined at the time and will be based around the nature of the incident, location and any requirements associated with State / Territory interaction.

8.3 IMT and FOB External Support Arrangements

The IMT Leader may activate external support if required, to assist with Jadestone incident response activities. Support to the IMT and/or FOB can be provided by the external agencies/organisations listed in Table A6-4.

Table A6-4 External support agencies/organisations for the IMT

Organisation	Types of services available	Arrangement
Australian Marine Oil Spill Centre (AMOSC)	Oil spill response resources (IMT/FOB staff, equipment, technical advice) – Australian based	Master Service Contract
Oil Spill Response Ltd (OSRL)	Oil spill response resources (IMT/FOB staff, equipment, technical advice) – Internationally based	Master Service Contract
Other Operators	Trained personnel in support of IMT/FOB (Mutual Aid)	AMOS Plan
Environmental Monitoring Provider	Implementation of the Scientific Monitoring Plan (oil spill response)	Contract
Aviation Service Provider	Provision and coordination of aviation support	Contract
Transport Service Provider	Provision of logistical support (road transport)	Contract
Waste Contractor	Provision of waste management support	Contract
Australian Maritime Safety Authority (AMSA)	Access to National Plan resources (personnel, equipment, technical advice) for oil spill response	N/A
Oceaneering	Specialist technical services to support deployment and operation of the Sub-Sea First Response Tool Kit and dispersant injection	OTA Agreement
Wild Well Control	Specialist technical services to support planning and conduct of well blow out operations	OTA Agreement

8.4 Cost Recovery

As required under Section 571(2) of the OPGGS Act 2006, Jadestone has financial assurances in place to cover any costs, expenses and liabilities arising from carrying out its petroleum activities, including major oil spills. This includes costs incurred by relevant control agencies (e.g. DoT) and third-party spill response service providers.

9. IMT Roles and Responsibilities

The following tables (Tables A6-5 to Tables A6-8) describe the roles and responsibilities of IMT Lead roles. Specific information relating to the Group Crisis Team (GCT) and the Incident Response Team (IRT) roles and responsibilities are provided in respective crisis management and incident response plans.

Table A6-9 outlines the key roles and responsibilities of Jadestone personnel required to be positioned in the State Maritime Environmental Emergency Coordination Centre (MEECC)/ DoT IMT in the event of a Level 2/3 spill. Table A7-10 outlines the roles and responsibilities of DoT personnel to be positioned within Jadestone's IMT. Duty Cards for all roles are provided in the IMTRP Appendix B – IMT Duty Cards.

Table A6-5: IMT Leader Key Roles and Responsibilities

DUTY CARD 1: IMT LEADER
ROLE
The IMT Leader has overall responsibility for the management the incident response. **The IMT Leader will be the initial point of contact for the Corporate Office.**
RESPONSIBILITIES
• Take charge and exercise leadership, including the establishment of the incident management structure • Set objectives for the incident response, considering the safety of all personnel as a priority • Develop and approve plans and strategies to control the incident • Implement the IAP and monitor its progress • Provide information and warnings to communities so that they can make informed decisions • Establish effective liaison and cooperation with all relevant agencies, affected communities and others external to the IMT • Obtain and maintain human and physical resources required for the resolution of the incident • Apply a risk management approach, and establish systems and procedure for the safety and welfare of all response personnel • Ensure effective communications with the GCT Leader, when activated • Ensure appropriate financial delegations are in place and these delegations are made known to the appropriate response personnel. • Ensure relief and recovery considerations are addressed • Ensure collaborations between all organisations supporting the response
SPECIFIC TASKS
Initial Actions
☐ Obtain briefing on incident from the OSC (or IRT contact) and review initial assessment ☐ Activate the necessary members of the IMT ☐ Proceed to IMT Room ☐ Ensure IMT Room is fully set-up before incident management commences ☐ Communicate with Country Manager, as link into Group Crisis Team (GCT) as appropriate ☐ Support Country Manager in seeking GCT guidance/support ☐ Support Country Manager in scheduling ongoing contact ☐ If an oil spill, confirm spill level
Determine Incident Objectives & general direction for managing the incident
☐ Establish the immediate priorities:

DUTY CARD 1: IMT LEADER

- ☐ Define IMT aim and objectives
- ☐ If necessary, confer with government agencies to agree on common incident objectives and priorities

☐ Chair initial IMT briefing

- ☐ Communicate priorities to the IMT
- ☐ Confirm ongoing means of communications with OSC has been established to Operations function
- ☐ Confirm which key stakeholders need to be notified, responsibility for notification and ongoing liaison including regulatory authorities
- ☐ Confirm with Planning Lead that all appropriate log-keeping, issues and actions, and status boards are maintained.
- ☐ If required, give direction to HR/Admin on HR expectations to: Employee communications, Victim / next of kin support, affected contractors

Ongoing Actions

☐ Refer to and follow the Incident Management Process as described at Section 5.0

☐ Use the STAKEHOLDER MANAGEMENT Form – Appendix E and in OneNote – to assist with tracking stakeholder contact.

☐ Hold regular IMT updates

- Time out, phones switched to time out mode
- Every 30 minutes initially (as a guide)
- Monitor effectiveness of response and review issues & actions and priorities.
- With Planning Lead, establish short-term/long-term recovery goals, milestones and resource requirements
- Brief Corporate Office as required

☐ Delegate Responsibilities

- Allow yourself to focus on key stakeholder liaison and setting strategic objectives for next operational period

☐ Determine duration and structure of incident response operations

- Decide duration of current operational period (start thinking of when to stand down or next day operations)
- Identify additional personnel needs to maintain 24-hour support.

Notifications & media strategy

☐ Confirm that required notifications are made and updates provided

- Ensure communications with governments/regulators are regular and proactive
- Consider need for additional senior management liaison / high level briefing with regulators

DUTY CARD 1: IMT LEADER
○ Ensure that internal notifications are made ☐ The Media Support Team decide on the position the asset/company adopts: ○ Ensure an initial pre-approved media holding statement is prepared ○ Agree on message content and timing of release to media, internal audiences, regulators, community leaders etc. ○ Be prepared to deal with rapid media interest and possible presence at scene
Stand Down
☐ Communicate end of IMT response to all relevant internal and external parties ☐ Provide copies of all incident related documents and logs to the Log Keeper ☐ Stand down those people not required in managing ongoing recovery process ☐ Hold debrief of IMT, specialist advisors, support teams and receive feedback ☐ Review any capability gaps and opportunities for improvement in the response ☐ Review and approve the incident report ☐ Commission post-incident investigation ☐ Ensure accepted recommendations have been incorporated into the IMTRP

Table A6-6: Operations Lead Key Roles and Responsibilities

DUTY CARD 2: OPERATIONS
ROLE
Reports to IMT Leader and is responsible for activating and supervising tactical response operations in the field. **Implements the operational plans to achieve response objectives and protect people, the environment and property**
RESPONSIBILITIES
– Obtain a briefing from the IMT Leader or the position that you report to – Establish the Operations Section appropriate to the size and complexity of the incident – Appoint unit coordinators as required and delegate tasks – Manage the personnel within the Operations Section – Develop and maintain an effective register of all resources, required, en route, allocated to and released from the incident – Adjust the structure of the Operations Section throughout the incident – Provide a safe working environment for personnel within the Operations Section

DUTY CARD 2: OPERATIONS
– Establish and maintain a log of activities and decisions for the Operations Section – Communicate Section performance to the IMT Leader or the position you report to – Prepare shift handover and brief incoming Operations Lead – Manage the continuity of Operations activities across shift changes – Consider sources of local knowledge and information relevant to the incident. – Identify new and emerging risks for the incident and address these in the IAP – Collect, collate and store incident records – Maintain a personal log of activities and decisions made • Conduct handover briefing
SPECIFIC TASKS
Initial Actions
☐ Identify and locate OSC - obtain all available information on the situation ☐ Agree call schedule with the OSC ☐ Use the INCIDENT STATUS Form – see Appendix E and in OneNote ☐ Assess incident, including incident potential ☐ Start a personal log

DUTY CARD 2: OPERATIONS
Ongoing Actions
☐ Propose and agree immediate priorities with the IMT Leader ☐ Update Planning Lead on situation for development of the Incident Action Plan ☐ Work with Logistics to identify logistical support requirements ☐ Identify issues and actions required for the next period - mark and track on display boards ☐ Source and provide technical information and support required by the response teams. ☐ Develop strategy (i.e., what we are attempting to achieve) ☐ Identify tactics/breaking down tactics into manageable tasks (i.e., how we are going to implement strategy) ☐ Confer with response contractors / consultants for equipment and techniques ☐ Allocate tactical resources based on strategy requirements ☐ Provide updates to the display boards to reflect current operations in the field ☐ Resource additional technical support as required
Stand Down
☐ Attend the IMT debrief ☐ Provide copies of all incident related documents and logs to the Log Keeper ☐ Monitor the demobilization of response teams

Table A6-7: Logistics Lead Key Roles and Responsibilities

DUTY CARD 4: LOGISTICS
ROLE
Reports to IMT Leader and manages all logistics and procurement requirements for the response
RESPONSIBILITIES
– Assist with setup and coordination of the incident control centre (ICC) – Obtain a briefing from the IMT Leader or the position that you report to – Establish the Logistics Section appropriate to the size and complexity of the incident – Appoint unit coordinators as required and delegate tasks – Manage the personnel within the Logistics Section – Provide mobilisation and demobilisation for equipment and services – Adjust the structure of the Logistics Section throughout the incident – Provide a safe working environment for personnel within the Logistics Section – Establish and maintain a log of activities and decisions for the Logistics Section – Communicate Section performance to the IMT Leader – Prepare shift handover and brief incoming Logistics Lead – Manage the continuity of Logistics activities across shift changes – Consider sources of local knowledge and information relevant to the incident. – Identify new and emerging risks for the incident and address these in the IAP • Collect, collate and store incident records – Maintain a personal log of activities and decisions made • Conduct handover briefing
SPECIFIC TASKS
Initial Actions ☐ Mobilize any additional resources or specialist advisors ☐ Determine and supply immediate incident resource and facility needs ☐ Establish communications, exchange information and coordinate activities with Logistic Supply Base(s) ☐ Use and maintain the Resources Summary sheet – Appendix E and in OneNote– to track resources ☐ Start a personal log
Ongoing Actions
☐ Establish contact & coordinate logistics-related activities with other agency logistics personnel ☐ Review logistics requirements for proposed tactics for upcoming operational period ☐ Advise other Functions on resource availability to support incident needs

DUTY CARD 4: LOGISTICS
☐ Coordinate and process requests for additional resources ☐ Work with the Operations Lead to track and display incident resources and facilities ☐ Confer with IMT Leader for acquisition or release of major / costly resources or services ☐ Provide responders in the field with adequate food, drink, medical assistance, communications, clothing, transportation (land, water and air), sanitary and sleeping arrangements, security and other requirements ☐ Ensure that responders are supplied with the proper PPE ☐ Provide management and security support for incident facilities such as: ☐ personnel and equipment staging areas ☐ warehouse and maintenance facilities; camps; heli-bases etc. ☐ As appropriate to the incident, work with the Operations & Planning Functions, contractors & government agency personnel to plan, permit and operate waste handling and disposal and injured wildlife rehabilitation facilities ☐ Identify long-term service and support requirements for planned and expected operations ☐ Recommend the reassignment or deactivation of incident resources
Stand Down
☐ Arrange for transportation of equipment and personnel in conjunction with demobilization ☐ Attend the IMT debrief ☐ Provide copies of all incident related documents and logs to the Log Keeper

Table A6-8: Planning Lead Key Roles and Responsibilities

DUTY CARD 3: PLANNING
ROLE
Reports to the IMT Leader and manages the IMT related planning functions for the response
RESPONSIBILITIES
– Assist with setup and coordination of the incident control centre (ICC) – Obtain a briefing from the IMT Leader or the position that you report to – Establish the Planning Section appropriate to the size and complexity of the incident – Appoint unit coordinators as required and delegate tasks – Manage the personnel within the Planning Section – Adjust the structure of the Planning Section throughout the incident – Provide a safe working environment for personnel within the Planning Section – Establish and maintain a log of activities and decisions for the Planning Section – Communicate Section performance to the IMT Leader – Prepare shift handover and brief incoming Planning Lead – Manage the continuity of Planning activities across shift changes Checklist – Consider sources of local knowledge and information relevant to the incident. – Identify new and emerging risks for the incident and address these in the IAP – Monitor effectiveness of risk mitigation strategies – Provide strategic advice to the IMT based on information received – Complete the Net Environmental Benefit Analysis (NEBA) – Prepare the IAP for the next operational period and any longer-term planning required – Disseminate the IAP throughout the incident management structure – Develop changeover and demobilisation plans and manage their implementation – Develop and review the Communications Plan and its implementation – Regularly communicate progress of strategies and the IAP to the IMT Leader – Collect, collate and store incident records – Maintain a personal log of activities and decisions made • Conduct handover briefing
SPECIFIC TASKS
Initial Actions ☐ Assist the IMT Leader to maintain and use the BRAINSTORMING/PLANNING Form – Appendix E and in OneNote ☐ Mobilize any additional resources or specialist advisors immediately required to commence recovery planning

DUTY CARD 3: PLANNING
☐ Ensure Log Keeper is in place and the IMT is maintaining an auditable documentation trail ☐ Consider need to activate Environmental Support ☐ Setup and maintain a document retention process for all response documentation ☐ Start a personal log
Ongoing Actions
☐ Drive and monitor the incident management process – See Section 5.0 ☐ Oversee and coordinate the actions of the Environmental Support Team. ☐ Prepare the Incident Action Plan (IAP) –: ☐ Establish time for next operational period (generally starting the next morning for 24-hour duration) ☐ Create Incident Objectives for next operational period and submit to IMT Leader for approval ☐ Create Meeting Schedule and advise IMT Leader on planning process issues ☐ Develop plans for recovery operations to implement tomorrow, the next day, next week etc. ☐ Consolidate the IAP and assemble for final approval and signoff
Stand Down
☐ Ensure team members and supports complete any outstanding log/record keeping ☐ Ensure all log sheets are collected before the team leaves the room. (All notebooks to be copied and / or originals to be retained) ☐ Arrange for copies of all email traffic and incident files to be collated and stored. ☐ Consider need to photograph IMT room and key display boards before it is tidied ☐ Contribute to the development of the incident report.

Table A6-9: Roles and Responsibilities of Jadestone Personnel Positioned in State Maritime Environmental Emergency Coordination Centre (MEECC)/ DOT IMT

Key Roles	Responsibilities
CMT Liaison Officer	• Provide a direct liaison between the Jadestone and the State MEECC • Facilitate effective communications and coordination between the Jadestone CMT Leader and the SMEEC • Offer advice to SMEEC on matters pertaining to Jadestone crisis management policies and procedures
Deputy Incident Controller	• Provide a direct liaison between the DoT IMT and the Jadestone IMT • Facilitate effective communications and coordination between the Jadestone IMT (W) Leader and the DoT Incident Controller • Offer advice to the DoT Incident Controller on matters pertaining to the Jadestone incident response policies and procedures • Offer advice to the Safety Coordinator on matters pertaining to Jadestone safety policies and procedures particularly as they relate to Jadestone employees or contractors operating under the control of the DoT IMT
Deputy Intelligence Officer	• As part of the Intelligence Team, assist the Intelligence Officer in the performance of their duties in relation to situation and awareness • Facilitate the provision of relevant modelling and predications from the Jadestone IMT • Assist in the interpretation of modelling and predictions originating from the Jadestone IMT • Facilitate the provision of relevant situation and awareness information originating from the DoT IMT to the Jadestone IMT • Facilitate the provision of relevant mapping from the Jadestone IMT • Assist in the interpretation of mapping originating from the Jadestone IMT • Facilitate the provision of relevant mapping originating from the Jadestone IMT
Deputy Planning Officer	• As part of the Planning Team, assist the Planning Officer in the performance of their duties in relation to the interpretation of existing response plans and the development of incident action plans and related sub plans • Facilitate the provision of relevant IAP and sub plans from the Jadestone IMT • Assist in the interpretation of the Jadestone OPEP from Jadestone • Assist in the interpretation of the Jadestone IAP and sub plans from the Jadestone IMT • Facilitate the provision of relevant IAP and sub plans originating from the DoT IMT to the Jadestone IMT • Assist in the interpretation of Jadestone's existing resource plans • Facilitate the provision of relevant components of the resource sub plan originating from the DoT IMT to the Jadestone IMT • (Note this individual must have intimate knowledge of the relevant Jadestone OPEP and planning processes)
Environment Support Officer	• As part of the Intelligence Team, assist the Environmental Coordinator in the performance of their duties in relation to the provision of environmental support into the planning process • Assist in the interpretation of the Jadestone OPEP and relevant TRP plans

Key Roles	Responsibilities
	• Facilitate in requesting, obtaining and interpreting environmental monitoring data originating from the Jadestone IMT • Facilitate the provision of relevant environmental information and advice originating from the DoT IMT to the Jadestone IMT
Deputy Public Information Officer	• As part of the Public Information Team, provide a direct liaison between the Jadestone Media team and DoT IMT Media team • Facilitate effective communications and coordination between Jadestone and DoT media teams • Assist in the release of joint media statements and conduct of joint media briefings • Advise on appropriate Aboriginal engagement and management strategies in the event of potential exposure of Aboriginal heritage sites, lands or waters to hydrocarbon spills, or for the potential access of responders to Aboriginal heritage sites or lands • Assist in the release of joint information and warnings through the DoT Information & Warnings team • Offer advice to the DoT Media Coordinator on matters pertaining to Jadestone media policies and procedures • Facilitate effective communications and coordination between Jadestone and DoT Community Liaison teams • Assist in the conduct of joint community briefings and events • Offer advice to the DoT Community Liaison Coordinator on matters pertaining to Jadestone community liaison policies and procedures • Facilitate the effective transfer of relevant information obtained from through the Contact Centre to the Jadestone IMT
Deputy Logistics Officer	• As part of the Logistics Team, assist the Logistics Officer in the performance of their duties in relation to the provision of supplies to sustain the response effort • Facilitate the acquisition of appropriate supplies through Jadestone's existing OSRL, AMOSC and private contract arrangements • Collects Request Forms from DoT to action via the Jadestone IMT • (Note this individual must have intimate knowledge of the relevant Jadestone logistics processes and contracts)
Deputy Operations Officer	• As part of the Operations Team, assist the Operations Officer in the performance of their duties in relation to the implementation and management of operational activities undertaken to resolve an incident • Facilitate effective communications and coordination between the Jadestone Operations Section and the DoT Operations Section • Offer advice to the DoT Operations Officer on matters pertaining to Jadestone incident response procedures and requirements • Identify efficiencies and assist to resolve potential conflicts around resource allocation and simultaneous operations of Jadestone and DoT response efforts
Deputy Waste Management Coordinator	• As part of the Operations Team, assist the Waste Management Coordinator in the performance of their duties in relation to the provision of the management and disposal of waste collected in State waters

Key Roles	Responsibilities
	• Facilitate the disposal of waste through Jadestone's existing private contract arrangements related to waste management and in line with legislative and regulatory requirements • Collects Waste Collection Request Forms from DoT to action via the Jadestone IMT
Deputy Finance Officer	• As part of the Finance Team, assist the Finance Officer in the performance of their duties in relation to the setting up and payment of accounts for those services acquired through Jadestone's existing OSRL, AMOSC and private contract arrangements • Facilitate the communication of financial monitoring information to the Jadestone to allow them to track the overall cost of the response • Assist the Finance Officer in the tracking of financial commitments through the response, including the supply contracts commissioned directly by DoT and to be charged back to Jadestone
Deputy Division Commander	• As part of the Field Operations Team, assist the Division Commander in the performance of their duties in relation to the oversight and coordination of field operational activities undertaken in line with the IMT Operations Section's direction. • Provide a direct liaison between Jadestone's Forward Operations Base/s (FOB/s) and the DoT FOB • Facilitate effective communications and coordination between Jadestone Division Commander and the DoT Division Commander • Offer advice to the DoT Division Commander on matters pertaining to Jadestone incident response policies and procedures • Assist the Safety Coordinator deployed in the FOB in the performance of their duties, particularly as they relate to Jadestone employees or contractors • Offer advice to the Safety Coordinator deployed in the FOB on matters pertaining to Jadestone safety policies and procedures

Table A6-10: Roles and Responsibilities of DoT Personnel to be Positioned in Jadestone's IMT/CMT

Key Roles	Responsibilities
DoT Liaison Officer	• Facilitate effective communications between the SMEEC and Incident Controller and Jadestone's appointed CMT Leader and Incident Controller • Provide enhanced situational awareness to DoT of the incident and the potential impact on State waters • Assist in the provision of support from DoT to Jadestone • Facilitate the provision technical advice from DoT to Jadestone's Incident Controller as required
Media Liaison Officer	• Provide a direct liaison between Jadestone's Media team and DoT IMT Media team • Facilitate effective communications and coordination between Jadestone and DoT media teams • Assist in the release of joint media statements and conduct of joint media briefings • Assist in the release of joint information and warnings through the DoT Information and Warnings team • Offer advice to the Jadestone Media Coordinator on matters pertaining to DoT and wider Government media policies and procedures

10. Incident Assessment & Orientation

The IMT Leader is to lead and manage the IMT in responding to all incidents, with their priority being to provide support and/or assistance to the facility or associated Jadestone activity.

10.1 Understand & Assess the Situation

The IMT Leader is to coordinate personnel in understanding and assessing the situation with consideration given to the following:

- Size, scope, effect, or potential effect of the incident on:
  - People, Environment, Assets, Reputation, Livelihood (PEARL)
  - Consultation with the GCT with respect to Recovery/Business Continuity;
- Capture information relating to:
  - Incident history and responses already taken
  - Current response actions
  - Confirmation of spill level
  - Other response organisations that are activated

10.2 Initial Briefing

The IMT Leader is to conduct an initial briefing to bring key IMT members together to share initial assessment information and to outline the process for initial response activities.

The initial brief is designed to provide all personnel with information about the incident, reason for IMT activation and initial intentions. The objectives of the initial briefing will be to confirm:

- Outline of incident;
- need to confirm spill level;
- Actions taken at the tactical level prior to activation;
- Overarching intention with respect to IMT actions; and
- Provision of initial actions to be taken by the IMT.

If required, the initial briefing may be conducted by teleconference ahead of the IMT arriving at the ICC.

10.3 Notifications

Depending on the type and nature of the incident various internal and external notifications will be required. It is therefore vitally important to ensure that accurate and timely information is captured and that situational awareness is achieved quickly. The IMT Leader must ensure that notifications (where required) are completed and managed as part of an ongoing incident.

IMT Leader should notify the Country Manager of the event within one hour of receiving initial call. As situational awareness is gained, the incident/spill level is reassessed by the IMT Leader. Specific guidance relating to the regulatory notifications required during an oil spill incident are provided at:

- Appendix A of the IMTRP (Oil Spill Response Arrangements); and
- Oil Pollution Emergency Plans (OPEP) (this document).

Jadestone store and maintain an Incident Management Contact List on the Jadestone intranet page which contains the contact numbers for external organisations and facilities required to be contacted in the event of an emergency. This includes the organisations to be contacted in Appendix A5: Regulatory Notifications.

11. il Spill Response Cycle

It is the function of the On-Scene Commander (OIM or Vessel Master for Level 1 incidents) or the IMT Leader (Levels 2) to assess the incident and respond as per the procedures outlined in the Jadestone IMTRP (JS-70-PLN-F-00008). The following sections describe the methods to assess oil spill response priorities.

11.1 Gaining Situational Awareness

The IMT needs to review the applicability of the response strategies contained within OPEPs to the actual incident characteristics. This is achieved using operational monitoring to gain situational awareness and obtain answers to the following:

- What type of hydrocarbon has been spilt?
- What is the expected behaviour of the hydrocarbon that has been spilt?
- How much has been spilt?
- Is the source under control?
- Where is the hydrocarbon going?
- Is there anything in the path of the predicted hydrocarbon travel zones?
- Can the hydrocarbon be approached or are there safety concerns?
- Can the hydrocarbon be contained?
- Can the hydrocarbon be dispersed?
- Will shoreline impact occur and clean-up be required?
- Will wildlife be affected and require response?

11.2 Assess Appropriate Strategies

Identify and assess known response strategy activities against the criteria detailed below using NEBA:

- Applicability of the response strategy to the range of credible spills (as detailed in the OPEP), including the potential effectiveness of the response in managing the environmental risks associated with each spill.
- Acceptability of the response strategy in relation to the potential environmental impact caused by the implementation of the response.

11.3 OPEP Actions Tables

The Action Tables detailed in the facility specific OPEPs have been developed to assist the IMT in commencing an oil spill response. They have been developed utilising risk assessments to identify credible worst case spill scenarios, expected/ calculated release rates, known information of hydrocarbon types and behaviour, and expected partitioning of the hydrocarbon within the marine environment with an estimate of the volume of persistent oil.

Models give a theoretical zone of spread that is used to identify potential sensitive receptors and response strategies required to reduce the consequences of a spill to ALARP. The response strategies described in the facility specific OPEPs are assessed using a NEBA process so the most effective response strategies with the lowest environmental consequences can be identified, documented and prepared for.

Jadestone uses a planning process based on risk-based scenario planning which required the team to:

- Understand the hazard profile;
- Identify parameters to assess applicable response strategies and scale of the event & suitable response strategies;

- Understand the impacts associated with response strategies; and
- Ensure capability supports management of risks to ALARP.

The outcome of this approach is that oil spill hazards associated with Jadestone's activities are addressed and risks are managed to ALARP; and that response strategies and resources are based on the nature and scale of the incident.

Spill response planning to identify a suitable combination of response strategies involves estimating required resources based on potential effectiveness. Capability to support the minimum resources required has been planned for and is presented in each facility specific OPEP**.**

11.4 Incident Action Plan

The Incident Action Plan (IAP) formally documents and communicates the:

- Incident objectives;
- Effectiveness of the response strategies;
- Status of assets;
- Operational period objectives; and
- The response strategies approved by the IMT Leader during response planning.

It is the responsibility of the IMT to evaluate the response strategies provided in the OPEP based on real time information. The actual response may not always adopt all response options; this is outcome based depending on the circumstances that will produce impacts that are ALARP. The process implemented throughout the response by the IMT to assess the appropriate response strategies and implement these in a controlled manner to ensure the health and safety of operational personnel and effectiveness in response is the Incident Action Planning (IAP) process.

Jadestone IMT use the incident management planning process described in Section 5 of the IMTRP to develop IAPs.

The IAP is developed and implemented by the IMT for each defined operational period following the initial first-strike IAP, notifications, and activations defined in OPEPs. An operational period is the period scheduled for execution of actions specified in the IAP. The IAP is refreshed when conditions change and can have multiple objectives, strategies and tactics.

11.5 Monitoring Performance of IAP

As IAPs are implemented their performance is monitored through IMT communication with in-field response personnel (e.g. surveillance personnel, vessel masters, air-attack supervisors, team leaders etc.) who report on the effectiveness of the response strategies. Communication to the IMT is both verbally and through logs/ reports/ photos sent throughout the response.

The performance objectives and standards for response strategies and tactics are documented in the IAP. Performance against the objectives and standards are assessed through field observations and response monitoring and recorded in the IAP in the next operational period. Through this method, the performance measurement results (gathered from scientific reports and verbal communication/ logs/ photos/ reports provided by response Team Leaders) are fed back into the IMT to provide the IMT with greater situational awareness to enable the effective formulation of following IAPs i.e. the response strategies that are effective in obtaining the IAP objectives are continued or increased, while ineffective strategies are scaled back or ceased.

11.6 Net Environmental Benefit Analysis (NEBA)

The IMT use NEBA to inform the development and refinement of IAPs, so the most effective response strategies with the least detrimental environmental impacts can be identified, documented and executed. The Planning Lead is responsible for reviewing the priority receptors identified within the EP and OPEP and application of the NEBA to identify which response options are preferred for the situation, oil type and behaviour, environmental conditions, direction of plume and priorities for protection. The EP describes the Strategic NEBA which has directed the selection of response strategies in this OPEP to the sensitivities of the priority receptors.

When a spill occurs, NEBA is applied to the current situation, or operationalised, using the Operational NEBA'S provided in the IMTRP Appendix D – Operational NEBA Form.

- All ecological and socioeconomic sensitivities identified within the spill trajectory area are inserted; and
- Potential effects of response strategies on each sensitivity are assessed and assigned a positive, negative or no change rating.

The Operational NEBA Form documents the decisions behind the recommendation to the IMT Leader on which resources at risk to prioritise, and the positives and negatives of response strategies to deploy.

To maintain flexibility, response information is used by the IMT to redefine and revalidate the operational NEBA on a daily basis and is fed into the IAP process. Sources of data for the NEBA include:

- Vessel & aerial surveillance;
- Ongoing operational oil and oil in water monitoring (visual);
- Trajectory modelling;
- Tracking Buoy location updates;
- Satellite imagery (if required);
- UAV imagery (if required);
- Fluorometer readings (Entrained oil monitoring);
- Weather and ocean conditions;
- Source Control reports;
- Megafauna Reports;
- Containment and recovery boom effectiveness (m^3/day);
- Skimmer effectiveness (m^3/day and water cut);
- Nearshore ocean currents and tides (direction & strength);
- Shoreline Assessment reports;
- Oiled wildlife response reports; and
- Scientific monitoring reports.

The NEBA matrix table prioritises environmental sensitivities and assesses the individual net effect that each response option may have on it. This process enables the trade-off effect to be achieved and provides the ability for an informed decision to be made. NEBA is an integral part of the decision-making process and will ultimately result in a trade-off between priorities and response strategies. The outcome of the response however will result in an overall net environment benefit.

12. Further IMT Management Guidance

Further guidance on Jadestone IMT and response strategies are detailed in the IMTRP and supporting documentation. This is a controlled document and restricted to Jadestone. Refer to Jadestone Energy management information system for further details.

13. IMT Training and Competency

Internal drills/exercises to demonstrate competency are undertaken as per the Incident Management Exercise and Testing Program (JS-70-PR-F-00001). Jadestone IMT will undertake training in their respective roles and responsibilities as provided by an Australian Registered Training Organisations (RTO) or internationally accredited training provider.

Competencies for IMT members will be maintained and managed by the ER Lead. Training requirements and core competencies for Jadestone key IMT response staff are outlined in Table A6-11.

Table A6-11: IMT Roles – Training and Competency Requirements

IMT Role	Training										
	IMO 3 - Oil Spill Response – Command & Control Priority Level (1)	IMO 2 - Oil Spill Response Management Priority Level (1)	Coordinate Incident Response (PMAOMIR418) Priority Level (1)	Manage Incident Response Information (PMAOMIR320/ PMAOMIR322) Priority Level (1)	Jadestone Incident Management Team Introduction (Online Module) Priority Level (2)	IMT Duty Roster Orientation Priority Level (2)	IMT Oil Spill Response Workshop (Annual) Priority Level (3)	*IMT MAE Drill (Quarterly) Priority Level (3)	** Oil Spill Response Functional Exercise (Annual) Priority Level (3)	***Targeted Oil Spill Refresher Workshop (as required) Priority Level (3)	Media Awareness
IMT Leader	M		M	M	M	M	M	M	M	R	R
Operations Lead		M		M	M	M	M	M	M		
Planning Lead		M		M	M	M	M	M	M	M	
Logistics Lead		M		M	M		M	M	M		

Priority Levels - (1) Pre-join; (2) 0-3 months; (3) 0-12 months

Key: M – mandatory R – recommended

***** - to participate **or** be an observer in a minimum of one drill per year

****** - to attend a minimum of one within 3 year IMO certification period

***- to attend a minimum of three per year pro rata from starting time

13.1 IMT Exercise and Testing Program

To maintain the organisation's ability to react to and manage major incidents, a three-year exercise cycle shall be implemented. Over the course of a 3-year period it is intended that all major incident events including key MAEs and oil spills will be exercised using a stand-alone IMT drill or as part of an annual functional exercise.

The exercise cycle shall be planned to include a quarterly MAE scenario, oil spill response workshop and exercises to test the IMT and will alternate between offshore facilities. A quarterly MAE scenario can be substituted for or combined with the Annual Oil Spill exercise. Exercises program shall align with facility exercise programs wherever practical. All completed IMT exercises shall be recorded in BASSNET.

The Incident Management Exercise & Testing Program (JS-70-PR-F-00001) provides information on drill and exercises (types and documentation)

14. Scientific Monitoring

Scientific monitoring activities are the principle tool for monitoring environmental impacts from hydrocarbon exposure and allows operators to determine when their termination goals have been met during a response. Jadestone has prepared the Framework for Scientific Monitoring JS-70-PR-I-00038 (the Framework) to guide scientific monitoring activities in an oil spill response.

14.1 Objectives

The objective of the Framework is to describe scientific monitoring studies to quantify impacts to the environment and their subsequent recovery.

14.2 Industry Guidelines

The NOPSEMA Information Paper N-04750-IP1349: Operational and Scientific Monitoring Programs (OSMPs) sets out general principles and practical advice to assist operators in their planning for, and application of, fit-for-purpose SMPs.

Features of these documents have provided the basis for which the Framework has been developed, with specific guidance utilised in the development of the monitoring program designs and application considerations.

14.3 Monitoring Background

Scientific monitoring activities have very different objectives to operational monitoring which significantly influence the monitoring methods likely to be used, the degree of scientific rigour required to meet the monitoring objectives, and the scope of studies.

Operational monitoring is monitoring undertaken in OPEPs to obtain information which will assist in the planning and execution of the oil spill response. Scientific monitoring is undertaken to provide indicative or quantitative data for short term and longer-term environmental effects assessment. Table A6-12 provides the characteristics of each of the monitoring types.

Table A6-12: Characterisation Summary of Spill Monitoring Types

Monitoring Classification	Character / Criteria
Operational	• Results required short term; • Lower requirement for statistical strength; • Lower requirement for the identification of control sites or to demonstrate baseline conditions; • Concentration on key habitats or species that are indicators of biological community health, are of particular value or have slow recovery times; and • Includes monitoring to help predict environmental effects or define the sensitivity of resources to guide spill response actions.
Scientific	• May be longer-term studies and monitoring may extend beyond the time and location of the clean-up response; • Need for high statistical strength (e.g. potentially large number of samples or sample sites); and Need for high quality 'control' areas.

14.4 Revision of Monitoring Programs

Following a hydrocarbon spill, subsequent impacts to sensitive receptors will be apparent (e.g. oiling of habitats/fauna visible; surveillance activities confirm contact over time at receptor locations). Therefore, the requirement for long-term monitoring will be based on the nature of the spill and monitoring data collected for the short-term phase on the impact and recovery of sensitivities impacted.

Scientific monitoring activities will be assessed for their applicability and organised by the Environmental Team Lead. Using surveillance and spill fate modelling information collected as part of the operational monitoring, the IMT will assess and decide on the final suite of scientific response monitoring programs. Table A6-13 describes the linkages between the OMPs and the SMPs.

Table A6-13: Matrix of SMPs Triggered by OMPs

Operational Monitoring Strategy	SMP1	SMP2	SMP3	SMP4	SMP5	SMP6	SMP7	SMP8
Satellite tracking buoy	X	X	X	X	X	X	X	X
Aerial surveillance	X	X	X	X	X	X	X	X
Vessel surveillance		X	X	X	X	X	X	X
OSTM	X	X	X	X	X	X	X	X
Fluorometry	X						X	X
Shoreline habitat assessment		X	X	X	X	X	X	

SMP1 – Water Quality
SMP2 – Sediment Quality
SMP3 – Intertidal Mudflats, Sandy Beaches and Rocky Shores
SMP4 – Mangroves
SMP5 – Benthic Habitats
SMP6 – Marine Fauna
SMP7 – Seafood Quality, Fisheries and Aquaculture
SMP8 – Fish, Invertebrates (Crustaceans and Cephalopods)

14.5 Scientific Response Monitoring Service Providers

During and post a spill requiring scientific response, monitoring activities require resources external to Jadestone which include specialist technical capabilities. Jadestone has a monitoring service provider on contract for scientific response monitoring activities. The service provider has an implementation plan for the Operational and Scientific Monitoring Program which outlines how the provider will coordinate its response arrangements for Jadestone including procedures, logistics and coordination, resourcing and preliminary study specifications.

The service provider can increase resourcing for SMPs through the hiring of personnel and equipment through sub-contracted companies, as may be required to provide for the varied disciplines and fields of expertise for each of the SMPs, and to accommodate the scaling up of monitoring that may be required as the spatial extent of a spill increases. This is considered normal practice for environmental monitoring providers given the limited ability of any single provider to provide all expertise and equipment across the multitude of marine and coastal scientific disciplines. In support of this requirement the monitoring service provider provides three monthly reporting of available personnel to support Jadestone.

Vessels to mobilise field teams to monitoring sites or for on-water sampling activities will be mobilised through Jadestone existing MSAs through multiple vessel providers. Given that sampling locations for the

SMPs would in many instances be coincident to sites targeted for operational monitoring and spill response strategies, there exists opportunities for shared vessel usage during a spill.

14.6 Consultation

In the event of a level 2/3 hydrocarbon spill, Jadestone will notify all identified relevant persons within 72 hours of the event (refer to Appendix A5 – Regulatory Notifications). In addition, for each scientific monitoring program (SMP) triggered, a review of relevant persons and/or groups with a direct interest in either the area monitoring will occur or values that may be affected, will be undertaken. Any identified relevant persons/groups will be contacted prior to the SMP activities being undertaken and provided with a summary of the activities that will occur and an invitation to comment. Thereafter, relevant persons/groups will be provided with periodic updates while the SMP is being undertaken and notification prior to termination, again with an invitation to comment.