NATIONAL ENERGY RESOURCES AUSTRALIA

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Collaborative Seismic Oil Pollution Emergency Plan

Revision	Date	Reason for issue	Reviewers	Approvers
A	22 March 2021	Internal review	CSEP Environment Specialist	CSEP PM
B	20 April 2021	Issued to WA DoT, NT DEPWS and AMSA	Santos, Shell, INPEX	CSEP PM
C	11 May 2022	Issued to WA DoT, NT DEPWS and AMSA	Santos, Shell, INPEX	CSEP PM
0	5 August 2022	Submission to NOPSEMA	CSEP Environment Specialist	CSEP PM
1	16 September 2022	Submission to NOPSEMA	CSEP Environment Specialist	CSEP PM

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Acronyms

Term/Acronym	Definition
ADIOS2	Automated Data Inquiry for Oil Spills 2.0.12
AFMA	Australian Fisheries Management Authority
AIIMS	Australasian Inter-Service Incident Management System
ALARP	As Low As Reasonably Practicable
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Marine Safety Authority
BAOAC	Bonn Agreement Oil Appearance Codes
CMT	Crisis Management Team
CSEP	Collaborative Seismic Environment Plan
CSR	Client Site Representative
DAWE	Department of Agriculture, Water and the Environment (Cth)
DBCA	Department of Biodiversity Conservation and Attractions (WA)
DCCEEW	Cth Department of Climate Change, Energy, the Environment and Water
DEPWS	Department of Environment, Parks and Water Security (NT)
DFAT	Department of Foreign Affairs and Trade (Cth)
DITT	Department of Industry, Tourism and Trade (NT)
DoT	Department of Transport (WA)
DPIF	Department of Primary Industry and Fisheries (NT)
DPIRD	Department of Primary Industries and Resource Development (WA)
DMIRS	WA Department of Mines, Industry Regulation and Safety (WA)
EMBA	Environment that May Be Affected
ERP	Emergency Response Procedure
ERT	Emergency Response Team
EOC	Emergency Operations Centre
EP	Environment Plan
FOB	Forward Operations Base
GIS	Geographic Information Systems
HMA	Hazard Management Agency
IAP	Incident Action Planning
ISC	Incident Command System
IMO	International Maritime Organisation
IMT	Incident Management Team
IRT	Incident Response Team
JPDA	Joint Petroleum Development Area

Term/Acronym	Definition
JSA	Job Safety Analysis
MEE	Maritime Environmental Emergencies
MEECC	Maritime Environmental Emergency Coordination Centre
MEER	Maritime Environmental Emergency Response (unit)
MDO	Marine Diesel Oil
MGO	Marine Gas oil
MNES	Matter of National Environmental Significance
NOPSEMA	National Offshore Petroleum Safety and Environment Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
NTOWRP	Northern Territory Oiled Wildlife Response Plan
OPEP	Oil Pollution Emergency Plan
OPGGS Act	*Offshore Petroleum and Greenhouse Gas Storage Act*
OPGGS (Env) Regulations	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OSCP	Oil Spill Contingency Plan
OSRL	Oil Spill Response Limited
OSRO	Oil Spill Response Organisations
OSTM	Oil Spill Trajectory Modelling
OWR	Oiled Wildlife Response
POLREP	Pollution Report
SIMA	Spill Impact Mitigation Analysis
SIMAP	Spill Impact Mapping and Analysis Program
SMP	Scientific Monitoring Plan
SMPC	State Maritime Pollution Coordinator
SMPEP	Shipboard Marine Pollution Emergency Plan
SOPEP	Shipboard Oil Pollution Emergency Plan
TMPC	Territory Marine Pollution Coordinator
UXO	Unexploded Ordnances
WAOWRP	Western Australia Oiled Wildlife Response Plan

First Strike Activations

The initial response to an oil spill incident will be undertaken by the Vessel Master. For vessel oil spill incidents, the Vessel Master will act in accordance with the relevant Shipboard Oil Pollution Emergency Plan (SOPEP) where applicable, which will include notification to the relevant Control Agency (refer to Section 2.2 and 2.3).

Table A-1 outlines the first strike response actions that need to be followed in the event of a spill.

Once first strike actions are completed and initial notifications to the Control Agency are made (Section 3), titleholders shall maintain direct contact with the Control Agency and act as a Supporting Agency throughout the response. This includes providing essential services, personnel, material, or advice in support of the Control Agency. In addition, titleholders will be required to implement monitoring activities as outlined in their Oil Spill Response and Monitoring Bridging Plan.

Table A-1: First strike actions

Responsibility	Actions
Observer	❑ Provide details of the incident to the Vessel Master.
Vessel Master/On-Scene Commander (OSC)[1]	❑ Monitor the safety of all personnel. ❑ Take immediate actions to control the source of the spill, in accordance with the vessel specific SOPEP. ❑ If source control is not possible, ensure vessel safety by clearing the immediate vicinity of the spill, if possible. ❑ Conduct risk assessment and assess safe approach routes. ❑ Contact relevant Jurisdictional Authority and Control Agency, as soon as practicable, to inform them of the incident, providing as much information as possible via POLREP (Refer to Table 2.2 for a description of Jurisdictional Authorities and Control Agencies). ❑ Notify Titleholder Survey Representative of the spill.
Titleholder Survey Representative on vessel	❑ Notify the titleholder Duty Manager of the incident and ensure source control measures being implemented. ❑ Aid the Vessel Master/OSC in preparing the POLREP[2] and provide as much information[3] to the Incident Management Team (IMT) as soon as practicable, including: ☐ Name and details of vessel ☐ Location and coordinates ☐ Date and time the release occurred or was first reported ☐ How it was detected ☐ Names of any witnesses

1 The Vessel Master may act as the OSC or nominate a delegate for this role.
2 This information will also be required when completing incident reports and reports to external agencies.
3 Some details may be limited in the initial POLREP. Aim to get the initial report submitted as soon as possible and follow up with more detail as it becomes available.

Responsibility	Actions
	☐ Hydrocarbon type (e.g., Marine Diesel Oil (MDO)), any Material Safety Data Sheets ☐ Vessel's Oil Record Book (contains information on volumes and contents in each tank) ☐ Cause of the spill (e.g., collision) ☐ Source of spill (e.g., fuel tank) ☐ Approximate volume of spill (better to overestimate) ☐ If the spill is controlled or continuous ☐ Weather, tide, and current details ☐ Trajectory of the spill (what direction is the slick spreading) ☐ If any fauna has been observed nearby (e.g., whales, dolphins, seabirds) ☐ Notifications undertaken. ❑ Provide updated POLREP to the IMT as required. ❑ Use personal Incident Log to record events. ❑ Take photos and send to the IMT, if possible.
Duty Manager/ IMT Operations Section Chief Note: Duty Manager may take on the role of IMT Operations Section Chief or handover command to the IMT Operations Section Chief	❑ Notify Incident Commander as soon as practicable that an incident has occurred and determine if IMT activation is required. ❑ Ensure IMT has been activated (if required). ❑ Confirm incident report and capture key details relating to the incident (obtain POLREP). ❑ Undertake external notifications and reporting (Refer to Section 3). ❑ Remain as the sole liaison and communication interface between the IMT Incident Commander and the Titleholder Survey Representative on the vessel.
IMT Incident Commander	❑ Evaluate initial incident report. ❑ Maintain contact with Control Agency to confirm actions (Australian Marine Safety Authority (AMSA), Western Australian Department of Transport (WA DoT) or Northern Territory (NT) IMT) (Refer to Section 2.2). ❑ Confirm level of the incident in consultation with Control Agency. ❑ Activate IMT in consultation with Duty Manager/Operations Section Chief. ❑ Notify Crisis Duty Manager Leader of incident (if level 2 or 3). ❑ Remain as the decision-making interface between the IMT and the Crisis Management Team (CMT) Leader.

1. Introduction

1.1 Purpose

This Oil Pollution Emergency Plan (OPEP) outlines oil spill response arrangements for spill scenarios that may occur from seismic surveys undertaken within the Collaborative Seismic Environment Plan (CSEP) Carnarvon, Browse and Bonaparte Operational Areas (Figure 1-1). It describes the spill response management arrangements, protection priorities and the process for selecting suitable oil spill response strategies.

This OPEP addresses the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS (Env) Regulations) and forms a supporting document to the CSEP. It is also consistent with the National Plan for Maritime Environmental Emergencies (AMSA 2020), the Western Australian (WA) State Hazard Plan for Maritime Environmental Emergencies (WA DoT 2021) and the NT Oil Spill Contingency Plan (NT DoT 2014).

1.2 Conditions of use

This OPEP forms part of the CSEP. Titleholders using this CSEP/OPEP will need to ensure their spill scenarios meet the following criteria:

- Spill source is limited to vessels from seismic activities.
- Spill source must be located inside the following Operational Areas, as shown in Figure 1-1:
    - Carnarvon Operational Area
    - Browse Operational Area
    - Bonaparte Operational Area
- Vessel largest fuel tank not to exceed 2,000 m^3.
- Hydrocarbon type is limited to marine diesel oil (MDO) and marine gas oil (MGO).

CSEP titleholders are required to ensure that their individual seismic surveys fall within the scope and limitations of the CSEP and OPEP and implement applicable controls to manage the associated impacts and risks from their activity to as low as reasonably practicable (ALARP) and an acceptable level. To support titleholders through this process, an Oil Spill Response and Monitoring Bridging Plan Template has also been developed that outlines the information to be presented by individual titleholders for each seismic survey.

1.3 Objectives

The objectives of this OPEP are to:

- Define the oil spill response arrangements that are in place for the credible spill scenarios.
- Provide guidance to the IMT in relation to spill response selection and response implementation.
- Provide procedures for identifying appropriate resources to support a marine hydrocarbon spill response associated with a seismic survey.

1.4 Geographical scope

This OPEP applies to a spill originating within the CSEP Operational Areas (Carnarvon, Browse and Bonaparte) within the Commonwealth Offshore Area (Figure 1-1). It does not include international waters or the previously defined Joint Petroleum Development Area (JPDA), which is now governed by the Government of Timor-Leste.

1.5 Operational scope

This OPEP only applies to marine seismic survey activities. It excludes all other petroleum related activities. It also excludes marine hydrocarbon spills originating from vessels outside of the CSEP Operational Area, which will be addressed by the vessel's SOPEP or Shipboard Marine Pollution Emergency Plan (SMPEP), as applicable to vessel class.

1.6 Regulatory requirements

1.6.1 Applicable CSEP contents

Appendix A: provides guidance on the requirements of the OPGGS (Env) Regulations and reference to the relevant section of this document or the broader suite of documents, which addresses that requirement.

1.7 Testing Arrangements

The OPGGS (Env) Regulations details that the proposed schedule of tests for an OPEP must provide for the following:

a) testing the response arrangements when they are introduced

b) testing the response arrangements when they are significantly amended

c) testing the response arrangements not later than 12 months after the most recent test

d) if a new location for the activity is added to the environment plan after the response arrangements have been tested, and before the next test is conducted—testing the response arrangements in relation to the new location as soon as practicable after it is added to the plan.

For the CSEP OPEP each titleholder conducting a seismic survey under the CSEP will undertake testing of their oil spill response capability and arrangements to meet the requirements of the CSEP OPEP. The exercise types, objectives, and frequency each titleholder will undertake is detail in Table 1-1.

As part of the exercise process, a number of documents are prepared to ensure exercises are well planned, conducted and evaluated. To support this, the following documents are used:

- Exercise scope document – provides background context to the exercise, outlines the exercise need, aim, objectives, details of the scenario, participating groups and agencies, exercise deliverables and management structure. This document can be used to engage a third-party contractor to assist in conducting the exercise.

- Exercise plan and instructions – provide instructions and 'play' (including any injects) for conducting the exercise
- Post exercise report – includes an after-action review of the exercise, evaluating how the exercise performed against meeting its aim and objectives.

Post-exercise debriefings following level 2-3 OPEP exercises and drills will be held to identify opportunities for improvement and communicate lessons learned. All actions that are derived from drills and exercises including debriefs are documented in the Titleholder process or system that tracks actions from exercises to completion.

Table 1-1: Exercise type, objectives and frequency

Exercise Type	Objective	Frequency
Notification exercise	To test all communication and notification processes to service providers and regulatory agencies defined within the OPEP	Prior to the start of a survey and then: • At least annually • When response arrangements have been significantly amended
Tabletop exercise	To encourage interactive discussions of a simulated scenario amongst IMT members and refresh roles and responsibilities	As per Titleholder Exercise and Training Schedule
Incident Management Exercise	To activate IMT and establish command, control, and coordination of a simulated level 2 or 3 incident and test response arrangements in OPEP	Minimum of one oil spill exercise per year for Titleholder Australia's activities. Where response arrangements are the same for a number of activity specific OPEPs, one exercise may be used to test these response arrangements for these OPEPs at the same time
National Plan Exercises or WA DoT exercises	Participate as required to ensure alignment between National/State Response Framework and <Titleholder> Response Framework	As determined by AMSA and/or WA DoT, Titleholder may not be requested to participate every year

1.8 Document review

This OPEP is required to be reviewed, and if applicable updated, to ensure that all relevant information is accurate, and that new information or improved technology is evaluated and used to adapt and improve the management of spills.

Reviews and revisions to this OPEP will be undertaken as per the CSEP review and revision process detailed in the CSEP Implementation Strategy.

This could include changes required in response to one or more of the following:

- When major changes have occurred, which affect oil spill response coordination or capabilities.
- Changes to the CSEP that affect oil spill response coordination or capabilities (e.g., a significant increase in spill risk, inclusion of new activity).
- Following routine testing of the OPEP if improvements are identified.
- After a Level 2/3 spill incident.

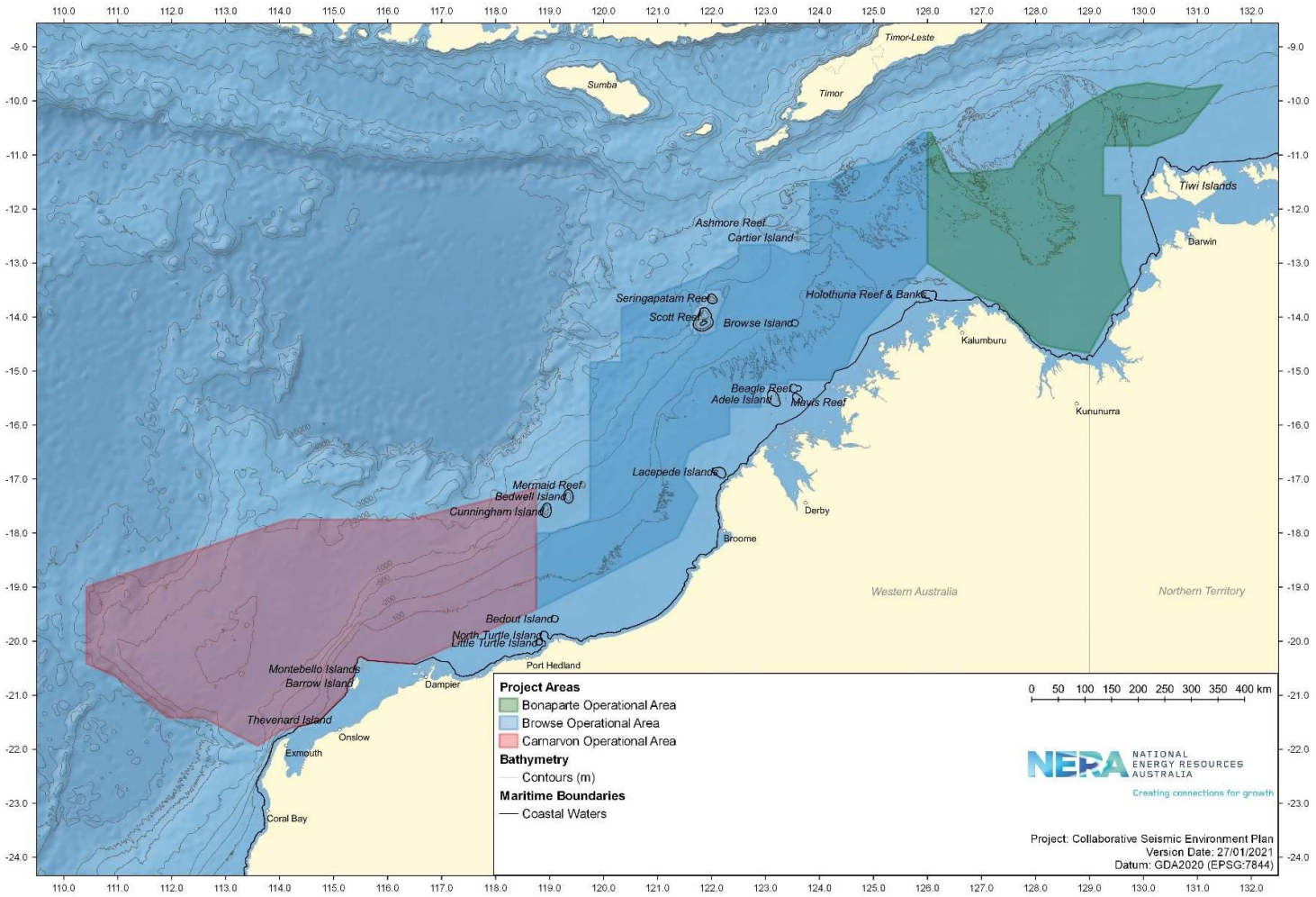

Figure 1-1: CSEP Operational Areas

2. Spill Management Arrangements

2.1 Response levels and escalation criteria

The National Plan for Maritime Environmental Emergencies (National Plan) (AMSA 2020) and the WA State Hazard Plan for Maritime Environmental Emergencies (MEE) (WA DoT 2021) identify three levels of incidents, which is consistently applied by titleholders.

An incident level (also referred to as 'tier' by some titleholders) will determine where the resources will be drawn from to respond to the spill and the level of incident management that is required to manage the response effort.

In the event of a spill occurring where 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 2-1) 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.

Table 2-1: Titleholder Incident Level Guidance

Characteristic	**Titleholder incident management response level**		
	Level 1	Level 2	Level 3
General description and escalation criteria	An incident that has not caused severe injury to personnel or damage to assets or the environment. Incident does not threaten the safety of a vessel/facility and can be managed by the IRT/ERT and its resources.	An incident that exceeds Level 1 capability and requires the assistance of the IMT and external support services/agencies. If no external support is required, an incident may be classified in a higher tier if there is potential for escalation or damaging public image or government relations.	An incident that exceeds Level 2 capabilities and resources and requires the assistance of the CMT. Incident may attract media coverage or create public outrage and has the potential to cause, or does cause, a major impact.
AMSA National Plan Levels and escalation criteria	Level 1 Generally able to be resolved by Responsible Party through the application of local or initial response resources (first strike response).	Level 2 Typically, more complex in size, duration, resource management and risk than Level 1 incidents. May require deployment of resources beyond the first strike response.	Level 3 Characterised by a high degree of complexity, require strategic leadership and response coordination. May require national and international response resources.
Titleholder IMT/ Crisis Management Team (CMT) activation	Vessel or Facility IRT/ERT activated.	IMT activated. CMT may be activated.	IMT activated. CMT activated.

Characteristic	Titleholder incident management response level		
	Level 1	Level 2	Level 3
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.

2.2 Control agencies and jurisdictional authorities

The responsibility for responding to an oil spill is dependent on location and spill origin. The National Plan for Maritime Environmental Emergencies (AMSA 2020) sets out the divisions of responsibility for an oil spill response. Definitions of Jurisdictional Authority and Control Agency are as follows:

- Control Agencies: the organisation assigned by legislation, administrative arrangements or within the relevant contingency plan, to control response activities to a maritime environmental emergency. Control Agencies have the operational responsibility of response activities but may have arrangements in place with other parties to provide response assistance under their direction.
- Jurisdictional Authority: the agency which has responsibility to verify that an adequate spill response plan is prepared and, in the event of an incident, that a satisfactory response is implemented. The Jurisdictional Authority is also responsible for initiating prosecutions and the recovery of clean-up costs on behalf of all participating agencies.

Table 2-2 provides guidance on the designated Control Agency and Jurisdictional Authority for Commonwealth and State/Territory waters and for vessel and petroleum activity spills.

It should be noted that in Commonwealth waters, vessels involved in seismic surveys are considered to be ‘vessels’ and not ‘petroleum activities’. However, in WA waters marine seismic surveys are considered to be a petroleum activity.

2.3 Seismic survey spills in Commonwealth waters

AMSA manages the National Plan for Maritime Environmental Emergencies (AMSA 2020) and is the Control Agency for all vessel-based spills in the Commonwealth jurisdiction. This includes vessels undertaking seismic surveys and associated supply or support vessels.

The Vessel Master is responsible for implementing source control arrangements detailed in the vessel specific SOPEP. Once initial notifications to the Control Agency are made, titleholders shall maintain direct contact with the Control Agency and act as a Supporting Agency throughout the response. This includes providing essential services, personnel, material, or advice in support of the Control Agency. In addition, titleholders will be required to implement monitoring activities as outlined in their Oil Spill Response and Monitoring Bridging Plan.

2.4 Seismic survey spills in WA waters

Although the National Plan defines seismic survey spills to be 'vessel-based' spills, this definition does not apply to WA waters, or to cross jurisdictional arrangements involving WA. The WA DoT manages the State Hazard Plan for Maritime Environmental Emergencies (WA DoT 2021) and is the Control Agency for both level 2/3 petroleum activity and vessel-based spills in WA waters.

As seismic survey spills are petroleum activity spills in WA waters, the DoT's Offshore Petroleum Industry Guidance Note – Marine Oil Pollution: Response and Consultation Arrangements (WA DoT 2020) shall apply.

2.5 Seismic survey spills in NT waters

The Northern Territory Oil Spill Contingency Plan (2014) is currently being updated but does not provide a definition for seismic survey spills. The Northern Territory Department of Environment, Parks and Water Security (DEPWS) will assume the Control Agency role for level 2/3 vessel-based spills in NT waters.

2.6 Cross jurisdiction vessel spills

If a level 2/3 vessel spill crosses jurisdictions between Commonwealth and State/Territory waters, two Jurisdictional Authorities will exist (AMSA for Commonwealth waters and DoT for WA State waters; or NT IMT for Territory Waters). The Control Agency will remain with the original nominated agency or organisation unless otherwise appointed through agreement between the Hazard Management Agency (HMA) / Jurisdictional Authority of both waters. Titleholders will continue to provide all necessary resources (including personnel and equipment) as a Supporting Agency, as detailed in Section 2.8.

AMSA may request that DoT manage a vessel incident in Australian Commonwealth waters (DoT 2021).

2.7 Titleholder Incident Management

For the period of a seismic survey the titleholder will maintain an IMT that is commensurate to the response level (Section 2.1) for the survey oil spill risk and impacts. The Oil Spill Response and

Monitoring Bridging Plan Template provides guidance on the minimum requirements titleholders must present to meet the OPGGS (Env) Regulations.

Table 2-2: Jurisdictional and Control Agencies for Hydrocarbon Spills

Jurisdictional boundary	Spill source	Jurisdictional authority	Control agency		Relevant documentation
			Level 1	Level 2/3	
Commonwealth waters (three to 200 nautical miles from territorial/state sea baseline)	Vessel [4]	AMSA	AMSA		Vessel SOPEP National Plan Activity OPEP (seismic)
	Petroleum activities[5]	NOPSEMA	Titleholder		Activity OPEP
Western Australian (WA) state waters (State waters to three nautical miles and some areas around offshore atolls and islands)	Vessel	WA Department of Transport (DoT)	WA DoT	WA DoT	State Hazard Plan: Maritime Environmental Emergencies Oil Spill Contingency Plan (OSCP) (WA DoT 2015) Activity OPEP (seismic)
	Petroleum activities	WA DoT	Titleholder	WA DoT	Activity OPEP State Hazard Plan: Maritime Environmental Emergencies (WA DoT 2021)
Northern Territory (NT) waters (territorial sea baseline to three nautical miles and some areas around offshore atolls and islands)	Vessel	DEPWS	Vessel owner	DEPWS	Vessel SOPEP Activity OPEP (seismic) Territory Emergency Plan (2021) NT Oil Spill Contingency Plan (2014)
	Petroleum activities	DEPWS	Titleholder [6]		Activity OPEP

[4] 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. Note: this definition does not apply to WA State waters.
[5] 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 OPGGS Act 2006.
[6] Titleholder will be the Control Agency but will request approval of IAPs from the NT IC.

Jurisdictional boundary	Spill source	Jurisdictional authority	Control agency		Relevant documentation
			Level 1	Level 2/3	
					NT Oil Spill Contingency Plan (2014)
NT shorelines	Vessel	DEPWS	Vessel owner	NT IMT[7]	Activity OPEP (seismic) NT Oil Spill Contingency Plan (2014)
	Petroleum activities	DEPWS	Titleholder	NT IMT	Activity OPEP NT Oil Spill Contingency Plan (2014)
International waters	Petroleum activities	Relevant foreign authority	Titleholder		Activity OPEP
	Vessel		Relevant foreign authority		National Plan

[7] NT IMT will be the Control Agency but will be supported by the Titleholder (additional support from AMOSC if required)

2.8 Integration with other organisations

2.8.1 Western Australia – Department of Transport

If a Marine Oil Pollution Incident enters, or has potential to enter, WA State waters, the DoT is the Hazard Management Agency (HMA) (DoT Chief Executive Officer or proxy). The Assistant Executive Director (or proxy) has been nominated by the HMA to perform the role of State Marine Pollution Coordinator (SMPC) (as prescribed in Section 1.3 of the SHP – MEE (WA DoT, 2021)) and DoT will take on the role as a Control Agency. The role of the SMPC is to provide strategic management of the incident response on behalf of the HMA.

The titleholder will notify the DoT Maritime Environmental Emergency Response (MEER) unit as soon as reasonably practicable (within 2 hours of spill occurring) if an actual or impending spill may impact WA State waters. On notification, the SMPC will activate their Maritime Environmental Emergency Coordination Centre (MEECC) and the DoT IMT. Titleholders 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).

The titleholder will conduct initial response actions in State waters as necessary in accordance with this OPEP and its Oil Spill Response and Monitoring Bridging Plan 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 titleholder will continue to provide all necessary resources, including personnel and equipment, to assist the DoT in performing duties as the Control Agency.

2.8.2 Northern Territory – NT Government

The Jurisdictional Authority for marine hydrocarbon spills in NT waters (with the exception of Darwin Port) is the Northern Territory (NT) Department of Environment, Parks and Water Security (DEPWS), and the Control Agency is the NT IMT. If a Level 2/3 spill arises which has potential to enter Territory waters, the titleholder must notify the Regional Harbourmaster and the NT Pollution Hotline.

The NT Government is currently in a transitional phase with its spill management arrangements. Prior to a seismic survey occurring that has the potential to impact NT waters, the titleholder will contact DEPWS and confirm the NT arrangements.

2.9 Interface with External Organisations

Titleholders may have agreements in place with external organisations involved in the storage, maintenance, and mobilisation of level 2 and 3 spill response resources.

If titleholders have access to these resources, then they may be requested by the relevant Control Agency to activate them in their role as Support Agency. A list of possible support organisations and resources is shown in Table 2-3. Titleholders individual resource capability is provided in the survey specific Oil Spill Response and Monitoring Bridging Plan.

Note that interface arrangements with Control Agencies is addressed in Section 2.

Table 2-3: External Support Resources

Support agency/role	Resources	Activation	Person responsible for activating
AMOSC AMOSC Duty Manager	If the titleholder is a member of AMOSC they can call upon AMOSC personnel and equipment (including oiled wildlife) under a Master Services Agreement. Under the AMOSPlan, members can also call upon mutual aid from other trained industry company personnel and response equipment. AMOSC stockpiles of equipment include dispersant, containment, recovery, cleaning, absorbent, oiled wildlife, and communications equipment. Equipment is located in Geelong, Fremantle, Exmouth, and Broome.	Titleholders should follow the activation instructions provided in their Master Services Agreement.	If support is required, the titleholder IMT will need to notify AMOSC.
Oil Spill Response Limited (OSRL) OSRL Duty Manager	If the titleholder is a member of OSRL they can call upon OSRL personnel and equipment under a Service Level Agreement.	Titleholders should follow the activation instructions provided in their Service Level Agreement.	If support is required, the titleholder IMT will need to notify OSRL.
Department of Biodiversity, Conservation and Attractions (DBCA)	DBCA has 1 oiled wildlife container positioned at Kensington.	If requested by WA DoT (as Control Agency), contact Oiled Wildlife Duty Officer.	Operations Section Chief or delegate.
Monitoring Provider	Monitoring Provider supply titleholders with scientific monitoring personnel and equipment in the event of a level 2 or 3 oil spill.	Contact Monitoring Provider's Duty Officer.	Environment Unit Lead or delegate.

2.10 Incident Action Planning

The incident action planning (IAP) process is built on the following phases:

1. Understand the situation.

2. Establish incident objectives.

3. Develop the plan.

4. Prepare and disseminate the plan.

5. Execute, evaluate, and revise the plan.

The Control Agency will use the IAP process to determine and document the appropriate strategies as more information becomes available during an incident response. The Control Agency IMT will use an IAP for each operational period following the initial first-strike assessments, notifications, and activations undertaken by the titleholder.

As Support Agency, titleholders may be requested by the Control Agency to develop or support the development of an IAP to help guide the incident response.

The Department of Transport (WA) have a suite of Incident Management System templates to assist with the preparation of an IAP. These can be found under the Incident Management System drop down list **here.**

3. External Notifications and Reporting Requirements

The titleholder is responsible for making external notifications and reporting. Table 3-1 outlines external notification and reporting requirements required for Level 2-3 incidents. Reporting requirements for Level/Tier 1 incidents is detailed in the CSEP.

Titleholders will detail in their survey specific Oil Spill Response and Monitoring Bridging Plan where personnel can source up to date emergency contacts for the relevant agencies detailed in Table 3-1.

Table 3-1: External Notifications and Reporting

Agency or Authority	Type of Notification /Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
AMSA (Rescue Coordination Centre)	Verbal notification without delay to include: • name of ship/s involved • time, type and location of incident • quantity and type of harmful substance • assistance and salvage measures • any other relevant information Written POLREP form, within 24 hours of request from AMSA	National Plan for Maritime Environmental Emergencies	All slicks trailing from a vessel All spills to the marine environment (notwithstanding the size or amount of oil or sheen) 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 Online POLREP - https://amsa-forms.nogginoca.com/public/
NOPSEMA (Incident Notification Office)	Verbal notification within 2 hours after Titleholder becomes aware of the incident Written report as soon as practicable, but no later than 3 days	Petroleum and Greenhouse Gas Storage Act 2006 Offshore Petroleum Greenhouse Gas Storage (Environment) Regulations 2009 (as amended 2014)	A spill associated with the activity that has caused, or has the potential to cause, moderate to significant environmental damage: Vessel loss of containment (MDO/MGO)	Notification by Titleholder	Incident reporting requirements: https://www.nopsema.gov.au/assets/Guidance-notes/A198752.pdf
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	Notification by Titleholder	Provide same written report as provided to NOPSEMA

Agency or Authority	Type of Notification /Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
		https://www.nopsema.gov.au/assets/Guidance-notes/A198752.pdf			
Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) (Director of monitoring and audit section)	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	Notification by Titleholder	Not applicable
Parks Australia (Director of National Parks)	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	Notification by Titleholder	No forms, but 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 response arrangements as per the OPEP • Details of the relevant contact person in the IMT
Australian Fisheries Management Authority (AFMA)	Verbal phone call notification as soon as practicable (within 24 hours)		Fisheries within the environment that may be affected (EMBA) Consider a courtesy call if not in exposure zone	Notification by Titleholder	Not applicable

Agency or Authority	Type of Notification /Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
If spill is heading towards WA waters					
WA DoT (WA Maritime Environmental Emergency Response (MEER) unit)	Immediate notification to the MEER Duty Officer Follow up with written POLREP, as soon as practicable Written Situation Report (SITREP) submitted within 24 hours of being directed by DoT	State Hazard Plan – Maritime Environmental Emergencies	All actual or impending spills in WA waters, regardless of source or quantity	Immediate notification by Titleholder POLREP to be submitted by Titleholder SITREP to be submitted by Titleholder	DoT POLREP: http://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-PollutionReport.pdf SITREP: http://www.transport.wa.gov.au/mediaFiles/marine/MAC-F-SituationReport.pdf
Department of Mines, Industry Regulation and Safety (DMIRS) (Petroleum Environment Duty Officer)	Verbal notification within 2 hours Notification report within 3 days	Guidance Note on Environmental Non-compliances and Incidents	All actual or impending spills in WA waters	Notification by Titleholder	Environmental and Reportable Incident/ Non-compliance Reporting Form http://www.dmp.wa.gov.au/Environment/Environment-reports-and-6133.aspx
Department of Biodiversity Conservation and Attractions (DBCA) (State Duty Officer)	Verbal notification as soon as practicable	WA 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)	Notification by Titleholder	Not applicable
Department of Primary Industries and Resource Development (DPIRD)	Verbal notification as soon as practicable (within 24 hours)	Agreed consultation	Notify if spill has the potential to impact or has impacted fisheries in State waters	Notification by Titleholder	Not applicable

Agency or Authority	Type of Notification /Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
If spill is heading towards NT waters					
NT Regional Harbourmaster	Verbal notification Follow up with POLREP as soon as practicable after verbal notification	Northern Territory Oil Spill Contingency Plan. As per State legislation (i.e., 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)	Notification by Titleholder	POLREP to be emailed to rhm@nt.gov.au (Regional Harbourmaster) Instructions for submitting POLREP (including a POLREP Template) are provided on the NT Government webpage https://nt.gov.au/marine/marine-safety/report-marine-pollution
NT Department of Environment, Parks and Water Security (DEPWS) Pollution Response Hotline 1800 064 567	Verbal notification as soon as practicable Written report to be provided as soon as practicable after the incident, unless otherwise specified by the Minister	Northern Territory Oil Spill Contingency Plan. As per State legislation (i.e., Marine Pollution Act 1999)	All actual or impending spills in NT waters	Notification by Titleholder	Marine Pollution Reports (POLREP) are to be emailed to pollution@nt.gov.au (Environmental Operations) Instructions for submitting POLREP (including a POLREP Template) are provided on the NT Government webpage https://nt.gov.au/marine/marine-safety/report-marine-pollution

Agency or Authority	Type of Notification /Timing	Legislation/ Guidance	Reporting Requirements	Responsible Person/Group	Forms
NT Department of Industry, Tourism and Trade (DITT))	Verbal notification, timing not specified	Not applicable	Fisheries within the EMBA Consider a courtesy call if not in exposure zone	Notification by Titleholder	Not applicable
If spill is heading towards international waters					
Department of 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	Not applicable	Notify DFAT that a spill has occurred and is likely to extend into international waters Inform DFAT of the measures being undertaken to manage the spill	Notification by Titleholder	Not applicable

4. Process for Selecting Suitable Oil Spill Response Strategies

4.1 Strategic spill impact mitigation analysis

Titleholders typically use a Spill Impact Mitigation Analysis (SIMA) or Net Environmental Benefit Analysis (NEBA) as their decision support tool to consider available information which helps them select the most suitable response strategies or combination of strategies that would minimise impacts to ecological, cultural, economic, and social values (hereafter referred to as receptors). Different response strategies provide varying levels of effectiveness and protection under different environmental conditions, depending on the individual spill (Coelho et al. 2014).

Conducting a SIMA[8] is an important step in the oil spill planning and preparedness process and is often called a Strategic SIMA. An overview of this assessment process is provided in Figure 4-1. To complete a Strategic SIMA, all available information on a potential spill is considered (e.g. oil type, volume, duration of release), together with any vector mapping or spill trajectory modelling to consider potential impacts to sensitive receptors.

A list of possible response strategies are considered from a 'response toolbox', as detailed in Table 4-3.

A detailed assessment of the benefits and drawbacks of each response strategy is completed to help determine the combination of strategies that would be most suited to each maximum credible spill scenario. This includes 'primary response strategies' and 'secondary response strategies', with the former typically being more reliable and effective in reducing impacts from an individual spill.

Table 4-3 details the Strategic SIMA for the CSEP spill scenario of an MDO/MGO spill from a vessel collision. It details the response strategies applicable or not applicable for an MDO/MGO spill.

[8] This OPEP refers to SIMA, but Titleholders may choose to refer to NEBA to be consistent with their existing processes.

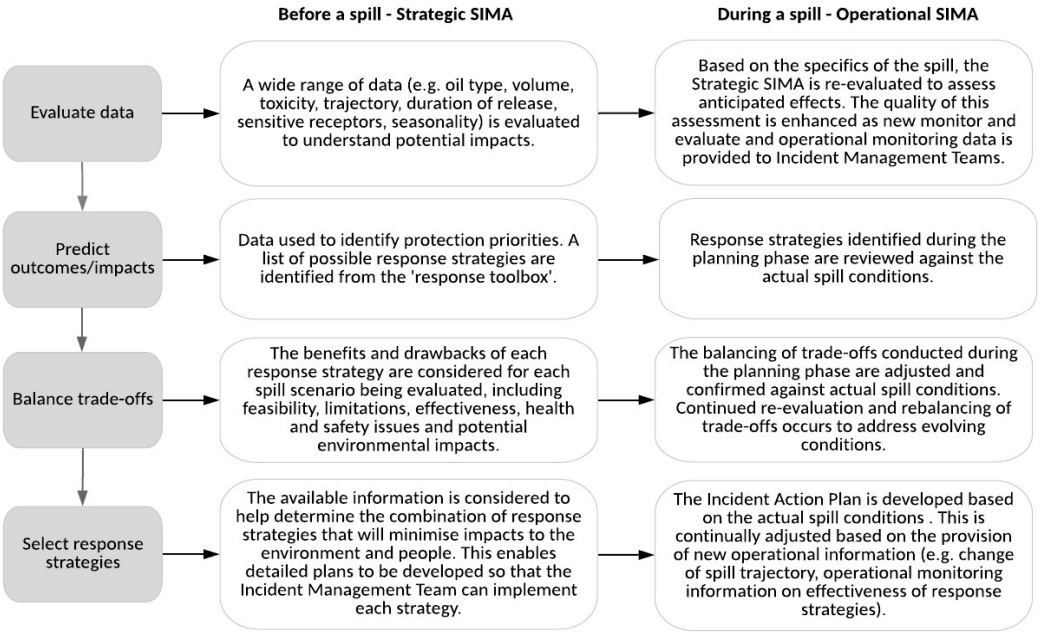

Figure 4-1: Spill Impact Mitigation Analysis Overview

4.2 Evaluate data

4.2.1 Spill scenarios

The worst-case spill scenario identify in the CSEP is a MDO or MGO spill from a vessel collision within the CSEP Operational Area (Figure 1-1).

4.2.2 Hydrocarbon properties

MDO/MGO are products that contain a mixture of volatile and persistent hydrocarbons. The two products have similar chemical properties. Table 4-1 shows the approximate physical properties and boiling point ranges of MGO and MDO.

When released to the marine environment, MDO/MGO will spread quickly and thin out to low thickness levels, thereby increasing the rate of evaporation. Due to its chemical composition, up to 65% will generally evaporate over the first two days depending upon the prevailing conditions and spill volume.

MDO/MGO has a strong tendency to entrain into the upper water column (0 m–10 m) (and consequently reduce evaporative loss) in the presence of moderate winds (> 10 knots) and breaking waves. However, the MDO/MGO re-surfaces when the conditions calm.

Table 4-1: MDO and MGO Representative Characteristics

Hydrocarbon type	Density (kg/m^3)	Viscosity (cP)	Component	Volatile (%)	Semi-volatile (%)	Low volatility (%)	Residual (%)
			BP (ºC)	<180	180–265	265–380	>380
MDO [1]	829 (at °C)	4.0 (at 25 °C)	% of total	6	35	54	5
MGO	820 - 860 (at 15 °C)	2 - 4.5 (at 40 °C)	% of total	16.4	49	31.9	2.7

[1] Data from SINTEF's Marine Diesel (IKU)

4.2.3 Operational area and spill EMBA

The CSEP describes how the Spill EMBA (environment that may be affected), shown in Figure 4-4, Figure 4-4 and Figure 4-6 were developed for the three Operational Areas; Carnarvon, Browse and Bonaparte. The Spill EMBAs have been developed by combining the spatial extents of all relevant spill modelling for each Operational Area.

The boundary of the Spill EMBAs is defined as including all modelled exposure at the 'low' exposure values (1 g/m^2 floating, 10 ppb dissolved and entrained) (NOPSEMA 2019). The shoreline extent of the EMBA is defined as all coastal areas within the offshore spatial extent (i.e., not based on shoreline contact from worst-case spill modelling).

4.2.4 Spill spatial extent forecasting

The predicted spatial extent of a spill is required to identify the sensitive receptors that may be affected by the spill and to determine protection priorities, which is important for spill response planning.

Titleholders will detail the spatial extent of the worst-case survey specific spill scenario and the process used to predict the spatial extent in the survey specific Oil Spill Response and Monitoring Bridging Plan.

The predicted spatial extent of a spill is typically determined using Oil Spill Trajectory Modelling (OSTM) or other tools, such as Automated Data Inquiry for Oil Spills 2.0.12 (ADIOS2) and vector mapping. These two methods are presented below.

ADIOS2 and vector mapping

ADIOS2 and vector mapping can be used as an initial tool to provide an estimation of slick movement and assist titleholders in understanding the spatial extent of individual survey spill risk and if OSTM is warranted. For example, ADIOS2 and vector mapping may show a survey location in the western extents of the Operational Areas will not impact upon any shorelines and/or offshore islands, so no OSTM is conducted. However, if ADIOS2 and vector mapping indicates shorelines are within the predicted spatial extent, OSTM will need to be used to help predict time to contact and shoreline oil volumes, which aid in the identification of protection priorities (Section 4.3.1).

To use this method, metocean conditions are required including wind direction, wind speed, current speed, and current direction. If the survey is to be conducted at any time of the year, then an

average of the available data should be used. Otherwise, seasonal data should be used if the survey is to be restricted to a season.

The ADIOS2 model can be downloaded free from the United States National Oceanic and Atmospheric Administration (NOAA) website - https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/response-tools/downloading-installing-and-running-adios.html

ADIOS2 provides a mass balance/oil budget plot that predicts the surface life of the spill. Figure 4-2 provides a worked example that illustrates the output of this tool. The example in Figure 4-2 can be used to indicate when no volume remains on the sea surface (12 hours) and the volumes which have dispersed into the water column and evaporated (79 m^3 and 21 m^3 respectively).

Vector mapping can then be used to predict the spatial extent of the spill. Surface oil movement on water can be calculated based on 3-4% of the wind speed and 100% of the current. The route of the surface oil can be determined by vector addition of the speed of the current and 3-4% of the wind (IPIECA, 2015) as shown in Figure 4-3.

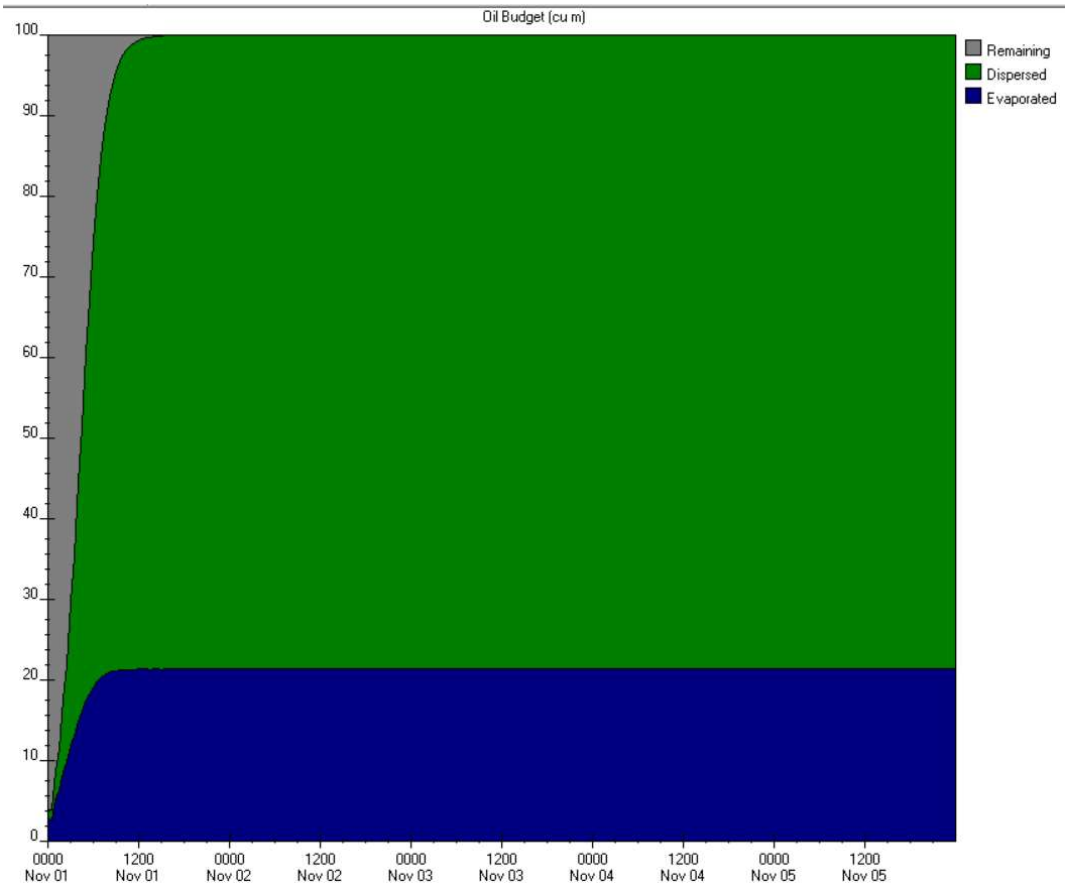

Figure 4-2: ADIOS2 example output showing mass balance/oil budget plot for a 100 m^3 diesel spill

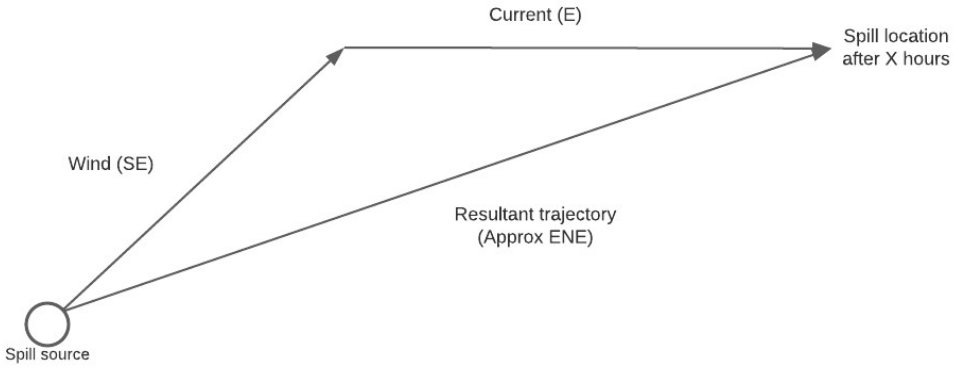

Figure 4-3: Vector mapping example

Oil spill trajectory modelling

OSTM can be used to determine the potential hydrocarbon oil exposure to environmental sensitivities from a survey specific MDO/MGO spill. Modelling locations should be carefully selected to ensure they include the closest location to sensitive receptors (e.g., shorelines, including offshore islands).

An appropriate number of simulations should be selected to represent the outer extent of the individual spill release which is commonly set as 100 simulations per location. In addition, a simulation duration should be selected and annualised and/or a range of seasons (e.g., Summer, Winter, Transitional) presented, unless the titleholder has certainty around timing of the survey.

The hydrocarbon exposure thresholds used will be those in the CSEP, and the following outputs requested from the modelling provider for floating, entrained, and dissolved hydrocarbons:

- Maximum distances travelled for each season.
- Maximum concentration.
- Minimum time to contact.
- Probability of shoreline.
- Maximum volume of oil that may contact shorelines from a single simulation.
- Maximum accumulated load that an individual shoreline may experience.

OSTM results for surface (floating), dissolved and entrained exposures and shoreline accumulation, if predicted will be detailed in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan. This information will be used to determine the response strategies applicable to the individual spill.

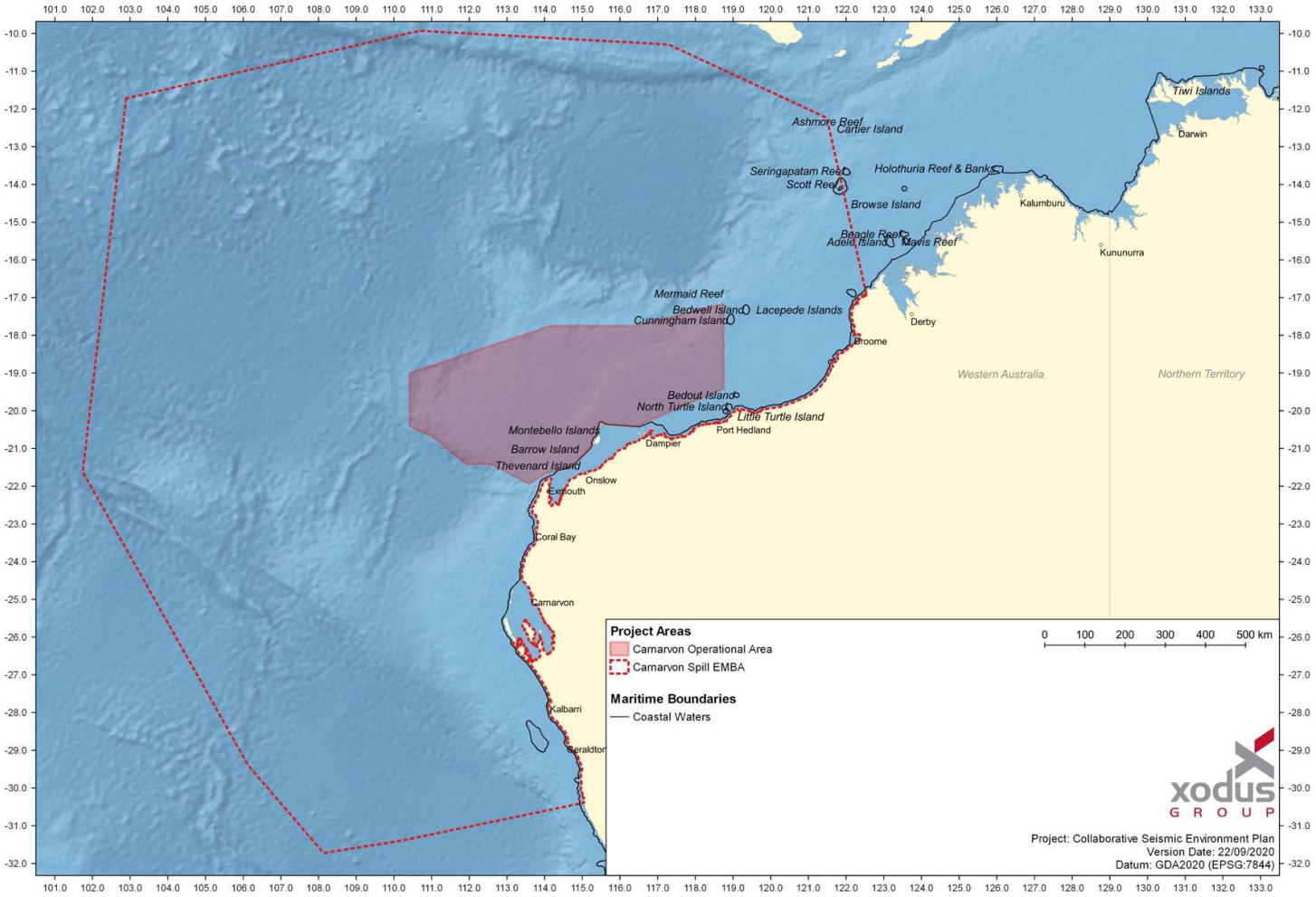

Figure 4-4: Carnarvon Operational Area and EMBA

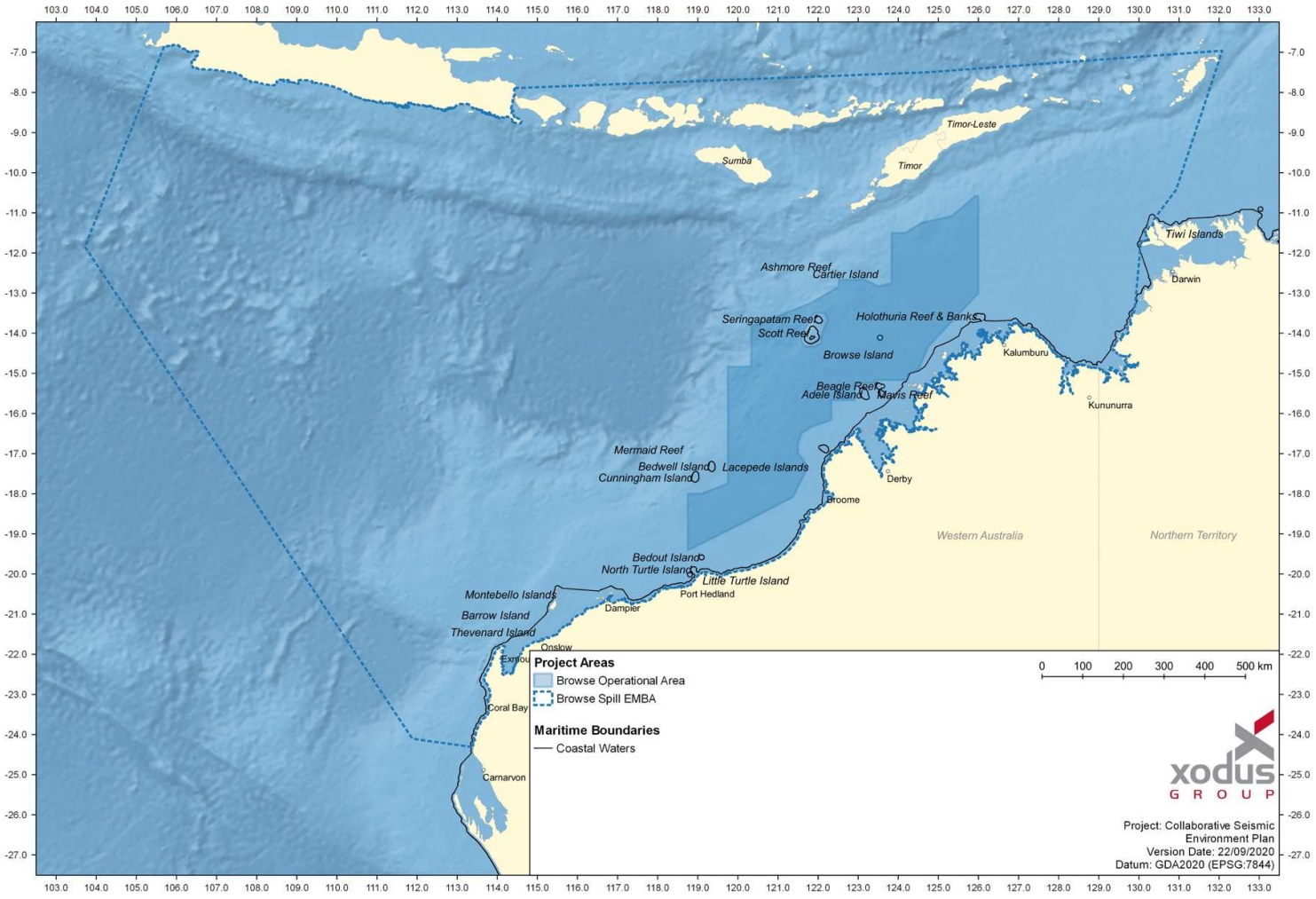

Figure 4-5: Browse Operational Area and EMBA

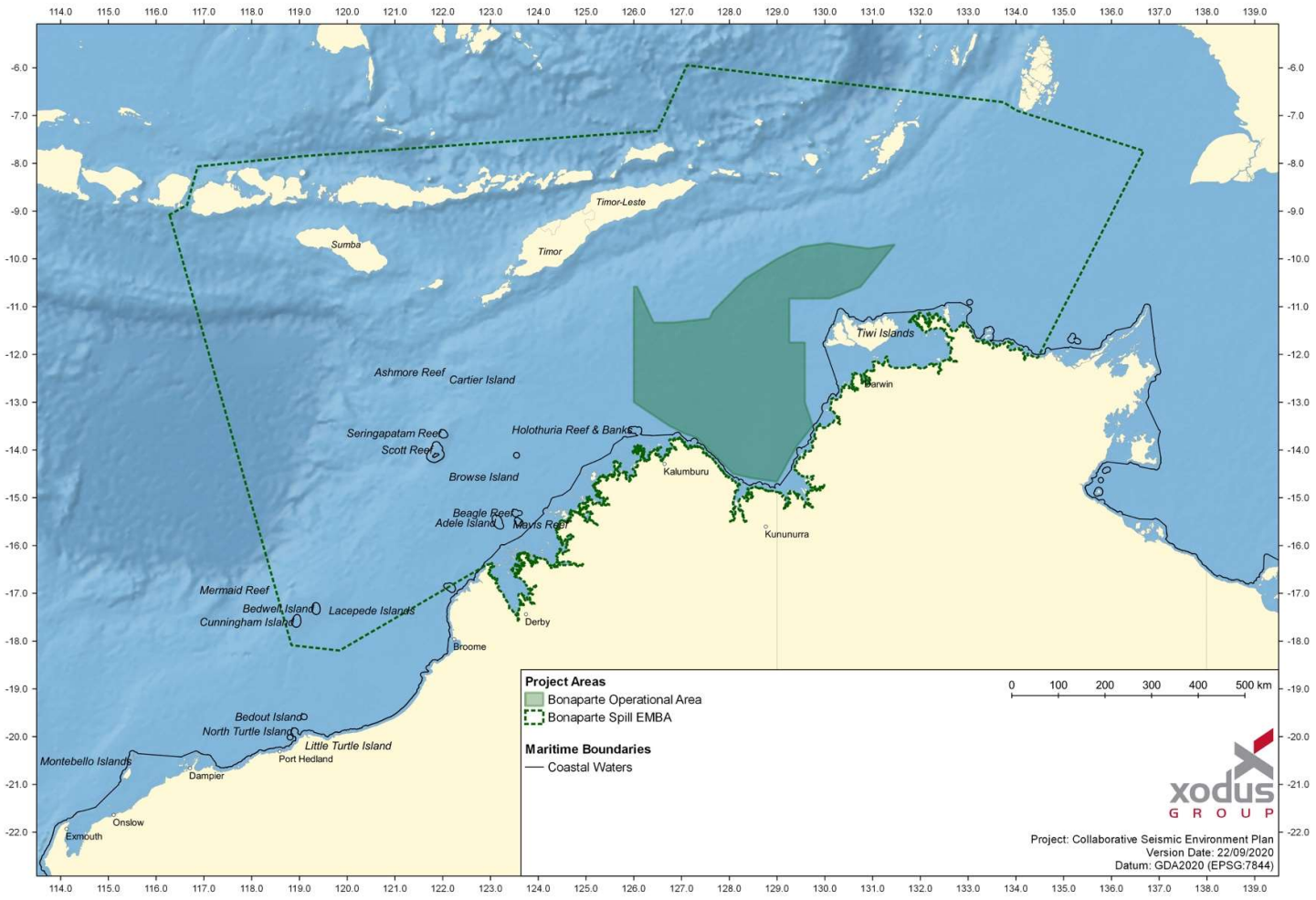

Figure 4-6: Bonaparte Operational Area and EMBA

4.3 Predict outcomes

4.3.1 Protection Priorities

When dealing with oil spills in remote environments, it is not always realistic or feasible to protect all receptors. Therefore, prioritising receptors helps identify where available resources should be directed for the best effect. It enables the Control Agency to make informed decisions, and ultimately develop and execute an effective response strategy.

For any oil spill entering or within WA State waters/shorelines, the WA DoT is the Control Agency and ultimate decision-maker regarding identification and selection of protection priorities.

For the purposes of this OPEP, protection priorities refer to the most significant receptors that require protection from the impacts of a spill. Section 5 of the CSEP describes the environment that may be affected (EMBA) by an oil spill, including the following:

- Protected Area Status: used as an indicator of the biodiversity values contained within that area e.g., World Heritage Areas, Ramsar sites and Marine Protected Areas.
- Biologically Important Areas (BIA) of Listed Threatened and Migratory Species: these are spatially defined areas where aggregations of individuals of a species are known to display biologically important behaviour such as breeding, feeding, resting or migration.
- Social values: socio-economic and heritage features (e.g., commercial fishing, recreational fishing, amenities, and aquaculture).
- Economic values: recreational and commercial fishing areas.
- Listed species status and predominant habitats (surface versus subsurface): critically endangered/ endangered species, listed species, surface species (e.g., reptiles and birds) and subsurface species (e.g., mammals, sharks, and fish).
- Species covered by Recovery Plans, Conservation Advice for threatened species.

Titleholders will identify their survey specific protection priorities in their survey specific Oil Spill Response and Monitoring Bridging Plan via the following method or another equivalent process:

- The results of individual spill forecasting discussed in Section 4.2.4 is compared against the location of sensitive receptors presented in the CSEP (Section 4: Description of the environment).
- Key sensitive receptors within the spatial extent of the spill with shortest potential timeframes to contact above the following moderate impact thresholds are identified[9]:
    - Floating oil: 10 g/m^2
    - Shoreline accumulation: 100 g/m^2
- Each key sensitive receptor is ranked according to WA Marine Oil Pollution Risk Assessment: Protection Priorities (Kimberley, Pilbara, and Mid-West Regions – Advisian 2017a, 2017b and 2018). This five-tier ranking is based on the receptor's sensitivity to hydrocarbons, which includes a numerical value and corresponding classification, Very Low to Very High. Two classifications are assigned to each receptor; one for surface oil, another for dissolved oil, as the effects of each can be different on individual receptors (e.g., dissolved oil can have greater adverse effects on fish than surface oil). Given the similarity of receptors, this is also applicable to the Northern Territory, as no equivalent process has been documented in that jurisdiction.

[9] More information on thresholds is provided in Section 4.3.3.

- The highest ranked locations are determined based on:
    - The highest additive ranking of receptors (for example, 'location A' may have mangroves (score of 4) and Vulnerable listed breeding shorebirds (score of 3) - Total additive score = 7; 'location B' may be a RAMSAR site (score of 5), be a key tourism population centre (score of 3) and have Vulnerable listed breeding shorebirds (score of 3) - Total additive score = 11); and
    - Has the largest shoreline accumulation volumes >100 g/m^2; or
    - Has the longest length of shoreline accumulation > 100 g/m^2; or
    - Has the shortest timeframe for shoreline accumulation > 100 g/m^2.

4.3.2 Response 'Toolbox'

Possible response strategies for an oil spill include:

- Monitor and evaluate
- Source control
- Containment and recovery
- (Mechanical) physical dispersion
- Chemical dispersion – surface application
- Shoreline protection
- Shoreline clean-up
- In-situ burning
- Oiled wildlife response

Support functions:

- Waste management
- Scientific monitoring

4.3.3 Response Planning Thresholds

In addition to the impact assessment thresholds described in the CSEP Section 7.11 Vessel Collision, response thresholds have been developed for response planning to determine the conditions that response strategies would be effective. These thresholds are provided as a guide for response planning based on case studies that have demonstrated some response strategies (e.g., chemical dispersant application) require certain oil spill thicknesses and conditions to be effective.

The thresholds assist with understanding worst-case spill scenario response strategy capability requirements when used in conjunction with oil spill trajectory modelling results. Modelling informs the predicted spatial extent of the spill at certain response thresholds, which in turn can inform response strategy capability.

Response planning thresholds are provided in Table 4-2.

Table 4-2: Surface and Shoreline Hydrocarbon Thresholds for Response Planning

Hydrocarbon (g/m^2)	Description	Justification
>1	Estimated minimum threshold for commencing some monitoring components (e.g., water quality monitoring) and monitoring and evaluation tactics (e.g., aerial surveillance)	This thickness approximates the range of socio-economic effects and helps to establish the spatial extent for scientific monitoring (NOPSEMA, 2019).
>10	Estimated minimum threshold for commencing all triggered monitoring components	This approximates the lower limit for harmful exposures to birds and marine mammals (NOPSEMA, 2019) so assists with planning for related scientific monitoring components.
50	Estimated minimum floating hydrocarbon threshold for on water response strategies	Surface chemical dispersants are most effective on hydrocarbons that are at a thickness of 50-100 g/m^2 on the sea surface. EMSA (2010) recommends thin layers of spilled hydrocarbons should not be treated with dispersant. This includes Bonn Agreement Oil Appearance Codes (BAOAC) 1-3 (EMSA, 2010). However, this may not always be practical in the field, as the actual thickness of a slick can vary greatly over even short distances (IPIECA-IOPG, 2015). Hence, this threshold is applied for planning purposes but should be judged according to real-time conditions in the event of a spill. McKinney and Caplis (2017) tested the effectiveness of various oil skimmers at different oil thicknesses. Their results showed that the oil recovery rate of skimmers dropped significantly when oil thickness was less than 50 g/m^2.
100	Estimated floating hydrocarbon threshold for on water response strategies Estimated minimum shoreline accumulation threshold for shoreline clean-up (if required) and subsequent waste management	This threshold is often used as the minimum thickness for effective shoreline clean-up (Owens and Sergy, 2000; French-McCay, 2009).

4.4 Balance trade-offs and select response strategies

Selecting which response strategies to use often involves making trade-offs (e.g., risk, feasibility, flexibility, effectiveness), based on which environmental receptors should receive priority for protection. A Strategic SIMA is presented in Table 4-3 and indicates the applicability of each possible response strategy (Section 4.3.2) for the CSEP spill scenario of a MDO/MGO spill from a vessel collision.

Table 4-3: Strategic SIMA for CSEP vessel collision MDO/MGO spill

Response strategy	Evaluation	Recommendation
Source control	In the event of a vessel spill, the Vessel Master would revert to the Ship Oil Pollution Emergency Plan (SOPEP), which is a MARPOL requirement for applicable vessels and not addressed by this SIMA.	n/a
Monitor and evaluate	The requirement for situational awareness is critical to implement a coordinated, focussed and effective spill response. This strategy has several tactics (e.g., tracking buoys, aerial surveillance) and is scalable according to the nature and scale of the spill. SIMA will always support the implementation of 'Monitor and Evaluate' given the clear benefits in maintaining situational awareness throughout the duration of a spill event and little or no environmental impact associated with its implementation. Therefore, the benefits of undertaking this response are considered to significantly outweigh the potential environmental risks/impacts.	Primary response strategy
Natural recovery	Natural recovery is often the most effective response for light hydrocarbons (Group 1-3), including MDO/MGO. MDO/MGO products lose a large percentage of their volume via natural weathering and fate processes in the first 24 hours following a spill. It is unlikely that significant response resources would be able to be deployed within this time, so much of the spill volume will weather and evaporate prior to the arrival of additional response resources. Allowing the product to weather naturally can often create less overall impact than intrusive methods of clean-up and response (e.g., the net impact of allowing small volumes of product to naturally degrade on sensitive offshore islands may be less than sending in shoreline clean-up teams and equipment, which may damage nesting locations, disturb fauna, and create significant waste volumes).	Primary response strategy
Containment and recovery	Unlikely to be effective as MDO/MGO products will rapidly degrade in the open ocean environment. For containment and recovery to be effective, a sufficient oil thickness is required be achieved by the containment booms (minimum of 50g/m^2). This strategy is often limited to heavier and more persistent Group 3 and 4 (ITOPF) hydrocarbons.	Not recommended
In-situ burning	To conduct in-situ burning, meteorological conditions and sea-state must allow the deployment of especially designed fire-retardant booms, which are required to corral hydrocarbons to a sufficient thickness to permit ignition and ongoing combustion. MDO/MGO is a rapidly evaporating and spreading hydrocarbon and is not expected to be available at sufficient thicknesses for ignition.	Not recommended
(Mechanical) physical dispersion	The benefits of undertaking this response are not considered to significantly outweigh the potential risk to human health due to the volatility of the hydrocarbon products. Mechanical dispersion is not considered a suitable response strategy for MDO/MGO scenarios.	Not recommended
Chemical	MDO/MGO has high natural spreading, dispersion and evaporation rates in the marine environment and would	Not recommended

Response strategy	Evaluation	Recommendation
dispersion – surface application	be too thin to enable effective use of chemical dispersants. Chemical dispersants have a window of opportunity, after which effectiveness decreases. This includes a workable area for dispersant application, adequate surface thickness and presence of dispersible components of oil. These characteristics typically exist in the initial hours following a release. Dispersant use is not considered to be effective on the spill scenarios given they are not continuous releases and slick characteristics amenable to dispersant operations will unlikely be present by the time dispersant operations are mobilised. Adding chemical dispersants would introduce more chemicals into the marine environment, for little to no benefit.	
Shoreline protection	Shoreline protection and deflection activities involve mobilising personnel and equipment to remote coastal environments, which can result in physical disturbance to intertidal and shoreline habitats. It would also require small inshore vessels and calm weather to be effective and temporary staging areas for waste that would be generated from the recovery of floating oil. Working in remote coastal environments present safety issues for response personnel, due to the presence of dangerous fauna (i.e., Saltwater crocodiles and Irukandji jellyfish) and requirement for remote accommodation (e.g., vessels requiring at-sea transfers). The effectiveness of this response will be dependent on local bathymetry, sea state, currents, tidal variations, and wind conditions at the time of implementation. It is typically more effective in areas with low to moderate tidal ranges on low energy coastline types such as sandy beaches. Moderate to high tidal ranges generally include stronger currents and larger/longer intertidal areas that make it less effective and more difficult to keep booms in place. Activities would focus on areas of high protection value in low energy environments based upon real-time operational surveillance, provided the environmental and metocean conditions are favourable for an effective implementation. An Operational SIMA should demonstrate that protection would result in an overall benefit to receptors. Consequently, this option may not be applicable across all areas or receptors identified as having priority for protection.	Secondary response strategy
Shoreline clean-up	Shoreline clean-up activities involve mobilising personnel and equipment to remote coastal environments, which can result in physical disturbance to intertidal and shoreline habitats. This may cause more impacts than leaving the hydrocarbon to degrade naturally, especially if the oiling is light. Intrusive activities such as physical removal of waste using manual labour or mechanical aids requires careful site-specific planning to reduce secondary impacts of habitat disturbance, erosion and spreading oil beyond	Secondary response strategy

Response strategy	Evaluation	Recommendation
	shorelines. Secondary impacts can be minimised using trained personnel to lead operations. Logistically, clean-up operations will require site access, decontamination, waste storage, PPE, catering, and transport services to support personnel working on shorelines. Working in remote coastal environments present safety issues for response personnel, due to the presence of dangerous fauna (i.e., Saltwater crocodiles and Irukandji jellyfish) and requirement for remote accommodation (e.g., vessels requiring at-sea transfers). Given the relatively small volumes predicted to come ashore for most locations, and the high rates of natural biodegradation of diesel, it would be better to focus on high priority areas for clean-up. This strategy is considered to be a secondary response strategy where it is safe and practical to implement and where an Operational SIMA demonstrates that clean-up would result in an overall benefit to receptors.	
Oiled wildlife response	Oiled wildlife response (OWR) includes wildlife surveillance/reconnaissance, wildlife hazing, pre-emptive capture and the capture, cleaning, treatment, and rehabilitation of animals that have been oiled. In addition, it includes the collection, post-mortem examination, and disposal of deceased animals that have succumbed to the effects of oiling. Wildlife surveillance/reconnaissance will likely form the main component of an OWR associated with the MDO/MGO scenarios.	Primary response strategy

4.5 Operational SIMA

An Operational SIMA is an iterative process that is used to help guide an IMT during a response. An outline of an Operational SIMA process is provided in Figure 4-1 and considerations to help refine the Operational SIMA are provided in Table 4-4. Real-time data from monitor and evaluate and operational monitoring activities should be incorporated into the Operational SIMA, so that the IMT can adjust the response according to the effectiveness of tactics during each operational period.

Following implementation of the initial (first strike) response, the Strategic SIMA (Table 4-3) will form the basis for the initial Operational SIMA.

The initial Operational SIMA should be a priority action for the Planning Section once they are activated but may be based on limited information. However, the overall response effort should not be delayed due to a lack of some information. The Operational SIMA can always be revised when more information is available.

The Planning Section is responsible for completing the Operational SIMA and to determine if outputs from the Strategic SIMA are still appropriate. The Operational SIMA should be revised during each new Operational Period and should incorporate post-spill trajectory modelling data, surveillance data, operational monitoring data and should be incorporated into the IAP.

Table 4-4: Operational SIMA Considerations

Response strategy	Considerations
Monitor and evaluate	• Which monitor and evaluate tactics will provide reliable and accurate data for the individual spill? • What sensitive receptors are in the current or anticipated trajectory? • What is the assessed volume and size of the spill? • Is the product weathering as anticipated? • What data is being returned from operational monitoring and how can this be used to aid decision making? • How do the response options and tactics seem to be influencing the spill? Shoreline assessment (only): • Will access to remote shorelines be safe and feasible? • Will assessment teams disturb sensitive seasonal nesting species?
Protection and deflection	• Have the protection priorities been ground-truthed and are there seasonal receptors that should be prioritised for protection? • 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)? • Can tactics be deployed in time? • 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?).

Response strategy	Considerations
	• Is there potential that reefs could be damaged from anchor drag?
Shoreline clean-up	• 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 (taking into consideration the effects of MDO/MGO as a lighter hydrocarbon type – high evaporation rates but more toxic and greater ability to penetrate sediments)? • Have the protection priorities been ground-truthed and are there seasonal receptors that should be prioritised for protection? • Will access to remote shorelines be safe and feasible? • Will responders disturb sensitive seasonal nesting species? • Would it reduce overall impacts to send small teams of clean-up personnel?
Oiled wildlife response	• Is there adequate monitoring for wildlife, taking into consideration temporal and spatial species-specific considerations? • Are known species breeding or nesting? • What level of wildlife impact has occurred or is expected to occur? • What wildlife response strategies are feasible and safe?

5. Source Control

Source control involves stopping the discharge of hydrocarbons from the source of the spill. If the source of the spill is a vessel, then the vessel owner is responsible for undertaking source control, although the titleholder may be requested to provide support.

Vessel based source control includes measures that can be undertaken onboard the vessel (e.g., shutoff valves, diversion to unaffected tanks) and support from other vessels (e.g., magnetic patches, salvage, transfer of hydrocarbons to alternate vessel) to control the source, reduce the loss of hydrocarbons and prevent escalation of the incident. This information is detailed in the relevant Ship Oil Pollution Emergency Plan (SOPEP).

6. Monitor and Evaluate

Monitor and evaluate involves the collection and evaluation of information to provide and maintain situational awareness in the event of a spill. Monitor and evaluate activities should be conducted throughout the spill response, as it provides the IMT with ongoing information on sensitive receptors at risk of impact from the spill and the effectiveness of spill response operations. This information should be used by the IMT when updating the response (operational) SIMA and in the development of IAPs.

The monitor and evaluate response strategy includes a range of tactics which may be suitable for the spill scenarios covered by this OPEP. The relevance and suitability of individual tactics will need to be considered when preparing the Operational SIMA for individual spills. Initiation of suitable tactics (with the exception of tracking buoys and fate/weathering modelling) will need to be confirmed by the Control Agency, prior to deployment.

- Deployment of tracking buoy(s) – requires a buoy to be deployed to the water at the leading edge of the spill to track the movement of the spill.
- Fate and weathering modelling – uses computer modelling (e.g., ADIOS2) to estimate the weathering of an oil spill.
- Oil spill trajectory modelling – uses computer modelling (e.g., SIMAP) to estimate the movement, fate and weathering of spills.
- Visual observation (via aerial and/or vessel surveillance) – requires trained observers to identify and characterise spills. Survey platforms typically include aircraft and/or vessels. Is also used to ground truth oil spill trajectory modelling and monitor the effectiveness of response options.
- Satellite surveillance and data capture – uses satellite technology to identify and track oil spills.
- Hydrocarbon properties and weathering behaviour at sea - provides in field information on the hydrocarbon properties, behaviour, and weathering of the spilled hydrocarbons to assist in determining suitability of spill response tactics and strategies.
- Water quality assessment - provides a rapid assessment of the presence, type, concentrations, and character of hydrocarbons in marine water to assess the extent of spill contact and inform impact predictions for other monitoring plans.
- Shoreline clean-up assessment – provides information on the physical and biological characteristics of shorelines to help inform suitable site-specific pre-impact and post-impact response options/activities and monitor the effectiveness of shoreline protection and/or clean-up activities.

6.1 Initiation and termination criteria

Tactic	Initiation criteria	Termination criteria
Tracking buoy	Notification of a Level 2/3 spill	Tracking buoy deployment will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Fate and weathering	Notification of a Level 2/3 spill -	Spill fate and weathering modelling will

Tactic	Initiation criteria	Termination criteria
modelling (e.g. ADIOS2)	may be deployed in a Level-1 incident (to be determined by On-Scene Commander)	continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Oil Spill Trajectory Modelling (OSTM)	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	OSTM will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Vessel surveillance	Notification of a Level 2/3 spill - may be deployed in a Level-1 incident (to be determined by On-Scene Commander); and Requested by the relevant Control Agency	Vessel surveillance will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Aerial surveillance	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	Aerial surveillance will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or As directed by the relevant Control Agency
Satellite surveillance and data capture	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	Satellite surveillance will continue for 24 hours after the source is under control and a surface sheen is no longer observable; or Satellite surveillance is no longer required to provide situational awareness; or Agreement has been reached with the Jurisdictional Authority relevant to the spill to terminate the tactic
Operational Monitoring Plan (OMP): Hydrocarbon properties and weathering behaviour at sea	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	The IMT Incident Commander (or delegate) considers that continuation of monitoring will not result in a change to the scale or location of active response options; or As directed by the relevant Control Agency; or The monitoring is no longer contributing to or influencing spill response decision-making; or Relevant scientific monitoring components initiation criteria have been triggered.
OMP: Water quality assessment	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency	The IMT Incident Commander (or delegate) considers that continuation of monitoring will not result in a change to the scale or location of active response options; or Agreement reached with the relevant Control Agency; or The spill is or is likely to be below visible criteria for surface oil (0.5 g/m^2), and below thresholds for entrained (10 ppb) and dissolved (6 ppb) oil concentrations; or The Monitoring Coordinator (or delegate)

Tactic	Initiation criteria	Termination criteria
		considers that continuation of monitoring is likely to increase overall environmental impact; or Relevant scientific monitoring components initiation triggers have been assessed
OMP: Shoreline clean-up assessment	Notification of a Level 2/3 spill; and Requested by the relevant Control Agency.	This activity will not result in a change to the scale or location of active response options; or Agreement reached with the relevant Control Agency; or Continuation of monitoring is likely to increase overall environmental impact; or Relevant scientific monitoring components initiation criteria have been triggered.

6.2 Implementation guide

Table 6-1 provides guidance on tasks and responsibilities that the titleholder should consider to support the Control Agency if they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken, or should be reassigned.

Information on resource capability for this strategy is shown in the titleholder's Oil Spill Response and Monitoring Bridging Plan.

Table 6-1: Monitor and evaluate implementation guide

Responsibility		Task	Consideration	Complete
Tracking buoy (if selected)				
Initial Actions	Titleholder Site Representative/Operations Section	Request onsite vessel to deploy tracking buoy.		❑
	Vessel Master	Direct personnel to deploy buoy from the vessel: • Remove buoy from packaging. • Remove On/Off magnet and place in safe location (back in the box). • Deploy buoy into the water from height not greater than 10 m unless the buoy design is robust to do so from a greater height.	Buoy should be deployed as close as possible to the leading edge of the spill (personnel and vessel safety is priority and must be considered by Vessel Master prior to selecting this tactic).	❑
	Titleholder Site Representative	Inform IMT that buoy has been deployed and provide IMT with current weather conditions.	Note deployment details in incident log.	❑
	Planning Section	Verify deployment of tracking buoy using tracking buoy login details.	Tracking buoy login details located in Titleholder Emergency Contacts Directory.	❑
Ongoing Actions	Planning Section	Use tracking buoy data to regularly update Common Operating Picture/Situation Boards in IMT.		❑
	Planning Section	Provide tracking buoy data to Control Agency as soon as possible.	Control Agency could provide data to spill trajectory provider improve the accuracy of spill model.	❑
	Planning Section	Liaise with Control Agency to seek direction regarding any additional deployments of tracking buoys.		❑

Responsibility		Task	Consideration	Complete
Trajectory and fate/weathering modelling (if selected)				
Initial Actions	Planning Section	Conduct hydrocarbon distribution, fate and weathering assessment using Automated Data Inquiry for Oil Spills (ADIOS2) using information available on oil type and provide information to Control Agency.		❑
	Planning Section	Use information to regularly update Common Operating Picture/Situation Boards in IMT.		❑
	Planning Section	Provide tracking buoy data to Control Agency as soon as possible.		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Initial Actions	Planning Section	Contact Control Agency to request modelling through AMSA National Plan arrangements or via AMOSC if titleholder is an AMOSC Member. Complete Spill Trajectory Modelling Request form and provide to Control Agency.	Complete Spill Trajectory Modelling Request form can be found here - https://www.amsa.gov.au/forms/national-plan-spill-trajectory-modelling-request. Modelling should be undertaken within 4 hours of the request being sent to OSTM Service Provider, then every operational day during the spill response. Note all actions in incident log.	❑
Ongoing Actions	Planning Section	Request trajectory modelling be provided daily throughout the duration of the response and integrate data into Common Operating Picture/Situation Boards.		❑
	Planning Section	Use results from monitor and evaluate activities, and/or operational monitoring data (where available) to improve spill trajectory model accuracy.	Provide available data to OSTM Service Provider at the end of each operational period.	❑

Responsibility		Task	Consideration	Complete
Vessel surveillance (if selected)				
Initial Actions	Titleholder Site Representative/Operations Section	Determine if there are any vessels available to follow spills and aid surveillance activities.	Support vessels may be able to provide surveillance.	❑
	Operations Section	Obtain approval from Control Agency to commence vessel surveillance in the vicinity.		❑
	Vessel Master	Provide IMT initial report on estimated spill volumes and movement based on visual observation (if possible).	Preliminary observations are intended to provide initial projections of spill trajectory and scale prior to more detailed modelling and surveillance. These observations should be immediately verified by more detailed surveillance. A Vessel Surveillance Observation Log is provided in Appendix C: Visual Surveillance Logs.	❑
Ongoing Actions	Planning Section	If vessel surveillance is feasible, ensure surveillance data is regularly incorporated into the Common Operating Picture/Situation Boards.		❑
Aerial surveillance (if selected)				
Initial Actions	Operations Section	Contact AMSA or AMOSC (if titleholder is an AMOSC Member) to request approval to commence deployment of aerial surveillance and trained aerial observers.	Trained observers should be familiar with the Bonn Agreement Aerial Operations Handbook (Part III) (Bonn Agreement, 2016). An Aerial Surveillance Observation Log is provided in Appendix C: Visual Surveillance Logs. Trained aerial observers are available from AMOSC (24 hours mobilisation time), AMSA National Response Team (via the National Plan) and through mutual aid arrangements from operators with trained staff	❑

Responsibility		Task	Consideration	Complete
	Operations Section	Once approval obtained, confirm availability of aerial surveillance platform to conduct initial surveillance flight by contacting aviation provider.	If aviation asset available near spill location, utilise where possible to gather as much information about the spill. If aviation asset not available at spill location IMT is to seek available resources through existing contractual arrangements. It is possible that the initial surveillance flight will not include a trained aerial surveillance observer. Initial flights can be conducted using a standard crew and initial surveillance should not be delayed waiting for trained personnel. Ensure all safety requirements are met prior to deployment. There should be an attempt to obtain the following data during initial surveillance: • name of observer, date, time, aircraft type, speed, and altitude of aircraft • location of slick or plume (GPS positions, if possible) • spill source • size of the spill, including approximate length and width of the slick or plume • visual appearance of the slick (e.g., colour) • edge description (clear or blurred) • general description (windrows, patches etc.) • wildlife, habitat, or other sensitive receptors observed • basic metocean conditions (e.g., sea state, wind, current) • photographic/video images	❑

Responsibility		Task	Consideration	Complete
	Operations Section	Obtain approval from Control Agency to commence surveillance flights in the vicinity of the spill.	Operations Section is to assume primary coordination for all flights if approved by Control Agency.	❑
	Operations Section	Once initial flight is complete, IMT in consultation with the Control Agency to determine if additional flights are required.		❑
	Operations Section	In addition to arranging initial flight, mobilise aircraft and trained observers to the spill location to undertake surveillance activities if approved by the Control Agency (these can be cancelled if initial flight determines no additional surveillance is required).	Aerial platform should be capable of providing the following: • immediate accessibility from a designated airport. • capability to fly at 150 feet. • provision of aircraft crew for 1 x aircraft and space for at least one trained aerial observer.	❑
	Operations Section	All records to be relayed to IMT and Control Agency when aircraft returns from observation flight.	Visual observations from aircraft have inherent subjectivity due to the effect of the angle of insolation on the surface of the ocean. Optical techniques are also dependent on cloud cover and daylight. 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.	❑
Ongoing Actions	Operations Section	In consultation with the Control Agency, develop a flight schedule for ongoing aerial surveillance.	Frequency of flights should consider information needs of IMT to help maintain the Common Operating Picture and determine ongoing response operations.	❑
Satellite imagery (if selected)				
Initial Actions	Intelligence/Planning Section	Contact AMSA or AMOSC (if titleholder is an AMOSC Member) to initiate satellite services.	AMOSC can provide satellite services to members.	❑

Responsibility		Task	Consideration	Complete
	Intelligence/Planning Section	Combine satellite data with other optical imagery (aerial surveillance, vessel-based observations) to mitigate issues of angle of insolation, thick cloud cover and night.	Satellite derived data can be used to broaden aerial survey data in terms of both spatial and temporal scale and provide images.	❑
Ongoing Actions	Intelligence/Planning Section	Request satellite imagery be provided every 48 hours throughout the duration of the response and integrate data into Common Operating Picture/Situation Boards.		❑
Hydrocarbon properties and weathering behaviour at sea and water quality assessment (if selected and initiation criteria are met)				
Initial actions	Planning Section	Liaise with Control Agency and determine resourcing required to finalise and implement monitoring plan.	Joint Industry Operational and Scientific Monitoring Plan Framework (APPEA, 2021) includes the following Operational Monitoring Plans, providing standard operating procedures, design considerations, equipment lists and reporting requirements to enable rapid finalisation of spill specific monitoring plans: OMP: Hydrocarbon Properties and Weathering Behaviour OMP: Water Quality Assessment	❑
Shoreline clean-up assessment (if selected and initiation criteria are met)				
Initial actions	Planning Section	Conduct Operational SIMA to determine if shoreline clean-up assessment is likely to result in a net environmental benefit.		❑
	Planning Section	Liaise with Control Agency and determine resourcing required to finalise and implement monitoring plan.	Joint Industry Operational and Scientific Monitoring Plan Framework (APPEA, 2021) includes the following Operational Monitoring Plan, which is consistent with the DoT's Shoreline Assessment Form and contains standard operating procedures, design considerations, equipment lists and reporting requirements to enable rapid finalisation of spill specific monitoring plans:	❑

Responsibility	Task	Consideration	Complete
		OMP: Shoreline Clean-up Assessment	
General Actions (to be coordinated between titleholder IMT and Control Agency)			
Surveillance Team	Record relevant data e.g., equipment used, time deployed, weather conditions, Job Safety Analysis (JSA) for all tasks.		❑
Surveillance Team	Hold pre-mobilisation survey team meeting, including communication of field survey schedules (provision for field personnel rotation).		❑
IMT	Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑
IMT	Assemble competent field team(s) (if required), including required personal protective equipment (PPE). Arrange any required inductions and/or permits.		❑
IMT	Arrange transportation (e.g., flights, vehicles), accommodation and food/equipment for field teams.		❑
IMT	Activate Geographic Information Systems (GIS) personnel to develop maps that can overlay surveillance data to enhance situational awareness of the spill.		❑
IMT	Review fate and weathering, tracking buoy, oil spill modelling data and satellite data with field surveillance data (aerial and vessel surveillance) to validate spill fate and trajectory.	Use available data to conduct Operational SIMA and confirm that pre-identified response options are still appropriate.	❑

Responsibility	Task	Consideration	Complete
IMT	Use monitor and evaluate data to periodically reassess the spill and modify the response (through the IAP), as required.		❑

6.3 Monitor and evaluate - environmental performance

Table 6-2details the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of monitor and evaluate tactics in order to provide situational awareness to inform Control Agency decision making.

Table 6-2: Environmental Performance – Monitor and Evaluate

Performance Standard	Measurement Criteria
Response Preparedness	
Maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of monitor and evaluate tactics	Contract with third party service providers maintained through duration of titleholder survey
	Aviation and vessel contracts in place for the duration of the titleholder survey
Tracking buoy available on seismic vessel and maintained according to manufacturer specifications for duration of the titleholder survey	Records demonstrate that tracking buoys are available on vessels and maintained according to manufacturer specifications for the duration of the titleholder survey
Response Implementation	
Offer support to the Control Agency in the selection and initiation of suitable monitor and evaluate tactics within 2 hours of notifying Control Agency of spill	Records demonstrate that IMT offered support to Control Agency in the selection and initiation of monitor and evaluate tactics within 2 hours of notifying Control Agency of spill
Deploy tracking buoys close to leading edge of spill (providing it is safe to do so) within 2 hours of Vessel Master being made aware of the spill	Records indicate that tracking buoys deployed close to leading edge of spill within 2 hours of Vessel Master being made aware of the spill
Initiate hydrocarbon distribution, fate and weathering assessment using ADIOS2 within 2 hours of IMT being made aware of the spill	Records indicate IMT initiated hydrocarbon distribution, fate and weathering assessment within 2 hours of spill notification

Performance Standard	Measurement Criteria
Provide available data from monitor and evaluate activities to modelling provider at the end of each operational period to help improve spill model accuracy	Records indicate that at the end of each operational period available data from monitor and evaluate activities was submitted to service provider to help improve spill model accuracy
Provide available monitoring data to Control Agency at the end of each operational period for inclusion into the Common Operating Picture and Operational SIMA to aid in response decision making	Incident Log shows available monitoring data provided to Control Agency at the end of each operational period

7. Natural Recovery

Natural recovery is a no impact response. There are no initiation or termination criteria, nor capability required to implement it apart from supporting strategies such as monitor and evaluate and oil spill monitoring.

Natural recovery is the process of letting hydrocarbons degrade naturally in the environment, either offshore or onshore. This section addresses offshore natural recovery, including degradation on or in the water column.

Oil on the ocean disperses and breaks up via several processes. Natural processes acting on the oil such as evaporation, dissolution, dispersion into the water column, biodegradation and photo oxidisation reduce the volume of oil over time. Evaporation can be the most important mechanism to reduce the volume of oil, especially in the short term. Approximately 65-80% of an MDO/MGO spill will generally evaporate over the first two days, depending upon the prevailing conditions and spill volume.

Whilst offshore natural recovery involves no direct response activities to mitigate the spill, it may be an appropriate response strategy to complement other intervention-based response strategies; or as a primary response strategy if other strategies are likely to cause a greater impact than leaving the oil to degrade naturally. It may also be the only viable response strategy during inclement weather (e.g., tropical cyclones), as responding could place personnel at risk.

Table 7-1 provides guidance on when natural recovery may be a suitable response option.

There is no implementation guide provided for this response option, as no direct tasks are required. However, if natural recovery is selected as a suitable response strategy, the Operational SIMA would need to confirm that natural recovery remains a suitable response strategy throughout the spill response.

Table 7-1: Natural Recovery Application Guidance

Recommended	Not Recommended
• For light, non-persistent hydrocarbons, such as ITOPF Group 1-2 hydrocarbons (e.g., MDO, condensate, hydraulic oil) • Product is weathering rapidly due to environmental conditions (e.g., high energy coastline, wave action) • Product is too thin for effective use of dispersants or containment and recovery • If responding during inclement weather conditions would place response personnel at risk	• For persistent hydrocarbons, such as ITOPF Group 3-4 hydrocarbons (Crude oil, Intermediate Fuel Oil, Heavy Fuel Oil) • Environmental conditions are not favourable for rapid degradation (e.g., calm seas) • Slick is continuous enough and thick enough to treat with dispersants or via containment and recovery methods

8. Shoreline Protection and Deflection

Protection and deflection tactics are utilised to divert hydrocarbons away from sensitive shoreline receptors and are more effective if they are deployed ahead of spill contact. They are typically used to protect smaller, high priority sections of shoreline. The relevant Control Agency has operational responsibility for the implementation of shoreline protection activities. Protection priorities are identified in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan but will need to be confirmed by the relevant Control Agency when the Operational SIMA is prepared.

The relevance and suitability of individual tactics (or combination of tactics) will need to be considered when preparing the Operational SIMA for individual spills. Initiation of suitable tactics will need to be confirmed by the Control Agency, prior to deployment.

- Shoreline booming – involves the use of a variety of booming techniques to exclude oil (exclusion booming), divert oil to a collection point where it can be removed from the environment (diversion booming) and redirecting flow of oil away from a priority area (deflection booming).
- Berms, dams, and dikes – uses sandbags or embankments to exclude oil from sensitive areas
- Shoreside recovery – uses nearshore skimmers to collect oil corralled by nearshore booms (also used during shoreline clean-up).
- Passive recovery -uses sorbent booms or pads to collect oil and remove it from the environment. This can be used as a pre-impact tactic where sorbents are laid ahead of the spill contacting the shoreline.
- Non-oiled debris removal – involves the removal of debris (e.g., seaweed) from the shoreline to prevent it being oiled, which in turn reduces impacts to wildlife and the volumes of waste produced during shoreline clean-up activities.

The effectiveness of shoreline protection and deflection tactics will be dependent upon metocean and wind conditions. It should be noted that much of the shorelines in this region experience high tidal fluctuations (up to 10m), which would exceed the capabilities of shoreline booms. Protection booms should only be installed in areas where tidal currents are below 0.75 knots.

8.1 Initiation and termination criteria

Initiation criteria	Termination criteria
Level 2 or 3 spills where shorelines with protection priorities will potentially be impacted; or SIMA demonstrates that the response strategy and selected tactics are likely to result in a net environmental benefit; and Requested by the relevant Control Agency	SIMA has determined that this strategy is unlikely to result in an overall benefit to the affected shoreline/s; and Control Agency decides to terminate the response strategy

8.2 Implementation guide

The locations for nearshore protection and deflection operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data and the protection priorities. In addition, the information obtained from monitor and evaluate activities will be used by the IMT in the development of the Operational SIMA to inform the most effective protection tactics (if any) to apply to individual sites. This will also consider the feasibility and effectiveness of selected tactics.

Deployment of equipment and personnel is to be at the direction of AMSA, and/or the WA DoT or NT IMT as the Control Agency (depending on the jurisdiction (Refer to Table 2-2)) and noting there are some islands in Commonwealth waters. The effectiveness of the protection and deflection strategy to achieve IAP objectives should be communicated to the Control Agency by a nominated Shoreline Response Team Leader.

Table 8-1 provides guidance on tasks and responsibilities that the titleholder should consider to support the Control Agency if they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken, or should be reassigned.

Information on resource capability for this strategy is shown in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan. Whilst preparing that plan, if the titleholder's Strategic SIMA/NEBA determines that shoreline protection and deflection is an effective response strategy for WA shorelines, the WA DoT has requested that they be consulted as part of the development of the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan. This does not currently apply to NT shorelines.

Table 8-1: Shoreline Protection and Deflection Implementation Guide

Responsibility		Task	Consideration	Complete
Initial Actions	Planning Section	Notify relevant authorities if there are likely to be any impacts on shorelines. Refer to Table 3-1 for details on notifications. Refer to Table 2-2 for details on Control Agency responsibilities.		❑
	Planning Section	Collect and provide spill trajectory modelling, other operational monitoring data and existing sensitivity information/mapping to Control Agency for confirmation of priority protection areas and Operational SIMA.		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Initial Actions	Planning Section	In conjunction with Control Agency conduct Operational SIMA to determine if protection and deflection is likely to result in a net environmental benefit using information from shoreline assessments and any tactical response plans for the area. Refer to Section 4.5 for guidance on Operational SIMA.	Shoreline Clean-up Assessment Teams are responsible for preparing field maps and forms detailing the area surveyed and making specific clean-up recommendations. The condition of affected shorelines will be constantly changing. Results of shoreline surveys should be reported as quickly as possible to the IMT and Control Agency to help inform real-time decision making. In consultation with Control Agency, engage a Heritage Advisor if spill response activities overlap with potential areas of cultural significance.	❑
Initial Actions	Planning Section	If Operational SIMA indicates that there is an overall environmental benefit, support Control Agency in the development of a Shoreline Protection Plan (IAP sub-plan) for each deployment area.	Shoreline Protection Plan may include (but not be limited to): • Priority nearshore and shoreline areas for protection	❑

Responsibility		Task	Consideration	Complete
			• Locations to deploy protection and deflection equipment • Permits required (if applicable) • Protection and deflection tactics to be employed for each location • List of resources (personnel and equipment) required • Logistical arrangements (e.g. staging areas, accommodation, transport of personnel) • Timeframes to undertake deployment • Access locations from land or sea • Frequency of equipment inspections and maintenance (noting tidal cycles) • Waste management information, including logistical information on temporary storage areas, segregation, decontamination zones and disposal routes • No access and demarcation zones for vehicle and personnel movement considering sensitive vegetation, bird nesting/roosting areas and turtle nesting habitat (utilise existing roads and tracks first).	
	Operations Section Logistics Section	Upon direction of Control Agency deploy shoreline protection response teams to each shoreline location selected and implement response as per Shoreline Protection Plan (IAP sub-plan).		❑
Ongoing Actions	Operations Section	Nominated Shoreline Response Team Leader to report back on effectiveness of response strategy to Control Agency and IMT.		❑

Responsibility	Task	Consideration	Complete
Planning Section	In conjunction with Control Agency conduct regular Operational SIMA to confirm effectiveness of tactics and demonstrate benefit of continuing to implement shoreline protection and deflection activities.		❑
General (to be coordinated between titleholder IMT and Control Agency)			
ERT	Record relevant data e.g., equipment used, time deployed, weather conditions, Job Safety Analysis (JSA) for all tasks.		❑
ERT	Hold pre-mobilisation survey team meeting, including communication of field survey schedules (provision for field personnel rotation).		❑
IMT	Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑
IMT	Assemble competent field team(s) (if required), including required personal protective equipment (PPE). Arrange any required inductions and/or permits.		❑
IMT	Arrange transportation (e.g., flights, vehicles), accommodation and food/equipment for field teams.		❑
IMT	Establish staging areas.		❑
IMT	Establish decontamination facilities (as required) for all equipment, vessels, and personnel.		❑
IMT	Prepare a communications plan for field personnel.		❑

8.3 Shoreline protection and deflection – environmental performance

Table 8-2 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of shoreline protection and deflection tactics to protect prioritised receptors from contact with hydrocarbons.

Table 8-2: Environmental Performance – Shoreline Protection and Deflection

Performance Standard	Measurement Criteria
Response Preparedness	
If the titleholder's Strategic SIMA determines that shoreline protection and deflection is a potential response strategy for WA shorelines, the WA DoT is consulted as part of the development of the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.	Consultation records show that WA DoT was consulted as part of the development of the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.
Maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of shoreline protection tactics.	Contract with third party service providers maintained through duration of titleholder survey.
	Vessel contracts in place for the duration of the titleholder survey.
Response Implementation	
Prepare Operational SIMA in conjunction with Control Agency to determine if shoreline protection is likely to result in a net environmental benefit.	Records demonstrate that an Operational SIMA was completed with Control Agency and indicated shoreline protection was likely to result in a net environmental benefit.
Locations for nearshore protect and deflect operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data and protection priorities.	Incident log.
If Operational SIMA indicates that there is an overall environmental benefit, support Control Agency in the development of a Shoreline Protection Plan (IAP sub-plan).	Shoreline Protection Plan (IAP sub-plan) is dated and indicates preparation done in conjunction with Control Agency and prior to shoreline protection operations commencing.
Shoreline protection activities will be implemented under the direction of the Control Agency.	Records demonstrate that shoreline protection activities implemented under the direction of the Control Agency.

9. Shoreline Clean-up

The relevant Control Agency has operational responsibility for the implementation of shoreline clean-up activities. Protection priorities are identified in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan but will need to be confirmed by the relevant Control Agency when the Operational SIMA is prepared.

Shoreline clean-up aims to remove hydrocarbons from shorelines and intertidal habitat to achieve a net environmental benefit. Removal of these hydrocarbons helps reduce remobilisation and contamination of wildlife, habitat, and other sensitive receptors. Shoreline clean-up is often a lengthy and cyclical process, requiring regular surveys (via Shoreline Clean-up Assessment – Section 6) to monitor the effectiveness of clean-up activities and assess if they are resulting in any adverse impacts.

The locations for shoreline clean-up operations will continue to be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data, operational monitoring data and the protection priorities identified in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.

The relevance and suitability of individual tactics (or tactics used in combination) will need to be considered when preparing the Operational SIMA for individual spills. Initiation of suitable tactics will need to be confirmed by the Control Agency, prior to deployment.

- Natural recovery – involves leaving the oil on the shoreline and allowing it to degrade naturally over time
- Manual and mechanical removal – requires the use of machinery, hand tools (or a combination) to remove hydrocarbons and oiled materials
- Washing, flooding, and flushing – involves using water, steam, or sand to flush hydrocarbons from impacted shoreline areas
- Sediment reworking and surf washing – uses various methods to move oiled material into the intertidal zone where the hydrocarbons are washed out by wave action.

The information obtained from Shoreline Clean-up Assessment Teams should be used by the IMT and Control Agency in the development of the Operational SIMA to inform the most effective clean-up tactics (if any) to apply to individual sites. A minimum threshold of 100 g/m^2 (concentration of accumulated hydrocarbons on shorelines) is used to determine the lower limit for commencing clean-up operations (Table 4-2).

9.1 Initiation and termination criteria

Initiation criteria	Termination criteria
Level 2 or 3 spills where shorelines with protection priorities will potentially be impacted; or SIMA demonstrates that the response strategy and individual tactics are likely to result in a net environmental benefit; and Requested by the relevant Control Agency	SIMA has determined that this strategy is unlikely to result in an overall benefit to the affected shoreline/s; and Control Agency decides to terminate the response strategy

9.2 Operational considerations

Tidal ranges in the EMBAs are large (7-8 m) and much of the coastline is remote and inaccessible via road, making many of shoreline clean-up techniques difficult and their use may result in greater environmental impacts than the hydrocarbon itself. In addition, the remote nature, presence of dangerous fauna (i.e., saltwater crocodiles and Irukandji jellyfish) can present significant safety risks to responders working in these environments.

Large scale operations involving large numbers of personnel may cause adverse environmental impacts at many of these sensitive shoreline locations. The constant removal of hydrocarbons mixed with sand and debris, even via manual removal can result in a removal of large volumes of substrate (e.g., sand, pebbles). If intrusive clean-up is conducted frequently, over a long period of time and along contiguous lengths of coastline, this may result in geomorphological changes to the shoreline profile and adverse impacts to shoreline invertebrate communities which provide an array of ecosystem services (Michel et al. 2017).

An Operational SIMA should consider the safety constraints and ecological sensitivities of these shorelines (Refer to considerations presented in Table 4-4). If an Operational SIMA deems clean-up is likely to result in a net environmental benefit, it may be beneficial for operations to be conducted by smaller teams (max 10 people/team) over a longer period. Intermittent manual treatment (<20 visits/month) and use of passive recovery booms is likely to be more effective than intrusive methods (e.g., intrusive manual removal >20 visits/month). Although this may take longer to undertake the clean-up, the benefits often outweigh the impacts as smaller teams are more targeted, recover more hydrocarbons and less sand and debris, reducing trampling of hydrocarbons into the shore profile and will minimise ecological impacts on the shorelines and their sensitive species.

Cartier Island is located within the Browse EMBA. 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. Therefore, shoreline clean-up assessment of these islands should be conducted via UAVs for Cartier Island.

Due to the sensitivity of these shoreline receptors and safety issues outlined above, the merits of shoreline clean-up will need to be discussed in consultation with Director of National Parks whilst preparing an Operational SIMA for Cartier Island, which would document this decision-making process.

Considerations for selecting and applying clean-up tactics, based on shoreline types, are shown in Table 9-1. Clean-up endpoints should be established in consultation with key stakeholders (e.g., Parks Australia, WA DBCA, NT DEPWS) early in the clean-up process.

Table 9-1: Shoreline Clean-up Selection Factors by Shoreline Type and Degree of Oiling for MDO/MGO

Shoreline Type	Degree of Oiling[10]	Shoreline Clean-up Tactic			
		Natural Recovery	Manual and Mechanical	Sediment Reworking	Flooding and Flushing
Exposed Rocky Shores	Light (e.g., <20%)	X	X	X	X
	Moderate (e.g., 20-60%)	X	X		X
	Heavy (e.g., >60%)	X	X		X
Sandy Shores and Beaches	Light (e.g., <20%)	X	X	X	X
	Moderate (e.g., 20-60%)	X	X		X
	Heavy (e.g., >60%)		X		X
Artificial Structures	Light (e.g., <20%)	X	X		X
	Moderate (e.g., 20-60%)	X	X		X
	Heavy (e.g., >60%)		X		X
Sheltered Rocky Shores	Light (e.g., <20%)	X	X	X	X
	Moderate (e.g., 20-60%)	X	X	X	X
	Heavy (e.g., >60%)		X		X
Mud and Tidal Flats	Light (e.g., <20%)	X	X		X
	Moderate (e.g., 20-60%)	X	X		X
	Heavy (e.g., >60%)				X
Mangroves and Wetlands	Light (e.g., <20%)	X	X		X
	Moderate (e.g., 20-60%)	X	X		X
	Heavy (e.g., >60%)				X

9.3 Implementation guide

The locations for shoreline clean-up operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data and the protection priorities. In addition, the information obtained from monitor and evaluate activities will be used by the IMT in the development of the Operational SIMA to inform the most effective protection tactics (if any) to apply to individual sites. This will also consider the feasibility and effectiveness of selected tactics.

[10] As described in Appendix D: Shoreline Assessment Form

Deployment of equipment and personnel is to be at the direction of AMSA, and/or the WA DoT or NT IMT, as the Control Agency (depending on the jurisdiction (Refer to Table 2-2)). The effectiveness of the shoreline clean-up strategy to achieve IAP objectives is to be communicated to the Control Agency by a nominated Shoreline Response Team Leader.

Table 9-2 provides guidance on tasks and responsibilities that the titleholder should consider to support the Control Agency should they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken, or should be reassigned.

Information on resource capability for this strategy is shown in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan. Whilst preparing that plan, if the titleholder's Strategic SIMA/NEBA determines that shoreline clean-up is an effective response strategy for WA shorelines the WA DoT has requested that they be consulted as part of the development of the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan. This does not currently apply to NT shorelines.

Table 9-2: Shoreline clean-up implementation guide

Responsibility		Task	Consideration	Complete
Initial Actions	Planning Section	Notify relevant authorities if there are likely to be any impacts on shorelines. Refer to Table 3-1 for details on notifications. Refer to Table 2-2 for details on Control Agency responsibilities.		❑
	Planning Section	Collect and provide spill trajectory modelling, other operational monitoring data and existing sensitivity information/mapping to Control Agency for confirmation of priority protection areas and Operational SIMA.		❑
	Planning Section	In conjunction with Control Agency, consult with Director of National Parks whilst preparing Operational SIMA for Designated Marine Parks.		❑
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Natural recovery (if selected)				
Initial Actions	Planning Section	If Operational SIMA supports natural recovery, use monitor and evaluate data to periodically reassess the condition of the shoreline/s and modify tactics, if required by the Control Agency.		❑
Manual and mechanical removal; washing, flooding and flushing; and/or sediment reworking and surf washing (if selected)				
Initial Actions	Planning Section	If Operational SIMA supports shoreline clean-up, support Control Agency in the development of a Shoreline Clean-up Plan (IAP sub-plan) for inclusion in the IAP.	Shoreline Clean-up plan may include (but not be limited to): • Clean-up objectives • Clean-up end points • Clean-up priorities	❑

Responsibility		Task	Consideration	Complete
			• Assessment and location of staging areas and worksites (including health and safety constraints, zoning) • Permits required (if applicable) • Chain of command for onsite personnel • List of resources (personnel, equipment, PPE) • Details of accommodation and transport • Waste management information, including logistical information on temporary storage areas, segregation, decontamination zones and disposal routes • No access zones (to minimise disturbance to sensitive receptors) Refer to IPEICA-IOGP (2015c) for additional guidance on shoreline clean-up planning and implementation.	
	Operations Section	Upon direction of Control Agency, commence implementation of Shoreline Clean-up plan, in particular mobilisation of personnel and equipment (including vessels) in readiness for deployment and use.		❑
Ongoing Actions	Operations Section	Support Control Agency in monitoring the effectiveness of shoreline clean-up operations by continual implementation of Shoreline Clean-up Assessment.	Where possible, maintain same composition of Shoreline Clean-up Assessment Teams. If the same personnel are able to recommend clean-up techniques and then monitor their implementation, they will be better placed to adapt their recommendations as the clean-up progresses and judge when the agreed end-points have been met.	❑

Responsibility	Task	Consideration	Complete
General (to be coordinated between titleholder IMT and Control Agency)			
IMT	Record relevant data e.g., equipment used, time deployed, weather conditions, Job Safety Analysis (JSA) for all tasks.		❑
IMT	Hold pre-mobilisation survey team meeting, including communication of field survey schedules (provision for field personnel rotation).		❑
IMT	Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑
IMT	Assemble competent field team(s) (if required), including required personal protective equipment (PPE). Arrange any required inductions and/or permits.		❑
IMT	Arrange transportation (e.g., flights, vehicles), accommodation and food/equipment for field teams.		❑
IMT	Establish decontamination facilities (as required) for all equipment, vessels, and personnel.		❑
IMT	Prepare a communications plan for field personnel.		❑
IMT	Consult with key stakeholders to develop clean-up end points for shorelines.		❑

9.4 Shoreline clean-up – environmental performance

Table 9-3 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of shoreline clean-up tactics to remove stranded hydrocarbons from shorelines in order to reduce impact on coastal protection priorities and facilitate habitat recovery.

Table 9-3: Environmental Performance – Shoreline Clean-up

Performance Standard	Measurement Criteria
Response Preparedness	
If the titleholder's Strategic SIMA determines that shoreline clean-up is a potential response strategy for WA shorelines the WA DoT is consulted as part of the development of the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.	Consultation records show that WA DoT was consulted as part of the development of the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.
Maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of shoreline protection tactics.	Contract with third party service providers maintained through duration of titleholder survey.
	Vessel contracts in place for the duration of the titleholder survey.
Response Implementation	
Prepare initial Operational SIMA in conjunction with Control Agency to determine if shoreline clean-up is likely to result in a net environmental benefit.	Records demonstrate that an initial Operational SIMA was completed with Control Agency and indicated shoreline clean-up was likely to result in a net environmental benefit.
Control Agency and IMT consult with Director of National Parks whilst preparing Operational SIMA for Designated Marine Parks.	Records demonstrate that Director of National Parks consulted when preparing Operational SIMA for Designated Marine Parks.
Shoreline clean-up activities will be implemented under the direction of the Control Agency.	Records demonstrate that shoreline clean-up activities implemented under the direction of the Control Agency.
Locations for clean-up operations will be evaluated by the relevant Control Agency throughout the incident response and will consider monitor and evaluate data, operational monitoring data and protection priorities.	Incident log.
If Operational SIMA indicates that there is an overall environmental benefit,	Shoreline Protection Plan (IAP sub-plan) is dated and indicates preparation done in

Performance Standard	Measurement Criteria
support Control Agency in the development of a Shoreline Protection Plan (IAP sub-plan).	conjunction with Control Agency and prior to shoreline protection operations commencing.

10. Oiled Wildlife Response

The short-term effects of hydrocarbons on wildlife may be direct such as the external impacts from coating or internal effects from ingestion and inhalation. Oiled wildlife response (OWR) includes wildlife surveillance/reconnaissance, wildlife hazing, pre-emptive capture and the capture, cleaning, treatment, and rehabilitation of animals that have been oiled. In addition, it includes the collection, post-mortem examination, and disposal of deceased animals that have succumbed to the effects of oiling.

Long-term effects of a spill on wildlife may be associated with loss/degradation of habitat, impacts to food sources, and impacts to reproduction. An assessment of such impacts is covered under scientific monitoring.

The relevant Control Agency has operational responsibility for the implementation of an OWR as outlined in Sections 10.1, 10.2 and 10.3. It is however also an expectation that the titleholder will conduct the initial first-strike response actions for wildlife and continue to manage those operations until the Control Agency takes over. Once the Control Agency takes over, the titleholder will function as a Support Agency, and continue to provide planning and resourcing support.

10.1 Commonwealth waters

The Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) is the Jurisdictional Authority for oiled wildlife in Commonwealth waters, although for vessel-based spills, the Control Agency function remains with AMSA. If an oiled wildlife response is required then this would be initiated through AMSA, who can access AMOSC oiled wildlife resources.

10.2 Western Australian waters

If an OWR is required in WA State waters, the Department of Biodiversity, Conservation and Attractions (DBCA) will lead the OWR under the control of the WA DoT (as Control Agency). The key plan for OWR in WA is the WA Oiled Wildlife Response Plan (WAOWRP). The WAOWRP has been developed by DBCA and AMOSC and is a sub-plan to the State Hazard: MEE.

There are several regional OWR plans that support the WAOWRP, providing operational guidance for each region. Regional OWR plans relevant to the EMBAs include:

- Draft Kimberley Region OWRP
- Pilbara OWRP

The WAOWRP can also be used for guidance to OWR in Commonwealth waters adjacent to State waters, noting that OWR requirements in State waters are expected to be greater.

10.3 Northern Territory waters

The Northern Territory Government have the following interim arrangements in place for OWR management:

- The NT Emergency Management Council will delegate responsibilities associated with wildlife and relevant activities in National Parks, Reserves and Marine Parks.

- Direct coordination shall be managed through the designated NT Government Functional Group.

In 2019, the Northern Territory Oiled Wildlife Response Plan (NTOWRP) was developed by AMOSC on behalf of AMOSC Titleholder Members ConocoPhillips, Inpex and Shell Australia to support their OWR operations in the NT. This plan also has application for other titleholders and may be used as a resource to help guide an OWR.

10.4 Initiation criteria

Initiation criteria	Termination criteria
Notification of a Level 2/3 spill	When the SIMA for oiled wildlife response activities indicates no further action required; and Control Agency decides to terminate the response strategy

10.5 Implementation guide

Wildlife surveillance/reconnaissance is a critical component of an OWR. Wildlife reconnaissance should be undertaken in close consultation with personnel undertaking relevant operational monitoring activities. The information gathered from wildlife reconnaissance and all relevant pre-existing wildlife data/information should be used to inform decisions and aid the on-going development of the OWR portion of the IAP.

Table 10-1 provides guidance on tasks and responsibilities that the titleholder should consider to support the Control Agency should they implement this response strategy. The Control Agency is responsible for the implementation of the response and therefore, depending on the circumstances of the spill, may determine that some tasks be varied, should not be undertaken, or should be reassigned.

Information on resource capability for this strategy is shown in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.

Table 10-1: OWR implementation guide

Responsibility		Task	Consideration	Complete
Initial Actions	Surveillance personnel	Personnel conducting monitor and evaluate activities shall report wildlife sightings in or near the spill trajectory (including those contacted with hydrocarbons or at risk of contact) and report them to the IMT within two hours of detection.	Record all reports of wildlife potentially impacted and impacted by spill. Record reports on: • location • access • number • species • condition of implanted animals (if available)	❑
	Environment Unit Lead	If wildlife i**s** sighted and are at risk of contact (or have been contacted), initiate OWR by notifying AMOSC Duty Manager (if titleholder is a member), and In Territory waters notify DEPWS (Pollution Response Hotline; Environmental Operations), and/or In State waters notify DCBA State Duty Officer (who will then activate their respective Oiled Wildlife Advisers).	Obtain approval from IC prior to activating AMOSC Oiled Wildlife Adviser. Refer to Table 3-1 for reporting requirements.	❑
	Environment Unit Lead	Notify Department of Agriculture, Water and the Environment if there is a risk of death or injury to a protected species (including Matters of National Environmental Significance [MNES]).	Refer to Table 3-1 for reporting requirements.	❑
	Environment Unit Lead	Review all wildlife reports from surveillance or opportunistic activities and contact personnel who made the reports (if possible) to confirm information collected.		❑

Responsibility		Task	Consideration	Complete
ACTIONS BELOW ARE INDICATIVE ONLY AND ARE AT THE FINAL DETERMINATION OF THE CONTROL AGENCY				
Initial Actions	Planning Section	Use information from initial assessments to prepare an Operational SIMA. Use this information to help determine: • initial OWR response level (as outlined in the WAOWRP) • what OWR activities are likely to result in a net environmental benefit	Targeted wildlife surveillance/reconnaissance is a critical component of an OWR. Oiled wildlife response activities such as hazing and pre-emptive capture can cause additional stress and mortality on individuals than oil pollution alone.	❑
	Planning Section	Support Control Agency in the development of a OWR Plan (IAP sub-plan) for inclusion in the IAP.	Targeted wildlife surveillance/reconnaissance needs to consider species known to occur in the impacted area, life-cycle stages, behaviour, and key risk periods. Wildlife reconnaissance should be undertaken in close consultation with personnel undertaking relevant operational monitoring activities. Confirm best reconnaissance platform (e.g., vessel, aerial, shoreline). Consider ability to share resources (e.g., Monitor and Evaluate activities, Scientific Monitoring).	❑
Ongoing Actions	Planning and Operations Section	Support Control Agency with any on-going OWR planning and resourcing support.		❑
General (to be coordinated between titleholder IMT and Control Agency)				
IMT		Record relevant data e.g., equipment used, time deployed, weather conditions, Job Safety Analysis (JSA) for all tasks.		❑

Responsibility	Task	Consideration	Complete
IMT	Hold pre-mobilisation team meeting, including communication of field schedules (provision for field personnel rotation).		❑
IMT	Obtain weather and tidal information from the Bureau of Metrology and on-scene observers.		❑
IMT	Assemble competent field team(s) (if required), including required personal protective equipment (PPE). Arrange any required inductions and/or permits.		❑
IMT	Arrange transportation (e.g., flights, vehicles), accommodation and food/equipment for field teams.		❑
IMT	Establish decontamination facilities (as required) for all equipment, vessels, and personnel.		❑
IMT	Prepare a communications plan for field personnel.		❑

10.6 Oiled wildlife response – environmental performance

Table 10-2 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Support implementation of OWR tactics in accordance with relevant State/Territory Oiled Wildlife Response Plans to prevent or reduce impacts, and to humanely treat, house, and release or euthanise wildlife.

Table 10-2: Environmental Performance – Oiled wildlife response

Performance Standard	Measurement Criteria
Response Preparedness	
Maintain contracts with third-party providers to provide access to suitably qualified and competent personnel and equipment to assist in the implementation of oiled wildlife response tactics.	Contract with third party service providers maintained through duration of titleholder survey.
Response Implementation	
Prepare initial Operational SIMA in conjunction with Control Agency to determine which OWR activities are likely to result in a net environmental benefit.	Records demonstrate that an initial Operational SIMA was completed with Control Agency and indicated which OWR activities are likely to result in a net environmental benefit.
OWR Plan developed and included in the IAP to provide oversight and management of OWR operations.	Records indicate IAP OWR Plan prepared prior to OWR operations commencing.

11. Scientific Monitoring

Scientific monitoring generally has objectives relating to attributing cause-effect interactions of the spill with changes to the surrounding environment. Consequently, such studies are required to account for natural or sampling variation, and study designs must be robust and produce defensible data. Scientific monitoring is typically conducted over a wide study area, extending beyond the spill footprint, and a long time period, extending beyond the spill response. It is also systematic and quantitative.

This OPEP covers a range of spill volumes and locations within the three Operational Areas shown in Figure 1-1, therefore an adaptive approach to applying receptor-specific Scientific Monitoring Plans (SMPs) is required.

A list of applicable SMPs for MDO/MGO spills is listed in Appendix E. This also provides the objectives, initiation, and termination criteria for the SMPs. SMPs are activated when initiation criteria are met, otherwise they are not applicable.

Appendix E refers to consultation with relevant Jurisdictional Authorities regarding termination of SMPs. Jurisdictional Authorities will be relevant to individual receptors and may differ to the Control Agency (e.g., Jurisdictional Authority for commercial fisheries in Commonwealth waters is the AFMA, whereas the Control Agency would be AMSA).

If scientific monitoring is required, the titleholder will be required to work with the Control Agency to implement monitoring activities, providing the resources, planning and equipment necessary for implementation. Information on how Monitoring Service Providers will be activated, how SMPs will be finalised and how plans will be implemented will need to be provided in the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan.

11.1 Scientific Monitoring - environmental performance

Table 11-1 indicates the environmental performance standards and measurement criteria for the following Environmental Performance Outcome:

- Implement monitoring programs to assess and report on the impact, extent, severity, persistence, and recovery of sensitive receptors contacted by a spill or affected by spill response.

Table 11-1: Environmental Performance – Scientific Monitoring

Performance Standard	Measurement Criteria
Response Preparedness	
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 third party service providers maintained through duration of titleholder survey
	Aviation and vessel contracts in place for the duration of the titleholder survey
Response Implementation	
Initiation criteria of SMPs will be reviewed during the preparation of the initial Incident Action Plan (IAPs) and subsequent IAPs; and if any criteria are met, relevant SMPs will be activated upon approval of Control Agency	Incident Action Plan and Incident Log
Monitoring priorities confirmed with Control Agency and key stakeholders (i.e., Jurisdictional Authority for receptor, appointed State/Territory Environmental Scientific Coordinator) and monitoring service providers (including subject matter experts, where available) at the time of the spill	Incident Action Plan and Incident Log

12. Response Termination

Terminating the spill response may involve demobilising personnel and equipment from response locations, post-incident reporting, identifying improvement opportunities, reviewing, and updating plans and restocking equipment supplies. Planning to demobilise should occur ahead of time, during the response, to facilitate rapid demobilisation of resources that are no longer needed, and which can significantly reduce response costs.

The decision to terminate individual response strategies will be made by the relevant Control Agency (Table 2-2), according to the termination criteria shown for each strategy (Sections 6 - 9).

Scientific monitoring may continue after response operations have ceased and may be used to inform remediation activities.

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Appendix A: Applicable CSEP Contents for Demonstrating OPGGS (Env) Regulation Requirements

Table A1-1: OPGGS (Env) Regulations Requirements and Corresponding Demonstration in Collaborative Seismic OPEP

Regulation	Environment Plan content requirements	Relevant section that addresses requirement
Part 2, Division 2.3, Regulation 14 (4)	The implementation strategy must establish a clear chain of command, setting out the roles and responsibilities of personnel in relation to the implementation, management, and review of the environment plan, including during emergencies or potential emergencies	Section 2: Spill Management Arrangements Appendix B: Roles and Responsibilities of Titleholder Personnel in State MEECC/ DoT IMT/ FOB Titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan - Section 2
Part 2, Division 2.3, Regulation 14 (5)	The implementation strategy must include measures to ensure that each employee or contractor working on, or in connection with, the activity is aware of his or her responsibilities in relation to the environment plan, including during emergencies or potential emergencies, and has the appropriate competencies and training	Section 2 - Titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan
Part 2, Division 2.3, Regulation 14 (8)	The implementation strategy must contain an oil pollution emergency plan and provide for the updating of the plan	This OPEP and the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan
Part 2, Division 2.3, Regulation 14 (8AA)	The oil pollution emergency plan must include adequate arrangements for responding to and monitoring oil pollution, including the following: (a) the control measures necessary for timely response to an emergency that results or may result in oil pollution;	a) This OPEP and the titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan
	(b) the arrangements and capability that will be in place, for the duration of the activity, to ensure timely implementation of the control measures, including arrangements for ongoing maintenance of response capability;	b) Titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan - Section 5

Regulation	Environment Plan content requirements	Relevant section that addresses requirement
	(c) the arrangements and capability that will be in place for monitoring the effectiveness of the control measures and ensuring that the environmental performance standards for the control measures are met;	c) Titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan - Section 5
	(d) the arrangements and capability in place for monitoring oil pollution to inform response activities	d) Section 6 Monitor and Evaluate
Part 2, Division 2.3, Regulation 14 (8A)	The implementation strategy must include arrangements for testing the response arrangements in the oil pollution emergency plan that are appropriate to the response arrangements and to the nature and scale of the risk of oil pollution for the activity	Section 1.7 Testing Arrangements Titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan - Section 2
Part 2, Division 2.3, Regulation 14 (8B)	The arrangements for testing the response arrangements must include: (a) a statement of the objectives of testing; and (b) a proposed schedule of tests; and (c) mechanisms to examine the effectiveness of response arrangements against the objectives of testing; and (d) mechanisms to address recommendations arising from tests	Section 1.7 Testing Arrangements Titleholder's survey specific Oil Spill Response and Monitoring Bridging Plan - Section 2
Part 2, Division 2.3, Regulation 14 (8D)	The implementation strategy must provide for monitoring of impacts to the environment from oil pollution and response activities that: (a) is appropriate to the nature and scale of the risk of environmental impacts for the activity; and (b) is sufficient to inform any remediation activities	Section 11 Scientific Monitoring
Part 2, Division 2.3, Regulation 14 (8E)	The implementation strategy must include information demonstrating that the response arrangements in the oil pollution emergency plan are consistent with the national system for oil pollution preparedness and response	Section 2 Spill Management Arrangements

Appendix B: Roles and Responsibilities of Titleholder Personnel in State MEECC/ DOT IMT/ FOB

Table B1-1 outlines the key roles and responsibilities of titleholder personnel potentially required to be positioned in the State Maritime Environmental Emergency Coordination Centre (MEECC)/ DoT IMT/ FOB in the event of a Level 2/3 spill that impacts WA waters or land. It should be noted the requirements outlines in Table B1-1 are the initial requirements, and not the minimum or maximum requirements.

Table B1-1: Roles and Responsibilities of Titleholder Personnel Positioned in State Maritime Environmental Emergency Coordination Centre (MEECC)/ DOT IMT/ FOB

Key Roles	Responsibilities
Crisis Management Team Liaison Officer (DoT MEECC)	Provide a direct liaison between the Crisis Management Team and the State MEECC. Facilitate effective communications and coordination between the Crisis Management Team Leader and the State MEECC. Offer advice to State MEECC on matters pertaining to titleholder crisis management policies and procedures.
Deputy Incident Officer (DoT IMT)	Provide a direct liaison between the titleholder IMT and the DoT IMT. Facilitate effective communications and coordination between the titleholder Incident Controller and the DoT Incident Controller. Offer advice to the DoT Incident Controller on matters pertaining to the titleholder incident response policies and procedures. Offer advice to the Safety Coordinator on matters pertaining to titleholder safety policies and procedures, particularly as they relate to titleholder employees or contractors operating under the control of the DoT IMT.
Deputy Intelligence Officer (DoT IMT)	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 titleholder IMT. Assist in the interpretation of modelling and predictions originating from the titleholder IMT. Facilitate the provision of relevant situation and awareness information originating from the DoT IMT to the titleholder IMT. Facilitate the provision of relevant mapping from the titleholder IMT. Assist in the interpretation of mapping originating from the titleholder IMT. Facilitate the provision of relevant mapping originating from the DoT IMT to the titleholder IMT.
Deputy Planning Officer (DoT IMT)	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 titleholder IMT. Assist in the interpretation of the titleholder OPEP from titleholder. Assist in the interpretation of the titleholder IAP and sub plans from the titleholder IMT.

Key Roles	Responsibilities
	Facilitate the provision of relevant IAP and sub plans originating from the DoT IMT to the titleholder IMT. Assist in the interpretation of titleholder's existing resource plans. Facilitate the provision of relevant components of the resource sub plan originating from the DoT IMT to the titleholder IMT. Note this individual must have intimate knowledge of the relevant titleholder OPEP and planning processes.
Environmental Support Officer (DoT IMT)	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 titleholder OPEP and relevant Tactical Response Plans. Facilitate in requesting, obtaining, and interpreting environmental monitoring data originating from the titleholder IMT. Facilitate the provision of relevant environmental information and advice originating from the DoT IMT to the titleholder IMT.
Deputy Public Information Officer (DoT IMT)	As part of the Public Information Team, provide a direct liaison between the titleholder Media team and DoT IMT Media team. Facilitate effective communications and coordination between titleholder 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 & Warnings team. Offer advice to the DoT Media Coordinator on matters pertaining to titleholder media policies and procedures. Facilitate effective communications and coordination between titleholder 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 the titleholder community liaison policies and procedures. Facilitate the effective transfer of relevant information obtained through the Contact Centre to the titleholder IMT.
Deputy Logistics Officer (DoT IMT)	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 titleholder's existing OSRL, AMOSC and private contract arrangements. Collects Request Forms from DoT to action via the titleholder IMT. Note this individual must have intimate knowledge of the relevant titleholder logistics processes and contracts.
Deputy Operations Officer (DoT IMT)	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 titleholder Operations Section and the DoT Operations Section.

Key Roles	Responsibilities
	Offer advice to the DoT Operations Officer on matters pertaining to titleholder incident response procedures and requirements. Identify efficiencies and assist to resolve potential conflicts around resource allocation and simultaneous operations of titleholder and DoT response efforts.
Deputy Waste Management Coordinator (DoT IMT)	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. Facilitate the disposal of waste through titleholder'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 titleholder IMT.
Deputy Finance Officer (DoT IMT)	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 titleholder's existing OSRL, AMOSC and private contract arrangements. Facilitate the communication of financial monitoring information to the titleholder 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 titleholder.
Deputy Division Commander (DoT FOB)	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 titleholder's Forward Operations Base/s (FOB/s) and the DoT FOB. Facilitate effective communications and coordination between titleholder On-Scene Commander and the DoT Division Commander. Offer advice to the DoT Division Commander on matters pertaining to titleholder incident response policies and procedures. Assist the Safety Coordinator deployed in the FOB in the performance of their duties, particularly as they relate to titleholder employees or contractors. Offer advice to the Safety Coordinator deployed in the FOB on matters pertaining to titleholder safety policies and procedures.

Appendix C: Visual Surveillance Logs

Vessel visual observer 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)		Time (seconds)	Width nm
Start Longitude	Start Longitude					Length nm
End Latitude	End Latitude		Vessel Speed (knots)		Vessel Speed (knots)	Width nm
End Longitude	End Longitude					Grid area km^2

Visual appearance slick
Colours, emulsification etc.
Any marine fauna or other activities observed

Aerial surveillance observation log

Date	Incident	Aircraft type	Call sign	Start time	End time	Av altitude/ air speed
Wind speed (kts)	**Wind direction**	**Visibility (nm)**	**Cloud base (ft)**	**Sea state**	**Observer name/s**	**Spill source**
Survey start /end coordinates	**Survey start time**	**Survey end time**	**Time high tide**	**Time low tide**	**Current speed (nm)**	**Current direction**
Notes (e.g., remote sensing used, wildlife or sensitive receptors observed, any response activities observed):						

Slick details

Slick	Time local	Slick (centre or start)		Slick (end)		Slick Orient Degrees	Oil slick length			Oil slick width			Area km^2	Coverage %	Oiled area km^2
		LAT N/S	LONG E/W	LAT N/S	LONG E/W		SOG KT	Time seconds	Distance km	SOG KT	Time seconds	Distance km			
A															
B															
C															
D															
E															

Appendix D: Shoreline Assessment Form

Department of Transport

When blank, this form is classed as **OFFICIAL**, when filled out, this form is classed as **OFFICIAL-SENSITIVE.**

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.

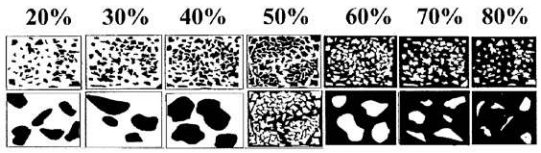
Biological character

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

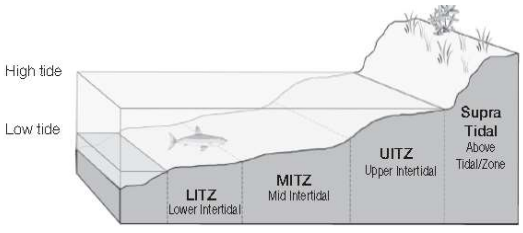


Oil thickness

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

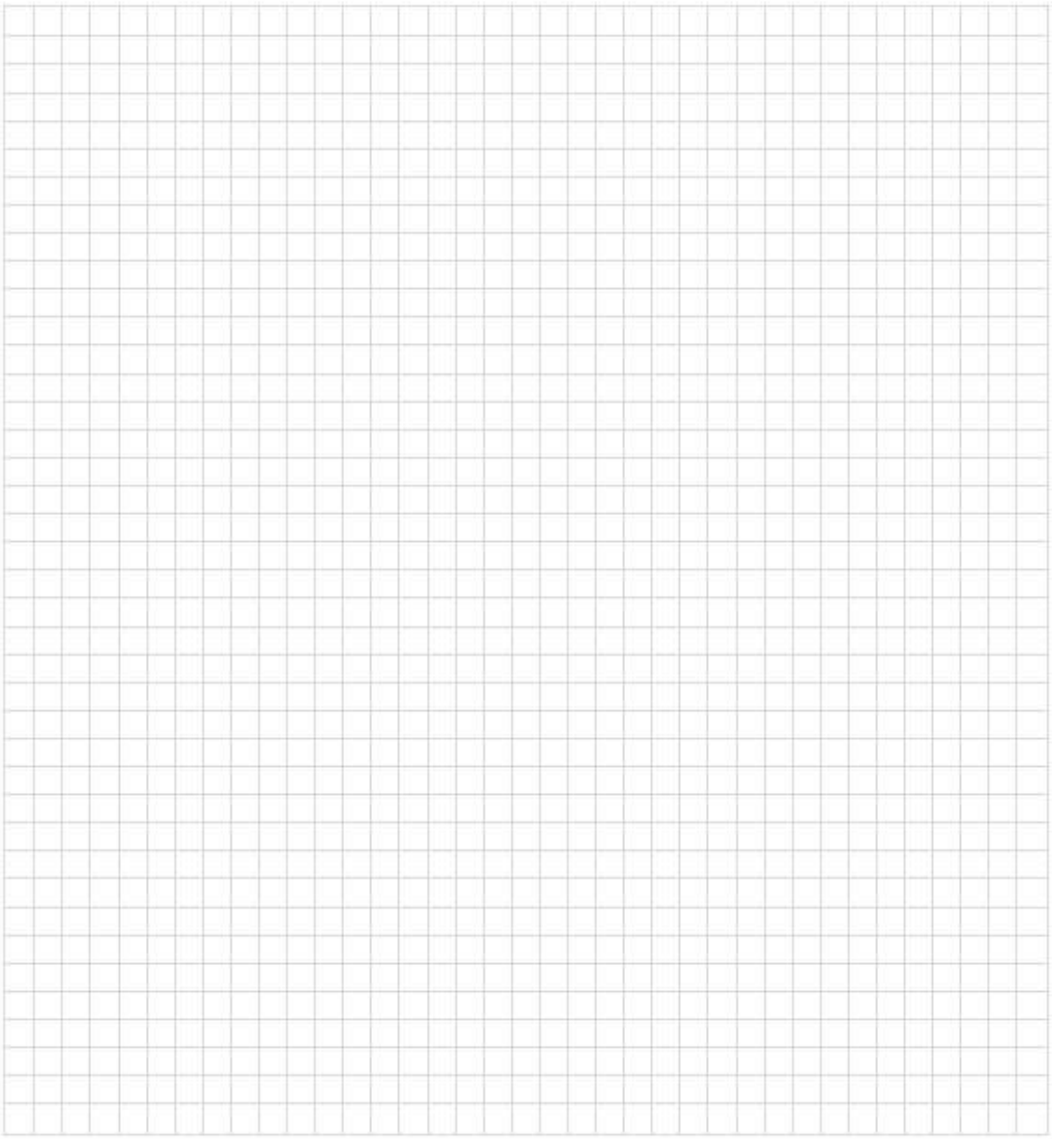


Incident		**Ref No.**	
REPORTING DETAILS			
Assessment Team Leader		**Position/ Organisation**	
Team Members (name/org)			
Date Completed		**Time Completed**	
Reporting to		**Position/ Organisation**	
Date Received		**Time Received**	
LOCATION DETAILS			
Sector		**Segment**	
Name of Beach/Location		**Description (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				

Sketch Map
Please include North point and scale



Notes

Appendix E: Scientific Monitoring Programs

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
Water quality impact assessment	Detect and monitor the presence, concentration, and persistence of hydrocarbons in marine waters following the spill and associated response activities. The specific objectives of this SMP are as follows: • Assess and document the temporal and spatial distribution of hydrocarbons in marine waters of sensitive receptors. • Consider the potential sources of any identified hydrocarbons. • Verify the presence and extent of hydrocarbons (both on water and in water) that may be directly linked to the source of the spill. • Assess hydrocarbon content of water samples against accepted environmental guidelines or benchmarks to predict potential areas of impact. • Provide information that may be used to interpret potential cause and effect drivers for environmental impacts recorded for sensitive receptors monitored under other SMPs.	• OMP: Water quality assessment has identified hydrocarbon concentrations exceed accepted guidelines and benchmarks; and • Requested to be implemented by the relevant Control Agency	• The relevant Jurisdictional Authority/ Government Agency has been consulted and has agreed that water quality monitoring can be ceased; and • Hydrocarbon concentrations in marine waters are below benchmark levels which can be defined as: ○ Toxicant default guideline values for water quality in aquatic ecosystems; or ○ the relevant regulatory site-specific trigger level (where these exist); or ○ below baseline levels; or ○ control site values (whichever is applicable).

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
Sediment quality impact assessment	Detect and monitor the presence, concentration and persistence of hydrocarbons in marine sediments following the spill and associated response activities. The specific objectives of this SMP are as follows: • Assess and document the temporal and spatial distribution of hydrocarbons in marine sediments of sensitive receptors. • Consider the potential sources of any identified hydrocarbon. • Verify the presence and extent of hydrocarbons that may be directly linked to the source of the spill. • Assess hydrocarbon content of sediment samples against accepted environmental guidelines or benchmarks to predict potential areas of impact.	• Spill modelling, surveillance or monitoring predicts or confirms exposure of sediments where protected species or commercially important species are likely to be present; and • Requested to be implemented by the relevant Control Agency	• The relevant Jurisdictional Authority/ Government Agency has been consulted and has agreed that water quality monitoring can be ceased; and • All hydrocarbon concentrations in sediments are below benchmark/guideline levels, which can be defined as: ○ toxicant default guideline values for sediment quality; or ○ the relevant regulatory site-specific trigger level (where these exist); or ○ below baseline levels; or ○ control site values (whichever is applicable).
Intertidal and coastal habitat assessment	To assess the impact (extent, severity, and persistence) and subsequent recovery of intertidal and coastal habitats and associated biological communities in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Collect quantitative data to determine short-term and long-term (including	• Spill modelling, surveillance or monitoring predicts or confirms exposure of coastal or intertidal habitats or communities to hydrocarbons; and • Requested to be implemented by the relevant Control Agency	• Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor; and • There has been no impact to coastal and intertidal habitats and associated biological communities (confirmation that habitats and species were not exposed to hydrocarbons); or

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
	direct and indirect) impacts of hydrocarbon (and implementation of response activities) on intertidal and coastal habitats and associated biological communities, post-spill and post-response recovery. • Monitor the subsequent recovery of intertidal and coastal habitats and associated biological communities from the impacts of the hydrocarbon release and response activities.		• Measured parameters of coastal and intertidal habitats and associated biological communities impacted by hydrocarbons spills have returned to within the expected natural dynamics of baseline state (taking into account natural variability) and/or control sites.
Seabirds and shorebirds	Document and quantify shorebird and seabird presence, and any impacts and potential recovery from hydrocarbon exposure and response activities. The objectives are to: • Identify and quantify, if time allows the post-spill/pre-impact presence and status (e.g., foraging and/or nesting activity) of shorebirds and seabirds in the study area. • Observe, and if possible, quantify and assess, the impacts from exposure of shorebirds and seabirds to hydrocarbons (i.e., post-impact) and to the response activities, including abundance, oiling, mortality, and sub-lethal effects. • Identify, quantify and evaluate the post-impact status and if applicable, recovery of key behaviour and breeding activities of shorebirds and	• Spill trajectory modelling, surveillance or monitoring predicts contact is possible to seabirds and/or shorebird populations or any of their habitats of importance for breeding, nesting, or foraging; or • There are reports or scientific evidence of oiled seabirds and/or shorebird populations; and • Requested to be implemented by the relevant Control Agency	• Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor; and • There has been no impact on seabirds and/or shorebirds or their key biological activities; or • The extent of damage and rate of recovery of key seabird and/or shorebird behaviour and breeding activities has been quantified; and ○ Measured parameters have returned to baseline conditions (taking into account natural variability) in terms of breeding population (for seabirds) or counts (for shorebirds) and impacts on species and taxa are

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
	seabirds (e.g., foraging and/or nesting activity and reproductive success) over time and with regard to control sites.		no longer detectable, with regard to control sites; or ○ Oil pollution effects/impacts on critical species and taxa are no longer detectable.
Marine mega-fauna assessment • Reptiles • Pinnipeds • Whale sharks, dugongs, and cetaceans	**Reptiles** Identify and quantify the status and recovery of marine reptiles, including marine turtles, sea snakes and estuarine crocodiles, related to a hydrocarbon spill and response activities. The objectives are to: • To observe and quantify the presence of marine reptiles (including life stage) within the area affected by hydrocarbons. • Where possible, assess and quantify lethal impacts and/or sub-lethal impacts directly related to the hydrocarbon spill or other secondary spill-related impacts (including vessel strike). • Assess the impact of the hydrocarbon spill on nesting turtles, nests, and hatchlings. • Understand changes in nesting beach usage by marine turtles following the hydrocarbon spill.	**a. Reptiles** • Spill trajectory modelling, surveillance or monitoring predicts contact is possible at important habitat locations for turtles (foraging and rookery), sea snakes and/or estuarine crocodiles; and • Requested to be implemented by the relevant Control Agency **b. Pinnipeds** • Spill trajectory modelling, surveillance or monitoring predicts contact is possible at important habitat locations for pinnipeds (foraging, breeding colonies, and haul out sites); and • Requested to be implemented by the relevant Control Agency **c. Whale sharks, dugongs, and cetaceans** • Spill trajectory modelling, surveillance or monitoring predicts contact is possible at important habitat	**a. Reptiles** • Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor; and • There has been no impact on reptiles or their key biological activities from the hydrocarbon spill; or • The extent of damage of impacted reptiles has been quantified; and • Measured parameters of turtle (and sea snakes and/or estuarine crocodiles, if determined appropriate) communities impacted by hydrocarbon spill have returned to within the expected natural dynamics of baseline state and/or control sites. **b. Pinnipeds** • Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor, and.

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
	Pinnipeds Identify and quantify the status and recovery of pinniped populations (Australian Sea Lion and New Zealand Fur Seal) related to a hydrocarbon spill and response activities. The objectives are to: • Identify mortality of pinnipeds, where possible, that is directly related to the hydrocarbon spill or indirectly associated to spill-related impacts (including boat strike). • Assess the impact of the hydrocarbon spill on pinniped species populations as recorded for breeding colonies and haul-out sites of hydrocarbon exposure/contact. • Evaluate the recovery of pinniped breeding colonies **Whale sharks, dugongs, and cetaceans** Identify and quantify the status and recovery of whale sharks, dugongs and cetaceans related to a hydrocarbon spill and response activities. The objectives are to: • Observe and quantify the presence of whale sharks, dugongs and cetaceans within the	locations for whale sharks, dugongs and/or cetaceans (foraging, migratory routes, breeding locations); and • Requested to be implemented by the relevant Control Agency	• There has been no impact on pinnipeds or their key biological activities from the hydrocarbon spill; or • The extent of damage and rate of recovery of impacted pinnipeds has been quantified at breeding colonies and haul out sites within the area affected by hydrocarbons; and • Measured parameters of pinniped populations impacted by hydrocarbon spill have returned to within the expected natural dynamics of baseline state and/or control sites. **c. Whale sharks, dugongs, and cetaceans** • Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor; and • There has been no demonstratable impact on whale sharks, dugongs and/or cetaceans or their key biological activities from the hydrocarbon spill; or • The extent of damage of impacted whale sharks, dugongs and/or cetaceans and/or their biologically

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
	area that may be affected by hydrocarbons • Where possible, assess and quantify lethal impacts and/or sub-lethal impacts directly related to the hydrocarbon spill or other indirect impacts (including vessel strike and impacts to important habitats) • If applicable, evaluate recovery of key biological activities of impacted species following impacts due to a hydrocarbon spill and undertaking response options.		important areas has been quantified; and • Measured parameters of whale sharks, dugongs and/or cetaceans and/or their biologically important areas impacted by hydrocarbon spill have returned to within the expected natural dynamics of baseline state and/or control sites.
Benthic habitat assessment	To assess the impact (extent, severity, and persistence) and subsequent recovery of subtidal benthic habitats and associated biological communities in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Collect quantitative data to determine short-term and long-term (including direct and indirect) impacts of hydrocarbon (and implementation of response options) on benthic habitats and associated biological	• Spill trajectory modelling, surveillance or monitoring predicts or confirms exposure of benthic habitats or communities to hydrocarbons; and • Requested to be implemented by the relevant Control Agency	• There has been no impact to benthic habitats and associated biological communities (confirmation that benthic habitats were not exposed to hydrocarbons); or • Measured parameters of benthic habitats and associated biological communities impacted by hydrocarbons spills have returned to within the expected natural dynamics of baseline state (taking into account natural variability) and/or control sites; and

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
	communities, post-spill and post-response recovery. • Monitor the subsequent recovery of benthic habitats and associated biological communities from the impacts of the hydrocarbon release.		• Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor.
Marine fish and elasmobranch assemblages assessment	To assess the impacts to and subsequent recovery of fish assemblages associated with specific benthic habitats (as identified in SMP: Benthic Habitat Assessment) in response to a hydrocarbon release and associated response activities. The specific objectives of this SMP are as follows: • Characterise the status of resident fish populations associated with habitats monitored in SMP: Benthic Habitat Assessment that are exposed/contacted by released hydrocarbons. • Quantify any impacts to species (abundance, richness and density) and resident fish population structure (representative functional trophic groups). • Determine and monitor the impact of the released hydrocarbons and potential subsequent recovery to residual demersal fish populations.	• Spill trajectory modelling, surveillance or monitoring predicts or confirms exposure to fish areas or fish habitat; and • Requested to be implemented by the relevant Control Agency	• Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor; and • There has been no impact on fish and fish population structure; or • Measured parameters of fish, fish habitat, and marine fisheries locations impacted by hydrocarbon spills have returned to within the expected natural dynamics of baseline state and/or control sites.

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
Fisheries impact assessment	To monitor potential contamination and tainting of important finfish and shellfish species from commercial, aquaculture and recreational fisheries to evaluate the likelihood that a hydrocarbon spill will have an impact on the fishing and/or aquaculture industry. The specific objectives of this SMP are as follows: • Assess any physiological impacts to important fish and shellfish species and if applicable, seafood quality and safety. • Assess targeted fish and shellfish species for hydrocarbon contamination. • Provide information that can be used to make inferences on the health of fisheries and the potential magnitude of impacts to fishing industries (commercial, aquaculture and recreational).	• Spill trajectory modelling, surveillance or monitoring predicts contact is possible to commercial, recreational, traditional species and or aquaculture species; or • Advice has been provided to government to restrict, ban, or close a fishery due to impacts from the spill; or • Declarations of intent by commercial fisheries or government agencies to seek compensation for alleged or possible damage; and • Requested to be implemented by the relevant Control Agency	• Agreement has been reached with the relevant Jurisdictional Authorities to cease monitoring of fisheries; and • Contamination in the edible portion or in the stomach/intestinal contents attributable to the spill is no longer detected; or • No differences are detected in commercial, recreational or aquaculture fisheries from control and impact sites; or • The physiological and biochemical parameters in the studied species have returned to baseline levels; or • Evidence that catch rates, species composition, community abundance, distribution and age structure of commercial fisheries and their by-catches have returned to baseline levels.
Heritage features assessment	To detect changes in the integrity of significant shipwrecks as a result of a hydrocarbon release and/or associated response activities.	• Spill trajectory modelling, surveillance or monitoring predicts or confirms hydrocarbon exposure to known heritage features; and • Requested to be implemented by the relevant Control Agency	• Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring this receptor; and • There has been no detectable impact to the integrity of the heritage feature/s; or • Measured parameters of heritage feature/s impacted by hydrocarbon

Scientific Monitoring Plan	Aim/Objective	Initiation criteria	Termination criteria
			spills have returned to within the expected natural dynamics of baseline state and/or control sites.
Social impact assessment	To assess the extent, severity, and likely persistence of impacts on cultural, commercial, recreational and/or industrial users from a hydrocarbon release and associated response activities. The specific objective of this SMP is as follows: • Determine direct and indirect impacts of a hydrocarbon spill and associated response activities on cultural, commercial, recreational and/or industrial users and identify areas where monitoring may need to continue for an extended period of time following termination of the response.	• Spill trajectory modelling, surveillance or monitoring predicts or confirms hydrocarbon exposure to high value socio-economic features; and • Requested to be implemented by the relevant Control Agency	• Agreement has been reached with the relevant stakeholders and Jurisdictional Authorities to cease monitoring these receptors; and • There has been no detectable impact to known socio-economic features; or • Measured parameters of socio-economic features impacted by hydrocarbon spills have returned to within the expected natural dynamics of baseline state and/or control sites; or • This SMP has been replaced by more detailed investigations.