Environment plan Appendix 9-2 Operational and scientific monitoring program (RPS)

Stromlo-1 exploration drilling program

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123 St Georges Terrace
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Australia

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OPERATIONAL AND SCIENTIFIC MONITORING PROGRAM (OSMP)

Implementation plan

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FIRST STRIKE INSTRUCTIONS

Instructions for immediate actions following a spill

- Go straight to Section 3 to refer to the Implementation Plan
- Contact the relevant service provider (i.e. RPS) OSMP Program Manager (Table 1), providing the following information
  - **The OMPs and SMPs that have been activated** (refer to **Section 4**), or whether this is an early-warning alert that may require subsequent activation (i.e. a Level 1 spill with potential for escalation)
  - The **nature and scale of the spill** (geographic location, when was the spill, what hydrocarbon(s) was spilled, approximate volume released)
  - Other relevant operational information (e.g. available situational awareness information, response strategies/tactics likely to be mobilised, etc.).

Table 1: OSMP program manager contact details

Service provider	Program manager	Contact details	Status
RPS	Jeremy Fitzpatrick	Work: +61 (0)8 9211 3501 Mobile: +61 (0)427 933 944 Email: jeremy.fitzpatrick@rpsgroup.com.au	Confidential
RPS	Garnet Hooper	Work: +61 (0)8 9211 1131 Mobile: +61 (0)458 568 277 Email: garnet.hooper@rpsgroup.com.au	Confidential

During periods of leave or absence, alternative OSMP Program Manager contacts will be nominated.

Key information sources

OSMP overview	Table 3
Contractual arrangements	Section 2.1
Organisational structure	Section 2.2
Communications and protocol	Section 2.3 & Table 2
OSMP resources	Section 2.5
Core OSMP personnel and resource requirements	Section 2.5.2
Health, Safety and Environment	Section 2.6
OSMP permit requirements	Section 2.10

Table 2: State and Commonwealth control agencies relevant to the Environment that Might Be Affected (EMBA) for reporting spills during OSMP operations

Jurisdiction	Control agency	Reporting marine pollution incidents
Commonwealth waters	Equinor	Refer to Section 4.2 of the OPEP
Commonwealth waters (vessel based spills only)	Australian Maritime Safety Authority (AMSA)	24-hour emergency helpline within Australia: 1800 641 792 outside Australia: +61 2 6230 6811 Submit a POLREP Email notification (select Marine Environment Protection in the 'send to' field): http://www.amsa.gov.au/contact-us/ Contact points in Australia for ships reporting pollution or potential incidents in accordance with MARPOL requirements: http://www.amsa.gov.au/environment/regulations/marpol/reporting-pollution/index.asp
Western Australian state waters	Department of Transport (DoT)	Notify Maritime Environmental Emergency Response (MEER) immediately: 24-hour emergency helpline: (08) 9480 9924 Email: marine.pollution@transport.wa.gov.au
South Australian state waters	Department of Planning, Transport and Infrastructure (DPTI)	24-hour emergency helpline: (08) 8248 3505
Victorian state waters	The Environmental Protection Authority Division of the Department of Transport Security and Emergency Management Division (SEMD)	Contact telephone numbers: • Portland region: (03) 5525 0900 (24 hours) • Port Phillip region: (03) 9644 9777 (24 hours) • Western Port region: 0428 549 235 (24 hours) • Gippsland region: (03) 5150 0500 (24 hours) • general marine oil spill enquiries: (03) 9655 9797 (9 am to 5 pm) Wherever possible you should provide the following information with your report: • Your name and contact details • Where and when the spill occurred • A description of the pollutant • The size of the area where the oil is visible • The source of the spill including vessel registration numbers if known • Any photographs you have of the incident.
Tasmanian state waters	Department of Primary Industries, Parks, Water and Environment (DPIPWE)	24-Hour emergency helpline: 1800 005 171
New South Wales state waters	Maritime and Roads via Transport for New South Wales (TfNSW)	Maritime Environmental Pollution: 13 12 36 The Transport for NSW Maritime Incident 24-hour Duty Officer must be notified of the incident: • Vessel traffic services: vts@portauthoritynsw.com.au • Port: 9296 4999 (24-hour) • General Manager, Operations and Deputy Harbour Master Sydney jmdrummond@portauthoritynsw.com.au
Within port jurisdictions (limits)	Relevant port authorities	Contact relevant port authority

1 INTRODUCTION

1.1 Purpose of the OSMP

Situational awareness is a critical requirement for effective spill response management and implementation. Operational Monitoring is a key process for providing information during the response phase. Equinor recognises the need for operational and scientific monitoring to support understanding of the actual extent of a hydrocarbon release, its impacts to environmental and socio-economic receptors, the duration of those impacts and subsequent recovery.

The Operational and Scientific Monitoring Program (OSMP) and Implementation Plan defined in this document, incorporating processes to demonstrate preparedness, have been developed to allow effective mobilisation of an OSMP response following a hydrocarbon release from an Equinor activity in southern Australian waters. In doing so, the OMSP meets the requirements of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the OPGGS(E) Regulations) Regulation 14, particularly:

- Regulation 14(8AA)(c) by including the arrangements and capability in place for monitoring oil pollution to inform response activities

- Regulation 14(8D) by providing 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

  b. Is sufficient to inform any remediation activities.

1.2 Defining operational and scientific monitoring components

The Operational and Scientific Monitoring Program is an integrated series of studies designed to provide critical information following a hydrocarbon release. The program allows for the management and implementation of three main components:

- Operational Monitoring. This is a series of Operational Monitoring Plans (OMPs) that are designed to be implemented in the response phase only. OMPs aim to provide situational awareness and to evaluate the efficacy and impacts of spill response strategies and tactics, and therefore do not have to meet the same level of scientific rigour as Scientific Monitoring Plans (SMPs). Data outputs tend to be more qualitative than quantitative. Operational Monitoring is further described in Section 1.4.1

- Scientific Monitoring. This is a series of Scientific Monitoring Plans (SMPs) that are predominantly designed to be implemented at the termination of the response phase to quantify the impacts from the spill (including spill response strategies and tactics) and subsequent recovery, to a high level of scientific rigour. Consequently, data outputs are more quantitative and with a greater level of data density. However, there are provisions for SMPs to be implemented during the response phase where required (e.g. post-release pre-exposure baseline data collection). A robust analysis of scientific monitoring data requires sufficient baseline (pre-spill) data of a suitable scientific standard, which have been collected using comparable scientific techniques. Scientific Monitoring is further described in Section 1.4.2.

- Post-release pre-exposure baseline data collection. This is a reactive ‘value add’ or optional component of the OSMP due to the potential challenges for the feasibility and practicability of successful implementation (mainly due to the geographic location, access and time to contact of the spill). Since this component employs Scientific Monitoring methods and principles, it is considered an integrated sub-component of Scientific Monitoring Plans (see Section 1.4.2), allowing for implementation during the response phase and potential for integration with relevant OMPs.

1.3 Lessons learned from previous post-spill monitoring campaigns

Following the PTTEP AA Montara spill, the Montara Commission of Inquiry (also commonly known as the Borthwick Inquiry) reviewed the circumstances resulting in the well blowout that occurred in the early hours of 21 August 2009.

The Report of the Montara Commission of Inquiry (Commonwealth of Australia, 2010) identified a series of lessons and considerations to enable a greater level of preparedness for any future incidents. With respect to Operational and Scientific Monitoring, these included:

- Improved integration of Operational and Scientific Monitoring, highlighting that Scientific Monitoring should be "adequate, peer-reviewed and timely"
- Full consideration of environmental issues in the National Plan (as there was no provision for recovery of Scientific Monitoring costs in the National Plan at the time of the incident)
- The response of the relevant Commonwealth Government Department (in the case of Montara, DEHWA) was delayed as DEWHA was not initially allocated the ESC role (they were appointed on 15 September 2009 – 26 days after the blowout) and their ability to implement a Scientific Monitoring program should not have been dependent on the co-operation (and willingness to pay) of the Titleholder
- Recommendation that it was the responsibility of the Commonwealth Government to put into place a 'polluter pays' approach, which would require petroleum companies to fully finance spill response and Operational and Scientific Monitoring operations (and associated operations)
- 'Off the shelf' OSMPs should be prepared (by AMSA and DEWHA) and be peer-reviewed and be adaptable to the nature and scale of an incident (in Commonwealth waters) to facilitate rapid implementation. This would prevent an unacceptable delay in implementation, which occurred following the Montara spill (the Monitoring Plan was not in place until October 2009 – 49 days into the response operation)
- There was an insufficient understanding of the extent of sub-surface dispersed oil (due to what was considered in the report to be an inadequate water sampling regime and lack of good baseline data), which may have been better considered via an integrated Operational and Scientific Monitoring program.

The conclusion of the Montara Commission of Inquiry Report was that the "environmental impacts from the Blowout are difficult to determine and are unlikely to ever be known" (Commonwealth of Australia, 2010).

Following the Montara Commission of Inquiry, the National Offshore Petroleum Safety Authority's (NOPSA) remit was extended to include the regulation well integrity (in April 2011). NOPSA's remit was again extended and, on 1 January 2012, the newly re-named National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) formally took over responsibility for regulating offshore environmental management. NOPSEMA then became the only Commonwealth environmental regulator for offshore oil and gas activities in February 2014, when NOPSEMA's environmental management authorisation process for referrals under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was endorsed by the Commonwealth Minister for the Environment. As part of their role, NOPSEMA publish a number of guidance documents to support informed environmental applications. One of these guidance documents pertains to Operational and Scientific Monitoring programs (NOPSEMA, 2016), in response to Recommendation 90 of the Montara Commission of Inquiry (Commonwealth of Australia, 2010). This document discusses lessons learned from previous OSMP responses to hydrocarbon releases. It highlights the obvious nature of the immediate impacts of marine hydrocarbon releases, and the potential to attract considerable media and public attention. The challenges in identifying impacts that may take some time to be recognised, may occur at different locations across a broad area, or result in indirect and/or long-term chronic impacts (that are harder to identify) – particularly where there is a paucity of solid and reliable baseline data – are raised in the guidance document. Similar challenges were found following the Macondo (Deepwater Horizon) spill in the US Gulf of Mexico in 2010.

NOPSEMA identify the following improvements to environmental monitoring of offshore petroleum incidents following Montara (NOPSEMA, 2016):

- Improved planning and preparedness for environmental monitoring, including the requirement for appropriate baseline data to inform environmental impact assessment
- Improved inter-relationship between operational and scientific monitoring scopes via an integrated monitoring program
- Increased efficiency in the implementation of scientific monitoring
- A more robust water quality survey program to be undertaken during the response phase to inform assessments of the transport, fate and potential impacts of oil and dispersed oil
- Scientifically robust, detailed design and implementation aspects of scientific monitoring
- Appropriate and effective monitoring triggers (for both activation and termination).

Considerations for planning and implementation of OSMPs were also provided in the guidance document. These included:

- The global significance of a number of environmental values, and the importance of considering these as part of the assessment of nature and scale of potential impacts
- Temporal (seasonal and inter-annual) variability in the occurrence and sensitivity of environmental values (such as critical life stages susceptible to oil spill and response impacts)
- The need to maintain a clean and healthy marine environment, which is critical for many of Australia's offshore (and coastal) environmental values
- The findings and recommendations of the Montara Commission of Inquiry, the Government's final response and implementation plan
- Lessons learned from Montara and Macondo
- The vastness and remoteness of the offshore area.

The geographic area within which an OSMP response may be implemented is a key consideration. Previous OSMP outcomes have demonstrated the need to understand (and plan for, as far as practicable) the nature and scale of the likely response—and the challenges in doing so. As an example of the scale of a response, following the Macondo spill NOAA reported that over 31,000 water and sediment samples were collected from >850 days at sea, and that more than 2,700 seafood samples were assessed using sensory (e.g. organoleptic testing) and chemical testing (Brown et al., 2011). Over 98 miles of shoreline were still being moderately to heavily oiled in October 2011 (around 18 months after the blowout), with over 458 miles still being subject to light or trace oiling. A fully-integrated OSMP must not only consider how to collect the required samples/data, but how they will be managed, transferred and processed. The approach must also be flexible enough to respond to the changing nature and scale over the lifecycle of the response, and to consider contingency requirements in order to support development of preparedness.

1.4 Objectives of the OSMP

In the event of a Level 2 (> 10 m^3) or Level 3 (> 1,000 m^3) hydrocarbon release (i.e. for any release volume of > 10 m^3), where triggered an integrated OSMP will be undertaken to meet the objectives outlined in the following subsections.

1.4.1 Operational monitoring

The objectives of Operational Monitoring (also known as 'Type I' or 'response phase' monitoring) are to:

- Provide situational awareness to the Incident Management Team (IMT), to allow effective ongoing planning and management of spill response activities and identify any significant changes in risk.
- Provide information to allow the assessment of the efficacy and potential impacts (positive and negative) of spill response strategies and tactics.
- Provide information that can be used to define the spatial extent of the spill, for comparison with the pre-defined Environment that May Be Affected (EMBA), and identify sensitive receptor locations at risk.
- Provide information required to assess whether individual SMPs should be activated (based on the specific activation triggers defined in each SMP).
- Provide information to support final development and implementation of post-release/pre-exposure baseline data collection and SMPs.

1.4.2 Scientific monitoring

The objectives of Scientific Monitoring (also known as 'Type II' or 'recovery phase' monitoring) are to:

- Determine the extent, level (= severity) and persistence of environmental impacts from a hydrocarbon release.
- Quantify exposure and potential persistence of hydrocarbons (and dispersants/chemical agents, if relevant) to specific environmental and socio-economic sensitivities (as defined in each SMP).
- Quantify short- and long-term impacts of the hydrocarbon release and response activities to specific receptors.
- Where feasible, allow potential assessment of the short- and long-term impacts of spill response strategies and tactics to specific receptors.
- Allow consideration of temporal variability (e.g. seasonality and inter-annual variability) on specific receptors.
- Allow consideration of spatial variability ('patchiness') of specific receptors.
- Identify the likely cause(s) of identified impacts at survey locations (e.g. spill hydrocarbons, spill plus response strategies, cumulative impacts with other anthropogenic/natural sources of impact, other anthropogenic/natural sources of impact, etc.).
- Identify, quantify and qualify recovery of specific receptors following termination of the response.
- Support post-release/pre-exposure baseline data collection where feasible.

One of the key objectives of Scientific Monitoring (and a common termination trigger) is to identify recovery following spill impacts. Although recovery will be compared over time against temporal variability at reference (control) locations and, where available, against baseline data, great care must be taken in defining what 'recovery' actually means. It is commonly considered that recovery is a return to a baseline or pre-impact condition. However, the feasibility of this type of recovery – or how recovery may actually manifest – must be carefully considered.

In an unimpacted environment, pre-impact conditions may have resulted from successional development until a 'climax community' had been achieved. However, changes in environmental conditions (e.g. climate change, ocean acidity, loss of keystone species) may result in successional development during recovery occurring along a different trajectory than that of the pre-impact community, potentially resulting in a different climax community. In such cases, it may be considered that recovery has not been achieved (in comparison to baseline/pre-impact conditions) and hence the response cannot be terminated - when for all intents and purposes recovery has occurred as far as is likely. The change in trajectory of the community may be considered as a cumulative impact of the hydrocarbon release and changes in environmental conditions over

time, though ultimately triggered by the spill. A change in community trajectory may not previously have been triggered, e.g. due to gradual adaptation to change, or due to the resilience of the community to changing environmental conditions (ecological inertia). Where the addition of spill impacts exceeded the ecological 'tipping point', this ecological inertia is lost. This loss of inertia affects the ability of a community to resist perturbation, and hence its ability to persist unchanged (resulting in an impact to the community). Subsequent recovery will depend on a range of factors such as recruitment from within and outside the community, the influence of keystone species, inter- and intra-specific competition, and influences of any changes in environmental variables.

For the purposes of this OSMP, 'recovery' is defined as a return to a stable ecological condition (where temporal variability may be comparable with reference locations or consistent over a number of survey periods), which in some cases may be considered as the development of a climax community. This definition has been applied as it is recognised that communities/sensitivities may not return to a pre-impact (baseline) condition.

Scientific monitoring will provide information that may be used to support remediation planning in some cases. The outcomes from Scientific Monitoring may also be used to demonstrate whether Equinor has met their environmental protection goals. Equinor will cross-reference scientific monitoring outcomes with the environmental protection goals and performance outcomes relating to environmental performance and OSMPs defined in the activity-specific Environment Plan to make this assessment.

1.4.3 Overarching objectives

The overarching objectives of Operational and Scientific Monitoring are to:

- Define the overall spatial extent of the hydrocarbon release, quantifying likely zones of impact based on measured hydrocarbon exposure thresholds over time (supporting an assessment of persistence of hydrocarbons and duration of exposures for different locations).
- Summarise the spatial extent and duration (short- and long-term) of identified impacts to environmental and socio-economic receptors.
- Summarise the recovery of receptors, including determining whether recovery is occurring along a different trajectory (i.e. development of a new climax community or new ecological/socio-economic equilibrium) and consideration of the ecological and socio-economic implications of the identified recovery responses (the "so what?").
- Provide recommendations and lessons learned as outcomes from the spill response and operational and scientific monitoring, to support industry-wide improvements in spill and monitoring response.

1.5 Scope of the OSMP

The OSMP has been designed to enable response phase and post-response monitoring following a hydrocarbon release. The structure of the OSMP allows for continual development and expansion of the scope of studies (as required) to maintain preparedness throughout the continuing development of Equinor in Australia. This approach provides a consistency of approach (which facilitates preparedness and implementation) while allowing flexibility to monitor additional ecological and socio-economic receptors, and to consider incorporation of emerging technologies to maximise the area that can be effectively surveyed in a robust (scientific) manner, to improve data quality and increase data density, and to reduce Health, Safety and Environment (HSE) risks. The OSMP structure also allows for modification/amendment to consider matters raised during ongoing consultation.

In most cases, the selection of the technologies and methods used to collect data to support situational awareness and scientific monitoring are driven by the environment within which the data is collected, and the type of sample (e.g. water, sediment, biological) required. Hydrocarbon type has some effect on methods (e.g. calibration, *In situ* measurement technologies and analytical methods) but generally has a lesser effect on the selection of the core survey methods. The methods presented in this OSMP are designed to support monitoring of a wide range of environments and spill scenarios, but with the built-in flexibility of approach required to address opportunities to acquire additional data at the planning stage (as defined in the Implementation Plan) and during the response (e.g. to consider issues or stakeholder requirements identified

during the response phase). Consideration of hydrocarbon type (among other factors) will be captured in the final development of OSMP survey plans following a spill and will be informed by initial estimates of the type and volume of spilled hydrocarbons (i.e. nature and scale).

The geographical extent used in the implementation planning of the OSMP has been based on the extent of the predicted Environment that May Be Affected (EMBA) (or Zone of Potential Impact, ZPI) as determined from the stochastic oil spill modelling that supported the planning and approvals phase. The extent of the oil spill response area is based on the hydrocarbon exposure thresholds at which potential impacts to environmental and/or social receptors may occur. However, the OSMP is designed to be scalable to allow reactive response to significant changes in risk, and to enable effective implementation in instances where an actual spill scenario results in extension of the EMBA (based on situational awareness obtained during spill response and operational monitoring). This approach is supported by the use of activation triggers for each individual Operational and Scientific Monitoring Plan, to make sure that the response is relevant to the nature and scale of the actual spill scenario. In the event of a spill, real-time oil spill trajectory modelling (OSTM) will be undertaken using actual weather conditions, oil types, volumes and flow rates to provide the best possible predictor of potential exposure of receptors within the EMBA and to identify potential for unexpected effects beyond the EMBA. Information on the spatial distribution of oil spill response strategies and tactics will be sourced from the outcomes of Net Environmental Benefit Analysis (NEBA) assessments, which will be undertaken and reviewed throughout the response phase.

The OSMP scope excludes economic analysis of the hydrocarbon release, potential impacts and recovery.

1.6 Linkages with relevant documents and processes

The OSMP supports the Oil Pollution Emergency Plan (OPEP), which in turn is part of the Environment Plan (EP). The relationship between documents and processes is presented in Figure 1-1. The contribution of OSMP outcomes to key decision-making processes are described in Figure 1-2.

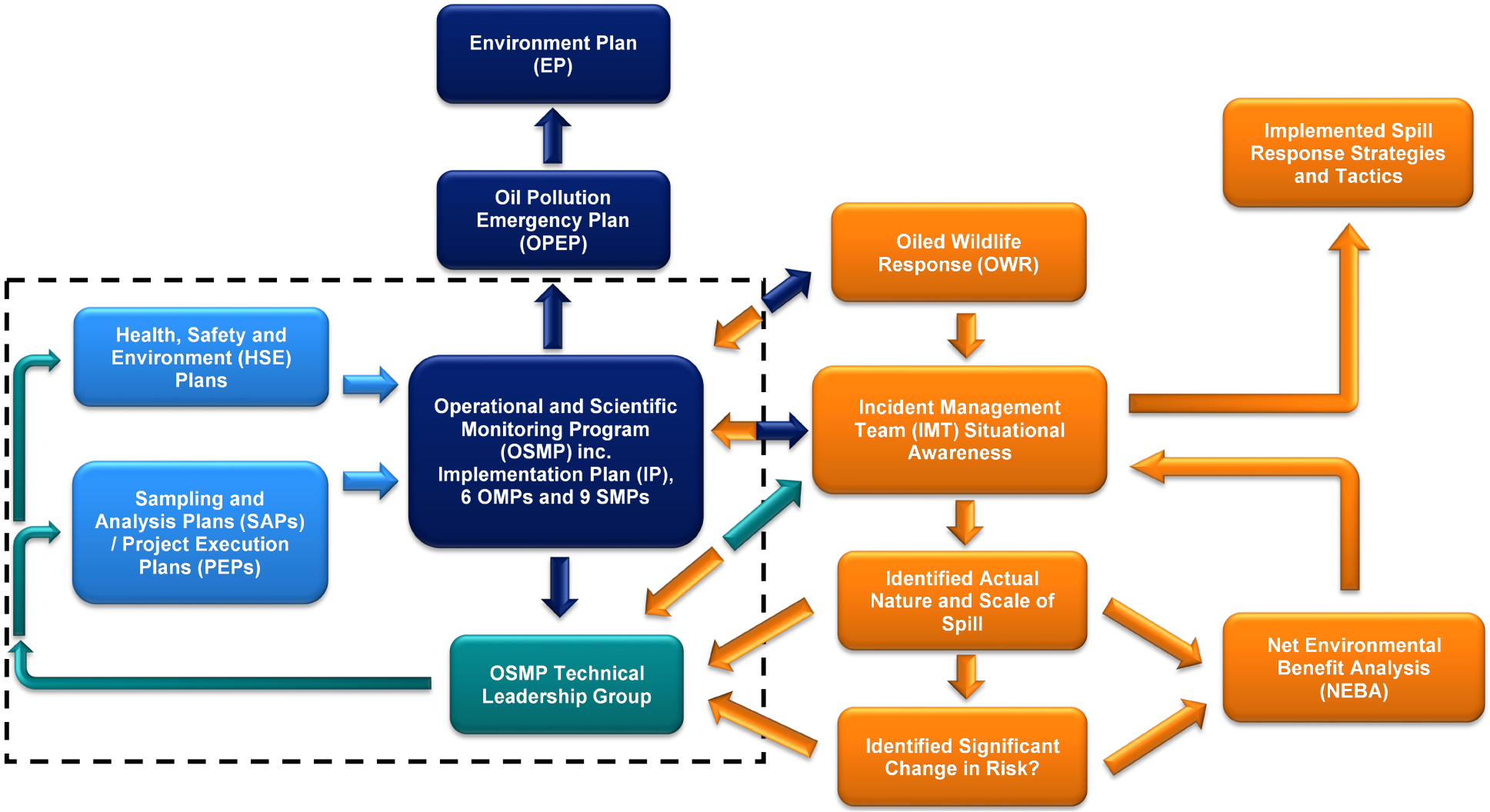
This OSMP document includes a QA/QC and review process (see Section 5.9), though this does not include any OSMP-specific performance standards or measurement criteria. Relevant standards are detailed in the activity-specific EP.

1.7 Identification of values and sensitivities

The values and sensitivities that must be considered in the final development of the OSMP studies are defined in the relevant activity-specific EP. However, those values and sensitives were defined *based on the credible spill scenarios defined in the EP at a set point in time*. The OSMP response, like the spill response, ***must be flexible to respond to change*** in the evolving nature and scale of the hydrocarbon release, and any significant changes in risk. The NEBA tool and OSMP are designed with this in mind. Should the nature and scale of the hydrocarbon release present a different level of risk to those defined in the credible scenarios, then the NEBA and OSMP can accommodate these changes as part of the ongoing re-assessment process. Circumstances that could result in a different level of risk include a change in the values and/or sensitivities that occur at specific sensitive receptor locations, or the identification of new sensitive receptor locations between acceptance of the EP and prior to the hydrocarbon release (e.g. newly-zoned Commonwealth Marine Reserves, which is feasible for activities with lifecycles of >20–25 years).

1.8 OSMP studies

In the event of a Level 2 or Level 3 hydrocarbon release, monitoring (and potentially post-release/pre-exposure baseline data collection) will be undertaken in accordance with up to six OMPs and nine SMPs (see Table 1-2). The actual number of OMPs and SMPs implemented following a hydrocarbon release will be dependent on the nature and scale of the release. The specific values and sensitivities of focus of each OSMP will be defined in each individual plan.



Dark blue = prepared documents, light blue = documents to be prepared based on nature and scale of spill, Orange = spill response processes, and green = group of OSMP technical leadership personnel.

Figure 1-1: Relationship between the OSMP and other relevant documents and processes during the response phase

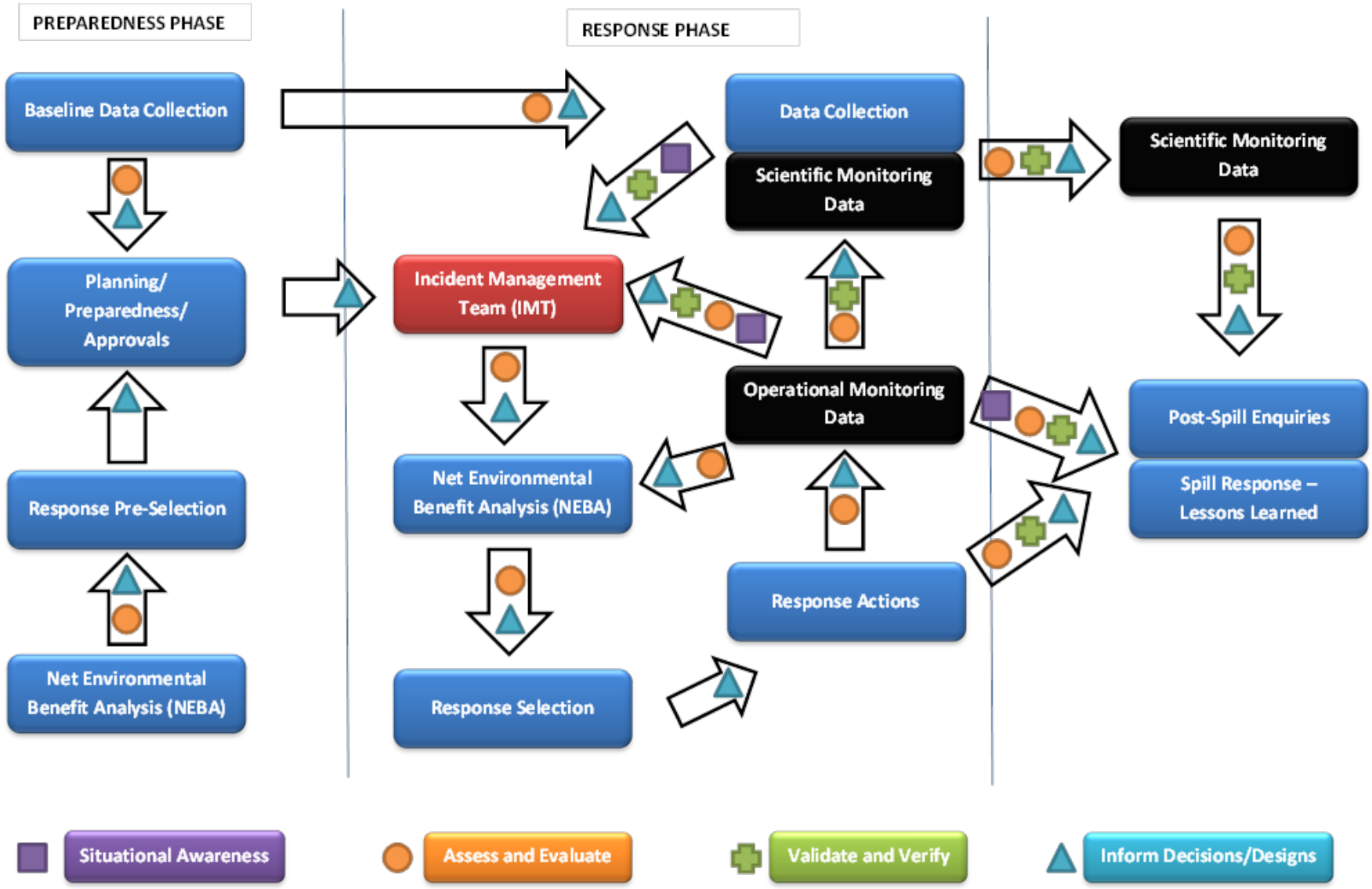


Figure 1-2: Contribution of OSMPs to key spill response decision-making processes during preparedness, response and post-response phases

The OSMPs described in this document provide key information with regards to the 'What', 'Who' and 'How' components of the survey design. The 'Where' and 'When' components will be specific to the actual spill scenario, will inform the development of the final survey documents (e.g. SAPs/PEPs, HSE Plans) and will support final implementation planning (e.g. logistics, sampling permit requirements). These processes will also be informed by the activity-specific EP (e.g. with respect to sensitive receptor locations and key environmental/socio-economic sensitivities). Sampling and analysis plans (SAPs) will be prepared for use in the Oil Spill Response Exercise. These will be finalised based on the nature and scale of the actual release as part of the OSMP implementation process.

Table 1.1: Operational and scientific monitoring plans

Plan ref.	Title	Target receptors
Operational monitoring plans (OMPs)		
OMP1	Oil Spill Modelling	Multiple receptors at local- to regional-level scales
OMP2	Surveillance and Tracking	Multiple receptors at local- to regional-level scales
OMP3	Monitoring of Hydrocarbons: Weathering and Behaviour in Marine Waters	• Coastal and offshore pelagic habitats (i.e. water column) exposed or at risk of exposure from spill hydrocarbons
OMP4	Monitoring of Dispersants and Chemical Control Agents	Areas where spill response chemical strategies and tactics were applied (e.g. SSDI, surface dispersant application, shoreline clean-up using chemicals). Includes analysis for chemical breakdown products
OMP5	Shoreline Assessment	Intertidal areas associated with land masses exposed or at risk of exposure from spill hydrocarbons
OMP6	Identification of Impacts to Benthic and Demersal Biota	Nearshore (coastal), offshore and deep water subtidal benthic habitats (e.g. seagrass, kelp forests, reefs, sponge beds, etc.) and demersal fish and groundfish/prawn assemblages exposed or at risk of exposure from spill hydrocarbons
Scientific monitoring plans (SMPs)		
SMP1	Assessment of Water Quality	Nearshore (coastal), offshore and deep-water pelagic zone. Includes sampling for dispersants, control agents and breakdown products
SMP2	Assessment of Impacts and Recovery of Benthic Sediments and Infauna	Nearshore (coastal), offshore and deep water marine benthic sediments and infaunal assemblages exposed / potentially exposed to spill hydrocarbons and unexposed reference locations
SMP3	Assessment of Impacts and Recovery of Intertidal Habitats	Environments exposed/potentially exposed to spill hydrocarbons and unexposed and equivalent reference locations that occur between Chart Datum (CD) (= Lowest Astronomical Tide; LAT) and hence subject to daily periods of tidal immersion. Examples include beaches, rocky shores, mud flats/samphire, emergent reefs and shoals, mangroves, and saltmarshes
SMP4	Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Fish	Nearshore (coastal), offshore and deep water subtidal benthic habitats (e.g. seagrass, kelp forests, reefs, sponge beds) and demersal fish and groundfish/prawns exposed/potentially exposed to spill hydrocarbons and unexposed reference locations
SMP5	Assessment of Impacts and Recovery of Seabirds and Shorebirds	Seabird colonies and populations, shorebird colonies and populations, migratory sea/shorebirds, penguin colonies and populations
SMP6	Assessment of Impacts and Recovery of Marine Megafauna	Cetaceans, pinnipeds, sharks/rays and reptiles (e.g. sea snakes)
SMP7	Assessment of Impacts and Recovery of Plankton	Phytoplankton and zooplankton communities, fish larval stages

Plan ref.	Title	Target receptors
SMP8	Assessment of Impacts and Recovery of Fisheries and Aquaculture	Commercial fisheries, recreational fisheries, aquaculture operations, aquaculture resource areas (includes seafood safety and quality assessments)
SMP9	Assessment of Impacts and Recovery of Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance	Areas recognised as important or zoned for recreation, tourism, conservation, heritage or native title

1.8.1 Inter-relationships between OSMP studies

Each OSMP study fits within a broader OSMP framework. Each plan links to other plans, by informing the analysis and interpretation of other studies, or by providing activation triggers for other plans (Section 4.1). The inter-relationships between plans are demonstrated in Table 1-2.

Table 1.2: Inter-relationships between operational and scientific monitoring plans

	OMP 1	OMP 2	OMP 3	OMP 4	OMP 5	OMP 6	SMP 1	SMP 2	SMP 3	SMP 4	SMP 5	SMP 6	SMP 7	SMP 8	SMP 9
OMP1															
OMP2	X														
OMP3	X	X													
OMP4	X	X	X												
OMP5	X, A	X, A	X	X, A											
OMP6	X, A	X, A	X	X, A											
SMP1	X	X	X, A	X, A		X, A									
SMP2	X	X	X, A	X, A			X								
SMP3	X	X	X, A	X, A	X, A		X, A	X							
SMP4	X	X	X, A	X, A		X, A	X, A	X, A							
SMP5	X	X	X, A	X	X	X	X, A	X	X	X					
SMP6	X	X	X, A	X, A			X, A			X					
SMP7	X	X	X, A	X, A			X, A			X		X			
SMP8	X	X	X, A	X, A		X	X, A	X, A	X	X		X	X		
SMP9	X	X	X, A	X, A	X	X	X, A	X, A	X, A	X	X	X	X	X	

X = informs other plans, **A** = provides an Activation trigger for other plans

The table should be read from the top row (x axis) labels in a downward direction (see arrow).

2 PREPAREDNESS

The aim of this document – appended OSMPs and associated Resources Register (defining personnel, equipment, supplier and laboratory resources appropriate for an OSMP response) – is to demonstrate preparedness to respond to activation of an OSMP response as far as reasonably practicable. The following information will be used to complete preparedness and initiate mobilisation:

- The location of a hydrocarbon release
- The nature and scale of the hydrocarbon release
- Any situational awareness information available (e.g. modelling, trajectory monitoring, spill response activities)
- Sensitive receptor locations likely to be (or have been) exposed to spill hydrocarbons
- Ports of mobilisation and vessels/aircraft potentially available
- Environmental/sea state/weather conditions and forecasts
- OSMPs triggered
- Available baseline data/information (including information on migration patterns of relevant biota)
- Any stakeholder requirements.

2.1 Contractual arrangements

2.1.1 RPS and Equinor

RPS is engaged by Equinor under a Procurement of Services Contract. In the event of an oil spill requiring operational and scientific monitoring, RPS' response would be activated using a Project Change Request Form (PCR).

Contractual arrangements with third parties will be in place with key third-party suppliers, service providers and organisations (e.g. CSIRO, SARDI) as part of a demonstration of preparedness prior to mobilisation.

Information on contractual status of resources will be included in the Resource Register (Appendix A). Contractual arrangements for any additional suppliers/personnel identified during the OSMP response planning (e.g. for newly-available technologies or processes that would have a positive impact on HSE and/or data collection/quality) that were not identified during the preparedness phase will be facilitated by Equinor to support a rapid response.

2.1.2 Logistics

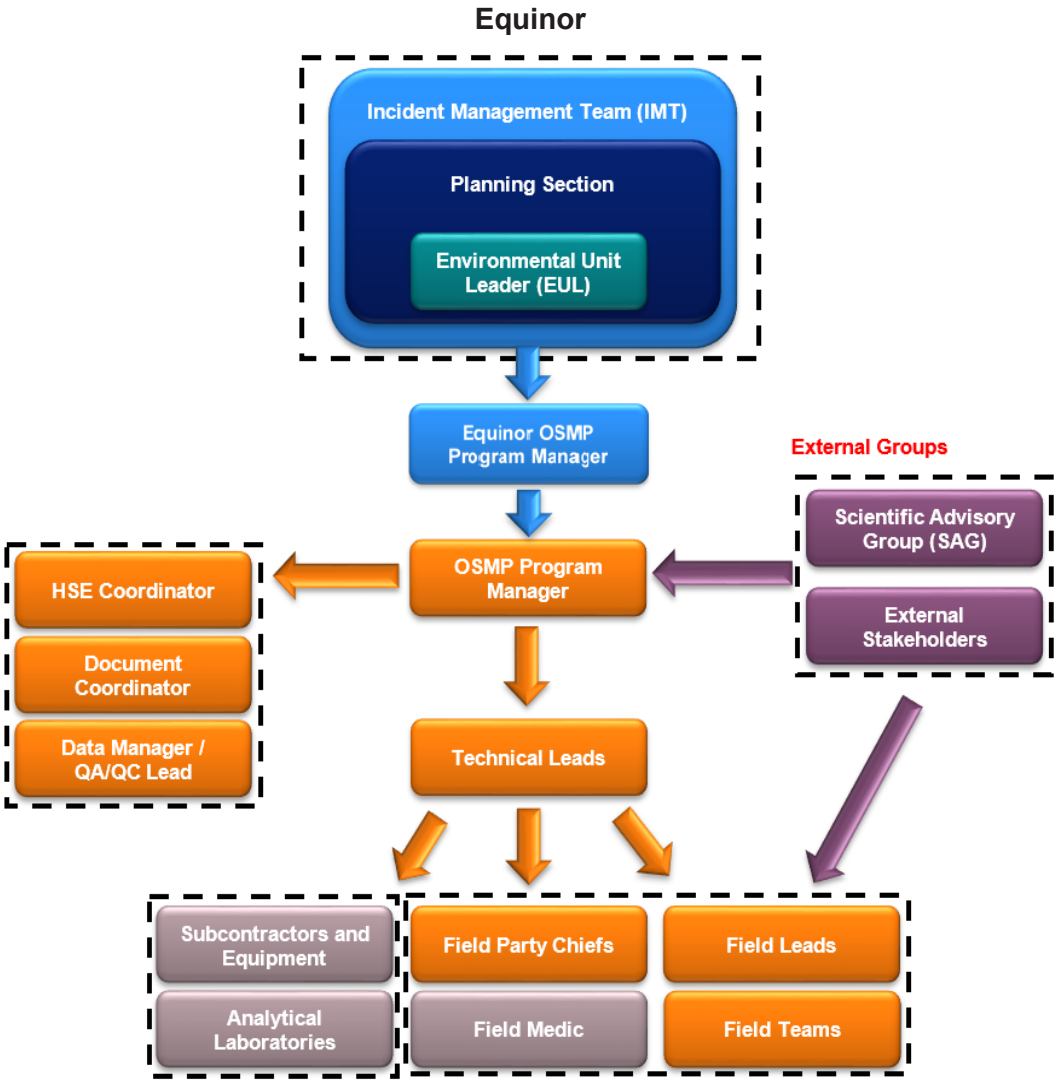
Logistical requirements (including but not limited to arrangement of transport, accommodation, victualling, shipping, vessels, etc.) will be contracted directly by Equinor, via existing contracts, direct sourcing or MSAs.

2.2 Organisational structure

The organisation structure that will support an OSMP response is outlined in Figure 2-1. The figure presents the internal Equinor stakeholders during the activation and implementation of the OSMP response. Following termination of the response phase, the IMT will be stood down and ongoing management of scientific monitoring studies will be transitioned to the normal Equinor Corporate structure. The Equinor OSMP PM will be maintained to ensure continuity and efficiency of communications and survey operations.

The structure shown identifies the core management, technical and survey teams (Figure 2-1). The field medic is an optional role that can support remote/offshore field operations if identified as a requirement during the HSE planning process (e.g. HAZID). Further information on specific OMP or SMP personnel requirements are described in each plan.

An Excel spreadsheet identifying resource requirements has been prepared (the 'Resource Register'), which allows resource availability to be periodically tested. Personnel (role), survey platforms and equipment requirements are also included in the NEBA tool to facilitate effective implementation.



Blue arrow = coordination; orange arrows = lines of management; and purple arrows = technical management/guidance. Blue/green boxes represent Equinor personnel, Orange boxes RPS personnel and purple and grey boxes represent external experts, stakeholders and subcontractors

Figure 2-1: Organisation structure of the OSMP team, showing relationship with the IMT

2.3 Communication and protocols

All OSMP response communications will be managed by the Equinor OSMP Program Manager (PM) and the RPS OSMP PM. The Equinor OSMP PM will work outside of the IMT, but in close proximity in order to engage closely with the IMT during the response phase and, in particular, the Environment Unit Leader (EUL) in the IMT Planning Section. The EUL will be the main point of contact in the IMT, from which directives (e.g. information requirements) will be communicated, and to whom all relevant outcomes, information and logistical support requests will be disseminated. The Equinor OSMP PM will be working with a team in an adjacent or closely-located building to facilitate rapid communications and allow regular face-to-face contact with the Environment Unit where required.

The Equinor OSMP PM will then pass relevant information (required to support OSMP response) from the Equinor IMT to the RPS OSMP PM. The RPS OSMP PM will in turn provide all information required to manage the implementation and mobilisation of a response (including contractual and logistical requirements) to the Equinor OSMP PM. All communications between the respective OSMP leads will be digitised and archived. All key decisions shall be recorded in an OSMP decision log. All requirements, actions and tasks should be recorded in an Incident Action Plan.

Communications from Equinor to the Service Provider (RPS) that do not align with the communication pathways detailed above will be reported to the RPS OSMP PM. The RPS OSMP PM will then seek guidance on the accuracy and authenticity of the information via the designated pathway (the Equinor OSMP PM). Any communications regarding safety that require rapid or immediate response (e.g. direction to evacuate an area) can be considered as an exception to this rule and shall be responded to as appropriate.

The OSMP structure has no stakeholder/external communications coordinator as this function will be undertaken by an Equinor communications specialist.

Note: Field survey vessels may be required to have a direct line of communication with the Equinor IMT during the response phase for effective management of simultaneous operations (SIMOPS) in the response area. This will be a particularly critical health and safety issue for operations within or adjacent to any exclusion or restricted access zones. The Equinor IMT will have overarching operational authority over survey vessels and will be able to direct operations in critical areas as part of their SIMOPS plan.

2.4 Key roles and responsibilities

The following sections describe the roles and responsibilities of the office-based leadership personnel that are engaged with all OSMPs (see Figure 2-1 for how these roles relate to the organisational structure). Roles and responsibilities that are specific to individual monitoring plans are not detailed in this section – refer to the relevant OMP or SMP for further information. Office-based personnel will be available to provide broader support during the response phase (e.g. with respect to approvals, stakeholder engagement, technical support to the environment team, NEBA, potential impacts to receptors, etc.) where this does not conflict with their primary OSMP roles. Due to the potential nature and scale of an OSMP response, it is strongly recommended that leadership personnel will only fulfil one specific role to maintain availability, capability and quality of work, and to manage stress and fatigue levels over a potentially prolonged period.

It is anticipated that external groups, such as an independent review panel and/or an external stakeholders group, will be convened to provide independent technical review and oversight of the OSMP scope but this is considered outside the scope of the core OSMP response process.

Exclusion of the independent review panel from the OSMP scope has been identified for two main reasons:

1. To maintain demonstrable independence from the OSMP process and hence retain technical objectivity

2. To ensure there are sufficient technical resources to support the OSMP in the first instance. Once 4OSMP personnel have been identified, appropriate independent technical review panel members can then be sourced (either nationally or internationally) and convened.

The panel is envisaged to provide an independent advisory and technical review function. It is likely that there will also be stakeholder input into the selection of the independent review panel to ensure the panel has demonstrable objectivity, in the form of a Scientific Advisory Group (SAG).

The SAG will be identified from key stakeholders (e.g. identified in the Resource Register; see Section 2.5.1), such as regulatory agencies, other government agencies/departments and recognised Subject Matter Experts (SMEs) from key stakeholder groups. The SAG will include independent SMEs to provide an advisory and review function. Their role is to support development of sampling plans, provide input into the development of the survey array (distribution of sampling locations), facilitate access to baseline data (if required), review outcomes from sampling plans, and provide an additional avenue to allow consideration of stakeholder input. It is envisaged that this group will be managed outside of the OSMP organisational structure and will provide an independent advisory (rather than management) function. Engagement with independent technical and stakeholder groups will provide a process through which consideration of the requirements of external stakeholders (such as government agencies and other parties) can be facilitated.

The Equinor OSMP PM and RPS OSMP PM will engage with government agencies to request provision of SMEs for the SAG. During consultation, State control agencies identified that they would require the opportunity to supply SMEs to support both the Scientific Advisory Group (SAG), and OSMP scopes. This would add considerable value to the outcomes, through incorporation of site-specific knowledge of receptors and State regulatory processes, and through facilitation of engagement with the State IMT. To this end, contact details for specific State and Commonwealth agencies will be incorporated into the resource register, to allow government agencies to nominate and mobilise relevant SMEs based on scope and availability. The contacted agencies will be able to recommend input from other agencies, and a list of SMEs. Equinor will compile a list of key academic SMEs (from Commonwealth research organisations and academia) that will either be selected as technical leads for OSMP scopes, or for the SAG (depending on the needs of the response and the availability of key SMEs). It is important to include both governmental and academic SMEs to allow SAG inputs to be guided by a broad range of excellence and experience.

The RPS OSMP PM will then continue to engage with agencies to confirm which agency SMEs would participate in the SAG, and which would participate in field implementation of the OSMP. A SAG lead will be determined by the SAG themselves (for the purpose of independence), via an appropriate process (e.g. blind vote). The approvals support role identified in the organisational structure refers to a role that has been engaged to support the spill response, and therefore is outside the scope of this OSMP and not defined here. However, it is important to recognise this potential role in the organisational structure as it may engage with the OSMP leadership group(s) to provide some regulatory approvals support as part of the OSMP. Direct lines of communication between the approvals support role and the OSMP PM/Technical Leadership Group have not been identified on the organisational structure as this role would be embedded with the IMT, and hence communications would be via the Equinor OSMP PM and service provider (RPS) OSMP PM.

Technical leads are not obliged to follow SAG instructions or directives – this is a process where the SAG provide an independent assessment and provide constructive information for consideration. However, technical leads must demonstrate that they have considered SAG input, either through records of communications or in OSMP documentation.

2.4.1 Overarching OSMP management

The roles responsible for the overall management of the OSMPs, and integration, data transfer and communications between Equinor and the Service Provider (e.g. RPS) are defined in Table 2-1.

Table 2.1: OSMP management roles and responsibilities

Jurisdiction	Control agency	Reporting marine pollution incidents
Equinor OSMP Program Manager	• The Equinor OSMP PM is the direct line of communication and Management between Equinor and the OSMP Service Provider (e.g. RPS). The role facilitates information transfer between the Equinor IMT/internal management and stakeholders and Service Provider, manages the day-to-day needs of the project (including addressing operational needs/requests), and makes sure that the OSMP meets the needs of Equinor (including Equinor's regulatory requirements) and external independent review/stakeholder groups • *Qualifications*: Equinor requirements for an ENV Unit leader. • *Experience*: Preferable experience as ENV Unit leader.	• Overall responsibility for the implementation of the OSMP • Liaises with regulators and relevant authorities (e.g. AMSA) • Alerts RPS following a spill (including following a Level 1 spill where there is potential for escalation) • Provides official notification of the requirement for an OSMP response • Facilitates information transfer between the OSMP service provider (RPS) and the IMT/internal stakeholders • Coordinates communication/liaison between RPS and all other stakeholders • Provides and/or facilitates relevant permissions and contract approvals required to implement the OSMPs • Provides and/or facilitates support to the OSMP service provider (e.g. in the application of permits) • Jointly with RPS OSMP PM and SAG, determines termination of OSMP activities
RPS OSMP Program Manager	• Direct engagement with the Equinor OSMP PM. Responsible for the implementation and day-to-day management of the OSMPs, and information transfer between Equinor and the OSMP response teams • Management of communications between the OSMP Service Provider (e.g. RPS) and Equinor • *Qualifications*: Graduate level as a minimum • *Experience*: At least 15 years' experience, including management of multiple complex (i.e. comprising multiple scopes) extended duration offshore marine field survey programs	• First point of contact in the event that an OSMP response is required • Response initiation • Management of RPS personnel and subcontractors • Day-to-day responsibility for facilitating/coordinating OSMP monitoring activities • Direct engagement with the Equinor OSMP PM • Maintenance of RPS' preparedness • Overall responsibility for HSE of RPS personnel and subcontractors • Jointly with Equinor OSMP PM and SAG, determines termination of OSMP activities

2.4.2 Technical leadership group

The technical leadership group will be managed by the RPS OSMP PM and comprises the program leaders for each technical scope required to support delivery of the OSMPs. The group will have a nominated lead (the RPS OSMP Technical Director) who will represent the group in management meetings and be the focal point for communications. Several of the program leaders will be responsible for both OMP and SMP scopes, and hence program leaders are identified by the technical subjects that they have overarching responsibility for. The OSMPs that each program leader will be responsible for are outlined in Table 2-1. This approach recognises the technical and logistical linkages between scopes, then opportunity for operational efficiencies, the requirement for operational awareness between scopes (critical where OMPs and SMPs are implemented concurrently and where implemented sequentially), and the potential for efficiencies in data transfer, survey design and response to changes in risk (Health, Safety and/or Environmental).

Program leaders may or may not be full-time staff of the Service Provider (i.e. RPS). The role must be filled by the most qualified and experienced personnel available to minimise risk and maximise the quality of the OSMP studies and outputs. It is widely recognised that a single organisation would not be capable of resourcing a large-scale Level 3 OSMP response, and hence this approach fits with the requirements of such an incident.

The technical leadership role includes engagement with external groups as necessary (e.g. independent technical review and/or stakeholder groups), scientific robustness and planning of survey scopes, QA/QC and management of data analysis, interpretation and reporting. It must be noted that each role is unlikely to be filled by a single person – the operational requirements during the response phase and the potential longevity of the response (especially where scientific monitoring follows straight on from the termination of operational monitoring at the end of the response phase) require consideration of personnel requirements for daily shifts and periodic shift rotations to manage fatigue.

Table 2.2: Technical leadership roles and responsibilities

Role	Description	Responsibilities
OSMP Technical Leadership Group		
Modelling lead	• Responsible for the technical design and implementation of the modelling scope of works • *Qualifications*: PhD level/equivalent, or at least post-graduate level and demonstrable leader in their field • *Experience*: At least 15 years' professional experience, with at least 10 years' relevant experience in modelling and management of modelling scopes for the oil and gas industry	• Technical leadership of OMP1 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Identification of current and relevant scientific protocols • Identification of data analysis and interpretation methods • Reporting and/or review
Water quality lead	• Responsible for the technical design and implementation of the water quality scopes of work • *Qualifications*: Preferably post-graduate level as a minimum, though level of experience may be considered the primary selection factor • *Experience*: At least 15 years' professional experience in water quality sampling projects, including design of long-term, complex offshore and/or coastal water quality monitoring projects. Considerable practical experience and/or awareness of a wide range of sampling and data collection technologies (e.g. wave gliders, environmental monitoring sensors)	• Technical leadership of OMP3, OMP4 and SM1 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of appropriate laboratories, analytical methods, limits of detection and holding times • Identification of data analysis and interpretation methods • Reporting and/or review
Sediment quality lead	• Responsible for the technical design and implementation of the sediment quality and infauna scopes • *Qualifications*: PhD level/equivalent • *Experience*: At least 15 years' professional experience in sediment quality sampling projects, including design of long-term, complex offshore and/or coastal monitoring projects. Must have considerable experience of infaunal surveys as this component is included in this scope for practical purposes; or if not, must be supported by an infaunal Subject Matter Expert (SME). Considerable practical experience with a wide range of sampling and data collection technologies.	• Technical leadership of OMP6, SMP2 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of appropriate laboratories, analytical methods, limits of detection and holding times • Identification of data analysis and interpretation methods • Reporting and/or review

Role	Description	Responsibilities
Ecotoxicology lead	• Responsible for the technical design and implementation of ecotoxicological studies which may include assessments of the effects of hydrocarbons and/or dispersants/control agents on biota • *Qualifications*: PhD level/equivalent • *Experience*: Over 15 years' professional experience. Recognised leader in field	• Technical leadership of OMP4 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Identification of current and relevant scientific protocols • Identification of appropriate samples, laboratories, analytical methods and biota for testing • Identification of data analysis and interpretation methods • Reporting and/or review
Intertidal survey lead	• Responsible for the technical design and implementation of the intertidal survey scope of works. This role may be supported from SMEs for specific habitat types, e.g. mangroves, salt marshes, samphires, intertidal reef, sandy shores, turtle nesting beaches, as required • *Qualifications*: PhD level/equivalent • *Experience*: 15 years' professional experience as a minimum. Considerable experience in intertidal surveys and field sampling. Considerable practical experience with a wide range of sampling and data collection technologies. Must be able to apply a robust understanding of intertidal zonation and shore profiling to survey design. Does not require experience in all intertidal environments but must be able to engage effectively with SMEs to lead the scope	• Technical leadership of OMP5 and SMP3 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of appropriate laboratories, analytical methods, limits of detection and holding times • Identification of data analysis and interpretation methods • Reporting and/or review
Demersal biota lead	• Responsible for the technical design and implementation of studies of demersal biota. This role may require technical support from SMEs for different survey types (e.g. Stereo Baited Remote Underwater Video Systems (SBRUVS), benthic trawls, traps/pots) • *Qualifications*: PhD level/equivalent • *Experience*: 15 years' professional experience as a minimum. Considerable experience in the design, management and implementation of surveys of demersal biota/fish assemblages. Considerable practical experience with a wide range of sampling and data collection technologies	• Technical leadership of OMP5 and SMP3 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of data analysis and interpretation methods • Reporting and/or review

Role	Description	Responsibilities
Benthic habitats lead	• Responsible for the technical design and implementation of studies of benthic habitats. This role may require technical support from SMEs for different habitat types (e.g. Sponge beds at the ancient coastline Key Ecological Feature (KEF), other filter feeder habitats, kelp beds, deep water habitats) • *Qualifications*: PhD Level/equivalent • *Experience*: 15 years' professional experience as a minimum. Considerable experience in the design, management and implementation of surveys of benthic habitats. Considerable practical experience with a wide range of sampling and data collection technologies (e.g. towed video, Remotely Operated Vehicles (ROVs) and/or Autonomous Underwater Vehicles (AUVs))	• Technical leadership of OMP5 and SMP4 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of data analysis and interpretation methods • Reporting and/or review
Seabirds/ shorebirds lead	• Responsible for the technical design and implementation of the seabird and shorebird (including penguins and migratory species) scope of works. This role may require technical support from SMEs (e.g. for necroscopy) • *Qualifications*: Graduate level as a minimum if combined with considerable experience • *Experience*: Over 15 years' professional experience. Recognised leadership in the field. Previous experience of post-spill monitoring would be an advantage	• Technical leadership of SMP5 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of appropriate laboratories, analytical methods, limits of detection and holding times • Identification of data analysis and interpretation methods • Reporting and/or review
Marine megafauna lead	• Responsible for the technical design and implementation of studies of marine megafauna. This role may require technical support from SMEs for different types of megafauna (e.g. cetaceans, sharks/rays, pinnipeds and reptiles) or scope components (e.g. necroscopy) • *Qualifications*: Graduate level as a minimum, preferably with Marine Mammal Observer (MMO)/Marine Fauna Observer (MFO) qualifications • *Experience*: At least 10 years' professional experience. Preferably with field MMO/MFO experience. Previous experience of post-spill monitoring would be an advantage	• Technical leadership of SMP6 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of data analysis and interpretation methods • Reporting and/or review

Role	Description	Responsibilities
Plankton lead	• Responsible for the technical design and implementation of the phytoplankton and zooplankton scope of works. This scope may require technical support from SMEs (e.g. for fish larval analysis) • *Qualifications*: Post-graduate level • *Experience*: At least 15 years' professional experience, with considerable experience of plankton sampling and taxonomic analysis as part of large-scale coastal and/or offshore monitoring programs	• Technical leadership of SMP7 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of appropriate laboratories, analytical methods, limits of detection and holding times • Identification of data analysis and interpretation methods • Reporting and/or review
Fisheries and aquaculture lead	• Responsible for the technical design and implementation of the fisheries and aquaculture scope of works. This scope may require technical support from SMEs (e.g. for monitoring hydrocarbons in tissues (and necroscopy), fisheries population studies, and impacts to cultured fish, shellfish and macroalgae including growth, mortalities, human health risks and quality testing) • *Qualifications*: PhD level/equivalent • *Experience*: At least 15 years' professional experience, with considerable experience of fisheries surveys and/or aquaculture monitoring experience. Does not require experience in all components of the scope (e.g. tissue sampling, necroscopy, organoleptic testing) but must be able to engage effectively with SMEs to lead the scope	• Technical leadership of SMP8 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Input and review of work instructions/SAPs/PEPs • Identification of current and relevant scientific protocols and/or new processes and technologies • Identification of appropriate laboratories, analytical methods, limits of detection and holding times • Identification of data analysis and interpretation methods • Reporting and/or review
Recreation, heritage, conservation and native title lead	• Responsible for the technical design and implementation of studies to determine the potential impacts to, and recovery of, areas of particular recreation, heritage, conservation and Native Title importance • *Qualifications*: Graduate level as a minimum • *Experience*: At least 10 years' professional experience	• Technical leadership of SMP9 • Technical engagement with external independent review panel and stakeholder groups (as necessary) • Potential support of Equinor IMT • Survey planning and design of survey arrays (where appropriate) • Identification of additional potential survey equipment/ processes • Input and review of work instructions/SAPs/PEPs • Identification of data analysis and interpretation methods • Reporting and/or review

2.4.3 Operational management personnel

The roles responsible for the day-to-day management of survey operations and operational activities (including data management, QA/QC and reporting) are outlined in Table 2-3.

Table 2.3: Operational personnel roles and responsibilities

Role	Description	Responsibilities
Field operations coordinator	• Responsible for supporting the mobilisation and the day-to-day field management of OSMPs. They are required to engage with the internal management team and Equinor logistics (in line with the communications protocol) to resource, equip and maintain all survey operations • *Qualifications*: Graduate level as a minimum • *Experience*: At least 10 years' experience, including project management of multiple complex (i.e. comprising multiple scopes) extended duration offshore marine field survey programs. Fewer years' experience would be accepted for this role only where the candidate is demonstrably the best available person for the role (e.g. through demonstrated capability and significant experience in project management of multiple large-scale, complex offshore marine field survey programs)	• Day-to-day management of field teams • Engagement with subcontractors and analytical laboratories • Sourcing personnel, equipment and consumables for OSMPs, including managing shifts and periodic shift rotations • Coordinating logistics with Equinor (equipment, sample containers, travel and accommodation, supporting infrastructure, etc.) • Managing relevant survey permit applications and notifications • Coordinating sample pick-up and shipping to labs in line with sample holding times • Arranging sample labels (e.g. barcodes) with laboratory • First point of contact for field teams • Management of personnel qualification, medical and accreditation database • Communicating survey platform requirements (e.g. winches, a-frames, deck cranes, deck space, etc.) • Identification of additional survey requirements (e.g. winch wire/Dyneema for deployment of survey equipment from vessels)
HSE coordinator	• Responsible for all health, safety and environment (HSE) aspects of the OSMP scope • *Qualifications*: Graduate level as a minimum • *Experience*: Currently acting in the role of a senior HSE advisor for the Service Provider, with considerable experience of working with the offshore oil and gas industry	• Management of HSE plan, HAZIDs, and JHA preparation • Point of contact for Health, Safety and Environment issues • Provision of guidance in all HSE matters • Management of HSE reviews, incident investigation and reporting • Management of post-survey debriefs and lessons learned as part of an ongoing improvement process • Review of load testing information for equipment and additional components (e.g. winches, winch wire, Dyneema, etc.)
Document coordinator	• Responsible for the technical quality and delivery of OSMP documentation • *Qualifications*: Graduate level as a minimum • *Experience*: At least 5 years' professional experience. Previous project and/or document management experience. Must be well-organised and a good facilitator	• Management of document preparation schedules • Management of technical and professional reviews • Management of responses to external comments and delivery of amended documents

Role	Description	Responsibilities
Data manager/ quality lead	• Responsible for managing the collection, transmittal, QA/QC and delivery of all OSMP and laboratory data. Responsible for ensuring all QA/QC procedures are in place and that processes have been adhered to • *Qualifications*: Post-graduate level as a minimum • *Experience*: At least 10 years' professional experience, with considerable data management and QA/QC management experience. Must have previous demonstrable experience of data management and QA/QC management of large-scale monitoring projects with a range of data types and sources	• Management of the preparation and implementation of Standard Operating Procedures (SOPs) in line with appropriate guidance and standards • Management of QA/QC reviews • Development and implementation of the data and metadata management plan • Provision of data management and QA/QC guidance throughout the OSMP response • Responsible for managing data quality reviews, issues and lessons learned
Logistics support coordinator	• Provision of logistical support to the field operations coordinator. Engages with the Equinor IMT/corporate logistics coordinator where necessary and where the communications protocol allows. • Survey equipment and sample containers will arrive separately. The logistics support coordinator will manage collation of individual survey equipment, sample containers and consumables into batches for transfer to specific survey teams based on equipment lists provided in specific OSMPs (and modified where necessary during post-spill method development) • *Qualifications:* Graduate level as a minimum • *Experience:* Minimum of 5 years' experience, including providing logistical support to extended duration, complex offshore and/or coastal marine survey programs	• Coordinating transfer of specific equipment/components (e.g. winch wire/Dyneema) to Equinor logistics hub(s) • Managing the preparation of survey equipment batches for specific OSMP teams, prepared from equipment sourced from a range of suppliers • Arranging transfer of survey team equipment batches to Equinor logistics hub(s)
Party chiefs	• Responsible for overall vessel-based survey management (e.g. HSE, field communications, field operational management decisions) • *Qualifications:* Graduate level as a minimum • *Experience:* At least 5 years' professional experience, with considerable demonstrable experience as Party Chief or Technical Lead for extended duration, complex offshore and/or coastal marine survey programs	• Supporting logistics • Mobilisation/demobilisation of survey vessels • HSE processes and briefings • Daily communications and point of contact for the OSMP Program Manager/Field Operations Coordinator • Communications with vessel master • Facilitating the survey requirements of the field technical leads • Daily toolbox and pre-start briefings • Field daily reporting

Role	Description	Responsibilities
Field technical leads	• Responsible for the technical quality of survey operations, data and sample collection in the field • Responsible for all non-vessel-based survey management (e.g. HSE, field communications, field operational management decisions) • Refer to specific OMPs and SMPs for details of qualification and experience requirements	• Supporting mobilisation and demobilisation of equipment • Participating in HSE processes (e.g. HSE briefings, toolbox talks) • Coordinating day-to-day survey planning with the Party Chief and/or other Field technical leads (where appropriate) • Pre-survey vessel contamination risk assessment (to plan deck operations to minimise vessel-related sample contamination risks) • Field management of technical survey protocols, equipment, personnel and subcontractors • Deployment and retrieval of survey equipment • *In situ* collection of samples in line with approved SAP/PEP procedures • QA/QC of samples and sampling procedures • *In situ* identification of biota (where required) • Collection of relevant environmental data (e.g. sampling positions, depth, etc.) • Management of sampling data records (e.g. field sheets, data) and imagery • Sample processing and proper storage • Sample transfer and Chain of Custody (CoC) forms • All field personnel have stop work authority – safety is everyone's responsibility
Field survey personnel (field teams)	• Responsible for the collection of data and samples under the direction of the field technical lead • Refer to specific OSMPs for details of qualification and experience requirements	• Supporting mobilisation and demobilisation of equipment • Participating in HSE processes (e.g. HSE briefings, toolbox talks) • Deployment and retrieval of survey equipment • Labelling of sample containers • In situ collection of samples in line with approved SAP/PEP procedures • Sample processing and proper storage • Data entry • Sample transfer and Chain of Custody (CoC) forms • All field personnel have stop work authority – safety is everyone's responsibility

2.4.4 Office-based support personnel

RPS will make office-based personnel available as part of the broader OSMP response team to provide support in the following areas:

- Scientific, technical and regulatory approvals support
- Reporting and file management
- Record keeping (to compile and manage all communications, data and reports generated during the OSMP response, from activation to close-out)
- HSE
- Global Information Systems (GIS)
- QA/QC

- Database management
- Finance/accounting
- Logistics and resourcing
- Contracts
- Scheduling
- Communications
- Administration.

2.5 Resources

Information regarding subcontractors, equipment, personnel, analytical laboratories and survey platform requirements are compiled and maintained in an Excel spreadsheet format (subsequently referred to as the 'Resource Register'). The introduction to the Resource Register is found at Appendix B, see further details in Section 2.5.1 below. Resource suppliers will be identified based on a series of criteria that include, but are not limited to:

- Appropriate accreditation (e.g. laboratories with National Association of Testing Authorities (NATA) accreditation of relevant analytical methods)
- Able to provide the relevant services to the required level of accuracy/reliability/environmental parameter/limit of detection
- Able to calibrate equipment (where required)
- Able to provide robust, commonly used, scientifically accepted survey equipment
- Multiple units of appropriate survey equipment available (preferably within Australia) with spares
- Previous experience with the supplier/subcontractor
- Reliability and reputation of supplier/subcontractor
- Qualifications, accreditation and experience of subcontractor personnel
- Able to source and mobilise equipment rapidly
- Availability to respond to queries/issues with survey equipment should they arise
- Location (e.g. based in Australia or international)
- Minimum mobilisation times.

This approach allows continual evolution and development of the understanding of the OSMP support resources available. The intent is to incorporate redundancy through the identification of a greater range of resources than should be required to support an OSMP response to the Level 3 spill scenario defined in the activity-specific EP. This applies the precautionary principal to address:

- Periods of high resource requirements during the response phase (i.e. to address surge capacity)
- Availability of resources, with identification of other comparable contingency resources that could be rapidly mobilised should primary resources be unavailable

- Identification of consumables and/or additional equipment/resources required to use equipment in the field or to achieve operational quality criteria (e.g. positional accuracy)
- Replacement of equipment that is unavailable (e.g. for servicing), unreliable, damaged or has been lost.

Consideration of the geographic location of resources also allows identification of the closest appropriate resources to key mobilisation points/ports to optimise operational efficiency.

Equinor may choose to purchase equipment rather than secure equipment on long-term hire for cost-management reasons. RPS will provide specialist technical guidance on equipment and supplier selection where appropriate. In such cases, short-term hire of equipment may be implemented to address manufacturer delivery timeframes where rapid mobilisation is required (i.e. during the spill response phase).

Third parties will be engaged via MOUs, contracts, Master Services Agreements (MSAs) and call-off contracts prior to the oil spill response exercise. The scope and strength of the engagement process will depend on the individual requirements of Equinor and resource provider, the availability of the resources they are providing, and any identified schedule risks from different contracting options. Key/scarce resources (e.g. subject matter experts (SMEs) who are recognised leaders in their field and are required as OMP/SMP scope leads would be engaged via MOU contract or call-off contract. Suppliers of standard 'off the shelf' equipment that is freely available across Australia (e.g. Bunnings) will not require any contractual agreement. During preparation and revisions of the Resource Register, potential suppliers will be engaged with to agree the level of contractual arrangement required to ensure access to defined resources in a timely manner, should they be required. The type of agreement will be defined in the Resource Register and will be confirmed during planned exercises. To allow for potential limitations in availability, suppliers will be identified that can provide as a minimum the resources required to support the resource requirements for the WCD 129 day OSMP response scenario identified in Table 2.4, and up to three times the required resources, where feasible and practicable (considering that it is not feasible in all cases, e.g. for SMEs and some specialist equipment).

Table 2.4: Example OSMP response for a WCD 129 day release

Plan	Post-release pre-exposure baseline survey - no. survey units required	Number of offshore survey units required	Number of near-shore survey units required
OMP3 Monitoring of hydrocarbons Weathering and Behaviour in Marine Waters	0	7	20 (8 in SA, 4 in VIC, 4 in TAS, inc islands, 4 in NSW)
OMP4 Monitoring of Dispersants and Chemical Control Agents	0	6	
OMP5 Shoreline Assessment	0	0	20
SMP1 Assessment of Water Quality	3 offshore; 10 nearshore		
SMP2 Assessment of Impacts and Recovery of Benthic Sediments and Infauna	3 offshore; 10 nearshore		
SMP3 Assessment of Impacts and Recovery of Intertidal Habitats	22	0	0
SMP4 Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Fish	3 offshore; 12 nearshore		
SMP5 Assessment of Impacts and Recovery of Seabirds and Shorebirds	5	0	0
SMP6 Assessment of Impacts and Recovery of Marine Megafauna	4 (plus observers on vessels for other scopes)	(observers on vessels used for other scopes only)	
SMP7 Assessment of Impacts and Recovery of Plankton	Combined with SMP1		
SMP8 Assessment of Impacts and Recovery of Fisheries and Aquaculture	15 (2 offshore and 5 nearshore and 8 intertidal)		
SMP9 Assessment of Impacts and Recovery Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance	12	0	0

Equinor holds a call-off contract with RPS which will provide the primary spill response monitoring team and this can be done within 24 – 48 hours. Most of the other third-party providers are known to RPS and pre-spud tests will show their availability.

2.5.1 Resource register

The Resource Register (Appendix B) will be used to manage and demonstrate preparedness. It will be maintained as a 'live' document and will be the responsibility of the RPS OSMP PM (though this task may be delegated to the Field Operations Coordinator following activation of the OSMP response). The Resource Register can be continually updated and enhanced to include additional personnel, equipment and suppliers to allow incorporation of new technologies or techniques where appropriate to study objectives (additional information to support implementation will be provided in appendices to relevant OSMPs). This approach also allows consideration of the natural movement of personnel within the employment market.

Due to the variable nature of the potential spill, with respect to direction and resources at risk, an estimate of potential OSMP response need has been identified based on the worst-case discharge (WCD) greatest shoreline accumulation deterministic run (Table 2-4). Using this run is considered a robust approach because it is representative of easterly-travelling spills, which characterised ~70% of the stochastic runs and the areas where oil would be freshest. Considering the highly conservative approach of using a deterministic worst-case discharge (WCD), it is considered that demonstrating that the available capacity of personnel and vessels/ equipment for this scenario (as will be used in the oil spill response exercise) covers the upper extent of spatial up-scaling.

The estimated resources required for response in each OSMP study (in terms of numbers of survey units) and mobilisation times have been included in Table 2-4. Full mobilisation of SMP scopes will be undertaken once the response phase (including OMP monitoring) has been completed and some plans do not require a continuous response and will be mobilised seasonally to annually as appropriate to the final plan. To take this into account, the supplied OSMP Resources Register considers potential time to mobilise to the field, not timeframes for mobilisation over the duration of response, allowing for the mobilisation of additional resources at different times to respond to a different nature and scale, should they be required. While dedicated SMP resources will be required for post-release, pre-exposure, baseline data collection (Table 2-4), there is some potential for resources to be shared between the OMPs and SMPs. During response, nearshore and intertidal survey priorities will be refined on the basis of situational information, and resources re-allocated from longer lead time sampling activities where required (e.g. those planned for >60 days). This will provide flexibility in resourcing across generalist skillsets.

It is assumed that not all of the resources from individual providers will be available at any one time. To account for this, the resource register will include provider details for two to three times the number of resources required to support the response (as defined in Table 2-4). The OSMP Resources Register identifies the resources required to support the level of response tested in the oil spill response exercise and outlines contractual arrangements to demonstrate the reliability of the resourcing plan.

The Resource Register also allows for testing of the availability of resources, providing records (e.g. date/time-stamped pdf files) that can be used to assess adequacy in preparedness over time. Where gaps or inadequacies are identified, the QA/QC process requires that additional resources relevant to non-compliances be identified and resourced.

Resources in the register will be reviewed quarterly (e.g. against new baseline study methods) and tested during the spill response exercise. Lessons learned during the response exercise will be actioned to demonstrate preparedness prior to mobilisation of the drilling activity.

Table 2.5: OSMP survey unit requirements for the first 60 days of the response phase, based on the unmitigated WCD greatest shoreline accumulation deterministic run

Monitoring plan	Number of offshore survey units	Number of near-shore survey units	Number of intertidal (shoreline) survey units
Operational monitoring			
OMP1 Oil Spill Modelling	NA		
OMP2 Surveillance and Tracking	(supported by observations and information from spill responders and OMP3, OMP4, OMP5 and OMP6)		
OMP3 Monitoring of hydrocarbons Weathering and Behaviour in Marine Waters	5	16 (8 in SA, 4 in VIC, 4 in TAS, inc. islands, 0 required in NSW until > day 100)	Combined with OMP5
OMP4 Monitoring of Dispersants and Chemical Control Agents	5		
OMP5 Shoreline Assessment	0	0	24 (12 in SA by day 20*, 6 in VIC by day 42*, 6 in TAS by day 53*, inc. islands. No teams are required in NSW until > day 100)
OMP6 Identification of Impacts to Benthic and Demersal Biota	3	12	0
Scientific monitoring conducted during the response phase (i.e. post-release pre-exposure baseline data collection			
SMP1 Assessment of Water Quality	3	8	0
SMP2 Assessment of Impacts and Recovery of Benthic Sediments and Infauna	3	8	0
SMP3 Assessment of Impacts and Recovery of Intertidal Habitats	0	0	18
SMP4 Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Fish	3	8	0
SMP5 Assessment of Impacts and Recovery of Seabirds and Shorebirds	0	0	3
SMP6 Assessment of Impacts and Recovery of Marine Megafauna	3 (plus observers on vessels for other scopes)		0
SMP7 Assessment of Impacts and Recovery of Plankton	Combined with SMP1		0
SMP8 Assessment of Impacts and Recovery of Fisheries and Aquaculture	2	4	6
SMP9 Assessment of Impacts and Recovery of Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance	0	0	8

Table 2.6: Minimum time to oil exposure for response planning (based on WCD 129-day stochastic modelling)

	Offshore Commonwealth waters	South Australian Shorelines	Victorian shorelines	Tasmanian shorelines	New South Wales Shorelines	Western Australia
Minimum time to shore	0 days	21 days	44 days	55 days	105 days	56 days
Earliest units mobilised	On site within 9 days	Nearshore – by day 18 Shoreline – by day 19* (as first shorelines contacted are offshore and inaccessible)	Nearshore – by day 40 for western Victoria. Shoreline – by day 41* as first shorelines contacted are offshore and inaccessible)	Nearshore – by day 52 for King Island. Shoreline – by day 53* (as first shorelines contacted are on King Island)	Nearshore – by day 102 for the New South Wales south coast. Shoreline – earliest by day 103*.	Nearshore- by day 53 for WA south coast.

Note: The Resource Register will focus on the requirement to implement field operations. It will not provide details of the support personnel requirements detailed in Section 2.4.4 as these roles are not considered a limiting factor for effective field mobilisation and ongoing maintenance of the OSMP response.

2.5.2 Core OSMP personnel and equipment requirements

The core personnel requirements for each of the six OMPs and nine SMPs are detailed in each monitoring plan and are summarised in Table 2-6. The core requirements (= 'survey units') specified are the minimum required to implement a specific OMP or SMP response for a single shift on a single survey platform (e.g. vessel) or shoreline. These survey units have been defined to allow a flexible response to an evolving situation. To increase response, the number of survey units can be increased. This approach allows flexibility to implement multiple monitoring plans from the same survey vessel through undertaking different scopes on different shifts (24/7 operations).

The OMP and SMP plans define the equipment and resources required for a 'survey unit' (summarised in Table 2-6) to facilitate scaling of response in terms of numbers of survey units. Full mobilisation of SMP scopes will only be undertaken once the response phase has been completed, though limited SMP scopes will be undertaken during the response phase to support post-release pre-exposure baseline data collection. As SMPs are not continuous response actions, this allows some resources to be shared between the OMPs and SMPs. Resources can also be activated at different stages dependant on the nature and scale of response required.

Note: Survey units do not include allocation of Party Chiefs to avoid duplication of this role in combined operations.

2.5.3 Personnel safety and security training requirements

The technical requirements and level of experience for each role are specified in Section 2.4 (for OSMP management and leadership teams) or individual OSMPs. Field personnel will also require the following valid and in-date safety and security training, accreditation and assessments as a minimum:

- Medical (e.g. UKOG offshore medical, or equivalent)
- Basic Offshore Safety Induction and Emergency Training (BOSIET) or Tropical Basic Offshore Safety Induction and Emergency Training (TBOSIET). The BOSIET and TBOSIET include Helicopter Underwater Escape Training (HUET).

Note: For personnel who require training or renewal during the OSMP response, a BOSIET or TBOSIET would be arranged for offshore operations.

In addition, there will be a requirement for at least one person with current Senior First Aid certification (or equivalent) per field team as a minimum.

Key RPS personnel identified in the OSMP Resource Register (Appendix B) will have in-date certification prior to spud. Training records of RPS personnel will be maintained, and relevant training will be renewed when required throughout the duration of the Stromlo-1 drilling campaign.

Before commencing field work for any project, all field personnel (including subcontractors) must undertake the RPS Project Induction (completed by RPS), the RPS HSE Induction, as well as any additional client required inductions. The purpose of these is to brief all personnel on project scopes and the risks identified during a Hazard Identification (HAZID) workshop.

Any required port- or site-specific inductions will be arranged during mobilisation. Vessel inductions will include a survival suit/cold water survival component, to familiarise those with TBOSIETs with the use of survival suits and identify key cold-water survival recommendations. Vessel safety drills will incorporate survival suits to develop practical experience in their fitting and use.

Table 2.7: Core OSMP survey unit requirements

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
Operational monitoring			
OMP1	Oil Spill Modelling	Not applicable (no field component)	Not applicable
OMP2	Surveillance and Tracking	Not applicable (no field component)* *Field scopes (of for example, satellite tracking buoy deployment) managed directly by IMT	Not applicable
OMP3	Monitoring of Hydrocarbons: Weathering and Behaviour in Marine Waters	• Water quality field lead • Water quality field scientist/ technician • Party chief	• Bomb samplers, Niskin bottles and/or van Dorn water samplers (plus spares and extra spare messenger weights) • Water quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter and conductivity/ temperature/depth (CTD) sensors • GO nets (pre-cleaned or new pre-packaged nets) • AGI Slick samplers with fishing pole, line and disposable floats (which will be discarded after every sampling attempt) • Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) for sampling surface hydrocarbons and for GO nets • Extendable sampling pole/boat hooks • Spares kits and tool kits • Laptop computer and backup (with appropriate software) • Uninterruptible Power Supply (UPS) unit plus spare • GPS plus spare unit • Eskies with ice blocks • Consumables • Optional: • Additional sensors for water quality logger (turbidity, particle analyser, fluorimeters (chlorophyll and coloured dissolved organic matter (CDOM)), dissolved oxygen (DO) • Wave glides with hydrocarbon fluorimeter, CTD, DO, current profiler
OMP4	Monitoring of Dispersants and Chemical Control Agents	• Water quality field lead	• Survey navigation software plus GPS unit/vessel GPS access and/or hand-held GPS unit plus spare • 100 ml & 250 ml beakers • 125 ml separating funnels

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
		• Water quality field scientist/ technician • Party chief	• 125 ml measuring cylinders • 250 ml conical flasks with caps • plastic disposable syringes • 15 ml vials • 3 x wide-mouth amber glass jar with Teflon-lined lid (min. 350 ml) • 3 x bomb samplers and/or Niskin Bottles (plus 2 spares and 2 extra spare messenger weights) • Water quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter and CTD sensors • Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) for sampling surface hydrocarbons (both for analysis and to collect representative hydrocarbon samples for QET/SQT testing) 2 x extendable sampling pole/boat hooks Water quality profiler(s) with: • Calibrated hydrocarbon fluorimeter • Calibrated multi-channel fluorimeter • Particle analyser, e.g. Laser In-Situ Scattering and Transmissometry (LISST, LISST-DEEP or equivalent) with a range of 2.5 to 2,000 µm if practicable • Turbidity logger • Dissolved oxygen (DO) sensor (e.g. calibrated using Winkler titrations) • In situ carbon dioxide sensor Volatile Organic Compounds (VOCs) in Air: • Hand-held Volatile Organic Compound meter / Lower Explosive Limit (LEL) monitor Optional: • Real-time CTD/Fluorometer/ oxygen sensor with Niskin rosette • Acoustic sensor if close to plume (if available – may still be in assessment and validation phase) • Gas Chromatography-Mass Spectrometry (GC-MS) with flame ionization detector (FID) capability on board vessel to determine Total Petroleum Hydrocarbons (TPH) • ROV-mounted SilCam (depth-rated to 3,000 m) for in-plume measurement of droplet sizes from 100-12,000 µm (Exponent and Sintef 2018) • Handheld thermal imaging camera to measure temperature differentials between effective and less effective dispersant/oil interactions (surface dispersant application only)Wave glider(s) with: – Hydrocarbon fluorimeter – CTD sensor – DO sensor – Current profiler Volatile Organic Compounds (VOCs) in Air: • Calibrated pump and specific sorbent tubes to determine identification and concentration of VOCs (requires laboratory analysis) – Photo Ionisation Detectors (PID)
OMP5	Shoreline Assessment	• Shoreline survey field lead • Shoreline survey field scientist/ technician	• Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) • 250 ml glass jars with lids • PVC or perspex corer (2–5 cm diameter) • Core (e.g. split PVC plastic pipe) • Siphon • 0.1 m^2 x 10 cm sand box quadrat, or equivalent (otherwise known as a metal perimeter; a metal box without a top or bottom)

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
		• Plus UAV pilot if required	• Palette knife or other flat metal blade • Compass • Mobile/satellite phone(s) • Radio • Multiple metal measuring tapes (30 m+) and metal rulers • Quadrats (0.1 and 1 m^2) • Metal spades/trowels/flat blades/scoops • Theodolite or dumpy level with tripod • Jam jar lids • Tall pole or cross-staff • Self-recording depth sensors or CTD sensors • Poles • Hammer • Marker stakes • UAVs
OMP6	Identification of Impacts to Benthic and Demersal Biota	• Benthic and demersal biota field lead • Benthic and demersal biota field scientist/ technician • Party chief Plus optionally: • ROV pilot • ROV technician • AUV technician • SBRUVs technician	• Video camera system (rated to an appropriate depth) • Video top box (including remote image capture system, image recording system, video overlay unit) • Video frame with mounts for multiple camera angles (must include 30° below horizontal), which can be converted from towed to drop-down orientations • ELVis-type sealed system with vertical camera mount and horizontal lighting mount and spares • Weights for video frame • 2 x halogen lights or 3 x LED light bars plus spares • Video cables sufficient for depth +50% plus spares • Sufficient distilled water to refill ELVis several times/day • USBL • ROV rated to appropriate depth plus spare • On-board camera of appropriate image resolution with backup • Halogen/LED lighting system • Video overlay • On-board gyro compass or equivalent • ROV top box (for viewing and recording imagery) and controller • On-board USBL or equivalent positioning technology • Scaling lasers • Control/video cables sufficient for depth +50% minimum plus spares • Weight block with shackle ring • AUV with on-board navigation software
			• Satellite telemetry communications system/WiFi/mobile network • On-board video/stills cameras of appropriate image quality • High-accuracy navigation system and GPS • Depth sensor • SBRUVs 2 x self-contained video systems (rated to an appropriate depth) • PVC tubes • Galvanised SBRUVs frames (horizontal look-outward systems) • Weights • Diode arms • Diodes • Bait arms plus spares

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
			• Bait bags plus spares • Self-contained Halogen or LED lighting and/or lighting with external battery housing • Laser scaling • Marker buoys (2 sets) • Shackles • Rope • Bait • Bait bin and lid • Grapple • SBRUV spares kit
Scientific monitoring			
SMP1	Assessment of Water Quality	• Water quality field lead • Water quality field scientist/ technician • Party chief	• Survey navigation software plus GPS unit/vessel GPS access and/or hand-held GPS unit plus spare • Wide-mouth amber glass jar with Teflon-lined lid (min. 350 ml) for surface water sampling • 3 x bomb samplers, Niskin bottles and/or van Dorn water samplers (plus 2 spares and 2 extra spare messenger weights) • Water quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter and CTD sensors • Water sampling Niskin Rosette* with CTD profiler (plus spare Niskin bottles, CTDs, etc.) rated to the appropriate sampling depth(s) Optional: • Additions to the water quality profiler: • turbidity logger • particle analyser • CDOM fluorimeter • chlorophyll fluorimeter • DO sensor • Wave glider(s)** with: • hydrocarbon fluorimeter • CTD sensor • DO sensor • current profiler
SMP2	Assessment of Impacts and Recovery of Benthic Sediments and Infauna	• Sediment quality field lead • Sediment quality field scientist/ technician • Party chief	• Grab sampler (minimum 0.025 m^2 in shallow coastal areas where samples may be hand-hauled; minimum 0.1 m^2 otherwise)/box core (0.1 m^2) plus spare. The spare need not be of the same type to allow for variability in sediment types • Rope for deployment of 0.025 m^2 grab • White plastic tray for 0.025 m^2 grab sample • Grab table/stand (if required) • Corer or multi-corer with 0.01 m^2 cores and spare • Spare cores • Sampler spares kits • 0.0024 m^2 corer and spare • Sample storage tub(s) with secure lids • 7% magnesium chloride ($MgCl_2$) • Sampler spares kits • Sample storage tub(s) with secure lids • USBL system • Endecott sieves (1 mm) • Wash bottles

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
			• Sieving station • 10% buffered formalin (buffer = disodium tetraborate) or 80% ethanol • Plastic containers for making up formal-saline (25 L with tap) if required • Saltwater deck hose with variable flow
SMP3	Assessment of Impacts and Recovery of Intertidal Habitats	• Shoreline survey field lead • 2 x shoreline survey field scientists/ technicians • Plus UAV pilot if required	• PVC or perspex corer (2–5 cm diameter) • Core (e.g. split PVC plastic pipe) • Siphon • 0.1 m^2 x 10 cm sand box quadrat or equivalent (otherwise known as a metal perimeter; a metal box without a top or bottom) • Palette knife or other flat metal blade • Spades/shovels/trowels/scoops • Compass • Mobile/satellite phone(s) • Radio • Multiple metal measuring tapes (30 m+) and metal rulers • Quadrats (0.01, 0.1 and 1 m^2) • Theodolite or dumpy level with tripod • Jam jar lids • Tall pole or cross-staff • Self-recording depth sensors or CTD sensors • Poles • Hammer • Marker stakes • UAVs Optional: • Trimble GPS mobile mapping unit, or equivalent
SMP4	Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Biota	• Benthic and demersal biota field lead • Benthic and demersal biota field scientist/ technician • Party chief Plus optionally: • ROV pilot • ROV technician • AUV technician • SBRUVs technician	• Video camera system (rated to an appropriate depth) • Video top box (including remote image capture system, image recording system, video overlay unit) • Video frame with mounts for multiple camera angles (must include 30° below horizontal) which can be converted from towed to drop-down orientations • ELVis-type sealed system with vertical camera mount and horizontal lighting mount and spares • Weights for video frame • 2 x halogen lights or 3 x LED light bars plus spares • Video cables sufficient for depth +50% plus spares • Sufficient distilled water to refill ELVis several times/day • USBL • ROV rated to appropriate depth plus spare • On-board camera of appropriate image resolution with backup • Halogen/LED lighting system • Video overlay • On-board gyro compass or equivalent • ROV top box (for viewing and recording imagery) and controller • On-board USBL or equivalent positioning technology • Scaling lasers • Control/video cables sufficient for depth +50% minimum plus spares • Weight block with shackle ring • AUV with on-board navigation software

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
			• Satellite telemetry communications system/WiFi/mobile network • On-board video/stills cameras of appropriate image quality • High-accuracy navigation system and GPS • Depth sensor • SBRUVs 2 x self-contained video systems (rated to an appropriate depth) • PVC tubes • Galvanised SBRUVs frames (horizontal look-outward systems) • Weights • Diode arms • Diodes • Bait arms plus spares • Bait bags plus spares • Self-contained Halogen or LED lighting and/or lighting with external battery housing • Laser scaling • Marker buoys (2 sets) • Shackles • Rope • Bait • Bait bin and lid • Grapple • SBRUV spares kit
			• 4 m scientific beam trawl, 2 m scientific beam trawl, Florida flyer, otter trawl or prawn trawl with spare(s) • Spares, including kit for repairing nets • Trawl box(es) • Fisheries (hanging) scales • Fish measuring boards (various sizes) • Dial callipers (e.g. Mitutoyo dial callipers) and/or Vernier callipers • Field identification keys/books • 10 L buckets with lids • 1 L buckets with lids • Internal sample labels, pre-printed on waterproof paper • Naturalist's dredge, box dredge, anchor dredge or pipe dredge with spares kit • Hoppers/tubs for holding samples for processing
SMP5	Assessment of Impacts and Recovery of Seabirds and Shorebirds	• Seabirds/ shorebirds field lead • 2 x seabird/ shorebird survey field scientist/ technicians Optional: • Uav pilot	• Laptop computer and backup (with appropriate software) • Hand-held GPS plus spare unit(s) • Digital stills camera(s) and digital video camera(s) plus waterproof housing if required, plus spares (memory cards/batteries) • Tape measures and transect tapes (up to 50 m) • Binoculars (8 x 30 and/or 10 x 50) • Spotting scope with tripod (magnification x 20 to x 60) • Measurement implements (e.g. Vernier callipers) • Radios, mobile phones, satellite phones • Nitrile gloves • Eskies with ice blocks (frozen) • Large heavy-duty plastic bags • Consumables Optional:

Plan ref.	Plan name	Minimum core personnel requirements	Minimum core equipment requirements
			• Unmanned Aerial Vehicles (UAVs) if required
SMP6	Assessment of Impacts and Recovery of Marine Megafauna	• Marine megafauna field lead • 2 x marine megafauna field scientist/ technicians Optional: • UAV pilot	• Laptop computer and backup (with appropriate software) • Hand-held GPS plus spare unit • Digital stills camera(s) and digital video camera(s) plus waterproof housing if required, plus spares (memory cards/batteries) • Tape measures and transect tapes (up to 50 m) • Binoculars (8 x 30 and/or 10 x 50) • Spotting scope with tripod (magnification x 20 to x 60) • Measurement implements (e.g. Vernier callipers) • Radios, mobile phones, satellite phones • Sufficient winch wire (rated) for depths to be sampled • Nitrile gloves • Eskies with ice blocks (frozen) • Consumables Optional: • Unmanned Aerial Vehicles (UAVs) if required, with full redundancy and spares kits
SMP7	Assessment of Impacts and Recovery of Plankton	• Plankton field lead • Plankton field scientist/ technician • Party chief	• Phytoplankton net (e.g. 20 µm mesh) plus spares • Zooplankton net (e.g. 100 µm mesh) plus spares • 125 ml plastic sample containers with lids • 100 µm mesh sieve • Rope for deployment of plankton nets • Sampler spares kits • Wash bottles • CTD sensors plus spare • Saltwater deck hose with variable flow
SMP8	Assessment of Impacts and Recovery of Fisheries and Aquaculture	• Fisheries and aquaculture field lead • Fisheries and aquaculture field scientist/ technician • Party chief	• Appropriate commercial trawl gear (e.g. Florida Flyer, Otter Trawl) • Trawl sample tray • Trawl spares kits • Sample storage tub(s) with secure lids • Wash bottles • 10% buffered formalin (buffer = disodium tetraborate), or 80% ethanol • Plastic containers for making up formalin (25 L with tap) if required • Saltwater deck hose with variable flow • Pots (single/fleets) • Spare pots • Spares kits • Commercial hook and line equipment • Recreational rod and line equipment
SMP9	Assessment of Impacts and Recovery of Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance	Desk study managed by the recreation, heritage, conservation and native title lead	• Desk study; but will utilise data captured by other relevant SMPs and will be reliant on applying outcomes against relevant management plans and objectives. Will require a great deal of stakeholder engagement and communications.

2.6 Health, safety and environment

HSE performance will be managed through Equinor's Management System. This system requires all contracted companies to have an HSE management system in place.

The RPS Safety Management System is an integrated component of its total Integrated Management System and is AS/NZS 4801:2001 & BS OHSAS 18001 certified. It defines the RPS processes used to achieve consultation, management ownership, periodic management system reviews and ongoing continual improvement, and forms the framework around which health and safety is managed within the organisation.

2.6.1 RPS HSE personnel

RPS has identified senior HSE personnel who are available to provide rapid response capability during an oil spill emergency:

- David Goff
- Gavan Wise.

These people can be mobilised to relevant ports and/or to study sites where necessary. The list may be updated from time to time.

2.6.2 HSE plan and HAZIDs

A draft HSE Plan for OSMP activities will be developed prior to mobilisation of the petroleum activity, which will be updated as relevant should OSMP activation occur. Operational monitoring will be undertaken during the response phase to support situational awareness and allow evaluation of spill response activities. There are inherent risks associated with working in a hydrocarbon spill area that need full consideration. Such risks include the potential exposure of operational personnel to hazardous hydrocarbon compounds (e.g. volatile organic compounds (VOCs) or benzene, toluene, ethylbenzenes and xylenes (BTEX)), and management actions such as safe work limits will be defined based on recommendations in the Equinor HSE plan.

Hazard Identification workshop(s) (HAZIDs) will be undertaken as soon as survey plans are finalised. Where feasible, HAZIDs will cover multiple OSMP scopes for efficiency and expediency. Workshops will be attended by HSE, technical and management personnel, plus relevant Equinor personnel. Where feasible, vessel owners/operators and subcontractors may be asked join via telephone if they cannot attend in person.

2.6.3 Job hazard analysis (JHAs) and MSDSs

RPS will prepare appropriate draft Job Hazard Analyses (JHAs) for the implementation of operational and scientific monitoring plans, prior to mobilisation of the petroleum activity. These will be reviewed following RPS activation and updated as required for the specific response requirements and situation at the time. Additional JHAs will be developed and implemented as required. Some sampling may require the use of chemicals for cleaning and/or storage of samples, in which case Material Safety Data Sheets (MSDSs) for relevant chemicals (and copies of the draft JHAs) will be appended to the HSE Plan.

2.6.4 Emergency response (RPS)

RPS' Emergency Response team may be engaged upon escalation by the RPS OSMP PM. RPS has a three-tiered emergency response model with plans in place in the event of any emergency situation occurring in the course of the Company operations in the Australia Asia Pacific region.

A second-tier emergency contingency resides within the specific RPS Business Unit Team that would support and direct RPS OSMP project team members in response to larger scale emergencies, where coordination of events is required. RPS staff in emergency response roles are provided suitable training and routinely participate in emergency response exercises.

If emergency response is required during the delivery of the operational and scientific monitoring studies, the Equinor Emergency Response Plan (ERP), Mobile Offshore Drilling Unit (MODU) or drilling rig ERP, and/or vessel ERPs (as applicable) would be implemented. All RPS personnel, including subcontractors, will operate under the RPS ERP.

2.6.5 Personal protective equipment (PPE)

All field staff will have appropriate Personal Protective Equipment (PPE) in suitable condition. As a minimum, these will include:

- Long-sleeved high visibility work shirts
- Spare safety overalls
- AS compliant hard hat with wide brim
- Sun visors/shade hat
- AS compliant boots with protective steel toecaps and/or gumboots with protective steel toecaps
- AS compliant gloves (rigger gloves and access to rubber/nitrile gloves for sample processing)
- Glove clips
- AS compliant eye protection – both clear safety glasses (AS/NZS1337) and polarised sunglasses
- Wet weather gear (appropriate for the Southern Ocean if offshore)
- Cold weather gear (appropriate for the Southern Ocean, and able to be worn beneath wet weather gear where necessary)
- Beanie hats and warm gloves (suitable for wearing under hard hats and waterproof protective gloves)
- Sunscreen
- Insect repellent (jungle formula)
- Earplugs
- Personal first aid kit.

Additional items of PPE will be issued where appropriate to the environment to be sampled (e.g. personal flotation devices (PFDs) on vessels to meet Australian Standards Offshore (ISO 12402-1), ear defenders and personal radios for intertidal or vessel-based surveys).

2.7 OMP considerations

Operational monitoring will be undertaken during a relatively constrained time period (<1 year) and requires rapid mobilisation. The data requirements for operational monitoring are much less rigorous than those for scientific monitoring (i.e. mostly qualitative data rather than quantitative data), though still robust and defendable.

Operational monitoring data is used to provide information on the:

- Extent and potential impacts of the spill
- Effectiveness and potential impacts (positive and negative) of spill response activities.

Rapid collection and dissemination (to Equinor) of operational monitoring data is a critical component of the spill response process.

2.8 SMP considerations

Field-based operational monitoring activities will be terminated at the completion of the response phase, but it is likely that the personnel and resources may transition immediately into scientific monitoring. This will be appropriately considered in HSE and QA/QC planning (e.g. fatigue management and sample/data management).

Scientific monitoring may be undertaken during the response phase and post-response phase. As with operational monitoring, response phase SMPs must be mobilised quickly but must also have the same level of scientific robustness as post-response scientific monitoring.

During the response phase, scientific monitoring is used to:

- Provide quantitative data on the extent and potential impacts of the spill (supporting situational awareness).
- Provide quantitative data on the effectiveness and potential impacts (positive and negative) of spill response activities.
- Collect post-release pre-exposure baseline data.

During the post-response phase, scientific monitoring is used to:

- Provide quantitative, scientifically robust and defensible data on the impacts of the spill to environmental and socio-economic values and sensitivities.
- Identify and quantify recovery from spill impacts.
- Provide scientifically-robust and defensible analyses of the impacts of spill response activities.

Scientific monitoring will capture (but not be limited to) data on species, habitats and areas of nature conservation and/or socio-economic importance (in line with Section 4 of NOPSEMA, 2016). The data collected will identify any direct impacts of the spill on these receptors. The scientific monitoring data will also provide evidence that may demonstrate potential indirect impacts that may have longer-term consequences on sensitive receptors; for example, disruptions in food webs or changes in critical habitats or habitat providers/modifiers.

Scientific monitoring can occur over a relatively unconstrained time period (>5 years) to track impacts and recovery over time, while accounting for seasonal and inter-annual variability. This requires effective fatigue management planning, and maintenance of high-quality sampling, and sample and data management.

2.9 Baseline data considerations

A gap analysis/review of Great Australian Bight (GAB) baseline data availability, survey/monitoring methods and outcomes is required as part of the preparedness phase. The outcomes of this review will inform the technical leadership group of gaps in baseline data that may be required to be addressed during a response.

Post-release pre-exposure (‘reactive’) baseline data collection will apply scientific monitoring methods to collect opportunistic quantitative data for values and sensitive receptors relevant to SMP scopes within and where appropriate, outside the EMBA. Reactive baseline surveys will target (where possible):

- Representative locations within the wider EMBA
- Locations that had previously been sampled as part of the GAB Research program (e.g. to allow consideration of temporal variability between baseline datasets and OSMP monitoring)
- Sensitive receptor locations identified in the activity-specific Environment Plan (where ‘time to exposure’ estimates allow).

These surveys will exclude areas that are known to be impacted by other anthropogenic activities (such as dredging projects).

Post-release pre-exposure ('reactive') baseline data collected during the response phase must not be considered as being a sufficiently-robust baseline dataset for post-impact comparison (e.g. for beyond BACI study designs – see Section 4.4). These data would be collected opportunistically rather than systematically, which means there are likely to be key gaps in the dataset. Any data collected may be used to supplement the data collected as part of the GAB Research Program (undertaken by CSIRO and SARDI). This will be the primary source of baseline data for the region.

A gap analysis will be undertaken to identify any technical scope areas unsupported by available baseline data. Additional baseline data from Western Australia, Tasmania and New South Wales shall be identified and sourced should waters in these jurisdictions fall within the EMBA. In the event of a hydrocarbon release, datasets will be requested from individuals or organisations to enhance the quality and/or spatial coverage of the baseline dataset. Data mining of publicly available data will also be used to identify potential sources of data or access datasets/reports (e.g. monthly MODIS-derived Coloured Dissolved Organic Matter (CDOM) datasets for ocean surface waters for the Australian EEZ and surrounding waters from January 2009 to December 2011 are freely available from GeoScience Australia[1]).

A review of the baseline data collection methods will be undertaken to understand the methodological approaches used to align OSMP sampling methods with baseline methods (to allow direct comparison). A critical assessment of the methods used in baseline data capture will be undertaken to identify potential limitations relevant to the requirements of each OSMP, or to identify new methods or technologies that may be more appropriate for the scope (e.g. in terms of improved data quality or density). Where alternative methods are identified and implemented in the OSMP studies, a scientifically-robust approach will be defined to allow direct comparison of baseline and OSMP data (e.g. conversions to different measurement units).

An initial record of baseline data (Appendix A) includes the CSIRO/ SARDI GAB Research Project studies, which were part-funded by Equinor and have been described in Section 4 and Appendix 7-3 of the EP. The record also lists peer-reviewed journal articles and privately or agency- held datasets from known, ongoing long-term monitoring studies, such as Port Authority and other industry monitoring programs that do not typically present their monitoring data as peer-reviewed research, but nonetheless hold valuable and relevant baseline data.

2.10 Permit requirements

OSMP field survey operations may be undertaken in both Commonwealth and state waters (the latter extend from the mean low water mark to the three-nautical mile limit) and a hydrocarbon release could conceivably reach both mainland and Tasmanian state waters (which are determined based on modelling outcomes and verified through surveillance during a spill). The permits generally required by the Commonwealth, Victoria, South Australia (SA), New South Wales (NSW), Tasmanian and Western Australian (WA) governments are listed in Table 2-7

In general, permit applications require details on the samples to be collected (including timing, species, numbers, methods to be used, etc.) and specific details of the survey platforms (e.g. vessel names and registration details) and personnel. Permits can take 4–6 weeks (or longer) to be approved, though in the event of an oil spill, the Responsible Agencies can expedite the process and/or possibly offer exemptions (depending on the legal ramifications to the relevant agency).

Notification SHALL be given to relevant government agencies in the region to be sampled, prior to mobilisation. Post-survey reports must also be filed in accordance with the requirements of the specific permit(s) in place.

Confirmation of any reporting requirements shall be sought should an exemption be granted.

[1] https://data.gov.au/dataset/modis-derived-coloured-dissolved-organic-matter-cdom-datasets

Table 2.8: Commonwealth and state permit requirements for the collection of survey samples and disturbance of heritage sites

Permit	Relevance	Legislation	Responsible agency	Advice from agency
Commonwealth				
General Permit Application for: • Threatened species and ecological communities • Migratory species • Whales and dolphins • Listed marine species.	Required for scientific sampling of matters listed under the *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*	EPBC Act	Department of the Environment and Energy (DEE)	It would also be beneficial to apply for an exemption from Part 13 permitting requirements under section 303A of the EPBC Act. The Minister would then consider whether it is in the national interest to grant an exemption. The EPBC Act provides that certain actions are not offences and, therefore, would not require a permit. However, the survey(s) (i.e. 'the action') would need to satisfy one of the criteria set out at section 197 and it is not immediately apparent that it would do so. If it did, there would still be a requirement to notify the Secretary if the action was taken.
Access to Biological Resources in a Commonwealth Area for Non-Commercial Purposes	An applicant must obtain written permission from each Access Provider. The Access Provider must state permission for the applicant to: • Enter the Commonwealth area • Take samples from the biological resources of the area • Remove samples from the area.			
South Australia				
A Scientific Research Permit is required for: • 'Taking' or 'interfering with' a protected animal species in the wild • Collecting native plant specimens from public land • Research carried out in any of the state's protected areas (including geological studies, and non-invasive activities such as mapping or remote observations)	Required to ensure that research does not impact on populations, environmental integrity of habitats or conservation values of protected areas. Exemptions include: • Non-native animals • Invertebrates, fish and frogs (other than threatened frog species) when outside a protected area • Collection of fish may require approval from the Primary Industries and Regions South Australia (PIRSA) Fisheries Division.	*National Parks and Wildlife Act 1972* and *Wilderness Protection Act 1992*	Department for Environment and Water (DEW)	
• Entering or engaging in a fishing activity in an aquatic reserve • Disturbance of water beds, or removal or interference with animals or plants in aquatic reserves.	Required for research in any aquatic parks under South Australian legislation (in State waters or in relation to any waters on the landward side of waters adjacent to the State that are within the Australian fishing zone)	*Fisheries Management Act 2007*	PIRSA	

Permit	Relevance	Legislation	Responsible agency	Advice from agency
Wildlife ethics application for state-wide fauna surveys	Taking tissue samples for hydrocarbon analysis from live vertebrates	*Animal Welfare Act 1985*	Department for Environment and Water (DEW)	
Heritage Permit	Required for the disturbance of: • Designated State Heritage Places under Sections 25-28 of the *Heritage Places Act 1993*	*Heritage Places Act 1993*	South Australian Heritage Council (SAHC)	
Section 23 Authorisation	Required for the disturbance of: Aboriginal Heritage sites under Section 23 of the *Aboriginal Heritage Act 1988*	*Aboriginal Heritage Act 1988*	Department of Premier and Cabinet (DPC) Aboriginal Affairs and Reconciliation (AAR)	Normally take several months to obtain permissions
Victoria				
Application for a scientific permit to conduct research in areas managed under the National Parks Act 1975	Required for any research activity in marine and intertidal parks protected under Victorian legislation	*National Parks Act 1975*	Department of Environment, Land, Water and Planning (DELWP)	Any sampling of water, sediments or fauna or within a marine park would require valid scientific permits to be in place prior to commencing sampling. In the event that OSMP sampling is required within Victorian waters, DELWP may either consider expediting the application process or providing a ministerial exemption
Application for a scientific permit	Required for any research involving fauna subject to the Wildlife Act 1975, including taking tissue samples for hydrocarbon analysis from live vertebrates	*Wildlife Act 1975*		
Cultural Heritage Permit	Required for the disturbance of Aboriginal Heritage, including: • Disturbing or excavating any land for the purpose of uncovering or discovering Aboriginal cultural heritage • Carry out scientific research on an Aboriginal place (including the removal of Aboriginal objects from that place for the purpose of that research) • Carry out an activity that will, or is likely to, harm Aboriginal cultural heritage • Buy or sell and Aboriginal object, or • Remove an Aboriginal object from Victoria.	*Aboriginal Heritage Act 2006*	Aboriginal Affairs Victoria (AAV)	

Permit	Relevance	Legislation	Responsible agency	Advice from agency
New South Wales				
Scientific research licence application for: Protected fauna, either individually or part of a declared threatened community	Licence class: Biodiversity assessment/Species Impact Statement assessments (1-3 years). Exclusions: Non-protected fauna, including invertebrates (except those listed in the *Threatened Species Conservation Act 1995* (TSC Act), either individually or part of a declared threatened community) Introduced species listed in Schedule 11 of the *National Parks and Wildlife Act 1974* (NPW Act) Fish, as defined in the Fisheries Management Act 1994 Non-protected flora (unless listed in Schedule 13 of the *NPW Act*, or in the Schedules of the *TSC Act*, either individually or part of a declared threatened community, or occur in national parks or reserves) When activities may be authorised via an existing licence or approval (e.g. licences issued under sections 120, 131 or 132 of the *NPW Act*, or Part 6 of the *TSC Act*, or approved under development consents and Reviews of Environmental Factors. Any research on animals would require an animal ethics form to meet obligations under the NSW *Animal Research Act 1985*, which is administered by the NSW Department of Primary Industries (DPI)	Threatened Species Conservation Act 1995 National Parks and Wildlife Act 1974 Fisheries Management Act 1994 *Animal Research Act 1985*	Office of the Environment and Heritage (OEH)	Longer permit licence terms may be granted for projects that are associated with a government department or similar statutory authority
Animal ethics permit	Taking tissue samples for hydrocarbon analysis from live vertebrates	*Animal Research Act 1985*	NSW Department of Primary Industries (DPI)	
Section 60 form, S140 Archaeological Permit and S144 Permit Variation Form	Required to disturb or excavate: Sites listed on the State Heritage Register or to which an interim heritage order applies (Section 60 form), or Sites not listed on the State Heritage Register (S140 and S144).	*Heritage Act 1977* and Amendments to the Heritage Act 1977 (2010)	OEH	
Aboriginal Heritage Impact Permit	The statutory instrument that is issued under Section 90 of the NPW Act to manage harm or potential harm to Aboriginal objects and places. Where harm to an Aboriginal object or place cannot be avoided, a Permit can be issued by the Chief Executive of OEH under Part 6 of the NPW Act	*National Parks and Wildlife Act 1974*	OEH	

Permit	Relevance	Legislation	Responsible agency	Advice from agency
Tasmania				
• Scientific Permit Application – Fauna • Scientific Permit Summary • Scientific Permit Report Proforma	Required for fauna covered under the *Nature Conservation Act 2002*	*Nature Conservation Act 2002*	Department of Primary Industries, Parks, Water and Environment (DPIPWE)	Any sampling for vertebrates or cephalopod molluscs would require a valid scientific permit to be in place prior to commencing sampling. Any sampling that was considered to be novel (i.e. not routinely used) or may result in the death of marine fauna would also require approvals by the Animal Ethics Committee. In the event that OSMP sampling was required within Tasmanian waters, DPIPWE may either consider expediting the application process or providing a ministerial exemption
DPIPWE Animal Ethics Committee (AEC) approval	Taking tissue samples for hydrocarbon analysis from live vertebrates	*Animal Welfare Act 1993*		
Disturbance of Aboriginal Heritage on public or private land	Any action that will have an impact on Aboriginal Heritage (no matter the size or condition) requires a permit under Section 14 of the *Tasmanian Aboriginal Relics Act 1975*	*Tasmanian Aboriginal Relics Act 1975*	Aboriginal Heritage Tasmania	
Western Australia				
Application for an exemption to collect aquatic organisms (alive or dead) for commercial purposes, including: • The eggs, spat, spawn, seeds, spores, fry, larvae or other source of reproduction or offspring of an aquatic organism (including plants and algae) • A part only of an aquatic organism, including the shell or tail. Exclusions from permit requirements include aquatic mammals, aquatic reptiles, aquatic birds, amphibians or (except in relation to Part 3 and Division 1 of Part 11) pearl oysters	Exemption under Section 7(2)(b) of the *Fish Resources Management Act 1994*	*Fish Resources Management Act 1994*	Department of Primary Industries and Regional Development (DPIRD)	Required anywhere in WA State waters and out to 200 nautical miles (NM). In the event that OSMP sampling was required within WA state waters, DPIRD may either consider expediting the application process or providing a ministerial exemption
• Application for a licence to take (i.e. capture, collect,	Fauna means: • Any animal indigenous to any state or territory of the	*Wildlife Conservation Act 1950*	Department of Biodiversity, Conservation	Required in WA state waters to three nm, and for collection of

Permit	Relevance	Legislation	Responsible agency	Advice from agency
disturb or study) fauna for scientific purposes (Regulation 17), and/or • Application form for a Scientific or Other Prescribed Purposes Licence to take protected flora from Crown land for non-commercial purposes (CLM59)	Commonwealth or the territorial waters of the Commonwealth • Any animal that periodically migrates to and lives in any state or territory of the Commonwealth or the territorial waters of the Commonwealth. The Act specifically refers to licensing the taking of protected fauna. However, it is recommended to have this in place for collection of any fauna should any protected fauna be inadvertently collected		and Attraction (DBCA)	biological resources in Commonwealth waters requiring transit through WA state waters. Permits require nomination of a person in charge who must be on site during sampling. Due to the potential for shift rotations during the permitted period, it is recommended that separate permits be obtained for party chiefs/Field leads involved (where multiple names cannot be included in a single permit). In the event that OSMP sampling was required within WA state waters, DBCA may either consider expediting the application process or providing a ministerial exemption
• Entry permits for access to Aboriginal Land, and • Requirements for disturbance or relocation of Aboriginal Heritage sites	Legally required for transit through an Aboriginal Reserve, under Part II of the Aboriginal *Affairs Planning Authority Act 1972* Natural Heritage Listed places are protected under the EPBC Act. Assessment under this Act may be required for any disturbance to the values for which these areas were listed (e.g. Aboriginal heritage). Removal, relocation or interference with Aboriginal heritage objects or sites requires Ministerial approval under Section 18 of the *Aboriginal Heritage Act 1972* (via DPLH) The DPLH maintains a register of Aboriginal sites, which can be accessed via the enquiry system at www.daa.wa.gov.au	*Aboriginal Affairs Planning Authority Act 1972* EPBC Act *Aboriginal Heritage Act 1972*	Department of Planning, Lands and Heritage (DPLH)	A Section 18 permit may take in excess of 18 months to obtain under normal conditions
Equipment-specific exemptions (all states and Commonwealth waters)				
Fisheries exemption for use of sub-legal mesh sizes	For demersal fish populations studies (including juveniles) as part of scientific monitoring	Local regulations (e.g. the Fisheries Management (South East Trawl Fishery) Regulations) made under the *Fisheries Management Act 1991*	Relevant Fisheries Departments	

2.11 Oiled wildlife response

Oiled Wildlife Response (OWR) will be a source of situational awareness and information/data for several OSMPs (SMP5, SMP6 and potentially SMP9). It is recommended that OWR operations are not undertaken aboard OSMP response vessels due to the high risk of contamination of samples and the conflicting demands on vessel space and time.

Oiled wildlife response would be run under the direction of the state control agencies according to the plans in place at the time.

Further information regarding this spill response strategy is presented in the activity-specific OPEP.

2.12 Quality control

Standard Operating Procedures (SOPs) for QA/QC, such as ISO 9000, will be applied by RPS and Equinor to all relevant components including:

- Training
- Protocols for the management of positional data
- Pre-mobilisation, *In situ* and demobilisation equipment checks
- Protocols for the download of data and preliminary field QA/QC of data quality
- Protocols for the calibration/adjustment (e.g. conversion) of raw data in line with accepted scientific methods
- Data management protocols and security and data audits.

2.13 OSMP preparedness commitments

To ensure that commitments made for the preparedness phase are implemented in the timeframe defined, and to facilitate monitoring for compliance, Table 2.9 identifies the commitments made in this OSMP:

Table 2.9: Preparedness commitments made in this OSMP and where they are located

Commitment	Location in OSMP IP
Preparation of sampling and analysis plans for use in the tier 3 desktop spill response exercise	Section 1.8
Contractual arrangements will be in place with key third-party suppliers, service providers and organisations (e.g. CSIRO, SARDI) prior to mobilisation	Section 2.1.1
Resources in the register will be reviewed quarterly and tested during the tier 3 desktop spill response exercise. Lessons learned during the exercise will be actioned prior to mobilisation of the drilling activity	Section 2.5.1
Field personnel will require valid and in-date safety and security training, accreditation and assessments	Section 2.5.3
An HSE Plan for OSMP activities will be developed prior to mobilisation	Section 2.6.2
An indicative field logistics plan will be prepared as part of the HSE planning process and prepared for use in the tier 3 desktop spill response exercise	Section 4.6
Commitments to review baseline data, including that the record of baseline data will be reviewed prior to the desktop oil spill response exercise and after accidental hydrocarbon release as part of post-release pre-response preparedness. Records of these reviews will be maintained.	Section 2.9 and Appendix A

3 IMPLEMENTATION PLAN

3.1 Purpose of the implementation plan

The purpose of the Implementation Plan (IP) is to guide the user to the relevant information on the activities and actions they need to undertake to implement an OSMP response appropriate to the nature and scale of a Level 2 or Level 3 hydrocarbon release. The IP is an overarching document to guide:

- Preparedness
- Activation
- Management of the ongoing OSMP response
- Finalisation and close-out.

3.2 Scope of the implementation plan

The scope of the IP is to provide information on:

- Activation of OSMPs following confirmation from Equinor that specific plans have been triggered
- Management of initial mobilisation
- Ongoing implementation of OSMPs (which may include periodic mobilisation of additional plans during an evolving spill scenario)
- Managing the transition from response phase monitoring (which is focused on gaining situational awareness and identifying impacts of spill response strategies) to post-response monitoring (focused on the scientific study of impact and recovery from the impacts of the spill and spill response strategies).

3.2.1 Potential variations from the scope

This OSMP IP has been prepared to address a range of spill scenarios and therefore a range of operational monitoring plans are presented. However, where a Level 2+ hydrocarbon release has resulted from a vessel incident (including an unanchored MODU being moved or in transit, and not undertaking drilling activities) in state or Commonwealth waters, the relevant control (= combat) agency is likely to define the operational monitoring response. A list of control agencies relevant to the potential geographic extent of, for example, the Great Australian Bight EMBA is presented in Table 3-1.

Note: Spill reporting and communications with the state and Commonwealth Agencies regarding operational monitoring must be undertaken by the Equinor IMT. The contact details provided in Table 3-1 are for Equinor's information only.

Table 3.1: State and Commonwealth control agencies relevant to the environment that might be affected (EMBA)

Jurisdiction	Control agency	Reporting marine pollution incidents
Commonwealth waters	Equinor	Refer to Section 4.2 of the OPEP
Commonwealth waters (vessel based spills only)	Australian Maritime Safety Authority (AMSA)	24-hour emergency helpline • Within Australia: 1800 641 792 • Outside Australia: +61 2 6230 6811. Submit a POLREP Email notification (select Marine Environment Protection in the 'send to' field): http://www.amsa.gov.au/contact-us/ Contact points in Australia for ships reporting pollution or potential incidents in accordance with MARPOL requirements: http://www.amsa.gov.au/environment/regulations/marpol/reporting-pollution/index.asp
Western Australian state waters	Department of Transport (DoT)	Notify Maritime Environmental Emergency Response (MEER) immediately: 24-Hour emergency helpline: (08) 9480 9924 Email: marine.pollution@transport.wa.gov.au
South Australian state waters	Department of Planning, Transport and Infrastructure (DPTI)	24-hour emergency helpline: (08) 8248 3505
Victorian state waters	The Environmental Protection Authority Division of the Department of Transport Security and Emergency Management Division (SEMD)	Contact telephone numbers: • Portland region: (03) 5525 0900 (24 hours) • Port Phillip region: (03) 9644 9777 (24 hours) • Western Port region: 0428 549 235 (24 hours) • Gippsland region: (03) 5150 0500 (24 hours) • General marine oil spill enquiries: (03) 9655 9797 (9 am to 5 pm) Wherever possible you should provide the following information with your report: • Your name and contact details • Where and when the spill occurred • A description of the pollutant • The size of the area where the oil is visible • The source of the spill including vessel registration numbers if known • Any photographs you have of the incident.
Tasmanian state waters	Department of Primary Industries, Parks, Water and Environment (DPIPWE)	24-hour emergency helpline: 1800 005 171
New South Wales state waters	Maritime and Roads Services via Transport for New South Wales (TfNSW)	Maritime Environmental Pollution: 13 12 36 The Transport for NSW Maritime Incident 24-hour Duty Officer must be notified of the incident: Vessel traffic services: vts@portauthoritynsw.com.au Port: 9296 4999 (24-hour) General Manager, Operations and Deputy Harbour Master Sydney jmdrummond@portauthoritynsw.com.au
Within port jurisdictions (limits)	Relevant port authorities	Contact relevant port authority

3.2.2 Inclusions and exclusions

The scope includes the following Operational (OMP) and Scientific (SMP) monitoring plans:

- OMP3 Monitoring of Hydrocarbons: Weathering and Behaviour in Marine Waters
- OMP4 Monitoring of Dispersants and Chemical Control Agents
- OMP5 Shoreline Assessment
- OMP6 Identification of Impacts to Benthic and Demersal Biota
- SMP1 Assessment of Water Quality
- SMP2 Assessment of Impacts and Recovery of Benthic Sediments and Infauna
- SMP3 Assessment of Impacts and Recovery of Intertidal Habitats
- SMP4 Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Fish
- SMP5 Assessment of Impacts and Recovery of Seabirds and Shorebirds
- SMP6 Assessment of Impacts and Recovery of Marine Megafauna
- SMP7 Assessment of Impacts and Recovery of Plankton
- SMP8 Assessment of Impacts and Recovery of Fisheries and Aquaculture
- SMP9 Assessment of Impacts and Recovery of Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance.

The scope of this IP excludes OMP1 and OMP2, which will be managed directly by Equinor IMT or the relevant Control Agency (CA) as part of their 'Monitor and Evaluate' strategy to obtain situational awareness. Also excluded are OSMP operations in high HSE risk situations. Perceived high-risk activities will trigger a risk assessment, the outcomes of which define the subsequent actions undertaken outside of the scope of this plan (e.g. termination of the perceived high-risk operations, or development and implementation of plans/strategies specifically developed for that operation).

4 ACTIVATION AND INITIAL MOBILISATION

4.1 OSMP activation and termination criteria

A Level 2 or 3 hydrocarbon release will trigger a review of the OSMP plan-specific activation criteria. Equinor will have the overall responsibility for the activation of the OSMP response. Activation of individual operational and scientific monitoring plans will occur where the specific activation criteria (triggers) for each plan have been met as documented in each plan and summarised in Table 4-1. The decisions regarding which OMPs and SMPs are activated will be made by Equinor (with potential input from relevant stakeholders and/or an independent review panel).

Although activation and termination criteria are defined to facilitate an appropriate OSMP response across the EMBA, these criteria may also be used to support an evolving survey design by providing a mechanism to add or remove specific locations or sensitive receptors. If applied in this fashion, this approach must be used in conjunction with robust scientific principles (see Section 4.4).

Equinor may choose to activate individual OSMPs that may not otherwise have been activated to support situational awareness or to obtain additional information that may support protection of environmental and/or socio-economic receptors or support determination of appropriate compensation. Scientific Monitoring Plans may also be implemented opportunistically during the response phase to support situational awareness and/or collect post-release pre-exposure baseline data where reasonable and practicable.

The decision to terminate the scientific monitoring program will likely involve external stakeholders, such as state and Commonwealth governmental agencies, non-governmental organisations and external technical specialists. This could be achieved by convening an independent review panel or Scientific Advisory Group (SAG), comprising representatives from e.g. the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA), the Commonwealth Scientific and Industrial Research Organisation (CSIRO), the South Australian Research and Development Institute (SARDI), local government agencies and academic institutions. This process would, by necessity, be independent to the OSMP response and managed by an external authority.

Note: OSMPs that have been terminated in line with the defined termination criteria may be re-activated should there be a significant change in risk, or where Equinor chooses (or is directed) to do so.

4.2 Activation of the OSMP response

Equinor will provide official notification informing the Service Provider (RPS) OSMP PM that the OSMP is on standby (e.g. Level 1 spill with potential for escalation) or that the OSMP response has been activated (Level 2 or 3 spill). Equinor will then inform the OSMP PM which OSMPs have been activated initially. The number of OSMPs activated and the scale of response will vary greatly depending on the nature and scale of the hydrocarbon release.

The activation decision-making process (Figure 4-1) will be continually re-assessed throughout the OSMP response (e.g. to facilitate a response to any identified significant changes in risk). An indicative OSMP activation timeline is presented in Section 4.3. Regular communication will be maintained between the Equinor OSMP PM and the Service Provider (RPS) OSMP PM following initial activation throughout the OSMP response for the transfer of critical information (e.g. current situational awareness) and to allow rapid and effective decision-making.

Note: Termination of an OMP does not necessarily infer immediate demobilisation, unless the survey team is scheduled to rotate from the field. In-field resources may be re-tasked to the implementation of triggered SMPs (as appropriate) to maximise potential of identifying short-term impacts (see Table 4-1). This shall be considered in planning rotations towards the end of the response phase, so that the appropriate equipment and personnel are available.

Table 4.1: Individual OMP and SMP activation and termination triggers

Plan	Activation triggers*	Termination triggers
OMP1: Oil Spill Modelling	• Level 2 or 3 hydrocarbon release • Activated by Equinor IMT/CA to support Situation Awareness	• It can be demonstrated that no further environmental improvement outcomes can be achieved through continued implementation of OMP1 **AND/OR** • Notification of termination of the spill response phase
OMP2: Surveillance and Tracking	• Level 2 or 3 hydrocarbon release • Activated by Equinor IMT and/or CA to support Situation Awareness	• It can be demonstrated that no further environmental improvement outcomes can be achieved through continued implementation of OMP2 AND/OR • Notification of termination of the spill response phase
OMP3: Monitoring of Hydrocarbons : Weathering and Behaviour in Marine Waters	• Level 2 or 3 hydrocarbon release	• It can be demonstrated that no further environmental improvement outcomes can be achieved through continued implementation of OMP3 **AND/OR** • Notification of termination of the spill response phase **Note:** The resources required for this OMP are likely to re-tasked to begin implementation of e.g. SMP1 following termination.
OMP4: Monitoring of Dispersants and Chemical Control Agents	• Level 2 or 3 hydrocarbon release **AND** • Dispersant and/or chemical control agents have been applied during the response	• It can be demonstrated that no further environmental improvement outcomes can be achieved through continued implementation of OMP4 **AND/OR** • Notification of termination of the spill response phase **Note:** The resources required for this OMP are likely to be re-tasked to begin implementation of e.g. SMP1 following termination.
OMP5: Shoreline Assessment	• Level 2 or 3 hydrocarbon release **AND** • Spill modelling and/or surveillance indicate that shorelines/intertidal habitat have been (or are at probable risk of being) exposed to spill hydrocarbons **OR** • Monitoring, spill modelling and/or surveillance indicate that shorelines/intertidal habitat have been (or are at probable risk of being) exposed to dispersants, dispersed hydrocarbons and/or chemical control agents	• It can be demonstrated that no further environmental improvement outcomes can be achieved through continued implementation of OMP5 AND/OR • Notification of termination of the spill response phase **OR** • The rapid categorical assessment of shorelines/intertidal habitats has been completed for all potential locations at risk* **Note:** The resources required for this OMP are likely to be re-tasked to begin implementation of SMP3 following termination.
OMP6: Identification of Impacts to Benthic and Demersal Biota	• Level 2 or 3 hydrocarbon release **AND** • Monitoring, Spill Modelling and/or Surveillance indicate that locations with sensitive benthic and demersal biota[2] have been (or are at probable risk of being) exposed to spill hydrocarbons **OR** • Monitoring, Spill Modelling and/or Surveillance indicate that locations with sensitive benthic and demersal biota have been (or are at probable risk of being) exposed to dispersants, dispersed hydrocarbons and/or chemical control agents	• It can be demonstrated that no further environmental improvement outcomes can be achieved through continued implementation of OMP6 **AND** • Notification of termination of the spill response phase by the IMT Incident Controller **Note:** The resources required for this OMP are likely to be re-tasked to begin implementation of SMP4 following termination.

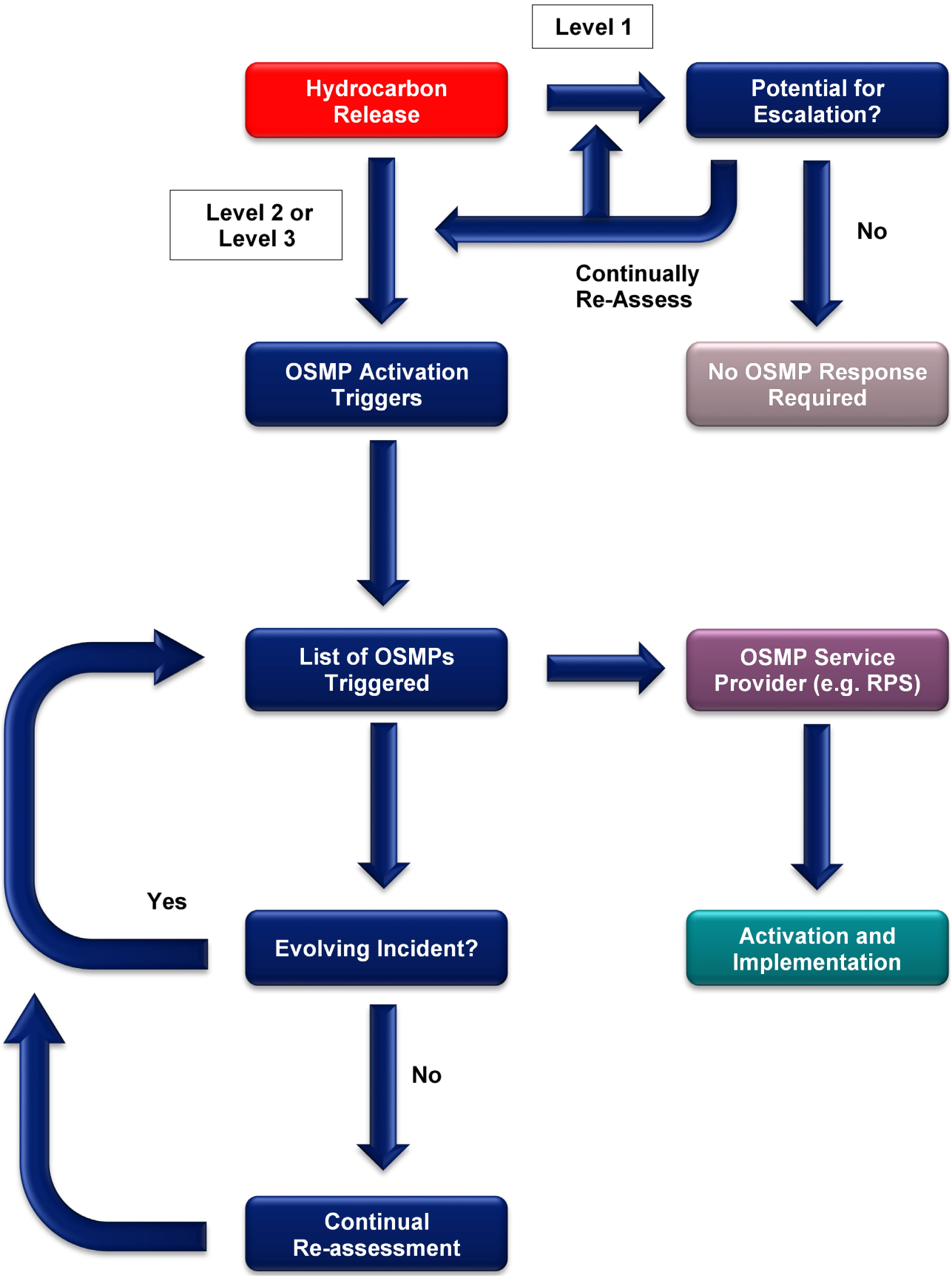
[2] For example (but not limited to) Threatened Ecological Communities (TECs), key habitats for multiple species (e.g. kelp beds, seagrass beds, sponge beds, mangrove) and protected or commercially-important demersal species.

Plan	Activation triggers*	Termination triggers
SMP1: Assessment of Water Quality	• Level 2 or 3 hydrocarbon release **AND** • Results of operational monitoring studies show likelihood of hydrocarbons at the surface at > 10 g/m^2, in the water column at ≥ 10 ppb **or** where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥ 6 ppb **OR** • Dispersants and/or chemical control agents were applied during the spill response	• Sufficiently robust scientific data has been collected to demonstrate that SMP1 is able to achieve its objectives **AND** • Monitoring outcomes have demonstrated consistent compliance with ANZECC/ARMCANZ (2000) water quality objectives for the protection of aquatic ecosystems across the re-modelled EMBA (derived from OMP1) (with the exception of sites of known or identified natural hydrocarbon seeps) **AND** • There are no detectable levels of dispersants and/or chemical control agents
SMP2: Assessment of Impacts and Recovery of Benthic Sediments and Infauna	• Level 2 or 3 hydrocarbon release **AND** • Results of monitoring studies show likelihood of hydrocarbons at the surface at > 10 g/m^2, ≥ 10 ppb for entrained hydrocarbons **or** where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥ 6 ppb **OR** • Where modelling indicates exposure of benthic sediments to dispersed hydrocarbons	• Sufficiently robust scientific data has been collected to demonstrate that SMP2 is able to achieve its objectives **AND** • Hydrocarbons are no longer detectable in marine sediments at levels greater than Revised Sediment Quality Guidelines (Simpson et al., 2013) **AND** • Impact and recovery to benthic infaunal communities and assemblages have been quantified across the identified exposure zone, with no further significant recovery of impacted locations (either in comparison with control locations or from comparison between surveys)
SMP3: Assessment of Impacts and Recovery of Intertidal Habitats	• Level 2 or 3 hydrocarbon release **AND** • Monitoring studies have identified potential exposure or exposure of hydrocarbons to intertidal habitats (> 10 g/m^2 on shore, where sediment hydrocarbons (from OMP5) exceed Revised ANZECC/ARMCANZ Sediment Quality Guidelines, ≥ 10 ppb for entrained hydrocarbons **or** where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥ 6 ppb) **OR** • Where dispersants/chemical control agents were applied on or in close proximity to sensitive intertidal habitats	• Sufficiently robust scientific data has been collected to demonstrate that SMP3 is able to achieve its objectives **AND** • Hydrocarbons are no longer detectable in intertidal sediments at levels greater than Revised ANZECC/ARMCANZ Sediment Quality Guidelines (Simpson et al. 2013) **AND** • Impact and recovery to intertidal habitats have been quantified, with no further significant recovery of impacted locations (in comparison with control locations and/or from comparison between surveys) **AND** • Restoration or resumption of key biological processes necessary for post-impact recovery (e.g. reproduction and recruitment) have been demonstrated for key receptors (e.g. macroalgae, plants)
SMP4: Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Biota	• Level 2 or 3 hydrocarbon release **AND** • Monitoring studies have identified potential exposure or exposure of hydrocarbons to benthic habitats at levels of > 10 g/m^2 on shore, where sediment hydrocarbons (i.e. from SMP2) exceed Revised ANZECC/ARMCANZ Sediment Quality Guidelines, ≥ 10 ppb for entrained hydrocarbons or where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥ 6 ppb **OR**	• Sufficiently robust scientific data has been collected to demonstrate that SMP4 is able to achieve its objectives **AND** • Impact and recovery to benthic communities and assemblages have been quantified, with no further significant recovery of impacted locations (in comparison with control locations and/or from comparison between surveys) **AND** • Restoration or resumption of key biological processes necessary for post-impact recovery (e.g. reproduction and recruitment) have been demonstrated for key receptors (e.g. macroalgae, seagrass, fish communities)

Plan	Activation triggers*	Termination triggers
	• OMP6 identifies potential impacts to marine benthic habitats and demersal biota **OR** • Where modelling indicates exposure of benthic habitats to dispersed hydrocarbons	
SMP5: Assessment of Impacts and Recovery of Seabirds and Shorebirds	• Level 2 or 3 hydrocarbon release **AND** • Spill modelling and/or operational monitoring have indicated potential for exposure of hydrocarbons/ dispersants to seabirds/ shorebirds, or a sensitive resource or location (e.g. for foraging, breeding or nesting)	• Sufficiently robust scientific data has been collected to demonstrate that SMP5 is able to achieve its objectives **AND** • Hydrocarbon pollution/oiling impacts to protected seabird and shorebird species are no longer detectable **AND** • The impacts to key seabird and shorebird behaviour, breeding activities and colonies/populations and subsequent recovery (where applicable) been quantified at locations exposed to hydrocarbons and/or spill response activities **AND** • The environment and important natural resources at key seabird and shorebird locations (feeding, roosting or breeding locations) are comparable to baseline or control locations
SMP6: Assessment of Impacts and Recovery of Marine Megafauna	• Level 2 or 3 hydrocarbon release **AND** • Spill modelling and/or monitoring have indicated exposure of hydrocarbons/dispersants to marine megafauna **OR** • Monitoring or field observations have identified an impact to marine megafauna as a result of the spill or associated response activities	• Sufficiently robust scientific data has been collected to demonstrate that SMP6 is able to achieve its objectives **AND** • Hydrocarbon pollution/oiling impacts to protected megafaunal species are no longer detectable **AND** • Restoration of key biological processes required for the recovery of megafaunal populations (e.g. reproduction) has been demonstrated
SMP7: Assessment of Impacts and Recovery of Plankton	• Level 2 or 3 hydrocarbon release **AND** • Results of monitoring studies show likelihood of hydrocarbons at the surface at > 10 g/m^2, in the water column at ≥ 10 ppb **<u>or</u>** where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥ 6 ppb **OR** • Dispersants and/or chemical control agents were applied during the spill response	• Sufficiently robust scientific data has been collected to demonstrate that SMP7 is able to achieve its objectives **AND** • Impact and recovery to plankton have been quantified, with no further significant recovery identified (in comparison with control locations and/or from comparison between surveys) **AND** • Restoration of key biological processes required for the recovery of populations and communities (e.g. reproduction; including larval stages of benthic and pelagic macrobiota) has been demonstrated

Plan	Activation triggers*	Termination triggers
SMP8: Assessment of Impacts and Recovery of Fisheries and Aquaculture	• Level 2 or 3 hydrocarbon release AND • Results of monitoring studies show likelihood of hydrocarbons at the surface at > 10 g/m^2, in the water column at ≥ 10 ppb, where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥ 6 ppb **or** where sediment hydrocarbons (i.e. from SMP2) exceed Revised ANZECC/ ARMCANZ Sediment Quality Guidelines **OR** • Dispersants and/or chemical control agents were applied in proximity to sensitive locations (e.g. known spawning areas, nursery areas, critical habitat or feeding grounds) during the spill response **OR** • Evidence of hydrocarbon contamination, tainting or significant mortality of fish or shellfish during the spill response **OR** • Declines in species composition or abundance in catches from individual fisheries, or production of aquaculture operations following the spill **OR** • There has been a government restriction, ban or closure of fisheries or aquaculture facilities	• Sufficiently robust scientific data has been collected to demonstrate that SMP8 is able to achieve its objectives **AND** • Fisheries and aquaculture products are identified as being safe for human consumption **AND** • The physical/biochemical parameters indicating exposure to hydrocarbons and/or tissue hydrocarbon contamination attributable to the spill are no longer detectable **AND** • Evidence has been collected that demonstrates that species composition and population structures of commercial fisheries (target and by-catch) have returned to baseline levels or are comparable with control locations **AND** • Olfactory/organoleptic testing shows that there is no difference in fish/shellfish quality between the impact zone and control locations
SMP9: Assessment of Impacts and Recovery of Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance	• Level 2 or 3 hydrocarbon release **AND** • Modelled spill trajectories are predicted to impact one or more cultural heritage / socio-economic resources, i.e. any areas of particular recreation, tourism, conservation, heritage and Native Title importance (including any recorded or unrecorded Aboriginal cultural heritage material, sites or places or intangible cultural heritage and/or historically listed heritage places or artefacts)	• Surveys determine that hydrocarbon pollution/oiling impacts to areas of particular recreation, tourism, conservation, heritage and Native Title importance are no longer detectable **AND** • A Health Impact Assessment (if required) determines there are no impacts to human health **AND** • A Socio-economic Impact Assessment determines there is no impact to socio-economic, Native Title and heritage values **AND** • Recovery of any affected sites has been demonstrated in two consecutive years of scientific monitoring data

***Note:** where operational monitoring is planned by a control agency (CA), and where the defined OMPs are not implemented, updated activation and termination triggers for scientific monitoring may be defined during planning. These will be based on the CA OMP objectives and data to be collected.



Dark blue = Equinor internal processes. The OSMP service provider may provide decision-making support if required.

Figure 4-1: Decision-making process for OSMP activation and implementation

4.3 Activation time lines

Initial actions and indicative timelines for the first week of the response are presented in Table 4-2.

Table 4.2: Indicative OSMP activation time line

Time line	Stimulus	Action	Role responsible
0–6 h	• Notification of hydrocarbon release and available information on location, nature and scale	• Inform relevant RPS management of situation • Equinor to provide a signed copy of the RPS Project Change Request (PCR) • Contact key OSMP operational management and office-based support personnel • Mobilise to office • Contact technical leadership group and arrange meeting	• RPS OSMP Program manager
6–12 h	• Level of spill • Indication of trajectory • Identification of preliminary receptors at risk • First OMP scopes triggered	• Key operational, support and technical leadership personnel assembled • Activate and mobilise additional resources • Confirm communications protocol with Equinor and internal OSMP team communications protocols • Identify available field personnel and equipment from information provided in OSMP Resource Register • Confirm availability of field personnel and status of required certifications • Notify field personnel that they are on call • Review activated OMPs and initiate development of OMP survey plans for an evolving incident	• RPS OSMP Program manager • Field operations coordinator • Technical leadership group
12–24 h	• Notification of evolving nature and scale of the spill and resources at risk • First SMP scopes potentially triggered	• Technical leadership group to confirm equipment, personnel and survey platform resources required to support activated OMPs • Identify initial field teams • Develop HSE plans, JHAs and arrange first HAZID • Start sourcing additional winch cable and Dyneema • Identify preliminary logistical requirements to Equinor and confirm process • Identify internal communications processes (e.g. schedule regular briefings, etc.) • Optional: Arrange for support personnel to contact existing project clients to optimise available resources	• Technical leadership group • Field operations coordinator and HSE coordinator • RPS OSMP Program manager
24–72 h	• Updates on evolving nature and scale of the spill and resources at risk • Additional OMPs and SMPs potentially triggered	• Regular situation briefings/ communications • Establish full office-based support team • Regular update of Equinor for logistical requirements (including specific survey platform requirements and details of first team(s) to be mobilised) • Equinor to inform RPS of logistical arrangements (e.g. logistics hubs, planned mobilisation ports, etc.) • Continue developing activated OMP and SMP survey plans and documents • Finalise OMPs for the first activated plans • Finalise HSE plans for the first activated OSMPs • Undertake first HAZID • Identify likely survey permit requirements, arrange preparation of applications and apply for permits • Continue to engage personnel and equipment required to support the evolving OSMP response • Identify additional winch wire and Dyneema requirements to Equinor Logistics • Engage relevant analytical laboratories and request sample containers, labels, eskies and ice bricks	• RPS OSMP program manager • Technical leadership group • HSE coordinator • Field operations coordinator

Time line	Stimulus	Action	Role responsible
By end of week 1	• Updates on evolving nature and scale of the spill and resources at risk • Additional OMPs and SMPs potentially triggered • Provision of mobilisation instructions from Equinor logistics	• Regular situation briefings/ communications • Regular update of Equinor for logistical requirements • Continue developing OSMP survey plans as the situation evolves and new plans are triggered • Develop and implement data management systems, databases and protocols (e.g. security, metadata) • First pre-mobilisation briefing and inductions • Continue evolving HSE plans • Arrange transfer of survey equipment and sample containers/eskies to local logistics hub or mobilisation port (as directed by Equinor) • Mobilise first field teams to site • Develop survey rotation plans for activated OSMPs based on available personnel resources	• RPS OSMP program manager • Technical leadership group • Data manager/ quality lead • HSE coordinator • Field operations coordinator

Note: Delays in mobilisation from port to survey locations may occur if all available resources are required to respond to human health and safety emergencies (e.g. recovery of casualties or personnel at risk). Human health and safety/rescue activities will **ALWAYS** be prioritised above OSMP mobilisation requirements.

4.4 Survey design

Survey designs will adopt best-practice robust scientific approaches, with consideration of how the data will be statistically analysed and interpreted. For example, in certain cases (e.g. where appropriate baseline data of sufficient quality is available), a stratified beyond-BACI (Before-After Control-Impact) design may be considered. This approach is used to identify impact and recovery of impacted locations relative to multiple comparable unimpacted control (reference) locations. In other cases, a gradient-of-effect approach may be appropriate in determining the spatial distribution of environmental variables, which can be used to identify zones of impact (to inform the design of other studies, or to identify cause-effect pathways). Each survey design will incorporate a number of the following scientific approaches:

- Authoritative/selective sampling: using expert judgement to select specific types of survey location (e.g. the most exposed locations). This approach requires sampling of fewer locations but is not statistically robust as the subjectivity in the approach introduces bias.

- Random sampling: a scientifically-robust, objective approach although often requires greater sampling effort to attain statistical robustness.

- Systematic sampling: using a grid or consistent pattern to identify survey locations across a geographic area (e.g. along a gradient of effect or across the EMBA and adjacent unimpacted reference locations). This is the best approach for identifying locations that are not obviously contaminated.

- Stratification of survey locations (based on pre-defined criteria, e.g. sediment type, zone on shore or habitat type): this approach minimises the effects of temporal variability and environmental gradients through use of a hierarchy of replication at a range of spatial scales, i.e. replicates within sites, sites within locations, locations within zones (e.g. impacted/unimpacted). An example of a stratified design is presented in Figure 4-2.

- Reference location selection: locations are selected based on similarity in environmental/substrate conditions to impact sites. These locations must be representative of the broader area, and relatively unimpacted by anthropogenic activities. Multiple locations are required to allow consideration of natural variability.

- The use of ‘context’ locations: These are locations that have been exposed to or impacted by the spill but have not been exposed to spill response strategies and tactics. This approach is used to identify the level of impact and rate of recovery from an unmitigated spill impact. This provides a point of reference for assessment of the impact and recovery of the spill, and the relative environmental benefits or cumulative impacts of the spill response strategies and tactics used.

The level of replication required for statistical robustness may in many cases be determined using power analysis, a method commonly used to determine the power to detect change and the risk of 'false positives' (e.g. Button et al., 2013). However, the degree of statistical robustness required will depend on the type of data to be captured by each specific survey. For example, qualitative data (e.g. from OMPs) does not need to be statistically as robust as the primary aim of these studies is, to provide situational awareness and information on potential impacts to inform the design of SMPs.

Power analysis is currently only usually applicable to univariate data (i.e. data on single variables) and cannot adequately determine the appropriate sampling effort for studies of multiple variables (i.e. multivariate data, such as multiple species in biological assemblages/communities). Although power analysis *can* be (and often is) used to determine the required replication based on indices derived from multivariate data (such as abundance, species richness or diversity), this approach fails to consider the relative contributions of the different components of an assemblage/community, and the complex interactions between those components and the environment. Power analysis may identify an unreasonable level of sampling effort because of this. The assemblage/community indices used also provide insufficient information on the nature of impacts and recovery – i.e. if abundance increases and species richness decreases following a hydrocarbon release, this would indicate a change to an opportunist-dominated biological assemblage. Should abundance, species richness and diversity then return to levels that are not statistically different from pre-spill levels, one would presume that the benthic community had recovered. This may not be the case as recovery may have followed a different trajectory, resulting in a different climax community. Although abundance, species richness and diversity may have 'recovered', the biological community may have experienced a trophic shift from one trophic status to another (e.g. primary producers to scavengers/detritus feeders) and therefore may be fulfilling a different ecological function. In addition, different components of biological communities tend to respond differently to stressors under different conditions, and this cannot be sufficiently identified using a univariate metric. Multivariate statistical techniques are much more powerful for detecting and identifying complex responses, and in such cases, multivariate approaches should be considered. Few protocols for multivariate-based power analyses exist, but this is an area still very much in development.

The sampling design must allow for analysis and interpretation of impacts and recovery at a range of spatial scales (local to regional). This approach allows consideration of the change in extents of impact zones as spill hydrocarbons being less bioavailable and biological communities recover, within the context of natural variability in natural environmental conditions and ecological communities.

Further information on recommended approaches is provided in specific OSMPs, but these are for guidance only. The final design approach will be determined by the relevant technical lead(s) once an understanding of the nature and scale of the hydrocarbon release is known.

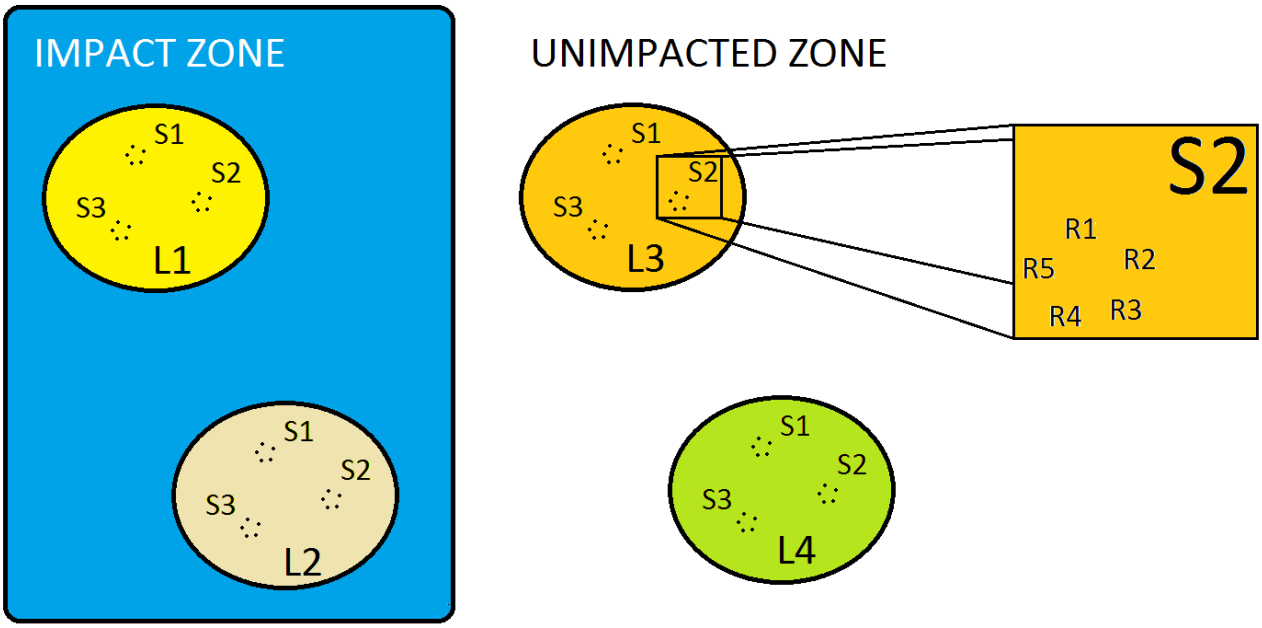


Figure 4-2: Example of a stratified survey design

The example in Figure 4-2 incorporates two zones (one impacted, one unimpacted), each with two survey locations with three sampling sites from which five replicates are taken (comprising a total of 2 zones x 2 locations x 3 sites x 5 replicates = 60 samples).

4.5 Consideration of environmental/geographic conditions

One critical component of the survey design will be consideration of environmental challenges and limitations based on an understanding of the area to be surveyed. For example, the Great Australian Bight is a challenging environment – especially for offshore surveys – due to the environmental conditions and the remoteness of the environments to be sampled. With water depths of up to 4,000 m+, the following will be considered (as a minimum):

- Weight of the sampler – if it's too light, the weight of the winch cable deployed will be too great and potentially drag sampler down, inverting it. This means that it will not sample properly and there are serious risks of fouling of the equipment.

- Rating of the winches, cables, deck cranes/a-frames, etc. These must include an assessment of the weight of the amount of cable to be deployed – this is not insignificant. Similarly, if the cable is not rated properly it could snap, losing the sampler (dropped object), but much more importantly could pose a significant risk to the health and safety of anyone on the deck (especially under tension). Alternatives to winch cable may be considered for some deployments (e.g. Dyneema for deployment of Niskin bottles to up to e.g. 600 m water depth), but cable should be used for seabed samplers (e.g. Dyneema will snap without warning if the sampler gets caught up on the seabed or vessel stern on retrieval) – though this may be a consideration of the relevant plan technical lead.

- Amount of winch cable required to deploy sediment sampling equipment (>1.5 times water depth) or benthic trawling (3–4 times water depth), and the time required for each sampling attempt (e.g. with a maximum descent rate of 1 m/second and at a winch retrieval rate of 30 m a minute, it would take over three hours and twenty minutes to deploy and retrieve a sampler from the seabed at 4000 m water depth).

- Pressure resistance and efficacy of sampling gear at depth – failure of gear due to distortion or implosion of components caused by the pressure can result in considerable time delays, failure to sample during critical or restricted sampling periods (e.g. weather windows), and loss or redundancy of equipment. All sampling equipment should be rated (and preferably pressure-tested) for the appropriate depth. For example, the following 'rule of thumb' guidance may be considered for the use of some types of sediment grab samplers/box cores (though vessel draft will be the primary method for determining minimum deployment depth)

  – 0–100 m: depth range for davit/Hi-Ab/crane/A-frame deployment of a 0.025 m^2 van Veen grab. Although it is possible to hand-haul this type of grab to 100 m water depth, this has a considerable impact on fatigue, with implications for health and safety and the ability to maintain survey operations over a prolonged period, and therefore should be restricted to ≤ 50 m water depth

  – 1–600 m: depth range for vessel (crane/A-frame) deployment of a 0.1 m^2 van Veen Grab (or similar)

  – 10–800 m: depth range for vessel (crane/A-frame) deployment of a 0.2 m^2 van Veen Grab (or similar)

  – 10–10,000 m: depth range for vessel (crane/a-frame) deployment of a 0.1 m^2 box core (of appropriate design – **check before mobilisation**) or multicorer

The manufacturer's recommendations for use, in addition to depth certification, should be used to define limitations of use. The greater the depth limit of the equipment, the larger and heavier it must be to resist the pressure and maintain weight on the end of the winch cable. This has implications for deployment and retrieval.

- Weather/sea conditions can prevent safe survey operations or reduce sampling efficiency – this needs to be considered in the survey design and captured in reporting throughout the OSMP response.

- The size of survey vessel. The further offshore, the larger the survey vessel will need to be to meet operational requirements. This does offer the opportunity of more bunking space for multiple survey shifts and potentially dual deployments – optimising operational efficiency during good weather windows and potentially increasing the range of weather conditions where it is safe to work. The capabilities of the vessel should also be considered – for example, a vessel with dynamic positioning system (DPS) and a moon pool enable safe deployment of sediment samplers over a much greater range of conditions than a stern or lateral deployment. The ability of the vessel and crew to hold position for sampling under normal weather conditions should be assessed and documented if not DP1 in offshore deep waters. Additionally, communications between the Party Chief (potentially in the wheelhouse) and deck personnel will be challenging on larger vessels, and therefore personal radio communications with headsets with remote controls should be used (by the Party Chief and deck lead as a minimum). Similarly, for surveys close to shore, the size of the vessel can limit access to certain sampling locations – e.g. the vessel draft will define the minimum safe sampling depth (remember to check whether the vessel's sounder provides 'depth below water surface' or 'depth below transponder' to avoid risk of grounding).

- 'Ranking' of survey operations based on the health and safety risk of deployment. When mobilising an offshore survey vessel, it would be wise to consider mobilising the equipment for multiple SMP scopes (where available) to maximise the opportunity to undertake survey operations safely over a range of environmental conditions. For example, equipment that is inherently heavy and has to be lifted over the stern/gunwale for deployment can develop a potentially-dangerous swing very quickly during deployment or retrieval. Safety protocols must be in place to minimise this risk. The individual characteristics of the survey vessel can have a great effect on this – the pitch/roll of the vessel, the height of the gunwale (for lateral deployments), height above sea level of the main deck, and the size of the A-frame are just a few examples (also see previous note on DPS and moon pool). This limits the weather/sea conditions in which a specific deployment can be undertaken safely. Different survey equipment have different weight/size and deployment characteristics, and therefore have different deployment limitations. By mobilising a range of different equipment onto the survey vessel, survey operations may be maintained over a greater range of weather/sea conditions. All personnel should be suitably qualified and experienced to use all equipment mobilised to their vessel.

Note: all personnel will have the right to suspend survey operations under conditions that pose a risk to health and safety and/or where there is a risk of damage to the survey equipment or vessel (i.e. Stop Work Authority).

- Exposure/fatigue of survey personnel. Deck survey personnel will be exposed to a range of conditions such as night operations, cold (and potentially icy decks), wet weather, wind and sun. The physical nature of survey operations, length of shifts/offshore periods, constant movement of the vessel, and sea sickness can also cause fatigue, impact morale and impact operational effectiveness and safety. This must be considered in the day-to-day and long-term management of survey personnel and in the provision of PPE. It is the responsibility of all, but in particular the Party Chief and Field Technical Lead, to watch for signs and manage personnel effectively. Survey design and planning should include consideration of breaks, although operationally it would be optimal to coincide these with transits between sites.

- Distance between survey sites. The size of the survey area would likely result in considerable distance between offshore survey locations. This should be considered in the design to optimise survey operations (e.g. samples/data collected) at each location. Vessel speeds should be used to estimate transit time, but allowances must be made for the impacts on wind and tide on vessel speed. Transit time must also be considered where there are a large number of sites to sample in a relatively constricted period of time (e.g. to monitor along the leading edge of the slick) and would help determine the number of vessels required to mobilise and the ports of mobilisation.

- Sampling in close proximity to subsea infrastructure/unprotected wreck sites. Where seabed and/or demersal sampling close to known subsea infrastructure or wreck sites that are not classified as protected (e.g. heritage), additional planning is required. A number of risk mitigation methods may be considered, including pre-surveying the sampling area with the vessel sounder to mark objects (though

this technology has its depth limitations), pre-survey using a Remotely Operated Vehicle (ROV) (preferably with scanning sonar), DPS vessel with high-accuracy subsea navigation systems (e.g. Ultra-Short BaseLine (USBL) in combination with navigation software such as HydroPro or equivalent) to monitor the relative position and depth of the sampling equipment relative to the vessel (and sea bed/infrastructure) in real-time, and/or sampling equipment fitted with scanning sonar and live video feeds (depth limited to around 100 m). A USBL system may also be required for equipment that is required to sample at specific depths (e.g. Bongo nets). Safety will be the priority at all times, so if there is a risk of fouling or damage to subsea infrastructure that would increase health and safety or situational risk, then abandonment of the site will be considered.

4.6 Logistical considerations

An indicative field logistics plan will be prepared as part of the HSE planning process and prepared for use in the Oil Spill Response Exercise. These will be finalised based on the nature and scale of the actual release as part of the OSMP implementation process. This need not be a full report but should contain sufficiently detailed information for the Equinor IMT to implement an effective logistical response in the first 7 days following activation of the OSMPs. An enhanced field logistics plan may then be developed to support maintenance of ongoing OSMP field surveys. Information included in the field logistics plan will include (but will not be limited to):

- Survey shifts and rotations of field personnel
- Survey platform types and number required (e.g. offshore survey vessels, coastal survey vessels, 4WD vehicles, hovercraft, helicopters/planes, etc.)
- Survey platform requirements (e.g. for offshore vessels, requirements may include information on deck space, deck hoses, A-frames, deck cranes, additional deck crew, bunking, etc.)
- Consideration of multiple scopes operating on single vessels (potential for dual deployments and 24-hour survey operations)
- Many vessel-based scopes assume that there is a spare deck crew member available to support deployment and retrieval of equipment. Where this is not the case, the relevant Technical Program Lead will provide an assessment of the potential requirement for an additional field scientist/technician on a case-by-case basis (e.g. due to HSE and sample quality risks)
- Consideration of including Marine Faunal Observers (MFOs) on coastal and offshore survey vessels.

To optimise vessel availability, it is recommended that a number of additional survey teams and equipment for core/critical OSMPs are mobilised to the port of mobilisation even if available vessels have not been identified. This would mean that survey operations could be implemented even in relatively small windows of availability or at short notice. Core/critical OSMPs or data requirements will be defined by the IMT at the time, based on their need for situational awareness and/or based on spill trajectory and predicted time to exposure of sensitive receptor locations (e.g. for opportunistic post-release pre-exposure baseline data collection).

There may also be a need to implement multiple shifts for office-based personnel to support 24-hour operations during initial implementation. Multiple resources (minimum 2–3 personnel) should therefore be allocated to each key role.

OSMP field operations (with the exception of MFOs) must not be mobilised on the same vessel as oil spill responders. There are several reasons for this:

1. Oil spill response needs to take priority and cannot be stood down for periods to allow operational and/or scientific monitoring.
2. Even if there are periods of spill response down-time (e.g. overnight) that could be available for OSMP activities, the potential risk of contamination of samples is too great.

3. OSMPs that don't have contamination considerations (e.g. identification of impacts to benthic biota and/or demersal biota) tend to have a large deck area requirement, which is likely not be available due to spill response deck requirements. Diurnal variability in the activity of benthic and demersal biota must also be considered.

Equipment and vessels engaged from outside Australia must meet Australian Quarantine Inspection Service (AQIS) requirements.

4.7 Mobilisation

4.7.1 Personnel transfer to site

All travel and accommodation will be managed by Equinor, or alternatively through RPS' Booking Agent, FCM Travel. Commercial airlines, hire car companies and taxi companies will be used for air and ground transport requirements. Off-road activities will preferably be undertaken using rented mine-specification 4WD vehicles where available (e.g. through Thrifty car rental – 136 139; other suppliers are available). Off-road trailers will be sourced where required.

4.7.2 Freight

Equinor will be responsible for logistical management of freight during the response phase.

Shipping of equipment will be managed by RPS during the scientific monitoring phase, or where otherwise requested by Equinor (e.g. to support freight management during periods of exceptionally high demand for logistical support). RPS has an existing national contract with TOLL Group. All freight will be handled by TOLL Express or TOLL Priority and delivered to the point of embarkation. RPS believes that the freight can be ready to ship within 24 hours of being notified. It is estimated that shipping to the offshore departure point would require an additional 24 to 36 hours.

Sample transfer and freight is described separately in Section 4.10.

4.7.3 Accommodation

Personnel mobilised for scientific studies may require accommodation. This will be managed by Equinor. Where Equinor directs RPS to arrange accommodation (e.g. to support scientific monitoring), the RPS administration team will source and book accommodation through FCM travel (or alternative).

4.7.4 Provisions and victualling

Intertidal survey teams will purchase sufficient provisions for their pre-defined survey period, in line with contractual arrangements. Recommendations on provisioning will be provided in HSE plans.

Survey vessels will be fully provisioned based on the maximum period at sea for the specific survey vessel and complement (up to a limit of 3 weeks). Where field survey operations will take longer than this period, the vessel will return to port for re-provisioning. This is to allow rotation of survey personnel for effective fatigue management.

4.8 Indicative response time frames

Indicative response time frames are presented in Table 4-3.

Table 4.3: Indicative OSMP activation time line

Time frame (following activation)	Activity
Intertidal (shoreline) survey and/or dockside sampling team(s)	
72–96 h (Day 3 to 4)	• Undertake pre-mobilisation briefings and inductions • Transfer to airport • Flight to closest commercial airport to survey locations • Pick up hire vehicle(s) • Transfer to accommodation
96–120 h (Day 4 to 5)	If freight has arrived: • Pick up freight • Check, and prepare survey equipment and consumables • Check equipment again, and pack into survey vehicle(s). hazardous chemicals (e.g. formal-saline) should be transported as per the relevant MSDS • Purchase provisions (in line with guidance in HSE documents) • Travel to first survey location • If in a remote area, set up campsite and sample storage equipment (e.g. fridge/freezers) first to allow time to reach sample storage temperatures before sample storage is required • If accommodation has been sourced, confirm booking/check in and confirm any arrangements for sample storage (e.g. available fridges/freezers) • Field Lead to undertake pre-survey safety and technical briefings • Field Lead to prepare and send daily progress report to Field Operations Coordinator If freight has not arrived: • Field Lead to confirm tide times, first sampling location and survey plan with Field Operations Coordinator • Field Lead to undertake pre-survey safety and technical briefings
120–144 h (Day 5 to 6)	If freight has arrived: • Pick up freight • Check, and prepare survey equipment and consumables • Check equipment again, and pack into survey vehicle(s). hazardous chemicals (e.g. formal-saline) should be transported as per the relevant MSDS • Purchase provisions (in line with guidance in HSE documents) • Travel to first survey location • If in a remote area, set up campsite and sample storage equipment (e.g. fridge/freezers) first to allow time to reach sample storage temperatures before sample storage is required • If accommodation has been sourced, confirm booking/check in and confirm any arrangements for sample storage (e.g. available fridges/freezers) • Field Lead to undertake pre-survey safety and technical briefings • Field Lead to prepare and send daily progress report to Field Operations Coordinator where mobile communications are available (satellite phones and radio communication equipment will be available for HSE purposes) If on site after Day 5 • Survey operations to be undertaken during daylight hours and where tidal state and allows
144–168 h (Day 6 to 7)	If on site after Day 6 • Survey operations to be undertaken during daylight hours and where tidal state allows
Aerial survey teams	
72h–96 h (Day 3 to 4)	• Undertake pre-mobilisation briefings and inductions • Transfer to airport • Flight to closest commercial airport to survey locations • Transfer to accommodation Confirm availability of aerial survey platforms and weather conditions for the following days

Time frame (following activation)	Activity
96–120 h (Day 4 to 5)	Where survey aircraft is available and weather permits: • Set up survey equipment (travelled with surveyors on commercial aircraft) • Field Lead to undertake pre-survey safety and technical briefings • Transfer to survey airfield • Field team to undertake relevant on-site inductions and safety briefings • Commence aerial surveys • Field Lead to prepare and send daily progress report to Field Operations Coordinator
Vessel-based survey teams, or where vessel access to sites is required	
72–144 h (Day 3 to 6) Timeframes are less certain due to the availability, calibration requirements and freight times for survey equipment and/or vessel availability	• Undertake pre-mobilisation briefings and inductions • Transfer to airport • Flight to closest commercial airport to port of embarkation • Pick up hire vehicle(s) • Transfer to accommodation or survey vessel (if in port) • Confirm arrival time/date of freight at survey vessel berth
96–168 h (Day 4 to 7)	If the survey vessel is in port and the freight is to be delivered that day: • Transfer to vessel port • Undertake port inductions where required • Transfer to vessel • Party Chief to confirm accommodation and sample storage arrangements for survey team • Party Chief to arrange for part of the team to purchase provisions (e.g. consumables) if required • Field Lead to undertake vessel contamination risk assessment and identify appropriate deck arrangements to mitigate risk in line with survey requirements • Receive freight delivery • Mobilise equipment onto vessel (via vessel deck cranes or pre-arranged port mobile crane) • Check, set up, and prepare survey equipment and consumables • Check equipment again and confirm operational, then secure on deck • Hazardous chemicals (e.g. formal-saline) should be stored as per the relevant MSDS • Party Chief to undertake pre-survey safety and technical briefings • Party Chief to prepare and send daily progress report to Field Operations Coordinator • Where embarkation is feasible, overnight transit to site If freight has not arrived or vessel is not available: • Field Lead to confirm tide times, weather forecasts, first sampling location and survey plan with Field Operations Coordinator
120–288 h (Day 5 to 12)	Where vessel is on site and relevant permits/exemptions are in place: Party Chief to undertake toolbox talk and pre-start briefings Commence survey operations OR • Survey team to transfer to intertidal survey location or seabird/shorebird colony • Commence survey operations

Note: Field survey personnel may be mobilised to site but be unable to commence certain survey operations if the required permits or exemptions are not in place. Delays in mobilisation from port to survey locations may also occur if all available resources are required to respond to human health and safety emergencies (e.g. recovery of casualties or personnel at risk). Human health and safety/rescue activities will ALWAYS be prioritised above OSMP mobilisation requirements.

4.9 Daily field reporting

All field teams will prepare daily reports for transmittal to the RPS Field Operations Coordinator. The Daily Progress Reports (DPRs) will contain the following information:

- Project and scope (OSMP) reference
- Date
- Name or person completing report
- Permit number (if relevant)
- Vessel name/registration number
- Name and contact details of vessel master (where relevant)
- Location (e.g. nearest geographic location, or closest survey site reference if at sea)
- Work day/shift start time(s) and end time(s)
- Name and contact details of Party Chief or Field Lead
- Daily HSE statistics and lessons learned
- Daily weather observations (e.g. wind and sea state)
- Daily events reported with event times
- Plans for subsequent day(s)
- List of vessel's complement, including names and details (company, role, date mobilised, date demobilised, total days on board) of all vessel crew and survey personnel
- Records of loss of equipment and/or down-time related to survey equipment and vessel deployment gear shall be kept, to allow office-based support staff to identify if particular equipment are likely to need replacement during the next rotation.

Where internet access is unavailable, survey personnel will call the RPS office via satellite phone to provide this information. The relevant DPR will then be prepared by office support staff.

4.10 Sample transfer and management

Samples collected for laboratory analysis as part of OSMP field operations will be stored and transferred as per the specific instructions provided by the analytical laboratory for each analytical method. Samples will be collated based on holding times, storage requirements and sample type, to maximise sample management and facilitate transfer of samples within holding times.

All samples submitted for analysis will be accompanied by a Chain of Custody (CoC) form, which details the laboratory the samples will be sent to, the analytical methods and the limits of detection required. The CoC form will accompany samples during transport and delivery. The form will be signed with the time and date recorded by each individual responsible for the samples including RPS staff and laboratory personnel. Upon each exchange, the CoC form is countersigned and duplicated by the relinquisher. The recipient retains the original. When samples are received by the laboratory, a duplicate of the original will be issued to RPS confirming arrival. The CoC allows RPS to track the samples and ensure that samples arrive at the intended destinations on schedule.

Where holding times are shorter than the survey rotation period (e.g. 7 days for water samples, with up to 3 weeks between survey personnel rotations), then alternative arrangements will be made to collect samples for transfer to the laboratory. For survey teams based on the mainland, 4WD vehicles (with off-road trailers) can travel between survey teams on a rota-basis to collect samples. Nearshore coastal vessels may be able to return to a port, harbour or jetty to offload samples. Where this is not feasible, arrangements will be made for either helicopter transfer of samples, or vessel-to-vessel transfers (of samples only).

Samples will either be freighted from site/ports to laboratories or accompany survey personnel on return flights for hand-delivery to laboratories. Refrigerated transport will be required for the majority of samples. In the event the refrigerated truck is not available on the day, previous survey experience in Australia has demonstrated that ice-packed eskies will suffice to store and transport samples to the laboratory.

4.11 Data transfer and management

During implementation, the Data Manager/Quality Lead will be responsible for finalising the following Standard Operating Procedures (SOPs):

- Pre-mobilisation, *In situ* and demobilisation equipment checks
- Protocols for the download of data and preliminary field QA/QC checks of data quality
- Protocols for the calibration/adjustment (e.g. conversion) of raw data in line with accepted scientific methods
- Data management protocols and security and data audits.

These SOPs will require internal approval (facilitated by the OSMP Program Manager).

Following field-based QA/QC check protocols, data collected in the field will be collated on a survey laptop and backed up on two secure (password-protected) external hard drives. Data will be partitioned on the drive in folders, as defined in the OSMP metadata requirements. Files will also be re-named in the field in line with metadata requirements, where time allows. Where this is not feasible, a comment to this effect will be included in daily progress reports and this task will then be allocated to office-based support personnel upon receipt of the raw field data.

Where critical to support situational awareness (following pre-approval by the Equinor OSMP PM), some data may be transferred via email or cloud storage drive. Most data will be transferred from the field via password-protected external hard drives, which will then be returned with survey personnel during their shift rotation (after a period of up to a maximum of three weeks in the field).

Laboratory data will be received by RPS approximately two weeks following receipt of the samples by the analytical laboratory. RPS will undertake a QA/QC review of laboratory reports and collate relevant data into files for subsequent analysis.

Field and laboratory data will be imported into an appropriate database. Relevant data and metadata will be transferred to RPS and/or Equinor GIS teams to support situational awareness and for reporting purposes.

Data (comprising QA/QC'd field data, laboratory reports, collated data or a high-level summary) will be transferred to Equinor in line with the relevant SOP. This may be achieved via the transmission of data files (in an electronic data deliverable format) or through provision of access to an online data portal.

5 ONGOING MAINTENANCE OF RESPONSE

5.1 Maintenance of resources

The Resource Register will be the main process for maintaining operational awareness of the availability of response resources. This will be used in conjunction with project management and scheduling software to plan rotations, mobilisation, and pre-emptive replacement of work equipment.

5.2 Scheduling

Scheduling of mobilisation and demobilisation of personnel, equipment and survey platforms (vessels, planes, etc.) will be based on fatigue management recommendations and, to a lesser extent, practical considerations (e.g. vessel endurance (the period between port visits)), and survey type (aerial, intertidal, coastal or offshore). HSE assessments will consider (but are not limited to) the following:

- The type of environment
- The remoteness of the environment
- The survey activities to be undertaken (including how arduous the activities are)
- The potential risks from fatigue and effective mitigation methods
- The effects on morale of the survey activities and location
- The local environmental hazards (e.g. tides, hazardous biota, engineering hazards, exposure to the elements, etc.).

Other considerations include the location and potential mobilisation requirements for personnel and equipment. Scheduling of rotations will be undertaken in advance to allow efficient logistical planning and management. This also allows alternative resources to be identified and engaged should they be required.

Schedules should also include office-based requirements such as regular OSMP program meetings, expected data delivery dates, reporting deadlines and to cover for staff absences (due to illness or leave). It must be remembered that during high-stress and high-demand periods (e.g. especially during the first few weeks of the response), office-based staff are also likely to become fatigued and an effective plan should be in place to manage this.

5.3 Logistical considerations

Mobilisation and demobilisation of field teams and resources will be managed by the Planning Section of the IMT during the spill response phase. Once the response phase has been terminated, the IMT will be stood down. Equinor will continue to undertake the logistical management of mobilisation and demobilisation of field teams and resources. The Equinor OSMP PM will retain their role to provide continuity in OSMP management.

5.4 Ongoing data management

The Data Manager/Quality Lead will be responsible for managing the receipt, QA/QC, transfer and collation (e.g. into databases) of OSMP field and laboratory data, in line with the data and metadata management plan. They will also be responsible for the continual management and implementation of OSMP metadata. The Data Manager and Field Operations Coordinator will work closely to develop a schedule for the anticipated delivery of field and laboratory data. The Data Manager will then be responsible for engaging with analytical laboratories to follow up on any data delivery and quality issues. The technical leadership team will engage with the Data Manager to identify data format and delivery schedules to support periodic technical reporting requirements.

5.5 Internal reporting requirements

Internal reporting requirements will be confirmed by the RPS OSMP PM upon implementation. These will be required to support an efficient response, via transfer of key information within the OSMP response team and the broader business entity (Service Provider). Reporting will address key business requirements including:

- Resourcing
- Internal communications
- OSMP progress reporting
- Reporting of HSE incidents (including near-misses and lessons learned) and personnel issues
- Audit/internal review reports
- Financial reporting, contractual arrangements and invoicing
- Forward planning and scheduling
- Internal equipment requirements
- IT reports.

Internal audit/review reports will be used to inform an ongoing HSE/quality improvement process.

5.6 Periodic reporting to Equinor

Periodic reporting refers to reports that are required at key stages or throughout the OSMP response. Some of these reports will be prepared on a post-survey, seasonal, annual or post-response phase basis. Reporting will comprise:

- OSMP program status reports
- Field daily progress reports
- Health, safety and environment (HSE) reports
- Technical reports
- Post-survey Environmental Performance Reports (PEPRs).

The structure, function, composition and time frames for OSMP program status reports will be agreed between Equinor and the Service Provider (RPS) as part of final agreement of the communications protocol. Indicative field day report formats are described in Section 4.9. Finalised OSMP reporting requirements (HSE reports and technical reporting requirements) will be defined in the plan-specific HSE plans and sampling and analysis plans (SAPs). These plans will include requirements for reporting delivery schedules, which will include provisions for stakeholder reporting requirements and any requirements for reviews of technical reports by an independent review panel. Technical reports will be prepared to address the stated objectives of the relevant OSMP (either in part or full, depending on the nature of the report).

5.7 Engagement with stakeholders

Engagement with stakeholders will be the responsibility of Equinor. However, under certain circumstances RPS teams (e.g. the technical leadership team) may be required to engage directly with stakeholder groups at the request of Equinor, such as an independent review panel or Scientific Advisory Group (SAG), if convened. This will facilitate:

- Ongoing technical guidance on OSMP scopes
- Consideration of stakeholder requirements
- Document/report reviews.

5.8 Termination and demobilisation of field scopes

Demobilisation of individual OSMP field scopes will be implemented following notification of termination by Equinor. Equinor will terminate scopes based on OSMP termination criteria (see Section 4.1) and following agreement with relevant stakeholders. Demobilisation will be managed by Equinor during and following termination of the oil spill response phase. Demobilisation of scientific monitoring scopes will be managed by Equinor and RPS in the post-response phase.

5.9 Review, audit and testing

The OSMP will be reviewed:

- At least annually from date of acceptance until the end of the EP
- At least two months prior to the MODU arriving on location for the petroleum activity
- Following the oil spill exercises and tests described in Section 13.2 of the OPEP
- After an actual oil spill into the marine environment
- If the oil spill risk profile changes significantly
- If changes to Commonwealth and state oil spill response plans or resources occur that affect Equinor's ability to effectively implement and comply with the OSMP

Review of the OSMP will consider the following:

- OSMP Resource register - A random subset of a minimum of ten suppliers outlined in the register will be contacted to determine current availability. Records will be maintained of the suppliers contacted from the register, and what resources were confirmed to be available at that point in time.
- OSMP sampling methods - the identification of available new technologies or methods may trigger a revision of individual monitoring plans should they be considered appropriate to the objectives of the OSMP, scientifically robust, and are likely to be of benefit to OSMP outcomes.

Review of available baseline data (Appendix A) may also trigger a revision of OSMP documentation should sampling methods be identified that are not described in relevant Operational Monitoring Plans (OMPs) or Scientific Monitoring Plans (SMPs).

All record keeping, including communication, schedules, CoCs, daily reports, HSE/incident reports, signed plans, field survey logbooks, and field datasheets are to be subject to the QA/QC process, then summarised (where necessary), digitised and archived. The continuous Lessons Learned and improvement processes will be a key component of OSMP outcomes.

6 REPORTING AND CLOSE-OUT

Upon termination and demobilisation of the final active OSMP, the operational and scientific monitoring program finalisation and close-out phase will commence. This phase incorporates:

- Data collation and delivery
- Analysis and interpretation
- Final reporting
- Engagement with stakeholders
- Archiving.

6.1 Data collation and delivery

As defined in Section 5.4, QA/QC'd data will be compiled in OSMP databases throughout the OSMP response. Data collation includes digital (scanned) copies of all field survey reports, field survey logbooks, CoCs and other records completed by hand.

The Data Manager will ensure the compiled datasets have been checked against data records to confirm that all data (and metadata) for each scope are accounted for and will confirm details of the QA/QC assessments undertaken on the data. Any remaining data gaps will be identified and addressed, with records generated detailing the outcomes.

Once all digital data (or sets of data) have been compiled and final checks have been completed, databases will either be transferred to Equinor via appropriate password-protected storage media, or (where applicable and in line with Corporate data management requirements) transferred via online resources (e.g. secure websites/data portals, cloud services and/or Corporate internet-based file transfer systems).

6.2 Analysis and interpretation

Final datasets for individual scopes (SMPs) will be analysed to provide interpretation of:

- Impacts of the spill on the values or sensitivities for each plan
- Potential impacts of spill response activities
- Recovery over time
- Consideration of the potential effects of other natural and anthropogenic impacts.

Statistical analyses of quantitative data will be undertaken using appropriate, commonly-used and scientifically-robust univariate and multivariate statistical analysis techniques. Depending on the size of datasets for each scope, data analyses may be undertaken solely by RPS or in conjunction with a third-party service provider.

6.3 Final reporting

Reporting will comprise:

- OSMP program status reports
- Field daily progress reports
- Health, safety and environment (HSE) reports

- Technical reports
- A summary report, collating the outcomes of each OSMP report
- A ‘lessons learned’ report, detailing OSMP challenges, solutions and future recommendations.

The structure, function, composition and timeframes for OSMP program status reports will be agreed between Equinor and the Service Provider (RPS) as part of final agreement of the communications protocol. Indicative field day report formats are described in Section 4.9. Finalised OSMP reporting requirements (HSE reports and technical reporting requirements) will be defined in the plan-specific HSE plans and SAPs. These plans will include requirements for reporting delivery schedules, which will include provisions for stakeholder reporting requirements and requirements for reviews of technical reports by an independent review panel.

6.3.1 Peer review

Scientific monitoring program reports will be peer reviewed by an independent and appropriately qualified and independent SME whose expertise is relevant to the topic of the report.

6.4 Engagement with stakeholders

Equinor will engage with external stakeholders. RPS will only engage with stakeholders forming part of the SAG (including during the SAG selection process) and those providing direct field support to the OSMP, or as a required component of studies (e.g. SMP9), unless directly requested by the Equinor OSMP PM. This may include support for engagement with stakeholder representatives or groups, or direct engagement with independent SMEs.

6.5 Archiving and close-out

All digital and paper records, data and reports will be archived in accordance with RPS internal archiving procedures and standards. Completion of the archiving process will be the final requirement of the operational and scientific monitoring program close-out phase. Equinor will then be informed that the OSMP response has been completed.

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8 ABBREVEATIONS, ACRONYMS AND DEFINITIONS

Acronym/abbreviation	Description
4WD	Four-wheel drive vehicle
AAR	Aboriginal Affairs and Reconciliation (SA)
AAV	Aboriginal Affairs Victoria
AEC	DPIPWE Animal Ethics Committee
AMSA	Australian Maritime Safety Authority
AQIS	Australian Quarantine Inspection Service
AS	Australian standard
AUV	Autonomous underwater vehicle
BOSIET	Basic Offshore Safety Induction and Emergency Training
CDOM	Coloured dissolved organic matter
CoC	Chain of custody
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CTD	Conductivity, temperature and depth sensor
DBCA	Department of Biodiversity, Conservation and Attraction (WA)
DELWP	Department of Environment, Land, Water and Planning (Victoria)
DEWHA	Department of the Environment, Water, Heritage and the Arts (now DEE)
DEWNR	Department of the Environment, Water and Natural Resources (SA)
DO	Dissolved oxygen
DoT	Department of Transport
DPI	NSW Department of Primary Industries
DPIPWE	Department of Primary Industries, Parks, Water and Environment (Tasmania)
DPIRD	Department of Primary Industries and Regional Development (WA)
DPLH	Department of Planning, Lands and Heritage (WA)
DPTI	Department of Planning, Transport and Infrastructure
DSD	Department of State Development (SA)
EEZ	Exclusive economic zone
EMBA	Environment that may be affected
Environment Plan	EP
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
Equinor	Equinor Australia B.V.
ESC	Environmental and Scientific Co-ordinator
EUL	Environment unit leader
GAB	Great Australian Bight
GIS	Global information system
GPS	Global positioning system
HAZID	Hazard identification
HSE	Health, Safety and Environment
HUET	Helicopter Underwater Escape Training
IMT	Incident Management Team
IP	Implementation plan
JHA	Job hazard analysis
KEF	Key ecological feature
MEER	Maritime Environmental Emergency Response
MFO	Marine fauna observer
MMO	Marine mammal observer

Acronym/abbreviation	Description
MSA	Master service agreement
MSIC	Maritime Security Identification Card
NATA	National Association of Testing Authorities
NEBA	Net Environmental Benefit Analysis
Nm	Nautical mile
NOAA	National Oceanic and Atmospheric Administration
NOPSA	National Offshore Petroleum Safety Authority
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NSW	New South Wales
OEH	Office of the Environment and Heritage NSW
OMP	Operational Monitoring Plan
OPEP	Oil Pollution Emergency Plan
OPGGS(E) Regulations	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OSMP	Operational and Scientific Monitoring Program
OSTM	oil spill trajectory modelling
OWR	Oiled Wildlife Response
PCR	Project change request
PEPR	post-survey Environmental Performance Reports
PEPs	Project Execution Plans
PIRSA	Primary Industries and Regions South Australia
PM	Project manager
POLREP	Oil Pollution Report
PPE	Personal protective equipment
QA/QC	Quality control/ Quality assurance
RMS	Roads and Maritime Services (NSW)
ROV	Remotely operated vehicle
RPS	RPS Australia West Pty Ltd
SA	South Australia
SAG	Scientific advisory group
SAHC	South Australian Heritage Council
SAPs	Sampling and analysis plans
SARDI	South Australia Research and Development Institute
SBRUVS	Stereo baited underwater video stations
SEMD	The Environmental Protection Authority Division of the Department of Transport Security and Emergency Management Division
SIMOPS	Simultaneous operations
SME	Subject matter exports
SMP	Scientific Monitoring Plan
SOP	Standard operating procedure
TBOSIET	Tropical Basic Offshore Safety Induction and Emergency Training
UAV	Unmanned aerial vehicle
USBL	Ultra-short baseline
VOC	Volatile organic compounds
WA	Western Australia
ZPI	Zone of Potential Impact

Appendix A

Record of baseline studies

APPENDIX A: RECORD OF BASELINE STUDIES

1 INTRODUCTION

Baseline data review is required as part of the preparedness phase of the Operational and Scientific Monitoring Program (OSMP). Baseline data has been reviewed and complied considering the recommended target receptors listed within each Operational Monitoring Plan (OMP) and Scientific Monitoring Plan (SMP).

Baseline data has been reviewed for spatial relevance and survey methods. The spatial scale covered by this report is the existing environment of the Risk EMBA as defined in Appendix 7-3 of the Stromlo-1 exploration drilling program environment plan.

Survey methods used in the collection of each baseline dataset has been reviewed where it has been provided in order to confirm alignment of the survey methods listed in each OMP and SMP. However, survey methods are not always clearly defined, particularly the size or type of sampling device used.

The record includes the Commonwealth Scientific and Industrial Research Organisation (CSIRO)/ South Australian Research and Development Institute (SARDI) Great Australian Bight (GAB) Research Project studies, which were part-funded by Equinor. The record also lists peer-reviewed journal articles and privately or agency- held datasets from known, ongoing long-term monitoring studies, such as Port Authority monitoring programs that do not typically present their monitoring data as peer-reviewed research, but nonetheless hold valuable and relevant baseline data.

This record of baseline data will be reviewed prior to the desktop oil spill response exercise and after accidental hydrocarbon release as part of post-release pre-response preparedness. Records of these reviews will be maintained.

2 RECOMMENDED TARGET RECEPTORS

2.1 Water quality

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. CSIRO internal dataset 2. NASA internal dataset 3. DoEE data within Australia – All Substances from oil and gas extraction. Water emissions totals by substance. 4. Maher, W.A. and Aislabie, J., 1992. Polycyclic aromatic hydrocarbons in nearshore marine sediments of Australia. Science of the total environment, 112(2-3), pp.143-164.	1. Meeuwig, J & Turner, J 2017, Bremer Canyon Progress Report: Spatial distribution of marine wildlife in the Bremer Bay region., no. June. 2. Western Australian Shellfish Quality Assurance Program Reports and internal dataset.	1. SARDI internal dataset 2. Gaylard S (2005). Ambient water quality monitoring: Nepean Bay, Kangaroo Island, report 1: 1999–2004, Environment Protection Authority, Adelaide. 3. IMOS Australian Ocean Data Network 4. Bryars S, Miller D, Collings G, Fernandes M, Mount G and Wear R (2006). Field surveys 2003–2005: assessment of the quality of Adelaide's coastal waters, sediments and seagrasses, ACWS technical report 14, prepared for the Adelaide Coastal Waters Study Steering Committee, SARDI publication RD01/0208-15, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 5. SA EPA Nearshore marine biounit Aquatic Ecosystem Condition Reports – Habitat and water quality data. 6. South Australian Shellfish Quality Assurance Program Reports and internal dataset. 7. Adelaide Metropolitan Nearshore Marine Biounit 2017 Aquatic Ecosystem Condition Report and internal monitoring records 8. Wear RJ, Eaton A, Tanner JE and Murray-Jones S (2006). The impact of drain discharges on seagrass beds in the South East of South Australia, final report prepared for the South East Natural Resource Consultative Committee and the South East Catchment Water Management Board, SARDI publication RD04/0229-3, South Australian Research and Development Institute (Aquatic Sciences) and Department of Environment and Heritage, Coast Protection Branch, Adelaide.	1. Burns, K.A. and Smith, J.L., 1982. Hydrocarbons in Victorian coastal ecosystems (Australia): chronic petroleum inputs to Western Port and Port Phillip Bays. Archives of environmental contamination and toxicology, 11(2), pp.129-140. 2. Victorian Shellfish Quality Assurance Program Reports and internal dataset.	1. Parsons, K. E. (2012). D'Entrecasteaux Channel and the lower Huon Estuary. Inventory of Scientific Information. Report for the D'Entrecasteaux Channel Project, prepared by Ecomarine Consulting. 2. Tasmanian Shellfish Quality Assurance Program and internal dataset	1. Marine Aquaculture Research Lease Annual Report Series https://www.dpi.nsw.gov.au/fishing/aquaculture/starting-up/finfish-aquaculture-lease-modification-application 2. Jahan, S. and Strezov, V., 2017. Water quality assessment of Australian ports using water quality evaluation indices. PloS one, 12(12), p.e0189284. 3. NSW Shellfish Quality Assurance Program and internal dataset.
Survey methods					
1. Conductivity/ temperature/ depth sensors 2. Remote sensing 3. Annual reporting desktop study 4. Desktop study	1. SeaGlider equipped with conductivity/ temperature/ depth sensors, optical sensor, dissolved oxygen sensor 2. Niskin bottle, shellfish flesh	1. Conductivity/ temperature/ depth sensors 2. Monthly water samples analysed by a NATA2 accredited laboratory 3. Predator borne Conductivity/ temperature/ depth sensors, Remote sensing, Moorings, Glider 4. Niskin bottle, SCUBA and ROV survey 5. Grab sample 6. Niskin bottle, shellfish flesh 7. Video belt transect, 2.5 l water grab samples, sonde 8. Field survey, wave height visual observation, quadrat sediment sampling, water quality meter, Niskin bottle, video transect, visual observation of profile lines	1. Mussel tissue analysis 2. Niskin bottle, shellfish flesh	1. Desktop study 2. Niskin bottle, shellfish flesh	1. Digital Optical dissolved oxygen Meter, Niskin bottle, sonde 2. Niskin bottle 3. Niskin bottle, shellfish flesh

2.2 Natural hydrocarbons

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Logan, G.A., Jones, A.T., Kennard, J.M., Ryan, G.J. and Rollet, N., 2010. Australian offshore natural hydrocarbon seepage studies, a review and re-evaluation. Marine and Petroleum Geology, 27(1), pp.26-45. 2. Dowling, L.M., Boreham, C.J., Hope, J.M., Murray, A.P. and Summons, R.E., 1995. Carbon isotopic composition of hydrocarbons in ocean-transported bitumen's from the coastline of Australia. Organic Geochemistry, 23(8), pp.729-737.	1. Alexander, R., Currie, T.J. and Kagi, R.I., 1994. The origins of coastal bitumen's from Western Australia. The APPEA Journal, 34(1), pp.787-798.	1. Ross, A, Corrick, A, Trefry, C, Gong, S, McKirdy, D, Hall, T, Dyt, C., Angelini, A., Kempton, R, Pickard, A, White, C, Maslin, C, Griffin, D, Middleton, J, Luick, J, Armand, S, Vergara, T & Schinteie, R 2017, Asphaltite and tarball surveys. Appendix 5: Great Australian Bight Research Program, GABRP Research Report Series Number 25b 2. Hook, S.E., Revill, A.T., Mondon, J., Corbett, P., Armstrong, E.K., Song, J., Tanner, J.E., Stalvies, C., Ross, A.S. and Williams, A., 2018. Naturally occurring hydrocarbon content and baseline condition of deep-sea benthic fauna from the Great Australian Bight. Deep Sea Research Part II: Topical Studies in Oceanography, 157, pp.106-120 3. van de Kamp, J., Hook, S.E., Williams, A., Tanner, J.E. and Bodrossy, L., 2019. Baseline characterization of aerobic hydrocarbon degrading microbial communities in deep-sea sediments of the Great Australian Bight, Australia. Environmental microbiology, 21(5), pp.1782-1797. 4. Ross, A, Trefry, C, Langhi, L, Strand, J, Stalvies, C, Ahmed, M, Armand, S, Fuentes, D, Gong, S, Sestak, S, Crooke, E, Qi, X, Gresham, M, Talukder, A & Maslin, S 2017, Delineation and characterisation of cold hydrocarbon seeps. Final Report GABRP Project 5.1. Great Australian Bight Research Program, GABRP Research Report Series Number 17. 5. Struckmeyer, H.I.M., Williams, A.K., Cowley, R., Totterdell, J.M., Lawrence, G. and O'Brien, G.W., 2002. Evaluation of hydrocarbon seepage in the Great Australian Bight. The APPEA Journal, 42(1), pp.371-385.	1. Phillips, D.J.H., Richardson, B.J., Murray, A.P. and Fabris, J.G., 1992. Trace metals, organochlorines and hydrocarbons in Port Phillip Bay, Victoria: a historical review. Marine Pollution Bulletin, 25(5-8), pp.200-217. 2. Cowley, R. and O'brien, G.W., 2000. Identification and interpretation of leaking hydrocarbons using seismic data: A comparative montage of examples from the major fields in Australia's northwest shelf and Gippsland basin. The APPEA Journal, 40(1), pp.119-150.	1. Conolly, J., Galloway, MJ., 1995. Hydrocarbon perspectivity of the offshore West Coast of Tasmania. Report for Mineral Resources Tasmania. 2. Terrens, G.W. and Tait, R.D., 1996, January. Monitoring ocean concentrations of aromatic hydrocarbons from produced formation water discharges to Bass Strait, Australia. In SPE Health, Safety and Environment in Oil and Gas Exploration and Production Conference. Society of Petroleum Engineers.	

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Survey methods					
1. Desktop study 2. Gas chromatography-isotope ratio mass spectrometer	1. Field collection	1. Field survey 2. 6-core multicore into an instrument coring platform and 30mm minicores 3. Field survey 4. Desktop study, SAR, acoustic survey, Conductivity/ temperature/ depth sensors and grab/core systems, benthic observation and grab system (BOAGS), ADCP, multicore fitted to BOAGS 5. Desktop study of SAR data	1. Desktop review 2. Desktop study	1. Desktop review 2. Desktop review	

2.3 Shorelines (not including mangroves and saltmarshes)

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. National Vegetation information System	1. WA DBCA Marine conservation research and monitoring internal dataset.	1. DEH (2007). A regional perspective of the Lower Spencer Gulf marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 2. DEH (2007). A regional perspective of the Far West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 3. DEH (2007). A regional perspective of the West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 4. Miller, D., Westphalen, G., Jolley, AM., Brayford, B., 2009. Marine Habitats within bays of the Eyre Peninsula NRM Region. Coast and Marine Conservation Branch, DoEE. 5. Eaton AM, Fotheringham D and Cole RG 2001. Beach and shoreline monitoring program – Eyre Peninsula Protection District. Office of Coast and Marine, NSWSSA, Department for Environment and Heritage, Adelaide 6. Ross, A, Corrick, A, Trefry, C, Gong, S, McKirdy, D, Hall, T, Dyt, C., Angelini, A., Kempton, R, Pickard, A, White, C, Maslin, C, Griffin, D, Middleton, J, Luick, J, Armand, S, Vergara, T & Schinteie, R 2017, Asphaltite and tarball surveys. Appendix 5: Great Australian Bight Research Program, GABRP Research Report Series Number 25b. 7. Oppermann, A. (1999). A Biological Survey of the South Australian Coastal Dune and Clifftop Vegetation. 1996-1998. Coast and Marine Section, Environment Protection Agency, South Australia 8. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide. 9. DEH 2000, Coorong, and Lakes Alexandrina and Albert Ramsar Management Plan, Adelaide, SA. 10. Wear RJ, Eaton A, Tanner JE and Murray-Jones S (2006). The impact of drain discharges on seagrass beds in the South East of South Australia, final report prepared for the South East Natural Resource Consultative Committee and the South East Catchment Water Management Board, SARDI publication RD04/0229-3, South Australian Research and Development Institute (Aquatic Sciences) and Department of Environment and Heritage, Coast Protection Branch, Adelaide	1. Parks Victoria 2012 Marine Natural Values Study Summary.	1. Barrett, N.S., Sanderson, J.C., Lawler, M.M., Halley, V. and Jordan, A.R., 2001. Mapping of inshore marine habitats in south-eastern Tasmania for marine protected area planning and marine management. 2. TPWS 2012, Tasmanian Marine Reserves.	1. Ward, T.J. and Jacoby, C.A., 1992. A strategy for assessment and management of marine ecosystems: baseline and monitoring studies in Jervis Bay, a temperate Australian embayment. Marine Pollution Bulletin, 25(5-8), pp.163-171
Survey methods					
1. Desktop study	1. (Various)	1. Desktop study 2. Desktop study 3. Desktop study 4. Satellite telemetry, digitised aerial imagery, ROV and CUBA survey, acoustic survey, 5. Field observation 6. Aerial digital mapping, Acoustic ground truthing 7. Field observation 8. Field observation 9. Desktop study 10. Field survey, wave height visual observation, quadrat sediment sampling, water quality meter, Niskin bottle, video transect, visual observation of profile lines	1. Desktop study	1. Aerial digital mapping 2. Desktop study	1. Desktop study

2.4 Mangroves and saltmarshes

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. DoEE Wetlands Ecological character assessments. Available from http://www.environment.gov.au/water/wetlands/publications 2. National Vegetation Information System 3. Australian Wetlands Database, RAMSAR Wetlands. 4. DEE 2017, 'Directory of Important Wetlands of Australia' Australian Wetlands Database. 5. Laegdsgaard, P., 2006. Ecology, disturbance and restoration of coastal saltmarsh in Australia: a review. Wetlands Ecology and Management, 14(5), pp.379-399. 6. TERN Mangrove Portal https://nationalmap.gov.au/#share=s-oj6Rbuzs3o0i6XKM60sRLaOlFdH	1. DEC 2009, Ecological Character Description of the Lake Gore Ramsar Site: A Report by the Department of Environment and Conservation, Perth, Western Australia.	1. Seaman, R.L., 2003. Coorong and Lower Lakes habitat-mapping program. Conservation Programs, Department for Environment and Heritage. South Australia. 2. DEH (2007). A regional perspective of the Lower Spencer Gulf marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 3. DEH (2007a). A regional perspective of the Far West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 4. DEH (2007c). A regional perspective of the West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 5. Miller, D., Westphalen, G., Jolley, AM., Brayford, B., 2009. Marine Habitats within bays of the Eyre Peninsula NRM Region. Coast and Marine Conservation Branch, DoEE. 6. Ross, A, Corrick, A, Trefry, C, Gong, S, McKirdy, D, Hall, T, Dyt, C., Angelini, A., Kempton, R, Pickard, A, White, C, Maslin, C, Griffin, D, Middleton, J, Luick, J, Armand, S, Vergara, T & Schinteie, R 2017, Asphaltite and tarball surveys. Appendix 5: Great Australian Bight Research Program, GABRP Research Report Series Number 25b. 7. Canty D and Hille B 2002. Coastal salt marsh and mangrove mapping. Technical Report. Environmental Analysis and Research Unit, Department for Environment and Heritage, Adelaide, SA. 8. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide. 9. Saintilan, N. and Rogers, K., 2013. The significance and vulnerability of Australian saltmarshes: implications for management in a changing climate. Marine and Freshwater Research, 64(1), pp.66-79.	1. Boon PI., Allen T, Brook J., Carr G, Frood D, Hoye J, HartyC, McMahon A, Mathews S, Rosengren N, Sinclair S, White M and Yugovoc J, 2011. Mangroves and coastal saltmarsh of Victoria: distribution, condition, threats and management. Report to Department of Sustainability and Environment by Institute for Sustainability and Innovation, Victoria University, Melbourne. 513pp. 2. DELWP 2017, Western Port Ramsar Site Management Plan, Melbourne, Victoria. 3. DELWP 2017, Western Port Ramsar Site Management Plan, Melbourne, Victoria. 4. Hale, J 2016, Ecological Character Description Addendum - Western Port Ramsar Site, Melbourne. 5. Crinall, S.M. and Hindell, J.S., 2004. Assessing the use of saltmarsh flats by fish in a temperate Australian embayment. Estuaries, 27(4), p.728.	1. Finley, L, Jensz, K & Roberts, A 2010, Ecological Character Description of the Logan Lagoon Ramsar Site, Canberra, Australian Capital Territory. 2. Newall, P. & Lloyd, LN 2012, Ecological Character Description for the Flood Plain Lower Ringarooma River Ramsar Site, Syndal, Victoria. 3. Spruzen, F.L., Richardson, A.M. and Woehler, E.J., 2008. Spatial variation of intertidal macroinvertebrates and environmental variables in Robbins Passage wetlands, NW Tasmania. Hydrobiologia, 598(1), pp.325-342. 4. Prahalad, V.N., 2014. Human impacts and saltmarsh loss in the Circular Head coast, north-west Tasmania, 1952–2006: implications for management. Pacific Conservation Biology, 20(3), pp.272-285.	1. Ward, T.J. and Jacoby, C.A., 1992. A strategy for assessment and management of marine ecosystems: baseline and monitoring studies in Jervis Bay, a temperate Australian embayment. Marine Pollution Bulletin, 25(5-8), pp.163-171 2. Mazumder, D., Saintilan, N. and Williams, R.J., 2006. Trophic relationships between itinerant fish and crab larvae in a temperate Australian saltmarsh. Marine and Freshwater Research, 57(2), pp.193-199.
Survey methods					
1. Field study 2. Desktop study 3. Desktop study 4. Desktop study 5. Desktop study 6. Desktop study	1. Desktop study	1. GIS, field survey 2. Desktop study 3. Desktop study 4. Desktop study 5. Aerial digital mapping, Acoustic ground truthing 6. Visual observation 7. Desktop study 8. Desktop study 9. Desktop study	1. Desktop study 2. Desktop study 3. Desktop study 4. Desktop study 5. Fyke and seine nets	1. Desktop study 2. Desktop study 3. Sediment cores, sieved to 1 mm 4. Desktop study	1. Desktop study 2. Quadrat transects

2.5 Coral and rocky reefs

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Reef Life Survey publicly available dataset. 2. Bax, N. J., and Williams, A. 2001. Seabed habitat on the south-eastern Australian continental shelf: context, vulnerability and monitoring. Marine and Freshwater Research 52: 491–512. 3. Edgar, G 2013, Ecology of Australian Temperate Reefs	1. Shepherd SA and Edgar GJ (2013). Ecology of Australian temperate reefs: the unique South. CSIRO Publishing.	1. DEH (2007). A regional perspective of the Lower Spencer Gulf marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 2. DEH (2007a). A regional perspective of the Far West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 3. DEH (2007c). A regional perspective of the West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 4. Turner DJ, Kildea T and Westphalen G (2007). Examining the health of subtidal reef environments in South Australia, part 2, Status of selected South Australian reefs based on the results of surveys undertaken in 2005, SARDI publication RD03/0252-6: 81, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 5. Turner DJ, Kildea T and Westphalen G (2007). Examining the health of subtidal reef environments in South Australia, part 2, Status of selected South Australian reefs based on the results of surveys undertaken in 2005, SARDI publication RD03/0252-6: 81, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 6. Shepherd SA and Edgar GJ (2013). Ecology of Australian temperate reefs : the unique South. CSIRO Publishing. 7. Golder Associates. 2011. Port Spencer Marine Baseline. Quantitative Surveys. Report Number. 107661001-092-R-Rev0. 8. DEH (2008). Biodiversity of Rocky Reefs Yorke Peninsula—South Australia, draft report, South Australian Department for Environment and Heritage, Adelaide.	1. Shepherd SA and Edgar GJ (2013). Ecology of Australian temperate reefs: the unique South. CSIRO Publishing. 2. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne. 3. Parks Victoria 2012 Marine Natural Values Study Summary.	1. Barrett, N.S., Sanderson, J.C., Lawler, M.M., Halley, V. and Jordan, A.R., 2001. Mapping of inshore marine habitats in south-eastern Tasmania for marine protected area planning and marine management. 2. Bax, N. J., and Williams, A. 2001. Seabed habitat on the south-eastern Australian continental shelf: context, vulnerability and monitoring. Marine and Freshwater Research 52: 491–512. 3. Shepherd SA and Edgar GJ (2013). Ecology of Australian temperate reefs: the unique South. CSIRO Publishing. 4. Freiwald, A, Fosså, JH, Grehan, A, Koslow, T & Roberts, MJ 2004, 'Cold-water coral reefs Out of sight – no longer out of mind Cold-water coral reefs'., UNEP World Conservation Monitoring Centre.	1. Ward, T.J. and Jacoby, C.A., 1992. A strategy for assessment and management of marine ecosystems: baseline and monitoring studies in Jervis Bay, a temperate Australian embayment. Marine Pollution Bulletin, 25(5-8), pp.163-171 2. Shepherd SA and Edgar GJ (2013). Ecology of Australian temperate reefs: the unique South. CSIRO Publishing.
Survey methods					
1. SCUBA transect 2. Physical and biological sampling 3. SCUBA transects, ROV, desktop study	1. Desktop study, SCUBA transect	1. Desktop study 2. Desktop study 3. Desktop study 4. SCUBA transect 5. SCUBA transect, ROV drift transect 6. Desktop study, SCUBA transect 7. Towed video survey, field observation, % cover count, SCUBA transect, grab sampling 8. Desktop study	1. Desktop study, SCUBA transect 2. High resolution bathymetry mapping 3. Desktop study	1. Aerial digital mapping 2. Desktop study 3. Desktop study, SCUBA transect 4. Desktop study	1. Desktop study 2. Desktop study, SCUBA transect

2.6 Seagrass/kelp

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Kirkman, H 1997, 'Seagrasses of Australia', Department of the Environment, Canberra, ACT 2. Seagrass Watch internal database	1. Huisman, J.M., Kendrick, A.J. and Rule, M.J. 2011. Benthic algae and seagrasses of the Walpole and Nornalup Inlets Marine Park, Western Australia. Journal of the Royal Society of Western Australia 94: 29-44. 2. Kirkman, H. and Kuo, J., 1990. Pattern and process in southern Western Australian seagrasses. Aquatic Botany, 37(4), pp.367-382.	1. DEH (2007). A regional perspective of the Lower Spencer Gulf marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 2. DEH (2007a). A regional perspective of the Far West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 3. DEH (2007c). A regional perspective of the West marine, coastal and estuarine environments—draft report, South Australian Department for Environment and Heritage, Adelaide. 4. Adelaide Metropolitan Nearshore Marine Biounit 2017 Aquatic Ecosystem Condition Report 5. Golder Associates, 2011. Port Spencer Marine Baseline Quantitative Surveys. Report Number. 107661001-092-R-Rev0. 6. Bryars S, Miller D, Collings G, Fernandes M, Mount G and Wear R (2006). Field surveys 2003–2005: assessment of the quality of Adelaide's coastal waters, sediments and seagrasses, ACWS technical report 14, prepared for the Adelaide Coastal Waters Study Steering Committee, SARDI publication RD01/0208-15, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 7. Bryars S and Wear R (2008). Investigator Group expedition 2006: seagrasses of the Investigator Group region: Posidonia meadow condition in a pristine offshore marine environment. Transactions of the Royal Society of South Australia 132:81–94 8. Bryars S, Neverauskas V, Brown P, Gilliland J, Gray L and Halliday L (2003). Degraded seagrass meadows and evidence of eutrophication in Western Cove, Kangaroo Island, PIRSA Fish Habitat Program, Primary Industries and Resources South Australia, Adelaide 9. Wear RJ, Eaton A, Tanner JE and Murray-Jones S (2006). The impact of drain discharges on seagrass beds in the South East of South Australia, final report prepared for the South East Natural Resource Consultative Committee and the South East Catchment Water Management Board, SARDI publication RD04/0229-3, South Australian Research and Development Institute (Aquatic Sciences) and Department of Environment and Heritage, Coast Protection Branch, Adelaide. 10. Turner DJ, Kildea T and Westphalen G (2007). Examining the health of subtidal reef environments in South Australia, part 2, Status of selected South Australian reefs based on the results of surveys undertaken in 2005, SARDI publication RD03/0252-6: 81, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 11. Kinloch M. A., Brock D. J., Kirkman H. and Laperousaz T. (2007). Seagrass Biodiversity on Kangaroo Island. KI NRM Board Coast and Marine Program Report No. CMP07/004.	1. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne. 2. Parks Victoria 2012 Marine Natural Values Study Summary.	1. Barrett, N.S., Sanderson, J.C., Lawler, M.M., Halley, V. and Jordan, A.R., 2001. Mapping of inshore marine habitats in south-eastern Tasmania for marine protected area planning and marine management. 2. Bax, N. J., and Williams, A. 2001. Seabed habitat on the south-eastern Australian continental shelf: context, vulnerability and monitoring. Marine and Freshwater Research 52: 491–512. 3. Rees, C.G., 1993. Tasmanian seagrass communities (Doctoral dissertation, University of Tasmania). 4. Sanderson, J.C. and Thomas, D.P., 1987. Subtidal macroalgal communities in the D'Entrecasteaux Channel, Tasmania. Australian journal of ecology, 12(1), pp.41-51. 5. Johnson, C.R., Banks, S.C., Barrett, N.S., Cazassus, F., Dunstan, P.K., Edgar, G.J., Frusher, S.D., Gardner, C., Haddon, M., Helidoniotis, F. and Hill, K.L., 2011. Climate change cascades: Shifts in oceanography, species' ranges and subtidal marine community dynamics in eastern Tasmania. Journal of Experimental Marine Biology and Ecology, 400(1-2), pp.17-32.	1. Ward, T.J. and Jacoby, C.A., 1992. A strategy for assessment and management of marine ecosystems: baseline and monitoring studies in Jervis Bay, a temperate Australian embayment. Marine Pollution Bulletin, 25(5-8), pp.163-171 2. DoE 2015, Approved Conservation Advice (including listing advice) for Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion ecological community, Canberra, ACT.
Survey methods					
1. Desktop study 2. Desktop study	1. Snorkelling transects 2. Snorkelling transects	1. Desktop study 2. Desktop study 3. Desktop study 4. Video belt transect, 2.5 l water grab samples, sonde 5. ROV transect 6. Desktop study, 100 mL water samples, Niskin bottle. SCUBA survey, ROV survey 7. Field survey 8. Field survey 9. Field survey, wave height visual observation, quadrat sediment sampling, water quality meter, Niskin bottle, video transect, visual observation of profile lines 10. SCUBA surveys 11. Aerial photography, field surveys, roller beam trawl (1m x 0.5m, mesh size 3mm, cod end 1mm)	1. Desktop study 2. Desktop study	1. Aerial digital mapping 2. Desktop study 3. Field sampling 4. Field observations 5.	1. Desktop study 2. Desktop study

2.7 Plankton

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. IMOS Australian Plankton Survey. Data available via the Australian Ocean Data Network.		1. Bryars S, Miller D, Collings G, Fernandes M, Mount G and Wear R (2006). Field surveys 2003–2005: assessment of the quality of Adelaide's coastal waters, sediments and seagrasses, ACWS technical report 14, prepared for the Adelaide Coastal Waters Study Steering Committee, SARDI publication RD01/0208-15, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 2. Gaylard S (2005). Ambient water quality monitoring: Nepean Bay, Kangaroo Island, report 1: 1999–2004, Environment Protection Authority, Adelaide. 3. Neira, F.J., 2005. Summer and winter plankton fish assemblages around offshore oil and gas operational areas in south-eastern Australia. Estuarine, Coastal and Shelf Science. 2005, Vol.63(4), pp.589-604 4. SARDI internal dataset 5. van Ruth, P.D., Patten, N.L., Bailleul, F., Chapman, P., Doubell, M., Everett, J., Goldsworthy, S.D., Harcourt, R.G., McGarvey, R., McMahon, C.R., Middleton, J.F., Redondo Rodriguez, A., Richardson, A.J., Richardson, L. and Ward, T.M. (2017). Spatial and temporal variability in shelf microbial and plankton communities in the Great Australian Bight. Final Report GABRP Project 2.1. Great Australian Bight Research Program, GABRP Research Report Series Number 27, 106pp. 6. Kloser R.J, van Ruth P.D, Doubell M, Downie R, Flynn A, Gershwin L, Patten N, Revill A, Richardson A.E, Ryan T.E and Sutton C.A 2017, Characterise spatial variability of offshore/slope plankton and micronekton communities. Final Report GABRP project 2.2.	1. Neira, F.J., 2005. Summer and winter plankton fish assemblages around offshore oil and gas operational areas in south-eastern Australia. Estuarine, Coastal and Shelf Science. 2005, Vol.63(4), pp.589-604 2. Bruce, B. D., Condie, S. A., & Sutton, C. A. (2001). Larval distribution of blue grenadier (*Macruronus novaezelandiae Hector*) in south-eastern Australia: further evidence for a second spawning area. Marine and Freshwater Research, 52(4), 603–610. 3. Gunn, J., Bruce, B., Furlani, D., Thresher, R., & Blaber, S. (1989a). Timing and location of spawning of Blue Grenadier, *Macruronus novaezelandiae* (*Teleostei: Merlucciidae*), In Australian Coastal Waters. Australian Journal of Marine and Freshwater Research, 40(1), 97–112.	1. Gibbs CF, Arnott GH, Longmore AR and Marchant JW, 1991. Nutrient and plankton distribution near a shelf break front in the region of the Bass Strait cascade. Australian Journal of Marine and Freshwater Research 42(2) 201 – 217 2. Neira, F.J., 2005. Summer and winter plankton fish assemblages around offshore oil and gas operational areas in south-eastern Australia. Estuarine, Coastal and Shelf Science. 2005, Vol.63(4), pp.589-604 3. Bruce, B. D., Condie, S. A., & Sutton, C. A. (2001). Larval distribution of blue grenadier (*Macruronus novaezelandiae Hector*) in south-eastern Australia: further evidence for a second spawning area. Marine and Freshwater Research, 52(4), 603–610. 4. Gunn, J., Bruce, B., Furlani, D., Thresher, R., & Blaber, S. (1989a). Timing and location of spawning of Blue Grenadier, *Macruronus novaezelandiae* (*Teleostei: Merlucciidae*), In Australian Coastal Waters. Australian Journal of Marine and Freshwater Research, 40(1), 97–112.	1. Marine Aquaculture Research Lease Annual Report Series 2. Neira, F.J., 2005. Summer and winter plankton fish assemblages around offshore oil and gas operational areas in south-eastern Australia. Estuarine, Coastal and Shelf Science. 2005, Vol.63(4), pp.589-604 3. Watson, C.F. and Chaloupka, M.Y. 1982. Zooplankton of Bass Strait: Species Composition, Systematics and Artificial key to Species. Tasmanian Institute of Marine Science Technical Report No. 1. 4. Bruce, B. D., Condie, S. A., & Sutton, C. A. (2001). Larval distribution of blue grenadier (*Macruronus novaezelandiae Hector*) in south-eastern Australia: further evidence for a second spawning area. Marine and Freshwater Research, 52(4), 603–610. 5. Gunn, J., Bruce, B., Furlani, D., Thresher, R., & Blaber, S. (1989a). Timing and location of spawning of Blue Grenadier, *Macruronus novaezelandiae* (*Teleostei: Merlucciidae*), In Australian Coastal Waters. Australian Journal of Marine and Freshwater Research, 40(1), 97–112.
Survey methods					
1. Continuous plankton recorder		1. Spectrophotometer at 750 and 665 nm 2. Monthly water samples analysed by a NATA2 accredited laboratory 3. Field survey 4. Vertical tow (3560µm mesh bongo net), vertical tow (150µm mesh net), Niskin bottle 5. Desktop study, mooring instruments: Conductivity/ temperature/ depth sensors, 12 Aquatec loggers, underwater PAR sensor with log amplifier and fluorometer. 5 l Niskin bottles. 6. Continuous plankton recorder, bio-acoustic survey	1. Field survey 2. Field survey 3. Ichthyoplankton surveys	1. Field survey 2. Field survey 3. Field survey 4. Ichthyoplankton surveys	1. Niskin bottle 2. Field survey 3. Desktop study 4. Field survey 5. Ichthyoplankton surveys

2.8 Benthic sediments

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. CAMRIS Marine Benthic Substrate Database – Marsed. Retained by Research Data Australia.	1. Port of Esperance Annual Marine sediment monitoring reports 2. Fisheries research reports and baseline datasets, Survey of the Albany marine area for introduced marine species.	1. James, NP & Bone, Y 2011, 'Neritic carbonate sediments in a temperate realm: South Australia'., Springer, Heidelberg. 2. Kloser, R.J., Bax, N.J., Ryan, T., Williams, A. and Barker, B.A., 2001. Remote sensing of seabed types in the Australian South East Fishery; development and application of normal incident acoustic techniques and associated' ground truthing'. Marine and Freshwater Research, 52(4), pp.475-489. 3. PIRSA 2007, Ecological Assessment of the South Australian Giant Crab (*Pseudocarcinus gigas*) Fishery, Adelaide, SA. 4. James, N., Bone, Y, Collins, L. & Kyser, TK 2001, 'Surficial Sediments of the Great Australian Bight: Facies dynamics and oceanography on a vast cool-water continental carbonate shelf.', Journal of Sedimentary Research, vol. 71, pp.549–567. 5. Hook, S., van de Kamp, J., Williams, A., Tanner, J., Bodrossy, L. (2016). Spatial distribution and diversity in hydrocarbon degrading microbes in the Great Australian Bight I: Functional Gene Distribution. Great Australian Bight Research Program, GABRP Research Report Series Number 8, 23pp. 6. Golder Associates. 2011. Port Spencer Marine Baseline. Quantitative Surveys. Report Number. 107661001-092-R-Rev0. 7. Dittmann S., Baring R., Jessup-Case H., Lam O. (2017) Adelaide Aqua Desalination Plant; Infauna Survey 2017. Final Report December 2017, Flinders University, Adelaide	1. Kloser, R.J., Bax, N.J., Ryan, T., Williams, A. and Barker, B.A., 2001. Remote sensing of seabed types in the Australian South East Fishery; development and application of normal incident acoustic techniques and associated' ground truthing'. Marine and Freshwater Research, 52(4), pp.475-489. 2. Heislers, S. and Parry, G. 2007. Species diversity and composition of benthic infaunal communities found in Marine National Parks along the outer Victorian coast. Parks Victoria Technical Series 53. 3. Coffey 2010. Snapper platform seabed survey- January 2010. Report CR 946_13_v3. Prepared for Esso Australia Pty Ltd by Coffey Environments Pty Ltd, Perth, Australia.	1. Jones H. A. & Davies P.J. 1983. Superficial sediments of the Tasmanian continental shelf and part of Bass Strait. Bureau of Mineral Resources Bulletin 218. 2. Kloser, R.J., Bax, N.J., Ryan, T., Williams, A. and Barker, B.A., 2001. Remote sensing of seabed types in the Australian South East Fishery; development and application of normal incident acoustic techniques and associated' ground truthing'. Marine and Freshwater Research, 52(4), pp.475-489. 3. Black, K., Rosenberg, M., Hatton, D., Colman, R., Symmonds, G., Simons, R., Pattiaratchi, C., and Nielsen, P. 1991. Hydrodynamic and sediment dynamic measurements in eastern Bass Strait. Volume 2. Sea bed description and sediment size analysis. Working paper No. 21, Victorian Institute of Marine Sciences. 4. Edgar, G.J. and Barrett, N.S., 2002. Benthic macrofauna in Tasmanian estuaries: scales of distribution and relationships with environmental variables. Journal of Experimental Marine Biology and Ecology, 270(1), pp.1-24.	1. Marine Aquaculture Research Lease Annual Report Series https://www.dpi.nsw.gov.au/fishing/aquaculture/starting-up/finfish-aquaculture-lease-modification-application 2. Griffin, J.D., Hemer, M.A. and Jones, B.G., 2008. Mobility of sediment grain size distributions on a wave dominated continental shelf, south-eastern Australia. Marine Geology, 252(1-2), pp.13-23. 3. Schneider, P.M. and Davey, S.B., 1995. Sediment contaminants off the coast of Sydney, Australia: a model for their distribution. Marine Pollution Bulletin, 31(4-12), pp.262-272. 4. Radke Lynda C., Huang Zhi, Przeslawski Rachel, Webster Ian T., McArthur Matthew A., Anderson Tara J., Siwabessy P. Justy, Brooke Brendan P. (2011) Including biogeochemical factors and a temporal component in benthic habitat maps: influences on infaunal diversity in a temperate embayment. Marine and Freshwater Research 62, 1432-1448.
Survey methods					
1. Desktop study	1. Sediment cores via SCUBA 2. Sediment cores, grab samples, beam trawls, crab traps and seine nets, plankton nets	1. Desktop study 2. Acoustic backscattering measurements using 12, 38 and 120 kHz were collected over depths of 30–230 m, Video, photo and samples 3. Desktop study 4. Field study 5. 6-core multicore into an instrument coring platform and 30mm minicores 6. Towed video survey, field observation, % cover count, SCUBA transect, grab sampling 7. Box corer	1. Acoustic backscattering measurements using 12, 38 and 120 kHz were collected over depths of 30–230 m, Video, photo and samples 2. Field study 3. Field study	1. Acoustic backscattering measurements using 12, 38 and 120 kHz were collected over depths of 30–230 m, Video, photo and samples 2. Remote sensing 3. Field study	1. ROV transects, Grab sample (Van Veen), Core samples 2. Field study 3. Desktop study 4. Desktop study

2.9 Benthic infauna

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
	1. Port of Esperance Annual Marine sediment monitoring reports 2. Fisheries research reports and baseline datasets, Survey of the Albany marine area for introduced marine species.	1. Tanner, JE, MacIntosh, H, Williams, A & Althaus, F 2018, 'Spatial patterns in infaunal and meiofaunal assemblages from the Great Australian Bight continental slope'., Deep Sea Research II, no. Special Issue on the Great Australian Bight, pp.1–30. 2. Macintosh et al. 2018. Invertebrate diversity in the deep Great Australian Bight (200-5000 m) Marine Biodiversity Records 11 Article 23. 3. Currie, Sorokin, Ward. 2009. Infaunal macroinvertebrate assemblages of the eastern Great Australian Bight: effectiveness of a marine protected area in representing the region's benthic biodiversity. Marine and Freshwater Research 60(5) 459-474 4. Dittmann S., Baring R., Jessup-Case H., Lam O. (2017) Adelaide Aqua Desalination Plant; Infauna Survey 2017. Final Report December 2017, Flinders University, Adelaide	1. Heislers S and Parry GD 2007. Species diversity and composition of benthic infaunal communities found in Marine National Parks along the outer Victorian coast. Parks Victoria Technical Paper Series No. 53. Fisheries Victoria, Department of Primary Industries, Queenscliff. 2. Currie, D.R. (1995). 'Impacts of Exploratory Offshore Drilling on Benthic Communities in the Minerva gas Field, Port Campbell, Victoria', Victorian Institute of Marine Science.	1. Parsons, K. E. (2012). D'Entrecasteaux Channel and the lower Huon Estuary. Inventory of Scientific Information. Report for the D'Entrecasteaux Channel Project, prepared by Ecomarine Consulting.	1. Radke Lynda C., Huang Zhi, Przeslawski Rachel, Webster Ian T., McArthur Matthew A., Anderson Tara J., Siwabessy P. Justy, Brooke Brendan P. (2011) Including biogeochemical factors and a temporal component in benthic habitat maps: influences on infaunal diversity in a temperate embayment. Marine and Freshwater Research 62, 1432-1448.
Survey methods					
	1. Sediment cores via SCUBA 2. Sediment cores, grab samples, beam trawls, crab traps and seine nets, plankton nets	1. ROV, grab sampling 2. ROV, grab sampling 3. ROV, grab sampling 4. Box corer	1. Field study 2. Grab sampling	1. Desktop study	1. Desktop study

2.10 Benthic epifauna

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Reef Life Survey public dataset 2. O'Hara, TD & Poore, GCB 2000, 'Patterns of distribution for southern Australian marine echinoderms and decapods'., Journal of biogeography, vol. 27, pp.1321–1335.	1. Port of Esperance Annual Marine sediment monitoring reports 2. Fisheries research reports and baseline datasets, Survey of the Albany marine area for introduced marine species.	1. Schlacher, T.A., Schlacher-Hoenlinger, M.A., Williams, A., Althaus, F., Hooper, J.N.A., Kloser, R., 2007. Richness and distribution of sponge megabenthos in continental margin canyons off south-eastern Australia. Marine Ecology Progress Series 340, 73-88. 2. Baker, J.L., Shepherd, S.A., Turner, D. and Edyvane, K., 2008. Investigator Group Expedition 2006: Benthic Macroalgal Studies at Islands in the Eastern Great Australian Bight Over Three Decades. Transactions of the Royal Society of South Australia, 132(2), pp.251-267. 3. Currie, Sorokin, Ward. 2009. Infaunal macroinvertebrate assemblages of the eastern Great Australian Bight: effectiveness of a marine protected area in representing the region's benthic biodiversity. Marine and Freshwater Research 60(5) 459-474 4. Bax, N. J., and Williams, A. 2001. Seabed habitat on the south-eastern Australian continental shelf: context, vulnerability and monitoring. Marine and Freshwater Research 52: 491–512 5. Schlacher, T.A., Schlacher-Hoenlinger, M.A., Williams, A., Althaus, F., Hooper, J.N.A., Kloser, R., 2007. Richness and distribution of sponge megabenthos in continental margin canyons off south-eastern Australia. Marine Ecology Progress Series 340, 73-88. 6. Sorokin, S.J., Williams, A., Althaus, F. and Tanner, J. (2017). Deepwater sponges (Porifera) of the Great Australian Bight. Project 3.1 - Great Australian Bight benthic biodiversity characterisation. Great Australian Bight Research Program, Great Australian Bight Research Report Series Number 30, 133pp 7. Hook, S.E., Revill, A.T., Mondon, J., Corbett, P., Armstrong, E.K., Song, J., Tanner, J.E., Stalvies, C., Ross, A.S. and Williams, A., 2018. Naturally occurring hydrocarbon content and baseline condition of deep-sea benthic fauna from the Great Australian Bight. Deep Sea Research Part II: Topical Studies in Oceanography, 157, pp.106-120 8. Kinloch M. A., Brock D. J., Kirkman H. and Laperousaz T. (2007). Seagrass Biodiversity on Kangaroo Island. KI NRM Board Coast and Marine Program Report No. CMP07/004.	1. O'Hara, T and Barmby, V. 2000. Victorian Marine Species of Conservation Concern: Molluscs, Echinoderms and Decapod Crustaceans. Department of Natural Resources and Environment. 2. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne. 3. Victorian Benthic Habitats map dataset retained by Research Data Australia.	1. Edgar, G.J. and Barrett, N.S., 2002. Benthic macrofauna in Tasmanian estuaries: scales of distribution and relationships with environmental variables. Journal of Experimental Marine Biology and Ecology, 270(1), pp.1-24. 2. Wolf, B.M. and White, R.W.G., 1997. Movements and habitat use of the queen scallop, *Equichlamys bifrons*, in the D'Entrecasteaux channel and Huon River estuary, Tasmania. Journal of Shellfish Research, 16(2), pp.533-539.	1. Stuart-Smith, R.D., Stuart-Smith, J.F., Cooper, A.T. and Edgar, G.J., 2009. Baseline biodiversity survey of the Cod Grounds Commonwealth Marine Reserve.
Survey methods					
1. SCUBA transect 2. Desktop study	1. Sediment cores via SCUBA 2. Sediment cores, grab samples, beam trawls, crab traps and seine nets, plankton nets	1. ROV, grab sampling 2. ROV, grab sampling 3. ROV, grab sampling 4. Desktop study 5. Sled samples 6. Quadrat samples 7. 4m beam trawl 8. Aerial photography, field surveys, roller beam trawl (1m x 0.5m, mesh size 3mm, cod end 1mm)	1. Desktop study 2. Desktop study 3. Towed video	1. Field survey 2. Mark and recapture	1. SCUBA transect

2.11 Demersal species

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. ReefLife Survey dataset. Available online.	1. Chatfield, B.S., Van Niel, K.P., Kendrick, G.A. and Harvey, E.S., 2010. Combining environmental gradients to explain and predict the structure of demersal fish distributions. Journal of Biogeography, 37(4), pp.593-605. 2. Harvey, E.S., Cappo, M., Kendrick, G.A. and McLean, D.L., 2013. Coastal fish assemblages reflect geological and oceanographic gradients within an Australian zootone. PloS one, 8(11), p.e80955.	1. Brock DJ and Kinloch MA (2007). Reef fish biodiversity on Kangaroo Island, Coast and Marine Program report CMP07/006, Kangaroo Island Natural Resource Management Board, Kangaroo Island. 2. Bryars S (2011). Monitoring marine fishes of conservation concern on Adelaide coastal reefs: combined results of 2009–2010 and 2010–2011 surveys for the southern blue devil and harlequin fish, report to the Adelaide and Mount Lofty Ranges Natural Resources Management Board, South Australian Department of Environment and Natural Resources, Adelaide. 3. Steer MA, Galylard S and Loo M (2013). Monitoring the relative abundance and biomass of South Australia's giant cuttlefish breeding population, SARDI publication no. F2013/000074-1, SARDI research report series no. 684, South Australian Research and Development Institute (Aquatic Sciences), Adelaide 4. Williams, A, Althaus, F, Pogonoski, J, Osterhage, D, Gomon, M, Graham, K, Appleyard, SA, Gledhill, D, Bray, D, McMillan, P, Green, M, Doyle, S, Graham, A, Tanner, JE & Ross, A 2018b, 'Composition, diversity and biogeographic affinities of the deep-sea (200-3000 m) fish assemblage in the Great Australian Bight, Australia'., Deep Sea Research II, no. Great Australian Bight Special Issue. 5. Koslow, J.A., Bulman, C.M. and Lyle, J.M., 1994. The mid-slope demersal fish community off south-eastern Australia. Deep Sea Research Part I: Oceanographic Research Papers, 41(1), pp.113-141. 6. Thomson, R.J., Hill, N.A., Leaper, R., Ellis, N., Pitcher, C.R., Barrett, N.S. and J. Edgar, G., 2014. Congruence in demersal fish, macroinvertebrate, and macroalgal community turnover on shallow temperate reefs. Ecological applications, 24(2), pp.287-299. 7. Robbins, R.L., 2007. Environmental variables affecting the sexual segregation of great white sharks *Carcharodon carcharias* at the Neptune Islands South Australia. Journal of fish Biology, 70(5), pp.1350-1364.	1. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne. 2. Koslow, J.A., Bulman, C.M. and Lyle, J.M., 1994. The mid-slope demersal fish community off south-eastern Australia. Deep Sea Research Part I: Oceanographic Research Papers, 41(1), pp.113-141. 3. Thomson, R.J., Hill, N.A., Leaper, R., Ellis, N., Pitcher, C.R., Barrett, N.S. and J. Edgar, G., 2014. Congruence in demersal fish, macroinvertebrate, and macroalgal community turnover on shallow temperate reefs. Ecological applications, 24(2), pp.287-299.	1. Koslow, J.A., Bulman, C.M. and Lyle, J.M., 1994. The mid-slope demersal fish community off south-eastern Australia. Deep Sea Research Part I: Oceanographic Research Papers, 41(1), pp.113-141. 2. Bulman, C.M., He, X. and Koslow, J.A., 2002. Trophic ecology of the mid-slope demersal fish community off southern Tasmania, Australia. Marine and Freshwater Research, 53(1), pp.59-72. 3. Thomson, R.J., Hill, N.A., Leaper, R., Ellis, N., Pitcher, C.R., Barrett, N.S. and J. Edgar, G., 2014. Congruence in demersal fish, macroinvertebrate, and macroalgal community turnover on shallow temperate reefs. Ecological applications, 24(2), pp.287-299.	1. Stuart-Smith, R.D., Stuart-Smith, J.F., Cooper, A.T. and Edgar, G.J., 2009. Baseline biodiversity survey of the Cod Grounds Commonwealth Marine Reserve. 2. Wong, L & Lynch, T 2016, 'Monitoring of Spotted Handfish (*Brachionichthys hirsutus*) populations and on ground conservation actions', Hobart, Tasmania. 3. Koslow, J.A., Bulman, C.M. and Lyle, J.M., 1994. The mid-slope demersal fish community off south-eastern Australia. Deep Sea Research Part I: Oceanographic Research Papers, 41(1), pp.113-141.

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Survey methods					
1. SCUBA transects	1. BRUVS 2. BRUVS	1. SCUBA transect 2. SCUBA transect 3. ROV, SCUBA photo quadrats 4. Beam trawl 5. Trawl 6. Video tow	1. Desktop study 2. Trawl 3. Video tow	1. Trawl 2. Field study 3. Video tow	1. SCUBA transect 2. SCUBA transect 3. Trawl

2.12 Pelagic fish

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Bruce, B.D & Bradford, R.W (2008). Spatial dynamics & habitat preferences of juvenile white sharks: identifying critical habitat and options for monitoring recruitment. Final Report to the Department of the Environment, Water, Heritage and the Arts - Marine species Recovery Program. Hobart: CSIRO. 2. Bruce, G.D., Stevens, J.D., & Malcolm, H. (2006). Movements and swimming behaviour of white sharks (Carcharodon carcharias) in Australian waters. Marine Biology. 150:161-172. A 3. Chidlow, J, Gaughan, D & Mcauley, R 2006, 'Identification of Western Australian Grey Nurse Shark aggregation sites'.	1. Hoschke, AM & Whisson, GJ 2016, 'First aggregation of grey nurse sharks (Carcharias taurus) confirmed in Western Australia'., Marine Biodiversity Records, vol. 9, no. 1, p.17. 2. McAuley, RB, Bruce, BD, Keay, IS, Mountford, S, Pinnell, T & Whoriskey, FG 2017, 'Broad-scale coastal movements of white sharks off Western Australia described by passive acoustic telemetry data'., Marine and Freshwater Research, vol. 68, no. 8, pp.1518–1531. 3. Meeuwig, J & Turner, J 2017, Bremer Canyon Progress Report: Spatial distribution of marine wildlife in the Bremer Bay region., no. June.	1. Rogers, P.J., Drew, M., Bailleul, F. and Goldsworthy, S.D. (2016). Offshore survey of the biodiversity, distributions and habitat use of pelagic sharks in the Great Australian Bight. Great Australian Bight Research Program, GABRP Research Report Series Number 7, 77pp 2. Honda, K., A.J. Hobday, R. Kawabe, N. Tojo, K. Fujioka, Y. T. & K. M. (2010). Age-dependent distribution of juvenile southern bluefin tuna (*Thunnus maccoyii*) on the continental shelf off southwest Australia determined by acoustic monitoring. Fisheries Oceanography, 19(2), 151–158. 3. Harasti, D, Lee, K, Bruce, B, Gallen, C & Bradford, R 2017, 'Juvenile white sharks *Carcharodon carcharias* use estuarine environments in south-eastern Australia'., Marine Biology, vol. 164, no. 3, pp.1–14. 4. Rogers, P., and Drew, M., 2018. Movement, residency and habitat use of pelagic sharks in Spencer Gulf: resolving overlaps with marine industries and community activities. Fisheries Research and Development Corporation and South Australian Research and Development Institute. 5. Hobday, Alistair & Evans, Karen & Eveson, J.P. & Farley, Jessica & Hartog, Jason & Basson, Marinelle & Patterson, Toby. (2015). Distribution and Migration—Southern Bluefin Tuna (*Thunnus maccoyii*). 10.1201/b18714-12.	1. Honda, K., A.J. Hobday, R. Kawabe, N. Tojo, K. Fujioka, Y. T. & K. M. (2010). Age-dependent distribution of juvenile southern bluefin tuna (*Thunnus maccoyii*) on the continental shelf off southwest Australia determined by acoustic monitoring. Fisheries Oceanography, 19(2), 151–158. 2. Stevens, JD & West, GJ 1997, 'Investigation of school and gummy shark nursery areas in south-eastern Australia'.	1. Honda, K., A.J. Hobday, R. Kawabe, N. Tojo, K. Fujioka, Y. T. & K. M. (2010). Age-dependent distribution of juvenile southern bluefin tuna (*Thunnus maccoyii*) on the continental shelf off southwest Australia determined by acoustic monitoring. Fisheries Oceanography, 19(2), 151–158.	1. Reid D. D., Robbins W. D., Peddemors V. M. (2011) Decadal trends in shark catches and effort from the New South Wales, Australia, Shark Meshing Program 1950–2010. Marine and Freshwater Research 62, 676-693. 2. Honda, K., A.J. Hobday, R. Kawabe, N. Tojo, K. Fujioka, Y. T. & K. M. (2010). Age-dependent distribution of juvenile southern bluefin tuna (*Thunnus maccoyii*) on the continental shelf off southwest Australia determined by acoustic monitoring. Fisheries Oceanography, 19(2), 151–158. 3. Stevens, JD & West, GJ 1997, 'Investigation of school and gummy shark nursery areas in south-eastern Australia'.
Survey methods					
1. PSAT tagging, aerial survey 2. PSAT tagging, aerial survey 3. Desktop study	1. SCUBA transect 2. Acoustic telemetry 3. BRUVS	1. Pelagic longline, visual observation, satellite tags (SPOT, ST or Mini PAT) 2. acoustic monitoring 3. Acoustic telemetry 4. Acoustic and satellite telemetry 5. Satellite telemetry	1. Acoustic monitoring 2. Longlines and bottom-set monofilament gillnets	1. Acoustic monitoring	1. Netting 2. Acoustic monitoring 3. Hook and line fishing

2.13 Marine reptiles

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Bailey, H, Benson, SR, Shillinger, GL, Bograd, SJ, Dutton, PH, Eckert, SA, Morreale, SJ, Paladino, F V., Eguchi, T, Foley, DG, Block, BA, Piedra, R, Hitipeuw, C, Tapilatu, RF & Spotila, JR 2012, 'Identification of distinct movement patterns in Pacific leatherback turtle populations influenced by ocean conditions'., Ecological Applications, vol. 22, no. 3, pp.735–747. 2. Limpus, CJ 2008a, A Biological Review of Australian Marine Turtle Species.	1. DBCA internal stranding database	1. Hutchinson, M., 2018. The marine reptiles of south Australia. South Australian Museum. 2. Southern Australian Sea Turtles internal dataset	1. Southern Australian Sea Turtles internal dataset	1. Bone, C. (1998). 'Preliminary investigation into leatherback turtle, *Dermochelys coriacea* (L.) distribution, abundance and interactions with fisheries in Tasmanian waters. Unpublished Report. Tasmanian Parks and Wildlife Service 2. Southern Australian Sea Turtles internal dataset	1. Cogger HG 2000. The Status of Marine Reptiles in New South Wales. A Report prepared for the New South Wales. National Parks and Wildlife Service by. Dr Harold G. Cogger 2. Southern Australian Sea Turtles internal dataset
Survey methods					
1. Tracking data 2. Desktop study	1. Field observation	1. Field study 2. Desktop study	1. Desktop study	1. Field study 2. Desktop study	1. Desktop study 2. Desktop study

2.14 Cetaceans

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Aulich, M.G., McCauley, R.D., Saunders, B.J. and Parsons, M.J., 2019. Fin whale (*Balaenoptera physalus*) migration in Australian waters using passive acoustic monitoring. Scientific Reports, 9(1), p.8840. 2. Burnell, S.R. (2001) Aspects of the reproductive biology, movements and site fidelity of right whales off Australia Journal of Cetacean Research and Management (Special Issue) 2: 89–102 3. Mackay, A, Bailleul, F, Childerhouse, S, Donnelly, D, Harcourt, R, Parra, G & Goldsworthy, S 2015, Offshore migratory movement of southern right whales: informing critical conservation and management needs.	1. Dr. Leigh Torres, NIWA Dr. Tim Smith, World Whaling History Project Dr. Phil Sutton, NIWA Dr. Alison MacDiarmid, NIWA Mr. John Bannister, The Western Australian Museum, (2011). Habitat use and distribution patterns of southern right whales and sperm whales discerned from spatial analyses of 19th century whaling records. Prepared for Australian Marine Mammal Centre. December 2011 2. Meeuwig, J & Turner, J 2017, Bremer Canyon Progress Report: Spatial distribution of marine wildlife in the Bremer Bay region., no. June. 3. Wellard, R., Lightbody, K., Fouda, L., Blewitt, M., Riggs, D. and Erbe, C., 2016. Killer whale (*Orcinus orca*) predation on beaked whales (Mesoplodon spp.) in the Bremer Sub-Basin, Western Australia. PloS one, 11(12), p.e0166670.	1. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide. 2. Gill, P. C., 2002. A blue whale (*Balaenoptera musculus*) feeding ground in a southern Australian coastal upwelling zone. Journal of Cetacean Research and Management 4:179–184. 3. Gill, P.C., and Morrice, M.G., 2003. Blue Whale research in the Bonney Upwelling, South-east Australia – current information. Deakin University, School of Ecology and Environment, Technical paper 2001/1. November 2003. 4. Ross, A, Corrick, A, Trefry, C, Gong, S, McKirdy, D, Hall, T, Dyt, C., Angelini, A., Kempton, R, Pickard, A, White, C, Maslin, C, Griffin, D, Middleton, J, Luick, J, Armand, S, Vergara, T & Schinteie, R 2017a, Asphaltite and tarball surveys. Appendix 1: Data Management. Great Australian Bight Research Program, GABRP Research Report Series Number 25b 5. Bilgmann, K., Parra, G.J. and Möller, L.M. (2014). Inshore Cetacean Survey between Ceduna and Coffin Bay, eastern Great Australian Bight. Great Australian Bight Research Program, GABRP Research Report Series Number 1, 40pp 6. Charlton, C.M., Guggenheimer, S.N. and Burnell, S.R. 2014. Long term Southern Right Whale population monitoring at the Head of the Great Australian Bight, South Australia (1991-2013). Report to the Department of Environment, Australian Antarctic Division, Australian Marine Mammal Centre. May 2014. 7. Gill, P. and Morrice, M. 2003. Cetacean Observations. Blue Whale Compliance Aerial Surveys. Santos Ltd Seismic Survey Program Vic/P51 and P52. November/ December 2002. Report to Santos Ltd. 8. Gill, P. (2016). Offshore cetacean aerial surveys in the Great Australian Bight, Blue Whale Study Inc., Report to SARDI. Great Australian Bight Research Program. GABRP Research Report Number 10. 9. Gill, P.C., G.J.B. Ross, W.H. Dawbin & H. Wapstra (2000). Confirmed sightings of dusky dolphins (*Lagenorhynchus obscurus*) in southern Australian waters. Marine Mammal Science. 16:452-459 10. Bannister, J 2017, Project A7 Monitoring Population Dynamics of 'Western' Right Whales off Southern Australia 2015-2018. Final Report on Activities March 201, Research Plan RPv2 (2017). Report to the National Environmental Science Programme, Marine Biodiversity Hub. 11. Bilgmann, K, Parra, GJ & Möller, LM 2017, 'Occurrence, distribution and abundance of cetaceans off the western Eyre Peninsula in the Great Australian Bight'., Deep Sea Research Part II: Topical Studies in Oceanography. 12. Charlton, C 2017, Population demographics of southern right whales (*Eubalaena australis*) in Southern Australia. (PhD Thesis), Curtin University, Western Australia. 13. Cribb, N, Bartram, P, Bartram, T & Seuront, L 2018, 'New Evidence for Bottlenose Dolphin (*Tursiops* spp.) Population Connectivity between Kangaroo Island and South Australian Mainland Waters'., Open Journal of Marine Science, vol. 08, no. 01, pp.38–50. 14. Mackay, AI & Goldsworthy, SD 2015, Monitoring southern right whale abundance, distribution and population dynamics at the Great Australian Bight aggregation.	1. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne.	1. Charlton-Robb, K, Gershwin, L, Thompson, R, Austin, J, Owen, K & McKechnie, S 2011, 'A new dolphin species, the Burrunan dolphin *Tursiops australis* sp. nov., endemic to southern Australian coastal waters'., Plos one, vol. 6, no. 9, p.e24047.	1. Marine Aquaculture Research Lease Annual Report Series https://www.dpi.nsw.gov.au/fishing/aquaculture/starting-up/finfish-aquaculture-lease-modification-application 2. Allen, S., H. Marsh and A. Hodgson, 2004. Occurrence and Conservation of the Dugong (*Sirenia: Dugongidae*) in New South Wales. Proceedings of the Linnean Society of New South Wales. 125:211-216.
Survey methods					
1. Acoustic monitoring 2. Field study 3. Satellite telemetry	1. Desktop study 2. Aerial observation, acoustic telemetry 3. Field study	1. Field observation 2. Field observation 3. Field observation 4. Field observation 5. Field observation 6. Field observation 7. Aerial surveys 8. Field observation 9. Field observation 10. Field observation 11. Field observation 12. Desktop study 13. Photographic survey 14. Satellite telemetry	1. Desktop study	1. Field observation	1. MFO observations 2. Field observation

2.15 Pinnipeds

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Kirkwood, R., Pemberton, D., Gales, R., Hoskins, A.J., Mitchell, T., Shaughnessy, P.D. and Arnould, J.P.Y., 2010. Continued population recovery by Australian fur seals. Marine and Freshwater Research. 61:695-701. 2. Warneke, RM & Shaughnessy, PD 1985, ''*Arctocephalus phsillus*, the South African and Australian fur seal: Taxonomy, evolution, biogeography, and life history'' in Studies of Sea Mammals in South Latitude. 3. Warneke, RM 1982, 'The distribution and abundance of seals in the Australasian region, with summaries of biology and current research'., Mammals of the Seas. FAO Fisheries Series. 4. Kirkwood, R., Lynch, M., Gales, N., Dann, P. and Sumner, M., 2006. At-sea movements and habitat use of adult male Australian fur seals (*Arctocephalus pusillus doriferus*). Canadian Journal of Zoology, 84(12), pp.1781-1788.	1. Shaughnessy, P.D., Gales, N.J., Dennis, T.E. and Goldsworthy, S.D., 1994. Distribution and abundance of New Zealand fur seals, Arctocephalus forsteri, in South Australia and Western Australia. Wildlife Research, 21(6), pp.667-695. 2. Gales, N.J., Haberley, B. and Collins, P., 2000. Changes in the abundance of New Zealand fur seals, *Arctocephalus forsteri*, in Western Australia. Wildlife Research, 27(2), pp.165-168. 3. Mawson, P.R. and Coughran, D.K., 1999. Records of sick, injured and dead pinnipeds in Western Australia 1980-1996. Journal of the Royal Society of Western Australia, 82, p.121.	1. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide. 2. Ross, A., Corrick, A., Trefry, C., Gong, S., McKirdy, D., Hall, T., Dyt, C., Angelini, A., Kempton, R., Pickard, A., White, C., Maslin, C., Griffin, D., Middleton, J., Luick, J., Armand, S., Vergara, T. and Schinteie, R. (2017). Asphaltite and tarball surveys. Appendix 5: Beach Dossiers. Great Australian Bight Research Program, GABRP Research Report Series Number 25c, 225pp. 3. Goldsworthy, S & Page, B 2009, A review of the distribution of seals in South Australia, Adelaide. 4. Goldsworthy, SD, Mackay, AI, Shaughnessy, PD, Bailleul, F & Holman, D 2015, Maintaining the monitoring of pup production at key Australian sea lion colonies in South Australia (2014/15), Adelaide, SA. 5. Shaughnessy, P.D., Gales, N.J., Dennis, T.E. and Goldsworthy, S.D., 1994. Distribution and abundance of New Zealand fur seals, *Arctocephalus forsteri*, in South Australia and Western Australia. Wildlife Research, 21(6), pp.667-695. 6. Shaughnessy, P.D., Dennis, T.E. and Seager, P.G., 2005. Status of Australian sea lions, Neophoca cinerea, and New Zealand fur seals, Arctocephalus forsteri, on Eyre Peninsula and the far west coast of South Australia. Wildlife Research, 32(1), pp.85-101. 7. Goldsworthy, S.D. and Shaughnessy, P.D., 1994. Breeding biology and haul-out pattern of the New Zealand fur seal, Arctopehalus forsteri, at Cape Gantheaume, South Australia. Wildlife Research, 21(3), pp.365-375. 8. Shaughnessy, P.D., Goldsworthy, S.D. and Libke, J.A., 1995. Changes in the abundance of New Zealand fur seals, *Arctocephalus forsteri*, on Kangaroo Island, South Australia. Wildlife Research, 22(2), pp.201-215. 9. Shaughnessy, P.D., Goldsworthy, S.D., Hamer, D.J., Page, B. and McIntosh, R.R., 2011. Australian sea lions *Neophoca cinerea* at colonies in South Australia: distribution and abundance, 2004 to 2008. Endangered Species Research, 13(2), pp.87-98. 10. Shaughnessy, P.D., McKenzie, J., Lancaster, M.L., Goldsworthy, S.D. and Dennis, T.E., 2010. Australian fur seals establish haulout sites and a breeding colony in South Australia. Australian Journal of Zoology, 58(2), pp.94-103. 11. Dennis, T.E. and Shaughnessy, P.D., 1999. Seal survey in the Great Australian Bight region of Western Australia. Wildlife Research, 26(3), pp.383-388.	1. Shaughnessy, PD, Kirkwood, RJ & Warneke, RM 2002, 'Australian fur seals, *Arctocephalus pusillus doriferus*: Pup numbers at Lady Julia Percy Island, Victoria, and a synthesis of the species' population status'., Wildlife Research 2. Shaughnessy, PD, Testa, JW & Warneke, RM 1995, 'Abundance of Australian fur seal pups, *Arctocephalus pusillus doriferus*, at Seal Rocks, Victoria, in 1991-92 from Petersen and Bayesian estimators'., Wildlife Research. 3. Shaughnessy, P.D., Troy, S.K., Kirkwood, R. and Nicholls, A.O., 2000. Australian fur seals at Seal Rocks, Victoria: pup abundance by mark–recapture estimation shows continued increase. Wildlife Research, 27(6), pp.629-633. 4. Littnan, C.L. and Mitchell, A.T., 2002. Australian and New Zealand fur seals at The Skerries, Victoria: recovery of a breeding colony. Australian Mammalogy, 24(1), pp.57-64.	1. Arnould, J. P. Y. and Kirkwood, R. 2008. Habitat selection by female Australian fur seals (*Arctocephalus pusillus doriferus*). Aquatic Conservation: Marine and Freshwater Ecosystems. 17: S53–S67 2. Brothers, N. and Pemberton, D., 1990. Status of Australian and New-Zealand Fur Seals at Maatsuyker Island, Southwestern Tasmania. Wildlife Research, 17(6), pp.563-569. 3. Pemberton, D. and Gales, R., 2004. Australian fur seals (*Arctocephalus pusillus doriferus*) breeding in Tasmania: population size and status. Wildlife Research, 31(3), pp.301-309. 4. Pemberton, D. and Kirkwood, R.J., 1994. Pup production and distribution of the Australian fur seal, *Arctocephalus pusillus doriferus*, in Tasmania. Wildlife Research, 21(3), pp.341-351. 5. Arnould, J.P., Littnan, C.L. and Lento, G.M., 2000. First contemporary record of New Zealand fur seals *Arctocephalus forsteri* breeding in Bass Strait. Australian Mammalogy, 22(1), pp.57-62.	1. Marine Aquaculture Research Lease Annual Report Series https://www.dpi.nsw.gov.au/fishing/aquaculture/starting-up/finfish-aquaculture-lease-modification-application 2. Shaughnessy, PD, Briggs, S V. & Constable, R 2001, 'Observations on seals at Montague Island, New South Wales'., Australian Mammalogy. 3. Pemberton, D. & Kirkwood, R.J. 1994. Pup production and distribution of the Australian fur seal, *Arctocephalus pusillus doriferus*, in Tasmania. Wildlife Research. 21:341-352
Survey methods					
1. Desktop study 2. Desktop study 3. Desktop study 4. Desktop study	1. Field observation 2. Field observation 3. Desktop study	1. Field observation 2. Field observation 3. Desktop study 4. Field observation 5. Field observation 6. Field observation 7. Field observation 8. Field observation 9. Field observation 10. Field observation 11. Field observation	1. Field observation 2. Field observation 3. Mark- recapture 4. Field observation	1. Satellite telemetry 2. Filed observation 3. Field observation 4. Field observation 5. Field observation	1. MFO records 2. Field observation 3. Field observation

2.16 Birds

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Blakers, M.S., Davies, J.J.F. & Reilly, P.N. (1984). The Atlas of Australian Birds. Melbourne, Victoria: Melbourne University Press. 2. Bamford, M., Watkins, D., Bancroft, W., Tischler, G., & Wahl, J. (2008). Migratory shorebirds of the East Asian-Australasian Flyway: Population estimates and internationally important sites. Canberra, Australia: Wetlands International – Oceania 3. Burbidge, A.A. & P.J. Fuller (1996). The Western Australian Department of Conservation and Land Management seabird breeding islands database. In: Ross, G.J.B., K. Weaver & J.C. Greig, eds. The status of Australia's seabirds Proceedings of the National Seabird Workshop, Canberra, 1-2 November 1993. Page(s) 73-137. Canberra: Biodiversity Group, Env. Aust.	1. Powell, C.D., Wooller, R.D. and Bradley, J.S., 2007. Breeding biology of the flesh-footed shearwater (*Puffinus carneipes*) on Woody Island, Western Australia. Emu-Austral Ornithology, 107(4), pp.275-283. 2. Powell, C.D., 2009. Foraging movements and the migration trajectory of Flesh-footed Shearwaters *Puffinus carneipes* from the south coast of Western Australia. Marine Ornithology, 37, pp.115-120.	1. Neagle, N. (Ed.) (2009). A Biological Survey of the Yalata Indigenous Protected Area, South Australia, 2007-2008. (Department for Environment and Heritage, South Australia). 2. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide. 3. Ross, A, Corrick, A, Trefry, C, Gong, S, McKirdy, D, Hall, T, Dyt, C., Angelini, A., Kempton, R, Pickard, A, White, C, Maslin, C, Griffin, D, Middleton, J, Luick, J, Armand, S, Vergara, T & Schinteie, R 2017, Asphaltite and tarball surveys. Appendix 1: Data Management. Great Australian Bight Research Program, GABRP Research Report 4. Cox, J.B. (1976). A review of the Procellariiformes occurring in South Australian waters. South Australian Ornithologist. 27:28-82. 5. Chambers, L.E., Patterson, T., Hobday, A.J., Arnould, J.P., Tuck, G.N., Wilcox, C. and Dann, P., 2015. Determining trends and environmental drivers from long-term marine mammal and seabird data: examples from Southern Australia. Regional environmental change, 15(1), pp.197-209. 6. Berlincourt, M., Arnould, JPY. 2015. Breeding short-tailed shearwaters buffer local environmental variability in south-eastern Australia by foraging in Antarctic waters. Movement Ecology 3, (16).	1. Harris, M.P. and Norman, F.I. 1981. Distribution and status of coastal colonies of seabirds in Victoria. Memoires of the Museum of Victoria. 42: 89–106. 2. Dann, P., Arnould, J.P., Jessop, R. and Healy, M., 2003. Distribution and abundance of seabirds in Western Port, Victoria. Emu, 103(4), pp.307-313. 3. Jones, T.B., Patrick, S.C., Arnould, J.P., Rodríguez-Malagón, M.A., Wells, M.R. and Green, J.A., 2018. Evidence of sociality in the timing and location of foraging in a colonial seabird. Biology letters, 14(7), p.20180214.	1. Barton, D. (1979). Albatrosses in the western Tasman Sea. Emu. 79:31-35 2. Robinson, S., Gadd, L., Johnston, M. and Pauza, M., 2015. Long-term protection of important seabird breeding colonies on Tasman Island through eradication of cats. New Zealand Journal of Ecology, 39(2), pp.316-322. 3. Skira, I.J., Wapstra, J.E., Towney, G.N. and Naarding, J.A., 1986. Conservation of the short-tailed shearwater *Puffinus tenuirostris* in Tasmania, Australia. Biological conservation, 37(3), pp.225-236.	1. Wood, K.A. (1992). Seasonal abundance and spatial distribution of albatrosses off Central New South Wales. Australian Bird Watcher. 14:207-225. 2. Cooper, R.M. 1989. 1985 New South Wales Bird Report. Australian Birds. 22:1-52. 3. Brothers et al., 2001. Tasmania's Offshore Islands: seabirds and other natural features. Tasmanian Museum and Art Gallery. Hobart
Survey methods					
1. Desktop study 2. Count 3. Desktop study	1. Field observations 2. Field observation	1. Pitfall traps, scat ID, nets 2. Field observation 3. Field observation 4. Field observation 5. Desktop study 6. GPS and geolocation data loggers	1. Field observation 2. Field observation 3. GIS taggers	1. Field observations 2. Field observation 3. Desktop study	1. Field observations 2. Field observations 3. Desktop study

2.17 Commercial fisheries and aquaculture

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. AFMA Commonwealth fisheries catch and effort data. Available from https://www.afma.gov.au/resources/catch-data 2. Ellis, D., & Kiessling, I. (2016). Ranching of Southern Bluefin Tuna in Australia. In Advances in Tuna Aquaculture (pp. 217–232). Elsevier 3. ABARES Fishery Status Reports 4. Phillips, K, Giannini, F, Lawrence, E & Bensley, N 2010, Cumulative assessment of the catch of non-target species in Commonwealth fisheries: a scoping study, Canberra.	1. WA state fishery catch and effort data.	1. CSIRO 2014. Orange Roughy (*Hoplostethus atlanticus*) Eastern Zone stock assessment incorporating data up to 2014. 2. Dixon CD, Hooper GE and Roberts SD (2010). Spencer Gulf Prawn, *Penaeus (Melicertus) latisulcatus*, Fishery 2008–09. Fishery assessment report to PIRSA Fisheries, SARDI publication F2007/000770-4, SARDI research report 511, South Australian Research and Development Institute (Aquatic Sciences), Adelaide. 3. Status of Australian Fish Stocks Reports. 4. Thredgold, C., Beer, A., Cutler, C. and Horne, S. (2014). Interim Community Profile and Literature Review. Project 6.1: Social Profile of the Eyre Peninsula and West Coast Region: Literature Review and Community Analysis. Great Australian Bight Research Program, GABRP Research Report Series Number 2, 95pp. 5. Wear RJ, Mandee T, Bryars S, Tanner J and De Jong S (2004). Environmental risk assessment of intertidal shellfish aquaculture in South Australia, Fisheries Research and Development Corporation project 2003/223, South Australian Research and Development Institute (Aquatic Sciences), South Australia. 6. South Australian Shellfish Quality Assurance Program Reports. 7. Pascoe, S., Beer, A., Thredgold, C., Young, M. and Whetton, S., 2018. Establishing a social and economic baseline prior to the development of an offshore oil industry: An example from the great Australian bight. Australasian Journal of Regional Studies, The, 24(2), p.213. 8. Izzo, C., Gillanders, B. M., & Ward, T. M. (2012a). Movement patterns and stock structure of Australian sardine (*Sardinops sagax*) off South Australia and the East Coast: implications for future stock assessment and management. 9. PIRSA 2007, Ecological Assessment of the South Australian Giant Crab (*Pseudocarcinus gigas*) Fishery, Adelaide, SA.	1. Sause BL. Gwyther D, Hanna PJ and O'Connor NA 1987. Evidence for winter – spring spawning of the scallop *Pectan alba (Tate)* in Port Phillip bay, Victoria, Australia, J. Mar. Freshwat. Res. 38: 329-337. 2. CSIRO 2014. Orange Roughy (*Hoplostethus atlanticus*) Eastern Zone stock assessment incorporating data up to 2014. 3. Victoria State fishery catch and effort data. 4. Koopman, M., Knuckey, I., Harris, A. and Hudson, R. 2018. Eastern Victorian Ocean Scallop Fishery 2017-18 Abundance Survey (VFA Project Number 17/646976). Prepared by Fishwell Consulting (Queenscliff) for the Victorian Fisheries Authority (Melbourne). 5. Coutin, P., Cashmore, S., & Sivakumuran, K. (2003a). FRDC Final Report Assessment of the snapper fishery in Victoria FRDC Project No. 97/128. Queenscliff, Victoria. 6. Izzo, C., Gillanders, B. M., & Ward, T. M. (2012a). Movement patterns and stock structure of Australian sardine (*Sardinops sagax*) off South Australia and the East Coast: implications for future stock assessment and management Movement patterns and stock structure of Australian sardine. 7. Levings, AH & Gill, PC 2011, 'Seasonal Winds Drive Water Temperature Cycle and Migration Patterns of Southern Australian Giant Crab *Pseudocarcinus gigas*'., Biology and Management of Exploited Crab Populations under Climate Change, no. September 2015, pp.461–478.	1. CSIRO 2014. Orange Roughy (*Hoplostethus atlanticus*) Eastern Zone stock assessment incorporating data up to 2014. 2. Tasmania State fishery catch and effort data. 3. Department of the Environment and Energy fisheries assessments - Tasmania managed fisheries 4. Parsons, K. E. (2012). D'Entrecasteaux Channel and the lower Huon Estuary. Inventory of Scientific Information. Report for the D'Entrecasteaux Channel Project, prepared by Ecomarine Consulting.	1. CSIRO 2014. Orange Roughy (*Hoplostethus atlanticus*) Eastern Zone stock assessment incorporating data up to 2014. 2. DPI NSW Marine Aquaculture Research Lease – Annual Environmental Management Report series. 3. NSW state fishery catch and effort data. 4. Department of the Environment and Energy fisheries assessments - New South Wales managed fisheries.

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Survey methods					
1. Vessel catch report 2. Desktop study 3. Phone diary 4. Desktop study	1. Vessel catch reports	1. Desktop study 2. Desktop study 3. Vessel catch reports 4. Desktop study 5. Desktop study 6. Nskin bottle, flesh samples 7. Desktop study 8. Desktop study 9. Desktop study	1. SCUBA collection 2. Desktop study 3. Vessel catch reports 4. Dredge tow 5. Desktop study 6. Desktop study 7. Temperature loggers, CARS data	1. Desktop study 2. Vessel catch reports 3. Desktop study 4. Desktop study	1. Desktop study 2. Dissolved oxygen meter, niskin bottle, ROV survey, van veen grab samples, core samples, MFO observation 3. Vessel catch reports 4. Desktop study

2.18 Recreational fishing

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. National recreational fishing survey of Southern Bluefin Tuna 2. Recfish Australia 2010: Recreational fishing in Commonwealth Waters: a preliminary assessment, Recfish Australia, Brisbane, Australia 63p	1. Ryan, KL, Hall, NG, Lai, EK, Smallwood, CB, Taylor, SM & Wise, BS 2015, 'State-wide survey of boat-based recreational fishing in Western Australia 2013/14'., Fisheries Research Report No. 268, p.208. 2. RecFishWest Annual Report Series. Available online. 3. McLeod, P., Lindner, R., 2018. Economic Dimension Of Recreational Fishing In Western Australia Research Report For The Recreational Fishing Initiatives Fund□. RecFIshWest and WA DPIRD.	1. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide 2. PIRSA 2016, Draft Management Plan for Recreational Fishing in South Australia, Adelaide, SA. 3. RecFish SA Annual Report series. Available online.	1. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne.	1. Lyle, JM, Stark, KE & Tracey, SR 2014, Survey of recreational fishing in Tasmania, Hobart, Tasmania. 2. Parsons, K. E. (2012). D'Entrecasteaux Channel and the lower Huon Estuary. Inventory of Scientific Information. Report for the D'Entrecasteaux Channel Project, prepared by Ecomarine Consulting.	1. Murphy, J,. Henry, G., Chapman, D. and Lowry, M. (2002). The Gamefish Tournament Monitoring Program, 1994 - 2000. NSW Fisheries Final Report Series No. 38. ISSN 1440-3544
Survey methods					
1. Phone diary and size validation on-site (data available 2020 onwards) 2. Desktop survey	1. Phone diary 2. Phone diary 3. Desktop study	1. Desktop study 2. Desktop study 3. Desktop study	1. Desktop study	1. Phone diary 2. Desktop study	1. Analysis of scheduled radio reporting

2.19 Native title and heritage

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. NNTT Search register of Native Title claims. 2. National Oceans Office, 2002. Sea Country – an Indigenous perspective The South-east Regional Marine Plan Assessment Reports. 3. Australian Heritage Database. 4. Australian National Shipwreck Database.	1. WA Department of Planning, Lands and Heritage Aboriginal Heritage Inquiry System and internal datasets.	1. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide 2. National Oceans Office, 2002. Sea Country – an Indigenous perspective The South-east Regional Marine Plan Assessment Reports. 3. Neagle, N. (Ed.) (2009). A Biological Survey of the Yalata Indigenous Protected Area, South Australia, 2007-2008. (Department for Environment and Heritage, South Australia).	1. Victorian Government Victorian Aboriginal Heritage Register internal dataset.	1. Parsons, K. E. (2012). D'Entrecasteaux Channel and the lower Huon Estuary. Inventory of Scientific Information. Report for the D'Entrecasteaux Channel Project, prepared by Ecomarine Consulting.	1. NSW Department of the Environment Aboriginal Heritage Information Management System and internal dataset.
Survey methods					
1. Desktop study 2. Desktop study 3. Desktop study 4. Desktop study	1. Desktop study	1. Desktop study 2. Desktop study 3. GPS quadrats	1. Desktop study	1. Desktop study	1. Desktop study

2.20 Tourism and recreation

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Austrade Tourism Research Australia internal dataset and annual reporting. Available online.	1. Tourism WA research and reports: internal datasets	1. Bryars, S., Brook, J., Meakin, C., McSkimming, C., Eglinton, Y., Morcom, R., Wright, A. and Page, B. 2016, Baseline and predicted changes for the Far West Coast Marine Park, DEWNR Technical report 2016/11, Government of South Australia, through Department of Environment, Water and Natural Resources, Adelaide.	1. GTSD 2018, Gippsland Tourism Strategic Direction 2013-2018 2. Business Victoria. Victoria's Tourism, Events and Visitor Economy research overview series and internal dataset.	1. Parsons, K. E. (2012). D'Entrecasteaux Channel and the lower Huon Estuary. Inventory of Scientific Information. Report for the D'Entrecasteaux Channel Project, prepared by Ecomarine Consulting. 2. Tourism Tasmania visitor statistics and research report series.	1. NSW Government, Destination NSW Facts, figures and research. Internal dataset. Available online.
Survey methods					
1. Desktop study	1. Desktop study	1. Desktop study	1. Desktop study 2. Desktop study	1. Desktop study 2. Desktop study	1. Desktop study

2.21 Conservation zoned areas

National	Western Australia	South Australia	Victoria	Tasmania	New South Wales
Studies					
1. Bailleul, F, Goldsworthy, SD, Rogers, PJ, Mackay, AI, Jonsen, I, Hindell, M & Patterson, T 2017, Identifying biologically important areas for iconic species and apex predators in the Great Australian Bight. Final Report GABRP Project 4.2. 2. Parks Australia internal dataset and reports.	1. WA Department of Biodiversity, Conservation and Attractions internal dataset and reports. 2. WA Department of Primary Industries and Regional Development internal dataset and reports.	1. SA Department of Environment and Water internal dataset and reports. 2. Primary Industries and Regions SA internal dataset and reports.	1. Barton, J., Pope, A. and Howe, S. 2012. Marine Natural Values Study Vol 2: Marine Protected Areas of the Flinders and Twofold Shelf Bioregions. Parks Victoria Technical Series. Number 79. Parks Victoria. Melbourne. 2. Parks Victoria (2006). Twelve Apostles Marine National Park and the Arches Marine Sanctuary Management Plan (online). 3. Parks Victoria 2005, Point Addis Marine National Park, Point Danger Marine Sanctuary and Eagle Rock Marine Sanctuary, Melbourne, Victoria. 4. Parks Victoria 2006, Wilsons Promontory Marine National Park and Wilsons Promontory Marine Park Management Plan, Melbourne, Victoria 5. Parks Victoria 2006, Bunurong Marine National Park, Bunuron Marine Park, Bunurong Coastal Reserve and Kilcunda-Harmers Haven Coastal Reserve Management Plan, Melbourne, Victoria. 6. Parks Victoria 2012 Marine Natural Values Study Summary.	1. TPWS 2012, Tasmanian Marine Reserves. 2. Department of Primary Industries, Parks, Water and Environment (Tasmania). Internal dataset and reports.	1. DECC 2007, Lord Howe Island Biodiversity Management Plan, Sydney, NSW. 2. NSW Department of Planning, Industry and Environment internal dataset and reports 3. NSW Office of Environment & Heritage internal dataset and reports.
Survey methods					
1. Desktop study 2. Desktop study	1. Desktop study 2. Desktop study	1. Desktop study 2. Desktop study	1. Desktop study 2. Desktop study 3. Desktop study 4. Desktop study 5. Desktop study 6. Desktop study	1. Desktop study 2. Desktop study	1. Desktop study 2. Desktop study 3. Desktop study

Appendix B

Resource register

APPENDIX B: RESOURCE REGISTER

The OSMP Resource register provides details of potential resources required to support the implementation of the Stromlo-1 exploratory drilling OSMP, excluding Equinor personnel. The resource register to be used for the Stromlo-1 exploratory drilling activity is a 'living' document that has been developed in an MSExcel format, providing a real-time demonstration of the level of preparedness, a format for testing resource availability and an auditable document (see examples in Figure 1 and Figure 2). The document provides a wide range of critical information, including (but not limited to) lists of the resources required (as defined in the OSMP documents), provider information (including contact details and number of each item that the provider holds), contractual status, technical resource requirements (e.g. personnel qualifications, equipment specifications). Each tab within the MSExcel spreadsheet also has a section for quarterly testing the availability of resources.

This register identifies potential suppliers of resources such as (but not limited to):

- Scientific Advisory Group (SAG) personnel resources
- Office-based personnel resources
- Field personnel resources
- Monitoring equipment.

The following are excluded from the resource register as they either would be sourced under contracts in place to support the broader response (e.g. surveillance, shoreline clean-up), or where resources/services can be obtained through commercial organisations without requirement for a contract:

- Vessels
- Vehicles
- Aircraft
- Personal protection equipment
- Fly camps and associated infrastructure (field latrines, showers, canteens, etc.)
- Transport suppliers
- Analytical laboratories.

All relevant qualifications and training certifications defined as requirements for specific roles in the OSMP must be in-date as relevant for all OSMP activities. The qualifications and experience detailed in the OSMP are the minimum required to undertake the technical components of the scope for each program. Each survey unit is the minimum requirement to undertake each field survey operation at one location for one shift.

When not detailed, PPE requirements are the Standard Personal Protective Equipment requirements detailed in Section 2.6.5 of the OSMP Implementation Plan.

Data to be included upon quarterly review of the Resource Register for each identified supplier/ contractor is:

- Name
- Contact information
- Currency of certification (for personnel)
- Number and type of units available (for equipment).

This document was correct at the time of publishing.

Table 1: Operational and scientific monitoring plans

Plan ref	Title	Target receptors
Operational monitoring plans (OMPs)		
OMP1	Oil Spill Modelling	Multiple receptors at local- to regional-level scales
OMP2	Surveillance and Tracking	Multiple receptors at local- to regional-level scales
OMP3	Monitoring of Hydrocarbons: Weathering and Behaviour in Marine Waters	Coastal and offshore pelagic habitats (i.e. water column) exposed or at risk of exposure from spill hydrocarbons
OMP4	Monitoring of Dispersants and Chemical Control Agents	Areas where spill response chemical strategies and tactics were applied (e.g. SSDI, surface dispersant application, shoreline clean-up using chemicals). Includes analysis for chemical breakdown products
OMP5	Shoreline Assessment	Intertidal areas associated with land masses exposed or at risk of exposure from spill hydrocarbons
OMP6	Identification of Impacts to Benthic and Demersal Biota	Nearshore (coastal), offshore and deep water subtidal benthic habitats (e.g. seagrass, kelp forests, reefs, sponge beds, etc.) and demersal fish and groundfish/prawn assemblages exposed or at risk of exposure from spill hydrocarbons
Scientific monitoring plans (SMPs)		
SMP1	Assessment of Water Quality	Nearshore (coastal), offshore and deep-water pelagic zone. Includes sampling for dispersants, control agents and breakdown products
SMP2	Assessment of Impacts and Recovery of Benthic Sediments and Infauna	Nearshore (coastal), offshore and deep water marine benthic sediments and infaunal assemblages exposed / potentially exposed to spill hydrocarbons and unexposed reference locations
SMP3	Assessment of Impacts and Recovery of Intertidal Habitats	Environments exposed/potentially exposed to spill hydrocarbons and unexposed and equivalent reference locations that occur between Chart Datum (CD) (= Lowest Astronomical Tide; LAT) and hence subject to daily periods of tidal immersion. Examples include beaches, rocky shores, mud flats/samphire, emergent reefs and shoals, mangroves, and saltmarshes
SMP4	Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Fish	Nearshore (coastal), offshore and deep water subtidal benthic habitats (e.g. seagrass, kelp forests, reefs, sponge beds, etc.) and demersal fish and groundfish/prawns exposed/potentially exposed to spill hydrocarbons and unexposed reference locations
SMP5	Assessment of Impacts and Recovery of Seabirds and Shorebirds	Seabird colonies and populations, shorebird colonies and populations, migratory sea/shorebirds, penguin colonies and populations
SMP6	Assessment of Impacts and Recovery of Marine Megafauna	Cetaceans, pinnipeds, sharks/rays and reptiles (e.g. sea snakes)
SMP7	Assessment of Impacts and Recovery of Plankton	Phytoplankton and zooplankton communities, fish larval stages
SMP8	Assessment of Impacts and Recovery of Fisheries and Aquaculture	Commercial fisheries, recreational fisheries, aquaculture operations, aquaculture resource areas (includes seafood safety and quality assessments)
SMP9	Assessment of Impacts and Recovery of Areas of Particular Recreation, Tourism, Conservation, Heritage and Native Title Importance	Areas recognised as important or zoned for recreation, tourism, conservation, heritage or native title

Operational monitoring plans

OMP1: Oil spill modelling

Table 2: Resource requirements for OMP1

Resource	Role requirements	Qualifications/experience required
Modelling Team	Team requirements will be supported primarily by the Queensland RPS modelling team with the WA (Perth) team available to support this scope should contingency be required (e.g. during periods of high demand). The number of personnel and computers required will be dependent on the nature, scale and evolution of the incident. Minimum requirement would be one modeller, with relief to enable 24/7 support.	All RPS modelling personnel have the appropriate level of qualification and experience necessary to ensure robust application of the models.

Table 3: Equipment requirements for OMP1

Equipment	Core equipment requirements
Modelling software	One modelling-spec computer with appropriate software (as SIMAP (Spill Impact Mapping Analysis Program) or OILMAP) to run the models.

OMP2: Surveillance and tracking

Due to the direct management by the Equinor IMT, the limitations on availability of different remote sensing technologies, and consideration that survey platforms (vessels, aircraft and satellites) are likely to have different sensor payloads, a standard requirement for core equipment is not appropriate. Some recommendations have been provided for visual observation teams.

Table 4: Resource requirements for OMP2

Resource	Role requirements	Qualifications/experience required
Spill observers	Trained oil spill observers will be contracted directly by Equinor as part of the broader spill response. Unmanned Aerial Vehicle (UAV) pilots will be suitably certified and carry the appropriate insurances.	Experience: Previous experience in undertaking oil spill observer role as part of a spill response would be preferable.

Table 5: Field observation equipment requirements for OMP2

Sampling environment	Core equipment requirements
Visual observations	Spares kits for survey equipment Laptop computer/Tablet computer and backup (with appropriate software) Hand-held GPS plus spare unit GPS-tagging cameras (stills and/or video) and spare Observation logbooks Binoculars Consumables (e.g. batteries) Satellite tracking buoys UAVs with spares kit and spare

Table 6: Core OMP2 logistical requirements

Components	Requirements
Survey platform requirements	Vessel specifications: • Elevated decks • Access to deck area with clear view of water surface • Indoor table access with direct access to work deck • Access to bridge • GPS positioning • Sufficient bunking space for vessel crew and field survey teams Potential requirement for tender vessel (small, shallow-draft vessel) for shallow water or shoreline observations Aerial survey platform requirements: • Suitable downward visibility: • Helicopters for coastal aerial surveys • Aircraft with wings mounted above fuselage or larger aircraft for offshore surveys • GPS positioning systems

OMP3: Monitoring of hydrocarbons: weathering and behaviour in marine waters

Table 7: Field survey unit personnel requirements for OMP3

Title	Role requirements	Qualifications/experience required
Water Quality Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks, and toolbox talks Management of the technical components of field operations Pre-start assessment of potential sources of contamination Daily sampling plans (with Party Chief and vessel master, where appropriate) QA/QC of sampling methods QA/QC of field sampling logs Management of sample integrity and storage Health and safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' offshore and coastal WQ and water column profiling experience in both field scientist and field lead role, preferably with the use of fluorimeters in the field. Previous experience of intertidal field surveys.
Water Quality Field Scientist/ Technician	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks, and toolbox talks Undertaking technical scopes of OMP3 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and field logs Supporting the Water Quality Field Lead Setting up and deployment of sampling equipment Collecting and labelling samples Sample storage Downloading field data Securing field sampling equipment during vessel transits	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: Offshore and coastal WQ and water column profiling experience.
Wave glider field technicians (2)	Set up, maintenance, deployment and retrieval of wave gliders	Appropriate technicians to be provided by wave glider supplier

Table 8: Core equipment requirements for OMP3 with recommendations for different sampling environments

Sampling environment	Core equipment requirements
General (all survey areas)	Spares kits for survey equipment and technologies Tool kits, including spanners, shifting spanners (large and small), socket sets, wire cutters/snips, pliers (needle-nosed and standard), Allen key sets (imperial and metric), screwdrivers (Phillips, flat head and screwdriver watch repair kits), Stanley knives and spare blades, tape measures (up to 30 m+), silicone grease, superglue, neoprene glue, duct tape, electrical tape, packaging tape, hose clamps (Jubilee clips) and cable ties (various sizes) Sample containers, appropriate to samples Thin foam/bubble wrap sample jar pockets Aluminium foil

Sampling environment	Core equipment requirements
	Laptop computer and backup (with appropriate software) UPS unit plus spare Hand-held GPS plus spare unit Nitrile gloves Decontamination cleaning product (e.g. Decon 90, or dichloromethane for cleaning of the slick sampler fishing pole) Eskies with ice blocks (frozen) Consumables (e.g. batteries)
Intertidal zone (e.g. shorelines)	Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) 2 × extendable sampling pole/boat hooks Booms and absorbent pads
Coastal (e.g. State waters to ≤100 m water depth)	Survey navigation software plus GPS unit/vessel GPS access and/or hand-held GPS plus spare 3 × bomb samplers, Niskin Bottles and/or van Dorn water samplers (plus 2 spares and 2 extra spare messenger weights) WQ profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter, and conductivity/ temperature/depth (CTD) sensors GO nets (pre-cleaned or new pre-packaged nets) AGI slick samplers with fishing pole, line and disposable floats (which will be discarded after every sampling attempt) Wide-mouth amber glass jars with Teflon-lined lid (min. 350ml) for sampling surface hydrocarbons and for GO nets 2 × extendable sampling pole/boat hooks Optional: Additions to the WQ profiler: turbidity logger particle analyser coloured dissolved organic matter (CDOM) fluorimeter chlorophyll fluorimeter dissolved oxygen (DO) sensor
Offshore (e.g. Commonwealth waters)	Survey navigation software plus GPS unit/vessel GPS access and/or hand-held GPS plus spare 3 × bomb samplers and/or Niskin Bottles (plus 2 spares and 2 extra spare messenger weights) WQ profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter, and conductivity/ temperature/depth (CTD) sensors GO nets (pre-cleaned or new pre-packaged nets) AGI slick samplers with fishing pole, line and disposable floats (which will be discarded after every sampling attempt) Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) for sampling surface hydrocarbons and for GO nets 2 × extendable sampling pole/boat hooks Optional: Additions to the water quality (WQ) profiler: turbidity logger particle analyser coloured dissolved organic matter (CDOM) fluorimeter chlorophyll fluorimeter dissolved oxygen (DO) sensor Wave glider(s)** with: hydrocarbon fluorimeter CTD sensor DO sensor weather station current profiler

Table 9: Core OMP3 logistical requirements

Component	Requirement
OSMP equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batches of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core field survey team	Intertidal surveys: 2 technical personnel (Field Lead and Field Technician) Vessel-based surveys: 2 technical personnel (Field Lead and Field Technician) 1 operational personnel (Party Chief)
Survey platform requirements	Vehicles for intertidal surveys: 4WD off-road vehicles (preferably mine-rated) Off-road trailers for shelter and sample transport Quad bikes may be appropriate in some areas Vessel specifications: Sufficient deck space for sampling Covered area of deck for shelter from the elements Sample storage space (refrigerated) Access at stern or via gunwale for deployment of sampling equipment Hi-Ab, crane and/or A-frame (suitably rated) Winches with sufficient winch wire (rated to a minimum of 2T) Winch with sufficient Dyneema Deckhands with appropriate certifications Deck hoses (freshwater and seawater) Dynamic positioning systems (DPS) preferable (critical in offshore deep-water environments) Indoor table access with direct access to work deck Access to bridge (for Party Chief) GPS access/outputs Sufficient bunking space for vessel crew and field survey teams Sufficient crew to allow 24-hour operations where appropriate Potential for dual deployments (in offshore environments) Potential requirement for tender vessel (small, shallow-draft vessel) for shallow water sampling
Sample transfer requirements	Vessel-based surveys are likely to require regular pick-up of samples to enable shipment and analysis within holding times. Therefore, a process to enable ship-to-ship or ship-to-helicopter transfer of samples must be in place
Data management	2 × 2 TB external hard drives with password protection to allow transfer of data with returning field personnel

OMP4: Monitoring of dispersants and chemical control agents

Table 10: Field survey unit personnel requirements for OMP4

Title	Role requirements	Qualifications/experience required
Water Quality Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks, and toolbox talks Management of the technical components of field operations Pre-start assessment of potential sources of contamination Daily sampling plans (with Party Chief and vessel master, where appropriate) QA/QC of sampling methods QA/QC of field sampling logs Management of sample integrity and storage Health and safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' offshore and coastal water quality and water column profiling experience in both field scientist and field lead role, preferably with the use of fluorimeters in the field. Previous experience of intertidal field surveys.
Water Quality Field Scientist/ Technician	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks, and toolbox talks Undertaking technical scopes of OMP4 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and field logs Supporting the Water Quality Field Lead Setting up and deployment of sampling equipment Collecting and labelling samples Sample storage Downloading field data Securing field sampling equipment during vessel transits	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: Offshore and coastal water quality and water column profiling experience.
Field laboratory technician (where required for in-field sample analysis)	To determine Total Petroleum Hydrocarbons (TPH) on board vessel	Experienced with Gas Chromatography-Mass Spectrometry (GC-MS) with flame ionization detector (FID) capability
Wave glider field technicians (2)	Set up, maintenance, deployment and retrieval of wave gliders	Appropriate technicians to be provided by wave glider supplier

Table 11: Core equipment requirements for OMP4 with recommendations for different sampling environments

Sampling environment	Core equipment requirements
General equipment (all areas)	Spares kits for survey equipment and technologies Tool kits, including spanners, shifting spanners (large and small), socket sets, wire cutters/snips, pliers (needle-nosed and standard), hex key sets (imperial and metric), screwdrivers (Phillips, flat head and screwdriver watch repair kits), Stanley knives and spare blades, tape measures (up to 30 m+), silicone grease, superglue, neoprene glue, duct tape, electrical tape, packaging tape, hose clamps (Jubilee clips) and cable ties (various sizes) Sample jars containers, appropriate to sampling

Sampling environment	Core equipment requirements
	Thin foam/bubble wrap sample jar pockets Aluminium foil Laptop computer and backup (with appropriate software) UPS unit plus spare Hand-held GPS plus spare unit Nitrile gloves Decontamination cleaning product (e.g. Decon 90) Tissues/paper towels Eskies with ice blocks (frozen) Plastic stirrers/teaspoons Consumables (e.g. batteries, garbage bags, sharpies and fine-point permanent markers, Blu tack, dishwashing detergent, white paper) A stand for separation funnels Solvent (white spirit/turpentine) for extraction and cleaning (min. 2 L) Plastic liquid waste bucket (10 L) >30 vials (15 ml), marked with a 10 ml fill line using a reference vial that has been accurately-filled with 10 ml as a guide Pre-completed stick-on labels Collapsible test-tube rack Syringes for measuring oil, that have been marked on the plunger at the top of the barrel for the correct volumes (marked volumes on the syringe are in black, and often cannot be read against the oil) 10 L sea water, also collected offshore, in a clean, labelled bucket
QET Procedure (after Hook et al., 2016) Up to four sets of equipment may be required to test a blank plus up to three dispersants*	250 ml beaker for measuring seawater 3 × 125 ml separating funnel 3 × 100 ml beakers 3 × 1 ml plastic disposable syringes 3 × 2 ml plastic disposable syringes 4 × 5 ml plastic disposable syringes 4 × 10 ml plastic disposable syringes 4 × sticky labels, pre-marked “B(lank)”, “D(ispersant)1”, “D2” and “D3” 7 × 15 ml vials
SQT Procedure (after Hook et al., 2016)	1 × 1 ml plastic disposable syringe 6 × 15 ml vials 2 × 125 ml measuring cylinders 2 × 250 ml conical flasks with caps 4 × sticky labels, pre-marked “100%”, “50%”, “25%”, “12%” and “6%”
Intertidal zone (e.g. shorelines)	Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) 2 × extendable sampling pole/boat hooks Booms and absorbent pads
Coastal (e.g. State waters to ≤100 m water depth)	Survey navigation software plus GPS unit/vessel GPS access and/or hand-held GPS plus spare 3 × bomb samplers, Niskin Bottles and/or van Dorn water samplers (plus 2 spares and 2 extra spare messenger weights) Water Quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter, and conductivity/ temperature/depth (CTD) sensors Wide-mouth amber glass jars with Teflon-lined lid (min. 350ml) for sampling surface hydrocarbons (both for analysis and to collect representative hydrocarbon samples for QET/SQT testing) 2 × extendable sampling pole/boat hooks Optional: Additions to the water quality profiler: turbidity logger particle analyser coloured dissolved organic matter (CDOM) fluorimeter chlorophyll fluorimeter dissolved oxygen (DO) sensor

Sampling environment	Core equipment requirements
Offshore (e.g. Commonwealth waters)	Survey navigation software plus GPS unit/vessel GPS access and/or Hand-held GPS plus spare 3 × wide-mouth amber glass jar with Teflon-lined lid (min. 350ml) 3 × bomb samplers and/or Niskin Bottles (plus 2 spares and 2 extra spare messenger weights) Water Quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter, and conductivity/ temperature/depth (CTD) sensors Wide-mouth amber glass jars with Teflon-lined lid (min. 350ml) for sampling surface hydrocarbons (both for analysis and to collect representative hydrocarbon samples for QET/SQT testing) 2 × extendable sampling pole/boat hooks Hand-held Volatile Organic Compound meter / Lower Explosive Limit (LEL) monitor Optional: Additions to the water quality profiler: • real-time data display with Niskin rosette • turbidity logger • particle analyser • coloured dissolved organic matter (CDOM) fluorimeter • chlorophyll fluorimeter • dissolved oxygen (DO) sensor Wave glider(s) with: • hydrocarbon fluorimeter • CTD sensor • DO sensor • current profiler
Deep Oceanic Waters (e.g. Commonwealth waters/EEZ, >500m water depth)	Survey navigation software plus GPS unit/vessel GPS access and/or hand-held GPS plus spare Wide-mouth amber glass jar with Teflon-lined lid (min. 350ml) Water sampling Niskin Rosette* with CTD profiler (plus spare Niskin bottles, CTDs, etc.) rated to the appropriate sampling depth(s) Calibrated hydrocarbon fluorimeter Calibrated multi-channel fluorimeter Particle analyser, e.g. Laser In-Situ Scattering and Transmissometry (LISST, LISST-DEEP or equivalent) with a range of 2.5 to 2,000 µm if practicable CDOM fluorimeter Chlorophyll fluorimeter Turbidity logger Dissolved oxygen (DO) sensor (e.g. calibrated using Winkler titrations) In situ carbon dioxide sensor Hand-held Volatile Organic Compound meter / Lower Explosive Limit (LEL) monitor Water samples for ecotoxicological testing Optional: Acoustic sensor if close to plume (if available – may still be in assessment and validation phase) Gas Chromatography-Mass Spectrometry (GC-MS) with flame ionization detector (FID) capability on board vessel to determine Total Petroleum Hydrocarbons (TPH) ROV-mounted SilCam (depth-rated to 3,000 m) for in-plume measurement of droplet sizes from 100-12,000 µm (Exponent and Sintef 2018) Handheld thermal imaging camera to measure temperature differentials between effective and less effective dispersant/oil interactions (surface dispersant application only) Additions to the water quality profiler: real-time data display with Niskin rosette turbidity logger particle analyser coloured dissolved organic matter (CDOM) fluorimeter chlorophyll fluorimeter dissolved Oxygen (DO) sensor Wave glider(s) with: hydrocarbon fluorimeter

Sampling environment	Core equipment requirements
	CTD sensor DO sensor current profiler For VOC monitoring: Calibrated pump and specific sorbent tubes to determine identification and concentration of VOCs (requires laboratory analysis) Photo Ionisation Detectors (PID) For plankton sampling: Water sample filtration equipment and vacuum pumps (including appropriate filters)

* This equipment list does not include any contingency, so additional spares of each line item shall be considered.

Table 12: Core OMP4 logistical requirements

Component	Requirements
OSMP equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batches of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core field survey team*	Intertidal surveys: 2 technical personnel (field lead and field technician) Vessel-based surveys: 2 technical personnel (Field Lead and Field Technician) 1 operational personnel (Party Chief)
Survey platform requirements	Vehicles for intertidal surveys: 4WD off-road vehicles (preferably mine-rated) Off-road trailers for shelter and sample transport Quad bikes may be appropriate in some areas Vessel specifications: Sufficient deck space for sampling Covered area of deck for shelter from the elements Sample storage space (refrigerated) Access at stern or via gunwale for deployment of sampling equipment Hi-Ab, crane and/or A-frame (suitably rated) Winches with sufficient winch wire (rated to a minimum of 2 T) Winch with sufficient Dyneema Deckhands with appropriate certifications Deck hoses (freshwater and seawater) Dynamic positioning systems (DPS) preferable (critical in offshore deep-water environments) Indoor table access with direct access to work deck Access to bridge (for Party Chief) GPS access/outputs Sufficient bunking space for vessel crew and field survey teams Sufficient crew to allow 24-hour operations where appropriate Potential for dual deployments (in offshore environments) Potential requirement for tender vessel (small, shallow-draft vessel) for shallow water sampling

Component	Requirements
QET/SQT analysis	Rapid method for transfer of hydrocarbon sample to lab. Laboratory, either land-based or vessel-based: Well ventilated Lab Bench Sink and running water Regulated waste storage and disposal process Samples of relevant dispersants (to be) used
Sample transfer requirements	Vessel-based surveys are likely to require regular pick-up of samples to enable shipment and analysis within holding times. Therefore, a process to enable ship-to-ship or ship-to-helicopter transfer of samples must be in place
Data management	2 × 2 TB external hard drives with password protection to allow transfer of data with returning field personnel

OMP5: Shoreline assessment

Table 13: Field survey unit personnel requirements for OMP5

Title	Role requirements	Qualifications/experience required
Shoreline Survey Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks, and toolbox talks Management of the technical components of field operations Preparation of daily sampling plans QA/QC of sampling methods QA/QC of field sampling logs Management of sample integrity and storage Health and safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET medical (UKOG or acceptable alternative) MSIC Optional: senior first aid Experience: at least five years' water quality, sediment quality and/or intertidal survey experience in both field scientist and field lead role.
Shoreline Survey Field Scientist/ Technician	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks, and toolbox talks Undertaking technical scopes of OMP5 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and field logs Supporting the Shoreline Survey Field Lead Setting up and use of sampling equipment Collecting and labelling samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: Water quality, sediment quality and/or intertidal survey experience.
UAV pilot (where required)	Undertaking UAV surveys in line with OMP5 technical and survey requirements Management and maintenance of UAVs	Relevant UAV certifications and insurances

Table 14: Core equipment requirements for OMP5

Sampling environment	Core equipment requirements
General (all survey components)	Spares kits for survey equipment and technologies Tool kits, including spanners, shifting spanners (large and small), socket sets, wire cutters/snips, pliers (needle-nosed and standard), hex key sets (imperial and metric), screwdrivers (Phillips, flat head and screwdriver watch repair kits), Stanley knives and spare blades, tape measures (up to 30 m+), silicone grease, superglue, neoprene glue, duct tape, electrical tape, packaging tape, hose clamps (Jubilee clips) and cable ties (various sizes) Sample jars containers, appropriate to sampling Thin foam/bubble wrap sample jar pockets Aluminium foil Laptop computer and backup (with appropriate software) Hand-held GPS plus spare unit Camera plus waterproof housing plus spares Nitrile gloves Decontamination cleaning product (e.g. Decon 90) Eskies with ice blocks (frozen) Consumables (e.g. batteries, cable ties, duct tape waterproof paper, waterproof pens, pencils, adhesive tape, ziplock bags)

Sampling environment	Core equipment requirements
Shorelines	Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) 250 ml glass jars with lids PVC or Perspex corer (2–5 cm diameter) Core (e.g. split PVC plastic pipe) Siphon 0.1 m2 × 10 cm Sand box quadrat, or equivalent (otherwise known as a metal perimeter, which is a metal box without a top or bottom) Palette knife or other flat metal blade Compass Mobile/Satellite Phone(s) Radio Multiple metal measuring tapes (30 m+) and metal rulers Quadrats (0.1 and 1 m2) Metal spades/trowels/flat blades/scoops Theodolite or dumpy level with tripod Jam jar lids Tall pole or cross-staff Self-recording depth sensors or Conductivity Temperature Depth sensors (CTDs) Poles Hammer Marker stakes UAVs

Table 15: Core OMP5 logistical requirements

Component	Requirements
OSMP equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batches of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core field survey team*	Intertidal surveys: 2 technical personnel (Field Lead and Field Technician).
Survey platform requirements	Vehicles for intertidal surveys: 4WD off-road vehicles (preferably mine-rated) Off-road trailers for shelter and sample transport Quad bikes (with trailer) may be appropriate in some areas Hovercraft may be appropriate in some areas Inflatable dinghy with oars, anchor, safety kit and small outboard engine may be required in some areas (e.g. for shallow-sloping long beaches, where tidal encroachment is rapid). Vessel specifications (where used for transport and/or accommodation): Sufficient bunking space for vessel crew and field survey teams Requirement for tender vessel (small, shallow-draft vessel) for small boat transfers.
Sample transfer requirements	Surveys are likely to require regular pick-up of samples to enable shipment and analysis within holding times. Therefore, a process to facilitate rapid transfer of samples must be in place.
Data management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel.

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore would be added to this complement following activation.

OMP6: Identification of impacts to benthic and demersal biota

Table 16: Field survey unit personnel requirements for OMP6

Title	Role requirements	Qualifications/experience required
Benthic and Demersal Biota Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks, and toolbox talks Management of the technical components of field operations Pre-start assessment of potential risks for deployment and retrieval of equipment Daily survey plans (with Party Chief and vessel master, where appropriate) QA/QC of survey methods QA/QC of field data sheets Management of imagery/data file integrity and storage Health and safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of imagery and data Preparation of imagery and data for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' offshore and coastal benthic video survey experience in both field scientist and field lead role, preferably with the use of SBRUVs in the field.
Field Scientist/ Technician	Mobilisation and de-mob of field equipment Active engagement at hse briefings, pre-start checks, and toolbox talks Undertaking technical scopes of omp6 operations Take personal responsibility for management of visual equipment checks, safety, survey, data/imagery file integrity and field data sheets Supporting the benthic and demersal biota field lead Setting up, testing and deployment of survey equipment Sample storage Downloading field data and initial image qa/qc Securing field survey equipment during vessel transits	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: Offshore and coastal benthic video survey and/or SBRUVs experience.
Party Chief	Refer to Section 2.4.3 of the OSMP Implementation Plan	Refer to Section 2.4.3 of the OSMP Implementation Plan
ROV Pilot	Operational control of the ROV throughout deployment. Follows directions of the field lead to capture relevant imagery	To be supplied by reputable service provider
ROV technician	Set up of ROV equipment Deployment, retrieval and maintenance of ROV(s) Downloading of any additional imagery from untethered camera systems mounted on the ROV	To be supplied by reputable service provider
AUV technician/ pilot	Deployment, retrieval and maintenance of AUV(s) Downloading of imagery and data from the AUV	To be supplied by reputable service provider
SBRUVs technician	See Field Scientist/Technician, plus Equipment maintenance and calibration	To be supplied by reputable service provider

Table 17: Core equipment requirements for OMP6

Survey method	Core equipment requirements
General (all survey methods)	Spares kits for survey equipment and technologies Tool kits, including spanners, shifting spanners (large and small), socket sets, wire cutters/snips, pliers (needle-nosed and standard), hex key sets (imperial and metric), screwdrivers (Phillips, flat head and screwdriver watch repair kits), Stanley knives and spare blades, tape measures (up to 30 m+), silicone grease, superglue, neoprene glue, duct tape, electrical tape, packaging tape, hose clamps (Jubilee clips) and cable ties (various sizes) Two laptop computers and backup (with appropriate software) Additional computer screen plus cable (long extension) Survey navigational software (e.g. HydroPro or equivalent) for survey management, positional data capture and video overlay output strings Image analysis/habitat mapping software appropriate for environment to be surveyed Multiple UPS units plus spare Hand-held GPS plus spare unit Access to vessel GPS data outputs or GPS unit with outputs Consumables (e.g. Batteries, duct tape, cable ties, clip shackles, electrical tape, garden hose, tyre rubber/~3 inch bungee loops) Booms and absorbent pads
Towed/drop-down video	Video camera system (rated to an appropriate depth) Video top box (including remote image capture system, image recording system, video overlay unit) Video frame with mounts for multiple camera angles (must include 30 below horizontal) which can be converted from towed to drop-down orientations Weights for video frame 2 × halogen lights or 3 × led light bars plus spares Video cables sufficient for depth +50 % plus spares Optional: Scaling lasers (preferably class iii) Gyro compass Additional self-contained stills/video cameras USBL
Extreme Low Visibility (ELVis) video*	Video camera system (rated to an appropriate depth) Video top box (including e.g. remote image capture system, image recording system, video overlay) ELVis sealed system with vertical camera mount and horizontal lighting mount and spares weights for video frame 1/2 × Halogen lights or 2/3 × LED light bars plus spares Video cables sufficient for depth +50 % plus spares Sufficient distilled water to refill ELVis several times/day Silicone sealant Optional: USBL
Remotely Operated Vehicles (ROVs)	ROV rated to appropriate depth plus spare On-board camera of appropriate image resolution with backup Halogen/LED lighting system Video overlay On-board gyro compass or equivalent ROV top box (for viewing and recording imagery) and controller On-board USBL or equivalent positioning technology Scaling lasers Control/video cables sufficient for depth +50% minimum plus spares Weight block with shackle ring Optional: Additional self-contained stills/video cameras On-board scanning sonar

Survey method	Core equipment requirements
Autonomous Underwater Vehicles (AUVs)*	On-board navigation software Satellite telemetry communications system / WiFi / mobile network On-board video/stills cameras of appropriate image quality High-accuracy navigation system and GPS Depth sensor Optional: Fluorimeter Dissolved Oxygen (DO) sensor Turbidity sensor Conductivity/Temperature (CT) sensor Sidescan sonar/multi-beam echosounder/synthetic aperture sonar scattering meter
Stereo Baited Remote Underwater Video Stations/Systems (SBRUVs), per unit, Minimum eight required plus spares	2 × self-contained video systems (rated to an appropriate depth) PVC tubes Galvanised SBRUVs frames (horizontal look-outward systems) Weights Diode arms Diodes Bait arms plus spares Bait bags plus spares Self-contained halogen or led lighting and/or lighting with external battery housing Laser scaling Marker buoys (2 sets) Shackles Rope Bait Bait bin and lid Grapple SBRUV spares kit Optional: Stills camera with strobe

*Note: due to the limitations of access, availability and mobilisation periods for this technology, equipment redundancy may not be feasible. However, any data these technologies may collect will be additional to the specified.

Table 18: Core OMP6 logistical requirements

Component	Requirements
OSMP Equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core field survey team*	Vessel-based surveys: 2 technical personnel (Field Lead and Field Technician) 1 operational personnel (Party Chief)
Additional equipment-specific survey team requirements (per survey unit, where required)	ROV surveys: ROV Pilot ROV technician AUV Surveys: 1 additional AUV technician SBRUVs Deployments: 1 additional SBRUVs technician

Component	Requirements
Survey platform requirements	Vessel specifications: Sufficient deck space for survey equipment deployment and maintenance Covered area of deck for shelter from the elements Access at stern or via gunwale for deployment of survey equipment Hi-ab, crane and/or a-frame (suitably rated) Winches with sufficient winch wire (rated to a minimum of 2 t) Deckhands with appropriate certifications Deck hoses (freshwater and sea water) Dynamic positioning systems (DPS) preferable (critical in offshore deep water environments) Indoor table access with direct access to work deck Access to bridge (for party chief) Vessel GPS access/outputs Sufficient bunking space for vessel crew and field survey teams Sufficient crew to allow 24-hour operations where appropriate Potential for dual deployments (in offshore environments)
Data Management	4 × 2 TB external hard drives with password protection to allow transfer of data with returning field personnel

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore would be added the field team following activation.

Scientific monitoring plans

All of the following SMPs have the below general equipment requirements in addition to the specific requirements listed.

Table 19: Core equipment requirements for all SMPs

Sampling environment	Core equipment requirements
General (all survey components)	Spares kits for survey equipment and technologies Tool kits, including spanners, shifting spanners (large and small), socket sets, wire cutters/snips, pliers (needle-nosed and standard), hex key sets (imperial and metric), screwdrivers (Phillips, flat head and screwdriver watch repair kits), Stanley knives and spare blades, tape measures (up to 30m+), silicone grease, superglue, neoprene glue, duct tape, electrical tape, packaging tape, hose clamps (Jubilee clips) and cable ties (various sizes) Sample containers, appropriate to samples Thin foam/bubble wrap sample jar pockets Laptop computer and backup (with appropriate software) Uninterruptable power supply (UPS) units and spare Hand-held GPS plus spare unit Camera plus waterproof housing plus spares Radios (e.g. for deck-to-wheelhouse communications where required) Sufficient winch wire/Dyneema (rated) for depths to be sampled Nitrile gloves Decontamination cleaning product (e.g. Decon 90) Eskies with ice blocks (frozen) Consumables (e.g. batteries, cable ties, duct tape waterproof paper, waterproof pens, clipboards, string, mousing wire, pencils, sharpies (thick and fine-tipped permanent markers), adhesive tape, ziplock bags, D-shackles, garden hose)

SMP1: Assessment of water quality

Table 20: Field survey unit personnel requirements for SMP1

Title	Role requirements	Qualifications/experience required
Water Quality Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily sampling plans QA/QC of sampling methods QA/QC of field sampling logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' Water quality survey experience in both field scientist and field lead roles.
Water Quality Field Scientist/ Technician	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP1 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and survey data sheets Supporting the Water Quality Field Lead Setting up and use of sampling equipment Collecting and labelling samples Fixing/preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus: TBOSIET Medical MSIC Optional: Senior First Aid Experience: Water quality survey experience.

Table 21: Core equipment requirements for SMP1

Sampling environment	Core equipment requirements
Intertidal zone (e.g. shorelines)	Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) 2 × Extendable sampling pole/boat hooks Booms and absorbent pads
Coastal (e.g. state waters to ≤100 m water depth)	Survey navigation software plus GPS unit/vessel GPS access and/or Hand-held GPS plus spare 3 × Bomb samplers, Niskin Bottles and/or van Dorn water samplers (plus 2 spares and 2 extra spare messenger weights) Water Quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter, and conductivity/ temperature/depth (CTD) sensors Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) for surface water sampling 2 × Extendable sampling pole/boat hooks Optional: Additions to the water quality profiler: Turbidity logger Particle analyser Coloured dissolved organic matter (CDOM) fluorimeter Chlorophyll fluorimeter Dissolved Oxygen (DO) sensor

Sampling environment	Core equipment requirements
Offshore (e.g. Commonwealth waters)	Survey navigation software plus GPS unit/vessel GPS access and/or Hand-held GPS plus spare 3 × Bomb samplers and/or Niskin Bottles (plus 2 spares and 2 extra spare messenger weights) Water Quality profiler with self-recording polycyclic aromatic hydrocarbon fluorimeter, pH meter, and conductivity/ temperature/depth (CTD) sensors Wide-mouth amber glass jars with Teflon-lined lid (min. 350 ml) for surface water sampling 2 × Extendable sampling pole/boat hooks Optional: Additions to the water quality profiler Turbidity logger Particle analyser Coloured dissolved organic matter (CDOM) fluorimeter Chlorophyll fluorimeter Dissolved Oxygen (DO) sensor Wave glider(s) with Hydrocarbon fluorimeter CTD sensor DO sensor Current profiler
Deep oceanic waters (e.g. Commonwealth waters/ EEZ, >500 m water depth)	Survey navigation software plus GPS unit/vessel GPS access and/or Hand-held GPS plus spare Wide-mouth amber glass jar with Teflon-lined lid (min. 350 ml) for surface water sampling Water sampling Niskin Rosette* with CTD profiler (plus spare Niskin bottles, CTDs, etc.) rated to the appropriate sampling depth(s) Optional: Additions to the water quality profiler Turbidity logger Particle analyser Coloured dissolved organic matter (CDOM) fluorimeter Chlorophyll fluorimeter Dissolved Oxygen (DO) sensor Wave glider(s)† with Hydrocarbon fluorimeter CTD sensor DO sensor Current profiler For plankton sampling* - Water sample filtration equipment and vacuum pumps (including appropriate filters)

*Where the rosette has sufficient water sampling capacity (e.g. spare Niskin bottles), water samples may also be collected for plankton analysis to support the broader OSMP response (i.e. SMP7). The equipment required for plankton filtration should be therefore included in the survey consignment.

†Due to the limitations of access, availability and mobilisation periods for this technology, equipment redundancy may not be feasible. However, any data wave gliders may collect will be additional to the core studies and would increase situational awareness, so this method is considered a “value-add” approach rather than a core requirement.

Table 22: Core SMP1 logistical requirements

Component	Requirements
OSMP Equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.

Component	Requirements
Core Field Survey Team*	Intertidal surveys: 2 technical personnel (field lead and field technician) Vessel-based surveys: 2 technical personnel (field lead and field technician) 1 operational personnel (party chief)
Survey Platform Requirements	Vessel requirements: GPS access/outputs Depth sounder Dynamic Positioning System (DPS) optional Deckhand(s) with riggers/dogman certificates Appropriately rated winches, block, Hi-Ab, crane and/or A-frame Winch with sufficient Dyneema Deckhands with appropriate certifications Large deck area for sampling, sample processing and equipment cleaning and storage Access at stern or via gunwale for deployment of sampling equipment Covered areas for shelter Deck hoses (freshwater and seawater) Deck areas with low risk of contamination of samples Deck lighting for night operations Freezer space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient bunking space for vessel crew and field survey teams Sufficient crew to allow 24-hour operations where appropriate Potential for dual deployments (in offshore environments) Requirement for tender vessel (small, shallow-draft vessel) for small boat transfers or shallow water WQ sampling Fuel and victual storage for at least 20 days at sea Vessel-to-vessel transfer of samples to transfer vessel for shipping to laboratory within holding times
Sample transfer requirements	Survey vessels are likely to be offshore for up to 3 weeks at a time, and a number of analytes have holding times of 3-7 days. This will require arrangement of vessels and/or helicopters to collect samples from offshore survey vessels to return them for shipping within holding times. A process to facilitate rapid transfer of samples from the field to the laboratory must be in place
Data Management	Multiple external hard drives with sufficient storage and with password protection to allow transfer of data/imagery with returning field personnel

SMP2: Assessment of impacts and recovery of benthic sediments and infauna

Table 23: Field survey unit personnel requirements for SMP2

Title	Role requirements	Qualifications/experience required
Sediment Quality Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily sampling plans QA/QC of sampling methods QA/QC of field sampling logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' sediment quality survey experience in both field scientist and field lead roles.
Sediment Quality Field Scientist/	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP2 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and survey data sheets Supporting the Water Quality Field Lead Setting up and use of sampling equipment Collecting and labelling samples Fixing/preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Sediment quality survey experience.

Table 24: Core equipment requirements for SMP2

Sampling environment	Core equipment requirements
Grab/box core	Grab sampler (minimum 0.025m^2 in shallow coastal areas where samples may be hand-hauled; Minimum 0.1 m^2 otherwise) / box core (0.1m^2) plus spare. The spare need not be of the same type in order to allow for variability in sediment types Rope for deployment of 0.025 m^2 grab White plastic tray for 0.025 m^2 grab sample Grab table/stand (if required) Sampler spares kits Sample storage tub(s) with secure lids Endecott sieves (1mm) Wash bottles Sieving station 10% Buffered formalin (buffer = Disodium tetraborate), or 80% ethanol Plastic containers for making up formal-saline (25 L with tap) if required Saltwater deck hose with variable flow
Corer/multi-core	Corer or multi-corer with 0.01m^2 cores and spare Spare cores Sampler spares kits 0.0024 m^2 corer and spare Sample storage tub(s) with secure lids 7% Magnesium Chloride (MgCl2)

Sampling environment	Core equipment requirements
	Formaldehyde and Buffer (Disodium tetraborate), or 80% ethanol Deck hose
Deep-water sampling	Ultra-Short Baseline (USBL) system with mounting arm and bracket will be required to determine when the sampling equipment is on the sea bed (minimise risk of fouling of or damage to equipment) and to obtain high positional accuracy of site sampled Any additional equipment/software required to support this (e.g. GPS, pitch/roll/heave sensor, gyro compass, or survey navigation software such as HydroPro or similar)

Table 25: Core SMP2 logistical requirements

Component	Requirements
SMP Equipment logistics	SMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core Field Survey Team*	Intertidal surveys: 2 technical personnel (field lead and field technician) Vessel-based surveys: 2 technical personnel (field lead and field technician) 1 operational personnel (party chief)
Survey Platform Requirements	Vessel requirements: GPS Depth sounder Dynamic Positioning System (DPS) optional Deckhand(s) with riggers/dogman certificates Appropriately rated winches, block, Hi-Ab, crane and/or A-frame Winch with sufficient Dyneema Deckhands with appropriate certifications Large deck area for sampling, sample processing and equipment cleaning and storage Access at stern or via gunwale for deployment of sampling equipment Covered areas for shelter Deck areas with low risk of contamination of samples Deck lighting for night operations Freezer space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient bunking space for vessel crew and field survey teams Requirement for tender vessel (small, shallow-draft vessel) for small boat transfers or shallow water sediment sampling Fuel and victual storage for at least 20 days at sea Vessel-to-vessel transfer of samples to transfer vessel for shipping to laboratory within holding times
Sample transfer requirements	Survey vessels are likely to be offshore for up to 3 weeks at a time, and a number of analytes have holding times of 10 days. This will require arrangement of vessels and/or helicopters to collect samples from offshore survey vessels to return them for shipping within holding times. A process to facilitate rapid transfer of samples from the field to the laboratory must be in place
Data Management	Multiple external hard drives with sufficient storage and with password protection to allow transfer of data/imagery with returning field personnel

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore would be added to this complement following activation.

SMP3: assessment of impacts and recovery of intertidal habitats

Table 26: Field survey unit personnel requirements for SMP3 (excluding mangroves and saltmarsh surveys)

Title	Role requirements	Qualifications/experience required
Intertidal Survey Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily sampling plans QA/QC of sampling methods QA/QC of field sampling logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' intertidal, sediment and/or benthic habitat survey experience in both field scientist and field lead roles
2 × Shoreline Survey Field Scientist/	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP3 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and survey data sheets Supporting the Intertidal Survey Field Lead Setting up and use of sampling equipment Collecting and labelling samples Fixing/preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Sediment quality and/or intertidal survey experience.

Table 27: Core equipment requirements for SMP3

Sampling environment	Core equipment requirements
Intertidal habitats	PVC or Perspex corer (2-5 cm diameter) Core (e.g. split PVC plastic pipe) Siphon 0.1m^2 × 10 cm Sand box quadrat, or equivalent (otherwise known as a metal perimeter, which is a metal box without a top or bottom) Palette knife or other flat metal blade Spades/shovels/trowels/scoops Compass Mobile/Satellite Phone(s) Radio Multiple metal measuring tapes (30 m+) and metal rulers Quadrats (0.01, 0.1 and 1 m^2) Theodolite or dumpy level with tripod Jam jar lids Tall pole or cross-staff Self-recording depth sensors or Conductivity Temperature Depth sensors (CTDs) Poles Hammer Marker stakes UAVs

Sampling environment	Core equipment requirements
	Optional: Trimble GPS mobile mapping unit, or equivalent
Mangroves and saltmarshes	The above equipment plus: Standard point-intersect transects with 1 m^2 quadrats and/or 4 m × 4 m (16 m^2) sampling plots String Quadrats Laser distance sensor Optical reading clinometer Hypsometer 2 m measuring pole Densiometer Compass Remote sensing imagery Optional: Set-point photography

Table 28: Core SMP3 logistical requirements

Component	Requirements
SMP Equipment logistics	SMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core Field Survey Team*	3 technical personnel (field lead and two field technicians)
Survey Platform Requirements	Vehicles for intertidal surveys: 4WD off-road vehicles (preferably mine-rated) Off-road trailers for shelter and sample transport Quad bikes (with trailer) may be appropriate in some areas Hovercraft may be appropriate in some areas Inflatable dinghy with oars, anchor, safety kit and small outboard engine may be required in some areas (e.g. for shallow-sloping long beaches where tidal encroachment is rapid) Vessel specifications (where used for transport and/or accommodation): Sufficient bunking space for vessel crew and field survey teams Tender vessel (small, shallow-draft vessel) for small boat transfers
Sample transfer requirements	Surveys are likely to require regular pick-up of samples to enable shipment and analysis within holding times. Therefore, a process to facilitate rapid transfer of samples must be in place
Data Management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore would will be added to this complement following activation.

SMP4: Assessment of impacts and recovery of benthic habitats and demersal biota

Table 29: Field survey unit personnel requirements for SMP4

Title	Role requirements	Qualifications/experience required
Benthic Habitats and Demersal Biota Field Leads	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Pre-start assessment of potential risks for deployment and retrieval of equipment Daily survey plans (with Party Chief and vessel master, where appropriate) QA/QC of survey and sampling methods QA/QC of field data sheets In situ taxonomic identification of biota samples and from imagery In situ habitat classification of video imagery (if required) Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' offshore and coastal benthic video and trawl survey experience in both field scientist and field lead role, preferably with the use of dredges, ROVs and/or SBRUVs in the field.
Shoreline Survey Field Scientist/ Technician	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP4 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and survey data sheets Supporting the Benthic Habitats and Demersal Biota Field Leads Setting up and use of sampling/survey equipment Collecting and labelling samples Fixing/preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Offshore and coastal benthic video survey and/or SBRUVs and/or dredge/trawling experience.
Party Chief	Refer to Section 2.4.3 of the OSMP Implementation Plan	Refer to Section 2.4.3 of the OSMP Implementation Plan
ROV Pilot	Operational control of the ROV throughout deployment. Follows directions of the field lead to capture relevant imagery	To be supplied by reputable service provider
ROV technician	Set up of ROV equipment Deployment, retrieval and maintenance of ROV(s) Downloading of any additional imagery from untethered camera systems mounted on the ROV	To be supplied by reputable service provider
AUV technician	Deployment, retrieval and maintenance of AUV(s) Downloading of imagery and data from AUV(s)	To be supplied by reputable service provider
SBRUVs technician	See Field Scientist/Technician, plus Equipment maintenance and calibration	To be supplied by reputable service provider

Table 30: Core equipment requirements for SMP4

Sampling environment	Core equipment requirements
Towed/drop-down video	Video camera system (rated to an appropriate depth) Video top box (including remote image capture system, image recording system, video overlay unit) Video frame with mounts for multiple camera angles (must include 30° below horizontal) which can be converted from towed to drop-down orientations Weights for video frame 2 × Halogen lights or 3 × LED light bars plus spares Video cables sufficient for depth +50 % plus spares Scaling lasers (preferably Class III) Optional: Gyro compass Additional self-contained stills/video cameras USBL
Remotely Operated Vehicles (ROVs)	ROV rated to appropriate depth plus spare (rated to same depth or deeper) On-board camera of appropriate image resolution with backup Halogen/LED lighting system Video overlay On-board gyro compass or equivalent ROV top box (for viewing and recording imagery) and controller On-board USBL or other appropriate positioning technology Scaling lasers Control/video cables sufficient for depth +50 % minimum plus spares Weight block with shackle ring Optional: Additional self-contained stills/video cameras On-board scanning sonar
Autonomous Underwater Vehicles (AUVs)*	On-board navigation software Satellite telemetry communications system / WiFi / mobile network On-board video/stills cameras of appropriate image quality High-accuracy navigation system and GPS Depth sensor Optional: Fluorimeter Dissolved Oxygen (DO) sensor Turbidity sensor Conductivity/Temperature (CT) sensor Side-scan sonar/multibeam echo sounder/synthetic aperture sonar Scattering meter
Stereo Baited Remote Underwater Video Stations/Systems (SBRUVs), per unit, Minimum eight required plus spares	2 × self-contained video systems (rated to an appropriate depth) per frame, plus spares PVC tubes Galvanised SBRUVs frames (horizontal look-outward systems) Weights Diode arms Diodes Bait arms plus spares Bait bags plus spares Self-contained Halogen or LED lighting and/or lighting with external battery housing Laser scaling Marker buoys (2 sets) Shackles Rope Bait

Sampling environment	Core equipment requirements
	Bait bin and lid Shark clips Grapple Buoys (at least 2 per frame) SBRUV spares kit, including spanners (full set(s) and shifting spanners), clip pliers, pliers, knife, screwdrivers (Philips and flat head), hex keys (metric and imperial sets plus spares), silicon grease, O-rings, bolts, wing nuts, hose clamps, Lanox, duct tape and cable ties (multiple sizes) Optional: Stills camera with strobe
Trawls	4 m scientific beam trawl, 2 m scientific beam trawl, Florida flyer, otter trawl or prawn trawl with spare(s) Spares, including kit for repairing nets Trawl box(es) Fisheries (hanging) scales Fish measuring boards (various sizes) Dial callipers (e.g. Mitutoyo dial callipers) and/or Vernier callipers Field identification keys/books 10 L buckets with lids 1 L buckets with lids Internal sample labels, pre-printed on waterproof paper
Dredges	Naturalist's dredge, box dredge, anchor dredge or pipe dredge Spares kit Hoppers / tubs for holding samples for processing Fisheries (hanging) scales Fish measuring boards (various sizes) Dial callipers (e.g. Mitutoyo dial callipers) and/or Vernier callipers Field identification keys/books 10 L buckets with lids 1 L buckets with lids Internal sample labels, pre-printed on waterproof paper

*Note: due to the limitations of access, availability and mobilisation periods for this technology, equipment redundancy may not be feasible. However, any data these technologies may collect will be additional to the core studies and would increase situational awareness, so this method is considered a "value-add" approach rather than a core requirement.

Table 31: Core SMP4 logistical requirements

Component	Requirements
OSMP Equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core Field Survey Team*	3 technical personnel (field lead and two field technicians)
Additional Equipment-Specific Survey Team Requirements (per survey unit, where required)	ROV surveys: ROV Pilot ROV technician AUV Surveys: 1 additional AUV technician SBRUVs Deployments: 1 additional SBRUVs technician

Component	Requirements
Survey Platform Requirements	Vessel requirements (general SMP4 surveys): GPS Depth sounder Optional: Dynamic Positioning System (DPS) Deckhand(s) with riggers/dogman certificates Appropriately rated winches, block, Hi-Ab, crane and/or A-frame Winches with sufficient winch wire (rated to a minimum of 2 T) Access at stern or via gunwale for deployment of survey equipment Large deck area for sampling, sample processing and equipment cleaning, maintenance and storage Covered areas for shelter Deck areas with low risk of contamination of samples Deck lighting for night operations Deck hoses (freshwater and seawater) Dynamic positioning systems (DPS) preferable (critical in offshore deep-water environments) Refrigerator / freezer space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient crew to allow 24-hour operations where appropriate Potential for dual deployments (in offshore environments) Sufficient bunking space for vessel crew and field survey teams Fuel and victual storage for at least 20 days at sea Vessel-to-vessel transfer of samples to transfer vessel for shipping to laboratory within holding times (if required) Additional requirements for trawl surveys (on commercial vessels): Vessel to have been surveyed in line with Statoil Equinor vessel vetting procedures (which confirms registrations, insurances, etc.) Appropriate trawls, trawl gear and spares Appropriate rated deployment gear (winches, etc.) Deckhand(s) Depth sounder Indoor table space with direct access to deck
Sample transfer requirements	Survey vessels are likely to be offshore for up to 3 weeks at a time. If tissue samples have shorter holding times, this may require arrangement of vessels and/or helicopters to collect samples from offshore survey vessels to return them to shore for shipping. A process to facilitate rapid transfer of samples from the field to the laboratory must be in place
Data Management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore would be added to this complement following activation.

SMP5 Assessment of impacts and recovery of seabirds and shorebirds

Table 32: Field survey unit personnel requirements for SMP5

Title	Role requirements	Qualifications/experience required
Seabirds/ Shorebirds Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily survey plans QA/QC of survey methods QA/QC of field survey logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' seabird/shorebird survey experience in both field scientist and field lead roles.
Seabird/ shorebird Survey Field Scientist/ Technicians	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP5 operations Take personal responsibility for management of contamination risks, safety, surveys, sampling, sample integrity and survey data sheets Supporting the Seabirds/Shorebirds Field Lead Setting up and use of survey equipment Collecting and labelling samples Preserving samples Sample storage Downloading field data Data entry	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Seabird/shorebird survey experience.

Table 33: Core equipment requirements for SMP5

Sampling environment	Core equipment requirements
General (all survey components)	Optional: Unmanned Aerial Vehicles (UAVs) if required

Table 34: Core SMP5 logistical requirements

Component	Requirements
OSMP Equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.

Component	Requirements
Core Field Survey Team*	3 technical personnel (1 × field lead and 2 × field technicians) plus optional UAV pilot
Survey Platform Requirements	Aircraft requirements: Fixed wing or rotary aircraft Good downward visibility Adequate range for survey Vessel requirements: GPS Depth sounder Deckhand(s) with riggers/dogman certificates Covered areas for shelter Deck areas with low risk of contamination of samples Adequate fridge and freezer space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient bunking space for vessel crew and field survey teams Requirement for tender vessel (small, shallow-draft vessel) for small boat transfers Fuel and victual storage for at least 20 days at sea Vessel-to-vessel transfer of samples to transfer vessel for shipping to laboratory within holding times if required Vehicle requirements: Off-road 4wd vehicle (preferably mine-rated), with off-road trailer if required
Sample transfer requirements	Survey vessels may be offshore for up to 3 weeks at a time, and a number of analytes are likely to have holding times of less than this period. This will require arrangement of vessels and/or helicopters to collect samples from offshore survey vessels to return them for shipping within holding times. A process to facilitate rapid transfer of samples from the field to the laboratory must be in place
Data Management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel

SMP6 Assessment of impacts and recovery of marine megafauna

Table 35: Field survey unit personnel requirements for SMP6

Title	Role requirements	Qualifications/experience required
Marine Megafauna Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily survey plans QA/QC of survey methods QA/QC of field survey logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' Marine Faunal Observers survey experience (with relevant accreditation) in both field scientist and field lead roles.
Marine Megafauna Survey Field Scientist/ Technicians	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP6 operations Take personal responsibility for management of contamination risks, safety, surveys, sampling, sample integrity and survey data sheets Supporting the Marine Megafauna Field Lead Setting up and use of survey equipment Collecting and labelling samples Preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Marine Faunal Observer survey experience and appropriate accreditation
Optional: UAV operator	Provision, maintenance and operational control of UAV(s) Collection of video and positional data using UAV(s) Undertaking survey operations as directed by the Marine Megafauna Field Lead Effective data management and quality control	Qualifications: relevant UAV pilot accreditation and operational licence, plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Appropriate level of UAV flying experience, in the relevant survey environments (e.g. shorelines, vessels)

Table 36: Core equipment requirements for SMP6

Sampling environment	Core equipment requirements
General (all survey components)	Optional: Unmanned Aerial Vehicles (UAVs) if required, with full redundancy and spares kits

Table 37: Core SMP6 logistical requirements

Component	Requirements
OSMP Equipment logistics	OSMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core Field Survey Team*	3 technical personnel (1 × field lead and 2 × field technicians) plus optional UAV pilot
Survey Platform Requirements	Aircraft requirements: Fixed wing or rotary aircraft Good downward visibility Adequate range for survey Vessel requirements: GPS Depth sounder Deckhand(s) with riggers/dogman certificates Covered areas for shelter Deck areas with low risk of contamination of samples Refrigerator/freezer space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient bunking space for vessel crew and field survey teams Requirement for tender vessel (small, shallow-draft vessel) for small boat transfers Fuel and victual storage for at least 20 days at sea Vessel-to-vessel transfer of samples to transfer vessel for shipping to laboratory within holding times if required Vehicle requirements: Off-road 4wd vehicle (preferably mine-rated), with off-road trailer if required
Sample transfer requirements	Survey vessels may be offshore for up to 3 weeks at a time, and a number of analytes are likely to have holding times of 10 days. This will require arrangement of vessels and/or helicopters to collect samples from offshore survey vessels to return them for shipping within holding times. A process to facilitate rapid transfer of samples from the field to the laboratory must be in place
Data Management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel

SAMP7: Assessment of impacts and recovery of plankton

Table 38: Field survey unit personnel requirements for SMP7 (excluding Party Chief)

Title	Role requirements	Qualifications/experience required
Plankton Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily survey plans QA/QC of survey methods QA/QC of field survey logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' water quality survey experience (including plankton surveys) in both field scientist and field lead roles.
Plankton Field Scientist/	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP7 operations Take personal responsibility for management of safety, sampling, sample integrity and survey data sheets Supporting the Plankton Field Lead Setting up and use of survey equipment Collecting and labelling samples Fixing/preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: Water quality survey experience.

Table 39: Core equipment requirements for SMP7

Sampling environment	Core equipment requirements
Plankton sampling	Phytoplankton net (e.g. 20 µm mesh) plus spares Zooplankton net (e.g. 100 µm mesh) plus spares 125 ml plastic sample containers with lids 100 µm mesh sieve Rope for deployment of plankton nets Sampler spares kits Wash bottles CTD sensors plus spare Saltwater deck hose with variable flow

Table 40: Core SMP7 logistical requirements

Component	Requirements
SMP Equipment logistics	SMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/ service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.

Component	Requirements
Core Field Survey Team*	2 technical personnel (field lead and field technicians)
Survey Platform Requirements	Vessel requirements: GPS Depth sounder Deckhand(s) with riggers/dogman certificates Covered areas for shelter Appropriately rated winches, block, Hi-Ab, crane and/or A-frame Sufficient deck area for sampling, sample processing and equipment cleaning and storage Deck lighting for any night operations Refrigerator space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient bunking space for vessel crew and field survey teams Requirement for tender vessel (small, shallow-draft vessel) for small boat transfers or shallow water sediment sampling Fuel and victual storage for at least 20 days at sea
Data Management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore will be added to this complement following activation.

SMP8: Assessment of impacts and recovery of fisheries and aquaculture

Table 41: Field survey unit personnel requirements for SMP8

Title	Role requirements	Qualifications/ experience required
Fisheries and Aquaculture Field Lead	Contribution to and implementation of the SAP Contribution to HSE briefings, pre-start checks and toolbox talks Management of the technical components of field operations Preparation of daily survey plans QA/QC of survey methods QA/QC of field survey logs Management of sample integrity and storage Health and Safety during field operations Supervision of field scientists/technicians In-field management and QA/QC of data Preparation and QA/QC of Chain of Custody (CoC) Documents Preparation of samples for transport	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical (UKOG or acceptable alternative) MSIC Optional: Senior First Aid Experience: At least five years' fisheries survey experience in both field scientist and field lead roles.
Fisheries and Aquaculture Field Scientist/	Mobilisation and de-mob of field equipment Active engagement at HSE briefings, pre-start checks and toolbox talks Undertaking technical scopes of SMP8 operations Take personal responsibility for management of contamination risks, safety, sampling, sample integrity and survey data sheets Supporting the Fisheries and Aquaculture Field Lead Setting up and use of survey equipment Collecting and labelling samples Fixing/preserving samples Sample storage Downloading field data	Qualifications: Bachelor's degree in relevant subject (as a minimum), plus TBOSIET Medical MSIC Optional: Senior First Aid Experience: fisheries and/or aquaculture survey experience.

Table 42: Core equipment requirements for SMP8

Sampling environment	Core equipment requirements
Benthic trawls/ nets	Appropriate commercial trawl gear (e.g. Florida Flyer, Otter Trawl) Trawl sample tray Trawl spares kits Sample storage tub(s) with secure lids Wash bottles 10% Buffered formalin (buffer = Disodium tetraborate), or 80% ethanol Plastic containers for making up formal-saline (25 L with tap) if required Saltwater deck hose with variable flow
Pot surveys	Pots (single/fleets) Spare pots Spares kits Sample storage tub(s) with secure lids Formaldehyde and Buffer (Disodium tetraborate), or 80% ethanol Deck hose
Fishing line surveys	Commercial "hook and line" equipment Recreational rod and line equipment Spares kits Sample storage tub(s) with secure lids Formaldehyde and Buffer (Disodium tetraborate), or 80% ethanol Deck hose
Aquaculture surveys	Sample storage tub(s) with secure lids

Table 43: Core SMP8 logistical requirements

Component	Requirements
SMP Equipment logistics	SMP mobilisation will require consideration of the process of supply of equipment and mobilisation of survey equipment consignments to each survey unit. Each survey unit will have specific equipment needs, which will be sourced from a range of suppliers/ service providers. Batched of bulk-ordered items will need to be broken down and split into survey team consignments (based on pre-prepared equipment lists). This will require organisation of personnel and suitable location(s). Single-order items may be shipped directly to survey deployment locations (e.g. ports) where possible.
Core Field Survey Team*	2 technical personnel (field lead and field technicians)
Survey Platform Requirements	Vessel requirements: - Commercial fisheries vessel/recreational fishing vessel with: GPS Depth sounder Dynamic Positioning System (DPS) Deckhand(s) with riggers/dogman certificates Covered areas for shelter Appropriately rated winches, block, Hi-Ab, crane and/or A-frame Sufficient deck area for sampling, sample processing and equipment cleaning and storage Deck areas with low risk of contamination of samples Deck lighting for any night operations Fridge/freezer space for samples Indoor table space with direct access to deck Access to work on the bridge (Party chief) Sufficient bunking space for vessel crew and field survey teams Vessel-to-vessel transfer of samples to transfer vessel for shipping to laboratory within holding times where necessary Fuel and victual storage for at least 20 days at sea
Sample transfer requirements	Survey vessels are likely to be offshore for up to 3 weeks at a time, and a number of analytes may have holding times of less than that period. This will require arrangement of vessels and/or helicopters to collect samples from offshore survey vessels to return them for shipping within holding times. A process to facilitate rapid transfer of samples from the field to the laboratory must be in place
Data Management	2 × 2 TB external hard drives with password protection to allow transfer of data/imagery with returning field personnel

*Note: Additional field personnel, such as a field medic, may be identified during HSE planning (e.g. the HAZID), and therefore will be added to this complement following activation.

SMP9: Assessment of impacts and recovery of areas of particular recreation, tourism, conservation, heritage and native title importance

The resources required to carry out SMP9 include:

- Vessels (offshore site access for assessment of submerged cultural heritage sites, materials and artefacts such as shipwrecks and marine reserves)
- Vehicles (onshore access for assessment of intertidal areas of recreation, tourism, conservation, cultural heritage importance)
- Suitably qualified state/federal government heritage authority representatives
- Suitably qualified state government Aboriginal heritage authority representatives
- Suitably qualified heritage consultants to assess historic heritage
- Appropriate registered Aboriginal parties (lands councils, representative organisations)
- Maritime archaeological experts
- Socio-economic experts.

Function	Role/designation	Provider(s)	Contact details	Strength of engagement (contractual relationship)	Resource identified	Minimum qualification and experience requirements	Meets qualifications/ experience requirements?	Training and induction requirements		
								OSMP induction	Offshore medical	(T)BO
OSMP management	OSMP Program Manager	RPS	Jeremy Fitzpatrick T +61 8 9211 1111 E jeremy.fitzpatrick@rpsgroup.com.au							
OSMP management	OSMP Program Manager	RPS	Garnet Hooper T +61 8 9211 1111 E garnet.hooper@rpsgroup.com.au							
OSMP scope lead	Modelling lead	RPS	Murray Burling +61892111111 Murray.Burling@rpsgroup.com.au							
OSMP scope lead	Modelling lead	RPS	Scott Langtry +61892111111 scott.langtry@rpsgroup.com.au							
OSMP scope lead	Water quality lead	Leeder Analytical	Dr John Leeder 03 9481 4167							
OSMP scope lead	Sediment quality lead	RPS	Tamara Al-Hashimi D +61 8 9288 0810 E tamara.al-hashimi@rpsgroup.com.au							
OSMP scope lead	Ecotoxicology lead	RMIT	Professor Dayanthi Nugegoda (03) 9925 7150 dayanthi.nugegoda@rmit.edu.au							
OSMP scope lead	Ecotoxicology lead	Curtin University	Dr Monique Gagnon M.Gagnon@curtin.edu.au 08 9266 3723							
OSMP scope lead	Intertidal survey lead	Marine Science and Ecology	Dr Hugh Kirkman							
OSMP scope lead	Intertidal survey lead	RPS	Tamara Al-Hashimi D +61 8 9288 0810 E tamara.al-hashimi@rpsgroup.com.au							
OSMP scope lead	Demersal biota lead	Sea Research	Dr Avril Ayling 0409 666 655 tony.ayling@gmail.com							
			Dr Tony Ayling							

Figure 1: Example from Resource Register Excel workbook of office-based personnel

Monitoring Plan	Eqipment description	Provider(s)	Contact details	# Resource identified	Estimate of availability (date)	(date)	(date)
	WQ profiling system rated to 3000 m	CSIRO	Dr. Xiubin Qi Team Leader, Integrated Geochemical Science and Surveys, CSIRO Energy, Oil Gas and Fuels 26 Dick Perry Avenue, Kensington, WA, 6151, Australia Tel: +61 8 6436 8738(W); +61 423749542(M) Email: Xiubin.Qi@csiro.au	1			
	Oilfish (dispersant plume monitoring)		Dr. Xiubin Qi Team Leader, Integrated Geochemical Science and Surveys, CSIRO Energy, Oil Gas and Fuels 26 Dick Perry Avenue, Kensington, WA, 6151, Australia Tel: +61 8 6436 8738(W); +61 423749542(M) Email: Xiubin.Qi@csiro.au	2 x shallow (near-surface deployment), 1 x deep (600 m rated)			
	SilCam (depth-rated to 3,000 m)	Sintef	Emlyn John Davies 930 04 319 Email: emlyn.davies@sintef.no Per Johan Brankdvik 909 58 576 Email: Per.Brandvik@sintef.no	1			
SMP2	Grab sampler (0.025 m^2, 0.1 m^2)						
	Box core (0.1 m^2)						
	Corer/multi-corer (0.0024 m^2 and 0.01 m^2 cores)	CSIRO/ SAF	David Currie Tel: 08 8207 5318 Fax: 08 8207 5481 E–mail: david.currie@sa.gov.au				
	Endecott sieves (1mm)						
	Formalin and Buffer (Disodium tetraborate)						

Figure 2: Example from Resource Register Excel workbook of limited availability equipment