Environment plan
Appendix 9-1
Oil pollution emergency plan (OPEP)

Stromlo-1 exploration drilling program

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Table of contents

Page

OPEP structure **1**

Part one: First strike plan **2**

First strike plan – diesel spill from vessel **3**

First strike plan – loss of well control **4**

Part two: Operational response **6**

1.0 Level response structure **6**

2.0 Diesel spill from vessel within Operational Area **7**

2.1 Response flow chart **7**

2.2 Notification requirements **8**

2.3 Surveillance and monitoring **8**

2.3.1 Vessel surveillance 8

2.3.2 Aerial surveillance 9

2.3.3 Oil spill trajectory modelling 10

2.4 Operational and scientific monitoring program **11**

2.5 Overall response termination criteria **11**

3.0 Crude oil spill from well **12**

3.1 Response flow chart **12**

3.2 Notification requirements **13**

3.3 Source control **15**

3.4 Surveillance and monitoring **17**

3.4.1 Vessel surveillance 17

3.4.2 Aerial surveillance 17

3.4.3 Oil spill trajectory modelling 18

3.4.4 Satellite imagery 19

3.4.5 Surface slick tracking 19

3.4.6 Airborne remote sensing 19

3.5 Operational and scientific monitoring program **20**

3.6 Chemical dispersant **20**

3.6.1 Dispersant decision-making process 20

3.6.2 Sub-sea dispersant injection activities 25

3.6.3 Surface dispersant application activities 25

3.7 Containment and recovery **27**

3.7.1 Offshore 27

3.7.2 Near shore 29

3.8 Shoreline protection and clean-up **30**

3.8.1 Shoreline assessment and treatment recommendations 30

3.8.2 Shoreline protection and clean-up 33

3.9 Wildlife response ... 34
3.10 Overall response termination criteria ... 35
4.0 Waste management ... 37
5.0 Operational and scientific monitoring program ... 38
Part three: Planning and preparedness ... 45
6.0 Introduction ... 45
6.1 Purpose ... 45
6.2 Scope ... 45
6.2.1 Petroleum activity ... 45
6.2.2 Geographic area ... 46
6.2.3 Health and safety ... 47
6.3 Interface with other plans ... 48
7.0 Spill response framework ... 49
7.1 Legislative context ... 49
7.2 Equinor spill response organisation ... 49
7.3 Authorities and control agencies ... 52
7.3.1 AMSA ... 53
7.3.2 Equinor ... 53
7.3.3 South Australia ... 53
7.3.4 Victoria ... 54
7.3.5 Tasmania ... 54
7.3.6 Western Australia ... 54
7.3.7 New South Wales ... 55
7.3.8 Cross-jurisdictional response ... 55
7.4 Consultation ... 55
8.0 Spill scenarios and response options ... 59
8.1 Types of and characteristics of hydrocarbons ... 59
8.2 Fate and trajectory of spilled hydrocarbons ... 60
8.2.1 Diesel spill from offshore vessel ... 60
8.2.2 Loss of well control ... 60
8.3 Risk EMBA ... 75
8.4 Key protection priorities ... 76
8.5 NEBA ... 76
8.6 Assessment of spill response options for sub-sea release ... 79
9.0 Spill response priorities and incident action plan ... 80
9.1 Spill response priorities ... 80
9.2 Incident action plan ... 83
9.3 Tactical response plans ... 84
10.0 Spill capability ... 89

10.1 Tiered response resources ... 89
10.2 AMOSC ... 89
10.3 AMSA ... 90
10.4 OSRL ... 90
10.5 Wild well control ... 90
11.0 Response resources and logistics ... 91
11.1 Resources and logistics feasibility ... 91
11.1.1 Planning overview ... 91
11.1.2 Shoreline response logistics ... 92
11.1.3 Wildlife response ... 92
11.2 Equinor marine supply base ... 93
11.3 Vessels ... 93
11.3.1 Analysis of vessel need ... 93
11.3.2 Assessment and planning of vessels of opportunity ... 95
11.3.3 Ongoing vessel of opportunity assessment and preparedness ... 96
11.3.4 Response in the event of loss of well control ... 96
11.3.5 Vessel selection ... 97
11.4 Airports ... 100
11.5 Aircraft ... 101
11.6 Personnel ... 102
11.6.1 Trained personnel ... 102
11.6.2 Additional personnel ... 103
12.0 Training and exercises ... 104
12.1 Training and competency ... 104
12.2 Exercises, testing and drills ... 104
13.0 OPEP performance and review ... 106
13.1 Environmental performance outcome (EPO 13) ... 106
13.2 Control measures and performance standards ... 106
13.3 Review ... 116
14.0 Abbreviations ... 118
15.0 References ... 120

Tables

Table 1.1 Spill level and response definitions ... 6
Table 2.1 Notification requirements ... 8
Table 3.1 Notification requirements ... 14
Table 5.1 Operational monitoring program objectives and activation and termination criteria ... 40
Table 5.2 Scientific monitoring programs objectives and activation and termination criteria ... 42
Table 6.1 Stromlo-1 location information ... 45

Table 7.1 Equinor spill response tiers and teams 49
Table 7.2 Summary of relevant statutory agencies/jurisdictional authorities and control agencies ..53
Table 7.3 Summary of relevant statutory agencies, jurisdictional authorities, control agencies and Relevant Persons 56
Table 8.1 Physical characteristics for marine diesel and Statfjord-C blend crude oil 59
Table 8.2 Boiling point ranges for marine diesel and Statfjord-C blend crude oil 59
Table 8.3 Fate of spilled hydrocarbons 59
Table 8.4 Probability, minimum time and loading of weathered oil contact to shorelines for each state, at varying thresholds, for the unmitigated WCD_{129d} stochastic modelling 63
Table 8.5 Probability, minimum time and loading of weathered oil contact to shorelines for each state, at varying thresholds, for the unmitigated and mitigated $WCCD_{102d}$ stochastic modelling 66
Table 8.6 Summary of spill scenarios modelled 73
Table 8.7 Thresholds used to define the risk EMBA 75
Table 8.8 Spill response options assessed 79
Table 9.1 Response action priorities 80
Table 9.2 TRP status and content 84
Table 9.3 Shoreline sites in South Australia with primary tactical response plans 86
Table 9.4 Shoreline sites in South Australia with secondary tactical response plans 87
Table 9.5 Shoreline sites in South Australia with tertiary tactical response plans 88
Table 11.1 Strike team components – offshore containment and recovery 94
Table 11.2 Strike team components – nearshore containment and recovery 94
Table 11.3 AMSA commercial vessel classes 97
Table 11.4 Positions and numbers (per port) of potential VoOs 97
Table 11.5 Additional AMSA vessel registrations, July 2019 99
Table 11.6 Trained response personnel 102
Table 12.1 Equinor training and competency requirements 104
Table 12.2 Exercises, testing and drills 105

Figures

Figure 2.1 Response flow chart for diesel spill from vessel within Operational Area 7
Figure 3.1 Response flow chart for crude oil spill from well 13
Figure 3.2 SSDI application decision-making process 22
Figure 3.3 Surface dispersant application decision-making process 24
Figure 5.1 OSMP data flow during and after spill response 39
Figure 6.1 Stromlo-1 location, Equinor title and historic exploration wells 46
Figure 6.2 Risk EMBA 47
Figure 6.3 Interaction of this OPEP with Equinor, contractor and Australian agency plans 48
Figure 7.1 Equinor's Stromlo-1 response organisation 50
Figure 7.2 Equinor's reservoir IMT organisation 50
Figure 7.3 Equinor's GIMAT organisation 51
Figure 7.4 Equinor's Source Control Branch 52
Figure 8.1 Unmitigated stochastic analysis of potential oil exposure on the sea surface (WCD_{129d}) .61
Figure 8.2 Unmitigated stochastic analysis of potential shoreline loading (WCD_{129d}) 61
Figure 8.3 Unmitigated greatest shoreline accumulation deterministic analysis of potential shoreline loading (WCD_{129d}), commencing 26 April 2009 at 06:00 hrs 62

Figure 8.4 Unmitigated stochastic analysis of potential oil exposure on the sea surface ($WCCD_{102d}$) 64
Figure 8.5 Unmitigated stochastic analysis of potential shoreline loading from weathered oil ($WCCD_{102d}$) 65
Figure 8.6 Unmitigated deterministic simulation of oil exposure on the sea surface for “fastest time to shore” run from $WCCD_{102d}$ 67
Figure 8.7 Unmitigated deterministic simulation of shoreline loading for “fastest time to shore” run from $WCCD_{102d}$ 68
Figure 8.8 Mitigated (dispersants only) deterministic simulation of oil exposure on the sea surface for “fastest time to shore” 69
Figure 8.9 Mitigated (dispersants and capping stack) deterministic simulation of oil exposure on the sea surface for “fastest time to shore” 70
Figure 8.10 Mitigated (BOP intervention) deterministic simulation of oil exposure on the sea surface for “fastest time to shore” 71
Figure 8.11 Mitigated (dispersants only) deterministic simulation of potential shoreline loading for “fastest time to shore” 72
Figure 8.12 Mitigated (dispersants and capping stack) deterministic simulation of potential shoreline loading for “fastest time to shore” 72
Figure 8.13 Mitigated (dispersants and BOP intervention) deterministic simulation of potential shoreline loading for “fastest time to shore” 73
Figure 8.14 Process for identifying, selecting and using priority protection areas 76
Figure 8.15 NEBA process 78
Figure 9.1 Shoreline protection and clean-up, and wildlife response time frames 82
Figure 9.2 Equinor Australia B.V. incident action plan process 83
Figure 9.3 Coastal sectors for Western Australia and South Australia 86
Figure 10.1 Tiered response capability 89
Figure 11.1 Vessel transit range 100

Appendices

Appendix 1: Contacts directory
Appendix 2: Spill resources inventory
Appendix 3: Aerial observer log
Appendix 4: Bonn Agreement oil appearance code
Appendix 5: RPS OSTM request form
Appendix 6: Dispersant requirements and availability
Appendix 7: Dispersant application forms
Appendix 8: Shoreline assessment information
Appendix 9: NEBA information
Appendix 10: OPEP Waste Management Plan
Appendix 11: Priority protection areas identification process
Appendix 12: Role-specific response checklists

OPEP structure

This document has been divided into three distinctive parts to fulfil its operational purpose and meet mandatory legislative requirements:

Part one: First strike plan

This is the first strike plan. It covers the spill response actions for the first 24 hours of either a diesel spill from a vessel or a loss of well control.

Part two: Operational response (Sections 1.0 to 5.0)

This is the operational part of the Stromlo-1 exploration drilling program OPEP and outlines the ongoing response to an oil spill. The information provided clearly outlines the required actions that will be undertaken by spill responders.

Part three: Planning and preparation (Sections 6.0 to 13.0)

This is the non-operational part of the OPEP. The sections provide information related to spill response planning requirements. Detailed preparedness assessments are provided in the Stromlo-1 exploration drilling program Environment plan (EP); therefore, these sections only contain enough information to enable responders to quickly understand the context behind the spill response actions outlined in the operational section of the OPEP.

Part one: First strike plan

This part of the Oil pollution emergency plan (OPEP) states the first strike actions required within 24 hours of a spill being identified.

Note that the safety of all personnel will be prioritised in any response to an oil spill.

Click on these links to go to:

First strike plan – diesel spill from vessel

First strike plan – loss of well control

First strike plan – diesel spill from vessel

Note that the safety of all personnel will be prioritised in any response to an oil spill.

Time frame	Task	Who?
Escalation and notification		
ASAP	Immediately activate vessel Shipboard Oil Pollution Emergency Plan (SOPEP) and notify Offshore Installation Manager and vessel company.	Vessel Master
ASAP	Immediately activate MODU Emergency Response Plan and notify Drilling Superintendent.	Offshore Installation Manager
0-2 hours	Activate Equinor Incident Management Team (IMT).	Drilling Superintendent
0-2 hours	Conduct external verbal notifications (Table 2.1) including: • AMSA (ASAP) • NOPSEMA (within 2 hours) • DNP (within 2 hours).	Incident Commander
Surveillance and monitoring		
0-2 hours from IMT request	Mobilise SCV or PSV to spill location and commence vessel surveillance.	Incident Commander
0-48 hours from IMT request	Mobilise aerial support to well location and commence aerial surveillance.	Logistics Section Chief
0-2 hours from IMT request	Submit request to RPS using form in Appendix 5 and direct to commence oil spill trajectory modelling.	Planning Section Chief
Operational and scientific monitoring program (OSMP)		
0-2 hours from IMT request	Notify RPS to review incident information against OSMP activation triggers.	Planning Section Chief
0-24 hours from IMT request	Activate relevant OMPs and SMPs within 24 hours of RPS review of triggers.	Planning Section Chief

First strike plan – loss of well control

Note that the safety of all personnel will be prioritised in any response to an oil spill.

Role-specific checklists for key response personnel are provided in Appendix 12 at the back of this plan.

Timeframe	Task	Who?
Escalation and notification		
ASAP	Immediately activate MODU Emergency Response Plan.	Offshore Installation Manager
ASAP	Notify Drilling Superintendent.	Offshore Installation Manager
0-1 hour	Activate Equinor IMT.	Drilling Superintendent
0-2 hours from IMT request	Notify response partners and third-party providers (Appendix 1): • OSRL • AMOSC • WWC • RPS.	Incident Commander
0-24 hours	Conduct external agency verbal notifications (Table 3.1) including: • AMSA (ASAP) • NOPSEMA (2 hours) • DNP (ASAP) • SA DPTI (2 hours) • VIC DoT (24 hours) • WA DoT (24 hours) • EPA Tasmania (24 hours) • DPIPWE (24 hours) • NSW Maritime (24 hours).	Incident Commander
Source control		
0-24 hours from IMT request	Identify and request the required source control capability and commence mobilisation within 24 hours: • blowout preventer (BOP) intervention • seabed debris clearing equipment • well capping stack • sub-sea dispersant injection (SSDI) • rig for relief well drilling. If MODU not disabled mobilise drilling supplies to commence relief well drilling.	Operations Section Chief
0-24 hours from IMT request	Commence BOP closure. If first attempt is unsuccessful continue to attempt BOP closure/BOP intervention until successful or options are exhausted. Survey the BOP and seabed situation with ROV.	Operations Section Chief
Surveillance and monitoring		
0-24 hours from IMT request	Mobilise aerial support to well location and commence aerial surveillance.	Logistics Section Chief
0-2 hours from IMT request	Submit request to RPS using form in Appendix 5 and direct to commence oil spill trajectory modelling.	Planning Section Chief

Timeframe	Task	Who?
0-2 hours from IMT request	Activate satellite imagery provider and agree schedule for imagery capture.	Logistics Section Chief
0-2 hours from IMT request	Deploy tracking buoys from SCV.	Logistics Section Chief
0-12 hours from IMT request and every 12 hours thereafter	Identify key protection priorities and conduct a NEBA.	Environmental Unit Lead
0-12 hours from IMT request and every 12 hours thereafter	Implement actions based on outcome of NEBA.	Planning Section Chief
OSMP		
0-2 hours from IMT request	Notify RPS to review incident information against OSMP activation triggers. Refer to contact directory in Appendix 1.	Planning Section Chief
0-24 hours following RPS review	Activate relevant OMPs and SMPs within 24 hours of RPS review of triggers.	Planning Section Chief
Surface dispersant application		
0-2 hours from IMT request	If NEBA and mission priority allows, direct PSV to commence vessel dispersant application during daylight hours.	Logistics Section Chief
0-12 hours from IMT request	If mission priority allows, direct available SCV or PSV to conduct in-field quick effectiveness test of dispersant from vessel.	Logistics Section Chief
12-24 hours from IMT request	If NEBA demonstrates surface dispersant use beneficial, notify and mobilise aerial dispersant first strike teams.	Logistics Section Chief
12-24 hours from IMT request	Notify dispersant suppliers AMOSC and OSRL and mobilise dispersants. Refer to contacts directory in Appendix 1.	Logistics Section Chief
12-24 hours from IMT request	Notify dispersant suppliers OSRL to contact manufacturers and commence production of OSCA-registered dispersants. Refer to contact directory in Appendix 1.	Logistics Section Chief
Offshore containment and recovery		
12-24 hours from IMT request	If NEBA demonstrates offshore containment and recovery viable, notify and mobilise PSVs and C&R equipment.	Logistics Section Chief
Communication		
0-96 hours	Conduct follow-up written notifications (Table 3.1) using the POLREP template including: • AMSA (ASAP) • NOPSEMA (96 hours) • SA DPTI (2 hours) • VIC DoT (24 hours) • WA DoT (24 hours) • EPA Tasmania (24 hours) • DPIPWE (24 hours) • NSW Maritime (24 hours).	Incident Commander
0-24 hours from IMT request and daily thereafter	Conduct verbal and written stakeholder communications to stakeholders and media liaisons as defined in Section 7.4.	Public Information Officer

Part two: Operational response

1.0 Level response structure

The incident classification for an oil spill, including criteria for escalation and de-escalation, is provided in Table 1.1.

Table 1.1 Spill level and response definitions

Level	Range of spill volumes and resources required	Escalation criteria	De-escalation criteria
1	0 to 10 m^3 0 to 70 bbl 0 to 10 t Local response resources required (Mobile Offshore Drilling Unit (MODU)/Vessel)	Escalation required if: • evolving nature of release means that spill volume is likely to exceed 10 m^3/70 bbl/10 t • insufficient local resources likely to be available at the well location potential for exposure of sensitive environmental and/or socioeconomic receptors requires direct escalation to a Level 2 response for prompt mobilisation of additional resources.	Not applicable (NA).
2	10 to 1,000 m^3 70 to 7,000 bbl 10 to 1,000 t Regional to national response resources required (e.g. AMSA, National Plan Resources, Australian Marine Oil Spill Centre (AMOSC), states)	Escalation required if: • evolving nature of release means that spill volume is likely to exceed 1,000 m^3/7,000 bbl/1,000 t • insufficient resources are likely to be available on site, regionally or at a national scale potential for exposure of sensitive environmental and/or socioeconomic receptors requires direct escalation to a Level 3 response for prompt mobilisation of additional resources.	De-escalation when: • spill volume reduced to >10 m^3/ 70 bbl/10 t • resources are more than that required for spill response (with source controlled and subsequent escalation is unlikely). • no further risk of exposure to sensitive environmental and/or socioeconomic receptors to the spill.
3	>1,000 m^3 >7,000 bbl >1,000 t International response resources required (e.g. Oil Spill Response Limited (OSRL) and Equinor's Global Incident Management Assist Team (GIMAT))	NA.	• spill volume reduced to >1,000 m^3/7,000 bbl/1,000 t • resources are more than that required for spill response (with source controlled and subsequent escalation is unlikely) • no further risk of exposure to sensitive environmental and/or socioeconomic receptors to the spill.

2.0 Diesel spill from vessel within Operational Area

This section describes the actions required for a diesel spill from a vessel that occurs within the Operational Area. Refer to Section 13.0 of this OPEP for the environmental performance outcomes and environmental performance standards related to OPEP implementation that have been developed to measure the environmental performance of a response.

2.1 Response flow chart

The flow chart in Figure 2.1 outlines the response options and if they are conducted in parallel or sequential to another option.

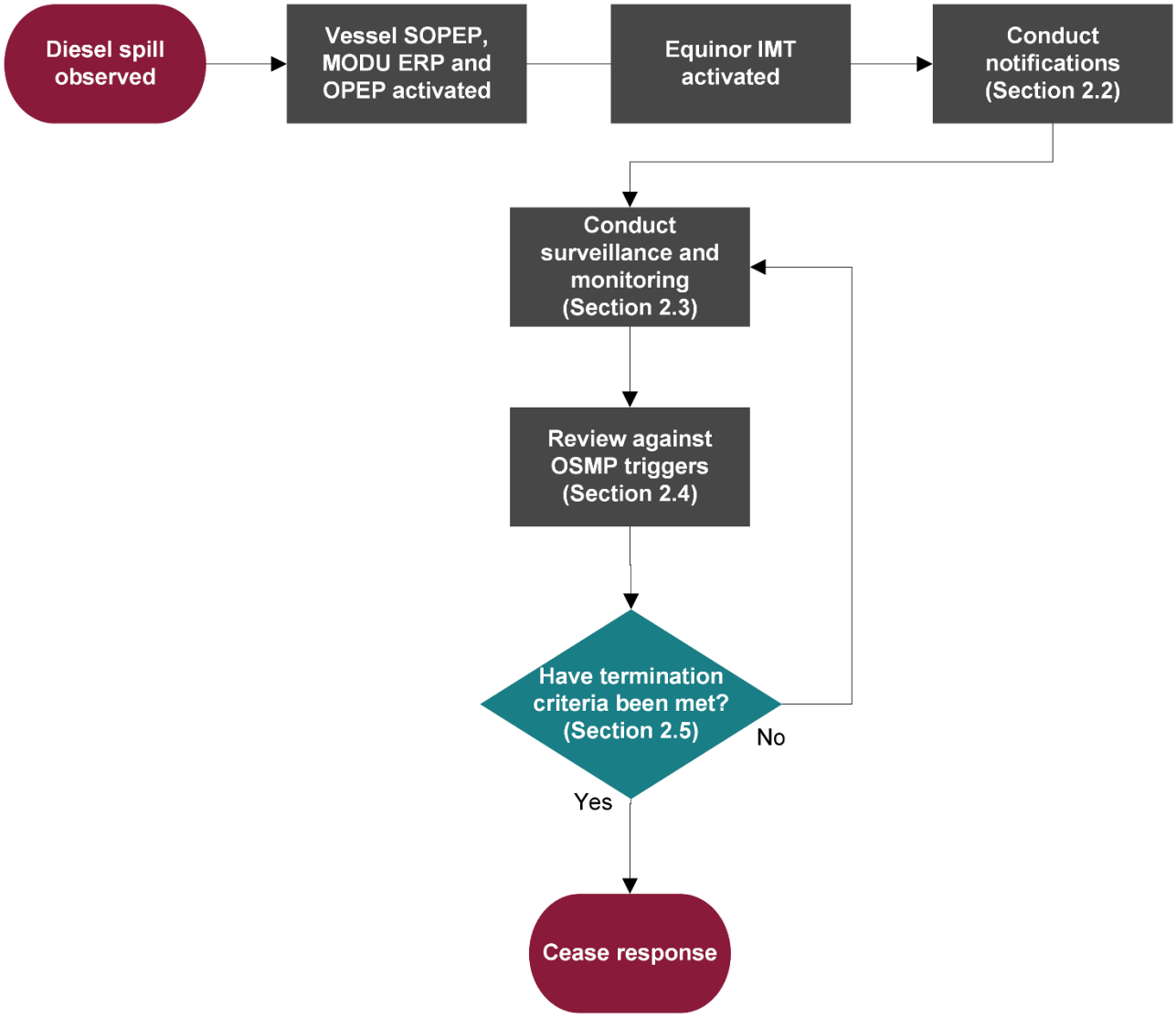


Figure 2.1 Response flow chart for diesel spill from vessel within Operational Area

2.2 Notification requirements

The notification requirements are provided in Table 2.1. Initial notifications will be made ASAP and will include information to provide the relevant organisation with situational awareness of the incident. Contact details for organisations to notify can be found in Appendix 1.

Table 2.1 Notification requirements

Organisation to notify		Who makes contact?	Who to contact?	Communication form	Time frame to contact
Vessel company		Vessel Master	Offshore Installation Manager (OIM)	Verbal	As soon as practicable (ASAP)
Equinor		OIM	Drilling Superintendent	Verbal	ASAP
Equinor		Drilling Superintendent	Incident Commander (IC)	Verbal	ASAP
				Written – marine pollution report (POLREP)	ASAP
Australian Maritime Safety Authority (AMSA)		IC	1800 641 792	Verbal	ASAP
			https://amsa-forms.nogginoca.com/public/polrep.html	Written – POLREP	Post-verbal notification
National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA)	If >80 L	IC	+61 8 6461 7090	Verbal	Two hours
			submissions@nopsema.gov.au	Written – POLREP	Three days
	If <80 L	Drilling Superintendent	submissions@nopsema.gov.au	Written – monthly report	No later than 15 days from end of month
Commonwealth Director of National Parks (DNP)	If >80 L	IC	+61 419 293 465	Verbal	Two hours
Aerial surveillance via AMSA, Australian Marine Oil Spill Centre (AMOSC) or other regional providers		Logistics Section Chief	Various, see Appendix 1	Verbal	Two hours
RPS oil spill trajectory modelling (24/7 response modeller)		Planning Section Chief	response@apasa.com.au	Written	Two hours
RPS OSMP Project Manager		Planning Section Chief	+61 8 9211 1111	Verbal	If OSMP activation required

2.3 Surveillance and monitoring

2.3.1 Vessel surveillance

Task	Who?
Immediately activate vessel Shipboard Oil Pollution Emergency Plan (SOPEP) and notify OIM and vessel company.	Vessel Master
Immediately activate MODU Emergency Response Plan (ERP) and this OPEP and notify Drilling Superintendent.	OIM

Task	Who?
Activate Equinor Incident Management Team (IMT).	Drilling Superintendent
Determine level of spill and action response flowcharts in this OPEP.	IC
Request any available vessel in close proximity to monitor spill.	IC
Ensure notifications are undertaken in accordance with the table in Section 2.2.	IC
Provide OIM information on spill such as trajectory, appearance and area of coverage.	Vessel Master
Termination criteria: continue to monitor spill through vessel surveillance until: • slick is no longer visible • aerial surveillance has commenced.	

2.3.2 Aerial surveillance

Task	Who?
Contact aviation provider to request aerial surveillance.	Logistics Section Chief
Contact aviation provider(s) to request aerial surveillance support (aircraft and trained aerial observers) via AMSA, AMOSC or other regional provider (refer to Appendix 1 for regional providers).	Logistics Section Chief
Supply a copy of the Aerial Observer Log (Appendix 3).	Air Operations Branch Director
Prepare and provide to the aviation contractor a pre-flight information pack containing: Safety considerations: • identify and obtain the appropriate personal protective equipment (PPE), aviation lifejackets should be worn in aircraft • identify risks and necessary controls • communicate the risks and controls in place through a pre-operation safety brief. Operational Communications Plan that documents: • specific contacts and names of assets deployed • methods of communication with personnel (including the crew of aircraft/vessels) • call signs and radio communication frequencies.	Air Operations Branch Director
Conduct pre-flight briefing, which shall include: • location of the area of operation • radio frequencies used in the area and on the response • call signs of other aircraft operating in the vicinity • locations of any temporary or permanent exclusion zones.	Air Operations Branch Director
Use a global positioning system (GPS) to track aerial surveillance operations.	Aerial observer
Conduct localised search: • use the predicted spill location as a starting point and conduct a localised search to determine the exact position of the spill • the aerial observer should sit directly behind the pilot, so the same perspective is shared, making it easier to direct the aircraft to the spill • observers will have different perspectives. Ensure a comprehensive hand over brief is given to maintain consistency of approach • fly the length and width of the spill (noting time taken and speed) • record and report observations of wildlife that are present in the area.	Aviation provider and aerial observer

Task	Who?
Record aerial surveillance using: • annotated maps or charts • photographs (preferably geo-referenced) • aerial surveillance logs.	Aerial observer
Undertake calculations (on the return journey or when the aircraft has landed): • calculate distance of spill length or width $Distance\ of\ slick\ length\ or\ width\ (nm) = \frac{time\ taken\ to\ fly\ (seconds) \times speed\ (knots)}{3600\ (or\ 60\ if\ time\ taken\ to\ fly\ is\ in\ minutes)}$ • divide answer by 1.85 to convert to km • calculate spill area. $Spill\ area\ (km^2)\ = length\ (km) \times width\ (km).$	Aerial observer
Calculate spill volume: • use the Bonn Agreement Oil Appearance Code (BAOAC) (Appendix 4) to estimate the percentage spill coverage • divide the spill into percentage areas based on its appearance (e.g. 10% sheen, 40% rainbow and 50% metallic) • use the following equation to calculate the minimum and maximum spill volume for each oil type: $Minimum\ spill\ volume\ (km^3) \times area\ covered\ with\ specific\ appearance\ (\%) \times layer\ thickness\ (max\ or\ min)(microns)$ • add together all the calculated volumes to calculate a total volume. The Air Operations Branch Director may decide that International Tanker Owners Pollution Federation (ITOPF) oil observation guidance could be used by aerial observers instead of the BAOAC. ITOPF methods are in the Aerial Observation of Marine Oil Spills Technical Information Paper (ITOPF 2011).	Aerial observer
Upon completion, provide the following to the Logistics Section Chief: • aerial surveillance logs • location of oil identified (e.g. shown on a map or chart, waypoints on GPS or geo-referenced photo) • quantity of oil observed and calculations • other relevant information on the aerial surveillance operations (e.g. pilot operational hours, fuel logs, maintenance issues, logistical requirements, aerial simultaneous operations (SIMOPS) issues).	Aviation provider and aerial observer
Termination criteria: Continue routine aerial observations daily during daylight hours until: • no slick can be observed.	

2.3.3 Oil spill trajectory modelling

2.3.3.1 Computer modelling

Task	Who?
Complete the RPS oil spill trajectory modelling (OSTM) Request Form (Appendix 5).	Planning Section Chief
Contact the RPS duty officer and email the completed form.	Planning Section Chief
Termination criteria: Repeat modelling as required until the response is terminated by the relevant IMT.	

2.3.3.2 Manual calculation

Task	Who?
If computer modelling is not yet available for a specific trajectory calculation, then a manual calculation can be completed.	Planning Section Chief
Using vectors, draw the resulting distance of 3% of wind speed and 100% of current from the initial spill location for a 1-hour duration.	Planning Section Chief
Repeat this process for each hour using the new location and predicted wind/current.	Planning Section Chief
Termination criteria: Repeat manual calculations as required until other oil spill modelling methods are available to provide the information required.	

2.4 Operational and scientific monitoring program

Task	Who?
Review data from surveillance and monitoring methods and compare against OSMP activation criteria (Section 5.0). Activate the operational and scientific monitoring program (OSMP) if activation criteria have been met.	Planning Section Chief
Mobilise relevant OSMP resources and commence monitoring in accordance with the requirements of the OSMP.	Planning Section Chief
Continually review OSMP activation criteria and mobilise resources as necessary.	Planning Section Chief
Review operational monitoring plan (OMP) termination criteria until termination of spill response phase.	Environmental Unit Leader
Termination criteria: Continue scientific monitoring plan (SMP) activities until termination criteria have been met as per Section 5.0.	

2.5 Overall response termination criteria

The overall response will terminate once Equinor and relevant government agencies agree the following criteria have been met:

- The source of the spill has been controlled such that no further hydrocarbons will be released.
- All termination criteria are met for
  - Section 2.3.1 Vessel surveillance
  - Section 2.3.2 Aerial surveillance
  - Section 2.3.3 Oil spill trajectory modelling.
- It has been identified (e.g. via health and safety assessment or net environmental benefit analysis (NEBA)) that the response strategy is likely to result in an increased risk to human health, or environmental and socioeconomic receptors (hence the response can no longer be defined as being as low as reasonably practicable (ALARP) and acceptable).

Equinor will appoint an investigation team following termination of a spill response. This team will be responsible for undertaking:

- an investigation into the cause of the spill. Feedback will be sought from stakeholders as part of the investigation and evaluation of response success (perceived or measured, e.g. through the OSMP)
- an after-action review of both the emergency and spill response actions
- close out of all IMT and emergency response personnel actions
- implementation of a lessons learned assessment process, which will form the basis of a post-incident improvement action plan
- liaison with all involved external agencies to support their post-incident investigations and close-out activities.

3.0 Crude oil spill from well

This section describes the actions required for a spill of crude oil from the well. Refer to Section 13.0 of this OPEP for the environmental performance outcomes and environmental performance standards related to OPEP implementation that have been developed to measure the environmental performance of a response.

3.1 Response flow chart

Figure 3.1 outlines the response options and if they are conducted in parallel or sequential to another option. The Equinor organisational structures to support response to an oil spill from the well (e.g. IMT, Source control response team) are in Section 7.2.

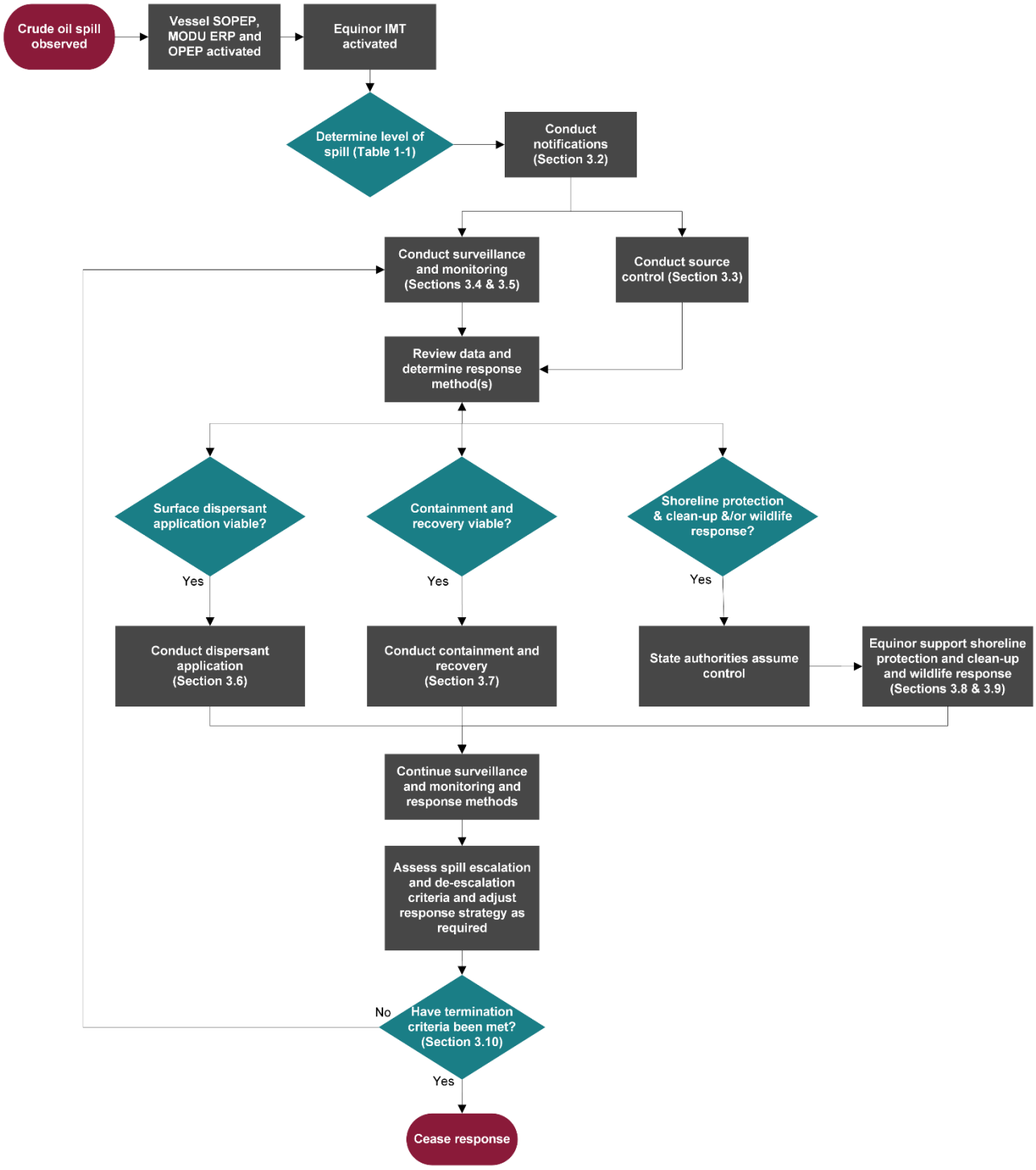


Figure 3.1 Response flow chart for crude oil spill from well

3.2 Notification requirements

The notification requirements are provided in Table 3.1. Initial notifications will be made ASAP and will include information to provide the relevant organisation with situational awareness of the incident. Contact details for organisations can also be found in Appendix 1.

Table 3.1 Notification requirements

Organisation		Who makes contact?	Who to contact?	Communication form	Time frame to contact
Equinor		OIM	Drilling Superintendent	Verbal	ASAP
Equinor		Drilling Superintendent	IC	Verbal	ASAP
				Written – POLREP	ASAP
Commonwealth and state government agencies					
AMSA		IC	1800 641 792	Verbal	ASAP
			https://amsa-forms.nogginoca.com/public/polrep.html	Written – POLREP	Post-verbal notification
NOPSEMA	If >80 L	IC	+61 8 6461 7090	Verbal	Two hours
			submissions@nopsema.gov.au	Written – POLREP	Three days
	If <80 L	Drilling Superintendent	submissions@nopsema.gov.au	Written – Monthly Report	No later than 15 days from end of month
DNP	If >80 L	IC	+61 419 293 465	Verbal	Two hours
SA DPTI*	If >80 L	IC	General 24-hour phone line 08 8248 3505 DPTI.oilspill@sa.gov.au Duty officer contact follows a weekly rotation. Contact information will be provided weekly via email to Equinor by DPTI.	Verbal and Written – POLREP	Two hours
SA DEW* (oiled wildlife response)		IC	DEW Duty Officer +61 419 806 726 (24 hours)	Verbal	Within 24 hours
VIC DoT*		IC	State Duty Officer +61 409 858 715 Message to voicemail with contact details appropriate semdincidentroom@ecodev.vic.gov.au	Verbal and Written – POLREP	
VIC DELWP* (oiled wildlife response)		IC	Wildlife incident reporting: State Agency Commander 1300 134 444	Verbal	
WA DoT*		IC	Maritime Environmental Emergency Response Unit (MEER) Duty Officer +61 8 9480 9924	Verbal	
WA DBCA* (oiled wildlife response)		IC	Marine emergencies +61 8 9474 9055 Wildcare Helpline +61 8 9474 9055	Verbal	
EPA Tasmania*		IC	State Oil Pollution Control Officer (SOPCO) +61 1800 005 171	Verbal	
TAS DPIPWE* (oiled wildlife response)		IC	Whale Hotline (spill of any size) +61 427 942 537	Verbal	
NSW Maritime*		IC	+61 13 12 36	Verbal	

Organisation	Who makes contact?	Who to contact?	Communication form	Time frame to contact
NSW DPI* (oiled wildlife response)	IC	Maritime emergency 24-hour hotline 1800 641 792	Verbal	
Key oil spill response providers				
AMOSC	IC	24-hour emergency telephone number +61 438 379 328 amosc@amosc.com.au	Verbal	Two hours
OSRL	IC	24/7 emergency telephone +65 6266 1566	Verbal	Two hours
		Download and complete the Mobilisation Authorisation and Notification Forms from https://www.oilspillresponse.com/activate-us/activation-procedure/	Written	Post-verbal notification
WWC	IC	1-281-784-4700	Verbal	Two hours
RPS OSTM	Planning Section Chief	response@apasa.com.au	Written	Two hours
RPS OSMP PM	Planning Section Chief	+61 8 9211 1111	Verbal	If OSMP Activation required
Aerial surveillance via AMSA, AMOSC or other regional providers	Logistics Section Chief	Various, see Appendix 1	Verbal	Two hours
Mutual aid resources	IC	AMOSC duty officer 0438 379 328	Verbal	Two hours

* State agency acronyms are as follows: South Australian Department of Planning, Transport and Infrastructure (SA DPTI); Victorian Department of Transport (VIC DoT); Western Australian Department of Transport (WA DoT); Environment Protection Authority Tasmania (EPA Tasmania); Tasmanian Department of Primary Industries, Parks, Water and Environment; New South Wales Maritime (NSW Maritime). Western Australia Department of Biodiversity, Conservation and Attractions (WA DBCA), South Australia Department of Environment and Water (SA DEW), Victorian Department of Environment, Land, Water and Planning, New South Wales Department of Planning and Infrastructure (NSW DPI).

3.3 Source control

Source control operations will be conducted in accordance with the Stromlo-1 Well Operations Management Plan (WOMP) and the Stromlo-1 Source Control Plan (within the WOMP). The table below provides a high-level overview of the actions that will be undertaken.

The first two days (48 hours) will be dedicated to search and rescue and blowout preventer intervention. After 48 hours from a loss of well control incident with high flow, the probability of successfully using the blowout preventer to stop the flow of oil is greatly diminished, and if an acoustic system is available the accumulator capacity will have been spent.

The amount of time for intervention will depend on when the closer of the platform supply vessels will arrive. While drilling the reservoir one platform supply vessel will always be within 12 hours transit to the Stromlo-location. This will then assume search and rescue duties and free the subsea construction vessel for intervention duty. If the platform supply vessel takes the full 12 hours to return to location, the amount of time allotted to carrying out the intervention with the subsea construction vessel will then be 36 hours. If the platform supply vessel returns earlier or is nearby, the intervention will be attempted for up to 48 hours. After the 48 hours, the subsea construction vessel is expected to port to pick up sub-sea dispersant injection equipment and debris clearance equipment arriving from Singapore.

Task	Who?
Immediately activate MODU ERP and this OPEP and notify Drilling Superintendent.	OIM
Activate Equinor IMT including additional resources required for source control response (Source Control Response Team).	Drilling Superintendent
Determine level of spill and action the response flowchart in this OPEP.	IC
Conduct notifications in accordance with the table in Section 3.2.	IC
Identify and request the required source control capability and commence mobilisation within 24 hours: • blowout preventer (BOP) intervention • seabed debris clearing (if it is required) • well capping stack • sub-sea dispersant injection (SSDI) • rig for relief well drilling.	Operations Section Chief
Whilst mobilising resources, immediately attempt BOP closure. If first attempt is unsuccessful continue to attempt BOP closure/BOP intervention until the subsea construction vessel is required to leave to pick up sub-sea dispersant injection equipment and debris clearance equipment from port.	Operations Section Chief
Throughout source control operations conduct practical barrier checks, self-verification and oversight of operations in accordance with the MODU Safety Case (if MODU is not compromised).	Operations Section Chief
Conduct debris clearance around the wellhead/BOP with remotely operated vehicle (ROV).	Operations Section Chief
As soon as SSDI equipment arrives at the well location, deploy and commence injection of dispersants.	Operations Section Chief
As soon as capping stack is available at the well location, deploy and attempt successful installation. If first attempt of capping stack installation is unsuccessful, continue attempts to install whilst drilling rig is mobilised to the well location.	Operations Section Chief
Spudding of a relief well may be commenced by either the MODU (if operational) or a rig that may be in closer proximity and able to commence drilling, until the relief well rig arrives. As soon as relief well drilling rig reaches well location, spud the well (if not already undertaken) and commence drilling of relief well to intercept and kill the well. Drilling the relief well may be commenced while attempts are still being made to install the capping stack	Operations Section Chief
Conduct drill fluid and cementing in accordance with the Stromlo-1 WOMP and Source Control Plan.	Operations Section Chief
Commence dynamic kill immediately upon penetration of the target wellbore and continue pumping until the blowout is dead.	Operations Section Chief
Provide Equinor IMT with the following records: • bridge logs verify source control procedures were followed • daily incident monitoring reports verify that surveillance and monitoring has been undertaken • daily drilling reports • IMT log • self-verification and audit records.	Operations Section Chief

3.4 Surveillance and monitoring

3.4.1 Vessel surveillance

Task	Who?
Request any available vessel in close proximity to monitor spill.	OIM
Provide OIM information on spill such as trajectory, appearance and area of coverage.	Vessel Master
Termination criteria: Continue to monitor spill through vessel surveillance until: • oil is no longer visible • aerial surveillance has commenced.	

3.4.2 Aerial surveillance

Task	Who?
Contact aviation provider(s) to request aerial surveillance support (aircraft and trained aerial observers) via AMSA, AMOSC or other regional provider (refer to Appendix 2 for regional providers).	Logistics Section Chief
Supply copies of the Aerial Observer Log (Appendix 3) to aerial observers.	Logistics Section Chief
Prepare and provide to the aviation contractor a pre-flight information pack containing: Safety considerations: • identify and obtain the appropriate PPE, aviation lifejackets should be worn in aircraft • identify risks and necessary controls • communicate the risks and controls in place through a pre-operation safety brief. Operational Communications Plan that documents: • specific contacts and names of assets deployed • methods of communication with personnel (including the crew of aircraft/vessels) • call signs and radio communication frequencies.	Logistics Section Chief
Conduct pre-flight briefing, which should include: • location of the area of operation • radio frequencies used in the area and on the response • call signs of other aircraft operating in the vicinity • locations of any temporary or permanent exclusion zones.	Logistics Section Chief
Use a GPS tracking system to track aerial surveillance operations.	Aerial observer
Conduct localised search: • use the predicted spill location as a starting point and conduct a localised search to determine the exact position of the spill. • the aerial observer should sit directly behind the pilot, so the same perspective is shared, making it easier to direct the aircraft to the oil spill. • observers will have different perspectives. Ensure a comprehensive hand over brief is given to maintain consistency of approach. • fly the length and width of the spill (noting time taken and speed). • record and report observations of for wildlife that are present in the area.	Aviation provider and aerial observer

Task	Who?
Record aerial surveillance observations using: • annotated maps or charts • photographs (preferably geo-referenced) • aerial surveillance logs.	Aerial observer
Undertake calculations (on the return journey or when the aircraft has landed): • calculate distance of spill length or width $Distance\ of\ slick\ length\ or\ width\ (nm) = \frac{time\ taken\ to\ fly\ (seconds) \times speed\ (knots)}{3600\ (or\ 60\ if\ time\ taken\ to\ fly\ is\ in\ minutes)}$ • divide answer by 1.85 to convert to km • calculate spill area $Spill\ area\ (km^2)\ = length\ (km) \times width\ (km).$	Aerial observer
Calculate spill volume: • use the BAOAC (Appendix 4) to estimate the percentage spill coverage • divide the spill into percentage areas based on its appearance (e.g. 10% sheen, 40% rainbow and 50% metallic) • use the following equation to calculate the minimum and maximum spill volume for each oil type: $Minimum\ spill\ volume\ (km^3) \times area\ covered\ with\ specific\ appearance\ (\%) \times layer\ thickness\ (max\ or\ min)(microns)$ • add together all the calculated volumes to calculate a total volume. The Air Operations Branch Director may decide that ITOPF oil observation guidance could be used by aerial observers instead of the BAOAC. ITOPF methods are in the Aerial Observation of Marine Oil Spills Technical Information Paper (ITOPF 2011).	Aerial observer
Upon completion, provide the following to the Logistics Section Chief: • aerial observer logs • location of oil identified (e.g. shown on a map or chart, waypoints on GPS or geo-referenced photo) • quantity of oil observed and calculations • other relevant information on the aerial surveillance operations (e.g. pilot operational hours, fuel logs, maintenance issues, logistical requirements, aerial SIMOPS issues, etc.).	Aviation provider and aerial observer
Termination criteria: Continue routine aerial observations during daylight hours until: • no slick can be observed.	

3.4.3 Oil spill trajectory modelling

3.4.3.1 Computer modelling

Task	Who?
Complete the RPS OSTM Request Form (Appendix 5).	Planning Section Chief
Contact the RPS duty officer and email the completed form.	Planning Section Chief
Termination criteria: Conduct modelling as required until the response is terminated by the relevant IMT.	

3.4.3.2 Manual calculation

Task	Who?
If computer modelling is not yet available for a specific trajectory calculation, then a manual calculation can be completed.	Planning Section Chief
Using vectors, draw the resulting distance of 3% of wind speed and 100% of current from the initial spill location for a one-hour duration.	Planning Section Chief
Repeat this process for each hour using the new location and predicted wind/current.	Planning Section Chief
Termination criteria: Repeat manual calculations as required until other oil spill modelling methods are available to provide the information required.	

3.4.4 Satellite imagery

Task	Who?
Contact satellite imagery provider OSRL (refer to Appendix 2).	Logistics Section Chief
Set up a forward/routine schedule for satellite imagery capture.	Planning Section Chief
Termination criteria: Continue to receive and assess satellite imagery until the response is terminated by the relevant IMT.	

3.4.5 Surface slick tracking

Task	Who?
Deploy tracking buoys that are stored on board Equinor support vessel.	Logistics Section Chief
Request additional tracking buoys as needed (refer to Appendix 2): • Primary supplier – AMOSC • Secondary supplier – OSRL.	Logistics Section Chief
Monitor movement of tracking buoys and deploy additional buoys if required.	Operations Section Chief
Analyse information from tracking buoys in conjunction with data from other surveillance and monitoring methods.	Planning Section Chief
Termination criteria: Repeat review process until: • sub-sea flow has ceased • no observations of oil at sea for 10 days.	

3.4.6 Airborne remote sensing

Task	Who?
Activate surveillance aircraft with airborne remote sensing capability for initial survey: • ultra violet images – small slicks • Side-Looking Airborne Rader – large slicks (image resolution 20 m^2).	Logistics Section Chief
Mobilise and execute routine airborne remote sensing.	Logistics Section Chief
Analyse information from remote sensing in conjunction with data from other surveillance and monitoring methods.	Planning Section Chief
Termination criteria: Continue routine airborne remote sensing as required until: • sub-sea flow has ceased • no observations of oil at sea for ten days.	

3.5 Operational and scientific monitoring program

Task	Who?
Review data from surveillance and monitoring methods and compare against OSMP activation criteria (Section 5.0). Activate the OSMP if activation criteria have been met.	Planning Section Chief
Mobilise OSMP resources and commence monitoring in accordance with the requirements of the OSMP.	Logistics Section Chief
Continually review OSMP activation criteria and mobilise resources as necessary.	Planning Section Chief
Review OMP termination criteria until termination of response.	Environmental Unit Leader
Termination criteria: Continue SMP activities until termination criteria have been met as per Section 5.0.	

3.6 Chemical dispersant

3.6.1 Dispersant decision-making process

3.6.1.1 Sub-sea dispersant injection (SSDI) decision process

The same dispersants would be used for subsea dispersant injection (SSDI) and for aerial and vessel surface dispersant applications. This simplifies the supply chain and allows rationalisation of dispersant stocks should the surface application methods be less effective due to sea states at the time. Appendix 6 provides information on dispersant selection, sourcing and availability. Supply chain calculations are also provided. Due to the requirements to mobilise international equipment stockpiles and based on the outcomes of the a priori spill response selection process, this strategy will be activated as soon as practicable following a LOWC incident.

A priori efficacy testing

All Oil Spill Control Agent (OSCA)-registered chemical dispersants considered for use in the sub-sea dispersant injection response will be tested in the Dispersant Injection Effectiveness Test (DIET) prior to selection and mobilisation to the Stromlo-1 location. SINTEF has developed DIET as a bench-scale dispersant effectiveness test, adapted for subsea dispersant injection. The test includes turbulent conditions, simulated subsea injection techniques and quantification of effectiveness; conditions more representative of an SSDI operation than the standard tests for surface dispersants.

Field efficacy testing during response

In the event of a spill, in-field efficacy testing would include monitoring to determine whether subsea dispersant use was being successful in dispersing oil into the water column. This information would inform the NEBA and a continuous assessment process implemented to review the continued use of SSDI. The planned approach for in-field efficacy monitoring in close proximity to the well site before and after dispersant addition, follows recommendations of American Petroleum Institute (2013) and IPIECA-IOGC (2015) best practice guidance and would include as a minimum:

1. visual ROV observations above the injection assessing whether the shape or colour of the oil discharge changes with dispersant addition. This will be a qualitative assessment of mixing and contact in the immediate vicinity of the injection point
2. assessments of air quality (particularly VOC concentrations), which indicate an improvement in conditions following SSDI implementation, which demonstrably reduce human health and safety risks
3. visually, by analysing the area and thickness of oil on the sea surface in aerial photographs, satellite images, vessel observations or other suitable remote sensing technology
4. outcomes of relevant OSMP (including OMPs such as Surveillance and Tracking, Monitoring of Hydrocarbons Weathering and Behaviour in Marine Waters and OMP4-Monitoring of Dispersants and Chemical Control Agents) indicate no significant negative impacts of SSDI.

5. the continual NEBA process indicates that a neutral or positive environmental benefit is still likely.

OMP4 Monitoring of Dispersants and Chemical Control Agents will be finalised in the event of a spill and will consider further optional monitoring methods including:

- towed fluorimeter survey under the surface slick to measure the concentrations of oil in water
- particle size analysis using a LISST (laser in-situ scattering and transmissometry) analyser to measure oil droplet size distributions
- analysis of backscatter data generated from a ROV-mounted sonar.
- water sampling for PAH (polycyclic aromatic hydrocarbon) analysis
- SINTEF Silhouette Camera systems (SINTEF 2017) for monitoring efficacy of subsea dispersant injection, which is an improvement on the laser in-situ scattering and transmissometry methods because it covers a better range of droplet sizes and also is capable for distinguish between gas bubbles and oil droplets.

Figure 3.2 describes the SSDI dispersant application decision-making process.

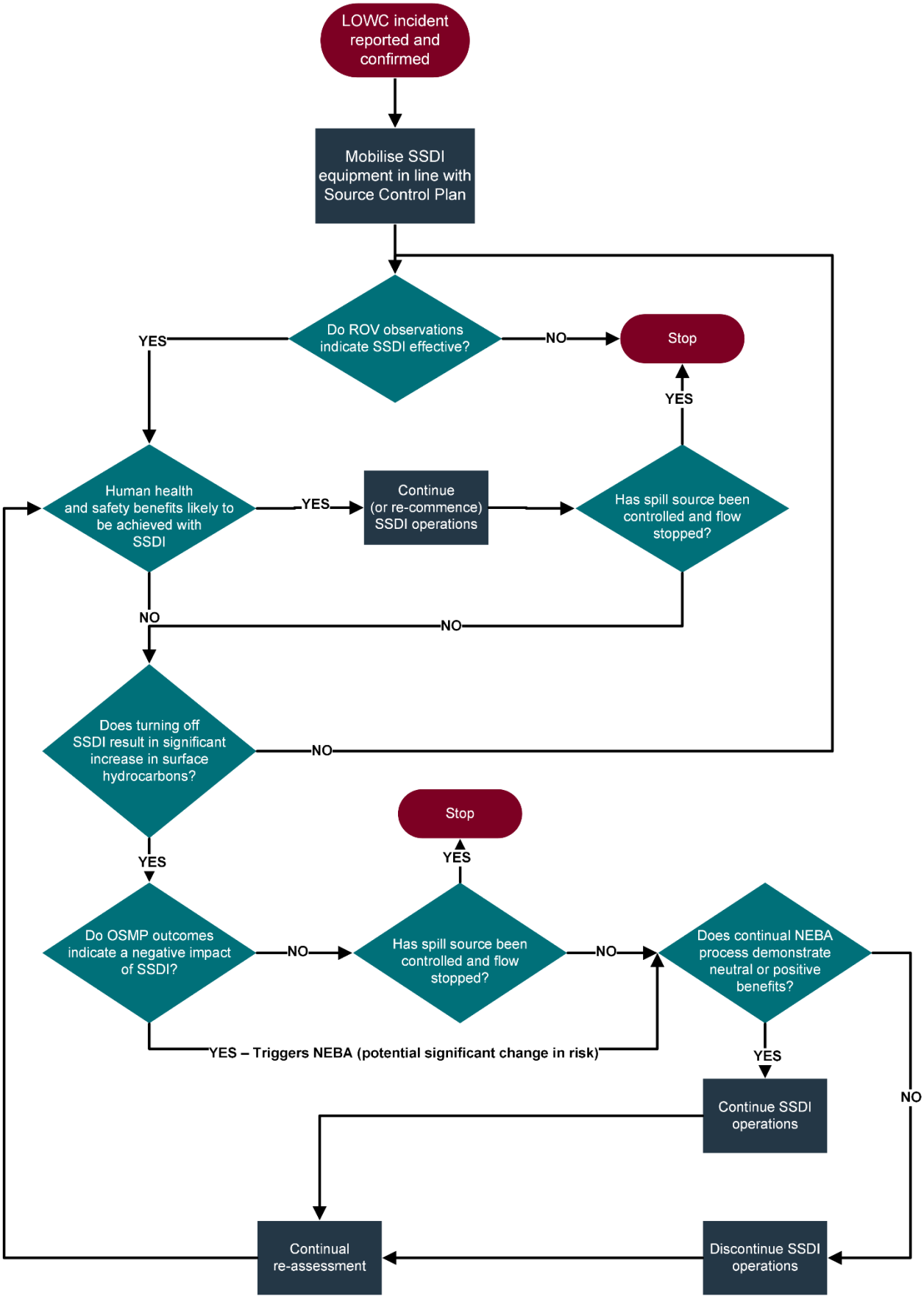


Figure 3.2 SSDI application decision-making process

3.6.1.2 Surface dispersant application decision process

Determine if the surface application of chemical dispersant is viable using the process in Figure 3.3.

If viable, dispersants approved under the National Plan and listed in the Register of Oil Spill Control Agents (OSCA) will be used (Dasic Slickgone and Total Finasol).

Daily dispersant requirements were estimated based on the use of surface dispersant application from day one of a response and SSDI from day nine, until well kill. This information was compared with the predicted volumes of dispersants available within Australia and internationally from AMSA, AMOSC, OSRL and mutual aid (Appendix 6).

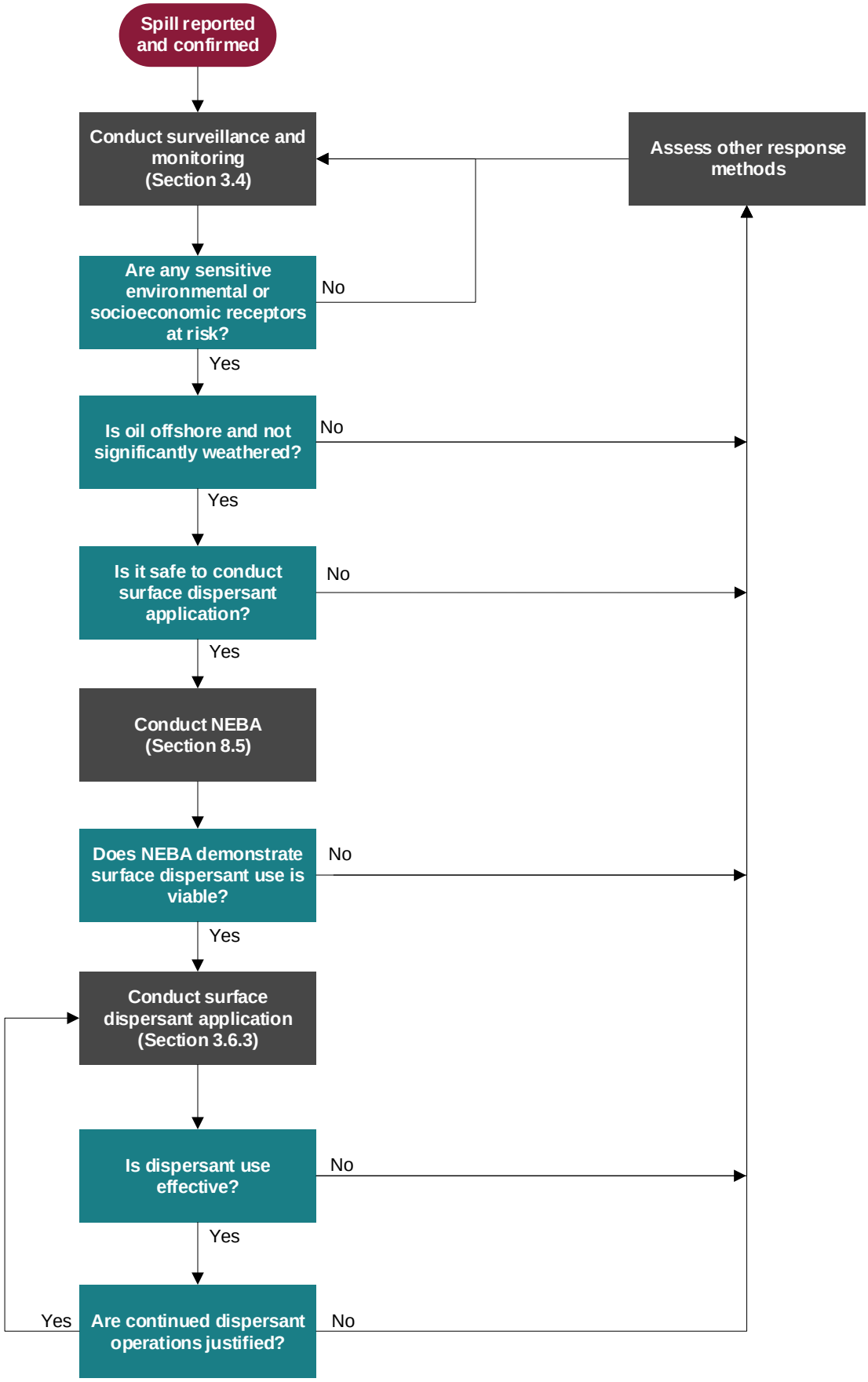


Figure 3.3 Surface dispersant application decision-making process

3.6.2 Sub-sea dispersant injection activities

Equinor's spill response process considers sub-sea dispersant injection activities as part of source control planning to optimise response (due to the synergy of these activities). Therefore SSDI activities will be defined in the Source Control Plan, which will be provided in the Well Operations Management Plan, to be accepted by NOPSEMA prior to commencement of the activity. Implementation and ongoing management of the Source Control Plan will be the responsibility of the Source Control Branch Director in the Equinor IMT (or if that role has not been mobilised, the Incident Commander), who will ensure that SSDI activities are undertaken in accordance with the Source Control Plan.

Equinor Australia B.V. relies primarily on its existing contracts worldwide with OSRL and WWC for debris clearance equipment. The WWC system stored in Singapore will be mobilised immediately after an incident. Equinor does not hold a subsea first response toolkit (SFRT) contract with AMOSC, but emergency access to the SFRT is allowable in our general membership contract (at a greater SFRT fee in the event of an incident). Equinor has access to half (i.e. 250 m^3) of the AMOSC SFRT stockpile of Dasic Slickgone NS (OSCA-registered dispersant) in Fremantle through its existing emergency arrangements with AMOSC and will have access to the remaining 250 m^3 on contract extension with AMOSC.

3.6.3 Surface dispersant application activities

Ensure surface dispersant application is undertaken in accordance with the Dispersant and Containment and Recovery Tactical Response Plan (TRP) and the Equinor Aviation Operations Plan (for aerial dispersant application). The surface and subsurface dispersant application environmental performance outcomes, standards and control measures are defined in Section 8.5.4 of the EP, including those which pertain to efficacy testing, selection and operational aspects.

Equinor will ensure surface dispersant application is undertaken in accordance with the relevant TRP and the Equinor Aviation Operations Plan (for aerial dispersant application). This will include determining if the surface application of chemical dispersant is viable using the process in Figure 3.3.

Dispersants approved under the National Plan and listed in the Register of Oil Spill Control Agents (OSCA) will be used preferentially (Dasic Slickgone and Total Finasol).

Daily dispersant requirements were estimated based on the use of surface dispersant application from day one of a response and SSDI from day nine, until well kill on day 102. This information was compared with the predicted volumes of dispersants available within Australia and internationally from AMSA, AMOSC, OSRL and mutual aid (Appendix 6).

Task	Who?
Direct platform support vessels (PSVs) or sub-sea construction vessel (SCV) with dispersant capability to spill location.	Logistics Section Chief
Contact aviation providers to request aerial dispersant aircraft and mobilise/prepare any additional support: • Primary – AMSA (Aerotech 1st Response) • Secondary – OSRL (Appendix 1) • Tertiary – regional providers (Appendix 1).	Logistics Section Chief
Contact dispersant suppliers and mobilise required volumes of dispersants: • Primary – AMOSC (Appendix 1) • Secondary – OSRL (Appendix 1) • Tertiary – international manufacturers (Dasic International Ltd and/or Total Special Fluids).	Logistics Section Chief
At the same time mobilisation is occurring, plan surface dispersant operations taking into consideration: • the estimated volume of dispersant required, based on surveillance and monitoring information • availability of dispersants and dispersant supply chain to airports • field testing of dispersant efficacy • aerial application methods (e.g. ladder or zig-zag patterns)	Logistics Section Chief

Task	Who?
• requirement to engage additional aircraft and personnel if necessary, to ensure continuous operations (as pilots will be restricted in their operational flight and duty times for health and safety reasons) • the potential longevity of the response • potential downtime for aircraft maintenance • the location of operational aircraft (i.e. Ceduna for Aerotech or Adelaide for OSRL) • limitations of aircraft operating from Ceduna (e.g. capacity of the airport, safety planning for aerial SIMOPS) • any approval requirements (if slick has potential to travel into state waters).	
If it is decided that vessels will apply dispersant, direct vessels to the areas with the highest concentrations of oil. Vessels will only be active during daylight hours.	Operations Section Chief
Prepare and provide to the aviation contractor a pre-flight information pack containing: Safety considerations: • identify and obtain the appropriate PPE, aviation lifejackets should be worn in aircraft • identify risks and necessary controls • communicate the risks and controls in place through a pre-operation safety brief. Operational Communications Plan that documents: • specific contacts and names of assets deployed • methods of communication with personnel (including the crew of aircraft/vessels) • call signs and radio communication frequencies.	Air Operations Branch Director
Supply a copy of the dispersant application log (Appendix 7) to aviation contractor personnel.	Logistics Section Chief
Conduct pre-flight briefing, which should include: • location of the area of operation • radio frequencies used in the area and on the response • call signs of other aircraft operating in the vicinity • locations of any temporary or permanent exclusion zones.	Air Operations Branch Director
Disseminate aerial flight plans to personnel.	Air Operations Branch Director
Aircraft to mobilise according to flight plans via the defined flight corridors to the dispersant spray zone under “freelance control”.	Air Operations Branch Director
Air Operations Branch Director will issue any path corrections and “directions to spray” to the dispersant aircraft.	Air Operations Branch Director
The Air Operations Branch Director will direct the tactical operation of aircraft onto a spraying area and shall maintain radio contact with the large and small dispersant aircraft as they approach the spray zones.	Air Operations Branch Director
Aircraft to queue up on approach and Air Operations Branch Director will direct them to spray one after another according to the chosen application pattern.	Air Operations Branch Director
Vessel and aircraft personnel visually monitor for wildlife in the area and report sightings to the Equinor IMT.	Vessel and aircraft observers
Conduct visual observations to determine dispersant effectiveness noting the following: • yellow, coffee or grey coloured slick (exact colour will vary depending on the original colour of the spill) • if the oil spill surface area has reduced • if oil is rapidly disappearing from the surface • if oil in some areas is being dispersed, leaving only a sheen on the surface. Note: The colour change may not be seen immediately, time should be given to permit the dispersion process to take place. This is particularly important for more viscous oils.	Vessel and aircraft observers

Task	Who?
Supplement visual observations with a small-scale test spray to determine dispersant efficacy before continued, large scale spray operations.	Vessel Master
Aircraft to use separate site egress back to their respective airports under “freelance” control during “change-overs”.	Aviation provider
Record and report the following to the Equinor IMT: • amounts and locations of dispersant sprayed • location of oil treated (either on map/chart, waypoints on GPS or georeferenced photo on mapping software) • method of dispersant application • time at which dispersant was applied • weather and sea state • visual observations of effectiveness • fluorometry measurements • degree of weathering and thickness of oil prior to dispersant application • any receptors that have been or may be impacted by the oil or dispersant application (e.g. marine mammals, seabirds, etc.).	Logistics Section Chief, Operations Section Chief, Planning Section Chief, Environmental Unit Leader
Termination criteria: Execute surface dispersant operations until the following termination criteria are reached: • dispersant is ineffective (based on in-field testing) or no longer effective (due to weathering) • NEBA assessment identifies that continued operations are likely to increase risk to human health and safety or environmental/socio-economic risk • monitoring indicates negative impacts of surface dispersant application to environmental/ socio-economic sensitivities • surface hydrocarbons are discontinuous/patchy or at a thickness considered insufficient for effective dispersant use • the cost of continued surface dispersant application is grossly disproportionate to the potential environmental/socio-economic benefit gained.	

3.7 Containment and recovery

Ensure containment and recovery operations are undertaken in accordance with the containment and recovery TRP.

3.7.1 Offshore

Task	Who?
Mobilise PSVs and containment and recovery equipment (refer to Appendix 2 for equipment).	Logistics Section Chief
Prepare an Operational Communications Plan that documents: • specific contacts and names of assets deployed • methods of communication with personnel (including the crew of aircraft/vessels) • call signs and radio communication frequencies • communicate this information to personnel.	Planning Section Chief

Task	Who?
Determine containment and recovery zones of response and operations daily, considering the following: • weather and sea state • health, safety and operational limitations (e.g. exclusion from aerial dispersant zone) • equipment variations (personnel training, availability of equipment) • minimal personnel numbers and any necessary adjustments.	Operations Section Chief
Conduct necessary toolbox talks.	Recovery Branch Director
Conduct Safety Job Analyses (SJAs).	Safety Officer
Prepare heavy duty offshore single-vessel containment and recovery system that includes skimmer on deck of vessel then deploy using boom vane single vessel configuration.	Operations Section Chief
Set up and secure temporary storage.	Logistics Section Chief
Prior to deployment ensure that equipment is correctly connected. Do not proceed with deployment until certain that all equipment is secured.	Operations Section Chief/ Recovery Branch Director
Conduct containment operations to corral floating oil.	Operations Section Chief/ Recovery Branch Director
Prepare and launch skimmer from vessel into heavy duty offshore single-vessel containment and recovery system to recover contained oil.	Operations Section Chief/ Recovery Branch Director
Recover oil and transfer to temporary storage until temporary storage capacity is reached.	Operations Section Chief/ Recovery Branch Director
Coordinate safe transfer and offload of stored oil to tanker or waste treatment facility prior to redeployment.	Operations Section Chief/ Recovery Branch Director
Ensure that all vessels involved in the operations adhere to the agreed communications protocols during deployment.	Operations Section Chief/ Recovery Branch Director
Vessel personnel visually monitor for wildlife in the area and report sightings to the Equinor IMT.	Operations Section Chief/ Recovery Branch Director
Record and report field observations to the Equinor IMT.	Operations Section Chief
Manage waste in accordance with the Stromlo-1 OPEP Waste Management Plan.	Logistics Section Chief/ Operations Section Chief
Provide the following records to the Equinor IMT: • daily log of containment and recovery operations/individual logs • toolbox talk and SJA checklists • operational constraints checklists • vessel surveillance records • records of sightings of sensitive receptors or oiled wildlife • records for types and quantities of oil recovered (this can be calculated on the aerial surveillance log) • records of final storage locations of recovered oil.	Logistics Section Chief/ Operations Section Chief
Termination criteria: Execute offshore containment and recovery operations until the following termination criteria are reached: • encounter rate of oil is not large enough to effectively capture • NEBA assessment identifies that continued operations are likely to increase environmental/socio-economic risk • The cost of continued operations is grossly disproportionate to the potential environmental/socio-economic benefit gained.	

3.7.2 Near shore

Within state coastal waters three nautical miles (NM) seaward of the territorial sea baseline, nearshore containment and recovery operations will be directed by the state control agency, subject to the requirements of the response (as determined by the state control agency) and the type and location of the pollution incident. Equinor will provide the response resources required by the state control agency(s) and support the state control agency(s) for the duration of the response by providing equipment, trained personnel, technical specialists and training for unskilled personnel. See examples below of possible tasks that may be undertaken, including the responsible Equinor IMT role.

Task	Who?
Liaise with relevant state control agency(s) to determine support requirements.	Equinor IC/Planning Section Chief/Logistics Section Chief
Contact providers of nearshore containment and recovery equipment (Appendix 2) and Vessels of Opportunity (VoOs) and request mobilisation to marine supply base in Adelaide or alternative staging location determined by the relevant IMT.	State control agency (supported by Logistics Section Chief)
Prepare an Operational Communications Plan that documents: • specific contacts and names of assets deployed • methods of communication with personnel (including the crew of aircraft/ vessels) • call signs and radio communication frequencies • communicate this information to personnel.	State control agency (supported by Planning Section Chief)
Determine containment and recovery zones of response and operations daily, considering the following: • weather and sea state • operational limitations • equipment variations (personnel training, availability of equipment) • minimal personnel numbers and any necessary adjustments.	State control agency (supported by Operations Section Chief)
Conduct necessary toolbox talks.	State control agency (supported by Operations Section Chief)
Conduct SJAs.	State control agency (supported by Safety Officer)
Set up and secure temporary storage.	State control agency (supported by Logistics Section Chief/ Recovery Branch Director)
Prepare single-vessel containment and recovery systems on vessels and deploy. Prior to deployment ensure that equipment is correctly connected. Do not proceed with deployment until certain that all equipment is secured.	State control agency (supported by Recovery Branch Director)
Conduct containment operations to corral floating oil.	State control agency (supported by Recovery Branch Director)
Prepare and launch skimmers from vessels to recover contained oil.	State control agency (supported by Recovery Branch Director)
Recover oil and transfer to temporary storage until temporary storage capacity is reached.	State control agency (supported by Recovery Branch Director)
Coordinate safe transfer and offload of stored oil to barge prior to redeployment.	State control agency (supported by Recovery Branch Director)
Ensure that all vessels involved in the operations adhere to the agreed communications protocols during deployment.	State control agency (supported by Recovery Branch Director)
Report visual sightings of sensitive receptors or oiled wildlife via direct communications (very high frequency (VHF), satellite phone or mobile phone) to the IC.	State control agency (supported by Recovery Branch Director)

Task	Who?
Recovery Branch Director to record and report sightings to Operations Section Chief who will report to the state control agency IMT(s).	State control agency (supported by Recovery Branch Director)
Manage waste in accordance with the Stromlo-1 OPEP Waste Management Plan (OWMP).	State control agency (supported by Logistics Section Chief/Operations Section Chief)
Provide the following records to the state control agency IMT(s): • Daily log of containment and recovery operations / Individual logs • Toolbox talk and SJA checklists • Operational constraints checklists • Records of sightings of sensitive receptors or oiled wildlife • Records for types and quantities of oil recovered (this can be calculated on the aerial surveillance log) • Records of final storage locations of recovered oil.	State control agency (supported by Recovery Branch Director)
Termination criteria: Execute nearshore containment and recovery operations until the following termination criteria are reached: • encounter rate of oil is not large enough to effectively capture • NEBA assessment identifies that continued operations are likely to increase environmental/socio-economic risk • the cost of continued containment and recovery operations is grossly disproportionate to the potential environmental/socio-economic benefit gained • state control agency(s) terminates response.	

3.8 Shoreline protection and clean-up

Shoreline protection and clean-up will be directed by the relevant state control agency(s), subject to the requirements of the response (as determined by the state control agency(s)) and the type and location of the pollution incident. Equinor will provide the response resources required by the state control agency(s) and support the state control agency(s) for the duration of the response by providing equipment, trained personnel, technical specialists and training for unskilled personnel. See examples below of possible tasks that may be undertaken, including the responsible Equinor IMT role. There is an existing draft Tactical Response Plan (TRP) – Shoreline that will be updated and implemented.

3.8.1 Shoreline assessment and treatment recommendations

Task	Who?
Liaise with and assist relevant control agency(s) to determine potentially impacted environmental sensitivities and rank priority for protection and clean-up activities.	Equinor Environmental Unit Leader
Update existing site-specific TRPs or develop site-specific TRPs for new areas as needed. New sites identified according to the primary, secondary or tertiary criteria. Shoreline TRPs will contain: Primary impacted sites: • TRP reference – sector, segment(s), coordinates • site details – site location image, site description, site access, site constraints, protection priorities and facilities/services • response information – response tasks, rationale, site reference and response checklist • site setup – schematic illustrating site zoning, control, waste and decontamination • concept of operations – guide to response deployment including boom placement, anchoring and oil recovery (where appropriate)	State control agency (supported by Planning Section Chief/ AMOSC)

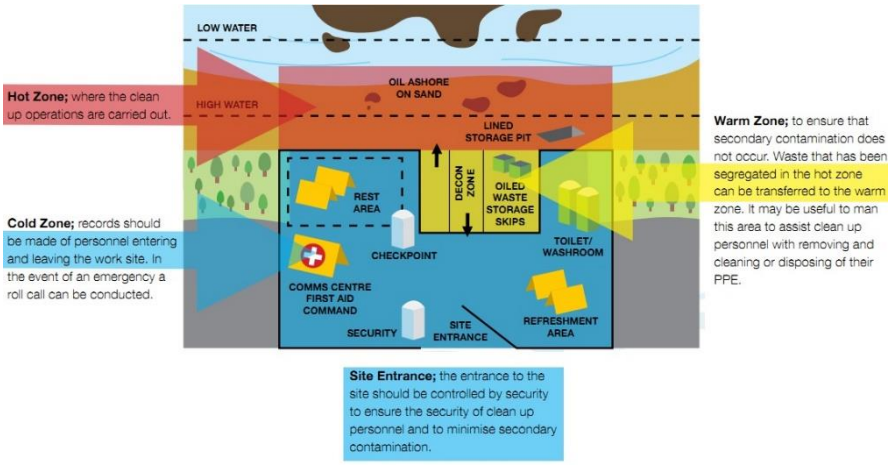
Task	Who?
• tactical assignments – response tasking and considerations, response personnel and communications • resources – inventory of personnel, oil spill equipment, vehicles/vessels, and site support resources required • personnel and emergency information – to be populated prior to implementation. Secondary impacted sites: • TRP reference – sector, segment(s), coordinates • site details – site location image, site description, site access, protection priorities and facilities/services • site reference – site reference image • response – site response justification, response initiation tasks, actions required, site assessment checklist and local information. Tertiary impacted sites: • TRP reference – sector, segment(s), coordinates • site details – site location image, site description, site access, site constraints, protection priorities and facilities/services.	
Prepare an Operational Communications Plan that documents: • specific contacts and names of assets, personnel, equipment deployed • methods of communication with personnel (including the crew of vessels, shoreline personnel, aircraft conducting surveillance) • call signs and radio communication frequencies • communicate this information to personnel.	State control agency (supported by Logistics Section Chief)
Prepare the following: • report/log forms • method of communications (e.g. mobile, satellite phones, VHF radio) • handheld GPS and spare batteries • digital camera and spare batteries • compass • ruler for scale when taking photos • tape measure • flags or stakes (to mark the location of buried oil).	State control agency (supported by Logistics Section Chief)
Use oil spill modelling to determine potential extent of shoreline oiling and communicate to the state control agency IMT(s) when results are available.	State control agency (supported by Environmental Unit Leader)
Identify training requirements and locations. Commence sourcing and mobilisation of personnel (trained and untrained).	State control agency (supported by Planning Section Chief/AMOSC)
Activate 'train the trainer' program and the training of unskilled personnel.	State control agency (supported by Planning Section Chief/AMOSC)
Where requested by state control agency(s), form shoreline assessment field teams that should include: • representatives from Equinor, state authorities and relevant land managers • representatives trained in the shoreline clean-up and assessment technique (SCAT) (see Appendix 8 for supporting information) • technical experts on the environmental and socioeconomic sensitivities that have been or may be impacted • representatives with designated responsibility for the environmental and socioeconomic sensitivities that may be impacted.	State control agency (supported by Environmental Unit Leader)

Task	Who?
Using the SCAT, divide the shoreline into segments. Segments are defined geographic areas of similar physical features and sediment types. Subsegments can be used if the extent of oiling varies significantly between a given segment.	State control agency (supported by Environmental Unit Leader)
Identify shoreline ranking by assigning an Environmental Sensitivity Index (ESI) rank from 1–10 (where 10 is most sensitive). Use information from the following sources: • aerial surveillance • aerial photography • remotely sensed data • ground truthing Existing maps and data. NOAA ESI value — Shoreline type 1 — Exposed rocky shore 2 — Exposed rocky platforms 3 — Fine grained sand beaches 4 — Coarse grained sand beaches 5 — Mixed sand and gravel beaches 6a — Gravel beaches 6b — Riprap structures 7 — Exposed tidal flats 8a — Sheltered rocky shores 8b — Sheltered artificial structures 9 — Sheltered tidal flats 10a — Salt to brackish marshes 10b — Freshwater marshes 10c — Swamps 10d — Mangroves Note that ESI rankings may vary for specific areas at different times of the year.	State control agency (supported by Environmental Unit Leader)
Agree standardised descriptions for the oil that will be observed during shoreline surveys.	State control agency (supported by Environmental Unit Leader)
Assess shoreline segments: • utilising the SCAT, visit those segments of the shoreline that are accessible, with priority given to those segments most likely to be highly impacted. Inaccessible shoreline areas can be assessed using information sources listed above for the ESI ranking • assess the sensitivity of the shoreline and any specific constraints (e.g. logistical, environmental, and cultural) that might affect shoreline protection (e.g. deflection methods) and clean-up operations • for shoreline areas where oil may have already contacted, assess the nature and the degree of oiling.	State control agency (supported by Environmental Unit Leader)
Identify the shoreline protection and clean-up methods that will be used based on the type of shoreline, sensitivity, identified constraints and the level of oiling assessed. A key consideration when selecting clean-up methods is minimising the risk of further damage to habitats and resources from the clean-up activities themselves.	State control agency (supported by Environmental Unit Leader)
Develop recommendations for shoreline protection and clean-up. The shoreline assessment teams will develop shoreline treatment recommendations (STRs) for the shoreline segments that have been assessed. Clean-up of shorelines should be	State control agency (supported by Environmental Unit Leader)

Task	Who?
undertaken in a phased manner by first removing primary/bulk oil, before secondary and "fine cleaning" is undertaken.	
Establish termination criteria with state agencies. Identifying these early enables shoreline protection and clean-up methods are selected to meet the end points. Example termination criteria are provided below. Termination criteria — Description No visible oil — Often used for sand beaches where oil removal can be effective without delaying resource recovery. No more than background oil — Often applied where there is significant background rate of tar ball deposition on the shoreline. No longer releases sheen that will affect sensitive areas, wildlife or human health — Used where sheening persists after clean-up efforts become ineffective or on sensitive habitats where further clean-up efforts will cause more harm than natural removal. Residual sheening should persist over a relatively short time period. No longer rubs off on contact — Defined as removal to a stain or coat or weathering to a point where it is no longer sticky. This is appropriate for hard substrates. Oil removal to allow recovery without causing more harm than natural removal of oil residues — Used where further oil removal will result in excessive habitat disruption or high biota mortality.	State control agency (supported by Environmental Unit Leader)
Communicate STRs and endpoints to the state control agency IMT(s).	State control agency (supported by Environmental Unit Leader)
Consult with other agencies and stakeholders on the STRs and termination criteria. When agreement is reached between stakeholders (or when directed by the control agency(s)), recommendations to be approved for implementation.	State control agency

3.8.2 Shoreline protection and clean-up

Task	Who?
Liaise with and assist relevant control agency(s) to determine protection and clean-up requirements including additional support required.	Equinor Environmental Unit Leader
Using shoreline resource tables in the appendices of the Tactical Response Plan – Shoreline (or similar) determine the type, quantity and location of: • nearshore and shoreline boom required for deflection • ancillaries to establish those boom sets • skimming systems or vacuum trucks • decontamination equipment • personnel (specialised and unskilled).	State control agency (supported by Environmental Unit Leader)
Mobilise identified resources to specific forward operating bases laydown areas/ deployment sites.	State control agency (supported by Logistics Section Chief)

Task	Who?
Plan the onshore site set-up to minimise the potential for secondary contamination and ensure site security. Identify cold, warm and hot zones for each site. Example of onshore set-up provided below. 	State control agency (supported by Operations Section Chief)
Issue and execute field orders for clean-up of oil.	State control agency (supported by Operations Section Chief)
Identify when pre-agreed termination criteria have been reached, conduct survey to confirm this and produce a shoreline inspection report (SIR). Review the SIR to confirm: • the protection and clean-up operations have met the intended goals • if recommendations for further work have been made, or alternatively, if shoreline segment conditions acceptable and may be signed-off.	State control agency (supported by Environmental Unit Leader)
State control agency IMT(s) to be provided with: • shoreline assessment records (maps, photos, logs) • records of STRs, end points, any relevant approvals obtained, stakeholders involved in agreement • shoreline assessments and treatment recommendations • records of field orders executed • SIRs and approval/sign off response completion.	State control agency (supported by Environmental Unit Leader)

3.9 Wildlife response

Wildlife protection and response operations will be directed by the relevant state control agency(s), subject to the requirements of the response (as determined by the state control agency(s)) and the type and location of the pollution incident. Equinor will provide the response resources required by the state control agency(s) and support the state control agency(s) for the duration of the response by providing equipment, trained personnel, technical specialists and training for unskilled personnel. See examples below of possible tasks that may be undertaken, including the responsible Equinor IMT role.

The majority of wildlife treatment required during a spill event involves routine veterinarian practices which are taught during veterinarian studies. This experience allows trained vets to be able to respond to wildlife needs in an oil spill incident under the guidance of experienced wildlife vets based on learnt skills that may not be used regularly but have been learnt during their studies. Western Australian and South Australian regional oiled wildlife response plans have identified wildlife veterinary expertise and domestic veterinary contacts that have been contacted and committed to best endeavours response in the event of an oil spill incident.

Task	Who?
Notify the relevant agency when injured/oiled wildlife is confirmed or could potentially occur. Note that notifications of oiled wildlife will occur via the relevant control agency(s). State waters Location of wildlife — Who to contact Western Australia — Department of Biodiversity, Conservation and Attractions (DBCA) South Australia — Department for Environment and Water (DEW) Victoria — Department of Environment, Land, Water and Planning (DELWP) Tasmania — Department of Primary Industries, Parks, Water and Environment (DPIPWE) New South Wales — Department of Primary Industries (DPI) Note: each state will act as the control agency for their corresponding regions.	IC
Obtain any licences required from the relevant state wildlife licensing authority, at the time of any incident and prior to undertaking any exclusion, hazing or fauna handling activities such as pre-emptive capture.	State control agency (supported by Planning Section Chief)
Provide additional support to control agency(s) as requested including logistics, equipment, personnel and training.	IC
Activate the relevant scientific monitoring program depending on species impacted.	Environmental Unit Leader
Termination criteria: Continue supporting the control agency in oiled wildlife response until: • all injured/oiled wildlife have been treated or euthanised • dead wildlife and waste have been disposed of • control agency(s) have ceased a response under their relevant plans.	

3.10 Overall response termination criteria

The overall response will terminate once Equinor and the state and commonwealth agencies agree that all the following criteria have been met:

- The source of the spill has been controlled such that no further hydrocarbons will be released.
- All termination criteria are met for:
  - Section 3.3 Source control
  - Section 3.4.1 Vessel surveillance
  - Section 3.4.2 Aerial surveillance
  - Section 3.4.3 Oil spill trajectory modelling
  - Section 3.4.4 Satellite imagery
  - Section 3.4.5 Surface slick tracking
  - Section 3.4.6 Airborne remote sensing
  - Section 3.6.3 Surface dispersant application
  - Section 3.7 Containment and recovery
  - Section 3.9 Wildlife response
- All relevant state agencies have ceased shoreline assessment and clean-up operations within their jurisdictions as per Section 3.8.
- It has been identified (e.g. via a health and safety assessment or NEBA) that the response strategy is likely to result in an increased risk to human health, or environmental and socioeconomic receptors (and hence the response can no longer be defined as being ALARP and acceptable).
- All state control agency related response activities have been terminated.

Equinor will appoint an investigation team following termination of a spill response. This team will be responsible for undertaking:

- an investigation into the cause of the spill. Feedback will be sought from stakeholders as part of the investigation and evaluation of response success (perceived or measured, e.g. through the OSMP)
- an after-action review of both the emergency and spill response actions
- close out of all relevant IMT, Crisis Management Team (CMT) and emergency response personnel actions
- implementation of a lessons learned assessment process, which will form the basis of a post-incident improvement action plan
- liaison with all involved external agencies to support their post-incident investigations and close-out activities.

4.0 Waste management

The following types of oily materials and waste may be generated during an oil spill event:

- oil (pure or near pure petroleum)
- oily material (oily sorbents, PPE, as well as liquid mixed with debris, soil, water, or other material)
- oily sediment (shoreline material mixed with oil)
- oily water (large amount water with some oil, with possible small amounts of debris)
- deceased fauna.

Waste management requirements in the event of an oil spill are detailed in the Equinor Stromlo-1 OPEP Waste Management Plan (OWMP) (Appendix 10), which Equinor will follow during a spill response. All waste generated from oil spill response strategies will be stored, transported, removed, reused, recycled or disposed of in accordance with the OWMP. The OWMP also covers requirements for determining the types, classification, segregation and tracking quantities of spill response wastes. There are also legislative recording and reporting requirements outlined in the OWMP that will be met for waste generated from oil spill response operations.

Environmental performance standards and measurement criteria have been developed to ensure the OWMP is effective in reducing the potential impacts of oil spill waste to ALARP and to an acceptable level (refer to Section 13.2).

Commonwealth and state control agencies may require a different OWMP to be followed during spill response. Equinor will adhere to such requirements as directed by the control agency.

5.0 Operational and scientific monitoring program

The overall objectives of the OSMP 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 the persistence of hydrocarbons and duration of exposures for different locations)
- summarise the spatial extent and duration (short-term 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/socioeconomic equilibrium) and consideration of the ecological and socioeconomic 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.

The objectives of each OMP and SMP are summarised in Table 5.1 and Table 5.2 respectively.

The Equinor OSMP comprises the following:

- **OMPs**: Aimed at obtaining situational awareness of a spill and providing information on potential impacts to environmental and socioeconomic receptors. A secondary objective of the OMPs is to assess the efficacy and potential impacts (both positive and negative) of spill response strategies.
- **SMPs**: Outline the process for conducting scientific assessment of spill impacts and the recovery of environmental and socioeconomic receptors following a spill. The SMPs also cover post-release/pre-exposure baseline data collection to collect data on the baseline condition of selected locations.
- **OSMP Implementation Plan**: Provides detailed information on roles and responsibilities, communication protocols, resources, HSE requirements, activation and termination criteria, logistics, reporting, etc.

The implementation of the OSMP will be performed by Equinor as the control agency in Commonwealth waters, except for a vessel release being classified as a Level 2 or above, where AMSA would be the Control Agency. In this circumstance, Equinor would implement the OSMP under the direction of the Commonwealth waters control agency. If a spill enters state coastal waters (3 NM seaward of the territorial sea baseline), each state jurisdiction that mobilises an IMT will have input to OSMP implementation via:

- direct communication between the state control agency IMT Environment Units and Commonwealth control agency IMT Environment Unit
- mobilisation of state liaison officers or Subject Matter Experts (SMEs) into the Commonwealth waters control agency IMT
- mobilisation of state SMEs into the OSMP independent Scientific Advisory Group (SAG) (or similar), which has direct input and oversight of the development and implementation of the OSMP
- mobilisation of state SMEs as part of OSMP field response teams.

The SAG (or similar) is an independent review body that will advise on the objectives, scope, analysis and interpretation, reporting and the termination of monitoring plans in the OSMP. The SAG is not a management group, but provides technical and regulatory guidance, and fulfils an independent review function of monitoring outcomes and deliverables. The SAG may comprise representatives from relevant Commonwealth and state agencies, academic institutions and consultancies.

Evidence and data that is collected and fed back to the Commonwealth and state IMTs will be used to manage and modify the response strategy and will support communication with stakeholders (Figure 5.1). Following spill response operations, when the Commonwealth and state IMTs have been demobilised, Equinor will continue to implement the SMPs and the data will be disseminated to agencies and other organisations involved in implementing the SMPs (Figure 5.1).

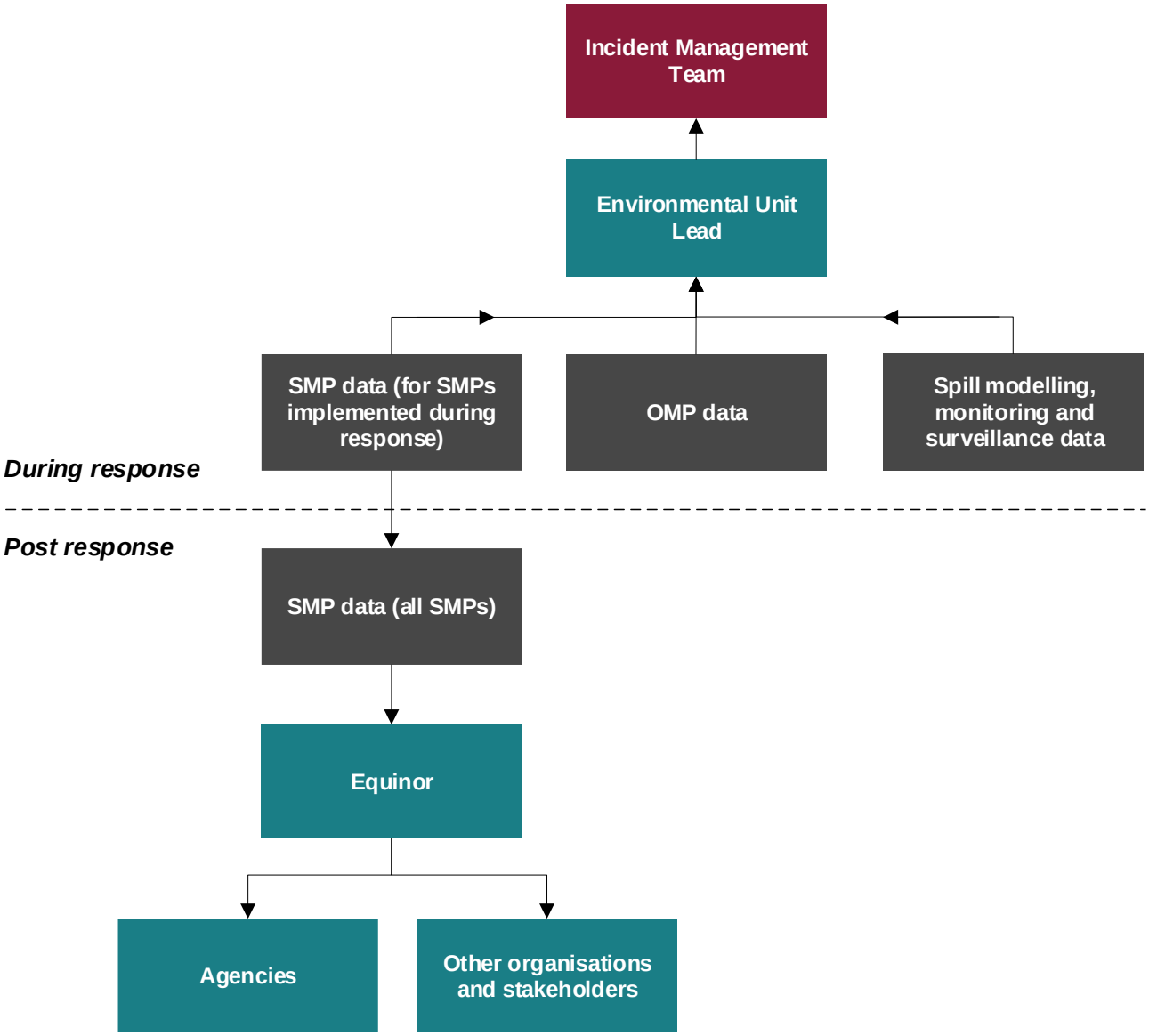


Figure 5.1 OSMP data flow during and after spill response

Table 5.1 Operational monitoring program objectives and activation and termination criteria

The information presented in this table was correct at the time this OPEP was developed. The OSMP may be amended over time, therefore the most current version of the OSMP will be referred to during an oil spill response.

The objectives of operational monitoring (also known as "Type I" or "response phase" monitoring) are to:

- Provide situational awareness to the IMT, to allow 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 risk 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 the final development and implementation of post-release/pre-exposure baseline data collection and SMPs.

OMP#	Title	Plan objectives	Activation triggers*	Termination triggers
OMP1	Oil Spill Modelling	Predict the trajectory and area swept by a hydrocarbon release based on the nature and scale of the release incident. Predict (based on the actual nature and scale of the incident): • the spatial extent of the hydrocarbon release • the risk EMBA • weathering of released hydrocarbons • time to contact at pre-defined sensitive receptor locations (defined in the EP) • resources at risk • the potential accumulation of hydrocarbons on shorelines based on the nature and scale of the release. Provide information to: • support the planning and implementation of spill response activities, other activated OMPs and SMPs, and post-release/pre-exposure baseline data collection • support the determination of the risk EMBA • inform other OMPs and SMPs. Where dispersants are considered for use: • provide situational awareness on the efficacy and potential effects of dispersed hydrocarbons.	• Level 2 or 3 hydrocarbon release • activated by Equinor IMT/control agency IMT to support situational 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	Confirm the trajectory of hydrocarbons released throughout the incident. Confirm and monitor: • the spatial extent of the hydrocarbon release • weathering of released hydrocarbons • time to contact at pre-defined sensitive receptor locations (defined in the EP) • the potential accumulation of hydrocarbons on shorelines based on the nature and scale of the release incident. Provide information to: • support the planning and implementation of spill response activities and other activated OMPs and SMPs • support the determination of the risk EMBA • inform other OMPs and SMPs. Where dispersants are considered for use: • provide situational awareness on the efficacy and potential effects of dispersed hydrocarbons.	• Level 2 or 3 hydrocarbon release • activated by Equinor IMT/control agency IMT to support situational 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	Predict the trajectory and area swept by a hydrocarbon release based on the nature and scale of the release incident. Predict the following (based on the actual nature and scale of the incident): • the spatial extent of the hydrocarbon release • the risk EMBA • weathering of the hydrocarbon • time to contact at pre-defined sensitive receptor locations (defined in the EP) • provide information to support the planning and implementation of other activated OMPs and SMPs. Where dispersants are considered for use: • predict the spatial distribution of dispersed hydrocarbons.	• 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 SMP1 following termination.

OMP#	Title	Plan objectives	Activation triggers*	Termination triggers
OMP4	Monitoring of Dispersants and Chemical Control Agents	Provide the following: • situational awareness of the efficacy of dispersants and chemical control agents to support continuous assessment of spill response activities. • information on the potential impacts of dispersants and chemical control agents on sensitive receptors • information to support the planning and implementation of other activated OMPs and SMPs.	• 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 SMP1 following termination.
OMP5	Shoreline Assessment	Undertake the following: • ground-truth spill hydrocarbons on shorelines, predicted by OMP1 or identified by OMP2 • identify the oiling status (distribution of surface and sub-surface occurrence) of shorelines • characterise the hydrocarbons found along and across the shoreline (e.g. accumulated oily patches or streaks, coating of substrates, waxy flakes, tar balls) • identify oiling of intertidal and supra-littoral biota • identify risk to shoreline areas of importance to shorebirds, seabirds (including penguins) and/or pinnipeds (e.g. roosting areas/colonies, feeding areas, haul-out zones).	• 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	Undertake the following: • identify potential impacts of the hydrocarbon release on benthic biota/habitats • identify potential impacts of the hydrocarbon release on demersal biota • identify the types of impacts observed (e.g. behavioural, mortality) • identify potential cumulative impacts of the hydrocarbon release and spill response strategies • provide information to support the planning and implementation of other activated OMPs and SMPs.	• Level 2 or 3 hydrocarbon release AND • monitoring, spill modelling and/or surveillance Indicate that locations with sensitive benthic and demersal biota[1] 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[1] 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 Commander (or Incident Controller). Note: The resources required for this OMP are likely to be re-tasked to begin implementation of SMP4 following termination.

1. 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.

Table 5.2 Scientific monitoring programs objectives and activation and termination criteria

Note: The information presented in this table was correct at the time this OPEP was developed. The OSMP may be amended over time, therefore the most current version of the OSMP will be referred to during an oil spill response.

The objectives of scientific monitoring (also known as "Type II" or "recovery phase" monitoring) are to:

- determine the extent, severity and persistence of environmental impacts from a hydrocarbon release
- quantify the 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 the short-term and long-term impacts of the hydrocarbon release and response activities to specific receptors
- where feasible, allow potential assessment of the short-term 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 response strategies, other anthropogenic/natural sources of impact, cumulative impacts, etc.)
- identify, quantify and qualify the recovery of specific receptors following termination of the response
- support post-release/pre-exposure baseline data collection where feasible.

Note: If undertaken during the response phase, an additional objective will be to provide situational awareness to the relevant IMT, to allow effective ongoing planning and management of spill response activities and identify any significant changes in risk.

SMP#	Title	Plan objectives	Activation triggers	Termination triggers
SMP1	Assessment of Water Quality	Undertake the following: • quantify the magnitude of exposure via assessment of the spatial and temporal distribution of hydrocarbons in marine waters within and outside of the predicted/observed AMBA against relevant guidelines (e.g. ANZECC/ARMCANZ (2000) Water and sediment quality guidelines) • determine the weathering, dispersion and persistence of hydrocarbons in marine waters • determine differences in hydrocarbon distributions and characteristics in marine waters to understand the potential effects and efficacy of spill response activities • determine the likely persistence and potential for toxicity • identify the spatial distribution of potential impacts and recovery of infaunal communities over time.	• 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 risk EMBA (derived from OMP1) (except for 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	Undertake the following: • quantify hydrocarbons in surficial subtidal benthic sediments within and outside of the predicted/observed risk EMBA • determine the spatial distribution of hydrocarbon accumulation • characterise hydrocarbons in sediments to understand the effects of weathering and spill response activities • determine the likely persistence and potential for toxicity • identify the spatial distribution of potential impacts and recovery of infaunal communities over time.	• 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 the 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 (compared to control locations or comparison between surveys).
SMP3	Assessment of Impacts and Recovery of Intertidal Habitats	Undertake the following: • quantify hydrocarbons in surficial subtidal benthic sediments within and outside of the predicted/observed risk EMBA • determine the spatial distribution of hydrocarbon accumulation in intertidal habitats • characterise hydrocarbons in intertidal habitats to understand the effects of weathering and spill response activities • determine the likely persistence and potential for toxicity • identify the spatial distribution of potential impacts and recovery of intertidal habitats over time.	• 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 the 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 near 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 the 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 (compared to control locations and/or 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).

SMP#	Title	Plan objectives	Activation triggers	Termination triggers
SMP4	Assessment of Impacts and Recovery of Marine Benthic Habitats and Demersal Biota	Undertake the following: • quantify potential impacts of the hydrocarbon release on benthic habitats and subsequent recovery • quantify potential impacts of the hydrocarbon release on demersal biota and subsequent recovery • define the types of impacts observed (e.g. behavioural, population structure/community composition, mortality) • determine the potential impacts of the hydrocarbon release and spill response strategies within the context of natural spatial and temporal variability • determine the spatial distribution of potential impacts and recovery of habitats and communities over time.	• Level 2 or 3 hydrocarbon release AND • monitoring studies have identified potential exposure or exposure of hydrocarbons to benthic habitats (>10 g/m^2 on shore, where sediment hydrocarbons (i.e. from SMP2) exceed the 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 • OMP6 identifies potential impacts to marine benthic habitats and demersal biota OR • where modelling indicates exposure of benthic habitats to dispersed hydrocarbons.	• 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 (compared to control locations and/or 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).
SMP5	Assessment of Impacts and Recovery of Seabirds and Shorebirds	Undertake the following: • quantify the status of seabird and shorebird populations within and outside of the predicted/observed risk EMBA • determine if impacts to health and/or mortalities are due to hydrocarbon exposure • identify and characterise subsequent recovery from hydrocarbon exposure.	• 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) have 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	Undertake the following: • quantify the status of marine megafauna populations within and outside of the predicted/observed risk EMBA • determine if impacts to health and/or mortalities are due to hydrocarbon exposure • identify and characterise subsequent recovery from hydrocarbon exposure.	• 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 because 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	Undertake the following: • characterise plankton communities throughout the year within and outside of the predicted/observed risk EMBA • identify the spatial distribution of potential impacts and recovery of plankton communities over time.	• 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 or where modelling indicates the likelihood of dissolved aromatic hydrocarbons at concentrations of ≥6 ppb AND • 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 (compared to control locations and/or 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.

SMP#	Title	Plan objectives	Activation triggers	Termination triggers
SMP8	Assessment of Impacts and Recovery of Fisheries and Aquaculture	Undertake the following: • quantify hydrocarbon contamination in commercial fish and shellfish within and outside of the predicted/observed risk EMBA • determine the physiological impacts to commercial fish and shellfish species • determine impacts to seafood safety and quality • identify the spatial distribution of potential impacts and recovery of commercial fisheries and aquaculture over time.	• 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 the revised ANZECC/ARMCANZ Sediment Quality Guidelines (Simpson et al., 2013) 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	Identify and monitor the impacts on, and recovery of, areas of recreation, tourism, conservation, heritage or native title importance due to a hydrocarbon spill and/or response.	• 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 Socioeconomic Impact Assessment determines there is no impact to socioeconomic, Native Title and heritage values AND • recovery of any affected sites has been demonstrated in two consecutive years of scientific monitoring data.

Part three: Planning and preparedness

6.0 Introduction

6.1 Purpose

The purpose of this OPEP is to describe the systems and processes that will be used by Equinor Australia B.V. (Equinor) and relevant subcontractors to mount a safe, rapid and effective response to oil pollution that may occur within the defined scope of the petroleum activity (hereafter referred to as "the activity"), and for ongoing maintenance of the response capability.

This OPEP, and the EP that this document supports have been developed to meet the requirements of the following key legislation:

- *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGS Act)
- Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS(E) Regulations).

6.2 Scope

6.2.1 Petroleum activity

This OPEP details the preparation and response for maritime pollution incidents relating to the petroleum activity described in Section 2.0 of the EP for the Stromlo-1 Exploration Drilling Program.

The Stromlo-1 well in the EPP 39 Permit Area will be drilled using a semisubmersible MODU to a planned total depth of 5,200 m to 5,700 m. The MODU will be supported by

two platform supply vessels (PSVs), one subsea construction vessel (SCV) and helicopters. A 500 m petroleum safety zone (PSZ) will be gazetted around the MODU after it reaches location.

The MODU, support vessels and helicopters will be conducting a "petroleum activity" whilst within the Operational Area, which is defined by a 2 NM radius around the MODU location. This area encompasses the 500 m PSZ and the surrounding area where support vessels engaged in the activity may be present during the activity.

All oil spill response activities that would be undertaken within and outside of the Operational Area, resulting from an incident occurring in the Operational Area are covered by this OPEP. However, this OPEP does not cover planned ("day-to-day") activities performed by the support vessels while outside the Operational Area, such as the general supply route or transit of support vessels between the Operational Area and Port Adelaide.

The planned duration of the activity is approximately 60 days and will be undertaken during the period; 1 October to 31 May. Details of the drilling campaign are provided in Table 6.1 and the location of the petroleum activity is shown in Figure 6.1.

Table 6.1 Stromlo-1 location information

Territorial waters	Australian Commonwealth waters	
Location	Latitude	Longitude
	34° 56" 21.47" S	130° 39" 44.61" E
Nearest ports/points of land	Location	Distance
	Closest point on mainland (unnamed)	201 NM (372 km)
	Head of Bight, SA	208 NM (385 km)
	Eyre Peninsula, SA	221 NM (410 km)

	Ceduna, SA	216 NM (400 km)
	Kangaroo Island, SA	297 NM (550 km)
	Israelite Bay, WA	348 NM (645 km)
	Adelaide, SA	395 NM (730 km)
Distance to Commonwealth/state waters boundary	~198 NM (367 km)	
Distance to nearest coastline	~201 NM (372 km)	
Water depth at well location	2239 m	
Supply base	Port Adelaide	
Sailing time (supply base to well location)	~40 hrs	
Project helicopter fleet base	Ceduna, SA	
Flight time – Adelaide to Ceduna	Fixed wing: 1.5 hours	
Flight time – Ceduna to MODU	Helicopter: 2 hours	

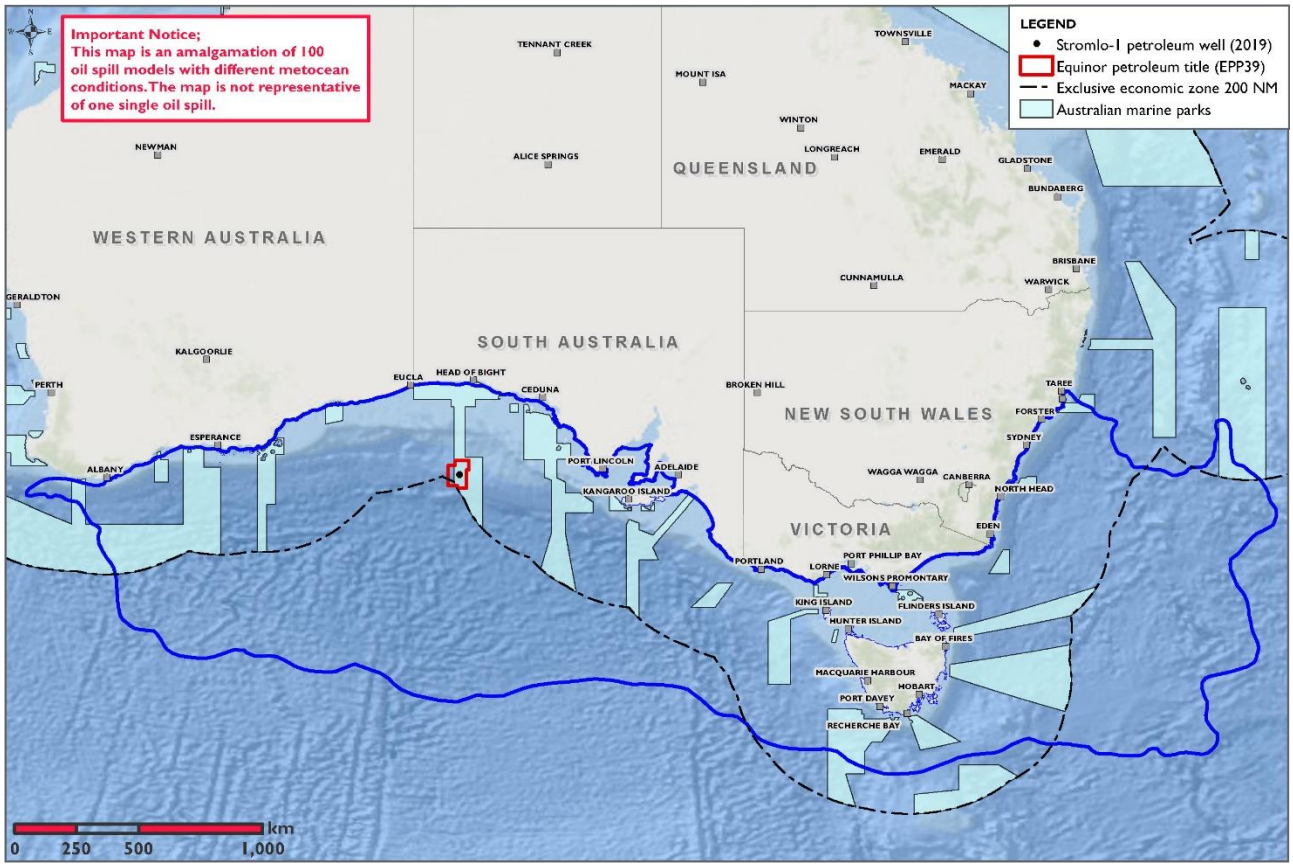


Figure 6.1 Stromlo-1 location, Equinor title and historic exploration wells

6.2.2 Geographic area

The geographic area that could theoretically be affected by an oil spill was determined from oil spill trajectory modelling (RPS 2019). Stochastic modelling of the worst-case discharge (WCD) scenario was conducted for a loss of well control and sub-sea oil release over the time estimated to mobilise a second rig and drill a relief well.

The greatest extent of the defined thresholds for the surface oil, dissolved oil and entrained oil components were identified to derive the area at risk of impacts from an oil spill. This area is referred to as the “risk EMBA”

(Figure 6.2). The risk EMBA set the geographic extent for identifying the environmental and socio-economic sensitivities and spill response planning. The risk EMBA extends from the southern coast of Western Australia to New South Wales and includes Tasmania.

No single spill could possibly cover the entire risk EMBA since it is defined from modelling of 100 spills. This ensures that whichever direction a spill may move following a release, the area that may be affected has been considered during the planning phase. The risk EMBA is explained further in Section 8.3.

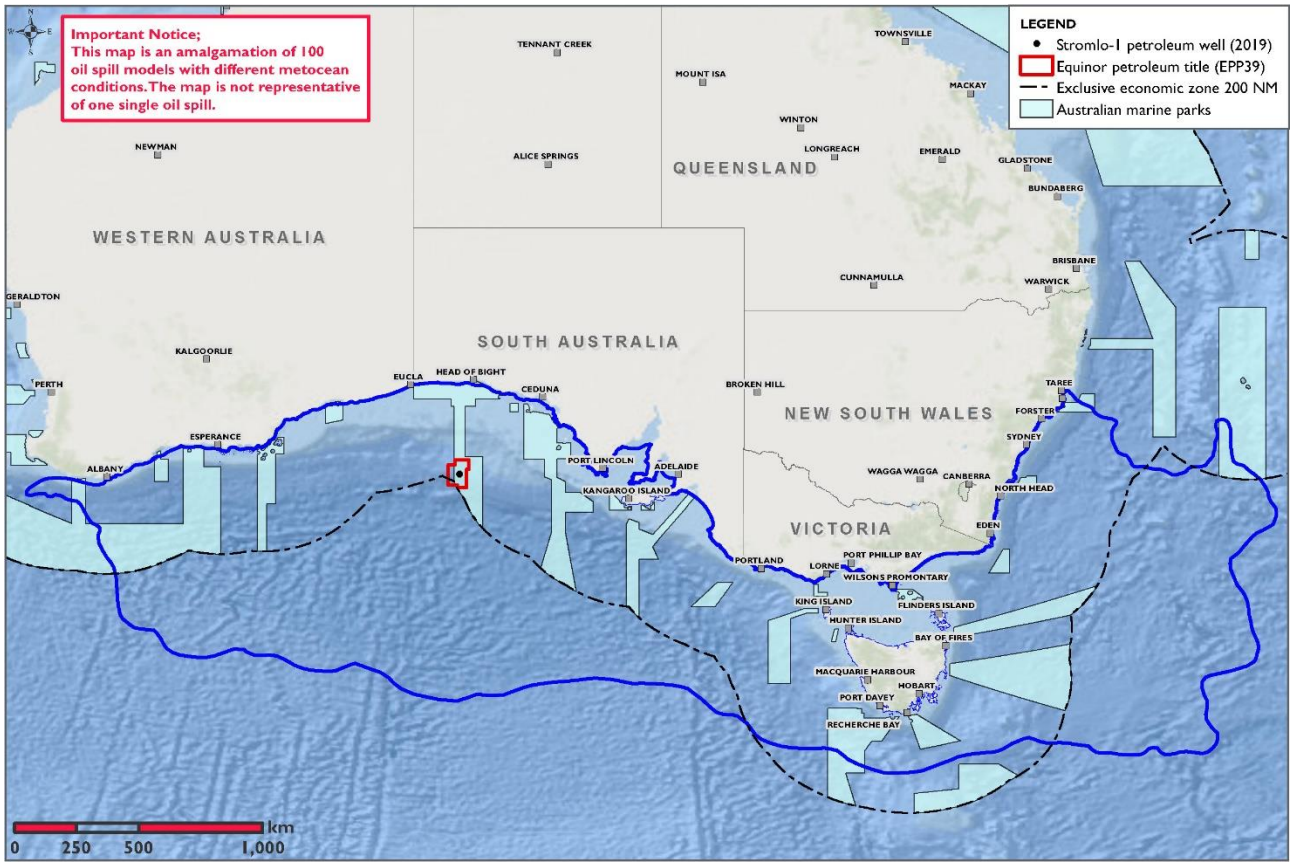


Figure 6.2 Risk EMBA

6.2.3 Health and safety

Modelling shows that hydrocarbons will surface from 6 to 24 hours after a LOWC causing release of oil at the wellhead. The water depth being 2239 m, the prevailing currents in the water column between 0.5 to 1 knot (generally NE–E) and the prevailing wind direction will also be from SW-W, any plumes will occur 3 to 12 NM away from the vertical surface location. Due to the water depth at the location, early response can be achieved by significant vertical offset from the location and the drill site. Health and safety concerns will be addressed in detail in the Safety Case for the response activities; however given the water depth and site conditions, it is unlikely that such concerns associated with gas plumes will delay the initiation of response activities

Equinor considers the health and safety of spill responders of paramount importance and if conditions during a response are not safe then personnel will not respond until the situation has been resolved. Equinor will align with the recommendations in the National Plan Marine Oil Spill Response Health and Safety Guidance (NP-GUI-026) (AMSA 2017c). In addition, under the Offshore Petroleum and Greenhouse Gas Storage (Safety) Regulations 2009, Equinor will have an accepted safety case in place for the MODU and for drilling rigs used to drill a relief well in the event of a well blowout. SOPEPs will be on board vessels that are required to have them under Australian legislation. Safety cases and SOPEPs identify the health and safety controls in place for potential marine pollution events. A continuous safety review would also be undertaken following an unplanned release. Therefore, this OPEP does not cover health and safety requirements associated with potential oil spills in detail.

6.3 Interface with other plans

This OPEP is part of Equinor's integrated Crisis and Emergency Management System, is consistent with the other Equinor plans and is to be used in conjunction with the following documents:

- The Equinor Book
- Safety and security (FR10)
- Preparedness and response (SF700)
- Business continuity management (SF801)
- Equinor Incident Management Handbook.

The Equinor Incident Management Handbook response framework, emergency response plans and procedures are intended to deliver an integrated approach between existing company emergency management plans and spill contingency plans specific to exploration and drilling campaigns. Figure 6.3 shows the main interfaces between this OPEP, Equinor internal and external plans, contractor plans and key Australian agency response plans.

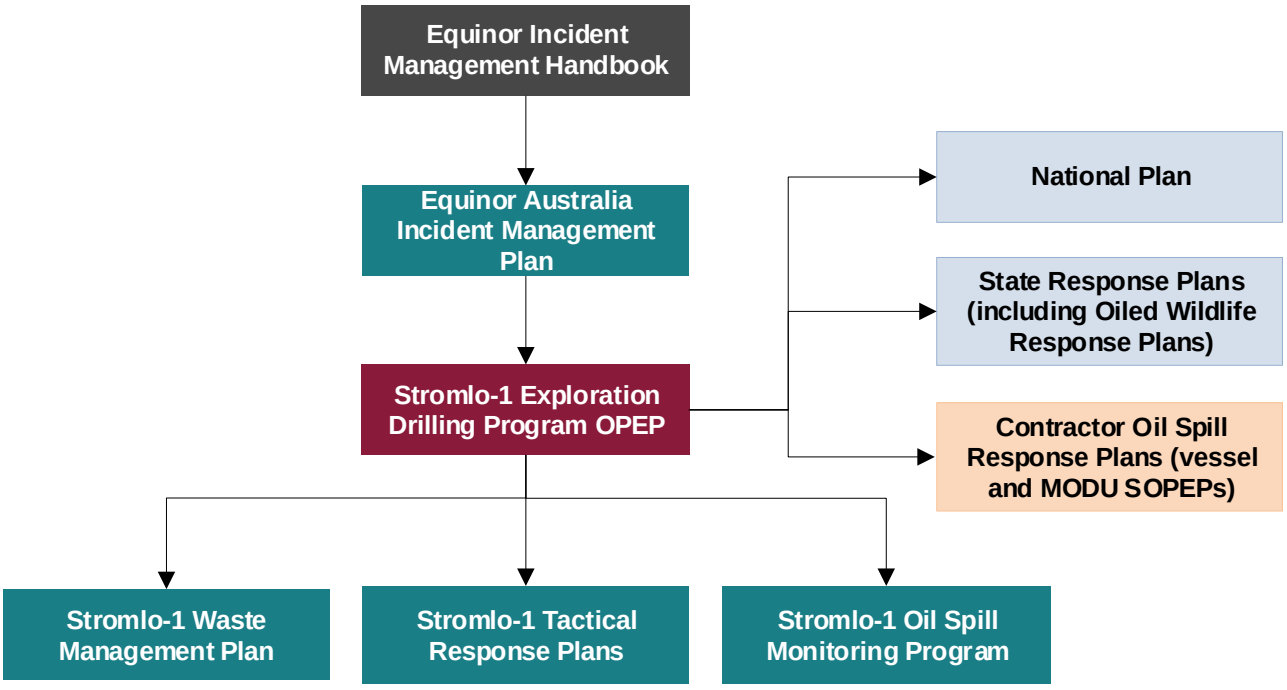


Figure 6.3 Interaction of this OPEP with Equinor, contractor and Australian agency plans

7.0 Spill response framework

7.1 Legislative context

The legislation that is relevant to oil spill incidents and response in both commonwealth and state waters is covered in Section 1.0 of the EP. This information has not been duplicated in this OPEP.

7.2 Equinor spill response organisation

The Equinor emergency response framework consists of three lines of response that correspond to the levels of oil spill response (Table 7.1). The response organisation for the Stromlo-1 exploration drilling program is in Figure 7.1. This figure shows how a response is escalated from the MODU/vessel Emergency Response Team (ERT) to the Equinor basic IMT organisation and finally to the Equinor CMT.

Equinor's basic IMT organisation will be expanded to support spill response, depending on the nature and scale of the spill. Figure 7.2 shows the additional IMT roles available to support when entering the reservoir. Equinor also has a GIMAT, which consists of more than 145 trained personnel throughout Equinor's global operations. GIMAT personnel will be mobilised to fulfil various response functions as required (Figure 7.3). Equinor's GIMAT includes Equinor's Source Control Branch, which is shown in full in Figure 7.4.

Table 7.1 Equinor spill response tiers and teams

Line	Team name	Respond to oil spill level	Type of response
1	Emergency Response Team (MODU/vessel)	Levels 1, 2 and 3	Combating and rescue
2	Equinor IMT (includes GIMAT and Source Control Branch)	Levels 2 and 3	Tactical guidance and support
3	Equinor CMT	Level 3	Strategic support

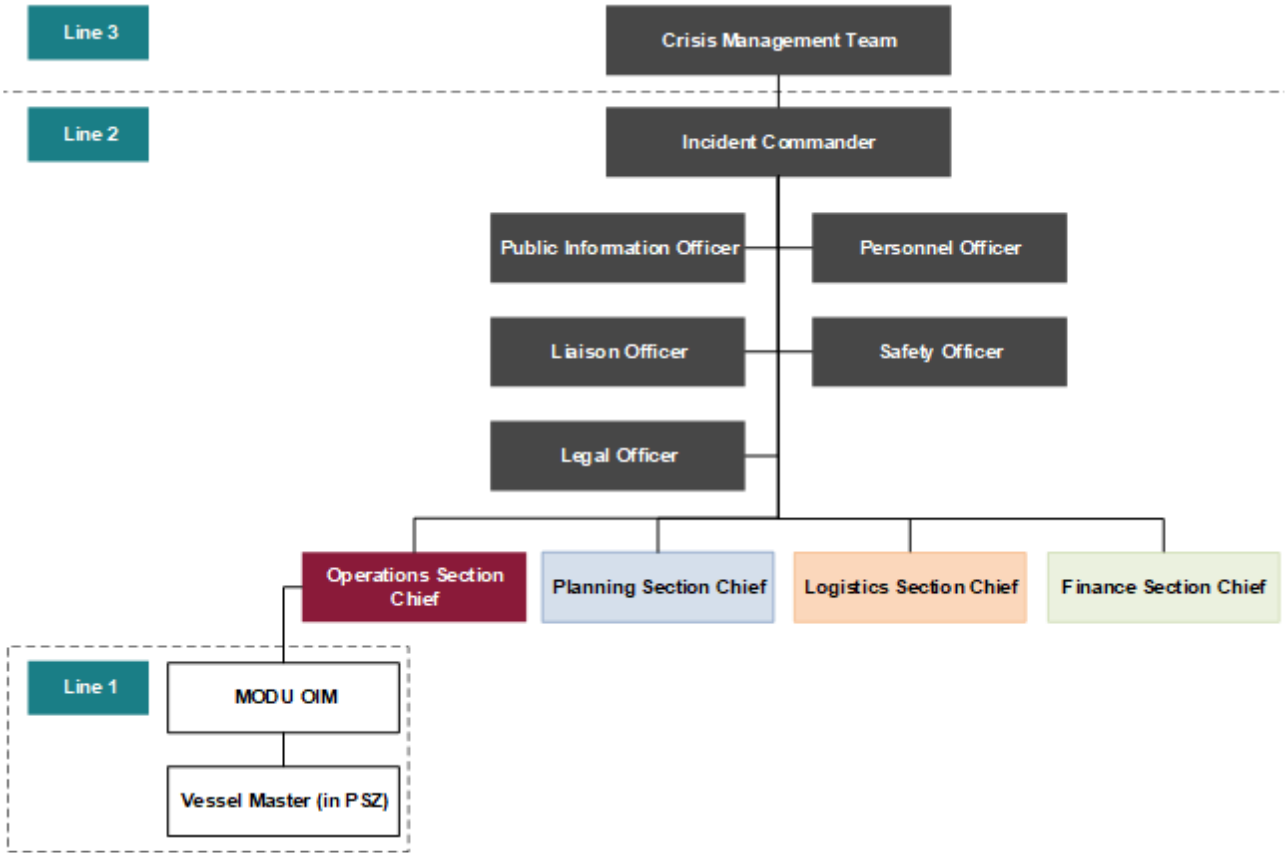


Figure 7.1 Equinor's Stromlo-1 response organisation

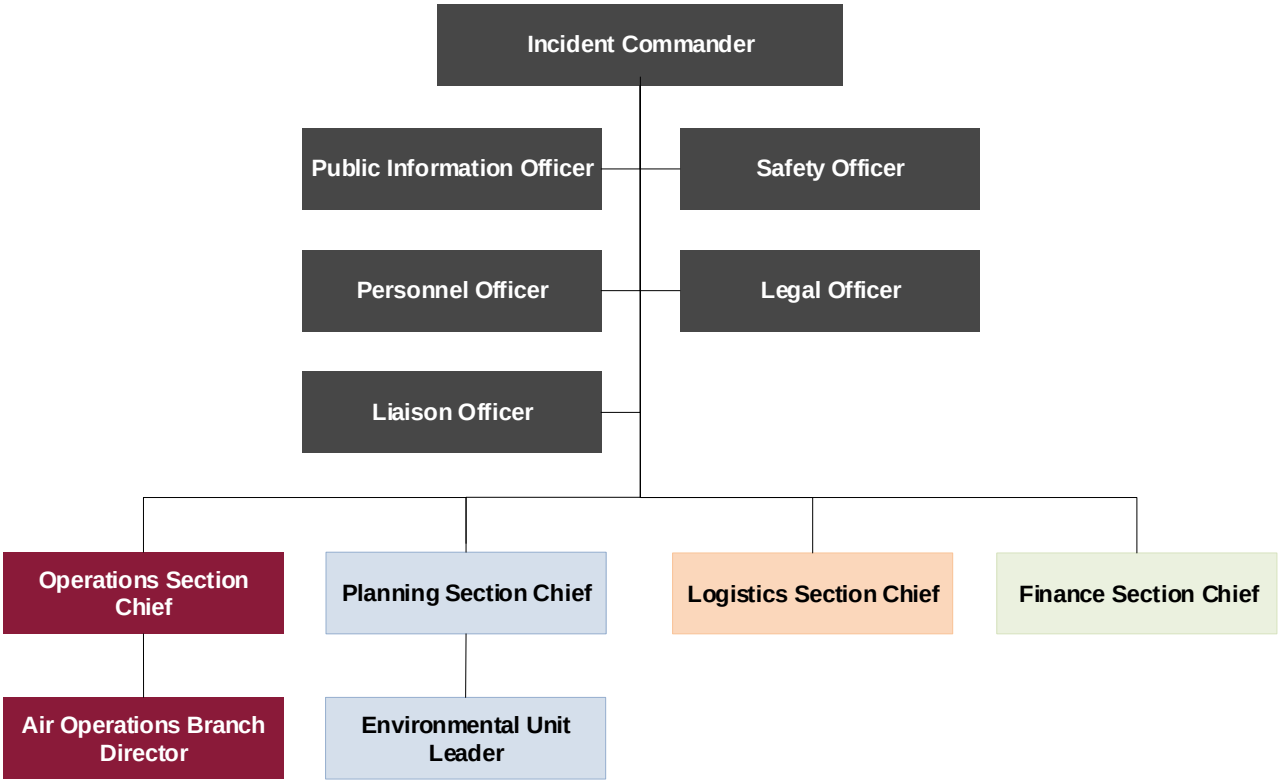
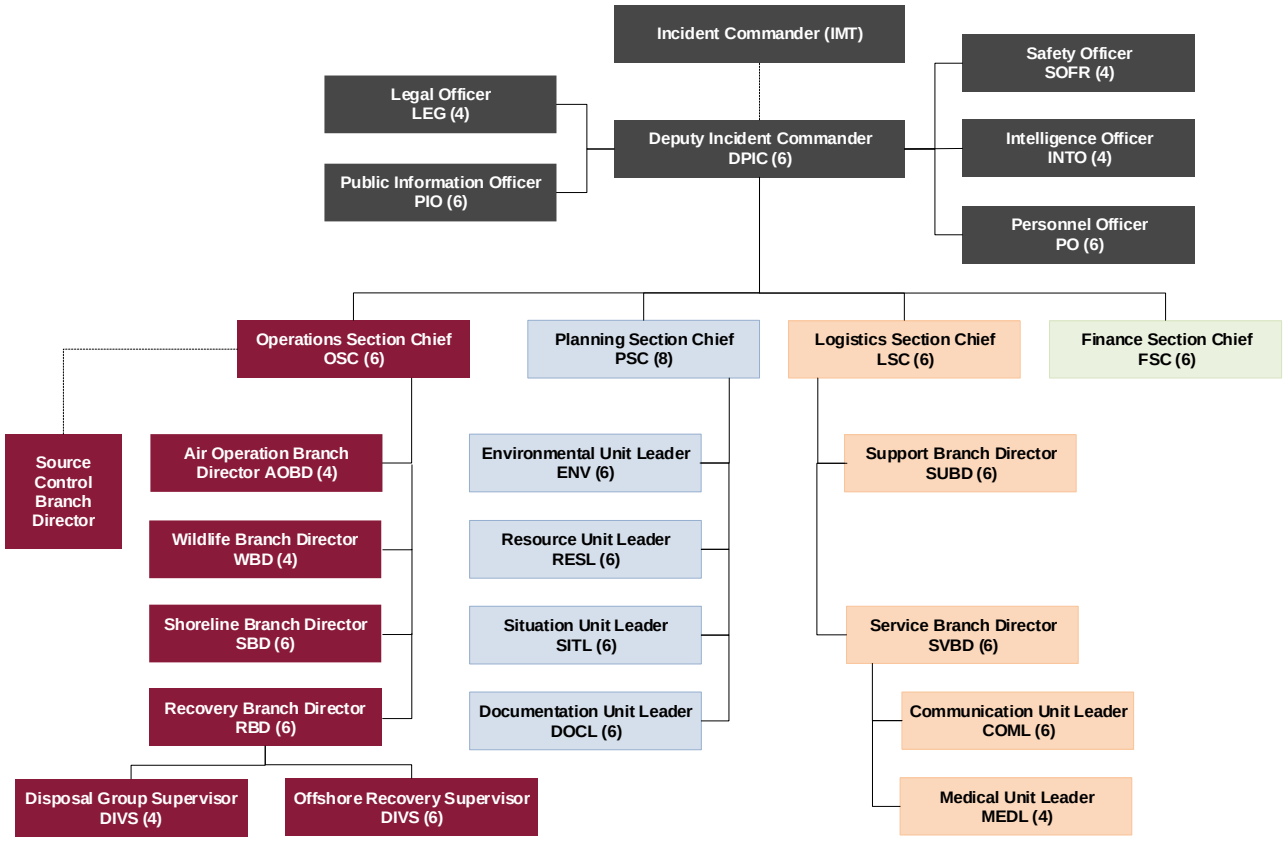


Figure 7.2 Equinor's reservoir IMT organisation



Note: The numbers in parentheses indicate the number of Equinor personnel able to fulfil the role.

Figure 7.3 Equinor's GIMAT organisation

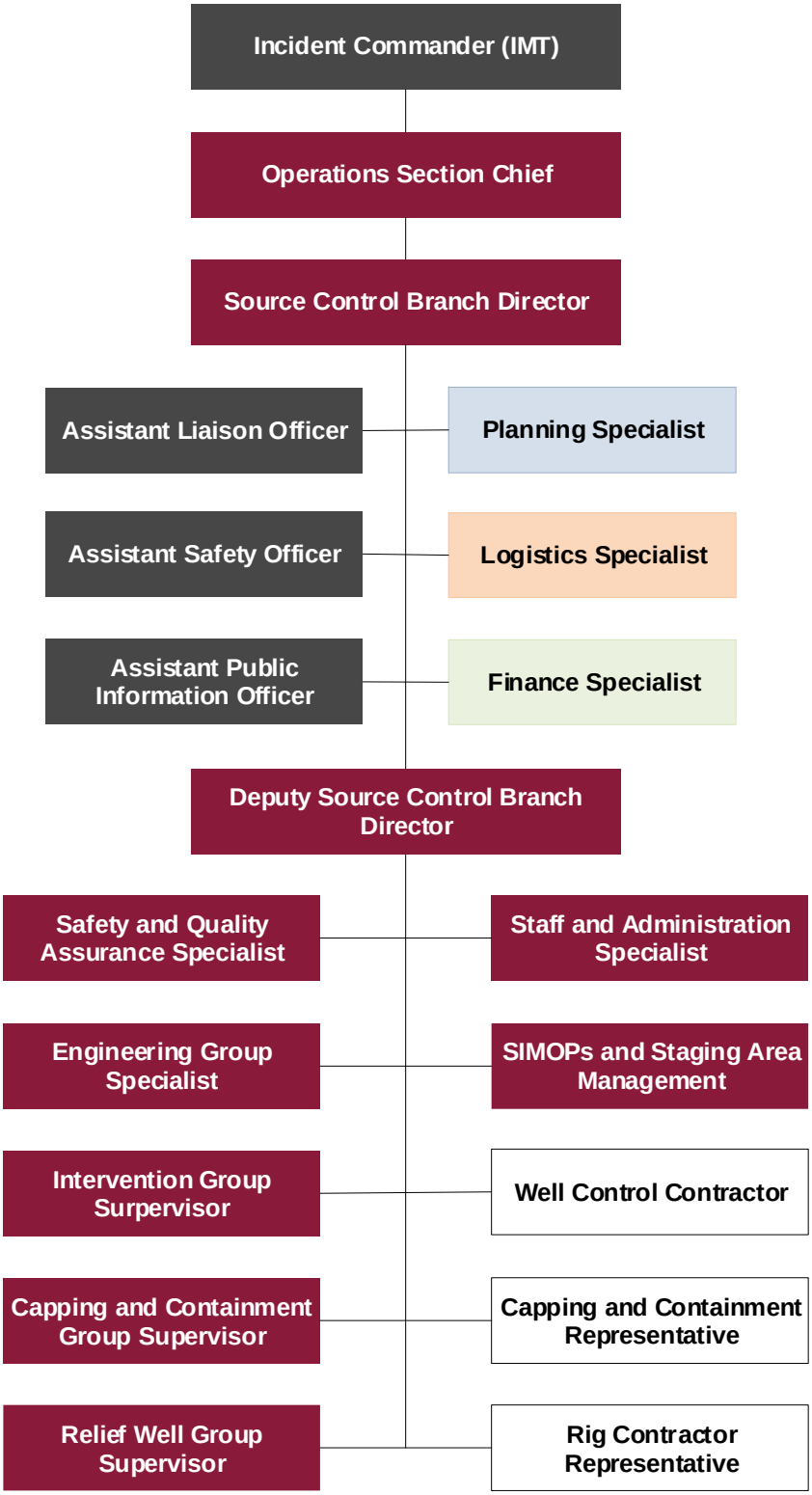


Figure 7.4 Equinor's Source Control Branch

7.3 Authorities and control agencies

Table 7.2 provides a summary of the designated statutory agencies/jurisdictional authorities and control agencies relevant to this OPEP for different levels and sources of spill.

Table 7.2 Summary of relevant statutory agencies/jurisdictional authorities and control agencies

Location	Source of spill	Statutory agency/ jurisdictional authority	Control agency	
			Level 1 spill	Level 2 or 3 spill
Commonwealth waters	MODU	NOPSEMA	Equinor	Equinor
	Support vessel	AMSA	Vessel owner	AMSA
Western Australia state coastal waters	MODU or vessel entering state waters	WA DoT		WA DoT
South Australia state coastal waters	MODU or vessel entering state waters	Department of State Development (DSD)		DPTI
Victorian state coastal waters	MODU or vessel entering state waters	VIC DoT		VIC DoT
Tasmanian state coastal waters	MODU or vessel entering state waters	EPA Tasmania)		EPA Tasmania
New South Wales state coastal waters	MODU or vessel entering state waters	NSW Maritime (Roads and Maritime Services)		NSW Maritime

7.3.1 AMSA

In the event of a spill from a vessel release in Commonwealth waters outside the PSZ, AMSA will be the control agency. Equinor will support the response if directed to by AMSA.

The overall responsibility for administration of the National Plan for Maritime Environmental Emergencies (National Plan) (AMSA 2019) lies with the AMSA. The National Plan defines national arrangements, principles and policies for responding to maritime emergencies. The Plan (and supporting documents) identifies how the Commonwealth, state, territory and industry organisational response capability framework integrates in an emergency.

7.3.2 Equinor

Equinor will be the control agency for spills from the MODU or support vessels within the Operational Area. Where a spill has the potential to enter state coastal waters, Equinor will enable the relevant state representative (or liaison officer) to engage with the Equinor IMT to facilitate communication and consultation. Equinor can provide relevant state representatives with access to the Equinor Incident Management System (IMS) which is based on the Incident Command System, to facilitate the sharing of information between Equinor and the state control agency.

If a spill enters state coastal waters, Equinor will hand control over to the relevant state control agency and support the control agency by providing equipment, trained personnel, technical specialists and training for unskilled personnel. The coordination of a cross-jurisdictional spill, including handover is briefly summarised in Section 7.3.8.

7.3.3 South Australia

The DPTI is the control agency for marine pollution in SA coastal waters (3 NM seaward of the territorial sea baseline). The DPTI will assume overall direction of emergency management activities in the event of an oil spill that enters SA coastal waters or is at risk of contacting the SA shoreline. Oil spill response in SA will be guided by the SA Marine Spill Contingency Action Plan (Government of South Australia 2016) that can be accessed via the Parliament of South Australia website (https://www.parliament.sa.gov.au/HouseofAssembly/BusinessoftheAssembly/RecordsandPapers/TabledPapersandPetitions/Pages/TabledPapersandPetitions.aspx?TPLoadDoc=true&TPDocType=0&TPP=53&TPS=2&TPItemID=604&TPDocName=DPTI%2bMarine%2bPlan.pdf).

In addition, SA emergency management arrangements and the SA State Emergency Management Plan can be accessed at https://www.dpc.sa.gov.au/what-we-do/services-for-government/security-and-emergency-management/state-emergency-management-plan.

The DEW has primary responsibility for wildlife impacted by marine pollution in SA state waters. The response by DEW will be guided by the South Australian Oiled Wildlife Response Plan (SAOWRP).

As for all state control agencies, Equinor will provide support capability as directed by the SA DPTI, which will include the update or development of TRPs, providing equipment, access to operational bases, logistics support and trained personnel and technical specialists.

7.3.4 Victoria

The DoT is control agency for oil spills that enter Victorian state waters. The Victorian State Maritime Emergencies (non-search and rescue) Plan is administered by DoT and provides strategic direction for the effective management of maritime emergencies including marine oil pollution. The objective of the plan is to ensure an integrated and coordinated approach to Victoria's management of maritime emergencies in order to reduce the impact and consequences of these events on the community, infrastructure and services and the environment. The plan is available via (https://www.emv.vic.gov.au/responsibilities/state-emergency-plans/state-maritime-emergencies-non-search-and-rescue-plan). Operational plans and supporting documents can be obtained via email request to marine.pollution@ecodev.vic.gov.au.

The DELWP has primary responsibility for wildlife impacted by marine pollution in Victorian state waters which will be defined in the Victorian Emergency Wildlife Plan for Marine Pollution (when completed) including linkage to the State Maritime Emergencies (non-search and rescue) Plan.

As for all state control agencies, Equinor will provide support capability as directed by the Victorian Government, which may include the update or development of TRPs, providing equipment, access to operational bases, logistics support and providing IMT personnel, field personnel, other trained personnel and technical specialists. Resources will be provided for the duration of the response, until the response is terminated by the state incident controller.

7.3.5 Tasmania

The Tasmanian Government has primary responsibility for the control of oil spills within Tasmanian state waters which either originate in Tasmanian waters or have the potential to impact on Tasmanian waters or shorelines. Within port waters the Tasmanian Ports Corporation (Tasports) will be the control agency. Outside of port waters the Tasmanian EPA is the control agency and Tasports will assist under Memorandum of Understanding (MOU) arrangements.

Tasmanian Marine Oil Spill Contingency Plan (TasPlan) is administered by the EPA Tasmania and is available on the EPA Tasmania website at http://epa.tas.gov.au/Documents/TasPlan.pdf. TasPlan is integrated with the National Plan, the Tasports Oil Spill Contingency Plan, the Tasmanian Emergency Management Plan and the Tasmanian Oiled Wildlife Response Plan (WildPlan).

In the event of a Level 2 or 3 spill, EPA Tasmania will provide an EPA Tasmania Liaison Officer, a Tasmanian GIS expert and an Environment Science Coordinator for inclusion in the Equinor IMT, so that Tasmanian priorities are considered throughout the response.

As for all state control agencies, Equinor will provide support capability as directed by Tasports and the EPA Tasmania, which may include the update or development of TRPs, providing equipment, access to operational bases, logistics support and trained personnel and technical specialists. Resources will be provided for the duration of the response, until the response is terminated by the state IC.

7.3.6 Western Australia

The WA DoT will be the control agency for oil spills in WA marine and inland waters. The WA DoT will assume overall direction of emergency management activities in the event of an oil spill that enters WA waters or is at risk of contacting the WA shoreline. Equinor will provide support capability as directed by the WA DoT, which may include the update or development of TRPs, providing equipment, access to operational bases, logistics support and trained personnel and technical specialists.

Oil spill response in WA is guided by the State Hazard Plan – Maritime Environmental Emergency (SHP-MEE) and the WA Oil Spill Contingency Plan (and supporting forms) that can be accessed at https://www.transport.wa.gov.au/imarine/oil-spill-contingency-plans.asp.

The Department of Parks and Wildlife is the lead agency in WA for oiled wildlife response within WA waters. Oiled wildlife response is implemented via the WA Oiled Wildlife Response Plan (DPAW 2014) that can be accessed at https://www.dpaw.wa.gov.au/images/documents/conservation-management/marine/wildlife/West_Australian_Oiled_Wildlife_Response_Plan_V1.1.pdf.

7.3.7 New South Wales

New South Wales Maritime is the control agency for marine pollution control incidents within state waters in accordance with the NSW State Emergency Management Plan (EMPLAN) and the NSW State Waters Marine Oil and Chemical Spill Contingency Plan which is a sub-plan of the EMPLAN. The NSW State Waters Marine Oil and Chemical Spill Contingency Plan can be accessed from the Emergency New South Wales website at https://www.emergency.nsw.gov.au/Pages/publications/plans/sub-plans/state-waters-marine-oil-and-chemical-spill-contingency-plan.aspx.

As for all state control agencies, Equinor will provide support capability as directed by NSW Maritime, which may include the update or development of TRPs, providing equipment, access to operational bases, logistics support and trained personnel and technical specialists.

7.3.8 Cross-jurisdictional response

The management and coordination of cross-border incidents will follow the National Plan Coordination of Cross-border Incidents Guideline (NP-GUI-023) (AMSA 2017a). The guideline recommends the following steps, which Equinor will follow:

Step 1: **REVIEW** the situation. Maintain situational awareness and evaluate situation information. Determine if another jurisdiction is likely to be exposed to an oil spill from the incident.

Step 2: **NOTIFY** adjacent jurisdictions at the earliest opportunity.

Step 3: **ESTABLISH** coordination arrangements (e.g. with State Marine Pollution Controllers) to establish and agree coordination arrangements and where necessary agree a “lead jurisdiction”. All decisions will be documented.

Step 4: **PREPARE** a formal coordination plan. The plan should be formally agreed by relevant Marine Pollution Controllers, and include:

- information on maintenance of the common operating picture
- agreed response priorities
- how resources will be allocated (including National Plan resources)
- strategy for the management of media and public information
- a government communications strategy
- agreed arrangements and triggers for transfer of control agency, which will follow the National Plan Change of Control Agency Protocol (NP-GUI-022) (AMSA 2017b).

Step 5: IMPLEMENT the agreed plan.

Following transfer of incident control from Equinor to the state control agency, Equinor will remain actively engaged in the response until stood down by the relevant State Marine Pollution Controller.

In the event of a major oil spill, a cross-jurisdictional response may be required if modelling data indicates that a spill could cross into state coastal waters. The Equinor IMT will engage with state agencies according to the requirements in State Emergency Response Plans.

7.4 Consultation

Statutory notifications required in the event of a hydrocarbon spill are covered in Table 2.1 (diesel spills) and Table 3.1 (oil spills). In addition, Equinor will work with agencies that have jurisdictional or other legislative responsibilities for marine oil spills to communicate with relevant stakeholders and the broader community who may be affected in an oil pollution emergency (Table 7.3).

Equinor's Public Information Officer in the Incident Management Team will receive briefings from the Incident Commander to disseminate information to external stakeholders and provide regular updates. Initial contact will be via phone calls followed by a daily teleconference dial-in to provide an update. The objective of the communications is to initiate consultation by providing relevant persons and the broader community with timely, accurate and factual information in the event of an oil pollution incident.

To further inform how individuals might be affected, the following updates will be made to the project website on a daily basis:

- one-day and seven-day trajectory models
- copies of media releases.

Information on how to seek further information in regard to specific issues and/or compensation claims will be provided on the project site, allowing for self-identification of stakeholders, including Relevant Persons, who may be potentially affected by an oil pollution emergency. The Public Information Officer will assemble an appropriately scaled team to provide for ongoing consultation with potentially affected stakeholders.

The Public Information Officer will also request that the following three bodies contact their members to advise as to how to seek information that might help in protecting their interests; Wildcatch Fisheries SA, Commonwealth Fisheries Association and Seafood Industry Australia. In addition, he/she will initiate regional radio broadcasts and place print advertisements with relevant information, request AMSA provide updates to vessels in the area, request ASFMA use VMS to identify and contact as necessary any fishing vessels adeemed at risk, ensure AIS is monitored, and broadcast emergency advice across emergency marine channels twice a day.

Table 7.3 Summary of relevant statutory agencies, jurisdictional authorities, control agencies and Relevant Persons

Stakeholder	Responsible party	Notifications	Method	Timing
All relevant persons and coastal councils in Risk EMBA	Public Information Officer	Email notification as soon as possible following a level 2 or 3 spill followed by daily email updates. Contact details as per consultation database.	Written	Within first 24 hours, then daily updates
Australian Fisheries Management Authority	Public Information Officer	Email notification following a level 2 or 3 spill. Initial notification to include request to check vessel monitoring system (VMS) and advise of nearby fishing vessels. Contact details as per consultation database. 24 hour number: 1800 274 634 info@afma.gov.au	First contact verbal and written, then written thereafter	Within first 24 hours, then daily updates
Commonwealth Fisheries Association	Public Information Officer	Email notifications following a level 2 or 3 spill. Initial notification to include specific request to notify their members and details of the latest trajectory modelling. Contact details as per consultation database (already a Relevant Person).	Written	Within first 24 hours, then daily updates
Seafood Industry Association	Public Information Officer	Email notifications following a level 2 or 3 spill. Initial notification to include specific request to notify their members and details of the latest trajectory modelling. Contact details as per consultation database (already a Relevant Person).	Written	Within first 24 hours, then daily updates

Stakeholder	Responsible party	Notifications	Method	Timing
Wildcatch Fisheries South Australia	Public Information Officer	As above	Written	Within first 24 hours, then daily updates
Broader community	Public Information Officer	Media release distributed via media channels and placed on Equinor's website.	Media release	Within first 24 Hours, then daily updates
		Media broadcasts with regional radio stations	Phone advice to stations	Within first 24 hours then daily updates
Departments or agencies Co-ordinated communications with relevant agencies communications teams via daily communication updates.				
Australian Maritime Safety Authority, Commonwealth	Public Information Officer	Initial notification to include request to provide updates to nearby vessels. +61 1300 624 633 media@amsa.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Defence/ Australian Hydrographic Office (AHO), Commonwealth	Public Information Officer	+61 2 6127 1999 media@defence.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Environment and Energy, Director of National Parks, Commonwealth	Public Information Officer	+61 417 256 971 kate.mathias@environment.gov.au	Verbal	Within first 24 hours, then daily updates
Department for Energy and Mining, SA	Public Information Officer	+61 8 8463 3000 dismedia@sa.gov.au	Verbal	Within first 24 hours, then daily updates
NOPSEMA	Public Information Officer	+61 476 827 635 communications@nopsema.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Industry Innovation and Science, Commonwealth	Public Information Officer	+61 2 6213 6308 media@industry.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Planning, Transport and Infrastructure, SA	Public Information Officer	1300 856 933 DLDPTIPBDmedia@sa.gov.au	Verbal	Within first 24 hours, then daily updates
Department for Environment and Water, SA	Public Information Officer	+61 8 8463 7412 jill.freear@sa.gov.au	Verbal	Within first 24 hours, then daily updates
Environment Protection Authority, SA	Public Information Officer	+61 422 004 677 Keith.Baldry@sa.gov.au	Verbal	Within first 24 hours, then daily updates
SA Police	Public Information Officer	+61 8 7322 3848 sapol.mediasection@police.sa.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Transport, Vic	Public Information Officer	+61 409 858 715 semdincidentroom@ecodev.vic.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Environment, Land, Water and Planning, Vic	Public Information Officer	+61 428 310 997 ewan.cook@delwp.vic.gov.au media@delwp.vic.gov.au	Verbal	Within first 24 hours, then daily updates

Stakeholder	Responsible party	Notifications	Method	Timing
Environment Protection Authority, Tas	Public Information Officer	+61 428 202 622 media@epa.tas.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Primary Industries, Parks, Water and Environment, Tas	Public Information Officer	+61 3 6165 3058 dpipwe.media@dpipwe.tas.gov.au	Verbal	Within first 24 hours, then daily updates
NSW Maritime	Public Information Officer	+61 2 9462 6299 media@rms.nsw.gov.au	Verbal	Within first 24 hours, then daily updates
Department of Transport, WA	Public Information Officer	+61 413 557 887 media@transport.wa.gov.au	Verbal	Within first 24 hours, then daily updates

8.0 Spill scenarios and response options

8.1 Types of and characteristics of hydrocarbons

These sections provide a high-level summary of the oil spill modelling (RPS 2019) conducted during preparation of the EP and this OPEP.

Marine diesel and crude oil were the two types of hydrocarbon identified as being associated with a potential unplanned spill during the activity. The physical characteristics for marine diesel and Statfjord-C blend crude oil are summarised in Table 8.1. Boiling point ranges are provided in Table 8.2 and weathering characteristics are presented in Table 8.3.

Marine diesel oil is a light petroleum distillate and given the environmental conditions at the Stromlo-1 location, it is predicted to undergo rapid entrainment and evaporative loss and consequently will degrade rapidly.

Since the exact properties of the Ceduna sub-basin reservoir oil are unknown, Equinor used geological analogues and modelling for the Stromlo-1 area to calculate the most likely oil type that may be encountered. Based on the analysis, Statfjord-C blend crude oil was selected as being an appropriate analogue for the assessment. The physical characteristics of Statfjord-C categorise it as a Group 2 (or medium persistent) oil according to both oil classifications for AMSA (2015) and the International Tanker Owner Pollution Federation (ITOPF 2014).

Table 8.1 Physical characteristics for marine diesel and Statfjord-C blend crude oil

Characteristic	Marine diesel	Statfjord-C blend crude
Density (kg/m^3)	829 at 15 °C	830 at 15 °C
API	37.6	38.8
Dynamic viscosity (cP)	4.0 at 25 °C	4.51 at 20 °C
Pour point (°C)	-14	-24
Oil property category	Group II	Group II
Oil persistence classification	Light-persistence oil	Medium-persistence oil

Table 8.2 Boiling point ranges for marine diesel and Statfjord-C blend crude oil

Fraction	Boiling point (°C)	Persistence	Marine diesel	Statfjord-C blend crude oil
Volatiles (%)	<180	Non-persistent	6.0%	30.6%
Semi-volatiles (%)	180–265	Non-persistent	34.6%	15.3%
Low volatiles (%)	265–380	Non-persistent	54.4%	21.3%
Residual (%)	>380	Persistent	5%	32.9%

Table 8.3 Fate of spilled hydrocarbons

Fate process	Marine diesel	Statfjord-C blend crude oil
Spreading	Rapid	Rapid
Evaporation	High	Moderate
Dissolution	Slight	Slight
Dispersion	High	Moderate-High

Fate process	Marine diesel	Statfjord-C blend crude oil
Emulsification	Slight	Moderate
Sedimentation	Low	Little
Biodegradation	Not Important	Potentially important
Photo-oxidation	Little	Little

Source: adapted from Hook et al. 2016.

8.2 Fate and trajectory of spilled hydrocarbons

8.2.1 Diesel spill from offshore vessel

In the marine environment diesel tends to spread rapidly in the direction of the prevailing wind and currents. Evaporation is likely to be the dominant process when on the sea surface. Entrainment of diesel, which will be driven by wind and wave action, will also result in a significant reduction in hydrocarbon mass on the sea surface. As diesel will spread quickly to form a thin surface layer, only relatively small amounts will become entrained over a relatively large area. These hydrocarbons will then be entrained and then diluted within a large volume of water (mainly the upper 10 m of the water column, though potentially down to 20 to 30 m water depth).

Equinor has identified that the largest volume of a single storage tank on an appropriately sized PSV is likely to be around 150 m^3 (based on the largest tank of the Solstad Offshore ASA OSV Normand Installer). To adopt a conservative approach, because the vessels have not been selected yet, a volume of 250 m^3 was assessed.

ADIOS weathering assessment undertaken for a 250 m^3 diesel spill indicates with wind speeds at 40 km/h the entire volume will evaporate or entrain in less than 15 hours. At a reduced wind speed of 20 km/h, the time taken for the spilled diesel to weather approximately doubles to just less than 30 hours.

Surface oil travels at approximately 3% of the wind speed, with surface currents adding up to an additional 22 km per day. This information was used to calculate the maximum linear distance travelled by the surface oil until it has completely evaporated or entrained, which was 45.5 km (24.6 NM). Given the minimum distance to state waters is 367 km (198 NM), a surface release within the PSZ will not reach state waters or the waters of the continental shelf.

8.2.2 Loss of well control

8.2.2.1 Stochastic modelling – unmitigated worst case discharge

This scenario is based on an unrestricted open hole flow during a loss of well control event, with an average sub-sea release rate of 8,943 m^3/day over 129 days (WCD_{129d}) tracked for an additional 60 days. Stochastic modelling of the unmitigated WCD_{129d} scenario was used to determine the potential extent of oil exposure on the sea surface (Figure 8.1) and the potential shoreline loading of weathered oil (Figure 8.2). Deterministic runs for the 'fastest shoreline contact' (Table 8.4) and greatest shoreline accumulation (Figure 8.3) were used for spill response planning. These runs were used to predict minimum time to shoreline contact to allow assessment of response timeframes, and to determining the response need based on the level of shoreline accumulation, shoreline type and shoreline accessibility to support robust determination of response resource requirements.

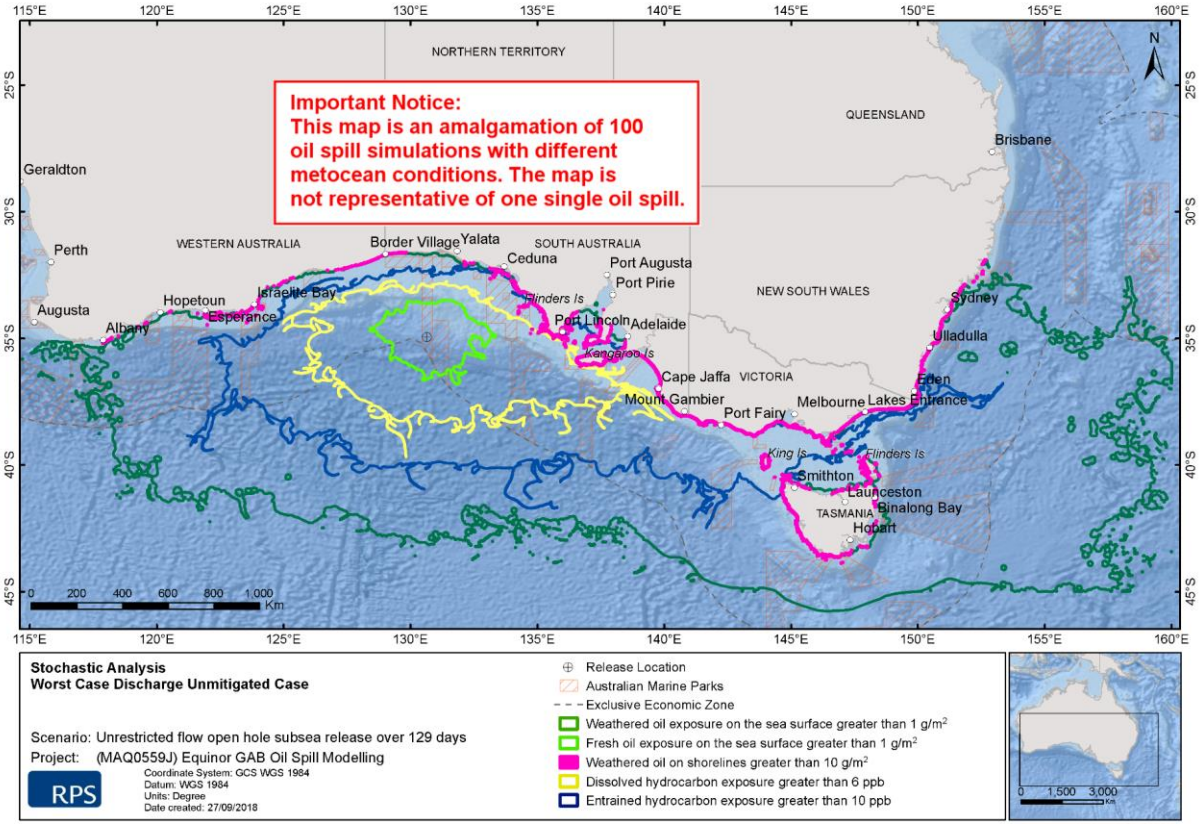


Figure 8.1 Unmitigated stochastic analysis of potential oil exposure on the sea surface (WCD_{129d})

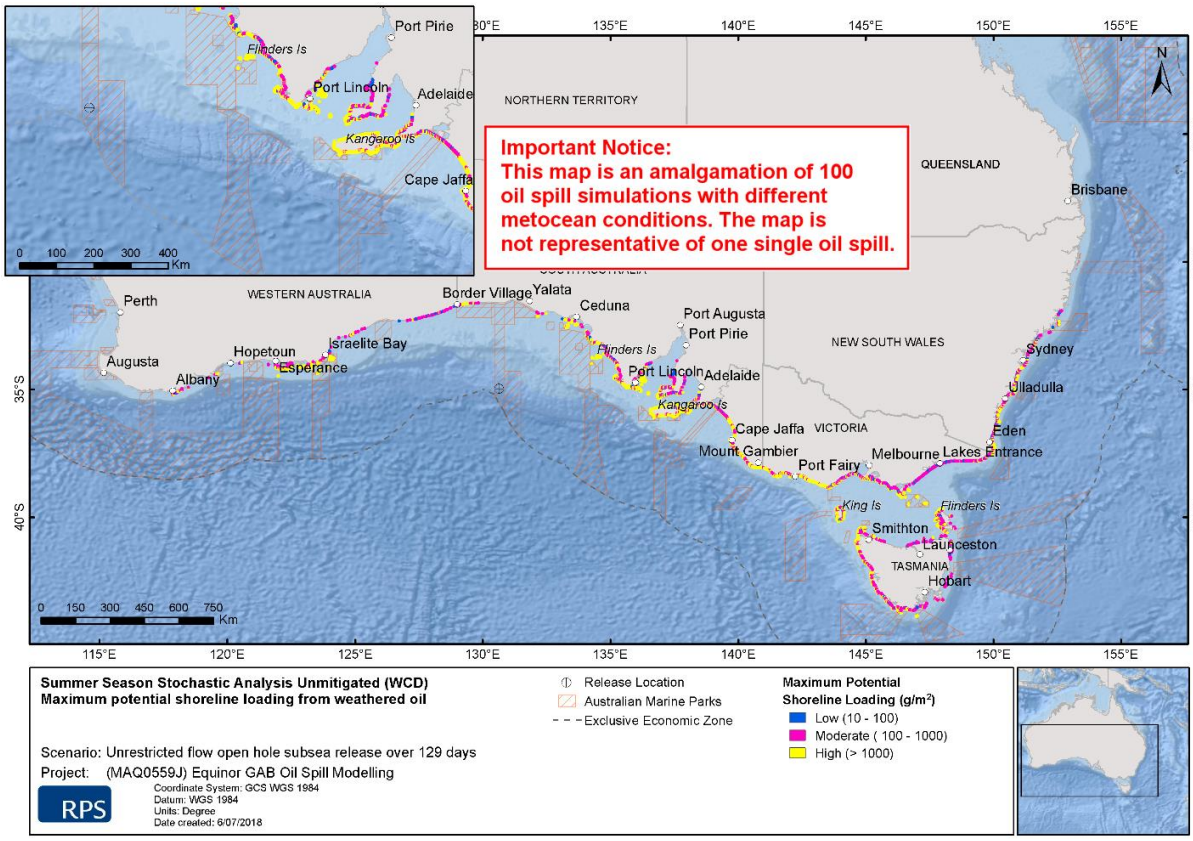


Figure 8.2 Unmitigated stochastic analysis of potential shoreline loading (WCD_{129d})

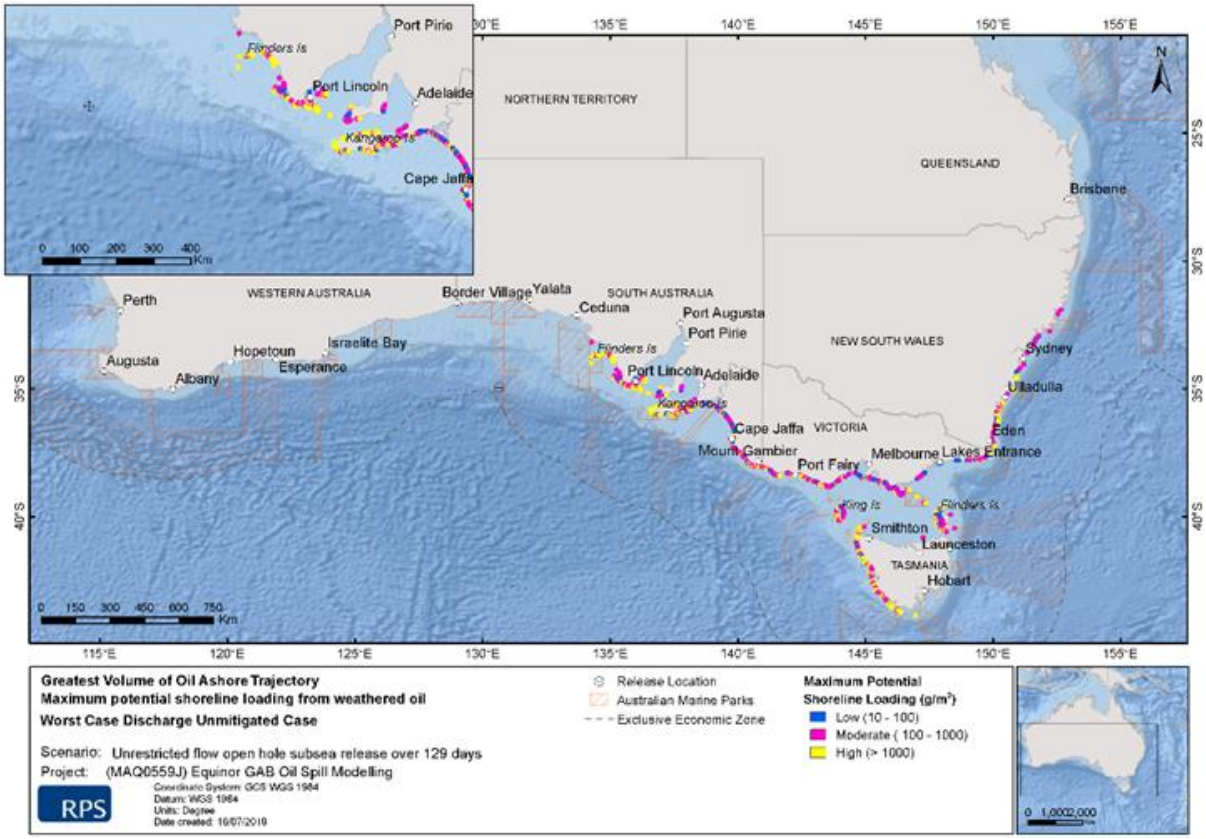


Figure 8.3 Unmitigated greatest shoreline accumulation deterministic analysis of potential shoreline loading (WCD_{129d}), commencing 26 April 2009 at 06:00 hrs

Table 8.4 Probability, minimum time and loading of weathered oil contact to shorelines for each state, at varying thresholds, for the unmitigated WCD_{129d} stochastic modelling

State	Probability of shoreline contact (%)			Minimum time before shoreline contact (days)			Load on shoreline (g/m^2)	Volume on shoreline (m^3)		Mean length of shoreline contacted			Maximum length of shoreline contacted (km)		
	Low	Mod.	High	Low	Mod.	High	Mean	Mean	Peak	Low	Mod.	High	Low	Mod.	High
Western Australia	30	30	27	56	56	58	5,144	1,864	11,679	84	81	60	342	318	188
South Australia	100	100	100	21	21	21	27,005	108,373	208,427	1,380	1,302	941	1,905	1,808	1,347
Victoria	96	96	92	44	44	44	13,490	25,954	62,553	571	512	328	905	828	592
Tasmania	85	85	85	55	55	55	7,933	14,764	67,742	537	505	307	1,027	987	717
New South Wales	51	51	45	105	105	110	1,389	101	532	43	39	15	209	181	68

8.2.2.2 Stochastic modelling – unmitigated worst credible case discharge

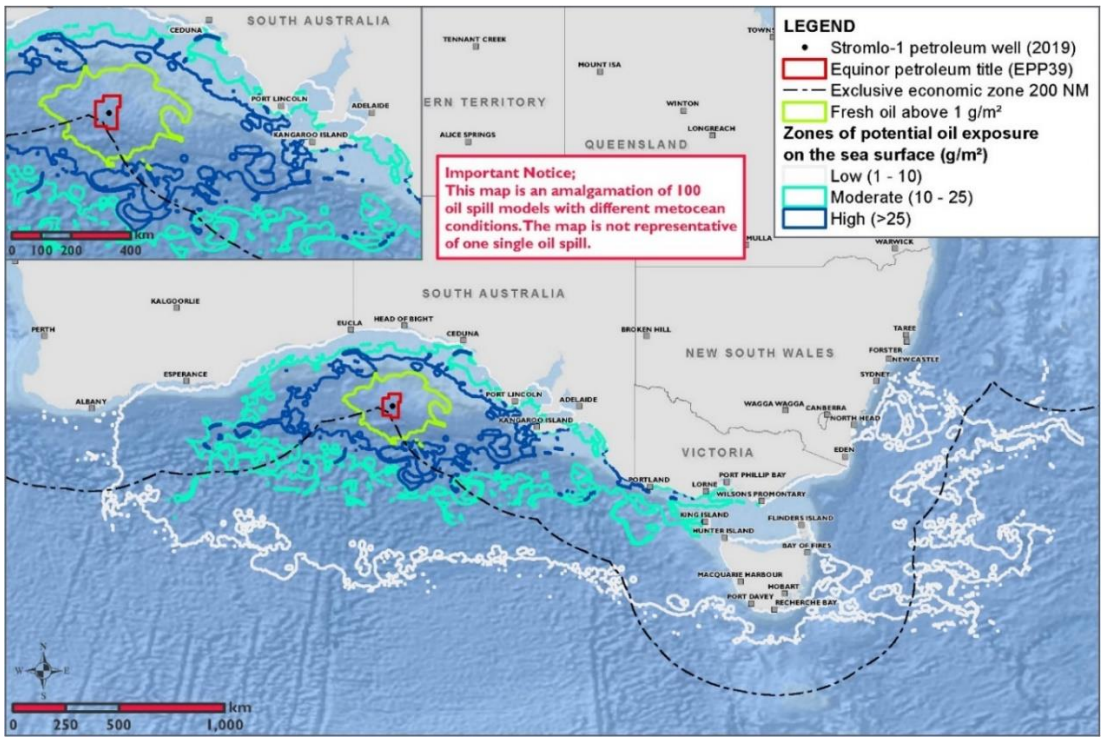
This scenario is based on unrestricted annulus flow during a loss of well control, with an average sub-sea release rate of 6,720 m^3/day over 102 days ($WCCD_{102}$) and tracked for an additional 60 days. Stochastic modelling of the unmitigated $WCCD_{102d}$ scenario was used to represent the potential oil exposure on the sea surface (Figure 8.4) and the potential shoreline loading of weathered oil (Figure 8.5).

Figure 8.4 shows that the potential fresh oil exposure on the sea surface (>1 g/m^2; prior to emulsification or evaporation of all volatile components) remains offshore, greater than 155 km from the nearest shorelines for all simulations. Beyond this zone would be a large sea surface area potentially affected by weathered oil, increasingly degraded with distance from the well.

The drift of the slick generally extends to the east of the well, indicating potentially high concentrations (>25 g/m^2) of surface oil near Ceduna, Port Lincoln, Kangaroo Island and Mount Gambier in SA and south-east of Port Fairy in Victoria. The zone of potential moderate concentrations (10–25 g/m^2) of surface oil occurs closest to shore near Ceduna and Port Adelaide and extends partway into Spencer Gulf. It also extends close to the coast from Kangaroo Island to Mount Gambier, and then from Mount Gambier to Wilsons Promontory in Victoria. Potential low concentrations (1–10 g/m^2) of weathered surface oil generally extend along the coastline from west of Hopetoun in WA to north of Eden in NSW and includes Tasmania.

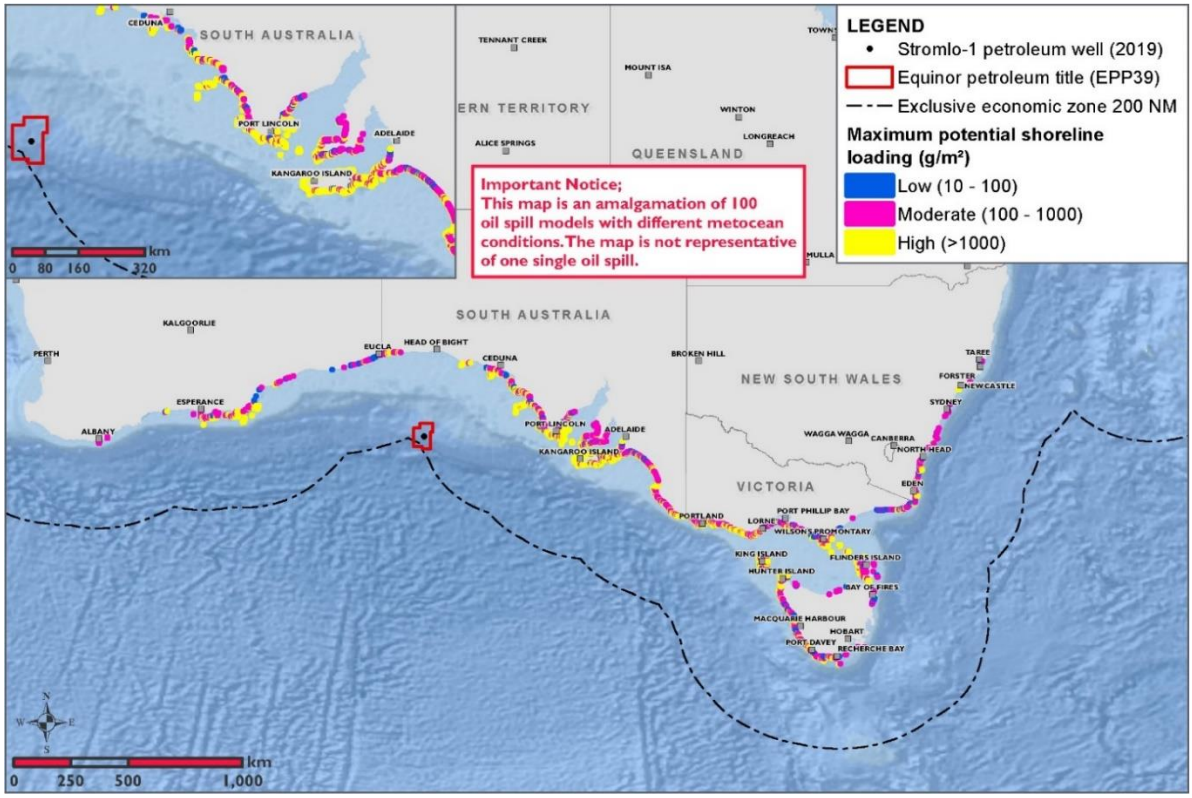
Figure 8.5 shows the potential shoreline loading of weathered oil (from the 100 simulations), which covers areas from Albany in WA to approximately Coffs Harbour in NSW and includes Tasmania. In WA the areas with potentially higher loadings generally occur between Esperance and Israelite Bay. High shoreline loadings cover a greater area in SA and are generally concentrated from Flinders Island east to Kangaroo Island. Smaller isolated areas with potentially high shoreline loadings occur near Border Village, Fowlers Bay, Ceduna, Cape Jaffa and Mount Gambier. In Victoria, shoreline loadings appear highest from the western state border to the Cape Otway region, and then at Mornington Peninsula, Wilsons Promontory. Flinders Island, King Island and north-west of Smithton are areas that could potentially receive the highest shoreline loadings for Tasmania. Potentially high shoreline loadings in NSW occur near Eden, Bateman's Bay and Newcastle north of Sydney.

Information on shoreline loadings and minimum time to contact that have been used for spill response planning are provided in Table 8.4. The minimum time to shoreline contact for each state is visually represented in Figure 9.1, along with estimated time frames for the oil spill response strategy.



Note: Based on combining 100 spills of unrestricted annulus flow sub-sea for 102 days and then tracked for an additional 60 days.

Figure 8.4 Unmitigated stochastic analysis of potential oil exposure on the sea surface ($WCCD_{102d}$)



Note: Based on combining 100 spills of unrestricted annulus flow sub-sea over 102 days plus 60 days.

Figure 8.5 Unmitigated stochastic analysis of potential shoreline loading from weathered oil ($WCCD_{102d}$)

Table 8.5 Probability, minimum time and loading of weathered oil contact to shorelines for each state, at varying thresholds, for the unmitigated and mitigated $WCCD_{102d}$ stochastic modelling

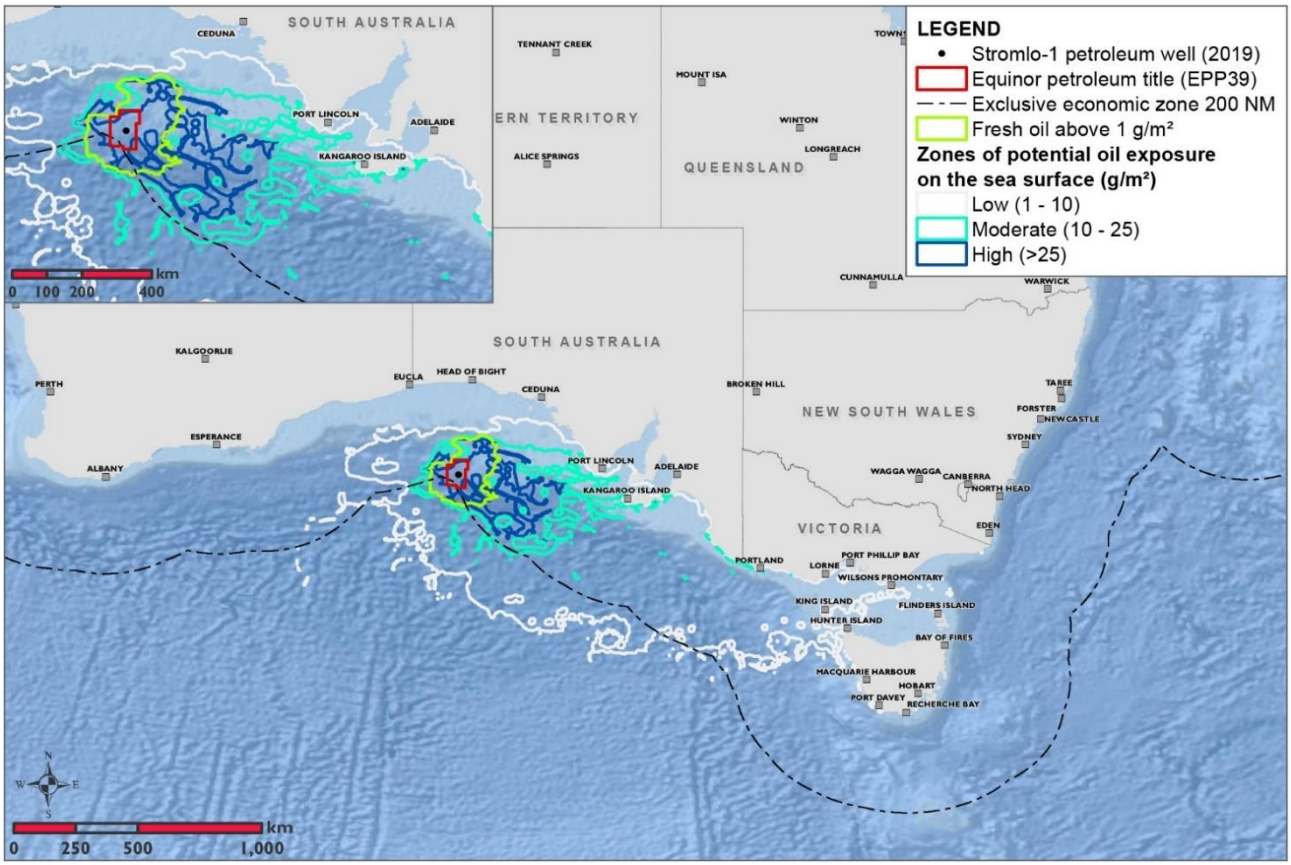
State	Unmitigated							Mitigated						
	Probability of shoreline contact (%)			Minimum time before shoreline contact (days)			Load on shoreline (g/m²)	Probability of shoreline contact (%)			Minimum time before shoreline contact (days)			Load on shoreline (g/m²)
	Low	Moderate	High	Low	Moderate	High	Mean	Low	Moderate	High	Low	Moderate	High	Mean
Western Australia	24	24	24	55.8	55.8	61.4	4776	22	22	21	56.1	57.9	58.5	2,610
South Australia	100	100	100	21.4	21.4	21.5	16,400	100	100	100	21.0	21.0	21.5	7,131
Victoria	84	84	82	43.7	43.7	43.8	8610	81	80	80	43.7	43.7	43.8	3,291
Tasmania	72	72	68	54.7	54.7	54.9	5558	66	66	62	54.6	54.6	55.0	2,793
New South Wales	31	30	22	110.1	110.1	129.2	1200	12	11	6	109.1	109.1	110.1	922

8.2.2.3 Deterministic modelling – unmitigated $WCCD_{102d}$ for "fastest time to shore"

Of the 100 spills from the stochastic results, a single deterministic simulation was selected to further investigate potential environmental impacts and the effects of identified spill response methods. The complete set of deterministic modelling runs for all states are available in the Oil Spill Modelling Study (RPS 2019). The "fastest time to shore" simulation for SA is described in this OPEP as it represents the shorelines predicted to be contacted by weathered oil first.

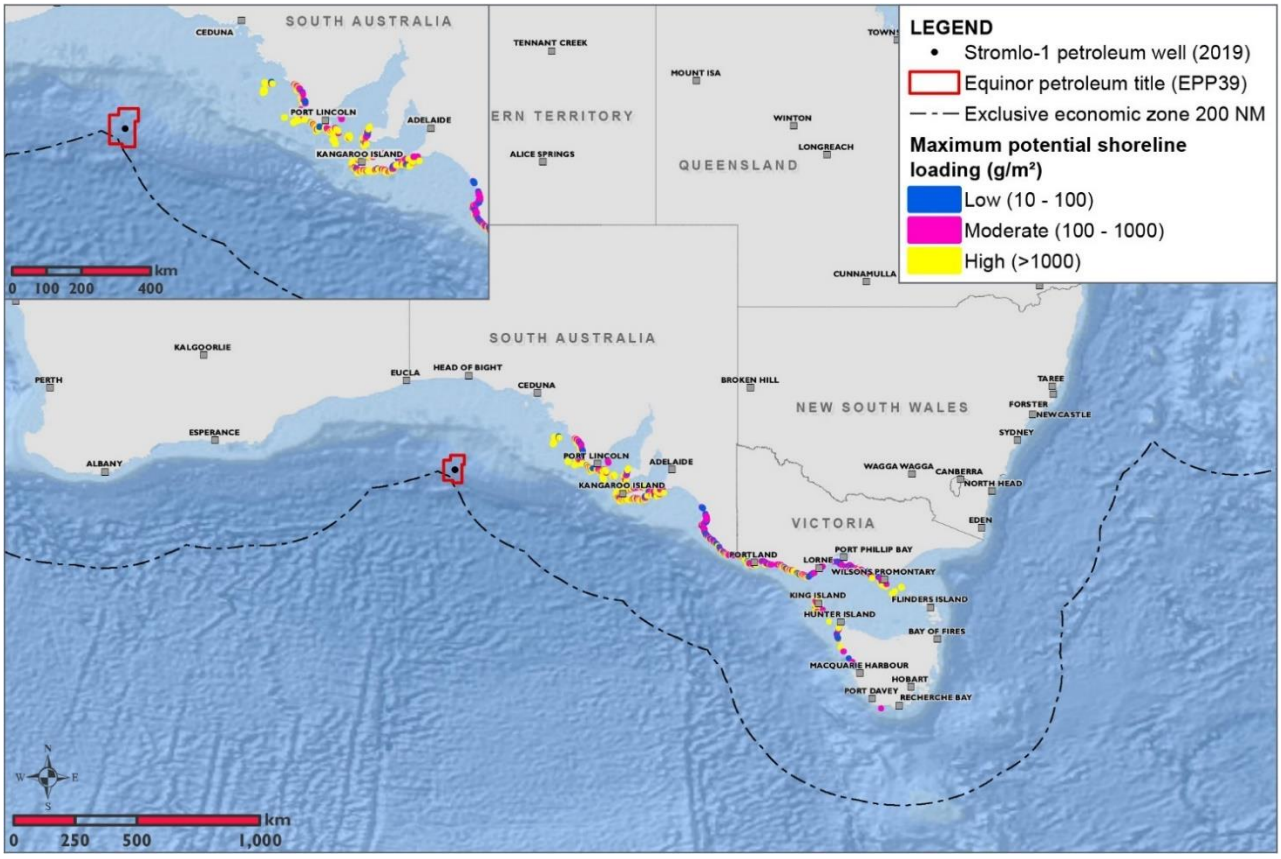
The oil exposure on the sea surface for the unmitigated "fastest time to shore" simulation is shown in Figure 8.6 and shoreline loading is in Figure 8.7. Figure 8.6 shows that no fresh oil or weathered surface oil of high concentration (>25 g/m^2) encroaches on the SA shoreline. Potential sea surface oil concentrations are moderate (10–25 g/m^2) near Coffin Bay National Park and Port Lincoln, Kangaroo Island, and approximately Cape Jaffa to Mount Gambier. Along the rest of the SA shoreline, surface oil concentrations are low (1–10 g/m^2) and below levels that would harm marine fauna.

Oil will be weathered by the time it reaches the shoreline; however, it would accumulate over time. Weathered oil is predicted to first contact the Eyre Peninsula and Talia shorelines after 21 days and Kangaroo Island after 31 days. Weathered oil does not contact the shoreline in other parts of SA for months. Figure 8.7 shows that potentially high shoreline loadings (>1000 g/m^2) predominantly occur from Flinders Island to the Yorke Peninsula and including Kangaroo Island.



Note: This is based on relief well success at end of day 102.

Figure 8.6 Unmitigated deterministic simulation of oil exposure on the sea surface for "fastest time to shore" run from $WCCD_{102d}$



Note: This is based on relief well success at end of day 102.

Figure 8.7 Unmitigated deterministic simulation of shoreline loading for "fastest time to shore" run from $WCCD_{102d}$

8.2.2.4 Deterministic modelling – mitigated $WCCD_{102d}$ for "fastest time to shore"

The deterministic simulations for the $WCCD_{102d}$ were also run with spill response methods in place to test the effectiveness and impact of the measures. This involved incorporating the application of aerial and sub-sea dispersant into the simulations, along with the selected source control options (BOP, capping stack). Other response methods such as containment and recovery were not accounted for in the modelling but would further reduce potential impacts. The mitigated deterministic simulations show that the use of sub-sea dispersant will be particularly effective in mitigating the impacts from a loss of well control event. This is consistent with the Deepwater Horizon experience. It is also notable that the "fastest time to shore" simulation represents the worst 1% of the modelled outcomes.

Figure 8.8 shows the oil exposure on the sea surface for the "fastest time to shore" simulation with aerial and sub-sea dispersant applied. The sub-sea dispersant reduced the oil droplet sizes, causing a greater volume of oil to remain entrained in the water-column and biodegrade faster than surface oil. This significantly reduces the weathered oil concentrations to <10 g/m^2 in all areas adjacent the shoreline, with the exception of Port Adelaide where concentrations remain between 10–25 g/m^2. The closest areas to shore with oil concentrations 10–25 g/m^2 are offshore of Port Lincoln.

The outcomes of further mitigating the scenario above by successfully installing a capping stack at the end of day 15 is shown in Figure 8.9. Stopping the flow at day 15 limits the moderate surface oil concentration (10–25 g/m^2) to the coastal waters of SA only, with low concentrations (1–10 g/m^2) generally extending from near Elliston to Port Adelaide, Kangaroo Island and east of Victor Harbour.

Successful BOP intervention will completely shut off the flow at seabed and obviously significantly reduce the amount of oil that reaches nearshore areas. As shown in Figure 8.10, moderate to high concentrations of surface oil will remain <175 km from the well and 180 km from the coastline. Some low concentration surface oil may reach Port Adelaide and York Peninsula.

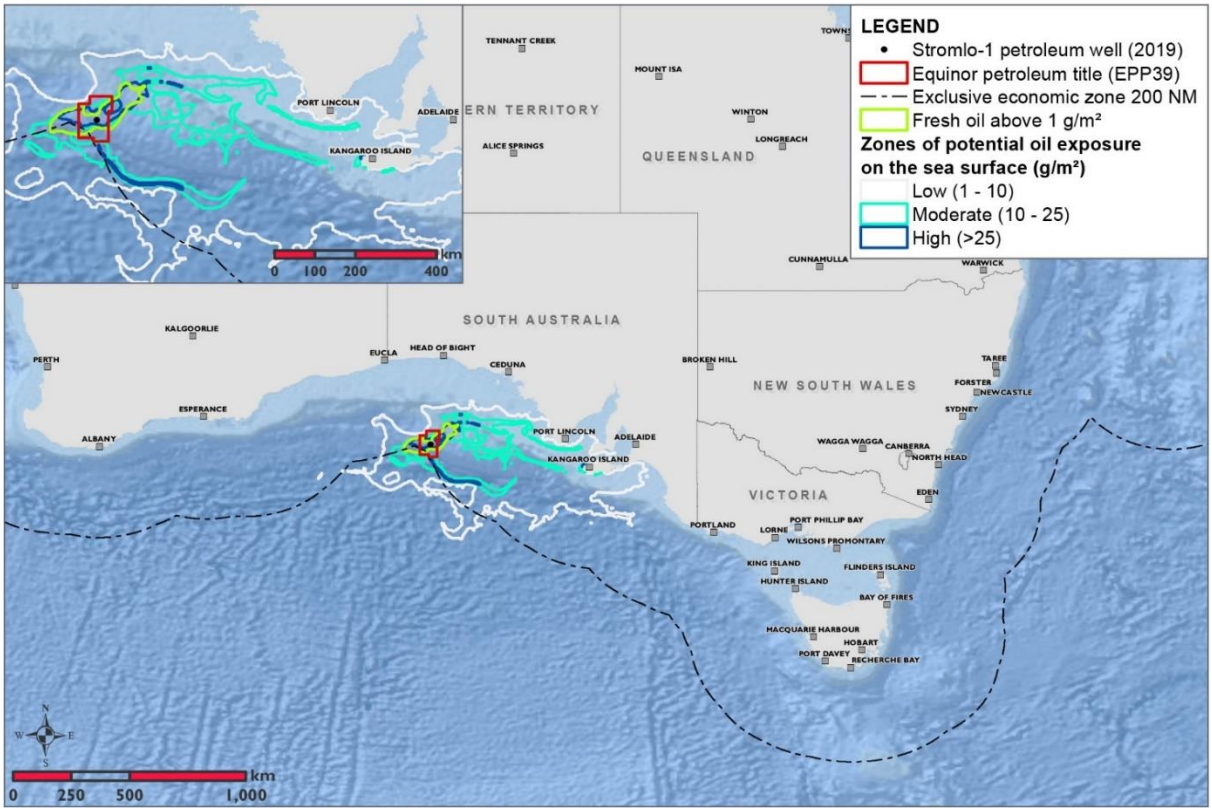


Figure 8.8 Mitigated (dispersants only) deterministic simulation of oil exposure on the sea surface for "fastest time to shore"

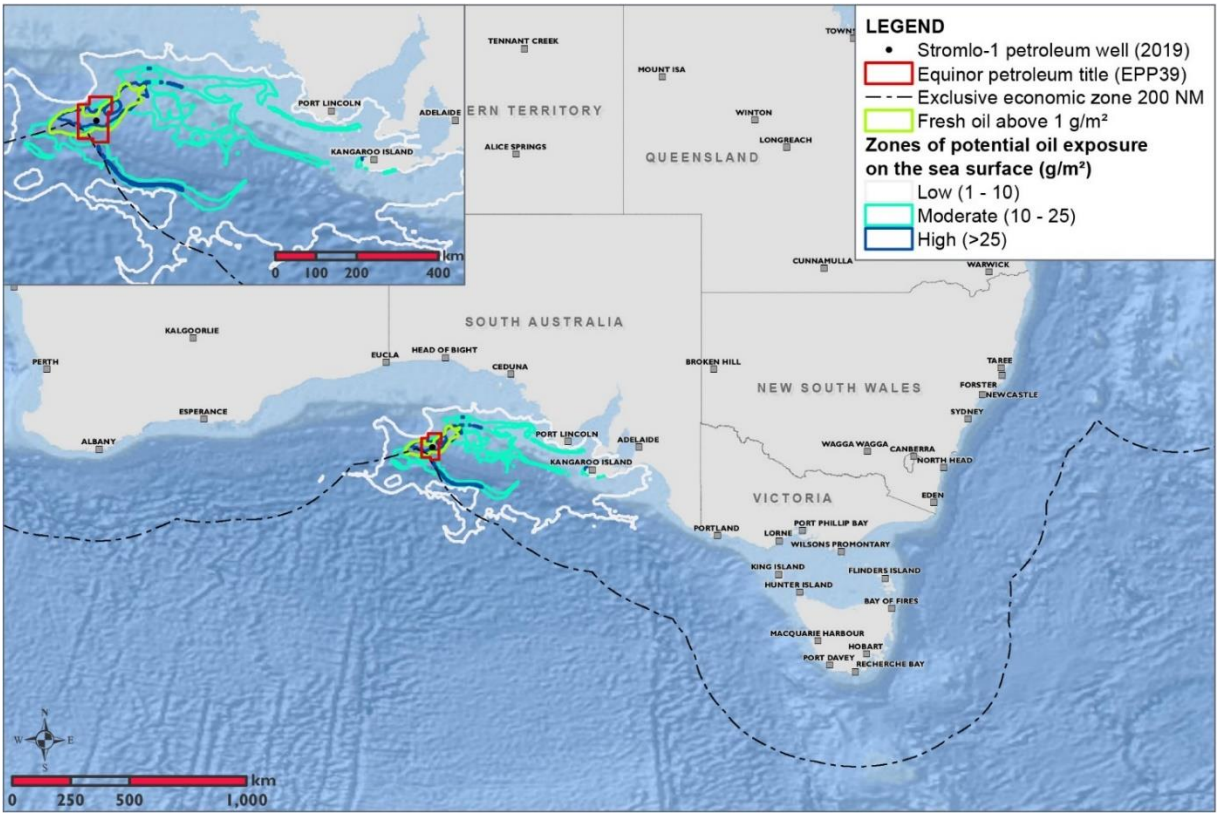


Figure 8.9 Mitigated (dispersants and capping stack) deterministic simulation of oil exposure on the sea surface for "fastest time to shore"

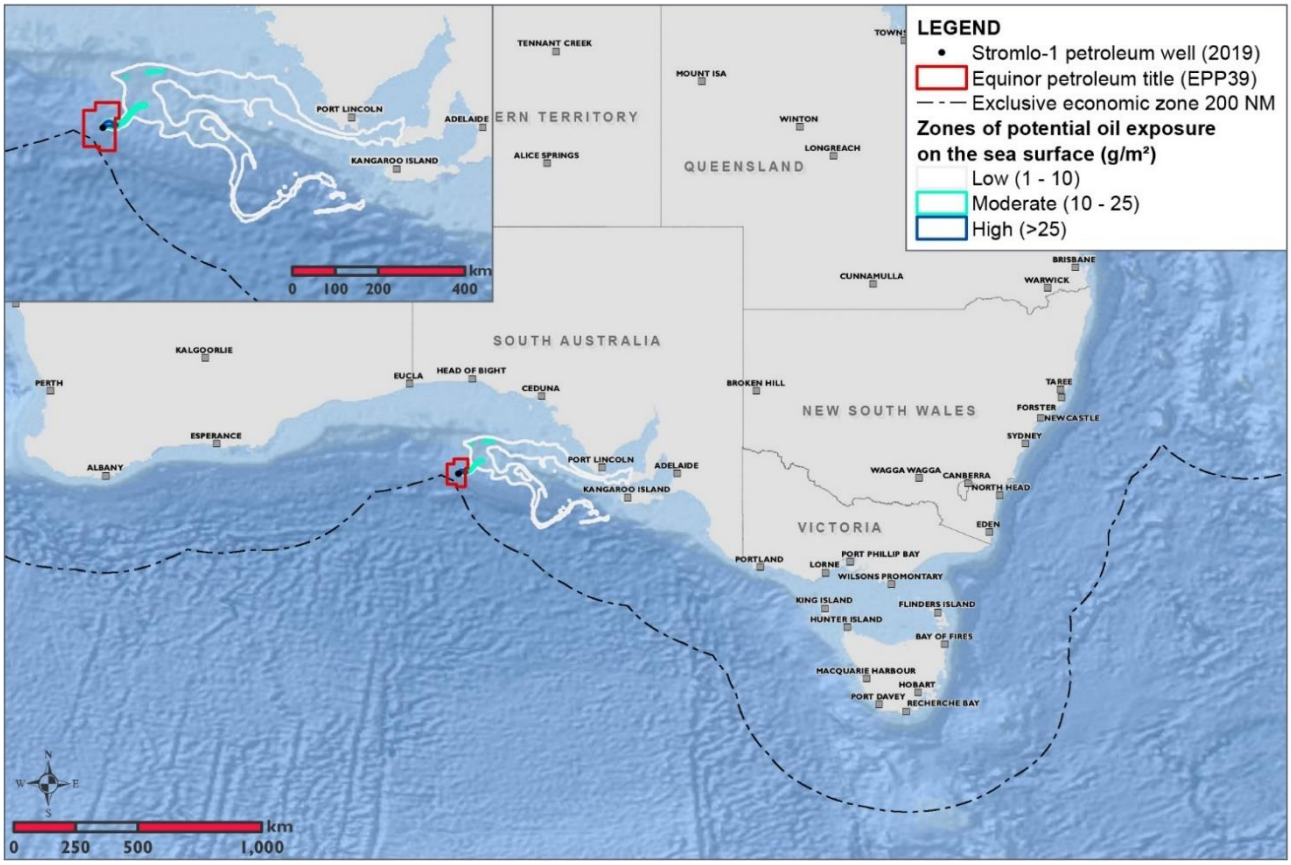


Figure 8.10 Mitigated (BOP intervention) deterministic simulation of oil exposure on the sea surface for "fastest time to shore"

The potential shoreline loadings for the $WCCD_{102d}$ "fastest time to shore" simulation with aerial and sub-sea dispersant applied is shown in Figure 8.11. The application of dispersants limits shoreline loading to areas within SA, Victoria and Tasmania. There is no shoreline contact indicated in WA or NSW. In SA, areas with high potential shoreline loadings (>1000 g/m^2) are around Flinders Island, Port Lincoln, Yorke Peninsula and Kangaroo Island. These are the same areas that received high loadings for the unmitigated deterministic modelling simulation (Section 8.2.2.1), however the use of dispersant has reduced the number of cells (and therefore shoreline areas) receiving high loadings.

The installation of the capping stack on day 15, with the use of dispersants (Figure 8.12), significantly reduces the duration of the spill and therefore also reduces the shoreline areas that could have potentially high loadings.

With successful BOP intervention at the end of day one (Figure 8.13), moderate to high shoreline loadings are restricted even further to the vicinity of Flinders Island, Port Lincoln and a small area on the Yorke Peninsula. There is no longer shoreline contact at Kangaroo Island and no contact at any other areas along the SA coastline.

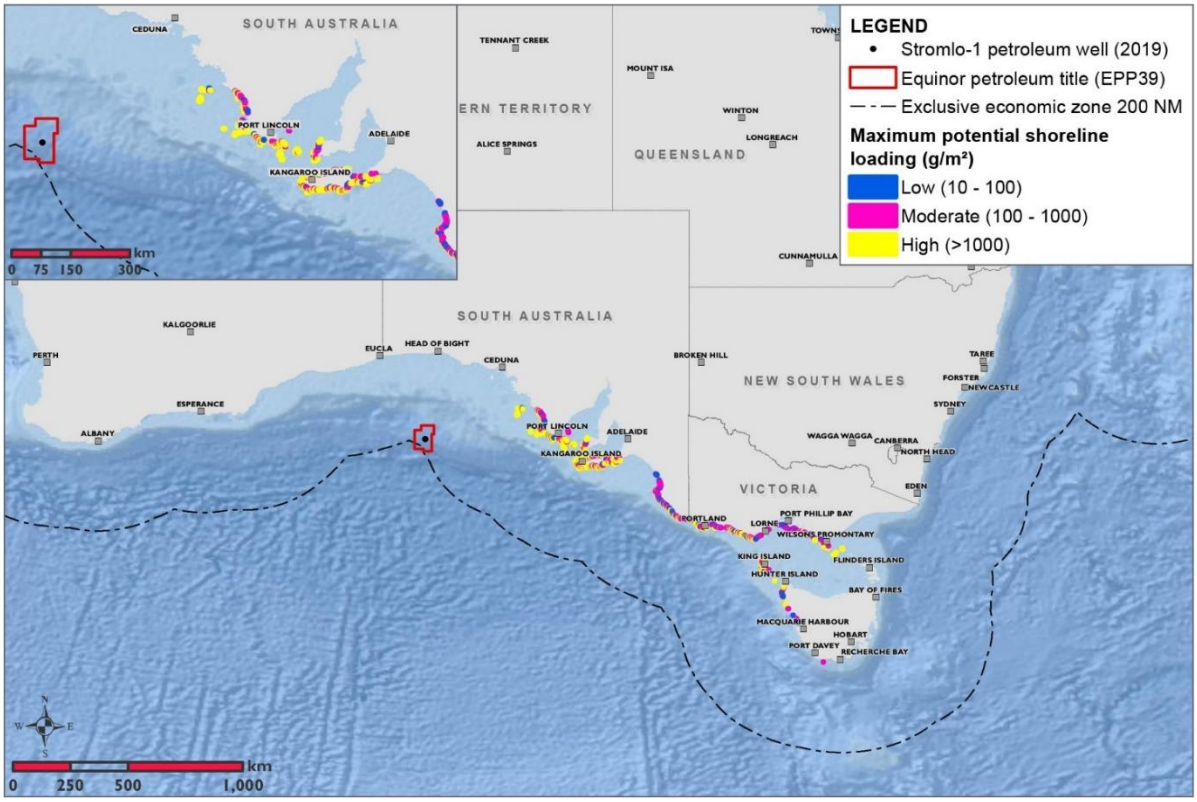


Figure 8.11 Mitigated (dispersants only) deterministic simulation of potential shoreline loading for "fastest time to shore"

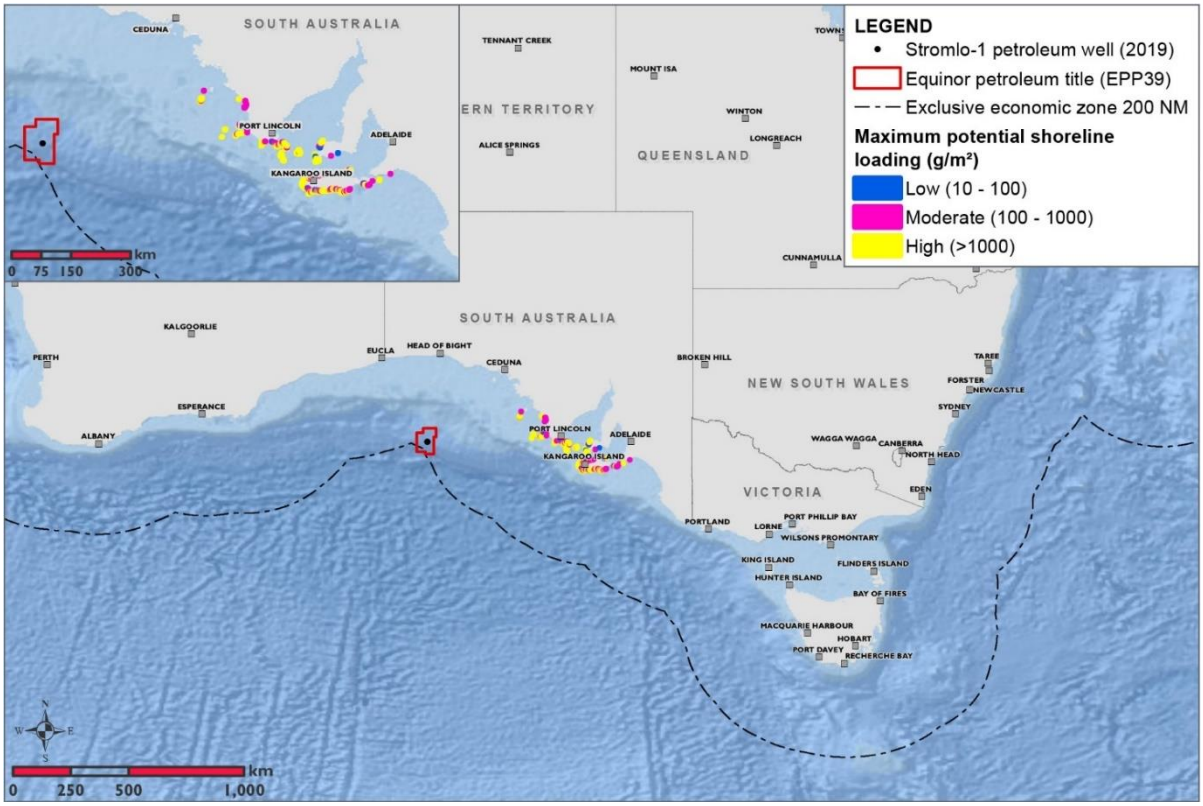


Figure 8.12 Mitigated (dispersants and capping stack) deterministic simulation of potential shoreline loading for "fastest time to shore"

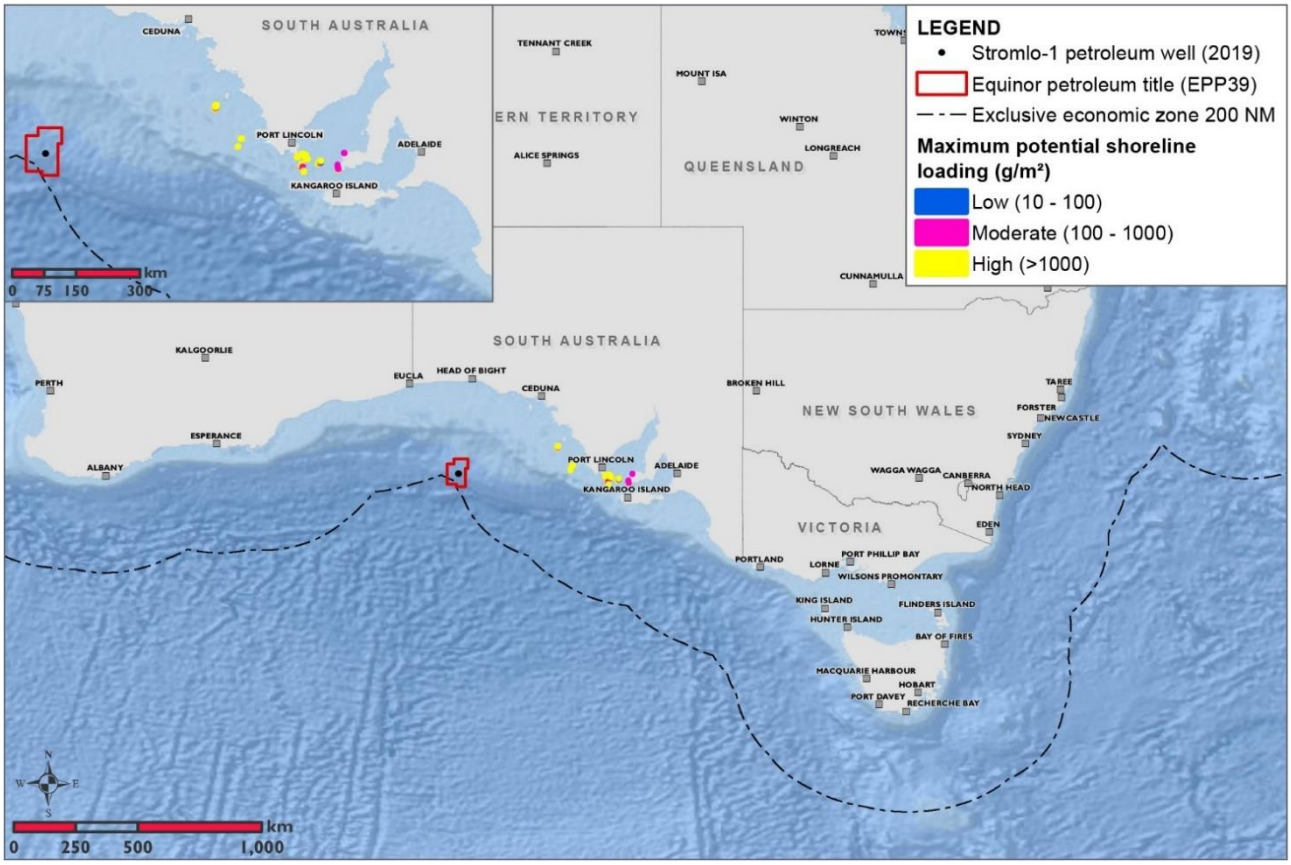


Figure 8.13 Mitigated (dispersants and BOP intervention) deterministic simulation of potential shoreline loading for "fastest time to shore"

8.2.2.5 Modelling outcomes

A summary of the modelling results described in this OPEP is provided in Table 8.6 below. All modelling results are available in the Oil Spill Modelling Study (RPS 2019).

Table 8.6 Summary of spill scenarios modelled

Scenario	Description	Purpose	Outcome
WCD_{129d} – stochastic Unmitigated.	WCD based on unrestricted open hole flow during a loss of well control event, with an average sub-sea release rate of 8,943 m^3/day over 129 days (WCD129d) tracked for an additional 60 days.	To identify the scale of response required based on WCD (despite being a very unlikely scenario).	No fresh oil reaches nearshore waters. Low surface concentrations of weathered oil may reach offshore waters south of Augusta in WA to north of Sydney in NSW and including Tasmania. Weathered oil of higher concentrations could in theory reach coastline areas from east of Albany in WA to north of Sydney and including most of the coastline of Tasmania. Potential shoreline loading of weathered oil from southern WA to NSW, including Tasmania (Figure 8.2). Areas with potentially high loadings from Esperance to Israelite Bay, WA; from Flinders Island to Kangaroo Island, and near Border Village, Fowlers Bay, Ceduna, Cape Jaffa and Mount Gambier in SA, through to Port Fairy in Victoria; Wilsons Promontory in Victoria; Flinders Island, King Island and west coast of

Scenario	Description	Purpose	Outcome
			Tasmania; small parts of coastline from south of Eden to south of Sydney in NSW.
$WCCD_{102d}$ – stochastic Unmitigated.	WCCD based on unrestricted annulus flow during a loss of well control, with an average sub-sea release rate of 6720 m^3/day over 102 days (well kill) and tracked for an additional 60 days. 100 spill runs combined to provide predictions of the distribution of hydrocarbons in the environment.	To identify the scale of response required based on worst credible rate.	No fresh oil reaches nearshore waters. Low surface concentrations of weathered oil may reach nearshore areas from Hopetoun, WA to just north of Eden, NSW and Tasmania. High levels indicated near Ceduna, Port Lincoln, Kangaroo Island and Mount Gambier in SA and southeast of Port Fairy in Victoria (Figure 8.4). Potential shoreline loading of weathered oil from southern WA to NSW, including Tasmania (Figure 8.5). Areas with potentially high loadings from Esperance to Israelite Bay, WA; from Flinders Island to Kangaroo Island, and near Border Village, Fowlers Bay, Ceduna, Cape Jaffa and Mount Gambier in SA; from western Victoria to Cape Otway, Mornington Peninsula and Wilsons Promontory in Victoria; Flinders Island, King Island and north west of Smithton in Tasmania; Eden, Bateman's Bay and Newcastle in NSW.
$WCCD_{102d}$ – deterministic Unmitigated.	WCCD based on unrestricted annulus flow during a loss of well control, with an average sub-sea release rate of 6720 m^3/day over 102 days (well kill) and tracked for an additional 60 days. The worst-case deterministic runs were selected from the stochastic modelling for assessment. The example in this OPEP is for the "fastest time to shore" run.	To identify the scale of response required and to allow comparison between unmitigated and mitigated deterministic modelling runs.	No fresh oil or weathered oil on the sea surface of high concentration reaches nearshore waters of any state (Figure 8.6). Potential moderate sea surface oil concentrations (10–25 g/m^2) in SA near Coffin Bay National Park and Port Lincoln, Kangaroo Island, and near Cape Jaffa to Mount Gambier. Shoreline contact was not indicated in WA and NSW (Figure 8.7). Weathered oil contacts SA shoreline first after 21 days. Potentially high shoreline loadings (>1000 g/m^2) from Flinders Island to the Yorke Peninsula and including Kangaroo Island. High loadings also indicated from east of Port Fairy to Wilsons Promontory in Victoria, and King Island and north-west of Smithton in Tasmania.
$WCCD_{102d}$ – deterministic Mitigated with dispersant only.	After drilling well to Total Depth (TD) there is a sub-sea release with unrestricted annulus flow on top of the wellhead or BOP (outside drill pipe). Following unsuccessful BOP closure and failure to install a capping stack, the well is killed by drilling a relief well after 102 days. The "worst case" deterministic runs were selected from the stochastic modelling for assessment. The example in this OPEP is for the "fastest time to shore" run.	To identify the scale of response required for this scenario and determine the effectiveness of aerial and sub-sea dispersant application.	No fresh or weathered oil on the sea surface of high concentration reaches the coastline of any state (Figure 8.8), however fresh oil slick now covers a larger offshore area. Significant reduction in sea surface oil concentrations compared to the unmitigated deterministic scenario, with potential moderate concentrations (10-25 g/m^2) indicated offshore of Port Lincoln (Figure 8.8). Shoreline contact occurs in relatively similar areas as the unmitigated deterministic scenario, except for Tasmania where a significant portion of the south western shoreline is no longer contacted (Figure 8.11). The use of dispersant has slightly reduced the number of shoreline areas that received high loadings.

Scenario	Description	Purpose	Outcome
$WCCD_{15d}$ – deterministic Mitigated with dispersant and capping stack.	After drilling well to TD there is a sub-sea release with unrestricted annulus flow on top of the wellhead or BOP (outside drill pipe). Following failure to close BOP, a capping stack is installed, and the flow stopped after 15 days. The "worst case" deterministic runs were selected from the stochastic modelling for assessment. The example in this OPEP is for the "fastest time to shore" run.	To examine the further effectiveness of successful installation of a capping stack.	Areas of fresh oil on offshore waters is significantly reduced with the addition of the capping stack. Low to moderate weathered surface oil concentrations in nearshore waters is now limited to SA and no other states (Figure 8.9). Weathered oil contacting the shoreline is now restricted to SA only, and no longer contacts Victoria and Tasmania (Figure 8.12). Potentially high shoreline loadings (>1000 g/m^2) now limited to vicinity of Flinders Island, Port Lincoln and Yorke Peninsula.
$WCCD_{1d}$ – deterministic Mitigated with dispersant and BOP intervention.	After drilling well to TD there is a sub-sea release with unrestricted annulus flow on top of the wellhead or BOP (outside the drill pipe). The fully open and empty BOP is closed by sub-sea ROV intervention and the flow stopped after 24 hours. The "worst case" deterministic runs were selected from the stochastic modelling for assessment. The example in this OPEP is for the "fastest time to shore" run.	To examine the further effectiveness of successful BOP intervention.	Moderate to high weathered oil concentrations of surface oil remain on waters within 175 km of the well and 180 km from the coastline. Some low concentration surface oil may occur near Port Adelaide and York Peninsula (Figure 8.10). Shoreline loadings significantly reduced and areas with low levels are now restricted to vicinity of Flinders Island, Port Lincoln and small area on Yorke Peninsula (Figure 8.13). No longer shoreline contact at Kangaroo Island and no contact at any other areas along the SA coastline.

8.3 Risk EMBA

The risk EMBA (Figure 6.2) represents the full geographic area that could be affected and was derived from stochastic modelling of 100 spill runs (RPS 2019). The low thresholds that were applied to determine the extent of the risk EMBA are provided in Table 8.7.

The locations of environmental and socio-economic receptors that could be affected within the risk EMBA were identified, based on the existing environment description in Section 4.0 of the EP. A list of the receptors considered to be within the risk EMBA is provided in Appendix 9 of this OPEP. These receptors were incorporated into the NEBA tool.

Table 8.7 Thresholds used to define the risk EMBA

Description	Low
Visible fresh and weathered sea surface oil	1 g/m^2
Shoreline oil contact	10 g/m^2
Dissolved hydrocarbons	6 ppb
Entrained hydrocarbons	10 ppb

8.4 Key protection priorities

In order to focus response planning in the preparedness phase prior to Stromolo-1 commencing and in particular to assist in developing tactical response plans in the early days following a spill, Equinor Australia B.V. has identified key protection priorities within the Risk EMBA. The process and steps used to select priorities are illustrated in Figure 8.14 and described in Appendix 11. The process was informed by the outputs of the EP risk evaluation and the broad existing environment description in Appendix 7-3 of the EP.

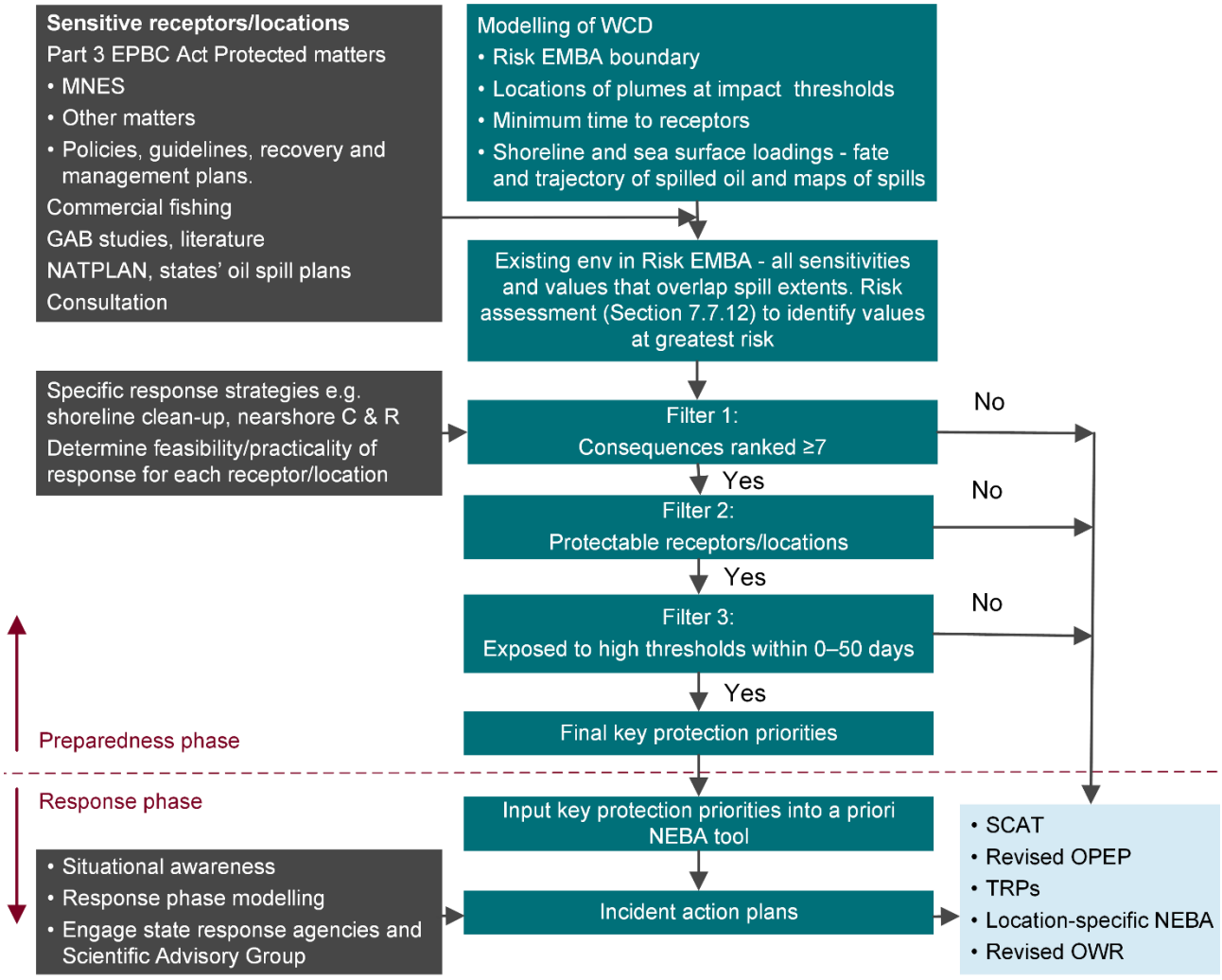


Figure 8.14 Process for identifying, selecting and using priority protection areas

8.5 NEBA

The NEBA process will be used to identify and assess the potential impacts (positive or negative) to sensitive environmental and socioeconomic receptors, associated with the implementation of spill response options. The NEBA process considers all response strategies and tactics against each other to allow appropriate comparative assessment. Equinor requires that the NEBA process comprise the following steps:

- compile and evaluate data
- predict the outcomes
- balance trade-offs
- select the best response options.

The NEBA process that will be followed during a spill response is provided in Figure 8.15.

During the preparation of this OPEP a NEBA assessment was conducted to identify response options and determine whether the impacts associated with each option were likely to result in a net benefit or disbenefit compared to a response with no control measures implemented. The information in Appendix 9 is already built into the Equinor NEBA tool developed for the activity.

During a spill response, the NEBA process will be undertaken by either:

- Equinor in consultation with the relevant state/commonwealth agencies; or
- the relevant state or Commonwealth IMT with assistance from Equinor.

For response activities undertaken by state or Commonwealth IMTs, the NEBA methodology may be adjusted or replaced with an alternative method as required.

NEBAs will be undertaken as required throughout the response phase, to allow consideration of the evolving nature and scale of the incident, and to address any identified potential changes in risk. The NEBAs that have been completed will be checked every operational period and the NEBA output will be attached to the Incident Action Plan.

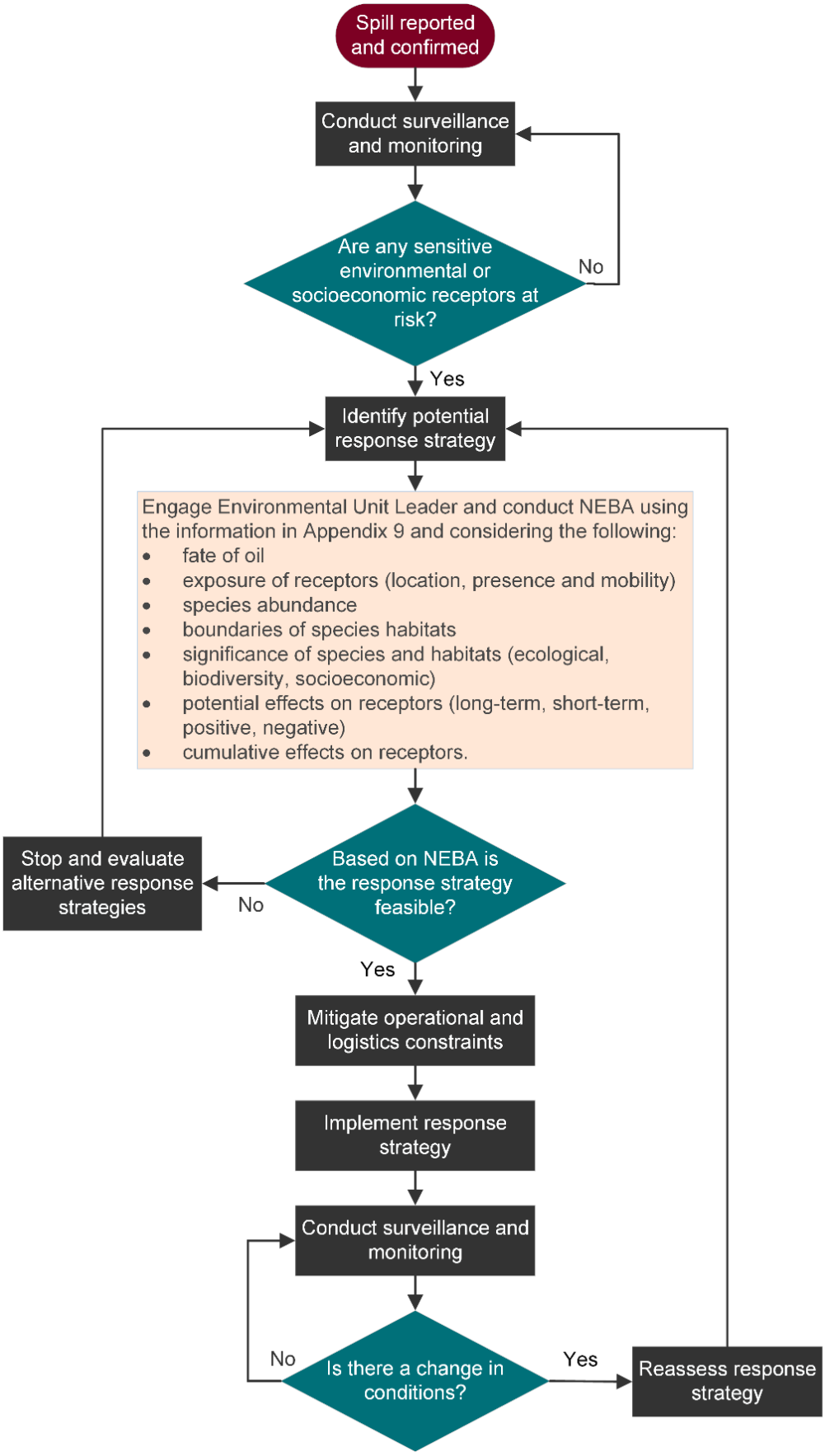


Figure 8.15 NEBA process

8.6 Assessment of spill response options for sub-sea release

Based on the environmental and socioeconomic sensitives identified, and the modelling analyses conducted, spill response options were assessed for feasibility, effectiveness and the potential to result in additional environmental impacts. Table 8.8 summarises the response options considered and whether they have been adopted. If they were not adopted, justification is provided. A detailed summary of the risk assessment conducted for these options is provided in Section 7.0 of the EP, and the ALARP and acceptability justification is provided in Appendix 5-1 of the EP.

It should be noted that the relevant state agencies will be the control agency within state coastal waters (3 NM seaward of the territorial sea baseline) and will therefore direct spill response within that zone (i.e. for nearshore containment and recovery within state waters, shoreline protection and clean-up and oiled wildlife response). Equinor will support the state response, providing resources and assisting with execution of the response.

Table 8.8 Spill response options assessed

Response option	Adopted / not adopted	Summary of justification
Source control	Adopted	Required.
Oil spill monitoring	Adopted	Required.
Aerial dispersant application	Adopted	Fast mobilisation and remote location.
Vessel dispersant application	Adopted	Shared resource available (vessel) however will depend on priorities.
SSDI	Adopted	Likely to be very effective method and is a more effective use of available dispersant stock than surface dispersant application.
In-situ burning	Not adopted	Light components of the oil will evaporate, which in conjunction with the operational uncertainties of concentrating the oil with booms to facilitate ignition, indicate a low likelihood of success. The operational safety hazards associated with in-situ burning are considered high risk, and in-situ burning has not been undertaken in Australia. Therefore, this option has not been adopted.
Offshore mechanical recovery	Adopted	Used in combination with other response methods to ensure the overall response strategy is robust (i.e. if sub-sea dispersant is less effective than anticipated).
Nearshore containment and recovery	Adopted	To protect high value coastal areas and sensitive receptors.
Shoreline protection and clean-up	Adopted	Required.
Oiled wildlife response	Adopted	Required.

9.0 Spill response priorities and incident action plan

9.1 Spill response priorities

In responding to a hydrocarbon spill the following priorities will be observed:

1. Human life, health and personal safety.
2. Stopping the pollution at the source.
3. Preventing impacts environmental and socioeconomic receptors.

Equinor will implement one or more of the following response methods:

- surveillance and monitoring
- source control (BOP intervention, capping and drilling a relief well)
- vessel dispersant application
- aerial dispersant application
- sub-sea dispersant application
- offshore and nearshore containment and recovery.

The most important thing to note is that in the event of a well blow-out, source control will be the most effective response method and therefore prioritised. However, the resources required to support additional response methods listed above will be mobilised at the same time. Table 9.1 summarises the response priorities for the various methods.

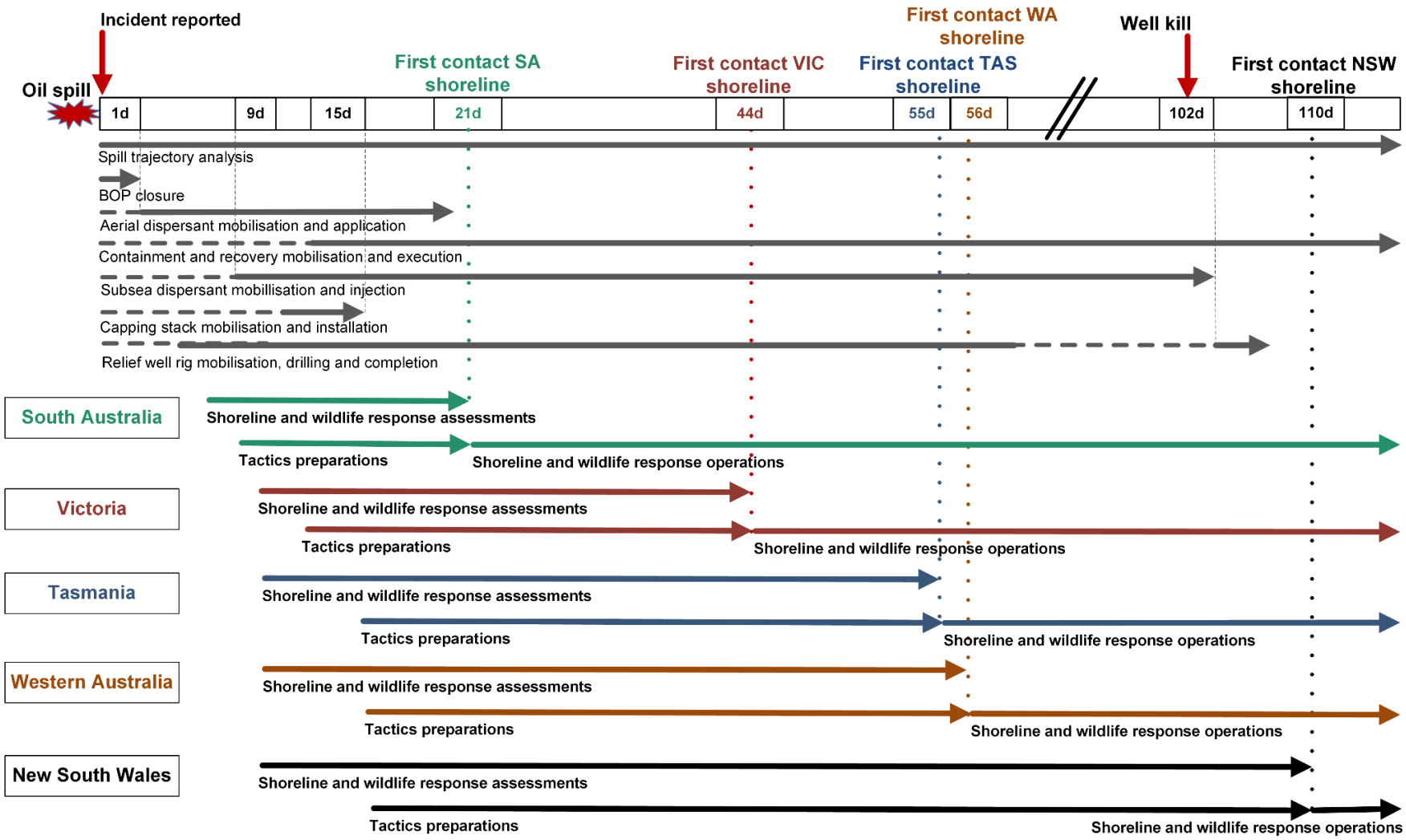
Key priorities for protecting environmental and socio-economic receptors are described in Section 8.4.

The state agencies will be the control agencies for spills that move into state coastal waters (3 NM seaward of the territorial sea baseline). Therefore, nearshore operations, shoreline protection and clean-up, and wildlife response operations within that zone will be under their direction. Equinor will support as directed by the states.

Table 9.1 Response action priorities

Method	Description
Surveillance and monitoring	Prioritised and activated immediately. Combination of methods utilised to provide 24-hour capability: • visual observations: conducted during daylight hours initially by vessel and then also aircraft once mobilised • oil spill modelling: conducted and ground-truthed with in-field surveillance methods • satellite surveillance: obtained from OSRL to provide information on the location and coverage of the oil slick and location of sensitive receptors • oil spill tracking buoys: to provide real-time sea surface current and temperature data that can verify spill trajectory modelling • aerial surveillance: conducted at least twice during daylight hours using aircraft with aerial remote sensing capability and trained observers. For spills requiring additional aerial support, unmanned aerial vehicles may be used • OSMP: series of OMPs and SMPs triggered in the event of a Level 2 or 3 spill.
Source control	The most effective response method and therefore prioritised and activated immediately. • in the event of a well blowout BOP closure will be immediately actioned • at the same time, other sub-sea source control resources will be mobilised (i.e. capping stack, equipment needed for debris clearance, SSDI delivery system equipment and tooling and the relief well drilling rig).

Method	Description
Surface Dispersant Application	Mobilisation of aerial and vessel dispersant resources will be activated simultaneously with source control resources: • vessel dispersant application: capability to support the first few days of spill response. • aerial dispersant application: capability to support for longer period (~22 days). Once SSDI has been initiated aerial application will continue and be phased out when it is no longer effective. In the unlikely event there are limitations on the volumes of dispersant available, SSDI will be prioritised over aerial dispersant.
Containment and recovery	Mobilisation of containment and recovery resources will be activated simultaneously with source control resources. If SSDI has commenced and aerial dispersant application ceased, then mechanical containment and recovery will be used.
Shoreline protection, clean-up and wildlife response	Prioritised and activated immediately under the direction of state control agencies. Figure 9.1 shows the time frames for oil contact with the shoreline for each state (based on WCCD modelling), which allow for the mobilisation of resources, update and development of TRPs, shoreline assessments and tactical operations to be conducted.



Notes:
The time frames in this figure are indicative only and are based on a number of assumptions. Details are available in the ALARP Assessment Report in Appendix 5-1 of the EP.
The grey horizontal dotted lines represent mobilisation of resources to the well location.
Relief well mobilisation time frames are heavily dependent on the location that the rig is sourced (current estimate is ~73-102 days, P90). 102 days has been used for spill response planning.

Figure 9.1 Shoreline protection and clean-up, and wildlife response time frames

9.2 Incident action plan

The Planning Section Chief has overall responsibility in developing and reviewing the Incident Action Plan (IAP) which forms a vital role in the Incident Management Team response process. The response process is summarised in Figure 9.2 and the personnel with roles in the Incident Action Plan process are captured in the role-specific checklists in Appendix 12 of this Oil Pollution Emergency Plan. The Incident Action Plan is developed, and then reviewed and updated every 24-hour cycle as a minimum, and be informed by a range of information including the most up-to-date situational awareness information and ongoing NEBA outcomes.

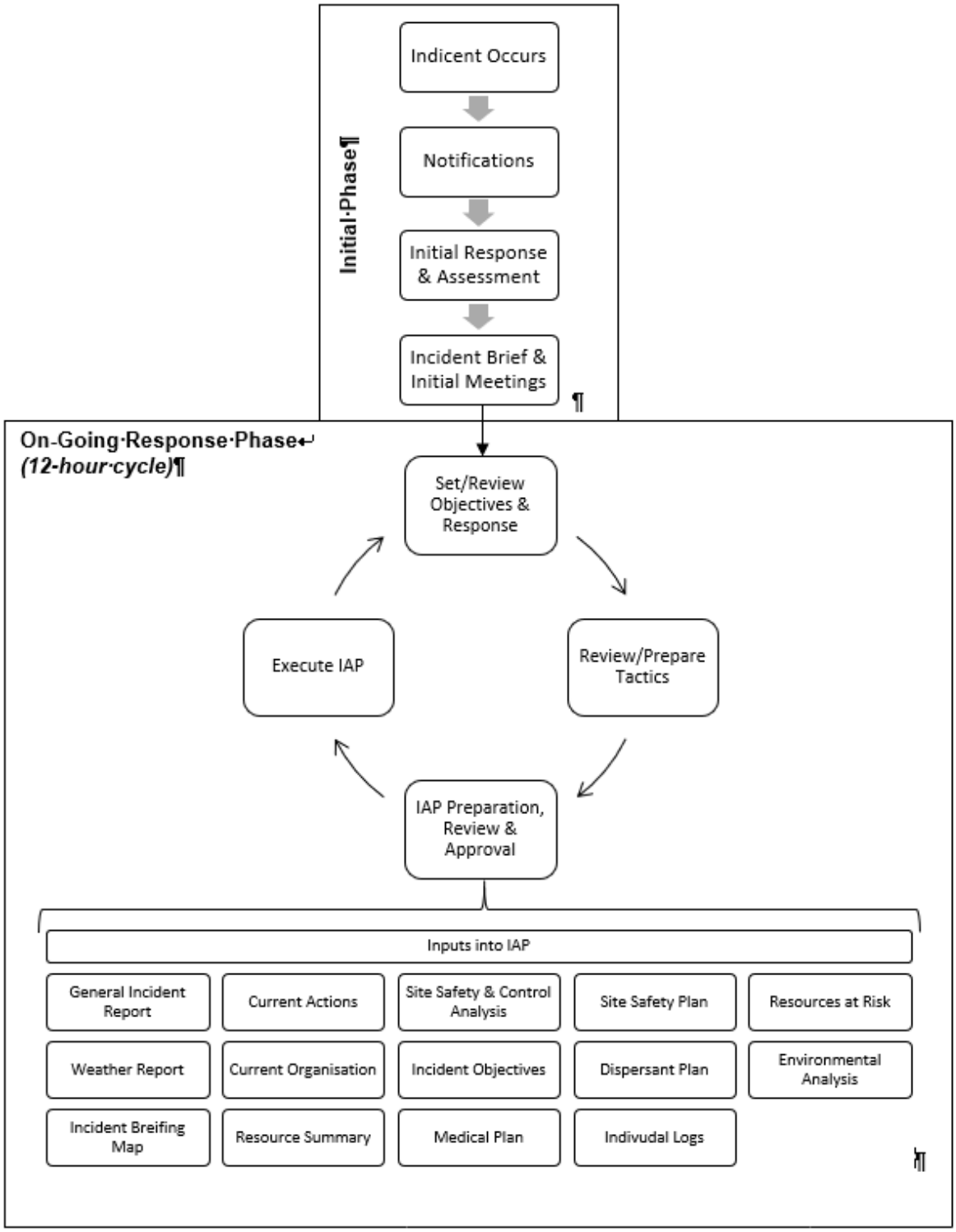


Figure 9.2 Equinor Australia B.V. incident action plan process

9.3 Tactical response plans

Tactical response plans (TRP) contain specific response strategies that feed into our response strategy. The Tactical response plans are at various stages of completion and it is intended that Tactical response plans with longer impact timeframes (e.g. as shoreline protection and clean-up) would be developed during spill response and in consultation with relevant state agencies. A summary of the TRPs that have been developed, their stage of completion, content and the key Equinor Australia B.V. personnel involved in their development and implementation is in Table 9.2.

Table 9.2 TRP status and content

TRP	Status and finalisation of TRP	Key content	Key Equinor personnel responsible for development and implementation*
Dispersant and Containment and Recovery (C&R) TRP	TRP drafted Will be finalised by Equinor prior to the Level 3 OPEP desktop exercise that is scheduled at least two months prior to mobilisation.	TRP includes: • detailed information on oil spill response strategies and methodology • known resources and mobilisation procedures • tactical implementation of dispersant application and/or C&R • maps of site location • ICS forms, checklists to be used in the response and included in the IAP • key protection priorities to be included in the IAP.	Planning Section Chief Logistics Section Chief Operations Section Chief
Tactical response Plans - Shoreline	The plan will be updated and finalised: • in the event of a Level 2 or 3 oil spill • by Equinor at the direction of relevant state agencies • taking into consideration surveillance and monitoring data (in particular to inform timeframe and locations). The plan will be finalised within five days of the predicted time to first shoreline contact (e.g. if there is 21 days to contact, the overarching TRP will be updated by Day 16) and continually reviewed to align with the revision of existing site-specific TRPs and development of new site-specific TRPs.	TRP already includes overarching shoreline response information that supports the site-specific TRPs: • planning, response organisation, responsibilities, compliance and response methodology • logistics arrangements – mobilisation of equipment, personnel and other supporting resources • specific equipment required for protection and cleaning methods, shoreline types • tactical implementation of shoreline response – shoreline segmentation process, key protection priorities, SCAT teams and process, site-specific TRP development and prioritisation.	Planning Section Chief Logistics Section Chief Operations Section Chief Environmental Unit Lead Safety Officer On-scene Commander
Site-Specific Shoreline TRPs	Primary and secondary TRPs have been drafted for multiple sites along the WA and SA coastline. Response guides have been prepared for nine tertiary sites in SA. A template TRP will be used to develop additional site-specific TRPs in VIC, TAS and NSW where required.	TRPs will include site-specific information on: • site description and map • main sensitivities • site access • existing facilities • response information and checklists.	As above

TRP	Status and finalisation of TRP	Key content	Key Equinor personnel responsible for development and implementation*
	Existing TRPs will be updated and new TRPs developed and finalised: • in the event of a Level 2 or 3 oil spill • by Equinor at the direction of relevant state agencies • taking into consideration surveillance and monitoring data (in particular to inform timeframe and locations). Site-specific TRPs will be finalised within two days of the predicted time to first shoreline contact (i.e. if there is 21 days to contact, TRP finalised by Day 19).		

*Note that within state jurisdiction, the state control agency will direct TRP development and finalisation and Equinor Australia B.V. will support.

A shoreline tactical response plan and multiple site-specific tactical response plans have been drafted for shoreline sites between Albany in Western Australia and Beachport in South Australia. Coastline sectors within this area have been divided into smaller segments, based on substrate type, sensitive receptors (ecological and socioeconomic), population, access and egress, distance between segments and bodies of water (e.g. embayments, estuaries, rivers). Sites within sectors are classified as primary, secondary or tertiary, based on how they align with the following criteria:

- identified protection priorities at the site. For example:
  - sensitivities identified during consultation with state control agencies
  - Protected Matters as defined in Part 3 of the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
  - legislated protected areas such as State Reserves, Nationally Important Wetlands, key ecological features, and threatened ecological communities and Biologically Important Areas for protected species
  - conservation status and International Union for Conservation of Nature (IUCN) protection category of areas and an assessment of any high conservation habitats and species
  - sensitivities identified in Commonwealth and state government guidelines, threatened species recovery plans, reserve management plans, etc.
  - socioeconomic sensitivities (commercial fisheries, etc.)
- logistics associated with the site:
  - site access via existing roads, tracks (4WD drive, pedestrian access or vessels)
  - existing facilities on-site
  - feasibility of mobilising equipment and personnel to site
  - size of area suitable to support equipment and personnel
- other site conditions:
  - clean-up method suitable for shoreline type
  - such as calm/rough water, sheltered, embayment, current flows, etc.

Figure 9.3 shows the geographic area of coverage and defined sectors within Western Australia and South Australia. The list of sectors and sites within South Australia that contain primary tactical response plans is in Table 9.3, secondary tactical response plans in Table 9.4 and tertiary site-specific guides in Table 9.5.

In the event of a loss of well control, the locations that require site-specific tactical response plans will depend on the trajectory of the spill and would be restricted to within the Risk environment that may be affected (EMBA) since this represents the maximum geographic area that a spill could cover.

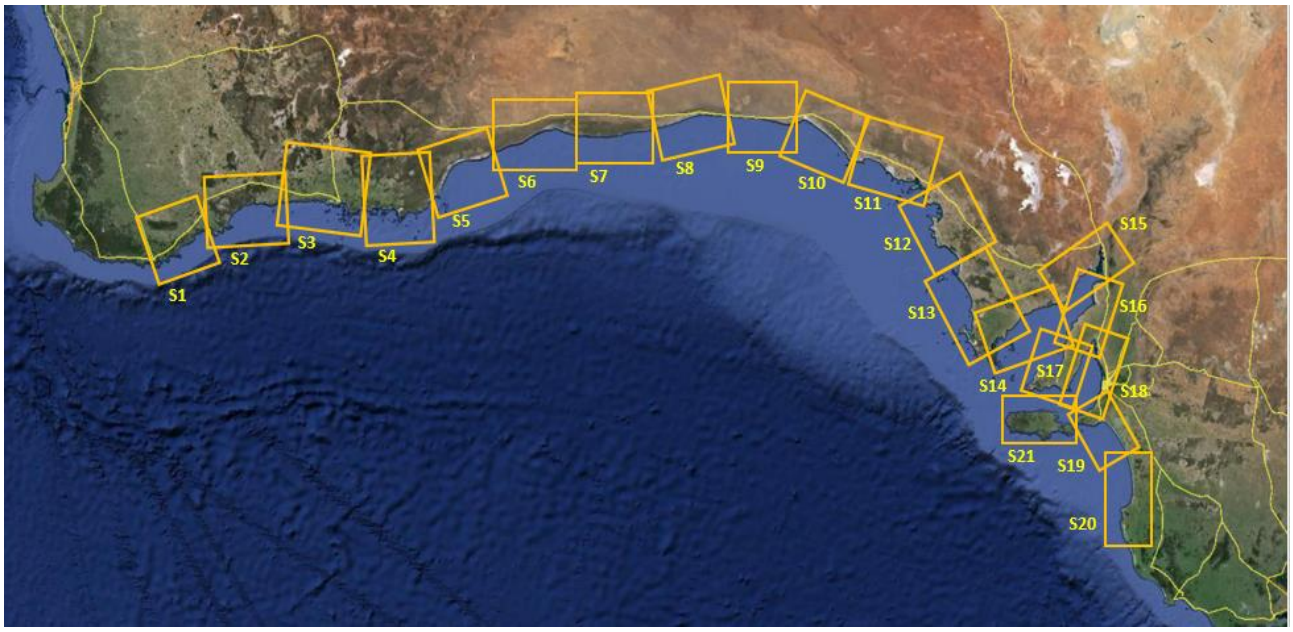


Figure 9.3 Coastal sectors for Western Australia and South Australia

Table 9.3 Shoreline sites in South Australia with primary tactical response plans

Sector number (Figure 9.3)	Sector name	Site
11	Ceduna	Davenport Creek Denial Bay Mangroves Eyre Island Wetlands Laura Bay Smoky Bay Jetty Smoky Bay South Inlet Smoky Bay West Inlet A Smoky Bay West Inlet B Tourville Bay East Tourville Bay North Tourville Bay West
12	Streaky Bay	Acraman Creek Conservation Baird Bay Narrows Streaky Bay Deflection Site 1 Streaky Bay Deflection Site 2 Streaky Bay Entrance Streaky Bay Head Streaky Bay Wetland – North Streaky Bay Wetland – South Venus Bay – Germein Island Venus Bay – North Head Venus Bay – Wetland Venus Bay Wharf

Sector number (Figure 9.3)	Sector name	Site
13	Elliston to Coffin Bay	Little Douglas Bay Entrance Little Douglas West Mount Dutton Bay 1 Mount Dutton Bay 2 Mount Dutton Bay 3 Point Longnose Yangie Bay Entrance
14	Port Lincoln	Arno Bay Creek Mouth Cowell Franklin Harbour Conservation Park North Channel Cowell Franklin Harbour Conservation Park North Head Cowell Franklin Harbour Conservation Park South Head Lincoln Cove Marina Murrays Point Selina Wetlands Tod River Mouth Tumby Bay – Second Creek Tumby Bay Marina
15	Upper Spencer Gulf	Mambray Creek Port Augusta River Port Pirie River River Broughton
16	Eastern Spencer Gulf	Copper Cove Fisherman Bay Port Broughton
17	Yorke Peninsula	Coobowie Salt Swamp Creek Port Vincent Marina
18	Adelaide	Gulf Point Marina Onkaparinga River Mouth Patawalonga Lake Entrance
19	Victor Harbour	Murray River Entrance
20	Robe to Bridgeport	Lake Butler Marina Maria Creek Entrance

Table 9.4 Shoreline sites in South Australia with secondary tactical response plans

Sector number (Figure 9.3)	Sector name	Site
15	Upper Spencer Gulf	Fitzgerald Bay River Mouth
19	Victor Harbour	Waitpinga Creek Entrance Hindmarsh River Mouth Inman River Mouth
21	Kangaroo Island	Hanson Bay River Entrance Middle River Mouth Stun Sail Boom River Mouth Harriet River Entrance Eleanor River Entrance Wilson River Entrance Chapman River Entrance

Table 9.5 Shoreline sites in South Australia with tertiary tactical response plans

Sector number (Figure 9.3)	Sector name	Site
15	Upper Spencer Gulf	Port Augusta Wetlands Blanche Harbour Wetlands Yatala Harbour Aquatic Reserve Port Germein Wetlands Port Pirie Wetlands
18	Adelaide	Wetlands West and East North Haven Wetlands

10.0 Spill capability

10.1 Tiered response resources

Equinor Australia B.V. will have the required capability available to activate and implement spill response methods. A spill resources inventory with providers of equipment, locations and mobilisation times is in Appendix 2.

The tiered preparedness and response framework for the Stromlo-1 petroleum activity will ensure that capability is adequate and scalable, with response personnel, equipment and additional support on hand. The capability is held locally (Tier 1), regionally (Tier 2) and internationally (Tier 3) and the tier classification adopted for the Stromlo-1 petroleum activity is shown in Figure 10.1.

Equinor will have resources on board the MODU and PSVs at the well location, and stockpiled resources stored at Ceduna Airport, and in Adelaide. A contract with AMOSC is in place to enable access to their resources. Further resources are available from industry via mutual aid and Equinor have access to OSRL and Wild Well Control (WWC) resources via memberships. Equinor has ensured that resource requirements beyond what is available via these arrangements have been identified and will be met through commercial companies and state agencies.

Equinor Australia B.V. relies primarily on its existing contracts worldwide with OSRL and WWC for debris clearance equipment.

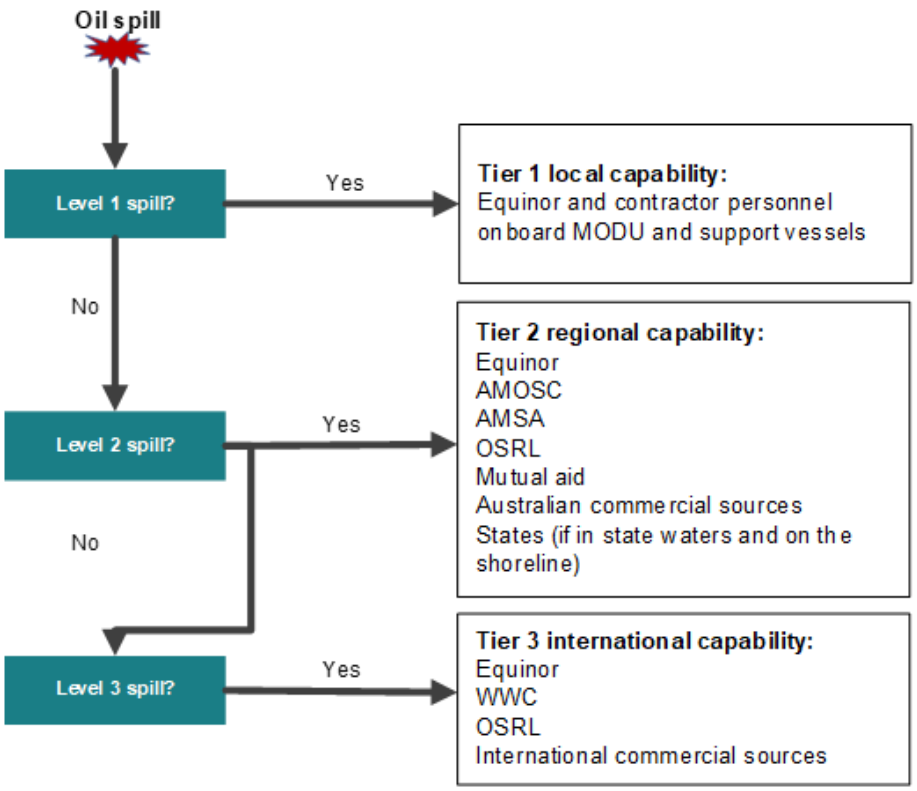


Figure 10.1 Tiered response capability

10.2 AMOSC

The AMOSC has offices in Geelong and Fremantle and maintains stockpiles of oil spill response and sub-sea intervention equipment at locations across Australia. A full inventory of AMOSC equipment is available from the AMOSC website (http://www.amosc.com.au/equipment.php).

Mobilisation time to Adelaide for the bulk of the equipment based in Geelong is approximately 14 hours. Additional equipment in Fremantle, Exmouth and Broome can be mobilised to the Equinor marine supply base, Port Adelaide in approximately 36, 51, 47 hours respectively. This includes an allowance of four hours for truck availability, sourcing and loading.

Thirteen permanent staff are available on a 24/7 basis, who may be supplemented by around 120 participating oil company personnel (the AMOSC Core Group), which are available through the National Plan. This group is trained above the levels normally undertaken as part of International Maritime Organization (IMO) Level I–III format oil spill response courses accredited by the Nautical Institute.

Training records are kept valid through refresher courses undertaken every three years (with a three-month grace period for revalidation). AMOSC also undertakes marine oil spill training courses in Geelong and Fremantle. AMOSC will provide support via:

- contracts: oiled wildlife call-off contract with provider
- agreements: air charter services with provider; land transport provider; National Plan – AMSA; alliance agreement with OSRL
- national and international relationships: global response network (OSRL); International Petroleum Industry Environmental Conservation Association; sub-sea response and equipment providers Trendsetter, Oceaneering and Add Energy; and oiled wildlife provider in the USA; National Plan partners.

10.3 AMSA

Equinor have access to 50% of available AMSA equipment through AMOSC and under the National Plan. AMSA maintain stockpiles of equipment in Adelaide, Brisbane, Dampier, Darwin, Devonport, Fremantle, Melbourne, Sydney and Townsville. A full inventory of AMSA equipment is available from the AMSA website (www.amsa.gov.au).

10.4 OSRL

Equinor has access to the Global Response Network and Global Dispersant Stockpile via OSRL. OSRL resources that Equinor has identified for use are likely to come from Singapore or the United Kingdom. Mobilisation times from the Singapore base is 2–4 days, and from the United Kingdom to Adelaide is 3–5 days. Capability assessments are based on Equinor having access to 100% of the available Global Dispersant Stockpile (https://www.oilspillresponse.com/globalassets/services/member-response-services/global-dispersant-stockpile/tis-gds-2017-oct-27.pdf).

10.5 Wild well control

In the event of a well blowout the WellCONTAINED package from Wild Well Control in Singapore will be mobilised by air, which includes kits for debris removal, SSDI and capping. Wild Well Control personnel will be mobilised from the United States and Europe to support source control operations. The WWC system stored in Singapore will be mobilised immediately after an incident and the mobilisation time for equipment from Singapore is 2–4 days (as for OSRL as a contingency).

11.0 Response resources and logistics

11.1 Resources and logistics feasibility

11.1.1 Planning overview

Regulation 14(8AA)(b) of the OPGGS(E) Regulations requires an OPEP to include the arrangements and capability that will be in place, for the duration of the activity, to ensure timely implementation of the control measures, including arrangements for ongoing maintenance of response capability.

Capability planning conducted for the proposed activity considered the following:

- What equipment, materials and personnel are required?
  - This involved understanding the capability requirements based on spill modelling and the selected spill response methods (Sections 8.0 and 9.0).
- What equipment, materials and personnel are available?
  - This involved identifying the tiered spill response capability that exists locally, nationally and internationally, and is available to Equinor via Mutual Aid and other agreements (Section 9.2).
- Where do gaps exist and how will they be addressed?
  - This involved comparing the required resources with those available and identifying solutions to fill gaps that were identified.

As indicated in Section 9.2, in the event of a major spill the majority of specialised response equipment and personnel will be provided by AMOSC, the Australian National Plan (via AMSA) and OSRL. Equinor has arrangements in place to provide the additional resources not available through the aforementioned organisations, including vessels of opportunity (VoOs), response personnel, training equipment and training personnel, etc.

Once spill response resources (equipment, materials and personnel) were understood, logistics feasibility planning commenced that focussed on ensuring that Equinor has the:

- ability to effectively deploy resources to the locations they are required, in a timely manner
- capacity to sustain the resources for the duration of a response.

Equinor's logistics feasibility study and subsequent consultation and planning resulted in the following outcomes:

- Resources will be positioned at locations that enable Equinor to deploy them in the time frames demonstrated to be ALARP and acceptable. The pre-positioning of resources has been devised taking mobilisation methods and time frames into account.
- The most practicable deployment pathways have been identified, which involved assessing various modes of transport, transport routes and time frames.
- The modes of transport for response equipment can accommodate the resources being transported.
- Transport routes have been reviewed to ensure they are feasible, accessible and can accommodate the particular modes of transport.
- Capability of facilities to support spill response has been reviewed (i.e. selected marine supply base (MSB) and airport locations can support resupply of fuel and personnel, have adequate space, equipment with adequate lifting capacity, etc.).
- Aspects such as crew change-outs, personnel rotations, down time for equipment maintenance and limitations on operations conducted only during daylight hours, etc. have been factored into logistics planning.

- Spill response operations can be scaled up accordingly as vessels, aircraft, equipment, materials and personnel become available and are mobilised to the location. The escalation of resources for the duration of the response is provided for as follows
  - Resources to support response to a Level 1 spill are available on board the MODU or support vessels.
  - Agreements and contracts with providers are in place to support an initial response to Level 2 or 3 spill, and to scale the response up as needed.
  - Equinor's spill response structure allows for their IMT to be scaled up (e.g. by mobilising the Source Control Branch, GIMAT).
  - Trained and capable personnel are identified and available to support (e.g. source control experts, oiled wildlife responders).
  - "In time" training of additional unskilled personnel is planned to ensure adequate numbers are available to supplement existing personnel.
  - Equinor has established processes for recruitment, procurement and supply chain management to ensure resources are mobilised to the locations they are required, in time frames that are considered ALARP and acceptable.

11.1.2 Shoreline response logistics

The resources to support shoreline protection and clean-up operations have been assessed. Oil spill modelling results were used to identify potential areas of actionable oil from worst-case greatest shoreline accumulation trajectory model runs (i.e. the greatest overall accumulation run, and the greatest accumulation run for each state). Modelling outputs were overlaid over satellite imagery in a GIS platform and the shoreline type and accessibility for shoreline response assessed for each polygon for each run. Potential high-level response categories were identified based on the level of shoreline loading, namely:

- natural attenuation
- site-specific assessment required
- manual clean-up
- manual and/or mechanical clean-up.

This approach was used to identify the length of accessible coastline for each category in order to estimate the worst-case response requirements and allow for a scalable response to a range of spill scenarios. The personnel and additional support required were then estimated to use as a basis for resources and logistics planning. It was understood that shorelines would undergo surveillance, and/or a SCAT undertaken following a release to inform the actual response at the time. The outcomes of this assessment have been presented to the state emergency response agencies who confirmed the process applied is appropriate.

Fly camp capability has been verified with three companies within Australia. A 50 person fly camp can be set up within one week, followed by three camps within 20 days. These camps are all inclusive (i.e. include catering, sanitation, black and grey wastewater facilities and communications capability such as Wi-Fi) and the time frames include obtaining the necessary permits.

Equinor have investigated and confirmed that PPE (including oil resistant boots) to support spill response operations can be made available in the time frames required (e.g. one provider has the capacity to provide 15,000–20,000 steel capped, oil resistant, gumboots and produce an additional 4000 per day if it were required). The availability of PPE will therefore not be a limiting factor in shoreline response logistics.

11.1.3 Wildlife response

Equipment to support oiled wildlife response will be primarily sourced from AMOSC and OSRL and can be provided in the necessary time frames (Appendix 2). The availability and mobilisation of equipment to support wildlife response is therefore not a limiting factor in shoreline response logistics.

In terms of personnel, Equinor is able to mobilise an oiled wildlife team capable of responding to the equivalent of a Level 6 oiled wildlife response, as documented in the WA Oiled Wildlife Response Plan (DPAW 2014). This first team can be mobilised before oil is predicted to contact the SA shoreline. AMOSC and OSRL have

training instructors and established oiled wildlife response training programs, therefore a second team can be trained to the same capability before oil is predicted to reach the second state shoreline. Equinor has confirmed that venues are available in each state to cater for training. In the event that specialist veterinarians are required (e.g. for specialist tasks such as euthanising animals), there are more than 11,000 registered veterinarians in Australia from that can be engaged to support the response. Assuming only 1% were available at the time, this would amount to more than 100 veterinarians, which would adequately cover response requirements.

11.2 Equinor marine supply base

The MSB for the activity will be located in Adelaide and will be used to support all vessel-related response operations. The following spill response equipment and materials will be stockpiled at the MSB:

- dispersant stockpile to support vessel dispersant application
- shoreline protection booms (for shoreline response and training purposes)
- shoreline clean-up equipment and tools (for shoreline response and training purposes)
- temporary storage (to store response related wastes)
- safety equipment and PPE
- wellhead, conductor and surface casing that will enable a relief well to be started immediately.

In the event of an emergency requiring the participation of many vessels, then ad-hock resupply, including bunkering, can be undertaken at Port Lincoln. Flinders Port manage 2022 m of berthing (daylight hours only).

11.3 Vessels

11.3.1 Analysis of vessel need

Vessels for source control and dispersant application: Two PSV vessels and one SCV vessel on contract for the duration of the drilling activity.

Vessels for offshore monitoring:

- One of the contracted vessels will undertake monitoring prior to implementation of subsea dispersant (day 9).
- Three additional vessels will be required by day 21. These three vessels will meet the following criteria:
  - designated Survey Class A (Unlimited domestic operations – greater than 200 NM from coast) or Class B (Offshore operations within 200 NM or other limits as specified by the local Marine Safety Agency)
  - hi-ab, crane or A-frame
  - room to accommodate up to six additional POB
  - ability to maintain operations for 21+ days
  - standard Marine/VHF communications.

Vessels for shoreline protection and deflection: Five small fishing or work vessels (within 21 days) with the following criteria as a minimum:

- trailer mounted (unless already at or close to TRP site)
- capable of carrying 4 people
- open, aluminium hull
- safety equipment as per state regulations
- lightweight

- 25 to 90 HP
- bow cleats
- rear tow line points
- tow bridle.

Vessels for containment and recovery:

Offshore: Eleven vessels once scaled up from day 15 and using offshore-rated boom system (Table 11.1).

Table 11.1 Strike team components – offshore containment and recovery

Single vessel	**Containment with offshore rated booming system**	
	Boom deployment/ recovery vessel	• designated Survey Class A (unlimited domestic operations – greater than 200 NM from coast) or Class B (offshore operations within 200 NM or other limits as specified by the local Marine Safety Agency) • ability to maintain operations for 14+ days • room to accommodate up 8 to 10 additional POB • open stern (Roller stern preferable) and clear transom • VHF and satellite communications capability • temporary waste storage.

Nearshore: scale up to 11 strike teams from when the trajectory of the oil spill and shoreline contact(s) are known (Table 11.2).

Table 11.2 Strike team components – nearshore containment and recovery

Lead pair	**Containment with open ended 'V shape' boom formation**	
	Tow vessel	• designated Survey Class B (Offshore operations within 200 NM or other limits as specified by the local Marine Safety Agency) or C (Restricted offshore operations within 30 NM of a safe haven or as specified by the local Marine Safety Agency) • room to accommodate up to 2 additional POB • standard Marine/VHF communications
	Boom deployment/ recovery vessel	• designated Survey Class B (Offshore operations within 200 NM or other limits as specified by the local Marine Safety Agency) or C (Restricted offshore operations within 30 NM of a safe haven or as specified by the local Marine Safety Agency) • room to accommodate up 8 to 10 additional POB • open stern (Roller stern preferable) and clear transom • recovery system • temporary waste storage • deck crane with safe Working Load Limit minimum 2 tonnes at full extension. • VHF and satellite communications capability.
Following pair	**Containment and recovery in J-sweep formation**	
	Tow vessel	• designated Survey Class B (offshore operations within 200 NM or other limits as specified by the local Marine Safety Agency) or C (restricted offshore operations within 30 NM of a safe haven or as specified by the local Marine Safety Agency) • room to accommodate up to 2 additional POB • standard marine/VHF communications.
	Boom and skimmer deployment/ recovery vessel	• designated Survey Class B (offshore operations within 200 NM or other limits as specified by the local Marine Safety Agency) or C (restricted offshore operations within 30 NM of a safe haven or as specified by the local Marine Safety Agency) • room to accommodate up 8 to 10 additional POB • open stern (roller stern preferable) and clear transom • temporary waste storage • deck crane with safe Working Load Limit minimum 2 Tonnes at full extension. • VHF and satellite communications capability.

Vessels for oil waste management: tanker vessel(s) with no less than 35,000 DWT.

11.3.2 Assessment and planning of vessels of opportunity

Equinor will have three support vessels contracted and available to commence a first strike response; two PSVs and one sub-sea construction vessel (SCV). The SCV will be on standby near the MODU when drilling the reservoir section and will be able to respond immediately. While in the reservoir, one PSV will be available within 12 hours to support the response on location. The SCV will have the following equipment to support spill response:

- oil spill detection radar
- tracking buoys
- infra-red camera
- ROV on board to facilitate BOP intervention.

The two PSVs will have:

- surface dispersant application capability (spray system and dispersant testing kit on board)
- capability to support transportation (from Adelaide to well location) and installation of SSDI equipment (coiled tubing unit, sub-sea dispersant toolkit).

Vessels of opportunity (VoOs) will generally be sourced from within Australia, but also internationally (Singapore) depending on the purpose of the vessel and the availability of VoOs at the time. Equinor will ensure VoOs are available for containment and recovery operations and for general surveillance and support operations as they are needed. VoO arrangements include:

- vessels with offshore containment and recovery capability
  - able to transport and deploy offshore skimmer systems, booms, etc.
  - adequate temporary waste storage on board to store recovered oil in internal tanks with OILREC certification or in temporary tanks or bladders on deck
  - dynamic positioning (DP) that will allow transfer of oil offshore to another DP vessel
  - able to accommodate trained responders and additional response personnel
  - able to operate independently for many weeks in open sea with no restrictions (DNV R0)
  - the vessels that meet such specifications are PSVs and anchor handling tug supply (AHTS) vessels and >50 of these vessels in Australia and ~60 in Singapore have been identified
  - all vessels in Australia fall under the APPEA mutual aid agreement and some of the vessels would be made available within days
- vessels capable of supporting nearshore containment and recovery and shoreline protection (deflection) operations
  - able to transport and deploy smaller nearshore deflection booms, skimmer systems, smaller single or dual vessel boom systems, etc.
  - able to operate independently for many days or weeks and able to operate 50 NM offshore (minimum DNV R2/GL RSA 50)
  - using the AMSA ship register there are almost 500 vessels over 18 m in length (in the group of fishing vessels, workboats, and tuggers) registered with home ports from Fremantle, WA to Yamba, NSW and including Tasmania). Traveling time to Port Adelaide would be less than a week assuming they are travelling at less than 10 knots. If only 10% of those vessels could be contracted in the first week and another 5% the week after, a fleet of more than 70 vessels (>18 m) could be available and trained before first oil reaches the shores
- vessels for general surveillance and support operations. Using the AMSA ship register there are ~450 private vessels over 18 m in length, in addition to the work vessels mentioned above. Assuming that less than 5% of those vessels could be rented, a fleet of more than 20 additional vessels (>18 m) could be made available and used for auxiliary tasks such as monitoring and surveillance.

In the event of a loss of well control, additional PSVs and offshore containment and recovery equipment will be mobilised. All available vessels (i.e. vessels on contract in Australia via mutual aid and VoOs) will be called upon. In addition, mobilisation of equipment from Australia and Singapore will commence. Initial containment and recovery operations will commence from approximately day 15 and scaled up as more vessels and equipment arrive.

11.3.3 Ongoing vessel of opportunity assessment and preparedness

Equinor will embark on a VoO program in the event of a significant spill occurring in the Great Australian Bight. The Australian Marine Oil Spill Centre (AMOSC) will support this program with data and investigations into potential VoOs. The program will comprise of a preparedness phase and a response phase.

Six months prior to OPEP desktop exercise, the AMOSC will:

- undertake an indicative study on potential VoOs based within a 20-day transit of Port Lincoln (complete).
- provide Equinor Australia B.V. with vessel numbers per port.

A minimum of two months prior to campaign commencing, the AMOSC will:

- provide Equinor Australia B.V. with a VoO support plan designating:
  - four fleet management bases (Port Lincoln/Streaky Bay/Port Adelaide/Kangaroo Island)
  - crew induction packs
  - financial claims by vessels of opportunity
  - draft contracts.
- identify vessels located within a 20-day transit for oil spill response operations in offshore and nearshore areas of the Great Australian Bight. This will include:
  - a stand-by notification mechanism whereby the AMOSC is aware of the approximate location of vessels
  - a contracting mechanism for the AMOSC to access these vessels at short notice.
- evaluate the suitability of vessels through the application of an accepted suite of standards (based on NOFO Standard: Requirements for oil recovery vessels on Norwegian Continental Shelf) that may include:
  - Australian survey or certification
  - size, speed, endurance, cabin/personnel capacity
  - deck space, recovered oil carrying capacity or dispersant carrying capacity
  - inherent pumping capacity
  - inherent lifting (crane) capacity
  - availability of anchoring and towing points
  - minimum bollard pull.

During drilling in the hydrocarbon bearing zones, provide to Equinor Australia B.V. a five day ‘look ahead’ of vessels and vessel locations as identified through the process in the bullet above.

11.3.4 Response in the event of loss of well control

During a significant spill event, the following actions will occur:

- using the 5-day forecast, the AMOSC will contract and activate the selected vessels for VoO operation
- vessels will commence transit to one of the fleet management bases (VoO support plan)
- on arrival at a fleet management base:
  - VoOs will be assigned a response category (C&R/P&D/patrol)
  - VoO crews will be inducted into the response

  - VoOs will be tasked into a role and area for response.
- during spill operations, VoOs will be placed under a fleet organogram and be wholly supported for victuals, fuel, spares by the fleet management base.

11.3.5 Vessel selection

Noting the NOFO Standard for oil recovery vessels, there will be three main categories of vessels applicable for this VoO program as follows:

- Category 1 – PSV; not part of the vessels of opportunity program but will be used in conjunction with the vessels of opportunity daily collection figures. The NOFO Standard applies for this category.
- Category 2 – non Safety of Life at Sea 15 m-38 m vessels; constitute the main part of the vessels of opportunity fleet with seakeeping ability for 5 days plus, continuous operations. Can be used up to 200 NM from the coastline but would generally operate in the nearshore zone out to 50 NM out from the coastline in the GAB. These vessels will be contracted and supported from one of the four fleet management bases. This category will also be the most closely monitored category to support the VoO program. Operational area "B" according to the AMSA classifications.
- Category 3 – small inshore vessels; operating very near to the coast and generally capable of daylight operations only. These vessels will be contracted as VoOs but will form part of a VoO Ad Hoc program – covered in the VoO Support Plan.
- AMSA National standard for commercial vessels (NSCV) vessel classes (Table 11.3).

Table 11.3 AMSA commercial vessel classes

Operational area	Indicated by
Unlimited domestic operations (no longer available to domestic commercial vessels). Vessels operating in Australian waters must be Australian regulated vessels under the *Navigation Act 2012*.	A
Extended offshore operations (beyond 200 NM from the baseline of the Australian mainland, Tasmania, a recognised island but within the exclusive economic zone).	B extended
Offshore operations (within 200 NM from the baseline of the Australian mainland, Tasmania a recognised island but within the exclusive economic zone).	B
Restricted offshore operations (within 30 NM from the baseline of the Australian mainland, Tasmania, a recognised island; within 50 NM of the baseline of Queensland, within the Great Barrier Reef Region or the Torres Strait Zone; whilst remaining within the exclusive economic zone.	C
Restricted offshore operations – specified areas	C restricted
Partially smooth water operations	D
Smooth water operations	E

Table 11.4 Positions and numbers (per port) of potential VoOs

Location	Tugs	Fishing	Barge	Work boat	Days
Port Adelaide	15	133	8	1	1
Port Lincoln	10	2	0	0	1
Geelong	0	6	0	0	2
Melbourne	15	56	6	0	2
Portland	3	26	0	0	2
Burnie	0	6	0	0	3
Devonport	0	7	0	0	3

Location	Tugs	Fishing	Barge	Work boat	Days
Hobart	10	61	1	0	3
Launceston	0	31	0	0	3
Jervis Bay	0	3	0	0	4
Newcastle	5	15	2	2	4
Port Kembla	5	4	0	0	4
Sydney	24	67	15	0	4
Yamba	0	12	0	0	4
Brisbane	33	77	41	0	5
Bundaberg	0	17	0	0	5
Cairns	10	115	13	3	5
Fremantle	34	181	26	15	5
Gladstone	19	13	8	0	5
Hamilton Island	0	0	1	0	5
Hayman Island	0	0	1	0	5
Karumba	0	1	0	0	5
Kingston	0	4	0	0	5
Mackay	6	3	0	1	5
Maryborough	0	16	2	0	5
Mooloolaba	0	23	0	2	5
Mourilyan	0	1	0	0	5
Port Douglas	0	1	0	0	5
Rockhampton	2	0	0	0	5
Southport	0	6	0	0	5
Townsville	11	27	10	0	5
Broome	3	1	0	0	6
Dampier	29	3	10	9	6
Darwin	16	38	6	8	6
Gove Harbour	0	1	2	0	6
Port Hedland	15	2	1	0	6
Total	**265**	**959**	**153**	**41**	

Notes:
1. Data sourced from AMSA database (July 2019) not independently verified: https://www.amsa.gov.au/vessels-operators/ship-registration/list-registered-ships
2. Days transit to location based on 10 knots vessel speed over 24 hours (Range A = 1 day, Range B = 2 days, etc). Refer to Figure 11.1.
3. Data provides conservative estimate of available vessels as it does not include foreign registration or additional listings in Australian ports including the vessel types categorised below, some of which may be suitable for elements of the Containment and Recovery or Dispersant Application strategies proposed.

Table 11.5 Additional AMSA vessel registrations, July 2019

Vessel type	Units	Vessel type	Units
Accommodation vessel	1	Dumb Barge	19
Anchor Handling	1	Landing Barge	25
Barge Ro Ro	1	Landing Barge Cargo	1
Bunker Barge	5	Landing Craft	31
Bunker tanker	1	Multi-purpose Ship	6
Canal Boat	1	Offshore support vessel	5
Catamaran Charter	4	Prawn Trawler	4
Charter	8	Research	2
Charter / Research Vessel	2	Research Vessel	3
Charter Ferry	2	Supply	1
Charter Launch	11	Supply Boat	1
Charter Vessel	6	Supply Vessel	10
Construction Vessel	1	Support Craft	1
Crane/derrick barge	2	Support ship	2
Crew Boat	1	Survey Vessel	3
Deck Barge	1	Trawler	36
Dive Charter	2	Tug Supply	1
Dive Launch	1	Tug Survey	1
Dive Vessel	1	Tug Workboat	1
Diving support vessel	4	Utility	8
Dredger	13	Utility Cat	1
Dry Bulk Cargo Ship	1		
Additional listings held	**232**		

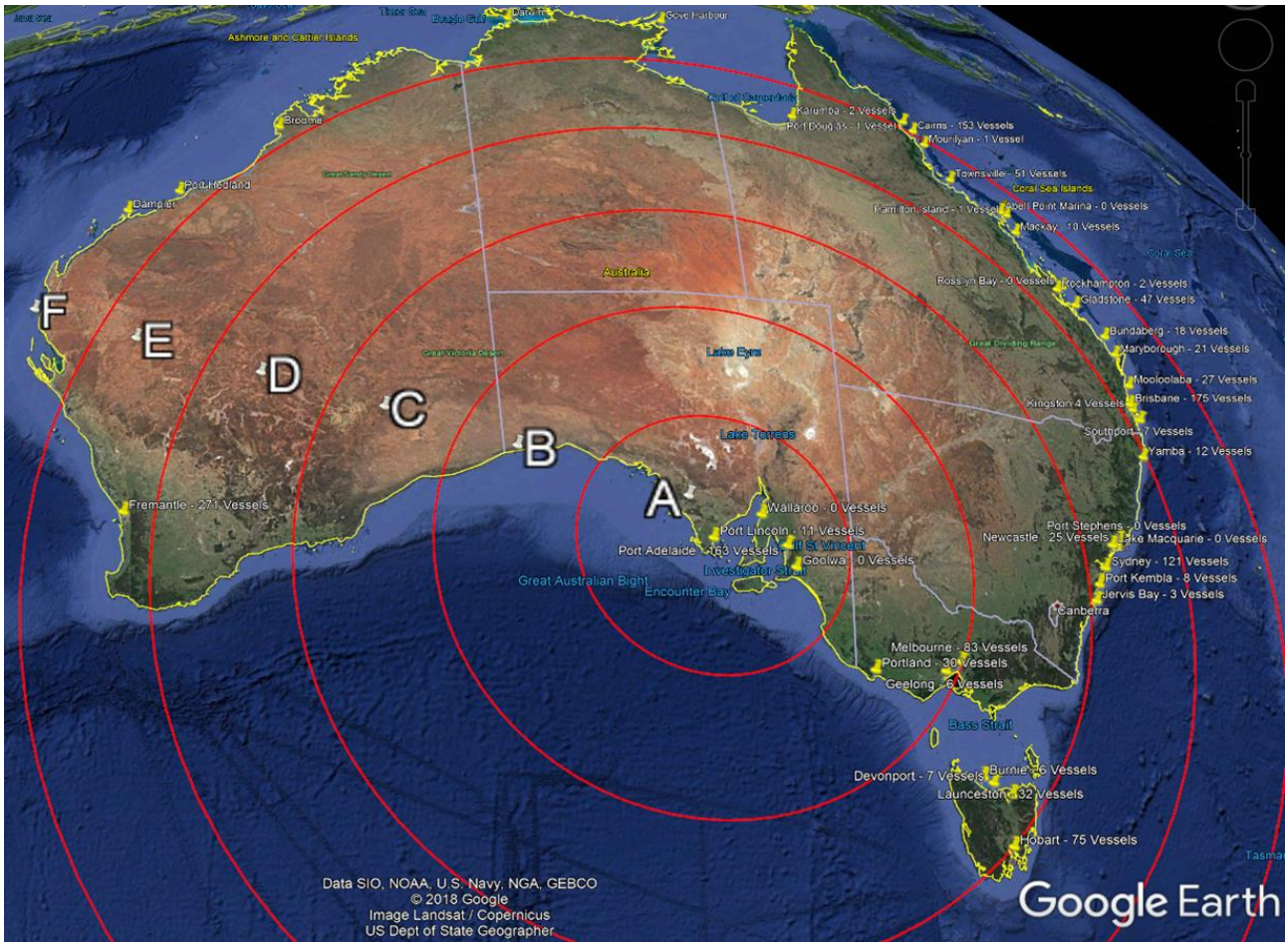


Figure 11.1 Vessel transit range

11.4 Airports

Large aircraft (i.e. Hercules and Boeing 727 dispersant capable aircraft) will operate out of Adelaide Airport and smaller aircraft (e.g. surveillance aircraft) will operate out of Ceduna or Port Lincoln airports. These airports will support resupply of fuel and personnel. Helicopters will also operate out of Ceduna Airport, and helicopter refuelling can also take place on the MODU. A dispersant stockpile of 6 m^3 will be stored at Ceduna Airport to support initial aerial dispersant application.

International (Tier 3) response equipment, materials and personnel will transit through Adelaide, Melbourne or Sydney airports. Once clearing customs, equipment and personnel will then be mobilised via other logistics pathways depending on their destination.

There are daily freight-only Boeing 747 flights arriving at both Sydney and Melbourne. Melbourne Airport will be used as needed to relieve Adelaide Airport, for additional capacity, and to allow night activity, without the need to violate the night curfew at Adelaide Airport. Sydney Airport will be used to unload heavy equipment that cannot be unloaded at either Adelaide or Melbourne airports. One element of the capping stack and two elements of the sub-sea debris clearance kit have single items with weights that require the use of a main deck loader with at least a 23 tonne capacity. Sydney Airport has a main deck loader with working capacity of 35 tonnes. After unloading these items, they will be trucked to Adelaide (16–24 hours' drive).

The roads from all airports to Port Adelaide (Berth 25) have been assessed for restrictions, including weight, height and width. No issues were identified for any of the potential emergency response equipment. Given the driving time exceeds health and safety requirements to prevent driver fatigue, more than one driver will be available to cover the distance without delays.

Customs clearance procedures have been checked and verified by the Australian Border Force. All equipment needed for the emergency response will be pre-declared in the Integrated Cargo System (ICS), which is available 24/7 and all shipments will have declarations submitted prior to arrival in Australia. If needed an "urgent cargo clearance" will be requested. Pre-departure biosecurity screening will be done from airports that support this service, such as Singapore. This will expedite the release of equipment and materials.

11.5 Aircraft

Equinor will utilise aircraft available under the National Plan (via the Australian Maritime Safety Authority) for aerial surveillance, aerial dispersant application and to direct vessels undertaking containment and recovery operations. A single aircraft may fulfil a single function or combination of activities.

Two types of fixed wing aircraft have therefore been identified to support surveillance or to function as a spotter plane:

- Fairchild Swearingen Metroliner or Fairchild Aerospace Metro 23 (or similar)
- Beechcraft King Air (or similar).

Equinor has confirmed there are >20 aircraft of these types available (Appendix 2). These aircraft have the required capability to enable them to undertake the full range of aerial surveillance and support activities. Both types of aircraft will operate out of Ceduna Airport and have sufficient range to travel to the spill location and remain on target for several hours.

In addition to aircraft available under the National Plan, Equinor will have access to one Hercules (located in Kuala Lumpur) and one Boeing 727 (located in the United Kingdom) dispersant capable aircraft through OSRL. These aircraft can be mobilised to the well location (via Adelaide Airport) in approximately 2–4 days

For aerial dispersant application, aircraft operations are planned to commence from day 2 of the response, and current logistics planning accounts for up to nine dispersant aircraft mobilised by day 4. The simulations and the anticipated effect of sub-sea dispersant injection is such that this capacity of dispersant will exceed the needed capacity. Equinor has however, also confirmed that there are >20 additional aircraft of the air tractor type that can be used for dispersant application. The same aircraft are also used to fight bushfires and may be occupied with that task.

The dispersant required is 38 m^3/day on day two, 92 m^3/day on day three and about 110 m^3/day from day four to day 20 totalling 2000 m^3 of dispersant for aerial operations Dispersant will be required to be supplied to Ceduna airport via aircraft or by trucks. There will be an air operations plan created as part of the IAP during the incident commencement.

Distance to site; due to the distance offshore (close to operational range of the aircraft), Australian Marine Oil Spill Centre/Australian Maritime Safety Authority fixed wing aerial dispersant capability (FWADC) aircraft dispersant application time on site will be limited to 20 minutes. Safety requirements for this activity will be addressed in the aerial operations plan and Simultaneous Operations (SIMOPS) planning. FWADC aircraft operating out of Ceduna will carry 3 m^3 of dispersant per aircraft. The total sortie time per aircraft travelling at 150 knots for 200 nautical miles is 2.7 hours plus 20 minutes onsite for application flight time. This would mean that a 3-hour sortie plus 30 min reload is 3.5 hours total, or 10.5 hours per day would equate to a minimum of 3 sorties per day per aircraft with the potential of 4 sorties per day deploying a minimum of 9 m^3 of dispersant. All vessels and aircraft within 100nm of the well head will be managed by the On-scene Commander (OC) who will be embarked in a command and control vessel. The intention is also for a helicopter to be stationed at either the dispersant deployment platform or the relief well rig to also act as a search and rescue helicopter. Therefore, for any aerial spraying operation using the fixed wing aerial dispersant aircraft, there will be a spotter/air attack supervisor located in an overhead aircraft controlling the tactical level spraying (this will be a long range/long endurance aircraft deployed for 8-10 hours daily) the spraying on the slick.

Within the current contracted fleet (6 dedicated aircraft) Aerotech First Response would comfortably be able to deliver 54 m^3 per day.

The Oil Spill Response Limited Hercules C-130A and Boeing 727 operated out of Adelaide are capable of carrying 13 m^3 and 15 m^3 respectively. They have a delivery capacity of two sorties per day for each aircraft totalling 56 m^3/day.

To deliver 110m³/day

Hercules C-130A and Boeing 727 = 56 m^3

Current Fixed Wing Contract (6) = 54 m^3

In recent (July 2019) discussion with Aerotech First Response (AFR), the 6 x 24/7/365 AT 802 contracted aircraft are available from the 6 designated airports for the support of any Australian Marine Oil Spill Centre member. This means Equinor Australia B.V. will have access to at least six aircraft in Ceduna from day four of an incident given activation and mobilisation of the aircraft from home bases by hour one, day one. During bushfire season; while the fire season response may require up to 10 air tractors an any one time (provided generally from the affected region only) the Aerotech level of confidence in supplying at least another six air tractors from other regions to Ceduna within four days is very high. There are around 20 x AT802 compliant (for over the water aerial dispersant spraying) aircraft based in Australia at any one time. Pilots flying hours in any 24-hour period are 12 hours.

We believe with the current contracted fleet (six dedicated aircraft) Aerotech First Response would comfortably be able to deliver 54 m^3/day.

11.6 Personnel

11.6.1 Trained personnel

As shown in Section 7.2, Equinor will provide trained spill response personnel via the ERT, IMT and CMT response structures. In the event that further personnel are required, Equinor has access to more than 145 trained personnel from around the world via the GIMAT. GIMAT personnel may support from overseas or be mobilised to Australia depending on the personnel requirements at the time.

Equinor will utilise trained responders available under the National Plan (via AMSA), from AMOSC, OSRL and WWC. Table 11.6 summarises the personnel available via these agreements. Beyond that, Equinor will have access to trained personnel via third-party contactors such as RPS and support vessel contractors.

Table 11.6 Trained response personnel

Organisation	Personnel
AMOSC	• AMOSC Core Group – 13 permanent staff available 24/7, who can be supplemented with ~120 participating oil company personnel • Aerial observers • Shoreline protection and clean-up personnel and specialists (personnel trained in SCAT processes and oil spill clean-up, technical experts) • Tactical planning personnel (personnel involved in developing TRPs and logistics planning) • Oiled wildlife response personnel: – OWR Industry Team personnel (18 responders) – Blue Planet Marine (10 to 20 responders) – Massey University (4 to 6 responders) – Phillip Island National Parks (20 to 40 responders) – International Bird Rescue (4 responders)
National Plan (administered via AMSA)	• Aerial observers
OSRL (five personnel)	• Well control technical personnel • Training personnel for shoreline clean-up • Oiled wildlife response personnel: • Sea Alarm Foundation (fulfil the role of Wildlife Advisor) • Global Oiled Wildlife Response Network.

Organisation	Personnel
WWC	• Well control specialists
Equinor contractors	• Oil spill modelling personnel (RPS) • Vessel crew trained in the operation of specific spill response equipment (i.e. vessel dispersant and containment and recovery systems) (support vessels) • Air attack supervisors

11.6.2 Additional personnel

In the event of a large spill, additional personnel with no formal spill response training will be utilised to implement an effective response. Equinor's logistics planning has considered the following sources of additional personnel:

- support vessel crew (generally trained in the use of a range of spill response equipment)
- VoO crew: able to support visual observations and spill monitoring for situational awareness, and will be provided with in-time training upon arrival in Port Adelaide
- general unskilled labour (engaged via a recruitment agency) will be trained to support shoreline protection and clean-up operations.

Staffing and recruitment agencies have confirmed that more than 100 people can be recruited per week in Adelaide and Melbourne. Additional FIFO personnel will be contracted from across Australia and relocated to training centres in the first instance. Equinor will provide "in-time" training for nearshore containment and recovery operations and shoreline protection and clean-up operations.

In-time training for shoreline protection and clean-up can provide up to:

- approximately 8 trainers from AMOSC, who can train 50-60 personnel per week, who can train 10-20 personnel per trainer per week
- approximately 10 trainers from OSRL, who can train 75 personnel per week, who in turn can train ten personnel per trainer per week.

Experienced personnel already trained in shoreline clean-up will undergo a 'train the trainer' course (likely to be a 1-2 day course). Untrained personnel would undergo a two-day course covering shoreline assessment and clean-up (one day in the classroom and one day in the field).

12.0 Training and exercises

12.1 Training and competency

Equinor will maintain competent and trained response personnel to ensure that emergency management and response capability is maintained throughout the activity. Equinor IMT personnel are required to complete training in the Incident Management System, which is based on the Incident Command System. Table 12.1 lists further training and competency requirements relevant to this OPEP.

The training specified is in line with the legal requirements for petroleum activities in Australia. Training and certification of individual personnel are tracked in SAP software.

Table 12.1 Equinor training and competency requirements

Nominated position	Training/competency
All onshore drilling/project personnel	Equinor IMT/OPEP familiarisation training
Equinor IC	Oil Spill Response Management (IMO III or equivalent)), ICS/IMS 100/200 E-learning, IMS initial phase to operational phase lecture, response IT-tool e-learning, media training for dedicated personnel and personnel emergency response basic course for dedicated functions.
Equinor GIMAT Operations Section Chief, Planning Section Chief, Logistics Section Chief	Oil Spill Response Management (IMO II or equivalent)Oil Spill Response Management (IMO II or equivalent), Incident Management Course ICS 100/200, 300 E-learning, ICS 320 scenario-based training, Equinor customised oil spill response training course, IMS initial phase to operational phase lecture, response IT-tool e-learning, media training for dedicated personnel and personnel emergency response basic course for dedicated functions.
Equinor GIMAT Environmental Unit Leader	OSRL (or equivalent) tactical Environment Advisor and Oiled Wildlife Response Planning courses.

12.2 Exercises, testing and drills

The exercises listed in Table 12.2 will be conducted for the activity. The schedule below aligns with requirements of Sub-regulation 14(8C) of the OPGGS(E) Regulations. Response arrangements will be tested if they are significantly amended, and no later than 12 months after the most recent test.

Testing response arrangements will include:

- clear statement of the objectives of testing
- mechanisms for evaluating the exercise against the agreed objectives
- mechanisms for addressing recommendations arising from the exercise.

Following each exercise, a debrief will be conducted and opportunities to improve will be identified and recorded. A written report will be developed for each exercise in Table 12.2. The reports will include:

- description of scenario, objectives and organisations/groups involved
- description of observations, actions and responsibilities
- summary and conclusions.

The findings from exercises are recorded in Synergi along with corrective actions identified. Personnel responsible and the deadline for completing actions is also identified in Synergi. All corrective actions will be closed out in Synergi on time and the OPEP and supporting documentation (OSMP, TRPs, OWMP, etc.) updated, if required in response to a finding.

Table 12.2 Exercises, testing and drills

Exercise	Objective	Description	Frequency
Equinor IMT desktop exercise	Verify Equinor IMT systems and resources in place and Stromlo-1 OPEP response requirements are understood	Equinor internal test of a Level 3 oil spill event response. The exercise will involve the Equinor Australian based team. The exercise will test: • internal notification process • personnel availability to fill critical IMT roles and their understanding of their responsibilities • spill response training and competency requirements of Equinor Australian based personnel • communications between Australian and overseas response personnel • international personnel that may be required in Australia have necessary permits/visas in place.	At least three months prior to mobilisation (within Australia) to well location
Level 3 oil spill OPEP desktop exercise	Verify oil spill response resources, plans and procedures are in place and effective in responding to a Level 3 oil spill.	An OPEP desktop exercise to test oil spill response plans for a Level 3 oil spill event. The objective of the exercise will test: • notification, activation and mobilisation procedures • interfaces with commonwealth and state control agencies (cross-jurisdictional arrangements), response partners, third-party providers and stakeholders • activation of First strike plan, tactical response plans, the OSMP and OPEP waste management plan • process for escalation of response • logistical arrangements (i.e. availability and mobilisation times) through desktop application • application of identifying protection priorities and the NEBA process. Exercise will involve response partners (e.g. AMOSC, OSRL, WWC) and third-party providers (e.g. RPS). The following critical response arrangements for the following response methods will be tested: • source control, including SSDI • surface dispersant application • containment and recovery • shoreline protection and clean-up • oiled wildlife response. Commonwealth and state control agencies will be invited to participate in this exercise.	At least two months prior to mobilisation (within Australia) to well location
OPEP communications test	Verify contact details in the OPEP are accurate	Test of all contact numbers including Equinor personnel, response partners, third-party providers, response stakeholders and control agencies.	Approximately one week prior to mobilisation (within Australia) to well location

13.0 OPEP performance and review

13.1 Environmental performance outcome (EPO 13)

To implement spill response operations in a timely manner.

13.2 Control measures and performance standards

The control measures in the table below are those that will ensure a timely spill response. The environmental performance standards have been developed to ensure that the spill response control measures are measurable and meet set levels of performance. Additional control measures and environmental performance standards for spill preparedness and response are in the following sections:

- Source control: Section 7.7.13.4 of the EP
- Dispersants: Section 8.5.4 of the EP
- Containment and recovery: Section 8.6.4 of the EP. For further information on decanting process (from vessel tanks and temporary storage containers) also see Section 9.5 of the OWMP
- Shoreline protection and clean-up: Section 8.7.4 of the EP
- Oiled wildlife response: Section 8.8.4
- Operational and scientific monitoring program: Section 8.9.4 of the EP.

The control measures and environmental performance standards in those sections of the EP and in this OPEP, together represent the full suite of oil spill response control measures and environmental performance standards.

Where Equinor are the control agency, state agencies will have a Liaison Officer in the Equinor IMT as an observer to feed information back to their teams. Within state jurisdiction, the state agency is the control agency (i.e. for shoreline protection and clean-up and oiled wildlife response). Where an authorised government officer, such as the designated State Controller, directs Equinor to act in such a manner that adherence to the commitments described in the EP including this OPEP can no longer reasonably be achieved, and as a result an environment performance standard can no longer be met, the failure to meet that standard will not constitute a non-conformance under the EP. However, any such instances will be listed in the post-activity environmental performance report described in Section 9.0 of the EP.

Legislative and other requirements	In addition to those listed in Sections 7.0 and 8.0 the following are relevant to spill response: • National Plan (AMSA 2019) • State oil spill response plans (outlined in Section 7.3) • WA Oiled Wildlife Response Plan (DPAW 2014) • SA Oiled Wildlife Response Plan (DEW 2019)
Industry standards	In addition to those listed in Sections 7.0 and 8.0 the following are relevant to spill response: • IPIECA-IOGP series of “Good Practice Guides” on oil spill preparedness and response • National Plan policies and guidelines, including the National Plan Coordination of Cross-border Incidents Guideline (NP-GUI-023) (AMSA 2017a) and the National Plan Change of Control Agency Protocol (NP-GUI-022) (AMSA 2017b).
Equinor standards	In addition to those listed in Sections 7.0 and 8.0 the following are relevant to spill response: • SF700 – Preparedness and response • R-38072 – Oil spill preparedness and response.

Control measure	Environmental performance standard	Measurement criteria	Responsibility
Notification schedule and communications	OPEP EPS 13.1: In the event of a reportable hydrocarbon spill, external agencies will be notified of hydrocarbon spills to the marine environment in the manner and timeframes specified in Section 2.2 (diesel spills within the Operational Area) and Section 3.2 (loss of well control) of this OPEP.	Daily logs, daily incident reports, completed oil Pollution reports (POLREPs), confirm that notifications completed in accordance with Sections 3.2 and 4.2 of this OPEP.	Incident Commander
	OPEP EPS 13.2: In the event of a Level 2 or 3 hydrocarbon spill, external stakeholders will be notified in the manner and timeframes specified in Section 8.4 (Consultation).	Daily log, daily incident reports, communications records, media releases	Public Information Officer
Spill response equipment and trained personnel to support response – general	OPEP EPS 13.3: Equinor will have the required contracts, agreements and memberships with AMOSC, OSRL and WWC prior to Level 3 OPEP desktop exercise.	Copies of contracts, agreements or memberships that demonstrate Equinor has access to spill response equipment and personnel prior to Level 3 OPEP desktop exercise	Equinor Drilling Manager
	OPEP EPS 13.4: Review of equipment and trained personnel conducted as part of Level 3 OPEP desktop exercise and OPEP/OSMP updated prior to mobilisation, if required, to address corrective actions and lessons learned.	Records and report from desktop exercise, and revised OPEP/OSMP if updates required	SSU Manager
	OPEP EPS 13.5: Equipment used for spill response will be in-date, in-test and calibrated as defined by manufacturer's instructions	Equipment lists Equipment records, including manufacturer's instructions for use	State control agency (supported by Equinor Logistics Section Chief)
Equinor IMT, GIMAT and CMT personnel available to support response	OPEP EPS 13.6: Personnel available to fulfil Equinor IMT roles in event of spill - Incident Commander, Operations Section Chief, Planning Section Chief, Logistics Section Chief, Air Operation Branch Director and Environmental Unit Leader present in Adelaide while the drilling activity is in the reservoir and able to muster within one hour.	Records demonstrate personnel fulfilling IMT roles located in Adelaide, reports and records of Level 3 OPEP oil spill exercise demonstrate personnel muster within one hour, IMT log	SSU Manager
	OPEP EPS 13.7: Personnel available to fulfil GIMAT and CMT roles in event of Level 2 or 3 spill, as response escalated: • Incident Commander, Personnel Officer, Operation Section Chief, Planning Section Chief and Logistics Section Chief on standby in Norway with valid visa while the drilling activity is in the reservoir and mobilised to Australia within 48 hrs of IMT request. • GIMAT mobilised to Stavanger Norway within 72 hours of notification by IMT and remain in Norway until visas are obtained. • CMT located in Stavanger Norway and fully manned within one hour of mobilisation.	Copies of visas, records of travel times meet the timeframes specified, IMT log and personnel daily logs	SSU Manager
	OPEP EPS 13.8: Five ICS trained advisers from OSRL with valid visas capable of mobilisation to Australia within 24 hours.	Copies of visas, location of advisors within 24 hours of Australia	SSU Manager

Control measure	Environmental performance standard	Measurement criteria	Responsibility
Equinor IMT and GIMAT personnel are trained and competent in oil spill response	OPEP EPS 13.9: GIMAT personnel – Deputy Incident Commander Operation Section Chief, Planning Section Chief, Logistic Section Chief have undertaken ~~OPEP EPS 13.10:~~ Incident Management Course, ICS 100/200, 300 E-learning, ICS 320 scenario-based training and Equinor customised oil spill response training.	Training records, matrices, certification show personnel listed have required training	SSU Manager
	OPEP EPS 13.10: IMT personnel – Incident Commander, Operations Section Chief, Planning Section Chief and Logistics Section Chief have undergone the following training: • ICS/IMS 100/200 E-learning • IMS initial phase to operational phase lecture • response IT-tool e-learning • media training for dedicated personnel • personnel emergency response basic course for dedicated functions.	Training records, matrices, show personnel listed have required training	SSU Manager
	OPEP EPS 13.11: GIMAT – GIMAT team has performed the GIMEX annual three-day exercise (24/7 exercise).	Reports and records from annual exercise	SSU Manager
	OPEP EPS 13.12: IMT – Equinor Australia IMT has undertaken response tabletops and exercise prior to entering reservoir.	Reports and records from tabletops and exercise.	SSU Manager
Vessel preparedness for oil spill response through vessels of opportunity	OPEP EPS 13.13: Six months prior to mobilisation a study will be undertaken to determine potential vessels of opportunity based within a 20-day transit of Port Lincoln.	Reports from AMOSC demonstrate vessel of opportunity study undertaken	SSU Manager
	OPEP EPS 13.14: Minimum two months prior to mobilisation a vessel of opportunity plan will be developed.	Copy of VoO plan	SSU Manager
	OPEP EPS 13.15: When drilling is in the reservoir a five-day synopsis of vessels and their locations will be developed.	Copy of five-day synopsis	SSU Manager
Vessels available for oil spill response through vessels of opportunity	OPEP EPS 13.16: In the event of loss of well control: The five-day forecast all available vessels will be used to contract and activate vessels within three days of loss of well control.	Equinor IMT log, daily incident reports confirm vessels of opportunity	Incident Commander
Spill response exercises and tests	OPEP EPS 13.17: Equinor IMT desktop exercise conducted at least three months and Level 3 oil spill OPEP desktop exercise conducted at least two months prior to mobilisation (within Australia) to well location. OPEP communications test conducted approximately one week prior to mobilisation (within Australia) to well location.	Records and reports for exercises and tests confirm timeframes prior to mobilisation were met.	SSU Manager
	OPEP EPS 13.18: Scope of exercises include the items listed in the 'Description' column of Table 12.2 of the OPEP.	Records and reports for exercises and tests cover scope of items in Table 12.2 of OPEP.	SSU Manager

Control measure	Environmental performance standard	Measurement criteria	Responsibility
	OPEP EPS 13.19: Findings and corrective actions entered into Synergi and tracked to closure.	Data in Synergi, reports for exercises and tests.	SSU Manager
	OPEP EPS 13.20: OPEP and supporting documentation (OSMP, TRPs, OWMP, etc.) updated, if required in response to exercise findings.	Copies of revised documents, reports for exercises and tests, data in Synergi.	SSU Manager
	OPEP EPS 13.21: Response partners (e.g. AMOSC, OSRL, WWC) and third-party providers (e.g. RPS) participated in Level 3 oil spill OPEP desktop exercise and Commonwealth and state control agencies invited to participate.	Reports for exercises and tests, records of invitation to Commonwealth and state agencies.	SSU Manager
	OPEP EPS 13.22: Contact details in the OPEP up to date prior to mobilisation (within Australia) to well location.	Updated contact list, report for OPEP communications test.	SSU Manager
Shipboard Oil Pollution Emergency Plan (SOPEP)	OPEP EPS 13.23: Response activities will be implemented immediately as identified in the vessel SOPEP	Records of incident and response demonstrate response was timely and commensurate with the spill, as defined in the vessel SOPEP, daily logs, communications reports	Vessel Master/ MODU Offshore Installation manager
Oil Pollution Emergency Plan (OPEP) activation and termination	OPEP EPS 13.24: The OPEP will be activated immediately following initial report of the spill, to provide a first strike response commensurate with the nature and scale of the spill in line with directions provided in this OPEP.	Records of communications/ notifications, IMT log, daily logs, records of IMT mobilisation demonstrate OPEP activated immediately	Incident Commander
	OPEP EPS 13.25: Spill response operations will continue until Equinor and the relevant government agencies involved in the response agree that the overall response termination criteria in Section 2.5 (diesel spills within the Operational Area) and Section 3.10 (loss of well control) of this OPEP have been met.	Equinor IMT log, communication records with relevant government agencies confirm that overall termination criteria were met prior to termination of the response.	Equinor Incident Commander or state control agency
OPEP Waste Management Plan (OWMP)	OPEP EPS 13.26: In the event of a Level 2 or 3 oil spill to the marine environment, copy of OWMP provided to waste contractor(s) at the time.	Communications records/transmittals demonstrating waste contractor(s) have copy of OWMP in event of a Level 2 or 3 oil spill.	Drilling Superintendent
	OPEP EPS 13.27: OWMP requirements tested as part of the Level 3 OPEP desktop pre-mobilisation exercise.	Records and reports for Level 3 OPEP desktop exercise provide evidence that TRP tested.	SSU Manager
	OPEP EPS 13.28: Recovered liquid and solid waste stored onboard vessels and tanker (if used) safely secured and able to be unloaded safely.	ICS records, waste manifests, IMT log demonstrate temporary waste storage safely secured and capable of being unloaded safely.	Vessel Master

Control measure	Environmental performance standard	Measurement criteria	Responsibility
	OPEP EPS 13.29: In event of a loss of well control, appropriate tanker vessel is sourced (available from e.g. broker) on Day 1. Tanker vessel able to be mobilised to site (offshore or in Port Adelaide) by Day 20 if required Selected tanker has a capacity of no less than 35,000 dead weight tonnage (DWT).	Records demonstrate that an appropriate tanker of no less than 35,000 dead weight tonnage (DWT) has been sourced on Day 1 confirmed available to mobilise to site by Day 20. VoO register / overview from brokers (Clarkson's and/or Fearnley's) confirms vessel source and availability.	Incident Commander
	OPEP EPS 13.30: Shoreline recovered waste loaded on trucks is safely secured and able to be unloaded safely.	Waste manifests demonstrate waste safely secured and capable of being unloaded safely.	OPEP Waste Contractor
	OPEP EPS 13.31: Recovered waste unloaded in accordance with requirements in OWMP.	Waste manifests, IMT log.	Vessel Master
	OPEP EPS 13.32: Recovered waste disposed in accordance with requirements in OWMP.	Records of final disposal location.	Onshore Materials and Logistics Supervisor
Dispersant and Containment and Recovery Tactical Response Plan (TRP)	OPEP EPS 13.33: Dispersant and Containment and Recovery TRP finalised as part of the Level 3 OPEP desktop pre-mobilisation exercise.	Copy of the final TRP	SSU Manager
	OPEP EPS 13.34: Dispersant and Containment and Recovery TRP activated within two hours of request by IMT.	ICS records, IMT log records that TRP activated within 2 hours of IMT request.	Incident Commander
	OPEP EPS 13.35: A minimum two nautical mile exclusion zone initially established around the source of the spill.	IAP, ICS records, IMT log demonstrate exclusion zone established.	Incident Commander
	OPEP EPS 13.36: In the event of a Level 1 hydrocarbon spill, vessel on location to observe and report to IMT.	Vessel log, communications records demonstrate vessel on location used for surveillance of Level 1 spills.	Incident Commander
	OPEP EPS 13.37: In the event of a Level 2 or 3 hydrocarbon spill, dispersant and/or C&R First Strike response operations activated within 2 hours of request by IMT. Regional (Tier 2, within Australia) response containment and recovery personnel and equipment mobilised. International (Tier 3) response personnel and equipment mobilised if escalation of response required and requested by the IMT.	ICS records, IMT log, shows first strike response for C&R and dispersant operations activated within 2 hours of Level 2 or 3 spill and further Tier 2 and/or 3 response resources requested if required.	Incident Commander
Tactical Response Plan – Shoreline	OPEP EPS 13.38: Overarching shoreline response TRP reviewed and updated at least five days before first shoreline contact. Weekly review to document development of new site-specific TRPs and identify revised lists of primary, secondary and tertiary response sites (as required).	Records demonstrate TRP reviewed at least 5 days before incident spill modelling predicts first shoreline contact Revision status information in TRP confirms weekly revisions	State control agency (supported by Equinor Incident Commander)

Control measure	Environmental performance standard	Measurement criteria	Responsibility
Site-specific shoreline Tactical Response Plans	OPEP EPS 13.39: Existing site-specific shoreline TRPs reviewed and updated, and new primary and secondary shoreline TRPs developed from template TRP, based on Shoreline Clean-up Assessment Technique (SCAT) surveys (as required). Site-specific TRP prepared for any new tertiary sites identified, based on template TRP.	SCAT survey reports, completed site-specific shoreline TRPs	State control agency (supported by Equinor Incident Commander)
	OPEP EPS 13.40: TRPs for shoreline locations finalised for implementation within at least 10 days prior to the predicted time to first shoreline contact.	Completed site-specific shoreline TRPs and records of date of approval that demonstrate - timeframe for completion was met.	State control agency (supported by Equinor Incident Commander)
NEBA	OPEP EPS 13.41: NEBA reviewed and validated during each operational shift of the IMT.	Incident Action Plan, IMT log shows NEBA reviewed each operational shift of the IMT.	Incident Commander
	OPEP EPS 13.42: NEBA considers key protection priorities.	NEBA records show key protection priorities considered	Incident Commander
	OPEP EPS 13.43: Results of NEBA shared with IMT observers from relevant Commonwealth and state agencies.	IMT log	Incident Commander
	OPEP EPS 13.44: Surveillance (including modelling) and OSMP data inform ongoing NEBA.	Surveillance and OSMP records, records show how surveillance and OSMP data informed NEBA	Incident Commander
	OPEP EPS 13.45: NEBAs required within state jurisdiction directed by relevant state control agency with Equinor support.	IAP incl. NEBA, IMT log, communications records	State control agency (supported by Equinor Incident Commander)
Incident Action Plan (IAP)	OPEP EPS 13.46: Incident Action Plan to include results of NEBA.	IAP incl. NEBA, IMT log, communications records	Planning Section Chief
	OPEP EPS 13.47: During emergency response, the Incident Action Plan (IAP) is reviewed and updated on a 24-hour cycle taking into account situational awareness data and NEBA outcomes. IAP considers current situational awareness information and NEBA outcomes (available within the previous 24 hours).	Review of the IAP status information shows it is current and has been revised in last 24 hours	Incident Commander
Oil spill surveillance and monitoring – general	OPEP EPS 13.48: For a Level 2 or 3 oil spill to the marine environment, surveillance and monitoring activities capable of providing 24-hour coverage when aerial surveillance activities commence.	Aerial observation logs, satellite surveillance reports, satellite tracking buoy data, oil spill trajectory modelling, IMT log	Incident Commander
	OPEP EPS 13.49: Visual sightings of wildlife during response operations will be reported to the IC	IMT log confirms that wildlife sighted have been reported to the IC.	Vessel and aircraft observers

Control measure	Environmental performance standard	Measurement criteria	Responsibility
Vessel surveillance	OPEP EPS 13.50: The SCV will have the following equipment to support spill response: • oil spill detection radar • tracking buoys • infra-red camera • ROV on board to facilitate BOP intervention.	Pre-mobilisation check confirms equipment onboard SCV.	Equinor Drilling Manager
	OPEP EPS 13.51: In the event of a hydrocarbon spill to the marine environment, standby vessel on location to commence vessel surveillance within 2 hours of request from IMT.	IMT log confirms vessel surveillance commenced within 2 hours of request from IMT	MODU OIM (for Level 1), Equinor IC (for Level 2 and 3)
Oil spill trajectory modelling	OPEP EPS 13.52: For a Level 2 or 3 spill to the marine environment, submit a written request for OSTM services within 2 hours of request from IMT.	Equinor IMT log and copy of completed OSTM Request Form demonstrate written request sent within 2 hours request from IMT.	Planning Section Chief
Satellite surveillance	OPEP EPS 13.53: For a Level 2 or 3 oil spill, the satellite surveillance contractor will be contacted within 2 hours of request from IMT to provide satellite imagery to track and monitor the spill.	Equinor IMT log confirms satellite surveillance contractor was contacted for surveillance services within 2 hours of request from IMT.	Logistics Section Chief
Satellite tracking buoys	OPEP EPS 13.54: For a Level 2 or 3 oil spill the satellite tracking buoys stored on board the support vessel(s) or MODU will be deployed within 2 hours of IMT request.	Equinor IMT log and vessel logs demonstrate buoys deployed within 2 hours of request from IMT.	Logistics Section Chief
Aerial surveillance	OPEP EPS 13.55: For a Level 2 or 3 spill to the marine environment, aerial surveillance support (spotter plane) will be mobilised to spill location within 24 hours request by IMT.	Equinor IMT log confirm spotter plane requested and mobilised to well location within 24 hours of request by IMT.	Logistics Section Chief
	OPEP EPS 13.56: Aerial surveillance conducted by aerial observers that meet the training requirements in the National Plan Policy NP-PL-005 (or equivalent) available at https://www.amsa.gov.au/marine-environment/national-plan-maritime-environmental-emergencies/np-pol-005-national-plan-air.	Training records confirm aerial observers meet National Plan Policy NP-PL-005 qualification requirements.	Logistics Section Chief
	OPEP EPS 13.57: For a Level 2 or 3 spill to ocean, aerial surveillance will be conducted at least twice daily during daylight hours.	Equinor IMT log, aerial observer logs confirm surveillance conducted at least twice daily during daylight hours.	Logistics Section Chief
Operational and Scientific Monitoring Program (OSMP)	OPEP EPS 13.58: Request review of activation criteria for the OMPs and SMPs in the OSMP within 2 hours of request from IMT.	Equinor IMT log confirms review of OSMP activation criteria was undertaken within 2 hours of request from IMT.	Planning Section Chief
	OPEP EPS 13.59: If the criteria have been met, activate relevant OMPs and SMPs within 24 hours of review of activation criteria.	Equinor IMT log confirms relevant OMPs and SMPs activated within 24 hours of review.	Planning Section Chief

Control measure	Environmental performance standard	Measurement criteria	Responsibility
	OPEP EPS 13.60: Once the OSMP has been activated, Scientific Advisory Group (SAG) (consisting of key stakeholders identified in the Resources Register/OSMP Implementation Plan) mobilised within 24 hours of request by IMT.	Equinor IMT log confirms SAG mobilised following activation of the OSMP and within 24 hours of IMT request.	Planning Section Chief
	OPEP EPS 13.61: Once the OSMP has been activated, OSMP field survey resources mobilised to the field within one week of triggering the respective OMP/SMPs.	Equinor IMT log confirms resources mobilised to field within one week of triggering the respective OMP/SMP.	Logistics Section Chief
Dispersant application/ injection	OPEP EPS 13.62: Stockpile dispersant on MODU or SCV/PSV for vessel surface dispersant application.	Pre-mobilisation check confirms dispersant stored onboard MODU or SVC/PSV and available for vessel application	Equinor Drilling Manager
	OPEP EPS 13.63: Contract with AMOSC to provide a subsea dispersant toolkit, coiled tubing unit available in Perth and a contract in place for deployment of SCV.	Pre-mobilisation check shows subsea dispersant toolkit and coiled tubing unit in Perth and contract in place for SCV.	Equinor Drilling Manager
	OPEP EPS 13.64: Aircraft are available for aerial dispersant application: • air tractors from day 2; up to nine aircraft mobilised by day 4 • one Hercules ex Kuala Lumpur from day 2 (OSRL) • one 727 ex UK (OSRL).	Pre-mobilisation check confirms contracts or MOU are in place for appropriate planes within the times specified.	Equinor Drilling Manager
	OPEP EPS 13.65: Contract in place to supply six dedicated fixed wing aircraft, a Hercules C-130 and a Boeing 727.	Documented evidence of contracts in place, Equinor IMT log, daily incident reports confirm aircraft and dispersant application.	Equinor Drilling Manager
	OPEP EPS 13.66: In the event of a loss of well control, fabricate more dispersant to ensure sufficient supply during response.	Records of request for manufacture of additional dispersant to support response.	Equinor Incident Commander
Containment and recovery	OPEP EPS 13.67: Mobilise PSV for mechanical recovery from either South East Asia or Australia immediately following request from IMT, without waiting for assessment of source control and dispersant effectiveness.	IMT log shows PSV mobilised immediately.	Equinor Incident Commander
	OPEP EPS 13.68: Prepare a logistic plan that will allow vessels to be equipped with containment and recovery equipment and prepared for operations immediately after arrival.	Pre-mobilisation check confirms logistics plan provides for vessels to be equipped with containment and recovery equipment	Equinor Drilling Manager
	OPEP EPS 13.69: Offshore rated booms and skimmers selected to improve potential operational effectiveness and recovery potential.	Pre-mobilisation check confirms selected booms and skimmers are offshore rated.	Equinor Drilling Manager

Control measure	Environmental performance standard	Measurement criteria	Responsibility
	OPEP EPS 13.70: Provide for potential mobilisation of more than eleven nearshore containment and recovery strike teams to reduce impacts to protection priorities under the direction of state control agency(s).	IMT log demonstrates at least eleven nearshore containment and recovery strike teams provided.	State control agency (supported by Equinor Logistics Section Chief) (within state jurisdiction)
	OPEP EPS 13.71: Nearshore containment and recovery strike teams provided with equipment in-time to allow for training.	IMT log, training records demonstrate equipment provided for training.	State control agency (supported by Equinor Logistics Section Chief) (within state jurisdiction)
Shoreline protection and clean-up	OPEP EPS 13.72: A shoreline TRP template is available prior to the OPEP desktop exercise.	Report, records from desktop exercise demonstrate shoreline TRP drafted.	SSU Manager
	OPEP EPS 13.73: Recruitment process in place and in-time training program for shoreline protection and clean-up provides personnel for shoreline response via: • provision of approximately 8 trainers from AMOSC/OSRL • commence training trainers within 2 weeks • commence training of responders within 3 weeks.	Recruitment records demonstrate contracting of personnel commenced within 1 week of a loss of well control incident. Shoreline protection and clean-up training records demonstrate AMOSC trainers in place by week two and OSRL trainers in place in week 4 (subject to visa approval). Records demonstrate the total number of trainers trained over the response phase, and the total number of shoreline response personnel trained.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.74: In the event of a Level 2 or 3 oil spill to the marine environment, in-time training will be provided to untrained personnel involved in shoreline protection and clean-up and oiled wildlife response.	Training records, attendance records, records of communications, IMT log.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.75: Locate booms in Adelaide to support shoreline protection and deflection in-time training and response operations.	Pre-mobilisation check demonstrates booms located in Adelaide.	Equinor Drilling Manager
	OPEP EPS 13.76: Shoreline protection equipment from stockpiles/forward operating bases/logistic hubs mobilised at least five days before predicted shoreline exposure for the relevant IBRA sub-region.	IMT log demonstrates equipment mobilised at least five days before predicted shoreline exposure.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.77: Basic set-up for two shoreline clean-up crews in Adelaide (standard container kits); PPE pre-ordered and supply chain prepared for escalation to improve response capacity.	Pre-mobilisation check demonstrates PPE available in Adelaide and additional PPE can be supplied as response escalates.	Equinor Drilling Manager

Control measure	Environmental performance standard	Measurement criteria	Responsibility
Oiled wildlife response plan	OPEP EPS 13.78: OWR 'gap plan' prepared for Victoria, Tasmania, New South Wales, South Australia and Western Australia prior to spud to resolve gaps in resourcing in the current state OWR plans	Copy of oiled wildlife response 'gap plan' that identifies gaps in response resources available prior to spud.	SSU Manager
Oiled wildlife response	OPEP EPS 13.79: Potential staging areas for oiled wildlife response identified prior to reservoir exposure.	Records of potential staging areas (available prior to reservoir exposure).	SSU Manager
	OPEP EPS 13.80: Sufficient equipment to undertake two by level 6 (WA OWRP, 2014) response during full scale response.	Copies of contracts, agreements etc. with OSRL/ AMOSC/ other providers of oiled wildlife response equipment.	SSU Manager
	OPEP EPS 13.81: Logistics for oiled wildlife response initiated within 2 days of receiving operational monitoring results.	IMT log, IAP.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.82: Pre-emptive capture, deterrence and hazing will be initiated in priority protection areas prior to first shoreline contact by oil.	Daily logs, oiled wildlife response plan, site-specific TRPs, IAP.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.83: Wildlife reconnaissance and recovery initiated in priority protection areas prior to first shoreline contact by oil.	IMT log, daily logs, IAP.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.84: Staging areas/oiled wildlife assessment and treatment facilities established in protection priority areas prior to first shoreline contact.	IMT log, daily logs, IAP, maps showing locations.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.85: Personnel (minimum of 40) deployed to protection priority areas by first shoreline contact.	IMT log, daily logs, IAP.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.86: Sufficient personnel to undertake two by level 6 response (WA OWRP, 2014) (minimum 244 people) during full scale response and trained by qualified trainers.	IMT log, daily logs, IAP.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.87: A full-time OWR liaison officer will coordinate communications between Equinor and state IMTs to ensure efficient use of available response resources.	Copy of contract, agreement (or similar) for role when filled.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.88: Contracts in place with AMOSC and OSRL who will provide equipment and personal to undertake two by level 6 response (WA OWRP, 2014) and who have call off contracts in place with equipment and personnel providers.	Copies of contracts held with service providers.	SSU Manager
	OPEP EPS 13.89: Finances available for AMOSC and OSRL to purchase OWR additional equipment prior to shoreline contact to meet increasing OWR need.	Finance records.	SSU Manager

Control measure	Environmental performance standard	Measurement criteria	Responsibility
	OPEP EPS 13.90: Volunteer wildlife care groups available in WA, SA, Victoria and Tasmania.	Listings, contact details (or similar) for volunteer groups.	State control agency (supported by Equinor Wildlife Branch Director)
	OPEP EPS 13.91: Oiled wildlife training to be initiated within 2 weeks of loss of containment.	IAP, IMT log.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.92: Basic training program in place with AMOSC (or equivalent) to train at least 30 lead responders per week, at least 50 unskilled responders per day, and veterinarians as required.	Records of training program, contract or agreement with AMOSC or similar provider.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.93: All personnel inducted in oiled wildlife techniques by qualified oiled wildlife responders prior to participating in response.	Induction records, IMT log.	State control agency (supported by Equinor Logistics Section Chief)
	OPEP EPS 13.94: Nearshore VoO and mutual aid vessels – Adelaide, Port Lincoln and Melbourne available on site to support wildlife response before a plume reaches coastal waters.	Records identify that VoOs/mutual aid vessels were on site to support wildlife response prior to the plume reached coastal waters (3 NM limit)	State control agency (supported by Equinor Logistics Section Chief)
Equipment and personnel to regain control of the well	OPEP EPS 13.95: Equinor will activate mobilisation of the required source control capability within 24 hours of a LOWC.	Equinor IMT log, daily incident reports, logistical documentation (e.g. purchase orders) confirm source control capability mobilised within 24 hours.	Equinor Operations Section Chief
	OPEP EPS 13.96: If immediate remote Blowout Preventer (BOP) closure is unsuccessful, Equinor will attempt BOP closure using remotely operated vehicle (ROV) within 24 hours of a LOWC.	Daily log, ROV video files, daily incident reports confirm that BOP closure using ROV was attempted within 24 hours.	Equinor Operations Section Chief
	OPEP EPS 13.97: Equinor will mobilise the Sub-sea Dispersant Injection (SSDI) package and commence injection nine days following a LOWC.	Equinor IMT log, daily incident reports confirm SSDI commenced nine days following a LOWC.	Equinor Incident Commander
	OPEP EPS 13.98: Equinor will mobilise and install capping stack in 15 days following a LOWC.	Equinor IMT log, daily incident reports confirm capping installation completed 15 days following a LOWC.	Equinor Incident Commander
	OPEP EPS 13.99: Equinor will mobilise rig for relief well drilling, complete drilling and kill the well within 102 days of a LOWC.	Equinor IMT log, daily incident reports confirm well kill within 102 days of a LOWC.	Equinor Incident Commander

13.3 Review

The OPEP will be reviewed:

- less than 6 months prior to spud and prior to desktop exercise
- following the oil spill exercises and tests described in Section 12.2

- after an actual oil spill to the marine environment
- if the oil spill risk profile changes significantly
- if changes to the Commonwealth and state oil spill response plans or resources occur that affect our ability to effectively implement and comply with the OPEP.

Section 9.0 of the EP summarises the changes that could trigger the need for review of the EP (including the OPEP).

Review of the OPEP will consider the following:

- the outcomes of corrective actions developed in response to oil spill exercises and tests conducted for the activity
- the outcomes of corrective actions developed in response to non-conformances identified during assurance activities
- lessons learned from actual oil spill events
- changes in relevant legislation
- feedback from relevant persons as part of ongoing consultation program
- advice from government agencies on changes to protection priorities
- updates to Commonwealth or State protected areas, marine park management plans and species conservation plans
- new knowledge about the receiving environment in bioregional profiles or published scientific literature that may contribute to environmental baselines or data collection methods
- changes relevant to the OSMP.

Updates made to the OPEP as a result of reviews that are conducted will be communicated to Equinor personnel and contractors and a copy of the updated OPEP provided to them.

14.0 Abbreviations

Abbreviation	Definition
AHTS	Anchor Handling Tug Supply
ALARP	As Low as Reasonably Practicable
AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
ANZECC	Australia New Zealand Environment and Conservation Council
ARMCANZ	Australian National Health and Medical Research Council
ASAP	As soon as practicable
BAOAC	Bonn Agreement Oil Appearance Code
BIA	Biologically Important Area
BOP	Blowout Preventer
CMT	Crisis Management Team
DBCA	Department of Biodiversity, Conservation and Attractions (Western Australia)
DEE	Department of the Environment and Energy
DELWP	Department of Environment, Land, Water and Planning (Victoria)
DEW	Department for Environment and Water (South Australia)
DIIS	Department of Industry, Innovation and Science (Commonwealth)
DNP	Director of National Parks (Commonwealth)
DoT	Department of Transport (Western Australia and Victoria)
DPI	Department of Primary Industries
DPIPWE	Department of Primary Industries, Parks, Water and Environment (Tasmania)
DPIRD	Department of Primary Industries and Regional Development
DPTI	Department of Planning, Transport and Infrastructure (South Australia)
DP	Dynamic Positioning
DSD	Department of State Development (South Australia)
EMBA	Environment that May Be Affected
EMPLAN	NSW State Emergency Management Plan
EP	Environment Plan
EPA	Environmental Protection Authority
Equinor Australia	Equinor Australia B.V. (previously Statoil)
ERP	Emergency Response Plan
ESI	Environmental Sensitivity Index
GIMAT	Global Incident Management Assist Team
GPS	Global Positioning System
IC	Incident Commander (note: Equinor uses “Commander” – other Australian jurisdictions/companies use “Controller”)
ICS	Integrated Cargo System
IMO	International Maritime Organization
IMS	Incident Management System
IMT	Incident Management Team
ITOPF	International Tanker Owners Pollution Federation
MEER	Maritime Environmental Emergency Response
MODU	Mobile Offshore Drilling Unit
MoU	Memorandum of Understanding
MSB	Marine Supply Base
NA	Not applicable
National Plan	National Plan for Maritime Environmental Emergencies
NEBA	Net Environmental Benefit Analysis
NM	Nautical Mile

Abbreviation	Definition
NOAA	National Oceanic and Atmospheric Administration
NOPSEMA	National Offshore Petroleum Safety and Environmental Management Authority
NOPTA	National Offshore Petroleum Titles Administrator
NSW	New South Wales
OIM	Offshore Installation Manager
OMP	Operational (Type I) Monitoring Plan
OPEP	Oil Pollution Emergency Plan
OPGGS Act	*Offshore Petroleum and Greenhouse Gas Storage Act 2006*
OPGGS(E) Regulations	Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009
OSCA	Register of Oil Spill Control Agents
OSMP	Operational and Scientific Monitoring Program
OSRL	Oil Spill Response Limited
OSTM	Oil Spill Trajectory Modelling
OWMP	OPEP Waste Management Plan
PIRSA	Primary Industries and Regions South Australia
POLREP	Marine Pollution Report
PPE	Personal Protective Equipment
PSZ	Petroleum Safety Zone
PSV	Platform Support Vessel
ROV	Remotely Operated Vehicle
RPS	RPS Australia West Pty Ltd
SA	South Australia
SAG	Scientific Advisory Group
SCAT	Shoreline Clean-up and Assessment Technique
SCV	Sub-sea Construction Vessel
SIMOPS	Simultaneous Operations
SIR	Shoreline Inspection Report
SJA	Safety Job Analyses
SME	Subject Matter Expert
SMP	Scientific (Type II) Monitoring Plan
SOPCO	State Oil Pollution Control Officer
SOPEP	Shipboard Oil Pollution Emergency Plan
SSDI	Sub-sea Dispersant Injection
STR	Shoreline Treatment Recommendations
TAS	Tasmania
TasPlan	Tasmanian Marine Oil Spill Contingency Plan
Tasports	Tasmanian Ports Corporation
TEC	Threatened Ecological Community
TD	Total Depth
TRP	Tactical Response Plan
VHF	Very High Frequency
VoO	Vessel of Opportunity
WA	Western Australia
WCD	Worst Case Discharge
WCCD	Worst Credible Case Discharge
WildPlan	Tasmanian Oiled Wildlife Response Plan
WOMP	Well Operations Management Plan
WWC	Wild Well Control

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Appendix 1

Contacts directory

Appendix 1 Contacts directory

This table was current at the time this document was developed.

Organisation	Phone	Email
Commonwealth		
National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA)	+61 8 6461 7090	submissions@nopsema.gov.au
	Media communications: +61 476 827 635	communications@nopsema.gov.au
Australian Maritime Safety Authority (AMSA)	1800 641 792 (24 hours)	https://amsa-forms.nogginoca.com/public/polrep.html (online form)
	Media communications: +61 1300 624 633	media@amsa.gov.au
Director of National Parks (DNP)	Marine Compliance Duty Officer: +61 419 293 465 (24 hours)	NA
	Media communications: +61 417 256 971	kate.mathias@environment.gov.au
National Offshore Petroleum Titles Administrator (NOPTA)	Titles Hotline: +61 6424 5317	titles@nopta.gov.au
Commonwealth Department of the Environment and Energy (DEE)	Switchboard: +61 2 6274 1111	NA
Department of Industry, Innovation and Science (DIIS)	Switchboard: +61 2 6213 6000	NA
	Media communications: +61 2 6213 6308	media@industry.gov.au
Department of Defence / Australian Hydrographic Office	+61 2 4223 6500	datacentre@hydro.gov.au
	Media communications: +61 2 6127 1999	media@defence.gov.au
Western Australia		
Department of Transport (DoT)	Maritime Environmental Emergency Response (MEER) Unit Duty Officer +61 8 9480 9924 (24 hours)	marine.pollution@transport.wa.gov.au
	Media communications: +61 413 557 887	media@transport.wa.gov.au
Department of Mines, Industry Regulation and Safety (DMIRS)	Environmental Reporting: +61 419 960 621 (24 hours)	Environmental petroleum.environment@dmirs.wa.gov.au
Department of Primary Industries and Regional Development (DPIRD)	Perth Office: +61 8 6551 4444 Esperance District Office: +61 8 9071 1839	environment@fish.wa.gov.au
Department of Biodiversity, Conservation and Attractions - Parks and Wildlife	Marine emergencies: +61 8 9474 9055 Wildcare Helpline: +61 8 9474 9055 General enquiries: +61 8 9219 9000	enquiries@dbca.wa.gov.au
Esperance Port Authority	Emergencies: 0428 712 111 (24 hours) General enquiries: +61 8 9072 3333	enquiries.esperance@southernports.com.au
Department of Water and Environmental Regulation	1300 784 782 (24 hours)	pollutionwatch@dwer.wa.gov.au

Organisation	Phone	Email
South Australia		
Department of Planning, Transport and Infrastructure (DPTI)	+61 8 8260 0202 (24 hours)	dpti.oilspill@sa.gov.au
	Media communications: 1300 856 933	DLDPTIPBDmedia@sa.gov.au
Department for Environment and Water (DEW)	DEW Duty Officer: +61 419 806 726 (24 hours) General enquiries: +61 8 8204 1910	NA
	Media communications: +61 8 8463 7412	jill.freear@sa.gov.au
DEW Coast Protection Board	+61 8 8124 4928	dewcoastprotectionboard@sa.gov.au
Environmental Protection Authority	+61 8 8204 2004 or 1800 623 445	NA
	Media communications: +61 422 004 677	keith.baldry@sa.gov.au
Department for Energy and Mining	+61 8 8463 3000	dem.petroleum@sa.gov.au
	Media communications: +61 8 8463 3000	resources.customerservices@sa.gov.au dismedia@sa.gov.au
Department of Primary Industries and Regions SA (PIRSA)	Fishwatch Hotline: 1800 065 522 (24 hours)	NA
Flinders Ports	+61 8 8447 0611	flindersports@flindersports.com.au
SA Police	Urgent: 000 (24 hours) Non-urgent: 131 444 (24 hours)	NA
	Media communications: +61 8 7322 3848	sapol.mediasection@police.sa.gov.au
Victoria		
Department of Transport (DoT)	Incident reporting State Duty Officer (24 hours) +61 409 858 715	semdincidentroom@ecodev.vic.gov.au
	Media communications: As above	As above
	General enquiries +61 3 9208 3404	marine.pollution@ecodev.vic.gov.au
Port of Portland (coastal response agency for Victoria west of Cape Otway)	+61 3 5525 0900	NA
Victorian Ports Corporation (coastal response agency for Victoria east of Cape Otway)	+61 3 9644 9777	NA
Maritime Safety Victoria	Emergencies notification: 1300 965 784	marineincidents@transportsafety.vic.gov.au
Environmental Protection Authority (EPA)	1300 372 842 (24 hours)	NA
Department of Environment, Land, Water and Planning (DELWP)	Wildlife incident reporting: State Agency Commander 1300 134 444	sccvic.scmdr.delwp@scc.vie.gov.au
	General enquiries: 13 61 86	NA
	Media communications: +61 428 310 997	ewan.cook@delwp.vic.gov.au media@delwp.vic.gov.au

Organisation	Phone	Email
VIC Police	Urgent: 000 (24 hours) Water Police: 1800 135 729	NA
Tasmania		
Environmental Protection Authority (EPA)	Pollution Incidents (SOPCO): 1800 005 171 General enquiries: +61 3 6165 4599	NA
	Media communications: +61 428 202 622	media@epa.tas.gov.au
Department of Primary Industries, Parks, Waters and Environment (DPIPWE)	Pollution Incidents: 1800 005 171	NA
	Media communications: +61 3 6165 3058	dpipwe.media@dpipwe.tas.gov.au
New South Wales		
NSW Maritime (Roads and Maritime Services)	Pollution incidents: 13 12 36	NA
	Media communications: +61 2 9462 6299	media@rms.nsw.gov.au
NSW DPI	Maritime emergency 24-hour hotline 1800 641 792	NA
NSW Police	Urgent: 000 (24 hours) Water Police: 1800 658 784 (24 hours)	NA
Industry oil spill response assistance		
WWC	Emergency phone: 1-281-784-4700	NA
OSRL	24/7 emergency telephone +65 6266 1566	NA
AMOSC	24-hour emergency telephone number 0438 379 328	amosc@amosc.com.au
RPS Oil Spill Trajectory Modelling	0408 477 196	response@apasa.com.au
RPS OSMP PM	08 9211 1111	NA
AMOSC mutual Aid	AMOSC duty officer 0438 379 328	NA
Fisheries associations		
Commonwealth Australian Fisheries Management Authority	1800 274 634 (24 hours)	info@afma.gov.au
Commonwealth Fisheries Association	Contact details as per consultation database	Contact details as per consultation database
Commonwealth Seafood Industry Association	Contact details as per consultation database	Contact details as per consultation database
Wildcatch Fisheries South Australia	Contact details as per consultation database	Contact details as per consultation database

Appendix 2

Spill resources inventory

Appendix 2 Spill resources inventory

Aircraft

This list was current at the time this document was developed. The tables below include aircraft registration numbers, owners, locations and contact phone numbers.

Fairchild Swearingen Metroliner or Fairchild Aerospace Metro 23

Registration	Type	Owner	Location	Contact
VH-ANA	Metro 23	Air North	Darwin, Northern Territory	1800 627474
VH-ANW	Metro 23			
VH-ANY	Metro 23			
VH-KGX	Metro II	Complete Aviation (CASAIR)	Jandakot, WA	+61 8 6399 4300
VH-NGX	Metro II			
VH-OGX	Metro II			
VH-WGX	Metro II			
VH-ZGX	Metro II			
VH-VEK	Metro 23	Corporate Air Vee H Aviation	Canberra, Australian Capital Territory	1300 441 000
VH-VEU	Metro 23			
VH-SSV	Metro II	FIFO Jet	Archerfield, Queensland	+61 438 737 787
VH-CHN	Metro 23	Hardy Aviation	Darwin, Northern Territory	+61 8 8927 8111
VH-HVH	Metro 23			
VH-TFG	Metro III			
VH-TGD	Metro III			
VH-TWL	Metro 23			
VH-OYB	Metro 23	Pearl Aviation	Darwin, Northern Territory	+61 8 8920 6609
VH-OYG	Metro 23			
VH-OYI	Metro 23			
VH-OYN	Metro 23			
VH-HWR	Metro 23	Sharp Airlines	Essendon, Victoria	1300 556 694
VH-MYI	Metro 23			

Beechcraft King Air

Registration	Type	Owner	Location	Contact
VH-LOA	King Air 200	Air South Charter	Adelaide, SA	+61 8 8234 3244
VH-ZMO	King Air 200	Australasian Jet	Essendon, Victoria	+61 3 9379 6999
VH-ZMP	King Air 200			
VH-ZMW	King Air 200			
VH-ITA	King Air 200	Awesome Flight Services	Perth, WA	+61 8 6189 0700
VH-LOA	King Air 200			
VH-SKU	King Air 200	Barrier Aviation	Cairns, Queensland	+61 428 739 759
VH-MWX	King Air 200	Broome Air Services	Broome, WA	+61 8 9192 6100
VH-URU	King Air 200	Corporate Aircraft Charter	Adelaide, SA	+61 8 8234 4423
VH-ODI	King Air 200	Dick Lang's Bush Pilots	Adelaide, SA	+61 8 8264 7200
VH-HLJ	King Air 200	Hinterland Aviation	Cairns, Queensland	1300 359 428
VH-XCB	King Air 200	Jandakot Flight Centre	Jandakot, WA	+61 8 9417 2258
VH-KFE	King Air 200	Karratha Flying Services	Karratha, WA	+61 8 9144 2444
VH-KFH	King Air 200			
VH-KFX	King Air 200			
VH-KQB	King Air 200	Kestrel Aviation	Mangalore, Victoria	+61 3 5796 2373
VH-ZOK	King Air 200	Kirkhope Aviation	Moorabbin, Victoria	1300 206 130
VH-PFJ	King Air 200	Pacific Flight Services	Bankstown, NSW	+61 2 9791 0055
VH-PFK	King Air 200			
VH-LAB	King Air 200			
VH-FII	King Air 200	Pearl Aviation	Darwin, Northern Territory	+61 8 8920 6609
VH-NTH	King Air 200			
VH-OYD	King Air 200			
VH-OYE	King Air 200			
VH-OYH	King Air 200			
VH-OYT	King Air 200			
VH-TLX	King Air 200			
VH-FIX	King Air 200			
VH-FIY	King Air 200			
VH-FIZ	King Air 200			
VH-VAD	King Air 200	Pel-Air Aviation	Mascot, NSW	+61 2 9667 7700
VH-VAE	King Air 200			
VH-VAH	King Air 200			
VH-VAI	King Air 200			
VF-MWF	King Air 200	Silver City Air Charter	Broken Hill, NSW	+61 8 8088 5702
VH-CWO	King Air 200	Star Aviation	Perth, WA	+61 8 9477 4402
VH-LKF	King Air 200			
VH-LKR	King Air 200			
VH-XDB	King Air 200			
VH-XDW	King Air 200	West Wing Aviation Skytrans Airlines	Townsville, Queensland	+61 7 4721 5151

AMOSC resources

This list was current at the time this document was developed. A full and up to date inventory of AMOSC equipment is at http://www.amosc.com.au/equipment.php.

Category	Product name	Quantity	Metres	Location	Response time[1]
Boom	Beach Guardian Boom	4	100	Broome	47 hours
Boom	Zoom Boom	8	200	Broome	47 hours
Boom	200 m HDB 1300 Boom on Hyd Reel	2	400	Broome	47 hours
Boom	200 m Ro-Boom	2	400	Exmouth	51 hours
Boom	Beach Guardian Boom	20	500	Exmouth	51 hours
Boom	Zoom Boom	17	425	Exmouth	51 hours
Boom	200 m Ro-Boom	6	1200	Fremantle	36 hours
Boom	Beach Guardian Boom	10	250	Fremantle	36 hours
Boom	Zoom Boom	16	400	Fremantle	36 hours
Boom	450 mm Curtain Boom	18	540	Fremantle	36 hours
Boom	200 m Ro-Boom	7	7	North Geelong	14 hours
Boom	36 m Ro-Boom	1	1	North Geelong	14 hours
Boom	Beach Guardian Boom	51	51	North Geelong	14 hours
Boom	Zoom Boom	114	114	North Geelong	14 hours
Boom	450 mm Curtain Boom	41	41	North Geelong	14 hours
Boom Accessories	Beach Guardian Deployment Kit	1		Broome	47 hours
Boom Accessories	Zoom Boom Anchor Kit	4		Broome	47 hours
Boom Accessories	Hydraulic Powered Reel Winder	2		Exmouth	51 hours
Boom Accessories	Beach Guardian Deployment Kit	1		Exmouth	51 hours
Boom Accessories	Shoreline Boom Anchoring kit	1		Exmouth	51 hours
Boom Accessories	Zoom Boom Anchor Kit	8		Exmouth	51 hours
Boom Accessories	Hydraulic Powered Reel Winder	6		Fremantle	36 hours
Boom Accessories	Ro-Boom Anchoring System	1		Fremantle	36 hours
Boom Accessories	Zoom Boom Anchor Kit	28		Fremantle	36 hours
Boom Accessories	Hydraulic Powered Reel Winder	8	8	North Geelong	14 hours
Boom Accessories	Beach Guardian Deployment Kit	3	3	North Geelong	14 hours
Boom Accessories	Ro-Boom Anchoring System	5	5	North Geelong	14 hours
Boom Accessories	Shoreline Boom Anchoring Kit	4	4	North Geelong	14 hours
Boom Accessories	Zoom Boom Anchor Kit	10	10	North Geelong	14 hours
Communications	I SPHERE Satellite Drift Buoys	2		Broome	47 hours
Communications	I SPHERE Satellite Drift Buoys	7		Fremantle	36 hours
Communications	Spot Gen 3	2		Fremantle	36 hours
Communications	I SPHERE Satellite Drift Buoys	4	4	North Geelong	14 hours
Communications	Spot Gen 3	2	2	North Geelong	14 hours
Communications	TX/RX Airband Hand-held Radio	1	1	North Geelong	14 hours
Communications	Garmin GPSMAP 78sc	4	4	North Geelong	14 hours
Decontamination	Oiled Fauna Kit	1		Broome	47 hours
Decontamination	Decontamination Kit	1		Broome	47 hours
Decontamination	Oiled Fauna Kit	1		Exmouth	51 hours
Decontamination	Decontamination Kit	1		Exmouth	51 hours
Decontamination	Decontamination Kit Locker	1		Fremantle	36 hours
Decontamination	Oiled Fauna Kit	2	2	North Geelong	14 hours

Category	Product name	Quantity	Metres	Location	Response time[1]
Decontamination	Decontamination Kit (First Strike Support)	2	2	North Geelong	14 hours
Decontamination	Decontamination Kit Locker	1	1	North Geelong	14 hours
Dispersant	Dasic Slickgone NS	75		Exmouth	51 hours
Dispersant	Dasic Slickgone NS	8		Fremantle	36 hours
Dispersant	Dasic slickgone NS	75	75	North Geelong	14 hours
Dispersant	Dispersant Effectiveness Field Test Kit	1	1	North Geelong	14 hours
Dispersant Spray Equipment	Afedo Spray System 200-TS	2		Broome	47 hours
Dispersant Spray Equipment	Vikospray Spray Unit	1		Exmouth	51 hours
Dispersant Spray Equipment	Simplex Helicopter Bucket	1		Exmouth	51 hours
Dispersant Spray Equipment	Dispersant Transfer Pump	1		Exmouth	51 hours
Dispersant Spray Equipment	Afedo Spray System 50	4		Fremantle	36 hours
Dispersant Spray Equipment	Boom Mounted Dispersant Spray System	1	1	North Geelong	14 hours
Dispersant Spray Equipment	Vikospray Spray Unit	3	2	North Geelong	14 hours
Dispersant Spray Equipment	Simplex Helicopter Bucket	1	1	North Geelong	14 hours
Dispersant Spray Equipment	Dispersant Transfer Pump	1	1	North Geelong	14 hours
Dispersant Spray Equipment	Afedo Spray System 200 DFWE	3	3	North Geelong	14 hours
General	Shipping Container	3		Broome	47 hours
General	Response Tool Box	1		Broome	47 hours
General	Shipping Container	1		Exmouth	51 hours
General	Wheelbarrow	10		Exmouth	51 hours
General	2 Stroke Air Blower	10		Fremantle	36 hours
General	Hydraulic Air Blower	3		Fremantle	36 hours
General	Aluminium Storage Box	5		Fremantle	36 hours
General	Shipping Container	8		Fremantle	36 hours
General	Portable Generator	1		Fremantle	36 hours
General	Shoreline Support Kit	1		Fremantle	36 hours
General	Aerial Surveillance Kit	1		Fremantle	36 hours
General	Gas Alert Monitor (Microclip)	2		Fremantle	36 hours
General	Ancillaries Box 1	4		Fremantle	36 hours
General	Ancillaries Box 2	4		Fremantle	36 hours
General	Oil sampling kit	2		Fremantle	36 hours
General	2 Stroke Air Blower	2	2	North Geelong	14 hours
General	Hydraulic Air Blower	3	3	North Geelong	14 hours
General	Aluminium Storage Box	1	1	North Geelong	14 hours
General	Portable Generator	3	3	North Geelong	14 hours
General	Beach Wash Down Kit	1	1	North Geelong	14 hours
General	Response Tool Box	1	1	North Geelong	14 hours
General	Dispersant Agitator	1	1	North Geelong	14 hours
General	Phantom 4 Drone	1	1	North Geelong	14 hours
General	Aerial Surveillance Kit	1	1	North Geelong	14 hours

Category	Product name	Quantity	Metres	Location	Response time[1]
General	Gas Alert Monitor (Microclip)	5	5	North Geelong	14 hours
General	Oil Sampling Kit	1	1	North Geelong	14 hours
Miscellaneous	Air Quality Monitoring System	1		Fremantle	36 hours
Miscellaneous	Shipping Container	8	8	North Geelong	14 hours
Power Packs, Pumps and Accessories	Lamor Hydraulic Power Pack	1		Broome	47 hours
Power Packs, Pumps and Accessories	Ro-Boom Power Pack	1		Exmouth	51 hours
Power Packs, Pumps and Accessories	GTA 30 Oil Transfer Pump	1		Fremantle	36 hours
Power Packs, Pumps and Accessories	GX-160 Honda Water Pump	4		Fremantle	36 hours
Power Packs, Pumps and Accessories	Ro-Boom Power Pack	2		Fremantle	36 hours
Power Packs, Pumps and Accessories	Hydraulic Power Pack LPP 36	3		Fremantle	36 hours
Power Packs, Pumps and Accessories	Spare Control Stand for LPP36	1		Fremantle	36 hours
Power Packs, Pumps and Accessories	Shoreline Flushing Kit	1		Fremantle	36 hours
Power Packs, Pumps and Accessories	GTA 30 Oil Transfer Pump	1	1	North Geelong	14 hours
Power Packs, Pumps and Accessories	Ro-Boom Power Pack	2	2	North Geelong	14 hours
Power Packs, Pumps and Accessories	Hydraulic Power Pack LPP 36	3	3	North Geelong	14 hours
Power Packs, Pumps and Accessories	Hydraulic Power Pack LPP7	1	1	North Geelong	14 hours
Power Packs, Pumps and Accessories	Spare Control Stand for LPP36	1	1	North Geelong	14 hours
Power Packs, Pumps and Accessories	General Purpose Pump	3	3	North Geelong	14 hours
Power Packs, Pumps and Accessories	DOP 250 Pump	1	1	North Geelong	14 hours
Power Packs, Pumps and Accessories	Shoreline Flushing Kit	1	1	North Geelong	14 hours
Skimmer	Minimax Brush Skimmer	1		Broome	47 hours
Skimmer	Komara 12K Skimmer	1		Exmouth	51 hours
Skimmer	Ro-Vac	1		Exmouth	51 hours
Skimmer	GT 185 Weir Skimmer	1		Exmouth	51 hours
Skimmer	Rope Mop 240 Oil Skimming Machine	1		Exmouth	51 hours
Skimmer	Komara 12K Skimmer	1		Fremantle	36 hours
Skimmer	Komara 20K Skimmer	1		Fremantle	36 hours
Skimmer	LWS500 Weir Skimmer	3		Fremantle	36 hours
Skimmer	Rope Mop 260 Oil Skimming Machine	1		Fremantle	36 hours
Skimmer	Komara 30K Skimmer	2	2	North Geelong	14 hours
Skimmer	Komara 12K Skimmer	2	2	North Geelong	14 hours
Skimmer	Ro-Vac	3	3	North Geelong	14 hours
Skimmer	GT 185 Weir Skimmer	1	1	North Geelong	14 hours
Skimmer	Desmi 250 Weir Skimmer	1	1	North Geelong	14 hours
Skimmer	LWS500 Weir Skimmer	3	3	North Geelong	14 hours
Skimmer	Ro-Skim Weir Boom System	2	2	North Geelong	14 hours
Skimmer	Canadyne Multi Head Skimmer	1	1	North Geelong	14 hours

Category	Product name	Quantity	Metres	Location	Response time[1]
Skimmer	Versatech Multi Head Skimmer	1	1	North Geelong	14 hours
Skimmer	Current Buster 2	1	1	North Geelong	14 hours
Skimmer	Speed Sweep	1	1	North Geelong	14 hours
Skimmer	Rope Mop 240 Oil Skimming Machine	1	1	North Geelong	14 hours
Skimmer	Rope Mop 260 Oil Skimming Machine	1	1	North Geelong	14 hours
Skimmer	Egmopol Barge	1	1	North Geelong	14 hours
Sorbents	Sorbent Squares	1		Broome	47 hours
Sorbents	Sorbent Boom	16		Broome	47 hours
Sorbents	Sorbent Squares	3		Broome	47 hours
Sorbents	Sorbent Boom	73	73	North Geelong	14 hours
Sorbents	Sorbent Squares	40	40	North Geelong	14 hours
Sorbents	Viscous Oil Snares	96	96	North Geelong	14 hours
Sorbents	Sorbent Roll	12	12	North Geelong	14 hours
Sorbents	Spare Rope Mops	31	31	North Geelong	14 hours
Trailer	Trailer/Generator/Karcher Pressure Washer Unit	1		Exmouth	51 hours
Trailer	Tool Trailer	1		Fremantle	36 hours
Trailer	Galvanised Tandem Trailer	2		Fremantle	36 hours
Trailer	Vehicle Washdown Trailer	1		Fremantle	36 hours
Trailer	Trailer	2	2	North Geelong	14 hours
Trailer	General Support Trailer	3	3	North Geelong	14 hours
Trailer	Egmopol Trailer	1	1	North Geelong	14 hours
Trailer	Trailer/Generator/Karcher Pressure Washer Unit	1	1	North Geelong	14 hours
Trailer	Vehicle Washdown Trailer	1	1	North Geelong	14 hours
Vehicle	Forklift	2		Fremantle	36 hours
Vehicle	AMOSC Vehicle	1		Fremantle	36 hours
Vehicle	Heli 5 Tonne Forklift	1	1	North Geelong	14 hours
Vehicle	AMOSC Vehicle	3	2	North Geelong	14 hours
Vessel	Zodiac Pro 500	1	1	North Geelong	14 hours
Waste Storage	Vikotank 13000 L	1		Broome	47 hours
Waste Storage	IBC	2		Broome	47 hours
Waste Storage	Fastank Temporary Storage	2		Exmouth	51 hours
Waste Storage	IBC	2		Exmouth	51 hours
Waste Storage	Fastank Temporary Storage	2		Fremantle	36 hours
Waste Storage	25 Cube Deck Storage Tanks	3		Fremantle	36 hours
Waste Storage	LCT 11.4 Collapsible Storage Tank	4		Fremantle	36 hours
Waste Storage	Fastank Temporary Storage	4	4	North Geelong	14 hours
Waste Storage	Vikotank 13000 L	1	1	North Geelong	14 hours
Waste Storage	25000 L Lancer Storage Barge	3	3	North Geelong	14 hours
Waste Storage	IBC	14	14	North Geelong	14 hours
Wildlife Support	Bird Scarer	1		Fremantle	36 hours
Wildlife Support	Wildlife washdown container	1		Fremantle	36 hours
Wildlife Support	Wildlife washdown container	1	1	North Geelong	14 hours

1. Response time is an estimate only and is based on an estimate of mobilisation time, flying distance and flight times to Adelaide.

Mutual aid resources

This list was current at the time this document was developed. AMOSC will act as agent on behalf of Equinor to seek agreement for hire from the members(s) who have the equipment that is being requested for response. The AMOSC duty officer is contactable on **0438 379 328** to assist. A current version of the Mutual Aid resources list is available in the members section of the AMOSC website and is updated quarterly.

Provider	Category	Product name	Quantity	Location
Quadrant	Absorbent, Boom	Boom, 3 m × 180 mm	144 m	WA, Varanus Island
Caltex	Absorbent, Boom	Rubberiser Boom	200 m	Lytton Refinery
ConocoPhillips	Absorbent, Boom	Absorbent, Boom	400 m	Darwin LNG Facility
ConocoPhillips	Absorbent, Boom	Absorbent, Boom	400 m	Curtis Island APLNG Facility
PTTEP	Absorbent, Boom	3M t270 Bags of Sorbent Boom 4x3 m bags	4 units	Darwin Container 1
PTTEP	Absorbent, Boom	3M t270 Bags of Sorbent Boom 4x3 m bags	4 units	Darwin Container 2
ROC Oil	Absorbent, Boom	8 × 3 m × 2 containers of absorbent booms 48 m	2 units	Port Denison, WA
PTTEP	Absorbent, Pad	HP156 Sorbent pads bag of 100	1 unit	Darwin Container 1
PTTEP	Absorbent, Pad	HP156 Sorbent pads bag of 100	1 unit	Darwin Container 2
Quadrant	Absorbent, Roll	Roll,40 m × 1.1 m	280 m	WA, Varanus Island
Quadrant	Boom, Nearshore	Zoom Boom	400 m	WA, Varanus Island
Caltex	Boom, Nearshore	GP 800 Fence Boom	180 m	Lytton Refinery
Caltex	Boom, Nearshore	Zoom Boom	150 m	Lytton Refinery
Esso	Boom, Nearshore	Expandi 3000 Harbour Boom	300 m	LIP Jetty
Esso	Boom, Nearshore	Expandi 3000 Harbour Boom	300 m	BBMT
Esso	Boom, Nearshore	Expandi 3000 Harbour Boom	300 m	LIP Jetty
Santos	Boom, Nearshore	Vikoma Shoreline (blowers and water pumps for deployment)	1000 m	Port Bonython
Viva	Boom, Nearshore	Zoom Boom, 25 m	200 m	Victoria, Geelong
Viva	Boom, Nearshore	Fence Boom, 600 mm, 20 m	160 m	Victoria, Geelong
Woodside	Boom, Nearshore	Fence Boom	150 m	WA, Dampier
Woodside	Boom, Nearshore	Sea Sentinel, 25 m	250 m	WA, Dampier
Woodside	Boom, Nearshore	Curtain Boom, 30 m	300 m	WA, Dampier

Provider	Category	Product name	Quantity	Location
Woodside	Boom, Nearshore	Zoom Boom, 25 m	150 m	WA, Dampier
Woodside	Boom, Nearshore	Zoom Boom, 50 m	125 m	WA, Dampier
Woodside	Boom, Nearshore	Anchoring Systems	17 units	WA, Dampier
Esso	Boom, Nearshore	Sea Sentinel (can be used offshore, ASTM connectors)	2000 m	LIP
Quadrant	Boom, Offshore	Sea Curtain Boom (Expandi – manual inflation) – 2 × reels	400 m	WA, Exmouth
Quadrant	Boom, Offshore	Sea Curtain Boom (Kepner – self inflation) – 1 × reel	300 m	WA, Dampier
Quadrant	Boom, Offshore	Sea Curtain Boom (Kepner – self inflation) – 1 × reel	200 m	WA, Varanus Island
Quadrant	Boom, Offshore	Sea Curtain Boom (Expandi – self inflation) – 4 × vertical bundles, 1 × retrieval reel	800 m	WA, Varanus Island
Quadrant	Boom, Offshore	Power Pack for Kepner Sea Curtain Boom	1 unit	WA, Dampier
Quadrant	Boom, Offshore	Power Pack for Expandi Sea Curtain Boom	1 unit	WA, Exmouth
Quadrant	Boom, Offshore	Power Pack for Kepner Sea Curtain Boom	1 unit	WA, Varanus Island
Quadrant	Boom, Offshore	Roto Cassette Retrieval Reel for Expandi Self-Inflating Sea Curtain Boom	1 unit	WA, Varanus Island
Quadrant	Boom, Offshore	Power Pack for Expandi Self-Inflating Sea Curtain Boom	1 unit	WA, Varanus Island
PTTEP	Boom, Offshore	LAMOR heavy duty offshore boom 1200 (200 m)	200 m	Darwin Container 1
PTTEP	Boom, Offshore	LAMOR heavy duty offshore boom 1200 (200 m)	200 m	Darwin Container 2
Santos	Boom, Offshore	RoBoom and associated equipment for deployment	1800 m	Port Bonython
Woodside	Boom, Offshore	Offshore Boom on reel, 200 m per reel	400 m	WA, Dampier
Quadrant	Boom, Onshore	Beach Guardian	100 m	WA, Varanus Island
Quadrant	Boom, Onshore	Beach Guardian	100 m	WA, Varanus Island
Quadrant	Boom, Onshore	Beach Guardian, Deployment Kit	2 unit	WA, Varanus Island
BP	Boom, Onshore	Beach Boom, Shore Guardian, 6 lengths	160 m	Bulwer Island
Caltex	Boom, Onshore	Beach guardian	7 units	Lytton Refinery
Caltex	Boom, Onshore	Anchor Kits	15 units	Lytton Refinery
Santos	Boom, Onshore	Beach Guardian (blowers and water pumps for deployment)	1000 m	Port Bonython
Viva	Boom, Onshore	Beach Guardian, 25 m	50 m	Victoria, Geelong
Viva	Boom, Onshore	Beach Guardian, Deployment Kit	1 unit	Victoria, Geelong
Woodside	Boom, Onshore	Shore Guardian, 20 m	160 m	WA, Dampier
Woodside	Boom, Onshore	Tidal Boom (Shore Guardian) 30 m	240 m	WA, Dampier

Provider	Category	Product name	Quantity	Location
PTTEP	Dispersant	Dasic Slickgone NS	13 m^3	Darwin, Truscott
Santos	Dispersant	Slickgone NS	4 m^3	Port Bonython
Woodside	Dispersant	Shell VDC	1 m^3/ vessel	WA, Dampier/ Exmouth, Supply Vessels
Woodside	Dispersant	Shell VDC	3 m^3	WA, Exmouth
Quadrant	Dispersant, Spray Systems	Single Arm Spray System	1 unit	WA, Exmouth
Quadrant	Dispersant, Spray Systems	4 × Lance Head Spray System	1 unit	WA, Exmouth
Quadrant	Dispersant, Spray Systems	Double Arm Spray System	1 unit	WA, Exmouth
Quadrant	Dispersant, Spray Systems	Double AFEDO Head Spray System	1 unit	WA, Dampier
Quadrant	Dispersant, Spray Systems	Double Arm Spray System	1 unit	WA, Dampier
BHP	Dispersant, Spray Systems	Auspray Dispersant System ASDS	1	Pyrenees FPSO
BHP	Dispersant, Spray Systems	Auspray Dispersant System ASDS	1	Exmouth
Esso	Dispersant, Spray Systems	Ayles Fernie Boatspray 100-TS with AFEDO nozzle	2	LIPx1, BBMTx1
PTTEP	Dispersant, Spray Systems	AFEDO Dispersant Spray System	1 unit	Darwin Container 1
Santos	Dispersant, Spray Systems	Afedo Dispersant Spray System 100TS	1 unit	Port Bonython
ROC Oil	General	High Density Landing Nets	6 units	Port Denison, WA
PTTEP	Power Pack	Spate 75C Dispersant Transfer Pump for FWAD	1 unit	Truscott
Santos	Shoreline Clean-up	Trailer 8 × 5	1 unit	Port Bonython
Santos	Shoreline Clean-up	Trailer 6 × 4	1 unit	Port Bonython
Woodside	Shoreline Clean-up	Spades, Rakes, some PPE, etc.	multiple units	WA, Dampier
Woodside	Shoreline Clean-up	Decontamination Kit	1 unit	WA, Dampier
Quadrant	Shoreline Clean-up Container	40 ft Container (wheelbarrows, shovels, brooms, squeegee, sorbents)	1 unit	WA, Varanus Island
Caltex	Shoreline Clean-up equipment	Oil Spill Shed	1 unit	Lytton Refinery

Provider	Category	Product name	Quantity	Location
Woodside	Skimmer	Lamor Multi Skimmer	1 unit	WA, Dampier
Esso	Skimmer, Brush	Aquaguard RB 5-05 Brush Skimmer	1	BBMT
Caltex	Skimmer, Multi Head	Versatech Multi Skimmer, Brush, Drum, Disc (with all hydraulic hoses), Oil Transfer Hose and Diesel Hydraulic Power Pack Deliver FIS	1 unit	Lytton Refinery
Quadrant	Skimmer, Oleophilic	Skimmer, Disc, 12k Komara	1 unit	WA, Varanus Island
Quadrant	Skimmer, Oleophilic	Power Pack for Disc, 12k Komara	1 unit	WA, Varanus Island
PTTEP	Skimmer, Oleophilic	Brush Skimmer Minimax 12 W/S	1 unit	Darwin Container 1
PTTEP	Skimmer, Oleophilic	Brush Skimmer Minimax 12 W/S	1 unit	Darwin Container 2
Santos	Skimmer, Oleophilic	Rope Mop OM 140	2 units	Port Bonython
Santos	Skimmer, Oleophilic	Rope Mop OM 260	1 unit	Port Bonython
Viva	Skimmer, Oleophilic	Disc, 12k Komara	1 unit	Victoria, Geelong
Santos	Skimmer, Vacuum	Viko Vac Vacuum Unit	2 unit	Port Bonython
Viva	Skimmer, Vacuum	Manta Ray Head	1 unit	Victoria, Geelong
Woodside	Skimmer, Vacuum	Delta Ray Head	2 units	WA, Dampier
Quadrant	Skimmer, Weir	Skimmer, Weir, Global	1 unit	WA, Dampier
Quadrant	Skimmer, Weir	Power Pack for Weir, Global	1 unit	WA, Dampier
Esso	Skimmer, Weir	RoSkim (Roulands)	1	LIP
Esso	Skimmer, Weir	RoSkim (Roulands)	1	BBMT
Esso	Skimmer, Weir	RoSkim (Roulands)	1	LIP
Esso	Skimmer, Weir	RoSkim (Roulands)	1	BBMT
Esso	Skimmer, Weir	GT-185 skimmer	1	LIP (N.B. 3 at LIP but 2 are permanent)
PTTEP	Skimmer, Weir	LAMOR Weir Skimmer LWS 500	1 unit	Darwin
Woodside	Skimmer, Weir	Dragon Fly Weir Skimmer	1 unit	WA, Dampier
Woodside	Skimmer, Weir	Global 30 m^3/hr Weir Skimmer	1 unit	WA, Dampier
Quadrant	Temporary Storage	CORT Bladder Tank	3 units	WA, Varanus Island
Esso	Temporary Storage	Aluminium Skips (3 m × 2 m × 600 mm High)	12 units	LIP
PTTEP	Temporary Storage	11-Tonne Collapsible Storage Tank	1 unit	Darwin Container 1
PTTEP	Temporary Storage	50-Tonne Deck Tank with 2.5" ball valve and 3" adapter	1 unit	Darwin Container 1
PTTEP	Temporary Storage	11-Tonne Collapsible Storage Tank	1 unit	Darwin Container 2

Provider	Category	Product name	Quantity	Location
PTTEP	Temporary Storage	50-Tonne Deck Tank with 2.5" ball valve and 3" adapter	1 unit	Darwin Container 2
Viva	Temporary Storage	10,000 Fastank	2 units	Victoria, Geelong
Woodside	Temporary Storage	10,000 Fastank	2 units	WA, Dampier
Woodside	Temporary Storage	Lamor Storage Tanks (like fast tanks) 7000 L	2 units	WA, Dampier
ROC Oil	Temporary Storage	IBC 1000 L IBC	4 units	Port Denison, WA
Quadrant	Tracking Buoys	Isphere	4 units	WA, Varanus Island
Quadrant	Tracking Buoys	Isphere	2 units	WA, Stag Platform
Quadrant	Tracking Buoys	Isphere	2 units	WA, Ningaloo Vision
Quadrant	Tracking Buoys	Isphere	2 units	WA, Dampier Store
Quadrant	Tracking Buoys	Isphere	2 units	WA, Rig 1 (or Dampier Store)
Quadrant	Tracking Buoys	Isphere	2 units	WA, Rig 2 (or Dampier Store)
ConocoPhillips	Tracking Buoys	Pathfinder Tracking Buoy	2 units	FSO Liberdade - Timor Sea
PTTEP	Tracking Buoys	Tracking Buoy	1 unit	Darwin Container 1
PTTEP	Tracking Buoys	Tracking Buoy	1 unit	Darwin Container 2
Esso	Trailer	Beach/Shoreline Clean-up Trailers	4	LIP × 2, BBMT × 1, Sale × 1
Esso	Trailer	Decontamination Trailer	1	LIP
Quadrant	Vessel	28' Aluminium Response Vessel "Monte Belle"	1 unit	WA, Varanus Island
BP	Vessel	5 m Work Punt	1 unit	Bulwer Island
Caltex	Vessel	4.75 m Aluminium Run-about "Jabiru"	1 unit	Lytton Refinery
Caltex	Vessel	5.7 L Multicruiser "Mimi"	1 unit	Lytton Refinery
Caltex	Vessel	135hp Honda "Ocean Cruiser"	1 unit	Lytton Refinery
Caltex	Vessel	Seamac (Punt)	1 unit	Lytton Refinery
Esso	Vessel	Sperm Whale for nearshore response.	1	BBMT
Esso	Vessel	3.2 m Dingy with 6 hp engine	1	Longford
Esso	Vessel	3.2 m Dingy with 6 hp engine	1	LIP
Santos	Vessel	8 m Shark Cat "TREGALANA" with spray equipment	1 unit	Port Bonython
Santos	Vessel	6 m Stabicraft with 135 HP outboard	1 unit	Port Bonython
Santos	Vessel	3.66 m Clark Open Boat Aluminium Dinghy with 9 hp outboard	1 unit	Port Bonython
Santos	Vessel	4.08 m Alocraft Sprint, Aluminium Open Boat with 20 hp outboard	1 unit	Port Bonython

OSRL resources

This list was current at the time this document was developed. A full and up to date inventory of OSRL equipment is within the OSRL Mobilisation Fact File 2017 at https://www.oilspillresponse.com/globalassets/technical-library/publications-2017/2017-mobilisation-fact-file.pdf.

Category	Product name	Quantity	Location	Response time[1]
Active boom systems	Ro-skim System, Tandem, 120 tph Skimmer, without power pack (can be used in conjunction with additional 200 m boom on reel)	2	Singapore	8-12 hours
Active boom systems	Nofi Current Buster 2	2	Singapore	8-12 hours
Active boom systems	Nofi Current Buster 2	1	Bahrain	15 hours
Active boom systems	Ro-skim System, Tandem, 120 tph Skimmer, without power pack (can be used in conjunction with additional 200m boom on reel)	2	United Kingdom	21-26 hours
Active boom systems	2 pump weir boom capacity (120 tph) - for use in conjunction with Roboom units excluding power systems	1	United Kingdom	21-26 hours
Active boom systems	Nofi Current Buster 2	2	United Kingdom	21-26 hours
Active boom systems	Nofi Current Buster 2	2	Fort Lauderdale, United States	63 hours
Aircraft	Hercules Aircraft	1	Singapore	8-12 hours
Aircraft	Boeing 727	1	Doncaster, United Kingdom	21-26 hours
Aircraft systems	Underslung Helicopter Mounted Spray System (150–240 gallons) (helicopter not included)	2	Bahrain	15 hours
Aircraft systems	Underslung Helicopter Mounted Spray System (150–240 gallons) (helicopter not included)	2	United Kingdom	21-26 hours
Aircraft systems	Cargo Slave Pallet	2	Fort Lauderdale, United States	25 hours
Ancillaries (power packs and generators)	Generator – 1 kW to 3 kW	8	Singapore	8-12 hours
Ancillaries (power packs and generators)	Diesel Generator	1	Singapore	8-12 hours
Ancillaries (power packs and generators)	Lamor 25 Power Pack (23 kW)	6	Singapore	8-12 hours
Ancillaries (power packs and generators)	Hatz Power Pack (25 kW)	2	Singapore	8-12 hours
Ancillaries (power packs and generators)	Desmi Power Pack (50 kW)	5	Singapore	8-12 hours
Ancillaries (power packs and generators)	Multi-purpose Power Pack (50 kW), winter version air fan/ lighting	3	Singapore	8-12 hours
Ancillaries (power packs and generators)	Vikoma Power Pack (80 kW)	1	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Ancillaries (power packs and generators)	Grizzly Power Pack (98 kW)	4	Singapore	8-12 hours
Ancillaries (power packs and generators)	Generator – 1 kW to 3 kW	6	Bahrain	15 hours
Ancillaries (power packs and generators)	Diesel Generator	1	Bahrain	15 hours
Ancillaries (power packs and generators)	GP30 Power Pack (21.9 kW)	2	Bahrain	15 hours
Ancillaries (power packs and generators)	Multi-purpose (same) Power Pack (50 kW)	2	Bahrain	15 hours
Ancillaries (power packs and generators)	Tiger Power Pack (84 kW)	3	Bahrain	15 hours
Ancillaries (power packs and generators)	Vikoma power pack (80 kW)	1	Bahrain	15 hours
Ancillaries (power packs and generators)	Generator – 1 kW to 3 kW	13	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Diesel Generator	1	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	GP10 Power Pack (7.4 kW)	1	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	GP30 Power Pack (21.9 kW)	4	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Lamor 25 Power Pack (23kW)	4	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Desmi Power Pack (50 kW)	3	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Tiger Power Pack (84 kW)	6	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Vikoma Power Pack (80 kW)	2	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Grizzly Power Pack (98 kW)	4	United Kingdom	21-26 hours
Ancillaries (power packs and generators)	Coleman Generator 3.5 kW	9	Fort Lauderdale, United States	93 hours
Ancillaries (power packs and generators)	Diesel Generator	8	Fort Lauderdale, United States	94 hours
Ancillaries (power packs and generators)	Hatz Power Pack (25 kW)	4	Fort Lauderdale, United States	95 hours
Ancillaries (safety and clean up)	Hydraulic Hose Reels	4	Singapore	8-12 hours
Ancillaries (safety and clean up)	Hydraulic Pressure Washers (without power pack)	4	Singapore	8-12 hours
Ancillaries (safety and clean up)	Mobile Diesel Drive High Pressure and Temperature Washer for sea water use (trailer mounted)	4	Singapore	8-12 hours
Ancillaries (safety and clean up)	Peli Lights	2	Singapore	8-12 hours
Ancillaries (safety and clean up)	Area Gas Monitor (4 channel + PID)	3	Singapore	8-12 hours
Ancillaries (safety and clean up)	Multi RAE lite	5	Singapore	8-12 hours
Ancillaries (safety and clean up)	Personal (4 Channel) Gas Monitor	19	Singapore	8-12 hours
Ancillaries (safety and clean up)	Gas Monitor (Drager Chip Measurement System (CMS)	5	Singapore	8-12 hours
Ancillaries (safety and clean up)	Air Monitor Microdust Pro	1	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Ancillaries (safety and clean up)	Hydraulic Hose Reels	4	Bahrain	15 hours
Ancillaries (safety and clean up)	Hydraulic Pressure Washers (without power pack)	5	Bahrain	15 hours
Ancillaries (safety and clean up)	Mobile Diesel Drive High Pressure and Temperature Washer for sea water use (trailer mounted)	1	Bahrain	15 hours
Ancillaries (safety and clean up)	Diesel Drive High Pressure and Temperature Washer for sea water use (skid mounted)	2	Bahrain	15 hours
Ancillaries (safety and clean up)	Powered floodlights	2	Bahrain	15 hours
Ancillaries (safety and clean up)	Peli lights	2	Bahrain	15 hours
Ancillaries (safety and clean up)	Area Gas Monitor (4 channel + PID)	3	Bahrain	15 hours
Ancillaries (safety and clean up)	Multi RAE lite	3	Bahrain	15 hours
Ancillaries (safety and clean up)	Personal (4 Channel) Gas Monitor	15	Bahrain	15 hours
Ancillaries (safety and clean up)	Hydraulic Hose Reels	15	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Hydraulic Pressure Washers (without power pack)	5	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Mobile Diesel Drive High Pressure and Temperature Washer for sea water use (trailer mounted)	4	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Crane Unit	5	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Powered Floodlights	4	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Peli Lights	2	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Orimulsion Reflotation Device without power pack	1	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Area Gas Monitor (4 channel + PID)	3	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Multi RAE Lite	5	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Multi RAE Plus Gas Monitor	3	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Personal (4 Channel) Gas Monitor	21	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Gas Detection Tubes	3	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Air Monitor Microdust Pro	3	United Kingdom	21-26 hours
Ancillaries (safety and clean up)	Diesel Drive High Pressure and Temperature Washer for freshwater use only	5	Fort Lauderdale, United States	96 hours
Ancillaries (safety and clean up)	Plug in Halogen Light Stands	12	Fort Lauderdale, United States	97 hours
Ancillaries (safety and clean up)	Prism Light comes with Generator	6	Fort Lauderdale, United States	98 hours
Ancillaries (safety and clean up)	Multi RAE Lite	2	Fort Lauderdale, United States	99 hours

Category	Product name	Quantity	Location	Response time[1]
Ancillaries (safety and clean up)	Personal (4 Channel) Gas Monitor	8	Fort Lauderdale, United States	100 hours
Ancillaries (transfer pumps)	Spate Diaphragm Pump 30 m³	7	Singapore	8-12 hours
Ancillaries (transfer pumps)	Desmi DOP 160 Pump without power pack	2	Singapore	8-12 hours
Ancillaries (transfer pumps)	Desmi DOP 250 Pump without power pack	2	Singapore	8-12 hours
Ancillaries (transfer pumps)	Water Injection Flange for DOP Pump	2	Singapore	8-12 hours
Ancillaries (transfer pumps)	Spate Diaphragm Pump 30 m³	3	Bahrain	15 hours
Ancillaries (transfer pumps)	Desmi DOP 160 Pump without Power Pack	2	Bahrain	15 hours
Ancillaries (transfer pumps)	Desmi DOP 250 Pump without Power Pack	2	Bahrain	15 hours
Ancillaries (transfer pumps)	Water Injection Flange for DOP Pump	4	Bahrain	15 hours
Ancillaries (transfer pumps)	Spate Diaphragm Pump 30 m³	12	United Kingdom	21-26 hours
Ancillaries (transfer pumps)	Desmi DOP 160 Pump without power pack	5	United Kingdom	21-26 hours
Ancillaries (transfer pumps)	Desmi DOP 250 Pump without power pack	5	United Kingdom	21-26 hours
Ancillaries (transfer pumps)	Water Injection Flange for DOP Pump	3	United Kingdom	21-26 hours
Ancillaries (transfer pumps)	Spate Diaphragm Pump 30 m³	4	Fort Lauderdale, United States	85 hours
Ancillaries (transfer pumps)	Desmi DOP 250 Pump without power pack	4	Fort Lauderdale, United States	86 hours
Ancillaries (transfer pumps)	Peristaltic Pump	9	Fort Lauderdale, United States	87 hours
Ancillaries (transfer pumps)	Sala Roll Pump comes with power pack	2	Fort Lauderdale, United States	88 hours
Ancillaries (transfer pumps)	Fire/Washdown Pump 2.5"	5	Fort Lauderdale, United States	89 hours
Ancillaries (transfer pumps)	Washdown Pump 2”	5	Fort Lauderdale, United States	90 hours
Ancillaries (transfer pumps)	Trash Pump, 6” HVLP Flushing System	5	Fort Lauderdale, United States	91 hours
Ancillaries (transfer pumps)	Shoreline Deluge/Flushing System	3	Fort Lauderdale, United States	92 hours
Capping Stack System (CSS)	SWIS Capping Stack (10k PSI, max 3000 m depth)	1	Singapore	8-12 hours
Capping stack System (CSS)	SWIS Capping Stack (10k PSI, max 3000 m depth)	1	South Africa	14 hours
Capping Stack System (CSS)	OSPRAG Capping Device	1	Aberdeen, United Kingdom	21-26 hours
Capping stack System (CSS)	SWIS Capping Stack (15k PSI, max 3000 m depth)	1	Norway	20 hours
Capping stack System (CSS)	SWIS Capping Stack (15k PSI, max 3000 m depth)	1	Brazil	18 hours
Communications	Single VHF Handset	20	Singapore	8-12 hours
Communications	Handheld GPS	30	Singapore	8-12 hours
Communications	VHF Sky Masts	1	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Communications	Iridium Satellite Phone	4	Singapore	8-12 hours
Communications	BGAN Hughes Network Systems (HNS) 9201	2	Singapore	8-12 hours
Communications	BGAN Nera WorldPro 1010	3	Singapore	8-12 hours
Communications	Portable Inflatable Shelter	3	Singapore	8-12 hours
Communications	Handheld GPS	2	Bahrain	15 hours
Communications	VHF Base Station	1	Bahrain	15 hours
Communications	Iridium Satellite Phone	1	Bahrain	15 hours
Communications	BGAN Hughes Network Systems (HNS) 9201	1	Bahrain	15 hours
Communications	BGAN Nera WorldPro 1010	1	Bahrain	15 hours
Communications	Portable Inflatable Shelter	1	Bahrain	15 hours
Communications	Single VHF Handset	90	United Kingdom	21-26 hours
Communications	Handheld GPS	71	United Kingdom	21-26 hours
Communications	VHF Base Station	5	United Kingdom	21-26 hours
Communications	VHF Base/Repeater Station	3	United Kingdom	21-26 hours
Communications	VHF Sky Masts	6	United Kingdom	21-26 hours
Communications	Iridium Satellite Phone	4	United Kingdom	21-26 hours
Communications	BGAN Hughes Network Systems (HNS) 9201	1	United Kingdom	21-26 hours
Communications	BGAN Nera WorldPro 1010	3	United Kingdom	21-26 hours
Communications	Portable Inflatable Shelter	6	United Kingdom	21-26 hours
Communications	VHF Radio	10	Fort Lauderdale, United States	76 hours
Communications	Tactical Comms-mobile Radio for vehicle use	3	Fort Lauderdale, United States	77 hours
Communications	Ground to Air Communications	4	Fort Lauderdale, United States	78 hours
Communications	Mobile Base Station	1	Fort Lauderdale, United States	79 hours
Communications	Iridium Satellite Phone	3	Fort Lauderdale, United States	80 hours
Communications	Inmarsat Satellite Phone	4	Fort Lauderdale, United States	81 hours
Communications	Inmarsat Satellite Phone for marine use	1	Fort Lauderdale, United States	82 hours
Communications	Thrane and Thrane Explorer 700 BGAN	3	Fort Lauderdale, United States	83 hours
Communications	Field Command Post (inflatable)	2	Fort Lauderdale, United States	84 hours
Dispersant	Dasic Slickgone NS	350 m^3	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Dispersant	Finasol OSR 52	350 m^3	Singapore	8-12 hours
Dispersant	Finasol OSR 52	800	South Africa	14 hours
Dispersant	Dasic Slickgone NS	500	Southampton, United Kingdom	21-26 hours
Dispersant	Finasol OSR 52	500	Southampton, United Kingdom	21-26 hours
Dispersant	Finasol OSR 52	1500	Vatry, France	21 hours
Dispersant application	Neat Sweep Dispersant Boom System	2	Singapore	8-12 hours
Dispersant application	Boat Spray Sets for use as vessel mounted Type 3 Dispersant Application System	10	Singapore	8-12 hours
Dispersant application	Fluorometer for Dispersant Application Analysis (spill response specialist required)	3	Singapore	8-12 hours
Dispersant application	Boat Spray Sets for use as vessel mounted Type 3 Dispersant Application System	3	Bahrain	15 hours
Dispersant application	Neat Sweep Dispersant Boom System	1	United Kingdom	21-26 hours
Dispersant application	Boat Spray Sets for use as vessel mounted Type 3 Dispersant Application System	10	United Kingdom	21-26 hours
Dispersant application	Fluorometer for Dispersant Application Analysis (spill response specialist required)	4	United Kingdom	21-26 hours
Dispersant application	Boat Spray Sets for use as vessel mounted Type 3 Dispersant Application System	3	Fort Lauderdale, United States	21 hours
Dispersant application	Fluorometer for Dispersant Application Analysis (spill response specialist required)	1	Fort Lauderdale, United States	22 hours
Dispersant application	Dispersant Eductor Spray System	1	Fort Lauderdale, United States	23 hours
Dispersant application	Dispersant Transfer System (metered)	2	Fort Lauderdale, United States	24 hours
Fire boom	Elastec Hydro Fire Boom 150 m – Offshore	1	Singapore	8-12 hours
Fire boom	Elastec Hydro Fire Boom 150 m – Offshore	3	United Kingdom	21-26 hours
Fire boom	Elastec American Fire Boom in 15 m sections	30	Fort Lauderdale, United States	64 hours
Fire boom	Heli Torch	2	Fort Lauderdale, United States	65 hours
Heavy oil skimmers	Giant Octopus Skimmer	1	Singapore	8-12 hours
Heavy oil skimmers	Komara Star including power pack	2	Singapore	8-12 hours
Heavy oil skimmers	WP 130 Drum Skimmer without power pack	1	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Heavy oil skimmers	Sea Devil Skimmer without power pack	1	Singapore	8-12 hours
Heavy oil skimmers	EARL Vessel Bow Skimmer	1	Singapore	8-12 hours
Heavy oil skimmers	Scan Trawl System	2	Singapore	8-12 hours
Heavy oil skimmers	Komara Star including power pack	2	Bahrain	15 hours
Heavy oil skimmers	Helix Skimmer	1	Bahrain	15 hours
Heavy oil skimmers	Giant Octopus Skimmer	1	United Kingdom	21-26 hours
Heavy oil skimmers	Komara Star including power pack	2	United Kingdom	21-26 hours
Heavy oil skimmers	WP 130 Drum Skimmer without power pack	1	United Kingdom	21-26 hours
Heavy oil skimmers	Rotodrum without power pack	2	United Kingdom	21-26 hours
Heavy oil skimmers	Sea Devil Skimmer without power pack	3	United Kingdom	21-26 hours
Heavy oil skimmers	Helix Skimmer	1	United Kingdom	21-26 hours
Heavy oil skimmers	Scan Trawl System	1	United Kingdom	21-26 hours
Heavy oil skimmers	Helix Skimmer	2	Fort Lauderdale, United States	70 hours
Heavy oil skimmers	High Viscosity Oil Pump Conversion Kit for Foilex TDS 200	1	Fort Lauderdale, United States	71 hours
Inshore boom	10 m Air/Skirt for coastal areas	58	Singapore	8-12 hours
Inshore boom	Air/Skirt Boom 20 m Air/Skirt for coastal areas	86	Singapore	8-12 hours
Inshore boom	Air/Skirt Boom 200 m Air/Skirt for coastal areas	4	Singapore	8-12 hours
Inshore boom	Beach Sealing Boom 10 m	57	Singapore	8-12 hours
Inshore boom	Beach Sealing Boom 20 m	33	Singapore	8-12 hours
Inshore boom	Troil Boom GP 1100 (25 m) (price per 25 m)	22	Singapore	8-12 hours
Inshore boom	Supermax – Rigid Boom in 25 m sections	26	Singapore	8-12 hours
Inshore boom	Sea Curtain – Foam Filled in 50 m sections	12	Singapore	8-12 hours
Inshore boom	10 m Air/Skirt for coastal areas	37	Bahrain	15 hours
Inshore boom	Air/Skirt Boom 20 m Air/Skirt for coastal areas	50	Bahrain	15 hours
Inshore boom	Beach Sealing Boom 10 m	54	Bahrain	15 hours
Inshore boom	Beach Sealing Boom 20 m	22	Bahrain	15 hours
Inshore boom	Troil Boom GP 750 (20 m) (price per 20 m)	4	Bahrain	15 hours
Inshore boom	Nearshore Boom 24” Solid Floatation in 30 m sections	2	Bahrain	15 hours
Inshore boom	10 m Air/Skirt for coastal areas	89	United Kingdom	21-26 hours

Category	Product name	Quantity	Location	Response time[1]
Inshore boom	Air/Skirt Boom 20 m Air/Skirt for coastal areas	216	United Kingdom	21-26 hours
Inshore boom	Beach Sealing Boom 10 m	42	United Kingdom	21-26 hours
Inshore boom	Beach Sealing Boom 20 m	91	United Kingdom	21-26 hours
Inshore boom	Troil Boom GP 750 (20 m)	8	United Kingdom	21-26 hours
Inshore boom	River Boom 12” Solid Floatation in 15 m sections	20	United Kingdom	21-26 hours
Inshore boom	Beach Sealing Boom 10 m	22	Fort Lauderdale, United States	26 hours
Inshore boom	Beach Sealing Boom 15 m	78	Fort Lauderdale, United States	27 hours
Inshore boom	Beach Sealing Boom 20 m	9	Fort Lauderdale, United States	28 hours
Inshore boom	River Boom 10” Solid Floatation in 10 m sections	15	Fort Lauderdale, United States	29 hours
Inshore boom	River Boom 12” Solid Floatation in 15 m sections	80	Fort Lauderdale, United States	30 hours
Inshore boom	Nearshore Boom 18” Solid Floatation in 30 m sections	60	Fort Lauderdale, United States	31 hours
Inshore boom	Nearshore Boom 20” Solid Floatation in 15 m sections	140	Fort Lauderdale, United States	32 hours
Inshore boom	Nearshore Boom 24” Solid Floatation in 30 m sections	24	Fort Lauderdale, United States	33 hours
Inshore boom ancillaries	Air and Water Pump Support Box	20	Singapore	8-12 hours
Inshore boom ancillaries	Boom Vane Small – Boom Deployment Unit	4	Singapore	8-12 hours
Inshore boom ancillaries	Air and Water Pump Support Box	10	Bahrain	15 hours
Inshore boom ancillaries	Air and Water Pump Support Box	31	United Kingdom	21-26 hours
Inshore boom ancillaries	Boom Vane Small – Boom Deployment Unit	3	United Kingdom	21-26 hours
Inshore boom ancillaries	Boom Vane Medium – Boom Deployment Unit	1	United Kingdom	21-26 hours
Inshore boom ancillaries	Air and Water Pump Support Box	4	Fort Lauderdale, United States	34 hours
Inshore boom ancillaries	Boom Vane Small – Boom Deployment Unit	1	Fort Lauderdale, United States	35 hours
Inshore boom ancillaries	Boom Vane Medium – Boom Deployment Unit	1	Fort Lauderdale, United States	36 hours
Inshore boom ancillaries	Boom Vane (Combination)	1	Fort Lauderdale, United States	37 hours
Inshore recovery skimmers	Diesel Driven Rope Mop System OM 140 Capacity 3-5 tph	3	Singapore	8-12 hours
Inshore recovery skimmers	Komara 7k Disc Skimmer including power pack	2	Singapore	8-12 hours
Inshore recovery skimmers	Elastec Combi Drum Skimmer including power pack	2	Singapore	8-12 hours
Inshore recovery skimmers	Vikoma Minivac Vacuum System	3	Singapore	8-12 hours
Inshore recovery skimmers	Roclean Minivac Vacuum System	4	Singapore	8-12 hours
Inshore recovery skimmers	Delta Skimmer – Weir Skimmer including Spate Pump, capacity 12 tph	3	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Inshore recovery skimmers	Slickdisc MK-13 Interchangeable Skimmer Brush/Disc/ Weir comes with Power Pack	3	Singapore	8-12 hours
Inshore recovery skimmers	Diesel Driven Rope Mop System OM 240, capacity 6 tph	1	Bahrain	15 hours
Inshore recovery skimmers	Diesel Driven Rope Mop System OM 140, capacity 3-5 tph	2	Bahrain	15 hours
Inshore recovery skimmers	Cowen Weir Skimmer	1	Bahrain	15 hours
Inshore recovery skimmers	Komara 20k Disc Skimmer including power pack	2	Bahrain	15 hours
Inshore recovery skimmers	Komara 12k Disc Skimmer including power pack	2	Bahrain	15 hours
Inshore recovery skimmers	Komara 7k Disc Skimmer including power pack	5	Bahrain	15 hours
Inshore recovery skimmers	Vikoma Minivac vacuum system	5	Bahrain	15 hours
Inshore recovery skimmers	Diesel Driven Rope Mop System OM 240, capacity 6 tph	1	United Kingdom	21-26 hours
Inshore recovery skimmers	Diesel Driven Rope Mop System OM 140, capacity 3-5 tph	4	United Kingdom	21-26 hours
Inshore recovery skimmers	Diesel Driven Rope Mop System 9D, capacity 12 tph	2	United Kingdom	21-26 hours
Inshore recovery skimmers	Komara 20k disc Skimmer including power pack	3	United Kingdom	21-26 hours
Inshore recovery skimmers	Komara 12k Disc Skimmer including power pack	4	United Kingdom	21-26 hours
Inshore recovery skimmers	Komara 7k Disc Skimmer including power pack	11	United Kingdom	21-26 hours
Inshore recovery skimmers	Elastec Combi Drum Skimmer including power pack	2	United Kingdom	21-26 hours
Inshore recovery skimmers	Vikoma Minivac Vacuum System	5	United Kingdom	21-26 hours
Inshore recovery skimmers	Roclean Minivac Vacuum System	5	United Kingdom	21-26 hours
Inshore recovery skimmers	Egmolap Belt Skimmer including Power System (requires working platform)	1	United Kingdom	21-26 hours
Inshore recovery skimmers	Komara 20k Disc Skimmer including power pack	2	Fort Lauderdale, United States	38 hours
Inshore recovery skimmers	Komara 12k Disc Skimmer including power pack	1	Fort Lauderdale, United States	39 hours
Inshore recovery skimmers	Elastec Combi Drum Skimmer including power pack	2	Fort Lauderdale, United States	40 hours
Inshore recovery skimmers	Elastec Magnum 100 Skimmer comes with power pack	3	Fort Lauderdale, United States	41 hours
Inshore recovery skimmers	Vikoma Minivac Vacuum System	4	Fort Lauderdale, United States	42 hours
Inshore recovery skimmers	Delta Skimmer – Weir Skimmer including Spate pump. Capacity 12 tph	2	Fort Lauderdale, United States	43 hours
Inshore recovery skimmers	Aquaguard RBS-20 Drum/Brush Skimmer comes with power pack	1	Fort Lauderdale, United States	44 hours
Inshore recovery skimmers	Aquaguard RBS-5 Drum/Brush Skimmer comes with power pack	7	Fort Lauderdale, United States	45 hours
Inshore recovery skimmers	Desmi DBD5 Disc/Drum skimmer comes with power pack	3	Fort Lauderdale, United States	46 hours

Category	Product name	Quantity	Location	Response time[1]
Inshore recovery skimmers	Elastec TracVac System	1	Fort Lauderdale, United States	47 hours
Inshore recovery skimmers	Vikoma Duplex Skimmer comes with power pack	1	Fort Lauderdale, United States	48 hours
Inshore recovery skimmers	Lamor LWS 70 Skimmer with brush attachment comes with power pack	3	Fort Lauderdale, United States	49 hours
Inshore recovery skimmers	Minimax Weir Skimmer	5	Fort Lauderdale, United States	50 hours
Inshore recovery skimmers	Trailerised Rope Mop System	4	Fort Lauderdale, United States	51 hours
Inshore recovery skimmers	Skim Pak Skimmer Head	2	Fort Lauderdale, United States	52 hours
Inshore storage equipment	Ro-tank Storage – capacity 10 m^3/2600 US gallons	6	Singapore	8-12 hours
Inshore storage equipment	Fastanks – capacity 9m^3/2400 US gallons	23	Singapore	8-12 hours
Inshore storage equipment	Fastanks – capacity 9m^3/2400 US gallons	7	Bahrain	15 hours
Inshore storage equipment	Fastank – capacity 2m^3/600 US gallons	10	Bahrain	15 hours
Inshore storage equipment	Fastanks – capacity 9m^3/2400 US gallons	63	United Kingdom	21-26 hours
Inshore storage equipment	Fastank – capacity 2m^3/600 US gallons	4	United Kingdom	21-26 hours
Inshore storage equipment	Decant Tank Aluminium 1300 US gallons/4T	2	Fort Lauderdale, United States	53 hours
Inshore storage equipment	Fastanks – capacity 9m^3 / 2400 US gallons	24	Fort Lauderdale, United States	54 hours
Inshore storage equipment	Canflex Floating Collar Tank – capacity 3000 US gallons	12	Fort Lauderdale, United States	55 hours
Inshore storage equipment	Canflex Floating Collar Tank – capacity 2000 US gallons	2	Fort Lauderdale, United States	56 hours
Inshore storage equipment	Canflex Floating Collar Tank – capacity 1000 US gallons	2	Fort Lauderdale, United States	57 hours
Inshore storage equipment	Pit Liner, 105,000 US gallons, 398 T	3	Fort Lauderdale, United States	58 hours
Offshore boom	Roboom 200 m Bay Boom, on reel without power pack	12	Singapore	8-12 hours
Offshore boom	Hi Sprint Rapid Boom with reel (300 m long without power pack)	2	Singapore	8-12 hours
Offshore boom	Roboom 200 m Bay Boom, on reel without power pack	4	Bahrain	15 hours
Offshore boom	Roboom 200 m Bay Boom, on reel without power pack	13	United Kingdom	21-26 hours
Offshore boom	Hi Sprint Rapid Boom with reel (300 m long without power pack)	1	United Kingdom	21-26 hours
Offshore boom	Roboom 200 m Bay Boom, on reel without power pack	4	Fort Lauderdale, United States	60 hours
Offshore boom	Ocean Boom 43” Inflation Boom in 30 m sections	100	Fort Lauderdale, United States	61 hours
Offshore boom	Ocean Boom 45” Inflation Boom in 30 m sections	18	Fort Lauderdale, United States	62 hours
Offshore recovery skimmers	Komara 50k Skimmer without power pack	2	Singapore	8-12 hours
Offshore recovery skimmers	GT 185 Weir Skimmer without power pack	1	Singapore	8-12 hours
Offshore recovery skimmers	Termite Weir Skimmer without power pack	4	Singapore	8-12 hours

Category	Product name	Quantity	Location	Response time[1]
Offshore recovery skimmers	Termite Combi System Brush/Disc/Weir without power pack	2	Singapore	8-12 hours
Offshore recovery skimmers	Terminator Combi System Brush/Disc/Weir Skimmer without power pack	2	Singapore	8-12 hours
Offshore recovery skimmers	Marflex Sweep Arms – Large Volume Skimming Arms without power pack	2	Singapore	8-12 hours
Offshore recovery skimmers	Komara 50k Skimmer without power pack	2	Bahrain	15 hours
Offshore recovery skimmers	Termite Weir Skimmer without power pack	2	Bahrain	15 hours
Offshore recovery skimmers	Terminator Weir Skimmer (with thrusters) without power pack	1	Bahrain	15 hours
Offshore recovery skimmers	Side Sweep Arms – Small Volume Skimming Arms without power pack	1	Bahrain	15 hours
Offshore recovery skimmers	Komara 50k Skimmer without power pack	2	United Kingdom	21-26 hours
Offshore recovery skimmers	Desmi DS 250 Skimmer without power pack	4	United Kingdom	21-26 hours
Offshore recovery skimmers	Ro-Disc Attachment for DS250	2	United Kingdom	21-26 hours
Offshore recovery skimmers	GT 185 Weir Skimmer without power pack	4	United Kingdom	21-26 hours
Offshore recovery skimmers	Termite Weir Skimmer without power pack	4	United Kingdom	21-26 hours
Offshore recovery skimmers	Terminator Weir Skimmer (with thrusters) without power pack	1	United Kingdom	21-26 hours
Offshore recovery skimmers	Desmi Seamop comes with transfer pump	3	United Kingdom	21-26 hours
Offshore recovery skimmers	Termite Weir Skimmer without power pack	2	Fort Lauderdale, United States	66 hours
Offshore recovery skimmers	Lamor Minimax 30BC Brush Skimmer comes with power pack	2	Fort Lauderdale, United States	67 hours
Offshore recovery skimmers	Foilex Rapid Deployment System comes with power pack	2	Fort Lauderdale, United States	68 hours
Offshore recovery skimmers	Desmi Seamop comes with transfer pump	3	Fort Lauderdale, United States	69 hours
Offshore storage equipment	Storage Barge – 25 m^3	8	Singapore	8-12 hours
Offshore storage equipment	Storage Barge – 50 m^3	4	Singapore	8-12 hours
Offshore storage equipment	Waste Containment Tank 10 m^3/2600 US Gallons	9	Singapore	8-12 hours
Offshore storage equipment	Storage Barge – 25 m^3	4	Bahrain	15 hours
Offshore storage equipment	Storage Barge – 50 m^3	2	Bahrain	15 hours
Offshore storage equipment	Unitor oil bag – capacity 500 m^3	1	Bahrain	15 hours
Offshore storage equipment	Unitor oil bag – capacity 200 m^3	1	Bahrain	15 hours
Offshore storage equipment	Storage Barge – 25 m^3	7	United Kingdom	21-26 hours
Offshore storage equipment	Storage Barge – 50 m^3	8	United Kingdom	21-26 hours
Offshore storage equipment	Storage Barge – 25 m^3	4	Fort Lauderdale, United States	72 hours

Category	Product name	Quantity	Location	Response time[1]
Offshore storage equipment	Sea Slug – capacity 5 T	10	Fort Lauderdale, United States	73 hours
Offshore storage equipment	Sea Slug – capacity 10 T	11	Fort Lauderdale, United States	74 hours
Offshore storage equipment	Sea Slug – capacity 50 T	12	Fort Lauderdale, United States	75 hours
Oiled wildlife response package	Search and Rescue	1	Singapore	8-12 hours
Oiled wildlife response package	Cleaning and Rehabilitation	1	Singapore	8-12 hours
Oiled wildlife response package	Search and Rescue	1	Bahrain	15 hours
Oiled wildlife response package	Cleaning and Rehabilitation	1	Bahrain	15 hours
Oiled wildlife response package	Search and Rescue	1	United Kingdom	21-26 hours
Oiled wildlife response package	Intake and Triage	1	United Kingdom	21-26 hours
Oiled wildlife response package	Cleaning and Rehabilitation	2	United Kingdom	21-26 hours
Oiled wildlife response package	Wildlife Rehabilitation Unit	1	Fort Lauderdale, United States	59 hours
Pre-loaded equipment	Load One – Shoreline Boom and Ancillaries	1	Bahrain	15 hours
Pre-loaded equipment	Load Two – Shoreline Boom and Ancillaries	1	Bahrain	15 hours
Pre-loaded equipment	Load Four – Offshore Containment and Recovery (Weir Boom)	1	United Kingdom	21-26 hours
Pre-loaded equipment	Load Five – Shoreline Package Standard	1	United Kingdom	21-26 hours
Pre-loaded equipment	Load Six – Offshore Containment and Recovery	1	United Kingdom	21-26 hours
Pre-loaded equipment	Load Seven - Egmopol Barge	1	United Kingdom	21-26 hours
Pre-loaded equipment	Load Eight – Shoreline Package Standard Supplement	1	United Kingdom	21-26 hours
Pre-loaded equipment	Load Nine – Shoreline Package Heavy Oil Supplement	1	United Kingdom	21-26 hours
Pre-loaded equipment	Load Eleven – High Volume Recovery Systems (offshore)	1	United Kingdom	21-26 hours
Spill tracking buoy	Oil Spill Tracking Buoy – I-Sphere	1	Singapore	8-12 hours
Spill tracking buoy	Oil Spill Tracking Buoy – ISMDB	2	Singapore	8-12 hours
Spill tracking buoy	Oil Spill Tracking Buoy – I-Sphere	1	Bahrain	15 hours
Spill tracking buoy	Oil Spill Tracking Buoy – ISMDB	1	Bahrain	15 hours
Spill tracking buoy	Oil Spill Tracking Buoy – I-Sphere	1	United Kingdom	21-26 hours
Spill tracking buoy	Oil Spill Tracking Buoy – ISMDB	2	United Kingdom	21-26 hours
Subsea Incident Response Toolkit (SIRT)	Subsea Incident Response Toolkit	1	Norway	20 hours
Subsea Incident Response Toolkit (SIRT)	Subsea Incident Response Toolkit	1	Brazil	18 hours

1. Response time is an estimate only and is based on an estimate of mobilisation time, flying distance and flight times to Adelaide.

Appendix 3

Aerial observer log

Appendix 3 Aerial observer log

Worksheet for estimating oil slick volume in accordance with the Bonn Agreement

Step 1. Total area: Estimate total size of the oil slick as a square or rectangle (in km²) [*e.g. 10 × 2 km = 20 km²*].

Step 2. Oil spill area: Assess the area affected by the slick in km² calculated as a % of the total area [*e.g. the slick affects 90% of the total area, 90% of 20 km² = 18 km²*].

Step 3. Estimate slick area by colour: Estimate the area covered by each oil appearance colour as a % of the area affected in km² [*e.g. 60% silvery sheen: 0.60 × 18 = 10.8 km², 40% metallic: 0.40 × 18 = 7.2 km² respectively*].

Step 4. Calculate minimum and maximum oil quantity by colour: Multiply the area covered by each oil appearance colour by the minimum and maximum possible volumes to get the minimum and maximum estimates of oil quantity. [*e.g. silvery sheen; min: 10.8 km² × 0.04 = 0.432* m³/km², *max: 10.8 km² × 0.3 = 3.24; metallic; min: 7.2 km² × 5 = 36, max: 7.2 km² × 50 = 360* m³/km²].

Step 5. Total quantity: Add all the quantity by colour figures to get total estimated minimum and maximum quantities of oil in m³.

Step 6. Conversion: If necessary, covert m³ to tonnes by multiplying total quantity in m³ by the Specific Gravity of the spilt oil.

Average width (km)		Average length (km)	
STEP 1	Total area (width × length) km²		
STEP 2	Oil spill area (estimated) km²		

Colour	Code	Minimum (m³/km²)	Maximum (m³/km²)	STEP 3% of area affected	STEP 3 Area covered (km²)
Silvery sheen	1	0.04	0.3		
Rainbow sheen	2	0.3	5.0		
Metallic	3	5.0	50		
Discontinuous true colour	4	50	200		
Continuous true colour	5	200	200		

Note: Calculation for Area Covered: km² = Oil Spill Area / 100 × % of Area Covered.

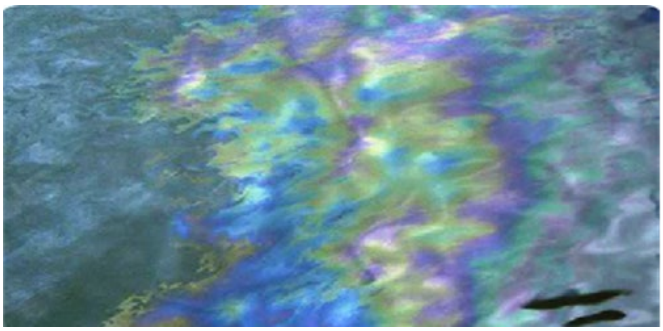
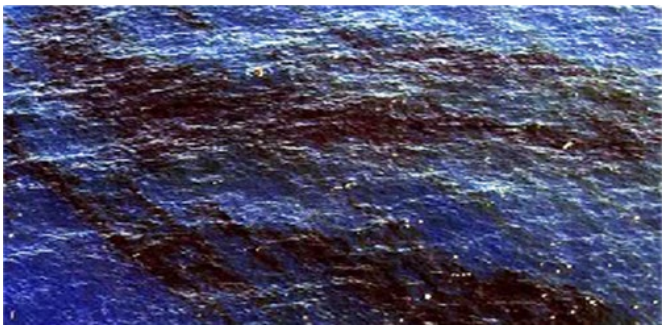
Colour	STEP 3 Area covered (km²)	STEP 4 Min volume (m³)	STEP 4 Max volume (m³)
Silvery sheen			
Rainbow sheen			
Metallic			
Discontinuous true colour			
Continuous true colour			

STEP 5	Total volume (m³)		
STEP 6	Total volume in tonnes (m³ × SG)		

Appendix 4

Bonn Agreement oil appearance code

Appendix 4 Bonn Agreement oil appearance code

Image	Description
	CODE 1 – Oil sheen silvery (0.04 µm–0.3 µm) Very thin films of oil reflect the incoming light better than the surrounding water and can be seen as a silvery or grey sheen. Above a certain height or angle of view the sheen may no longer be observed.
	**CODE 2 –** Oil sheen rainbow (0.3 µm–5.0 µm) Rainbow oil appearance is caused by an optical effect that is independent of oil type. Depending on angle of view and layer thickness, the distinctive colours will be diffuse to very bright. Bad light conditions may cause the colours to appear duller. A consistent layer of oil in the rainbow region will show different colours across the slick because of the change in angle of view. Therefore, if rainbow is present, a range of colours will be visible.
	CODE 3 – Oil sheen metallic (5.0 µm–50 µm) Although a range of colours can be observed (e.g. blue, purple, red and greenish) the colours will be distinctly different to a ”rainbow”. Metallic sheens will appear as a relatively homogeneous colour (blue, brown, purple or another colour). The ”metallic” appearance – caused by a mirror effect – is the common factor, with the colour dependent on light and sky conditions. For example, blue can be observed in clear, blue-sky conditions.
	CODE 4 – Discontinuous true colour (50 µm–200 µm) For oil slicks thicker than 50 µm, the true colour will gradually dominate. Brown oils will appear brown, black oils will appear black. Patchiness in colour due to thinner areas within the slick, results in a discontinuous appearance (though dominated by the true oil colour). The term “discontinuous” therefore should not be mistaken as necessarily describing the surface coverage of the oil.
	**CODE 5 –** Continuous true colour (>200 µm) The true colour of the specific oil is the dominant effect in this category. A more homogenous colour can be observed with no discontinuity as described in Code 4. This category is strongly oil type dependent and colours may be more diffuse in overcast conditions.

Appendix 5

RPS OSTM request form

OIL SPILL TRAJECTORY MODELLING REQUEST

Email completed form to RPS response staff – response@rpsgroup.com.au **BEFORE sending this request; phone Duty Officer on telephone number provided.**

Priority of request: ☐ **Urgent** ☐ **Exercise** **Date and time of request:**

Incident name	
Name of requesting person and position in response	**Contact telephone number**
Email address for model output (preferred method)	**Fax number for receipt of model output**

Surface or subsurface spill?	**If subsurface spill, describe the spill source.**
Surface ☐	☐ Low turbulence (e.g. low-pressure pipeline leak)
Subsurface ☐	☐ Medium turbulence (e.g. intermediate pressure pipeline leak)
Depth of spill (m)	☐ High turbulence (e.g. well blowout under pressure, or ruptured pipeline under pressure)

Spill start date			**Spill start time (use 24-hour clock, state time zone – GMT or Local)**	**Requested simulation length (hours)**
Day	Month	Year		

Oil name:	Oil type: *Bunker C, Diesel Fuel, Crude, Condensate*

Spill location (select one format)	Latitude of spill (N)	Longitude of spill (E)
Degrees, minutes and seconds	° ′ ″	° ′ ″
Degrees, minutes and decimal minutes	° . ′	° . ′
Degrees, minutes and decimal minutes	. °	. °
Easting and northing (Zone)	S/N	E/W

Instantaneous spill ☐	Amount	(select one) ☐ Tonnes ☐ Cubic metres ☐ Litres ☐ Barrels	
Continuous spill ☐	Duration (hours)	Amount (per hour)	☐ Tonnes ☐ Cubic metres ☐ Litres ☐ Barrels
Present wind speed and directions, sea states and water temperatures (°C) at the site (if known):			
NOTES (describe special details of the incident, special concerns, doubts about information etc.)			

Appendix 6

Dispersant requirements and availability

Appendix 6 Dispersant requirements and availability

1.1 Dispersant selection

The same dispersants would be used for subsea dispersant injection (SSDI) and for aerial and vessel surface dispersant applications. This simplifies the supply chain and allows rationalisation of dispersant stocks should the surface application methods be less effective due to sea state at the time. NEBA analysis may indicate it is not of net benefit to continue surface application and the dispersant stock may be redirected into the SSDI. Using the same group of dispersants enables the supply chain to cope with such changes without affecting, for example, manufacturing agreements. Dispersants found to be effective in surface application have also been shown to be effective in laboratory simulations of SSDI application (Brandvik et al 2019).

The dispersants that would be used, in order of priority, will be:

1. OSCA registered - Dasic Slickgone NS, Dasic Slickgone EW, Finasol 51 OSR and Finasol 52 OSR (existing Australian, then existing international stocks via OSRL).

2. OSCA registered as above but manufactured internationally.

1.2 Sourcing dispersants

Dispersants as identified above would be sourced from the same suppliers and stocks as for surface dispersants; recognising the much greater quantities required for SSDI as the primary response strategy and therefore manufacturing arrangements would include consideration of surface and SSDI volume demands.

Equinor would source dispersants through its OSRL worldwide contract and would have access to AMOSC, AMSA and industry Mutual Aid stocks in Australia. These arrangements have been confirmed with the suppliers:

- Equinor has received confirmation from OSRL that it has access to OSRL's existing stocks of OSCA-registered. OSRL confirmed that manufacture of new dispersants could be initiated immediately on notice of need

- Equinor has received confirmation that it can access AMOSC's stock of OSCA-registered dispersants

- Equinor has confirmed with AMSA that is would have access to AMSA's stocks of OSCA-registered dispersant stocks in Australia

- Under the industry Mutual Aid Agreements, and on agreement of other petroleum companies at the time, Equinor would have access to further OSCA-registered dispersant stocks in Australia.

- Other sources, for example, stockpiles of OSCA-registered dispersants held by operators around the world, would also be identified via Equinor's extensive industry networks during the first few weeks of an incident; these have not been included in the supply chain calculations because they are not considered necessary but would add further capacity if needed.

1.3 Dispersant availability

The available volumes and dispersant chemical types are shown below (Table 6.1); these figures do not take into account manufacture of new dispersant during a spill response.

Table 6.1 Availability of existing OSCA registered dispersants

Organisation	Dispersant stockpile (m^3)	
	Approved	Chemicals
AMSA	144	Slickgone NS
AMOSC	658	Slickgone NS
OSRL	4347	Slickgone NS Finasol OSR 52
Mutual Aid	27	Slickgone NS Finasol EW
Total	**5176**	

Existing stocks of OSCA-registered dispersants (5176 m^3 worldwide) can meet the requirements of the response plan (OPEP) for up to 44 days and Equinor will instruct OSRL to immediately commission manufacture of replacement stock in the event of a major spill. Dispersant manufacturers Dasic and Total have confirmed with OSRL that they can manufacture OSCA-registered dispersants and ramp up to full production within several weeks. Dasic can reach a manufacturing capacity of 54 m^3/day within 10 days which will be sufficient to supply the SSDI response (without taking into account decreasing requirement as reservoir depletes). This will ensure the supply of dispersants can be maintained to meet the requirements of the response plan. Contractual arrangements are already in place between OSRL and the manufacturers. Manufacture of new dispersants would be initiated under the first strike response processes in the OPEP (Part One in OPEP Rev 3) prior to exhausting the existing stockpiles such that 33 days before the end of the 44 day period during which existing supplies are used, manufacture of new dispersants could be in full production for Dasic (at 54 m^3/day) and these can be stockpiled to supply the response need after Day 44. It is calculated that the supply of OSCA-registered dispersants will exceed the needs of the ongoing dispersant application program until the relief well is successful in stopping the flow of oil after 88 days and all fresh oil has been treated or weathered to the point it is no longer amenable to dispersion. This does not rely on manufacture by more than one supplier, which is a conservative approach and the actual supply chain may be diversified and expanded during the response depending on circumstances at the time.

Australian stocks of dispersants will be flown or trucked to Port Adelaide where they will be transferred to supply vessels for transport to the spill site. The longest transport time is for trucking dispersants from Perth (or Fremantle) to Port Adelaide which takes approximately 30 hours. A national freight company such as Toll would be engaged when needed. International dispersant will be transported on freight aircraft on IBC pallets. Daily flights to Adelaide (1-2 aircraft) might be required depending on actual rate of use. Facilities in Perth can also be used to alleviate potential capacity challenges at Adelaide airport and Port Adelaide. The transfer of the fluid will be done in several stages, first pumped from IBC (1 m^3) containers to larger ISO tanks (21 to 40 m^3 each), then to Port Adelaide Berth-25 Liquid Mud Plant tanks (1800 m^3 capacity), and finally to PSV internal tanks (typically 800 to 1200 m^3 each). This would be a continuous concurrent operation as dispersant arrives in Adelaide and is transported to the port. Equinor currently leases Berth-25 in Port Adelaide and will hold this during the drilling. The PSV will then sail to the location where it will transfer the liquid from its tanks to the dispersant injecting vessel (another PSV with the CT/conductor to the subsea injection). This vessel will have similar tank capacity allowing for about two weeks of continuous injection even assuming the highest credible rate. The steaming time from Port Adelaide to the Stromlo-1 location is approximately 32 hours (at non-economic speed and allowing for P90 weather conditions).

1.4 Supply chain

The dispersant supply chain calculations are summarised below. The daily requirements for dispersants to supply the SSDI operations and surface applications have been combined to ensure the two requirements do not compete for resources. Figure 6.1 shows the daily dispersant volume requirements, based on:

- Vessel application on Day 1
- AMSA FWADC application from Day 2; scaling up to nine AMSA FWADAC aircraft from Day 4 to 20, 3 m^3; three sorties/day
- OSRL Hercules C-130A from Day 2 to 20; 1 aircraft; 13 m^3, two sorties/day
- OSRL 727 from Day 3 to 20; 1 aircraft, 15 m^3, two sorties/day
- SSDI from Day 9 to 102, 76 m^3/day.

The need for dispersants peaks at 186 m^3/day from Day 9 to Day 20, when SSDI and sea surface (aerial) applications are both underway. In reality, aerial dispersant application may be scaled back earlier if SSDI is as effective as expected. This would be a consideration of a NEBA based on field monitoring of subsea dispersant efficacy.

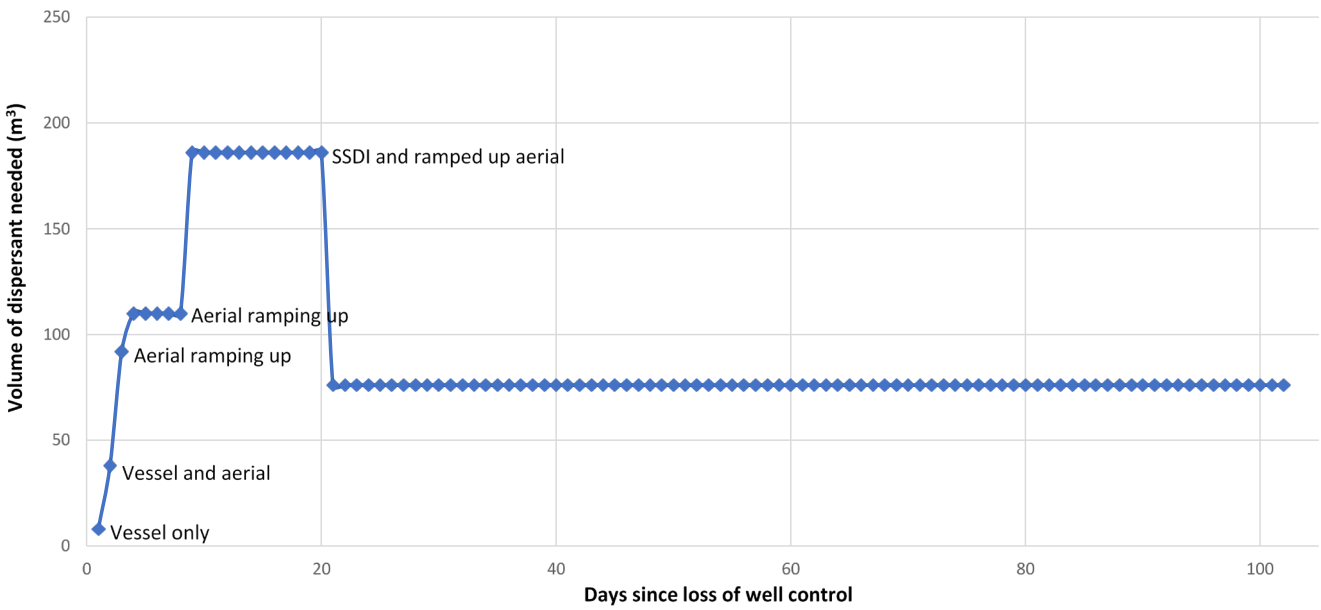


Figure 6.1 Predicted daily dispersant requirements until relief well kill

Calculations of daily demand and supply chain characteristics, including logistics considerations for stock piling in Port Adelaide and transport to location, show that existing stocks of OSCA-registered dispersants will supply response needs for the first 44 days. Daily requirements to supply SSDI only will drop to 76 m^3/day by Day 21 and by this stage, manufacture by Dasic will be running at 54 m^3/day (after a 10 day ramp up). Between Day 11 and Day 44 existing stocks are sufficient to cover demand and manufactured dispersant can be stockpiled. During this period a surplus of 1782 m^3 will have amassed which would be used to fill any daily production or supply chain shortfalls. This will be used to supply the SSDI operations until the end of the response. Assuming all existing stocks are used first, the 76 m^3 of SSDI dispersant required each day from day 45 to relief well success by Day 102 could be supplied by manufacture by Dasic alone (54 m^3/day) augmented by 31 m^3/day from the stockpile amassed from Day 11 to Day 44 (1782 m^3 over 57 days). This supply of dispersants is considered adequate to meet the needs of the planned response and can continue past the relief well kill date up to the 129-day worst case scenario (Figure 6.2).

Further reliability in the supply chain will come from the Total manufacture of OSCA-registered Finasol dispersants. It is assumed that manufacturers would not be supplying at full capacity – recognising competing demands worldwide and ingredient demands by other users. The supply of OSCA-registered dispersants by individual manufacturers and suppliers will be re-assessed at the time to ensure optimisation and security of supply; other suppliers will be considered if they can manufacture the required dispersants in shorter time frame, support a faster mobilisation time or are more cost-effective

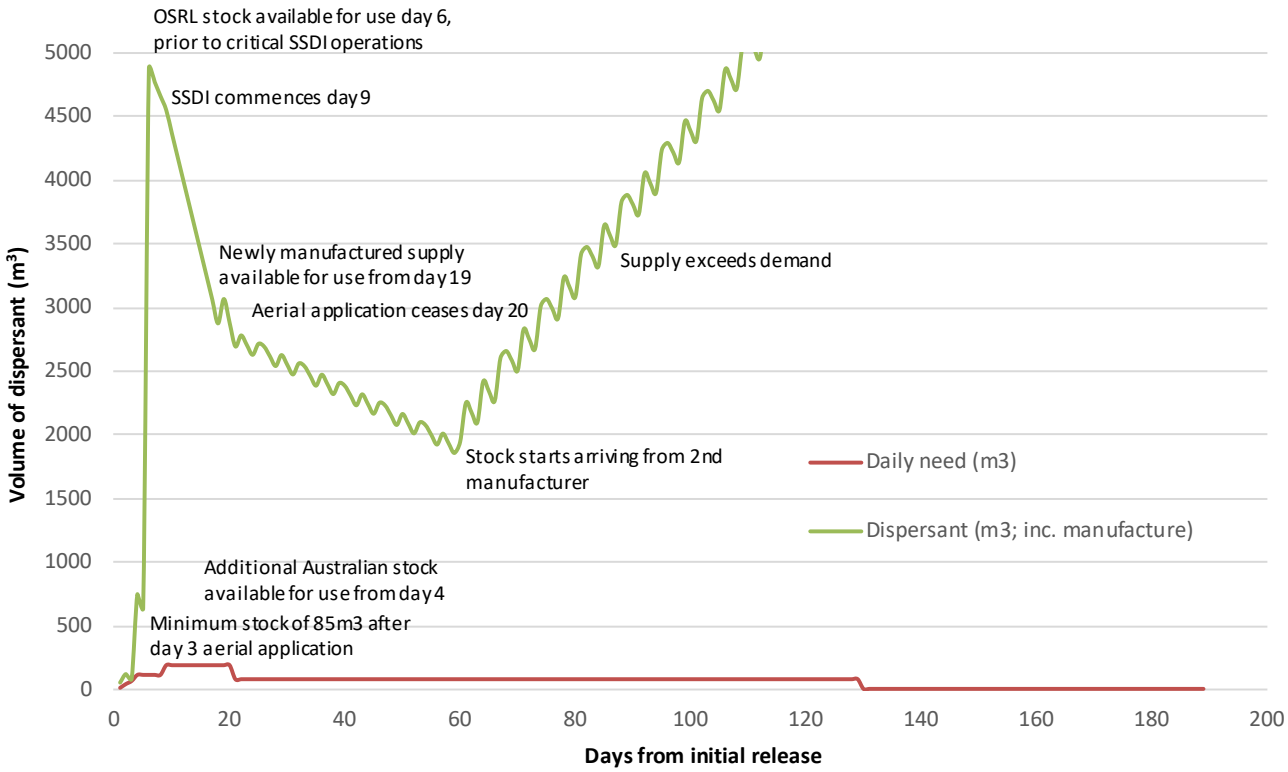


Figure 6.2 Predicted daily dispersant requirements and supply chain capacity for WCD_{129} scenario

Appendix 7

Dispersant application forms

Appendix 7 Dispersant application forms

Dispersant application summary (to be completed by dispersant applicators for aircraft and vessels)			
Name:	Organisation:	Date:	Time:
Application parameters	Application platform		
General location:	Aircraft/boat/other:		
Size of target area: km^2/Ha	Type:		
Volume of oil targeted: Litres/m^3/T	Capacity:		
Volume of dispersant required: Litres/m^3/T	Swath width:		
Dispersant : oil ratio (DOR):	Application speed:		
Dispersant being used:	Pump rate:		
Application capacity			
Distance to slick: km	Transit time to slick (return): mins.		
Resupply time: mins.	Spraying time per sortie: mins.		
Applications per hour:	Coverage per hour: km^2/Ha		
Sketch of proposed application: (include scale, north arrow, location of oil, flight path, prominent landmarks, etc.)			

Source: Stevens (2006).

Position log for dispersant applications			
Name:	Organisation:	Date:	Time:
Date of application:			
General location of application:			

Pass	Waypoint ID		Start position of application			Start position of application			Dispersant applied (L)
No.	Start	Finish	Time	Latitude (S)	Longitude (E)	Time	Latitude (S)	Longitude (E)	

Source: Stevens (2006)

Dispersant observation checklist (for dispersant observers to complete before departure)				
Name:	Organisation:		Date:	Time:
Communications	VHF channel	UHF frequency	Other	
Air to air				
Air to vessel				
Air to ground				
Ground to vessel				
Vessel to vessel				
	Aircraft/personnel names	Call sign	ETD to spill	ETA at spill
Sprayer 1				
Sprayer 2				
Observer				
Command centre				

Name of dispersant:	Dispersant : oil ratio (DOR):	
Dilution prior to application (if any):	Rate of application: Litres/Ha	
Dispersant application altitude: ft/m	Observation altitude: ft/m	
Weather Conditions ☐ sunny, ☐ overcast, ☐ cloudy, ☐ rain, ☐ fog		
Sea state:	Wind speed: knots	Air temperature: °C
Wave height: m	Wind direction: degrees true/magnetic	Sea temperature: °C
Water depth: m	Current speed: knots	Salinity: ppt
Visibility: NM/km	Current direction: degrees true/magnetic	Tide: flood/ebb/slack

Dispersant observation equipment and safety checklist	
Observation base maps/charts clipboard/notebook/reporting/forms/checklists pens/pencils GPS and spare batteries job aids for visual observation camera and spare film video camera and spare batteries binoculars Personal protective equipment lifejacket (and exposure suit if required) survival equipment (e.g. flares, locator beacon)	Safety brief safety brief with pilot/skipper purpose of mission operational constraints area orientation/observation plan trip duration landing/mooring sites radio frequencies and reporting schedule safety features (e.g. emergency locator beacon, fire extinguishers, first aid kit, radios, etc.) emergency exit procedures gear deployment (e.g. current drogue, dye)

Source: Stevens (2006)

Dispersant observation reporting form
(for recording dispersant observations from aircraft and vessels)

Name:	Organisation:	Date:	Time:

Pass no.	Waypoint ID		Start position of application			Start position of application		
	Start	Finish	Time	Latitude (S)	Longitude (E)	Time	Latitude (S)	Longitude (E)

Viewing difficulties (if any):

Visual appearance of slick (use Bonn Agreement oil appearance code definitions and visual guides)

Before application:	Immediately after application:	20 minutes after application:
Storage media Ref. No:	Storage media Ref. No:	Storage media Ref. No:
Image file Ref:	Image file Ref:	Image file Ref:

Dispersion cloud observed: YES/NO	Colour:	Time taken for cloud to form: mins.
Did oil slick reform (recoalesce)? YES/NO		Time taken to reform: mins.
% of slick treated:	% overspray:	Estimated efficiency of application (%):
Describe any variation in effectiveness across slick:		Describe differences between treated/untreated areas:
Describe any biota present and any effects observed:		General comments/problems encountered:

Recommendations for future applications:

Source: Stevens (2006)

Appendix 8

Shoreline assessment information

Appendix 8 Shoreline assessment information

Shoreline assessment information can be downloaded free of charge from the following links:

- National Oceanic and Atmospheric Administration (NOAA) Shoreline Assessment Manual – https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/shoreline-assessment-manual.html
- NOAA Shoreline Assessment Job Aid – https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/shoreline-assessment-job-aid.html
- NOAA Shoreline Assessment Forms – https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-spills/resources/shoreline-assessment-forms.html
  https://response.restoration.noaa.gov/oil-and-chemical-spills/oil-%5dspills/resources/shoreline-assessment-forms.html
- OSRL SCAT Field Guide – https://www.oilspillresponse.com/technical-library/scat-field-guide/.

The table below provides summary information on shoreline clean-up techniques, constraints and effects. The table is based on information provided in the NOAA Shoreline Assessment Manual.

Method	Objective	Description	Applicable habitat types	When to use	Biological constraints	Environmental effects	Waste generation
Natural recovery	No stranded oil is removed to minimise impact to the environment, or because no there is no effective/safe method for clean-up.	Oil is left in place to degrade naturally. Monitoring of the contaminated area may be required	Man-made Structures Rocky Shore Sandy Beach Tidal Flats Shallow Seagrass Reef Mangroves	When natural removal rates are fast (high evaporation, high energy coastline), when the degree of oiling is light or when clean-up actions will do more harm than natural recovery	Natural recovery may be inappropriate for area used by high numbers of mobile animals (birds, marine mammals) or endangered species	Same as from the oil alone	None
Manual oil removal	Removal of oil with hand tools and manual labour.	Removal of surface oil using hands, rakes, shovels, buckets, scrapers, sorbents, etc., and placing in containers. Includes underwater recovery of submerged oil by divers.	Preferred: Rocky Shore Sandy Beach Possible: Tidal Flats Mangroves	Light to moderate oiling conditions for stranded oil. Submerged heavy oils that have formed semi- solid/solid masses on the bottom.	Foot traffic over sensitive areas (wetlands, tidal pools, etc.) should be restricted or prevented. Shoreline access may need to be restricted/closed at times (i.e. during bird nesting/ turtle hatching). Permission to work in culturally significant sites.	Minimal, if surface disturbance by responders and waste generation is controlled.	Collection of oil mixed with sand. Oily wastewater following decontamination. Oiled personal protective gear. All will be properly treated and/or disposed.
Mechanical oil removal	Removal of oil from shorelines using mechanical equipment.	Oil is collected using equipment such as graders, bulldozers, dredges, beach cleaners, etc. Requires systems for temporary storage, transport and treatment/disposal of collected material.	Possible: Sandy Beach	When large amounts of oiled materials will be removed. Care should be taken to remove sediments only to the depth of oil penetration. Excessive sediment removal will cause erosion and significantly increase waste volume.	Use of heavy equipment in sensitive habitats (i.e. wetlands, soft substrates) should be restricted. Permission requested for use in culturally significant areas. Site area will be controlled to prevent physical disturbance to adjacent, unoiled areas. The noise generated by the mechanical equipment may present a constraint as well.	May be detrimental if excessive sediments are removed without replacement. Organisms in the sediment will be affected, although the need to remove oil may make this response method the best overall alternative. Re- suspension of exposed oil and fine- grained, oil sediments can affect adjacent bodies of water.	Can generate large quantities of contaminated sediment debris that requires treatment and/or disposal.
Sorbents	Removal of surface oil by absorption by oleophilic material placed at the waterline.	Sorbent material (boom, pads, snares) is placed on the floating oil or water surface, allowing it to absorb oil or is used to wipe or dab stranded oil. Recovery of all sorbent material is mandatory – they need to be firmly anchored in areas exposed to wave action/currents, to prevent stranding on the shoreline.	Preferred: Rocky shore Possible: Tidal Flats Shallow Seagrass Mangroves	When oil is free- floating in small rocky pools or stranded on shore. As a secondary treatment method after gross oil removal and in sensitive areas where access is restricted (i.e. mangroves). Note. Heavy oil will only coat the surface – therefore requires a large surface area to be effective.	Access for deploying and retrieving sorbents should not adversely affect wildlife. Application is soft or sensitive habitats will require deployment by boat or use of walking boards. Sorbent material left in place too long can break apart and present an ingestion hazard to wildlife.	Physical disturbance of habitat during deployment and retrieval.	All sorbent material will be collected and disposed appropriately. Caution should be taken to prevent overuse and the generation of large amounts of lightly oiled sorbents.
Pumps and vacuums	Removal of oil pooled on a shoreline substrate or sub-tidal sediments.	Vacuum unit or pump is attached via a flexible hose to a suction head that recovers free oil. May be mounted on vessels for water-based operations, on trucks driven to recovery areas, or hand-carried to remote sites.	Preferred: Rocky shore Possible: Man-made Structures Sandy Beach Tidal Flats Shallow Seagrass Mangroves	When oil is stranded on the substrate, pooled against a shoreline, concentrated in rocky trenches or trapped in vegetation. May be used in combination with low-pressure flushing to lift the oil off the substrate and vegetation.	Restrictions should be established for areas where foot traffic and equipment operation may be damaging, such as soft substrates.	Minimal, if foot and vehicle traffic are controlled and minimal substrate/vegetation is damaged or removed. Site restrictions and procedures should be developed and implemented.	Collected oil and or oil/water mix will need to be stored temporarily prior to treatment/disposal. Large amounts of water are often recovered, requiring separation and treatment.

Method	Objective	Description	Applicable habitat types	When to use	Biological constraints	Environmental effects	Waste generation
Debris removal	Removal of debris in path of spill prior to oiling and to remove contaminated debris from the shoreline and water surface.	Manual or mechanical removal of debris (seaweed, driftwood, wreckage, trash) from the shore or water surface.	Possible: Sandy Beach Tidal Flats Mangroves	When debris is heavily contaminated and provides a potential source of secondary oil release and/or contamination for other resources that use the area such as birds and small mammals. Removal of non- oiled debris (beach wrack) may be considered to reduce potential oiled waste; or likely clogging of recovery skimmers; or if it is likely to cause safety problems for responders	Foot traffic over sensitive areas (wetlands, spawning grounds) will be restricted/controlled. Debris may be a habitat and an important source of prey (i.e. shorebirds feeding in wrack on beaches).	Physical disruption of substrate.	Potential to generate large volumes of contaminated debris. Waste disposal options should be less restrictive for debris collected pre-spill.
Vegetation removal	To remove portions of oiled vegetation or oil trapped in vegetation to prevent oiling of wildlife or secondary oil releases.	Oiled vegetation is cut (weed trimmers, blades), picked or raked up and bagged for disposal.	Possible: Tidal Flats Mangroves	When the risk of oiled vegetation contaminating wildlife is greater than the value of the vegetation that is to be cut, and there is no less- destructive method that removes or reduces the risk to acceptable levels. Also, to remove thick oil residues under the oiled vegetation.	Cutting only the oiled portions of the plants and leaving roots and stems (as much as possible) will reduce impact to plants. Operations will be strictly monitored to minimise the degree of root destruction and mixing oil deeper into the sediments.	Vegetation removal/unnecessary trampling will destroy habitat for many animals. Cut areas will have reduced plant growth and, in some instances, plants may be killed. Along exposed sections of shoreline, the vegetation may not recover, resulting in erosion and habitat loss.	Cut portions of oiled plants will be collected and disposed of properly.
Sediment tiling	To break up oily sediments and surface oil deposits, increasing their surface area, and bringing deeper subsurface oil layers to the surface, enhancing the rate of degradation by aeration. Also, to increase the rate sediment re- working by wave action.	Oil sediments are mixed (i.e. rototilled) using mechanical equipment or manual tools. Along beaches, oiled sediments may be pushed to the lower intertidal zone to enhance natural clean-up by wave activity (surf washing). On gravel beaches, the process may be aided with high-volume flushing.	Possible: Sandy Beach Sedimentary substrate that can support mechanical equipment or foot traffic and hand tiling.	On sand to gravel beaches with subsurface oil where sediment removal is not feasible (due to erosion, transportation or disposal problems). On sand beaches where the sediment is stained or lightly oiled. May be appropriate for sites where the oil is stranded above the normal high waterline, so that the sediments can be reworked by wave action.	Avoid use on shores near sensitive wildlife habitats, such as fish- spawning areas or bird-nesting and adjacent to sub-tidal habitats such as shellfish beds, seagrass, or coral reefs.	Mixing of oil into sediments could further expose organisms that live below the original layer of oil. Repeated reworking could delay re-establishing of these organisms. Re-mobilised oil and oily suspended sediments from treated sites could contaminate adjacent waterbodies and shorelines.	None.
Flooding/ deluging	To lift and wash oil stranded on land to the water's edge for collection and disposal.	A perforated hose is placed above the oiled shore. Sea water is pumped through the hose at low pressure and flows downwards to the water where any released oil is collected by booms and recovered by skimmers or vacuum. On porous sediments, water flows through the substrate, pushing loose oil ahead of it. On saturated, fine-grained sediments, the technique will lift and flush the oil.	Preferred: Sandy Beach Possible: Man-made Structures Rocky Shore Tidal Flats Shallow Seagrass	In heavily oiled areas when the oil is still fluid and adheres loosely to the substrate, and where oil has penetrated gravel sediments. Can be used with other washing techniques (i.e. low or high-pressure flushing).	Care should be taken to recover oil where nearshore habitats contain rich biological communities. Not appropriate for soft, muddy substrates.	Habitat may by physically disturbed by foot traffic during operations and smothered by sediments washing. If containment methods are not sufficient, oil and oiled sediments may be flushed into adjacent areas. Flooding may cause sediment loss and erosion of the shoreline and shallow rooted vegetation. Oiled sediment may be transported to nearshore areas, contaminating them and burying benthic organisms.	Depends on the effectiveness of the collection method.
Low-pressure, ambient-water flushing	Removal of fluid oil that has adhered to the substrate or man-made structures, pooled on the surface, or become trapped in vegetation.	Ambient- temperature water (sea water) is sprayed at low pressure (<72 kilopascals (kpa)) from a hand-held hose, to lift oil from the substrate and float it to the water's edge for recovery by skimmers, vacuum or sorbents. Can be conducted from barges or flat- bottom vessels with long-reach spray systems. Usually used with flooding systems to prevent released oil from re- adhering to the substrate downstream of the treatment area.	Preferred: Sandy Beach Possible: Man-made Structures Rocky Shore Tidal Flats Shallow Seagrass	Where fluid oil is stranded onshore or floating on shallow intertidal areas.	May need to restrict use so that the oil/water effluent does not drain across sensitive intertidal habitats, and the mobilised sediments do not affect rich sub-tidal communities. Use from boats will reduce the need for foot traffic in soft substrates and vegetation. Flushed oil will be recovered to prevent further oiling of adjacent areas.	If containment methods are not sufficient, oil and oiled sediments may be flushed into adjacent areas. Flooding may cause sediment loss and erosion of the shoreline and shallow rooted vegetation. Some trampling of substrate and attached biota may occur.	Depends on the effectiveness of the collection method.
High-pressure, ambient water flushing	To remove oil that has adhered to hard substrates or man-made structures.	Similar to low- pressure flushing, except that water pressure is 720–7,200 kpa. High-pressure spray will more effectively remove sticky or viscous oils.	Preferred: Man-made Structures	When low-pressure flushing is not effective at removing adhered oil, which will be removed to prevent continued oil release or for aesthetic reasons. When a directed water jet can remove oil from hard to reach sites.	May need to restrict flushing so that the oil does not drain across sensitive habitat. Flushed oil will be recovered to prevent further oiling of adjacent areas. Should not be used directly on attached algae nor rich, intertidal areas.	All attached animals and plants in the direct spray zone will be removed, even when used properly. If containment methods are not sufficient, oil and oiled sediments may be flushed into adjacent areas. Some trampling of substrate and attached biota may occur. Inappropriate use may drive oil deeper into the substrate or erode fine sediments from shorelines.	Depends on the effectiveness of the collection method

Appendix 9

NEBA information

Appendix 9 NEBA information

Table 9.1 NEBA categories used for receptors

Category	Environmental and socio-economic receptors (values/assets)
Intertidal/coastal habitats	Mangroves
	Saltmarshes, wetlands and samphire
	Intertidal reefs
	Estuaries
	Embayments
	Lagoons
	Intertidal sand/mud flats
	Sandy Beaches
	Gravel beaches
	Rocky shores
	Boulder/cobble/pebble shores and riprap
	Cliffs
	Sand dunes
Benthic communities	Seagrass
	Macroalgae
	Giant kelp (*Macrocystis* spp.)
	Hard corals (including deep water corals)
	Subtidal reefs, shoals and banks
	Benthic mixed algal/sessile epibiota communities (shallow)
	Benthic filter-feeding communities (deep water)
	Benthic infaunal communities
Pelagic/demersal	Plankton (including pelagic larval stages)
	Pelagic fish
	Demersal fish
	Sharks and rays
	Prawns
	Rock lobster, lobster and giant crab
	Abalone
	Scallops
	Other shellfish
	Species with an extremely limited distribution (e.g. handfish, live-bearing sea star, cuttlefish, Maugean skate)
	Fish/cuttlefish aggregation area
	Threatened fish

Category	Environmental and socio-economic receptors (values/assets)
Marine megafauna and seabirds	Shark Biologically Important Areas (BIAs)
	Baleen whale BIAs
	Sperm whale BIA
	Cetaceans
	Marine reptiles
	Australian sealion BIA
	Pinnipeds
	Seabird/shorebird BIA
	Threatened seabirds/shorebirds
	Seabirds – little penguins
	Other seabirds
Fisheries and aquaculture	Aquaculture (fin fish, including tuna ranching)
	Aquaculture (shellfish)
	Prawn fisheries
	Rock lobster, lobster and giant crab fisheries
	Scallop fisheries
	Abalone fisheries
	Other commercial fisheries
	Recreational fisheries
Other socio-economic values	Protected areas
	Coastal saltmarsh Threatened Ecological Community (TEC)
	Giant kelp TEC
	Posidonia TEC
	Shore-based heritage sites (including Native Title)
	Sub-tidal heritage sites
	Ports
	Other coastal infrastructure and coastal settlements
	Shipping
	Petroleum exploration and production
	Tourism and recreation
	Defence

Table 9.2 NEBA impact scoring criteria

Category	Type of impact	Level of impact	Spatial scale of impact	Duration of impact
+3	Major positive impact	Likely to prevent mortality/loss of value/ assets	Likely to reduce spill impacts significant at national/international scales	Likely to reduce spill impacts by >5 years or prevent permanent loss
+2	Moderate positive impact	Likely to prevent chronic/ acute impacts of value/ assets	Likely to reduce spill impacts at regional scales	Likely to reduce spill impacts by 1–5 years
+1	Minor positive impact	Likely to prevent behavioural impacts of value/assets	Likely to reduce spill impacts at local scales	Likely to reduce spill impacts by <1 year
0	No difference to an unmitigated spill impact			
-1	Minor negative impact	Likely to cause additional behavioural impacts of value/assets	Likely to cause additional spill impacts at local scales	Likely to cause an additional increase of spill impacts for <1 year
-2	Moderate negative impact	Likely to cause additional chronic/acute impacts of value/assets	Likely to cause additional spill impacts at regional scales	Likely to cause an additional increase of spill impacts for 1–5 years
-3	Major negative impact	Likely to cause additional cumulative/causal impacts resulting in additional mortality/loss of value/ assets	Likely to cause additional increased spill impacts, significant at national/ international scales	Likely to cause an additional increase of spill impacts for >5 years or result in permanent loss

Appendix 10

OPEP Waste Management Plan

Oil pollution emergency plan
Appendix 10
OPEP Waste management plan

Stromlo-1 exploration drilling program

Equinor Australia B.V.
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Australia

Rev 4, November 2019

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Table of contents

Page

Abbreviations **1**

1.0 Scope **2**

2.0 Introduction **3**

3.0 Oil spill response arrangements **4**

4.0 Legislative framework **5**

4.1 National regulations **5**

4.2 International conventions **5**

4.2.1 MARPOL 73/78 convention 5

4.2.2 Basel convention 5

4.2.3 Other conventions 6

5.0 Waste strategy **7**

6.0 Volumes of waste streams **8**

6.1 Liquid waste **8**

6.2 Solid waste **8**

7.0 Waste movement and bulk disposal **10**

8.0 Waste methodology **11**

8.1 Sites of oil stranding on shoreline – WCD_{129} unmitigated **12**

8.2 Primary shoreline waste operations **12**

8.3 Waste management overview **14**

8.4 West - Port Lincoln **16**

8.5 West – Flinders Island **19**

8.6 East – Yorke Peninsula **21**

8.7 East – Victor Harbour **23**

8.8 Secondary shoreline waste operations **25**

8.9 Options for disposal – solid waste **25**

9.0 Waste segregation and minimisation **26**

9.1 Solid wastes **26**

9.2 Liquid wastes **26**

9.3 Logistics and support requirements **26**

9.4 Tiered response resourcing **26**

9.4.1 Tier 1 – Local response resources 27

9.4.2 Tier 2 – Regional response resources 27

9.4.3 Tier 3 – Global response resources 27

9.4.4 Oil spill industry support 28

9.4.5 Equinor supply base – Port Adelaide 28

9.4.6 Mobile offshore drilling unit (MODU) and platform support vessels (PSV and SCV) 29

9.4.7 Nearshore - vessels of opportunity (VoO) ... 29
9.4.8 Tanker/storage vessel ... 29
9.4.9 Regional temporary storage ... 29
9.4.10 Final waste disposal options ... 29

9.5 Offshore waste management implementation ... 31
9.5.1 Temporary storage of recovered oil/water at sea: recovery vessels ... 32
9.5.2 Transferring recovered oil/water at sea: from recovery vessels to tankers ... 33
9.5.3 Transferring recovered oil/water at the Equinor supply base: from recovery vessels to land ... 33

9.6 Onshore waste management implementation ... 33

9.7 Shoreline tactical response plan, scat and waste interface ... 35

9.8 Temporary storage of wastes collected from shorelines ... 35
9.8.1 Temporary storage of waste on site – standardised site setups ... 35
9.8.2 Baseline soil sampling ... 36
9.8.3 Options for temporary storage ... 36
9.8.4 Waste Tracking and Chain of Custody ... 36
9.8.5 Waste transport ... 37
9.8.6 Waste hierarchy: Reduction: pre-cleaning shorelines ... 37
9.8.7 Waste hierarchy: Reduction: appropriate methods of collecting oil/solids from shorelines (shoreline treatment recommendations) ... 37
9.8.8 Waste hierarchy: Reduction: Separation of different types of waste streams at site ... 38

10.0 Responsibilities ... 39

10.1 Supply and attendant vessels ... 39

10.2 Onshore waste contractors ... 39

10.3 Drilling supply manager ... 39

10.4 Offshore Installation Manager and supervisors ... 40

10.5 Offshore Materials & Logistics Coordinator ... 40

10.6 Onshore Materials & Logistics Supervisor ... 40

10.7 Supply and attendant vessels ... 40

10.8 Onshore waste contractors ... 41

Tables

Table 1 Specific national legislation ... 5
Table 2 Liquid waste volume ... 8
Table 3 Solid waste volume ... 9
Table 4 Waste stream for planning purposes ... 11
Table 5 Shoreline waste ... 12
Table 6 Enduring storage sites ... 30
Table 7 Thermal treatment plants ... 30
Table 8 Offshore waste strategy process flow checklist ... 31
Table 9 Onshore waste strategy process flow checklist ... 34
Table 10 Site size “waste ready reckoner” ... 36
Table 11 Waste tracking (SA EPA code example) ... 37

Figures

Figure 1 Tiered response resourcing 27
Figure 2 IPIECA waste management logistics model 35

Appendices

APPENDIX 1 Oil waste – List of known licensed waste storage/transfer facilities by sector
APPENDIX 2 Decanting – MARPOL exemption information
APPENDIX 3 Waste tracking and Chain of Custody form

Abbreviations

AMOSC	Australian Marine Oil Spill Centre
AMSA	Australian Maritime Safety Authority
DWER	Department of Water and Environment Regulation (WA)
EPA	Environmental Protection Act, or Relevant Environment Protection Authority
GAB	Great Australian Bight
IPIECA	International Petroleum Industry Environmental Conservation Association
JSA	Job Safety Analysis (risk assessment)
MODU	Mobile Offshore Drilling Unit
ODS	Ozone Depleting Substances
OPEP	Oil Pollution Emergency Plan
OSRL	Oil Spill Response Limited
OSR	Oil Spill Recovery
OWMP	OPEP Waste Management Plan
SA	Southern Australia
PSV	Platform Support Vessel
SAMSCAP	South Australian Marine Spill Contingency Action Plan
SCAT	Shoreline Contamination Assessment Team
SOP	Standard Operating Procedures
STS	Ship to Ship
TRP	Tactical Response Plan
VoO	Vessel of Opportunity
WA	Western Australia
WMP	Waste Management Plan

1.0 Scope

The scope of this document is a plan outlining the strategy to be adopted and actions required to undertake effective disposal of wastes generated in the unlikely event of an oil spill while drilling the Stromlo-1 exploration well (LOWC). This plan has been developed based on the spill response requirements for the first 189 days, for offshore areas and shorelines in South Australia, Victoria, Western Australia, Tasmania and New South Wales which modelling has indicated may be impacted during this period. Note that the 189 days represents an oil spill duration of 129 days, while current estimate is 88 days resulting in approximately 32% fewer oil spill release days than accounted for in this plan.

Routine waste planned to be produced while drilling the well is covered by a separate document, the Waste Management Plan which will be prepared prior to the MODU arriving on the Stromlo-1 site. Any secondary wastes generated as a result of activities under this OWMP will be managed under the WMP which would be scaled up accordingly.

2.0 Introduction

Equinor Australia B.V. (Equinor) have produced this OPEP Waste Management Plan (OWMP) to facilitate the effective management of unplanned wastes generated as a result a loss of well control (LOWC) during the Stromlo-1 drilling program in the Great Australian Bight (GAB).

3.0 Oil spill response arrangements

The Equinor OPEP details the arrangements for oil spill response. This plan will outline the responsibilities for waste collection and disposal. The relevant coordinating, jurisdictional and control agencies in a range of spill scenarios is described in the OPEP.

This OWMP must be consistent with the relevant jurisdiction's oil spill contingency plan:

- South Australia - the South Australian Marine Spill Contingency Action Plan (SAMSCAP)
- Victoria - the State Maritime Emergencies (non-search and rescue) Plan (Maritime Emergencies NSR)
- Western Australia - the State Hazard Plan for Marine Environmental Emergencies (MEE)
- Tasmania - the Tasmanian Marine Oil Spill Contingency Action Plan (TASPLAN)
- New South Wales - the State Emergency Management Plan (EMPLAN)
- Commonwealth - National Plan for Maritime Environmental Emergencies (National Plan)

4.0 Legislative framework

4.1 National regulations

Commonwealth and state laws relating to waste management include:

Table 1 Specific national legislation

Category	Jurisdiction	Legislation
Environment/ petroleum activity	Commonwealth	*Offshore Petroleum Greenhouse Gas Storage Act 2006* *Environment Protection and Biodiversity Conservation Act 1999* *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* *Hazardous Waste (Regulation of Exports and Imports) Act 1989* Regulations 1996 *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*
Safety	State	*NSW: Work Health and Safety Act 2011* *SA: Work Health and Safety Act 2012* *Tas: Work Health and Safety Act 2012* *Vic: Occupational Health and Safety Act 2004* *WA: Occupational Safety and Health Act 1984*
Waste management	State	*NSW: Protection of the Environment Operations Act 1997* *SA: Environmental Protection Act 1993* *Tas: Environmental Management and Pollution Control Act 1994* *Vic: Environment Protection Act 1970* *WA: Environmental Protection Act 1986; Contaminated Sites Act 2003*

In complying with the legislation, waste management (temporary storage, transport and disposal) must be:

- undertaken in accordance with applicable regulations, codes of practice, compliance codes and Australian standards.
- undertaken using a work safety processes such as Job Safety Analyses (JSAs) which must be developed and used for all operations
  - activities must be risk assessed before implementation, with appropriately competent personnel undertaking the operation, in a manner consistent with the developed safety processes
  - vessels and vehicles must be correctly registered and fit for purpose. Auditable, safe work systems consistent with their registration requirements must be in place. Other ancillary certification and assurance (such as for lifting equipment, hydraulic lines or engines) must be part of this registration.

4.2 International conventions

4.2.1 MARPOL 73/78 convention

Australia is a signatory to the MARPOL 73/78 Convention (International Convention for the Prevention of Pollution from Ships).

4.2.2 Basel convention

The Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal (Basel Convention) aims to protect human health and the environment against the adverse effects resulting from the generation, management, movement and disposal of hazardous waste.

Australia is a signatory to the Basel Convention. The convention obliges producers of hazardous waste to dispose of their waste in an environmentally responsible manner close to where it is generated. Strong controls on the movement, storage, transport, treatment, reuse, recycling, recovery and final disposal of hazardous waste are imposed. The convention regulates the transboundary movement of hazardous waste using the Prior Informed Consent Procedure such that shipments without prior consent are illegal.

4.2.3 Other conventions

Australia has also ratified the following conventions:

- Vienna Convention for Protection of the Ozone Layer & Montreal Protocol (1987) with Copenhagen Amendments (1992) on Substances that Deplete the Ozone Layer
- United Nations Convention on the Law of the Sea UNCLOS (1989); Protection and Preservation of the Marine Environment Part XII.

5.0 Waste strategy

Any major hydrocarbon spill or ongoing blow out from a drilling incident would result in significant amounts of oil being released into the marine environment. Once at surface, offshore strategies will be put in place including the use of surface and subsea dispersants and mechanical containment and recovery. Even with these strategies in place, there is the possibility of oil stranding on the shorelines.

The planning in this document makes the very conservative assumption that none of the offshore strategies will work or to be effective and significant volumes of oil will come ashore and be recovered from shorelines generating “bulked” waste. This is very unlikely as offshore oil spill response mitigations will be deployed reducing the solid oil waste ashore.

Containment and recovery operations will occur closer to source, and/or close to sensitive shorelines depending on the nature and scale of the spill.

Shoreline response may occur wherever oil is impacting the shore. The predicted recoverable amount stranding on shorelines is 45% of the total amount of oil accumulation. The remaining 55% of the oil is predicted to be either accumulating at levels too low for response (e.g. where response would cause greater environmental impact than the concentrations of stranded oil), or where oil is likely to be inaccessible. Following an incident, all shorelines will be monitored (surveillance and/or SCAT) to confirm accessibility and to monitor accumulation for response planning commensurate with the nature and scale of the actual release,

The containment and recovery, shoreline, and oiled wildlife operations have the potential to generate significant volumes of liquid and solid hydrocarbon waste. Actual quantities of waste will vary according to the conditions at the time.

6.0 Volumes of waste streams

This plan deals with two primary waste streams, these being liquid oil/water and oil/solid wastes, based on the unmitigated worst-case discharge (WCD_{129} and WCD_{88}) as presented in Appendix 7.1 Oil spill modelling study. Any secondary wastes generated as a result of activities under this OWMP will be managed under the WMP which would be scaled up accordingly.

The following WCD_{129} and WCD_{88} calculations produce values that are mutually exclusive, with resultant waste quantities calculated over a 189-day period and 148 days (the modelled period) from date of the LOWC incident, respectively. The waste streams cannot be summed in any meaningful manner as successful containment and recovery of liquids offshore and nearshore would result in a reduction in volumes of oil ashore.

6.1 Liquid waste

The following calculation assumes complete failure of the application of SSDI and surface dispersant application and assumes response teams as described in the relevant tactical response plan (TRP) referred to in the OPEP.

Table 2 Liquid waste volume

Containment and recovery	Number of strike teams	Daily oil recovery (m^3)	Days	Total recovered volume (m^3)
WCD_{129}				
Offshore teams	11	75.3	115	95,255
Nearshore teams	11	78	109	93,522
				188,777
WCD_{88}				
Offshore teams	11	75.3	74	61,294
Nearshore teams	11	78	68	58,344
				119,638

Note that Table 2 outlines the theoretical quantity of liquid waste that would be recovered. Thus, the 188,777m^3 (WCD_{129}) and 119,638 (WCD_{88}) volumes used to demonstrate capacity to deal with the liquid oil waste stream is conservatively higher than the likely quantity that would be recovered.

In addition, this number is conservatively larger than the likely actual volume that would be recovered due to factors including (but not limited to):

- Application of SSDI is likely to result in a significant reduction of surface oil volumes
- Application of aerial dispersant is likely to have some anticipated reduction in surface oil volumes

Based on the above the maximum volume this OWMP considers is 188,777 m^3 of oil waste in liquid form including any associated water.

6.2 Solid waste

Over 99% of oil arriving at shore is predicted to be in non-liquid form due to time taken to reach the coast and the impact of weathering (based on modelling). Therefore, a bulking factor of 10 has been applied to the 99% non-liquid component, and a bulking factor of 10 used for the 1% liquid component (IPIECA 2015). The following calculation assumes complete failure of the application of SSDI, aerial dispersants and the above containment and recovery, to provide a conservative prediction of maximum possible shoreline loadings.

Table 3 Solid waste volume

Description	Unmitigated quantity	
	WCD 129	WCD 88
Total volume of oil produced (m^3)	1,153,647	868,615
Total shoreline loading including 60 days (m^3)	244,466	182,498
Total accessible shoreline loading (m^3)	66,010	49,274
Waste bulking factor (solids/liquids)	10/10	10/10
Solids/liquids	99/1	99/1
Bulked volume of accessible shoreline loading (m^3)	660,100	492,740

As described in Appendix 7-1, oil spill modelling study, of the 868,615 m^3 total volume released during the unmitigated WCD_{88} modelled period, the maximum total volume accumulating on shore over a 148-day period is 182,498 m^3. Of this volume, 49,274 m^3 was predicted to be recoverable – that is, the shorelines are accessible, and both the volume of oil deposited and the nature of the shoreline impacted is conducive to clean-up activities, and that there is a net environmental benefit in carrying out the clean-up activities.

Table 3 is showing the total waste volume that needs to be considered for disposal under this OWMP is computed by applying a factor of 10 to allow for the bulking up with sand, soil and organic materials.

This number is conservatively larger than the likely actual volume that would be recovered due to factors including (but not limited to):

- Application of SSDI is likely to result in a significant reduction of surface oil volumes
- Application of aerial dispersant is likely to have some anticipated reduction in surface oil volumes
- Successful application of containment and recovery would result in reduced volumes ashore
- In addition, sieving of bulk waste can reduce the amount to be disposed (not accounted for in this plan)

7.0 Waste movement and bulk disposal

This plan considers that the two primary waste streams will be an oil/water liquid stream (collected predominately offshore and nearshore from vessel operations) and an oil/solids stream (collected from the shorelines).

1. Oil/water liquid waste will be:

   For offshore and nearshore operations, either:

   i. Transferred directly offshore via ship to ship transfer to tanker(s) The tanker(s) will sail to a refinery negotiated in- time where the recovered hydrocarbon will be processed.

   ii. As a secondary consideration, the recovery vessel may transport the waste for temporary storage. From here it will be moved by land or sea to a suitable refinery to processes the liquid oil or a depository (e.g. Sandy Ridge – Western Australia)

   For very close to the shore and shoreline operations:

   i. Liquid oil recovered from shore or nearshore operations will be transferred by road tankers to refineries either direct, or via transhipment by road or sea

   ii. A second option is by sea and/or road transport to Sandy Ridge depository in Western Australia

2. Oil/solid waste collected from shorelines will be collected and transferred to a:

   a. Land fill

   b. Land farming (tilling and biodegradation) or

   c. Bio-plant treatment, or

   d. Thermal treatment, or

   e. A combination of the options above.

In summary, the combination of Veolia's Integrated Waste Service's facility in Dublin, SA with an annual capacity of 200,000 m^3 of oil/solid waste, and Tellus' Sandy Ridge site in Sandy Ridge, WA with an annual capacity of 100,000 m^3 from July 2020 provide significant capacity to deal with the conservatively calculated maximum oil/solid waste of approximately 492,740 m^3. The secondary temporary storages provide additional flexibility. In addition, should sufficient onshore temporary storage sites not be located to cater for the additional 192,740 m^3 then bulk carriers will be chartered to serve as additional temporary storage facilities.

This would be a simple commercial operation consisting of one or more strategically placed bulk carriers being loaded either direct alongside where safe and permitted to do so or ferried by smaller transfer vessels to one or more bulk carriers. The waste would be thus stored until a suitable disposal location was found.

With respect to liquid oil recovered, this will be managed through established refineries in the Australasia region with well-established capacities. The Veolia facility in Kilburn, SA provides additional flexibility in the form of storage and treatment of liquid hydrocarbons.

Equinor have identified existing transport resources in place as part of the development of this waste management plan. These resources will be used as primary ('first strike') resources to support management of the waste generated from the first shoreline response, and will be supplemented by additional transport resources (e.g. B-double truck and trailer combinations) sourced following a loss of well control incident. Modelling has identified that Equinor would have more than three weeks before first shoreline contact to get resources in place, and this is considered sufficient time to obtain resources appropriate to the nature and scale of the actual release to supplement the 'first strike'.

8.0 Waste methodology

The calculations presented were based on the WCD_{129} scenario to determine the upper scaling of waste to be managed.

Table 4 Waste stream for planning purposes

Stream	Quantity used for response preparation	Comments
Oil/ solids	After approx. 6 months, the WCD_{129} discharge results in 66,010 m³ of hydrocarbons stranding onshore on an assumption all responses fail. When considering bulking factors for waste management, this equates to a bulked volume of 660,100 m^3	WCD_{129} is the greatest shoreline volume modelled by any of the deterministic runs modelled for this EP. Deterministic modelling from the greatest volume ashore, and an understanding of the likely hydrocarbon characteristics for oil accumulating on shore, were used to estimate shoreline response and waste generation. Of the coastlines that comprise the GAB predicted to be exposed to oil accumulation from the WCD 129-day LOWC scenario, waste is considered to be recoverable from sandy beaches, rocky shores, estuaries, artificial substrate; though the level of recovery success is likely to be affected by shoreline type. The remainder of the shorelines are comprised of rocky cliffs (such as S 34º E1250-S33º E1270), inaccessible cliff-back sandy/rocky shores (e.g. wave-cut platforms), offshore islands, and marshland type areas where little shoreline recovery could be expected. For the purpose of assessment, it was assumed that levels of accumulation of <100 g/m^2 were not sufficient for effective removal or would result in greater impact of the response than benefit of oil removal gained. Shorelines with <100 g/m^2 are to be surveilled to enable re-assessment of this assumption in the event of a response. It is therefore a theoretical amount only, used for preparedness planning.
Oil/ water	If all other responses fail, 188,777 m³ over the duration of the WCD_{129} discharge is a maximum estimate of oil liquids This quantity cannot be summed with oil and solids for a meaningful total	This is a theoretical maximum potential volume of recovering oil using booms and skimmers in ideal conditions

Oil/solids:
Unmitigated worst-case credible discharge, greatest shoreline loading is 66,010 m^3 (above 10 g/m^2):

- The 'bulked 660,100 m^3' oil volume ashore represents emulsified oil mixed with sand, rock, seaweed, flotsam and other debris. The bulking factor that has been applied is 10:1.

Oil/water:

- The offshore TRP details the response methods and numbers of teams involved in on-water containment & recovery
- A tanker will be available for potential ship-to-ship transfers of waste oil collected in the Bight
- The tanker will have an onward passage to a refinery/terminal facility for offload

8.1 Sites of oil stranding on shoreline – WCD_{129} unmitigated

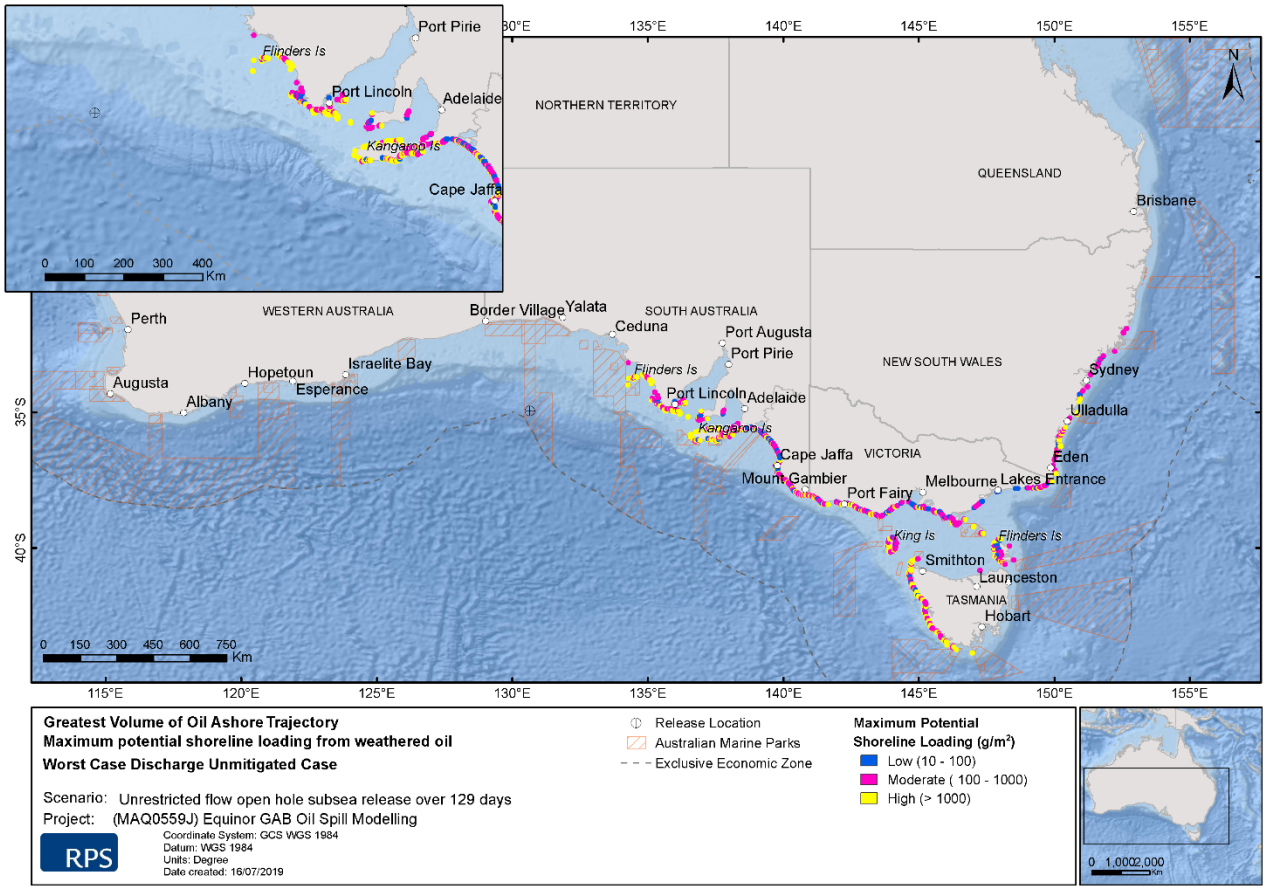

Figure 6.1 Predicted shoreline accumulation after 189 days from the unmitigated WCD 129 day LOWC scenario greatest shoreline accumulation deterministic modelling run

The initial shoreline impacts will occur on offshore islands, and around the Eyre Peninsular, Yorke Peninsula and Kangaroo Island. The initial focus of the waste plan is to recover waste from the areas outlined in S13.4.1 and then work into the shoreline impact zones of Bass Strait, King Island and Tasmania.

8.2 Primary shoreline waste operations

The key focus areas for the collection of shoreline bulk waste based on WCD_{129} shoreline loading of 660,100 m^3 after 189 days, averaged per day for 168 days (189 days – 21 days to fastest shoreline exposure) are:

Table 5 Shoreline waste

Where	(1) Gross stranding daily (estimated)	Resources	Waste site
Flinders Is SA	613 m³	Require landing barges to remove waste to Elliston	Tellus - Sandy Ridge
Elliston SA	769 m³	Use Elliston as marshalling point for 16 x B-Double trucks daily	Tellus - Sandy Ridge
Port Lincoln/ Coffin Bay SA	384 m³	Use Port Lincoln to stage 8 x B-Double trucks daily	Tellus - Sandy Ridge
Thistle Is SA	155 m³	Require landing barge to remove 100 tonnes every 5 days to Port Lincoln	Tellus - Sandy Ridge

Where	(1) Gross stranding daily (estimated)	Resources	Waste site
Yorke Peninsular SA	384 m³	Use Minlaton as marshalling point for 16 x B-Double trucks every 2 days	Veolia Dublin / Tellus Sandy Ridge
Kangaroo Is SA	462 m³	Use Kingscote as collection point – remove by barge to Seaford waste site every 4 days	Veolia Dublin / Tellus Sandy Ridge
Victor Harbour plus southern beaches SA	613 m³	Use 16 x B-Double trucks daily from VH to pick up waste at beach entry/exit points	Veolia Dublin / Tellus Sandy Ridge
Bass St Islands Tas	547 m³	Collect waste at King Is – utilise Bass Island Line barge for removal of waste to VIC	VIC Veolia Thermal Desorption treatment plant
Total	3930 m³		

8.3 Waste management overview

Waste management - overview			
Proposed activity	Waste generated by shoreline clean-up teams will be collected from multiple coastal locations, transferred to centralised distribution points and then transported to designated waste treatment facilities.		
Shoreline sector designations	The following sectors have been identified as likely to be impacted by oil within 21-45 days of a WCD_{129} from the Stromlo well location: Sector 13 [Elliston – Coffin Bay] (21 days) Sector 14 [Port Lincoln] (24 days) Sector 17 [Yorke Peninsula] (36 days) Sector 19 [Victor Harbour] (45 days) Sector 21 [Kangaroo Island] (32 days)		
	Sector Boundaries –SA sectorisation		
		Latitude	Longitude
	North: Elliston	33° 37.348'S	134° 50.720'E
	South West: King Island	35° 42.986'S	137° 56.634'E
	Potential impacted and accessible shoreline - Ceduna (SA) to Port Macquarie (NSW)	1,497 km	
	Waste Volume (WCD_{129})	660,100 m^3	

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Overview – western sectors

Expected waste volumes (per day)			
Flinders Island	613 (m^3)1	Coffin Bay	384 (m^3)1
Elliston	769 (m^3)1	Port Lincoln	
Thistle Island	155 (m^3)1	Total (Western Sectors)	1922 (m^3)1

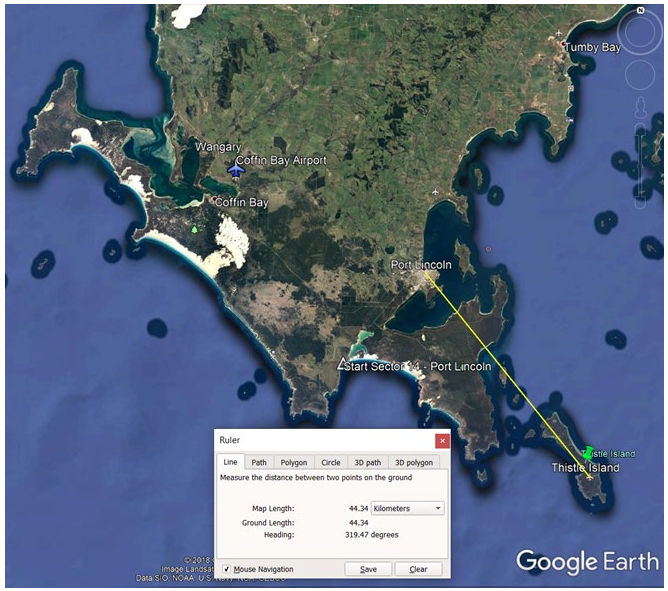
Overview – eastern sectors

Expected waste volumes (per day)			
Yorke Penninsula	384 (m^3)1	Bass Strait Islands	547 (m^3)1
Kangaroo Island	462 (m^3)1	Total (Eastern Sectors)	2007 (m^3)1
Victor Harbour	613 (m^3)1	Total (East + West)	3930 (m^3)1 2

1 Estimated volume breakdown used to illustrate planning requirements
[2] 79.7% of recoverable waste will be from SA, 7.6% from Vic, 12.5 % from TAS (inc. King Island), and 0.3% from NSW. This equates to daily waste volumes per state of 806 m^3 (SA), 77 m^3 (Vic), 126 m^3 (Tas) and 3 m^3 (NSW) = 1,012 m^3 per day.

8.4 West - Port Lincoln

Port Lincoln (Coffin Bay, Thistle Island)



Waste transfer process: Thistle Island	
1	Waste accumulated on shoreline is transported to accessible collection points adjacent to shoreline clean-up sectors. Depending on local logistics and access for vehicles between shoreline locations, additional collection points may be used between beaches and vessel collection point.
2	Waste at collection points is transferred onto landing craft or vessel. Vessel/waste transits from Thistle Island collection points to mainland via Port Lincoln.
Waste transfer process: Coffin Bay and Port Lincoln	
1	Waste accumulated on shoreline is transported to accessible collection points adjacent to shoreline clean-up sectors. Depending on local logistics and access for vehicles between shoreline locations, additional collection points may be used between beaches and Coffin Bay or Port Lincoln.
2	Waste at collection points is transferred and stockpiled at main transfer point based at the port of Port Lincoln where it is combined with waste streams from Thistle Island.
3	Waste transported by B-double is transferred to designated waste treatment facility.

Logistics	Location	Requirements/Considerations
Primary Collection Point/s	Thistle Island (Various)	Accessible by landing craft/vessel
Transfer Point/Laydown	Whalers Bay Jetty, Thistle Island	Manual handling/mechanical lift capacity for offloading from island. Waste transfer to landing craft or vessel for onward movement to Port Lincoln.
Primary Collection Point/s	Coffin Bay (Various)	Beaches accessible by personnel and vehicles.
Transfer Point/Laydown (Optional)	Coffin Bay Waste Transfer Station	Small regional facility with restricted capacity.
Primary Collection Point/s	Port Lincoln (Various)	Beaches accessible by personnel and vehicles.
Transfer Point/Laydown (Optional)	Port Lincoln Resource Recovery Centre	Regional facility with restricted capacity.
Major Stockpile/Transfer Point/Laydown	Port of Port Lincoln	Regional commercial port facility. Accessible for large transport.
Waste Treatment Facility	Tellus Sandy Ridge	Commissioned and operating from July 2020

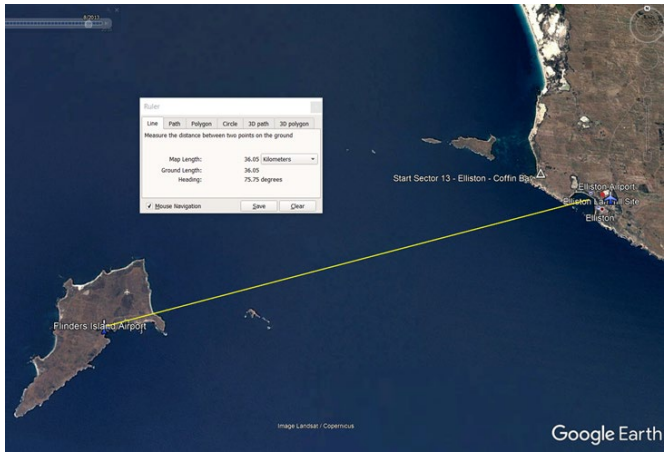
Logistics	Location	Requirements/Considerations
Personnel transfer	Port Lincoln airfield	Regional airfield – scheduled flights from Adelaide
	Vehicle from Adelaide	7 hrs
	Thistle Island airstrip	No commercial flights
Equipment	Units	Requirements/considerations
Landing Craft/barge	2	20m^3 per day capacity (Thistle Island transfers)
25kg heavy duty plastic bags	80,952	= (540 m^3/day x 150 per 1m^3)
B-double truck and trailer combination	4	50t (m^3) per unit. 22 per 48hrs (540 m^3 per day) volume. 40 hrs return transit. 4 hrs turnaround either end.
Rough terrain forklift	4	Coffin Bay region x 2 Port Lincoln region x 2
UTV	4	Personnel transport in addition to 4WD and local vehicles
Forward Operating Base	1	Port Lincoln
Sector command post	2	Portable office or cabin onsite to coordinate movements Coffin Bay, Thistle Island

1. Waste management: Port Lincoln		
Desired outcome	Teams access the shoreline using appropriate vessels or vehicles at pre-determined sites (from SCAT recommendations) adjacent to Coffin Bay, Port Lincoln, and on Thistle Island to remove waste accumulated by shoreline clean-up teams.	
Conduct	Transport	4WD or standard vehicle to beaches adjacent to Coffin Bay and Port Lincoln.
		Landing craft or barge vessel capable of providing access to Thistle Island for team or teams of personnel (up to 25 pax) to manually or mechanically remove accumulated waste
		Tender or smaller vessel/s capable of transporting teams and equipment to and from pre-determined sites.
	Equipment	
	Offshore	Waste storage – sealed skips or containers capable of holding collected hazardous waste
		Decontamination equipment – full decontamination of personnel and shoreline equipment

1. Waste management: Port Lincoln			
		HSE and First Aid equipment (May include specialist safety equipment related to the treatment of issues related to local region or environment)	
	Onshore	Waste storage – heavy duty plastic bags (Max 25lt)	
		Shoreline response tools and equipment (Appropriate collection and cleaning equipment will require validation prior to or during deployment)	
		Site setup and site management equipment	
		Communications equipment (UHF, VHF, Satphone, tetra, Spot gen3, BGAN)	
		HSE equipment including PPE and First Aid	
		Decontamination equipment – personnel decontamination to reduce potential for secondary contamination as personnel leave the shoreline	
	Personnel	Divisional Command	HSE Safety Officers
		Sector Commands	General labourers
		Team Leads	Local Ranger
		Decontamination Teams	
	Method	Thistle Island: Vessel/s are used to transport personnel and equipment to pre-determined locations on island. Teams transfer by day from vessel to the shoreline and conduct waste recovery operations. Welfare, equipment movements and waste collection are managed with ongoing vessel support and teams are returned to the mainland overnight.	
	Base operations	Location	Capacity
		Port Lincoln	+30 hotels
		Coffin Bay	+20 hotels
		Thistle Island	N/A

8.5 West – Flinders Island

Flinders Islands – Elliston



Waste Transfer process	
1	Waste accumulated on shoreline is transported to collection points along each beach. Depending on local logistics and access for vehicles between shoreline locations, additional collection points may be used between beaches and vessel collection point.
2	Waste at collection points is transferred onto landing craft or vessel. Vessel/waste transits from Flinders Island collection points to Elliston via Elliston Great Ocean boat ramp.
3	Hazardous waste is stockpiled at laydown area adjacent to Elliston boat ramp for transfer to B-Double.
4	Waste is transferred to designated waste treatment facility.

Logistics	Location	Requirements/Considerations
Primary Collection Point/s	Flinders Island (Various)	Accessible by landing craft/vessel
Transfer Point/Laydown	Elliston Great Ocean boat ramp, Clifftop Drive, Elliston	Manual handling/mechanical lift capacity for offloading. Waste transfers to B-Double for onward movement to designated Waste Treatment Facility
Transfer Point/Laydown (Optional)	Elliston Landfill	Potential for additional capacity. More central for large transport.
Waste Treatment Facility	Tellus Sandy Ridge	Commissioned and operating from July 2020
Personnel transfer	Elliston airfield	Regional airfield
	Vehicle from Adelaide	7.5hrs
Equipment	**Units**	**Requirements/Considerations**
Landing Craft/barge	1	80m^3 per day capacity
25kg heavy duty plastic bags	207,300	= (1382m^3/day x 150 per 1m^3)
B-double truck and trailer combination	12	50t (m^3) per unit. 28 per daily (1382m^3) volume.

		40hrs return transit. 4hrs turnaround either end.
Rough terrain forklift	1	
UTV	2	Personnel transport in addition to 4WD and local vehicles
FOB/Sector command post	1	Facility, portable office, or cabin onsite to coordinate movements

1. Waste Management: Flinders Island - Elliston				
Desired outcome	Teams access the shoreline using appropriate vessels at pre-determined sites (from SCAT recommendations) to remove waste accumulated by shoreline clean-up teams.			
Conduct	Transport	Landing craft or barge vessel capable of providing access to Flinders Island for team or teams of personnel (up to 25 pax) to manually or mechanically remove accumulated waste		
		Tender or smaller vessel/s capable of transporting teams and equipment to and from pre-determined sites		
	Equipment			
	Offshore	Waste storage – sealed skips or containers capable of holding collected hazardous waste		
		Decontamination equipment – full decontamination of personnel and shoreline equipment		
		HSE and First Aid equipment (May include specialist safety equipment related to the treatment of issues related to local region or environment)		
	Onshore	Waste storage – heavy duty plastic bags (Max 25lt)		
		Shoreline response tools and equipment (Appropriate collection and cleaning equipment will require validation prior to or during deployment)		
		Site setup and site management equipment		
		Communications equipment (UHF, VHF, Satphone, tetra, Spot gen3, BGAN)		
		HSE equipment including PPE and First Aid		
		Decontamination equipment – personnel decontamination to reduce potential for secondary contamination as personnel leave the shoreline		
	Personnel	Divisional Command	HSE Safety Officers	
		Sector Commands	General labourers	
		Team Leads	Local Ranger	
		Decontamination Teams		
	Method	Large vessels are used to transport personnel and equipment to pre-determined locations on Flinders Island. Teams transfer by day from vessel to the shoreline and conduct waste recovery operations. Welfare, equipment movements and waste collection are managed with ongoing vessel support and teams are returned to the mainland overnight.		
	Base Operations	Landing craft or barge access	Capacity	Distance from Flinders Island
		Elliston	+2 hotels	36km

8.6 East – Yorke Peninsula

Yorke Peninsula

Waste Transfer process	
1	Waste accumulated on shoreline is transported to collection points along each beach.
2	Waste at collection points is transferred onto truck for bulk transport to main stockpile location.
3	Hazardous waste is stockpiled at centralised location for transfer to B-Double.
4	Waste, transported by B-double, is transferred to designated waste treatment facility.

Logistics	Location	Requirements/Considerations
Primary Collection Point/s	Yorke Peninsula (Various)	Beaches accessible by personnel and vehicles.
Transfer Point/Laydown	Ramsay Landfill	Manual handling/mechanical lift capacity for loading trucks. Accessible for large transport.
Major Stockpile/Transfer Point/Laydown	Southern Region Waste Resource Authority Landfill.	Large commercial waste depot.
Waste Treatment Facility (Possible)	Seaford Heights Landfill	Subject to confirmation
Waste Treatment Facility	Tellus Sandy Ridge	Commissioned and operating from July 2020
Personnel transfer	Vehicle from Adelaide	3.5hrs
	Vehicle from Port Augusta	4hrs
	Vehicle form Port Lincoln	7hrs

Equipment	Units	Requirements/Considerations
25kg heavy duty plastic bags	57,656	= (384 m^3/day x 150 per 1m^3)
B-double truck and trailer combination	1 (Seaford Heights option) 3 (Tellus Sandy Ridge)	50t (m^3) per unit. 8 per day. 40 hrs return transit. 4 hrs turnaround either end.
Rough terrain forklift	1	
UTV	2	Personnel/waste transport in addition to 4WD and local vehicles.
Sector command post	1	Facility, portable office, or cabin onsite to coordinate movements

1. Waste Management			
Desired Outcome	Teams access the shoreline at pre-determined sites (from SCAT recommendations) to remove waste accumulated by shoreline clean-up teams.		
Conduct	Transport	4WD or standard vehicle to accessible beaches adjacent on Yorke Peninsula for team or teams of personnel (up to 25 pax) to manually or mechanically remove accumulated waste.	
	Onshore Equipment	Waste storage – heavy duty plastic bags (Max 25lt) Open top drums – 200lt, palletised.	
		Tools and equipment (Appropriate collection and cleaning equipment will require validation prior to or during deployment)	
		Site setup and site management equipment	
		Communications equipment (UHF, VHF, Satphone, tetra, Spot gen3, BGAN)	
		HSE equipment including PPE and First Aid	
		Decontamination equipment – personnel decontamination to reduce potential for secondary contamination as personnel leave the shoreline	
	Personnel	Divisional Command	HSE Safety Officers
		Sector Commands	General labourers
		Team Leads	Local Ranger
		Decontamination Teams	
	Base Operations	Location	Capacity
		Yorke Peninsula	+100 hotels

8.7 East – Victor Harbour

Victor Harbour, Kangaroo Island

Waste transfer process: Kangaroo Island	
1	Waste accumulated on shoreline is transported to accessible collection points adjacent to shoreline clean-up sectors.
2	Waste at collection points is transferred to centralised transfer station on Kangaroo Island (KI Resource Recovery Centre).
3	Waste is trucked, via Penneshaw – Cape Jervis ferry service, from Kangaroo Island to the Southern Region Waste Resource Authority Landfill.
Waste transfer process: Victor Harbour	
1	Waste accumulated on shoreline is transported to accessible collection points adjacent to shoreline clean-up sectors. Depending on local logistics and access for vehicles between shoreline locations, additional collection/transfer points may be used between beaches and waste stockpile location.
2	Waste at collection points is transferred and stockpiled at the Southern Region Waste Resource Authority Landfill where it is combined with waste streams from Kangaroo Island.
3	Waste, transported by B-double, is transferred to designated waste treatment facility.

Logistics	Location	Requirements/Considerations
Primary Collection Point/s	Kangaroo Island (Various)	Beaches accessible by personnel and vehicles.
Primary Collection Point/s	Victor Harbour (Various)	Beaches accessible by personnel and vehicles.
Transfer Point/Laydown	Kangaroo Island Resource Recovery Centre	Manual handling/mechanical lift capacity for loading trucks. Trucks are within the capacity of the Sealink ferry service to the mainland.
Major Stockpile/Transfer Point/Laydown	Southern Region Waste Resource Authority Landfill.	Large commercial waste depot. Accessible for large transport.
Waste Treatment Facility (Possible)	Seaford Heights Landfill	Subject to confirmation
Waste Treatment Facility	Tellus Sandy Ridge	Commissioned and operating from July 2020
Personnel transfer	Kingscote Airport (KI)	Regional airfield – scheduled flights from Adelaide
	Goolwa Airport	Regional airfield – no scheduled flights
	Vehicle from Adelaide	3.5hrs
Equipment	**Units**	**Requirements/Considerations**
25kg heavy duty plastic bags	161,321	= (1075 m^3/day x 150 per $1m^3$)

B-double truck and trailer combination	3 (Provisional based on Seaford Heights Landfill capacity) 7 (Tellus option)	50t (m^3) per unit. 22 per day. 34 hrs return transit 4 hrs turnaround either end.
Rough terrain forklift	4	Victor Harbour region x 2 Kangaroo Island x 2
UTV	4	Personnel/waste transport in addition to 4WD and local vehicles.
Forward Operating Base	1	Victor Harbour
Sector command post	1	Portable office or cabin onsite to coordinate movements Kangaroo Island

1. Waste Management: Victor Harbour, Kangaroo Island			
Desired Outcome	Teams access the shoreline using appropriate vessels or vehicles at pre-determined sites (from SCAT recommendations) adjacent to Victor Harbour, and on Kangaroo Island to remove waste accumulated by shoreline clean-up teams.		
Conduct	Transport	4WD or standard vehicle to accessible beaches adjacent to Victor Harbour and on Kangaroo Island for team or teams of personnel (up to 25 pax) to manually or mechanically remove accumulated waste.	
	Equipment		
	Onshore	Waste storage – heavy duty plastic bags (Max 25lt) Open top drums – 200lt, palletised.	
		Tools and equipment (Appropriate collection and cleaning equipment will require validation prior to or during deployment)	
		Site setup and site management equipment	
		Communications equipment (UHF, VHF, Satphone, tetra, Spot gen3, BGAN)	
		HSE equipment including PPE and First Aid	
		Decontamination equipment – personnel decontamination to reduce potential for secondary contamination as personnel leave the shoreline	
	Personnel	Divisional Command	HSE Safety Officers
		Sector Commands	General labourers
		Team Leads	Local Ranger
		Decontamination Teams	
	Method	Kangaroo Island: A scheduled ferry service provides access to the island for vehicles and personnel. Teams conduct waste recovery operations as needed to prepare waste for transfer to the mainland from a centralised location. Welfare, equipment movements and waste collection are managed with ongoing conventional support and teams can be accommodated locally.	
	Base Operations	Location	Capacity
		Kangaroo Island	+150 hotels
		Victor Harbour	+100 hotels

8.8 Secondary shoreline waste operations

Based on modelling, the earliest any shoreline impact after an oil spill might occur is in South Australia after 21 days. All other modelling runs show a longer time to shore. Primary shoreline waste sites would be established around the Eyre Peninsula, Yorke Peninsula and Victor Harbor to Bass Strait islands.

The secondary sites for shoreline impacts are detailed below. It is anticipated oil may continue to impact on the SA sector, and start stranding onto secondary sites (i.e. shorelines outside of SA). Detailed planning for these sites will be undertaken by Equinor based on:

1. Known and actual oil type and flow rates
2. Success of the intervention strategies i.e. stranding figures based on actual floating oil mass balances
3. Updated modelling and visual surveillance
4. Experience gained from the waste operations in the primary shoreline waste zone.

8.9 Options for disposal – solid waste

Waste treatment options for oil/solid wastes (refer to IPEICA – OGP Good Practice Guide – Oil Spill Waste Minimisation and Management) will require significant road transport effort which adds HSE risk that needs to be well controlled.

This is due to the isolation of the potentially affected coastlines, sparse populations in few population centres, limited industry that could use the hydrocarbon waste as feedstocks and lack of conveniently located thermal treatment plants.

Given this restriction, this plan has focussed on the use of (1) treatments at coastal temporary storage points to reduce the amounts of wastes generated, and then transporting materials to (2) existing or custom-built landfills and/or depository.

Where possible, bioremediation will occur at the same location as the final landfill to reduce the percentage of hydrocarbons and reduce total amounts of materials. Even with these limited options, wastes may need to be transported hundreds of kilometres by road to an appropriate site.

A number of existing/planned landfills in WA and SA have sufficient existing or planned capacity to receive the potentially large volumes of waste from the spill. These include Tellus' Sandy Ridge waste repository (open mid 2020), the Eyre Peninsula Landfill and the Southern Region Waste Resource Authority Landfill located in Seaford Heights. Once waste is recovered from outlying islands (Ref Flinders Is, SA/King Is TAS), this waste will be recovered to the mainland for further transportation to waste sites. Tasmania and NSW will also provide some ability to store contaminated solid waste. The waste quantities of NSW are estimated as very low and easily handled within current State contaminated waste sites (i.e. Less than 100 tonnes).

Each site can receive oil/solid wastes that have been contaminated by hydrocarbons to certain percentages. Hydrocarbon percentages p/volume will be able to be reduced through appropriate mixing with other materials in the landfill, and bio remediation prior to placing in the landfill. Veolia will be approached for access to their Thermal Treatment plant based in Dry Creek SA (15 tonnes/day disposal) as well as a Thermal Desorption unit in Brooklyn VIC (up to 60 tonnes/day/24 hrs)

Smaller quantities of mixed or special wastes (i.e. soiled clothing, etc.) will be able to be handled through existing localised domestic and industrial waste chains.

Engagement with the relevant environment protection authorities in SA, Tas, Vic, NSW and WA during the establishment of these waste streams is required to certify and license the "cradle to grave" processes of waste management generated by the spill.

9.0 Waste segregation and minimisation

9.1 Solid wastes

- Avoid mixing oil, fuels, or oily wastes with trash and garbage.
- Prevent oily wastes from contaminating soil. Use liners underneath drums, tanks, or cleaning operation sites.
- Avoid disposing of sorbent pads and booms that are only lightly oiled.
- When collecting mousse patties and oiled sand and gravel, minimise the amount of underlying or nearby clean sand or gravel that is collected.
- When using chemicals or other treatment agents, use all the material in the container. Wash the containers clean at the areas where they are used to the extent practical.
- Challenge the source of wastes that are not labelled properly or where there is suspicion that they did not come from the current spill effort.

9.2 Liquid wastes

- Cover, where practical, storage areas for fuel, chemicals and wastes, to minimise rainwater accumulation.
- Do not order more chemicals/solvents than are reasonably needed. Finish using one container prior to opening a new one.
- Take precautions not to contaminate fuels, lube oils, and wastes with water or solid contaminants. Keep tops and bungs on drums, tanks, and other containers.
- Examine the disposal implications before using chemical additives (e.g. de-emulsifiers in recovered oil).
- Use wash water sparingly. Ensure that hoses, valves, and taps are closed when not in use and repair leaking ones.
- If there is any question about the source or content of a waste oil, keep it separate from other storage containers until its source can be identified or it can be sampled and tested.

9.3 Logistics and support requirements

The information contained within this section of the document is designed to assist the logistics function within the Equinor/State IMT to establish suitable size waste handling and disposal chains for the size of the spill encountered.

It is also the intention that the planning function can reference information held here during the initial stages of a response, and then adopt a tiered approach to stand-up equipment and resources into the response should the spill grow in size.

9.4 Tiered response resourcing

For logistical arrangements the tiered response shall be scaled as below:

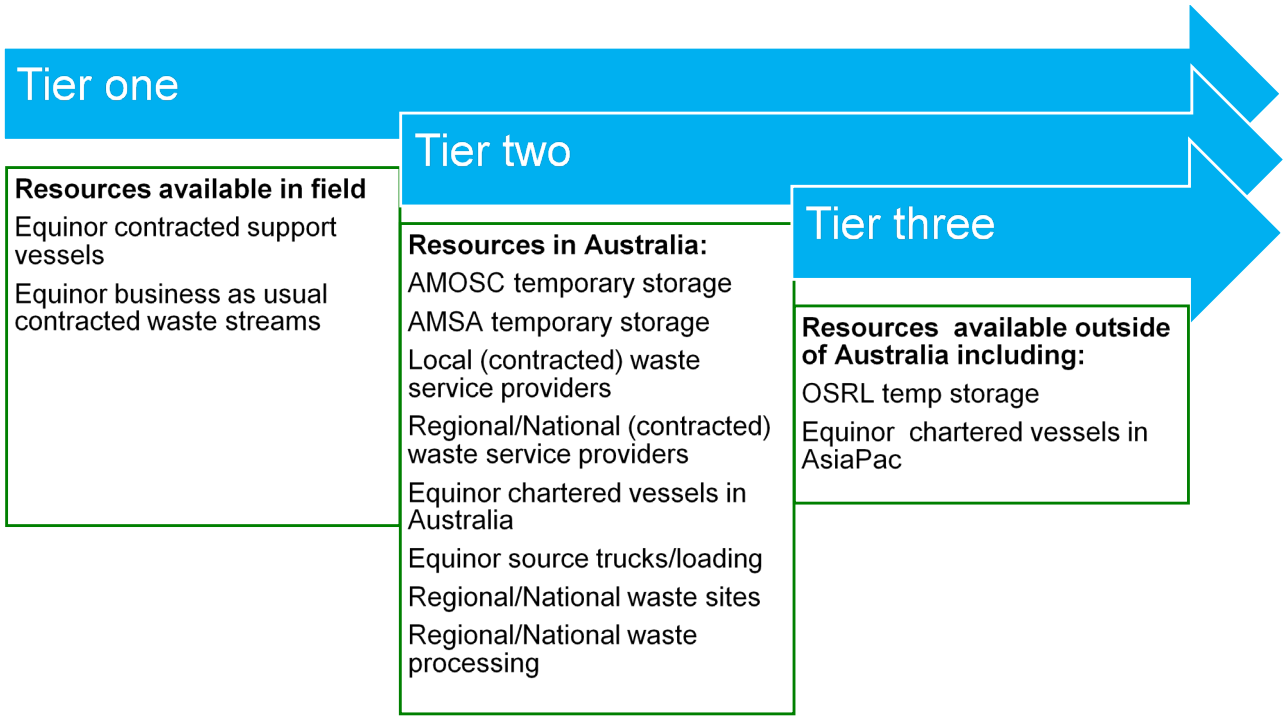


Figure 1 Tiered response resourcing

9.4.1 Tier 1 – Local response resources

Local response is conducted by Equinor with resources already in field/on location:

- in-field vessel commencing containment and recovery operations, storing oil on board.

9.4.2 Tier 2 – Regional response resources

Response is conducted by Equinor/jurisdictions using resources available from anywhere within Australia:

- tankers vessels of opportunity used in constant rotation to offtake oil from recovery vessels
- oil spill response specific temporary storage from AMSA, AMOSC and Mutual Aid equipment holders
- local temporary storage/waste contractors
- regional/national waste processing and storage facilities
- equipment and gear purchased from hardware chains (locally)/wholesalers specifically for the task.

9.4.3 Tier 3 – Global response resources

Response is conducted by Equinor/jurisdictions using global resources:

- tankers on charter from outside Australian waters especially for the response
- oil spill response specific temporary storage from OSRL and other international sources.

Al list of all available equipment incl. temporary storage equipment and response time is shown in Appendix 7-4 the OPEP Appendix 2 (Spill resources inventory).

9.4.4 Oil spill industry support

9.4.4.1 Tier 1 preparedness

While drilling operations are within the hydrocarbon reservoir, Equinor will ensure that supply vessels have sufficient equipment on board to combat a Tier 1 oil spill.

9.4.4.2 Tier 2 preparedness

Equinor will establish a stockpile of oil spill response equipment at their marine supply base in Port Adelaide. In addition, Equinor has access to AMOSC/NATPLAN equipment and resources Australia wide. Mobilisation time to Adelaide for the bulk of the equipment, based in Geelong, is approximately 14 hours. Additional equipment in Fremantle, Exmouth and Broome can be mobilised to Adelaide in approximately 36, 51, 47 hours respectively. This includes an allowance of four hours for truck availability/sourcing and loading.

A full inventory of AMOSC equipment is available from the AMOSC website, https://amosc.com.au/equipment-register/

9.4.4.3 Tier 3 preparedness

From the Equinor global Tier 3 response contractor Oil Spill Response Limited (OSRL), Equinor can access 50% of the available stock. To this end the figures quoted for OSRL are representative of 50% of the total stockholding.

A full inventory of OSRL equipment is available from the OSRL website, https://www.oilspillresponse.com/services/member-response-services/equipment-list/.

- OSRL (UK) mobilisation to Adelaide 3–5 days
- OSRL (Singapore) mobilisation to Adelaide 2–4 days.

During a marine response, staging areas will be utilised to receive and support the various equipment, resources and assets required as below.

9.4.5 Equinor supply base – Port Adelaide

Marine operations supporting the drilling program will be based in Port Adelaide. The supply base will be utilised during a response to support all response related vessel operations, and to act as a lay down area for OSR equipment prior to any deployment. Equipment will be stockpiled before onward loading onto deployment or supply/support vessels.

The following activities can be accommodated using the existing facilities at the supply base:

- loading and unloading facilities
- stevedoring
- vessel support (crew change out, resupplying)
- heavy vehicle parking
- warehousing
- office building.

Additional equipment and supplies that will need to be made available from the supply base for operations includes:

- PPE
- cranes
- pumps
- forklifts
- lifting equipment
- hardware

- lighting
- IBCs for storage.

The Equinor supply base is located at: Berth 25, Ocean Steamers Road, Port Adelaide.

9.4.6 Mobile offshore drilling unit (MODU) and platform support vessels (PSV and SCV)

Equinor will have as a minimum three support vessels contracted and available while drilling in the GAB. One vessel will remain in close proximity to the MODU at all times. The other two vessels will be in transit to or from the MODU in regular delivery patterns to maintain rig supplies as required. Maximum distance and time the PSV can be from the drilling location is approximately 385 nm or 40 hours sailing, respectively.

In addition to oil spill response equipment, each PSV will be able to store up a minimum of 1000 m^3 of oily waste collected from containment operations.

Equinor is estimating approx. 8 vessels will take part in response operations from day 15 and up to 30 vessels from day 30 after a major oil spill has occurred.

9.4.7 Nearshore - vessels of opportunity (VoO)

Commercial and fishing vessels can be sourced to support nearshore response, as described in the OPEP.

All vessels must be appropriately surveyed for the area of operations they will be within. Preference will be given to vessels with the capacity to undertake long endurance missions.

9.4.8 Tanker/storage vessel

Once containment and recovery vessels recover sufficient waste oil/water to reach temporary waste storage capacity on board they will need to offload before they are able to continue recovery operations. The following options exist for offloading:

1. Tanker to be based offshore in GAB with ship to ship transfer capability. Vessels offload in the field to tanker. Once tanker reaches capacity it sails for a suitable refinery in Asia-Pacific. Operation involves an elevated level of risk due to hose handling and operations between moving vessels at sea. Equinor will source a tanker on day 1 of a Loss of Well Control (LOWC) and available for lightering operations from C&R vessels from day 20 if required
2. Tanker in Port Adelaide. Vessels return to port and offload. Once tanker reaches capacity it sails for a suitable refinery that will accept the recovered oil in Asia-Pacific. Operation involves a lower level of risk due to hose handling and operations while in static port conditions.
3. No tanker. Vessels return to port and offload to temporary storage or direct to tanker truck. Tanker trucks transport waste by road to designated local facility or to other refineries.

For options 1 or 2 above, a tanker of no less than 35,000 DWT will be spot-chartered by Equinor for the purpose of liquid oily waste storage.

9.4.9 Regional temporary storage

Along the GAB coastline, many towns have small transfer stations, current, or former land fill sites, many of which have now been changed into waste transfer stations only. These sites have a base level of permitting which will allow them to be used in emergency conditions as primary temporary storage sites. Refer to Appendix 1 for this list of sites and contact details to access these sites.

Bunding to safely contain oil/solids within these sites may need to be constructed if sealed/lined pits or controlled drainage hard stand is unavailable to meet jurisdictional expectations.

9.4.10 Final waste disposal options

Final waste disposal takes the form of three options – the landfills listed in Appendix 1, along with Tellus' Sandy Ridge (Open Mid 2020).

9.4.10.1 Enduring storage sites

Tellus Holdings Pty ("Tellus" – http://www.tellusholdings.com) Sandy Ridge offers a permanent waste isolation site and is scheduled to receive waste from July 2020. This will allow acceptance of any wastes that could be generated from an oil spill, with capacity to receive 100,000 tonnes per annum as per meeting between Tellus and Equinor on 5 September 2019.

The site will consist of multiple pits excavated through mineable kaolin to a depth some metres above an impermeable granite layer. Waste will be suitably mixed with the excavated kaolin that ensures absorption and binding of any remaining liquid such that the final mass acts as a solid. The pit is then backfilled and compacted such that it is effectively impermeable to surface rainfall.

Table 6 Enduring storage sites

Storage site type	Site address	Waste volumes
Sandy Ridge Clay Mine, (Mt Walton East, WA)	Access via Mt Walton East Road, from the Great Eastern Hwy in Booradin, WA	100,000 tonnes p/annum

Tellus' contact details are as follows:

Phone: +61 (0)438 429 934

Address:

Tellus Holdings Ltd

Level 34 Exchange Tower

2 The Esplanade

PERTH WA 6000

9.4.10.2 Thermal treatment plants

Cleanaway operates a range of different sized thermal treatment plants (TTPs) that use heat to remove organic containments from soils, and therefore produce a low hazard/nil hazard clean fill. This fill can be (1) returned to site, (2) placed in a low-level landfill or (3) used for an industrial or residential construction purposes.

TTPs are portable, so can be shifted to an industrial area close to the waste generation point. They rely on large volumes of natural gas to operate (between 7–50 Gj/hr of operation) and produce atmospheric and noise emissions. Each plant can take between 8–12 weeks to mobilise and then set up.

Table 7 Thermal treatment plants

Thermal treatment plant type	Types of waste	Waste volumes (treatment per day, 12-hour shift)
"Baby" mobile direct fired desorption	Highly recalcitrant organic contaminants: dioxins and furans, PCBs, PAHs, heavy fuel oil such as hydrocarbons >C35, creosote and coal gasification waste	Up to 60 tonnes
Co-current/current direct fired desorption		Up to 360 tonnes

Cleanaway operates a number of TTPs that would be available for use, subject to being released from other contractual commitments.

Cleanaway can be contacted on:

Phone: +61 3 8397 5100

Address:

Level 4, 441 St Kilda Road
Melbourne
Metro Vic (South East) VIC 3004

Veolia Australia also has two hazardous waste treatment plants – their advertised capacity is:

Thermal treatment plant type	Types of waste	Waste volumes (treatment per day, 12-hour shift)
Mobile direct fired desorption	Highly recalcitrant organic contaminants: dioxins and furans, PCBs, PAHs, heavy fuel oil such as hydrocarbons >C35, creosote and coal gasification waste	Up to 15 tonnes (Dry Creek SA)
Co-current/current direct fired desorption		Up to 60 tonnes (Brooklyn VIC)

Veolia can be contacted at:

South Australia:

500 Churchill Rd, Kilburn SA 5084
Ph: 132 955

Victoria:

Level 5, 324 St Kilda Rd, Southbank VIC 3006
Ph: 132 955

9.5 Offshore waste management implementation

Waste generated offshore will predominately consist of oil/water residues with some potential for solids from consumables such as sorbents, PPE and sundry items.

This waste will result from the implementation of offshore/nearshore containment and recovery operations.

The oil spill modelling indicates that the crude will likely be of a highly viscous nature, and when combined with the high energy environment of the GAB, is likely to emulsify and weather. This means that the oil being collected is likely to be sticky solid-state residues and easily separated from water, but will require the use of mechanical/active skimming devices.

Table 8 Offshore waste strategy process flow checklist

Step	Action	Decision point	
		Yes	No
1	Are containment and recovery operations proposed?	Go to Step 2	Carry out other OSR operations
2	Will volumes exceed tank thresholds, requiring return trips to port for discharge?	Go to Step 3	Carry out other OSR operations
3.	Undertake decanting to reduce waste volumes Request from AMSA permission for exemption from MARPOL for purposes of decanting operations Using JIP 17 Industry Guidance Paper: The use of decanting during offshore oil spill recovery (OSR) operations, undertake operation		
4.	Do the volumes still exceed tank thresholds, requiring return trips to port for discharge?	Go to Step 5	Carry out other OSR operations
5.	Organise a chartered rotation of tankers for offshore STS for the duration of the operation • Develop and implement Tanker/Support Vessel STS • Continually rotate tanker operations through the response until finalised • Monitor volumes being transferred and received through the STS operation • Record daily and weekly amounts of waste being collected		

9.5.1 Temporary storage of recovered oil/water at sea: recovery vessels

9.5.1.1 On-board vessel tank storage

Vessels should be chartered that allow the use of mud or other on-board tanks for the storage of recovered oil/ water. Ideal total combined tank sizes are those greater than 1500 m^3 to allow for many days of continuous operations.

Equinor's chartered support vessels have tank capacities of ~1,000 m^3 This allows for approx. three days of oil recovery using the highest limits of oil recovery assumed (311 m^3/day).

9.5.1.2 On-board temporary storage

In the event that vessels do not have on-board tank facilities, commonly used standard (1000 litres) or large (4000 litre) intermediate bulk containers (IBCs) may be used, or oil recovery deck bladders (25,000 litres). Other storage devices with good structural integrity may also be considered such as bladders held within frames or sealed TEUs.

Temporary storage devices will need to be lifted onto and secured to the vessel consistent with AMSA marine orders (ref: Marine Order 32 – Cargo Handling Equipment 2011), to the satisfaction of the master of the vessel. Once secured on board the vessel, these temporary storage tanks should not be moved, unless they meet and are certified to the relevant DNV standard (such as EN12079/10) or acceptable equivalents.

9.5.1.3 Waste hierarchy reduction: decanting from oil recovery vessels

Decanting is an accepted practise of oil response, in-order to reduce to as little as possible, water being held on board the vessel in the oil/water storage tanks.

This in turn maximises the endurance of the vessel for its operations by allowing it to store more oil for each operational period.

Further information on decanting can be found in the JIP 17 Industry Guidance Paper: The use of decanting during offshore oil spill recovery (OSR) operations published by IPEICA.

The process of decanting is:

1. Once fluids are recovered on board the vessel, over time oil and water settle out with oil floating on top of the water, at which time:
2. The water can be drained or pumped from the bottom of the tank into either:
   a. The pocket of the boom allowing any overflowing oil to be recovered back through the skimmer; or;
   b. Into another tank, to allow further settling, decanting and concentration of oils.

Decanting in Australian waters is forbidden by state and Commonwealth laws. As such, during oil spill

response operations, this practise requires explicit, vessel by vessel approval from the Australian Maritime

Safety Authority, in order for that vessel to have an exemption from MARPOL requirements. The process for applying for an exemption is located at NP-GUI-016; National Plan maritime discharges of oil and oily water during emergency and response situations

This exemption can be sought via the AMSA Liaison Officer (LO) who will be located within the Equinor IMT. There is no standard format to seek an exemption, but a list of information that is likely to be required has been developed and is shown in Appendix 2. Working with the AMSA LO, an Equinor operations staff member will need to detail in writing to AMSA a justification for each decanting operation. Each time decanting is undertaken, a log must be kept using the ICS 214a to note the volumes of oil and water that were transferred, and the outcomes of the operation. This must be reported back to the IMT.

9.5.2 Transferring recovered oil/water at sea: from recovery vessels to tankers

Equinor's preferred strategy for the treatment of oil/water waste collected by oil recovery vessels is to transfer directly from recovery vessel to a chartered tanker, and for that tanker to then sail to a suitable refinery located in Australasia where the recovered hydrocarbon to be processed. During passage, normal on-board water/oil discharge processes will further concentrate the oil, reducing the quantities of water on board, before discharging the product.

9.5.2.1 Ship to ship (STS) operations

Any STS operations will be undertaken by way of an astern (to the tanker) floating hose to pump recovered oils from the recovery vessel into the tanker. This is in lieu of using cranes to sling IBCs or other temporary storage containers between the vessels. This procedure calls for an STS plan to be developed consistent with MARPOL Annex I Chapter 8.

Specifically, the STS Operations Plan must be drafted in accordance with the:

- IMOs "Manual of Oil Pollution, Section 1, Prevention" as amended
- International Safety Guide for Oil Tankers and Terminals and OCIMF "Ship-to-ship Transfer guide, Petroleum".

STS operations can take place in one of four locations, which will be dependent on the weather and sea conditions at the time:

1. In GAB open waters, adjacent to oil spill response operations
2. In the lee of the Eyre Peninsula, the lower Spencer Gulf
3. To the north-east of Kangaroo Island in Investigator Strait
4. Within the Port of Adelaide, at the wharf face.

Operations team will need to decide based on current and expected weather conditions, which of these four options presents (1), the least likelihood of risk with regards to spillage from the operations, and (2), the time taken for recover vessels to transit from operational areas to undertake the STS.

9.5.3 Transferring recovered oil/water at the Equinor supply base: from recovery vessels to land

During instances where only limited containment and recovery operations are taking place, or the operations are producing limited amounts of waste, then a tanker may not be used, and recovery vessels will return to the Equinor supply base in Adelaide, and discharge liquid wastes into road tankers.

These road tankers then have the option to transit (in order of priority) to:

1. A suitable refinery to processes the liquid oil; or
2. An appropriately licensed waste management facility or depository within South Australia or Sandy Ridge in Western Australia, respectively.

The strong preference is for the collected oil to go to a suitable refinery for processing.

9.6 Onshore waste management implementation

Waste generated onshore will predominately consist of oil/solid residues with some potential for oily liquid wastes, and then sundry wastes generated from consumables such as sorbents, PPE and other items.

The driver of this waste will be the implementing of shoreline clean-up operations.

The oil spill modelling indicates that the crude will likely be of a highly viscous nature, and when combined with the high energy environment of the permit area, may emulsify, and most definitely weather. This means that should shoreline oiling occur, the oil coming into contact with the shore will be heavily weathered, and resemble tar balls, coffee grinds and other semi-solid fractions.

Table 9 Onshore waste strategy process flow checklist

Step	Action	Decision Point	
		Yes	No
1	Are shoreline operations proposed that will generate oily waste?	Go to Step 2	Carry out other shoreline OSR operations.
2	Engage with contractor (e.g. Cleanaway, Environmental Pacific Service, Veolia or Toxfree) to oversee the implementation of the waste planning in the IMT.	Go to Step 3	
3.	Engage with relevant state agencies to work through the remainder of this plan as part of a multi-agency IMT.	Go to Step 4	
4.	Working with SCAT teams, estimated expected volumes of waste (upper bounding volumes.)	Go to Step 5	
5	Using the Annexure C, contact landfills nearest to shoreline contact area. Confirm those current capability and capacity to receive oily wastes.	Does the capacity match expected need?	Go to Step 6
6	Contact Cleanaway/Veolia to establish thermal treatment plants collocated with landfills, in order to reduce volumes prior to moving to lower threshold landfills	Does the capacity match? Go to Step 8	Go to Step 7
7	Contact Tellus to establish chain to receive waste in enduring storage site.	Go to Step 8 once completed	
8	Working with Logistics section, establish temporary storage sites on coast. Use standardised set-ups (Table 9) to guide site requirements based on expected, daily volumes. Request skip bins from nearest local contractor; or use Cleanaway, TPI, Toxfree or Veolia.	Move to 9 once actioned	
9	Working with Logistics section, establish movement chains from shorelines to final disposal sites.	Move to 10 once actioned	
10	Working with Operations Section, ensure that daily work orders for shoreline operations include instructions to: Minimise total volumes of materials collected. Collect only oil/ oiled materials. Segregate types of waste at shoreline collection point. Record total volumes for each operational period.		

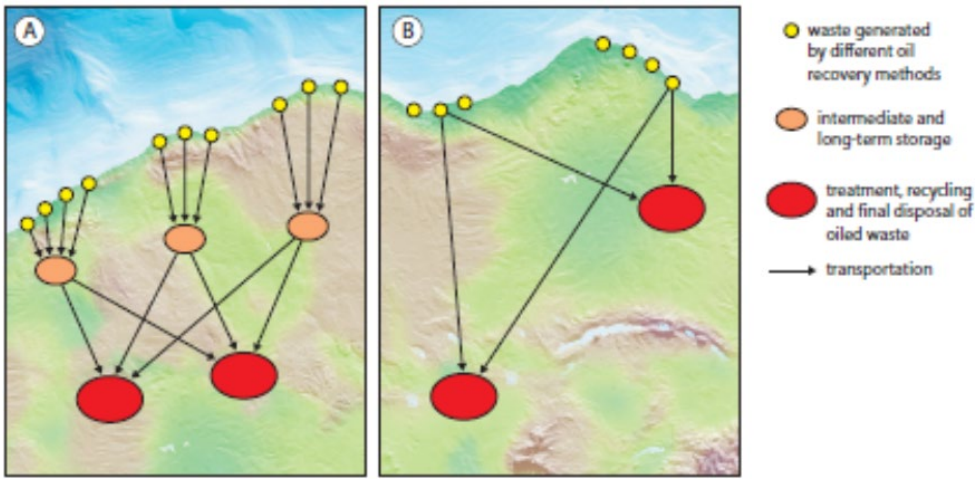


Figure 2 IPIECA waste management logistics model

Temporary sites may be used, but only if the regulatory requirements for final waste solutions are unable to be implemented in a timely fashion, or the sites are unable to process the volumes of wastes received in a timely manner.

The final treatment sites consist of industrial and municipal landfill sites which have capacity to take the potential total volumes. A number of these sites have been contacted and have agreed in principle that they could accept large volumes of oily/solid waste.

Tellus-operated Enduring Storage Site, Sandy Ridge in Western Australia, will have a capacity of up to 100,000 tonnes per annum from mid-2020. Tellus have actually provided a quote for 170,000 tonnes and are confident that permits can be easily arranged for such emergency conditions given the broad approvals in place for a facility of large spatial extent. Actual site preparation ahead of disposal is a simple earthmoving exercise and can be sawfly executed.

Veolia's Integrated Waste Service's facility in Dublin, SA has an annual capacity of 200,000 m^3 of oil/solid waste. and a quote has been received for the handling of 170,000 tonnes,

9.7 Shoreline tactical response plan, scat and waste interface

More than the other plans, the Shoreline Tactical Response Plan has a dependency on the Waste management plan.

Where a Shoreline TRP notes an action of oil recovery – through either a skimming package or a vacuum truck, then the onshore disposal task force needs to be sure that wastes generated by that action are appropriately managed.

From the SCAT survey, planning and operations may recommend that certain shorelines require shoreline clean up. Again, where these recommendations are made, the onshore disposal task force needs to manage the potential waste streams.

9.8 Temporary storage of wastes collected from shorelines

9.8.1 Temporary storage of waste on site – standardised site setups

As SCAT teams determine that shoreline clean-up is a viable option to be put in place, different size sites will need to be established along these shorelines to accommodate the scale of the response.

For sites relying on manual labour to clean up shorelines, three different sized standardised waste setup sites will be considered, to match the types and scale of the waste anticipated to be collected and the number of responders working on that site. For larger volumes of bulked accumulated hydrocarbons, setups will need to be co-located to increase the capacity of waste to be stored and responders to be accommodated.

For sites using plant or heavy machinery to collect oil/solids from the beach, additional suitable sized skip bins and storage will need to be sourced.

These standardised sites are (manual removal - labour only):

Table 10 Site size "waste ready reckoner"

Site size "waste ready reckoner"	Small	Medium	Large
Estimated shoreline material collected in total per day1	0–5 m^3	5–25 m^3	25–50 m^3
Responder numbers (undertaking shore cleaning)2	<7	7–21	21–49
Requirements for each site			
Skip bins – oil/solid (total volumes)3	5 m^3	25 m^3	50 m^3
Oil/water wastewater storage4	1 x IBC	2 x IBC	3 x IBC
PPE and soiled materials	1 m^3	1 m^3	2 m^3
General waste bin	1 × 200 litre	2 × 200 litre	4 × 200 litre
Recycles waste bin	1 × 200 litre	2 × 200 litre	4 × 200 litre

This is the net amount of oiled solids being collected from the shoreline per day to this waste point.
These are the shoreline workers only, and exclude support, ancillary or supervisory personnel. The assumption here is that a worker can, on average, shift 1m^3 of solid materials per day.
Skip bin needs to be sealed (bung holes filled or blocked), double lined with 100-gauge heavy duty black plastic (polyethylene) and covered with waterproofed canvas (or a lid) or some other weatherproof material to prevent rain soaking into the oiled solids.
This is to store water used for personnel decontamination, as workers move through the hot – cold zones.
General: Contents of bins and water wastes are disposed of once per 24-hour period.

9.8.2 Baseline soil sampling

In accordance with NP-GUI-015, base soil samples will be taken and stored with a chain-of-custody form for any temporary waste sites. This is to ensure there is no unnecessary secondary contamination or if there is, then the site will be cleaned and restored to the baseline.

9.8.3 Options for temporary storage

- Open-top collapsible containers: capacities to 10 m^3 (25,000 gal), not moveable when full
- Open-top drums: capacities to 0.2 m^3 (50 gal), useful only for small volumes, also useful for collecting small volumes of beach debris
- Plastic bags (heavy duty): suited to manual beach clean-up, easily manhandled when full, but may add to the disposal problem
- Skips: robust containers suitable for storing solid debris and transporting it to disposal sites that can be transported by barge or landing craft to remote sites
- Temporary storage pits: need to be lined with plastic sheets to prevent contamination of groundwater, may require pre-lining with sand to prevent damage from rocks or other protrusions.

9.8.4 Waste Tracking and Chain of Custody

Records must be kept of the type of waste being collected, quantities (by volume/weight if possible), date and locations it was taken from. Using these records, for all waste coming from the shoreline, a Chain of Custody shall be established that reports daily to the IMT the volumes of what sort of waste are being generated on the shoreline.

Classification of that waste shall be made using the following SA EPA prescribed industrial waste codes:

Table 11 Waste tracking (SA EPA code example)

State	Description	EPA code
Liquids	Oils emulsified	J120
	Oils non-emulsified	J120
	Oily wastewaters	J120
	Equipment supplies (solvents, chemicals, etc.)	Refer to SDS
Solids	Tar balls	J160
	Oiled solids such as sands, earth, gravel and soils*	N120
	Oiled plastics, woods, vegetation, sorbent materials	N120
	Oiled empty chemical bags/containers	N100
	Recyclables (papers, plastics)	
	Non-hazardous general waste	

*Contaminated soils and sediments will need to be sampled to establish hydrocarbon contents and for the presence of other heavy metals and potentially hazardous chemicals.

Each shoreline supervisor will need to ensure that this data is collected and filed each day. See Appendix 3 for applicable form.

As waste is moved from shoreline sites to temporary or final storage locations, a Chain of Custody form must be completed by the site supervisor, and driver of the company that hauls the waste. These must be collated on a daily basis and filed with the IMT.

9.8.5 Waste transport

Transport operators who are licensed to carry the appropriate category of waste will be used to haul the full skips, and other containers of waste to temporary or final treatment sites. A current list of these providers can be found through the DWER at https://cwts.der.wa.gov.au/#GuestMenu (require a user name and password). This includes small local operators who can provide this service, including the provision of skips to haul the waste.

If these operators do not have sufficient capacity to meet the demand, licensing will be sought during the spill from the relevant state EPA to grant certification to enable this process to occur.

9.8.6 Waste hierarchy: Reduction: pre-cleaning shorelines

Shoreline Tactical Response Plans will note that shorelines with identified recovery operations are to undertake pre-cleaning of these shoreline where appropriate. Similarly, SCAT processes may recommend in some instances that those shorelines are pre-cleaned.

Organic materials that are collected during this process should be stored above the mean high-water springs (MHWS) tidal mark, with a view to being returned to the shoreline after the response is over. Non-organic, man-made wastes should be cleaned and disposed of using available local municipal waste chains. If these are not available, then they should be stored above the MHWS mark.

Specific locations should be chosen that will not impede operational access to the beach or cause undue impact on the surrounding environment.

9.8.7 Waste hierarchy: Reduction: appropriate methods of collecting oil/solids from shorelines (shoreline treatment recommendations)

When collecting oils from the shoreline the correct technique must be used, and that technique must be correctly applied by operators who are trained and monitored in how to undertake manual clean up.

Particular care must be taken, whether by mechanical or manual means, to removing as little material as possible from the shoreline. This means closely monitoring the amount of sand/material being scrapped away with shovels or spades, and to ensure that this is mostly contaminated materials.

9.8.8 Waste hierarchy: Reduction: Separation of different types of waste streams at site

Shoreline operations will generate a range of wastes which must not be comingled. These are:

- general waste
- recycles
- contaminated PPE/workwear
- oil/waters wash down areas
- oil/solids from the shoreline.

Each site setup will include bins or other receptacles to allow responders the opportunity to correctly separate wastes at site. This will allow for easier, cheaper and more efficient final treatment and disposal.

10.0 Responsibilities

This section outlines the specific responsibilities for implementing this OWMP. In the absence of the designated party; the nominated delegate will perform the same functions. Additional responsibilities may be assigned by Equinor.

10.1 Supply and attendant vessels

The masters of the supply and attendant vessels are responsible for their respective vessels operating in accordance with this plan.

10.2 Onshore waste contractors

Onshore waste contractors will comply with the terms of contracts agreed with Equinor and the scope of services according to the agreement. They will ensure compliance with the Equinor management system, and disposal of all waste products shall be in accordance with all Australian state and federal regulatory requirements.

The onshore waste contractor shall ensure that the Onshore Materials & Logistics Supervisor has been notified of the receipt of any hazardous or recyclable waste and should complete and return the waste manifest confirming the hazardous waste treatment/ disposal.

The onshore waste contractor will liaise with the Onshore Materials & Logistics Supervisor on activities associated with the disposal of all waste from offshore that is delivered to the supply base. This shall be implemented through the submission of biweekly reports detailing waste container rentals, all waste types, and waste volumes shipped to shore and exported.

10.3 Drilling supply manager

It is the responsibility of the Equinor Drilling supply manager to ensure the compliance with all national and international legislation applicable to waste handling, storage, transportation and disposal both offshore and onshore. The responsibilities will be to ensure the following:

- the OWMP is developed and maintained in compliance with applicable regulatory requirements and is implemented accordingly
- project contractors/subcontractors operate in accordance with the requirements of the OWMP
- provide technical oversight and technical advice for implementing the OWMP
- availability of the necessary resources (financial, manpower etc) to implement the OWMP
- the management of all wastes carried out in a controlled and monitored manner
- all relevant personnel undergo environmental and waste management awareness as part of the project induction/orientation
- effective communication of the appropriate aspects of the OWMP with all internal/external (as applicable) stakeholders
- liaise with the rig and shore base operational and management personnel to ensure that duties and commitments in support of the OWMP are expedited efficiently and in a timely manner
- investigate the suitability of new waste disposal contractors, waste management/treatment/disposal facilities and waste receivers before use
- relevant compliance with Basel Convention for any transboundary shipments of hazardous waste.

10.4 Offshore Installation Manager and supervisors

The Mobile Offshore Drilling Unit's (MODU) Offshore Installation Manager (OIM) is responsible for ensuring that all waste resulting from a LOWC is managed in line with the requirements of this plan.

It is the duty of all supervisors to ensure that due regard is given to the minimisation of waste, and that adequate attention has been given to the aspects of segregation and disposal of wastes associated with any work. Staff must be made aware of the requirements for waste handling, as described in this plan, and those arising from local site rules and other legislation applicable to the handling and transportation of materials.

10.5 Offshore Materials & Logistics Coordinator

The Offshore Materials & Logistics Coordinator is responsible for ensuring that all waste originating offshore is managed according to this plan. These responsibilities include the following:

- Ensure compliance with the minimum requirements for waste containment, labelling and manifest documentation to allow safe and efficient disposal when received onshore
- Maintain a waste register that tracks waste container rentals, all waste types, and waste volumes shipped to shore and/or exported
- Ensure that the Onshore Materials & Logistics Supervisor has been notified of the dispatch of hazardous and recyclable waste, and that a detailed waste manifest describing the hazardous waste details, has been completed before transport to shore
- Ensure dispatch manifesting of waste materials is thorough and correct.
- Report the volume of waste returned to shore to the Equinor Drilling Superintendent
- Report any non-compliance with this plan to the Drilling Superintendent
- Resolve queries or uncertainties with respect to waste disposal in consultation with the Onshore Materials & Logistics Supervisor. Seek further advice as required from the onshore waste contractor and/or the Equinor Drilling HSE Coordinator.

10.6 Onshore Materials & Logistics Supervisor

Once transported onshore, the Onshore Materials & Logistics Supervisor becomes accountable for all waste. The Onshore Materials & Logistics Supervisor's responsibilities include the following:

- Co-ordinate all waste disposal activities with the onshore waste contractor
- Report all non-compliances with this plan to the Equinor Drilling Superintendent and Offshore Materials & Logistics Coordinator, or by completing hazard/incident reports, depending on the severity of breach
- Ensure labels for main waste items are supplied to the MODU from the supply base as required
- Coordinate with the Offshore Materials & Logistics Coordinator to ensure that hazardous waste identification numbers are correctly assigned to the waste
- Ensure any hazardous wastes are disposed of in accordance with stipulated requirements in conjunction with the supplier on-site representative.
- Ensure any deviations from the requirements of this plan shall be agreed with the Onshore Materials & Logistics Supervisor who shall consult with the Equinor HSE Manager as necessary.

10.7 Supply and attendant vessels

The masters of the supply and attendant vessels are responsible for their respective vessels operating in accordance with this plan.

10.8 Onshore waste contractors

Onshore waste contractors will comply with the terms of contracts agreed with Equinor and the scope of services according to the agreement. They will ensure compliance with the Equinor management system, and disposal of all waste products shall be in accordance with all Australian state and federal regulatory requirements.

The onshore waste contractor shall ensure that the Onshore Materials & Logistics Supervisor has been notified of the receipt of any hazardous or recyclable waste and should complete and return the waste manifest confirming the hazardous waste treatment/ disposal.

The onshore waste contractor will liaise with the Onshore Materials & Logistics Supervisor on activities associated with the disposal of all waste from offshore that is delivered to the supply base. This shall be implemented through the submission of biweekly reports detailing waste container rentals, all waste types, and waste volumes shipped to shore and exported.

APPENDIX 1

Oil waste – List of known licensed waste storage/transfer facilities by sector

Key	Description	Potential
	Major waste facility, including hazardous waste	Temporary storage and final disposal
	Major waste facility	Temporary storage and final disposal
	Landfill	Temporary storage and final disposal
	Transfer station	Temporary storage only

Quick ref	Waste management facilities	Approx. capacity (if known)	Type of wastes
	Major Facilities - Western Australia		
	Western Resource Recovery - Perth Veolia/Transpacific 113 Ewing Street Welshpool, WA 6106 (08) 9351 1350, 1800 774557 (1800 SPILLS)	50,000 m^3 To be confirmed	Major Hazardous Waste Facility
	Western Resource Recovery - Kalgoorlie Veolia/Transpacific Lot 221 Goldfields Highway South Boulder, WA 6432 (08) 9093 0633, 1800 774557 (1800 SPILLS)	10,000 m^3 To be confirmed	Major Hazardous Waste Facility
Sector 1 - Albany			
	Hanrahan Road Waste Minimisation Facility Hanrahan Rd Albany WA 6330 (08) 9842 1916	To be confirmed	Landfill
	City of Albany - Albany Refuse Site Maxwell Street Albany WA 6330 (08) 9841 9333	To be confirmed	Putrescible landfill site
	Cleanaway Solid Waste Services Lot 167, Cumming Road Albany, WA 6330 (08) 9841 2467		Landfill
Sector 2 - Hopetoun			
	Hopetoun Waste Transfer Station Hopetoun Rd - Ravensthorpe Rd Hopetoun, WA 6348 (08) 9839 0000	To be confirmed	Transfer Station only

Quick ref	Waste management facilities	Approx. capacity (if known)	Type of wastes
Sector 3 - Esperance			
	Wylie Bay Waste Facility 10km from town on Wylie Bay Rd Wylie Bay, Esperance WA 6450 (08) 9070 7594, (08) 9071 0666	To be confirmed	Landfill and Recyclables Transfer
Sector 4 - Eastern Recherche to Sector 10 - Fowler			
	No significant facilities – residential facilities only.		
Sector 11 - Ceduna			
	Ceduna Waste and Recycling Centre 336 The Trading Stock Route Ceduna, SA 5690 (08) 8626 9135	To be confirmed	Landfill and Recyclables Transfer
Sector 12 - Streaky Bay			
	Streaky Bay Waste Transfer and Resource Recovery Centre Flinders Highway Streaky Bay, SA 5680 (08) 8626 1001	To be confirmed	Transfer Station only
Sector 13 - Elliston/Coffin Bay			
	Venus Bay Waste Site District Council of Elliston (08) 8687 9177	To be confirmed	Transfer Station only
	Elliston Waste Transfer Station District Council of Elliston (08) 8687 9177	To be confirmed	Transfer Station only
	Coffin Bay Waste Transfer Station District Council of Lower Eyre Peninsula (08) 8676 2106	To be confirmed	Transfer Station only
Sector 14 - Port Lincoln			
	Veolia Resource Recovery Centre Hassell Road Port Lincoln, SA 5606 (08) 8682 3860, 0418 227 234	To be confirmed	Transfer Station Only
	1763 Butler Centre Road Butler, SA, 5605 (08) 86 88 22 35	To be confirmed	Landfill-Domestic

Quick ref	Waste management facilities	Approx. capacity (if known)	Type of wastes
Sector 15 - Upper Spencer Gulf			
	Whyalla Mount Laura Waste and Resources Recovery Centre Iron Knob Rd Whyalla, SA 5600 (08) 8640 3444	To be confirmed	Landfill and Recyclables Transfer
	Port Germein Transfer Station Havers Avenue Port Germein, SA 5495 (08) 8666 2014	To be confirmed	Transfer Station Only
	Port Pirie Resource Recovery Centre 245 Three Chain Road Port Pirie, SA 5540 (08) 8633 9666	To be confirmed	Transfer Station Only
	Port Augusta Resource Recovery Centre 59 Footner Rd Stirling North, SA 5710 (08) 8643 6975	To be confirmed	Transfer Station Only
Sector 16 - Eastern Spencer Gulf			
	Copper Coast Resource Recovery Centre Magazine Rd Wallaroo, SA 5556 (08) 8828 1200 (District Council Admin)	To be confirmed	Transfer Station Only
	Port Broughton Waste Disposal Site Dale Road Dale, SA 5522 (08) 8635 2107	To be confirmed	Transfer Station Only
Sector 17 - Yorke Peninsula [No significant supply]			
	Yorke Peninsula Service Centre 18 Bluff Road Minlaton, SA 5575 13 13 35	To be confirmed	Transfer Station Only
	Ramsey Transfer Station Dump Rd Port Vincent, SA 5581 (08) 8832 0000	To be confirmed	Transfer Station Only
Sector 18 - Adelaide			
	Southern Region Waste Authority Landfill 112 Bakewell Drive Seaford Heights, SA 5169 (08) 8386 0273	To be confirmed	Standard Waste

Quick ref	Waste management facilities	Approx. capacity (if known)	Type of wastes
	Integrated Waste Services Corner Hines Rd and Wingfield Rd Wingfield, SA 5013 (08) 8348 5100	To be confirmed	Major waste facility
	Integrated Waste Services Port Wakefield Rd Lower Light SA 5501 (08) 8348 5100	200,000 tonnes per annum	Major waste facility High level contaminated waste (Veolia email 13/9/2019)
	Veolia liquid treatment plant 540 Churchill Rd Kilburn SA (08) 8203 3672	>10,000 m^3 per annum 400m^3 tank space Hydrocarbons to landfill	Major hazardous waste facility (Veolia email and phone call 11/9/2019)
	Wingfield Waste & Recycling Centre 412 Hanson Road North Dry Creek, SA 5094 (08) 8345 4318	To be confirmed	Major waste facility
	Northern Adelaide Waste Management Authority Gate 3, Bellchambers Road, Edinburgh North, SA 5113 1800 111 004, (08) 8259 2100	To be confirmed	Major waste facility
Sector 19 - Victor Harbour			
	Fluerieu Regional Waste Authority Darren Stephens 0418 807 440	To be confirmed	Includes Victor Harbor , Goolwa, Yankalilla, and Kangaroo Island
	Goolwa Waste and Recycling Depot Goolwa to Victor Harbour Rd Goolwa, SA 5214 (08) 8555 7260	To be confirmed	Transfer Station Only
	Yankalilla Waste and Recycling Depot Lot 2 Victor Harbour Rd Yankalilla, SA 5203 0409 674 982	To be confirmed	Transfer Station Only
Sector 20 - Robe - Bridgeport			
	Robe Waste Transfer Station Evans Cave Rd Robe, SA 5276 (08) 8768 2003	To be confirmed	Transfer Station Only

Quick ref	Waste management facilities	Approx. capacity (if known)	Type of wastes
	Kingston Transfer Station Adam Rd Kingston SE, SA 5275 (08) 8767 2033	To be confirmed	Transfer Station Only
Sector 21 - Kangaroo Island			
	Kangaroo Island Waste and Recycling Depot 5 km from Kingscote on North Coast Rd Kingscote, SA 5223 (08) 8553 4514	To be confirmed	Transfer Station Only

APPENDIX 2

Decanting – MARPOL exemption information

Name of vessel (s) involved in decanting	
Timeframes and dates	
Overall contribution to oil spill operations	
Expected outcomes of decanting	
How excessive oil returning to water will be minimised	
Expected discharge volumes or rates	

APPENDIX 3

Waste tracking and Chain of Custody form

Part A – Waste tracking
(strike out sections that are not required)

Site name and segment (s) reference		
Date/times of collection		
Site supervisor/team leader		
Environmental unit representative		
Relevant state govt representative		
Waste unit representative		
	Volume/weight	Waste code
Volume sand/oil (est)		
Volume liquid		
Volumes soiled materials		
Other non-oiled waste		

Site supervisor/team leader signature	
Date/time	

Part B: Chain of Custody

Waste removed by:

Company name	
Contractor ABN	
Special licence/s numbers	
Driver name	

Driver statement:

In signing the below, I certify that I removed the volumes of waste as noted in Table A, and have taken custody of that waste on behalf of the company listed above in Table B.

Driver signature	
Date/time	

Reference

OPOL 2012. Oil Spill Cost Study – OPOL Financial Limits (2012). Joint study commissioned by OPOL and Oil & Gas UK.

Appendix 11

Priority protection areas identification process

Appendix 11 Key protection priorities

This appendix describes the four key steps used by Equinor Australia B.V. to identify key protection areas (PPA). These steps are consistent with the steps illustrated in Section 8.4 of the OPEP Rev 2 for the preparedness stage.

1. Preparedness phase

Modelling of the $WCD_{129\ days}$, (open-hole, 8,943 m^3/day, unmitigated) was undertaken to determine the fate and trajectory of oil spilled from the Stromlo-1 location. Stochastic modelling (100 runs) was used to determine the Risk EMBA which encompasses the areas which may be exposed to surface, in-water or shoreline accumulations of oil. The modelling also predicted the shortest time to shore and the greatest volume of oil ashore for each state.

2. Identify sensitive receptors and socio-economic values within the Risk EMBA

Sensitive receptors and locations within the Risk EMBA were identified as described in Section 4 and Appendix 7-3 of the EP. This required consideration of:

- Protected Matters as defined in Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Act lists Matters of National Environmental Significance (MNES) which have been determined for the Risk EMBA using the Protected Matters Search Tool (PMST). These matters comprise World Heritage Properties, National Heritage places, Wetlands of International importance, Listed Threatened Species and communities, Listed Migratory Species, Commonwealth Marine Areas and additional matters protected under the EPBC Act (Commonwealth land, Commonwealth Heritage Places, Listed Marine Species, Whales and other Cetaceans, Critical Habitats, Commonwealth Terrestrial Reserves and Commonwealth Marine Reserves of national environmental significance.

  Extra information comprises legislated protected areas such as State Reserves, Nationally Important Wetlands, KEFs and TECS and Biologically Important Areas for protected species. The National Conservation Value Atlas (http://www.environment.gov.au/webgis-framework/apps/ncva/ncva.jsf) was also used as a search tool. The conservation status and IUCN protection category of areas were considered along with an assessment of any high conservation habitats and species.

  Relevant guidelines (such as the Matters of National Environmental Significance Significant impact guidelines 1.1 *Environment Protection and Biodiversity Conservation Act 1999*, DoTE, 2013), threatened species recovery plans (e.g. the DoEE Species Profile and Threats Database), plans of management (such as Commonwealth reserve management plans), management principles and other documents e.g. threat abatement plans and conservation advice published on the DoEE website in relation to matters protected under Part 3 of the EPBC Act.
- Commercial fisheries stocks and fishing areas using state and Commonwealth reports and consultation with state and Commonwealth Department of Fisheries and commercial fisheries.
- Sensitivities identified within recent research such as the Great Australian Bight Deep Marine Program and Great Australian Bight Research Program; and consultation with researchers (e.g. Great Australian Bight Right Whale Study group).
- Consultation throughout the development of this EP.
- Protection priorities identified in state oil spill plans and within the NATPLAN e.g. priority protection criteria or categories listed in the National Marine Oil Spill Contingency Plan – human health and safety, habitat and cultural resources, rare and/or endangered flora and fauna, commercial resources, and amenities (AMSA 2011).

3. Identify potential key protection priorities (receptors and locations)

This step was used to identify priorities amongst the numerous receptors within the Risk EMBA. Three criteria (called “filters”) were used to guide this selection. A receptor had to “pass through” all three “filters” to be deemed a key protection priority. Just because a receptor is not assigned priority status in the Preparedness Phase does not mean it will not be a priority for management in the Response Phase or that it will not be protected.

- FILTER 1: Potential consequences to sensitive receptors and locations are ranked 7 and above in the WCD risk review (Appendix 7-5).

A ranking of 7 is defined in Section 5 of the EP as: Long term impacts (restitution time 3–10 years) on populations (global or national), ecosystems or environmentally sensitive areas of international or national importance OR very long or permanent impacts (restitution time >10 years) on populations (regional), ecosystems or environmentally sensitive areas of regional importance. A consequence ranking greater than 7 represents a worst-case outcome (refer to Section 5 of the EP).

- FILTER 2: Subject matter experts workshopped the use of specific response strategies likely to reduce potential spill effects. The potential protection priorities must be deemed practicably "protectable and accessible" using those strategies (e.g. containment and recovery (C&R), nearshore booming and shoreline clean up). If a particular value such as the foraging Biologically Important Area (BIA) for Australian sea lions was too large to be "protectable" because of the open ocean environment and the broadly distributed individual animals, the areas with greater densities or supporting critical life processes such as breeding colonies were identified. However, specific sea lion breeding colonies along remote cliffs may not be practicably protected by offshore booms and these were excluded as priority response is better directed where it has the most effect.
- FILTER 3: Oil loadings which are thick or concentrated enough to be amenable to response techniques (containment and recovery, deflection booming, shoreline clean-up) are considered "actionable" and also exceed the levels at which biological effects may be expected (for fresh oil). While oil washing ashore at 100–1000 g/m^2 can be considered amenable for clean-up in some areas, higher priority is placed on areas exposed to oil at >1000 g/m^2 where the oil is directly actionable. Exposure to floating surface oil >50 g/m^2 is also considered actionable.

  Oil at these concentrations / thicknesses are most likely to have a biological effect while fresh (before most toxic components are degraded), and therefore the areas exposed to higher loadings in shorter times are at greater risk and represent a higher priority for response. Under the worst-case discharge scenario, fresh oil is not predicted to reach shore in any states contacted. Two states (South Australia and Victoria) are predicted to be contacted first and in <50 days. Oil will be highly weathered after 50 days at sea and the biological risks of exposure to oily residues and solids after this time are greatly reduced.

4. *Select final key protection priorities*

Table 1 shows the selected protection priorities that represent the subset of areas where receptors of consequence category 7–8 (Filter 1) at biologically or socio-economically important sites (Filter 2) are exposed to higher oil loadings and while it is still relatively fresh (Filter 3).

This list would be reviewed and potentially revised in a Response Phase based on situation spill modelling and consultation with state response agents, operational monitoring and monitoring effectiveness of control measures. Other receptors and locations are also considered for protection (e.g. those contacted after 50 days, or at moderate exposure thresholds) but are considered second priority as generally there is more time to respond and impacts are lower because the oil would be more weathered and the situational information may lead to changed priorities and strategies.

Table 1 Key protection priorities

Receptor group / subgroup with consequence category 7 or 8 under WCD unmitigated case	Critical areas which are protectable / actionable	Minimum days to exposure to: ≥50 g/m² floating oil or ≥ 1000 g/m² oil ashore and sites < 50 days	Potential mitigation / response
Seabirds			
Shy albatross	Foraging area around key nesting habitat on Albatross Island (Tas)	>50; NA	NA
Pinnipeds			
Australian sea lions / New Zealand fur seals	Breeding sites at: Fowlers Bay (SA) Ceduna to Streaky Bay (incl Nuyts Archipelago) (SA) Elliston (SA) Coffin Bay (SA) Dangerous Reef – Port Lincoln (SA) Kangaroo Island (SA) Port Fairy, Portland (Vic) Cape Otway (Vic)	 38 21-38 21 25 25 32 45 42	South Australian Marine Spill Contingency Action Plan (Dec 2016) Seal/sealion breeding colonies may benefit from nearshore C&R, Shoreline Protection, Shoreline clean up
Australian fur seal	Portland (Vic) breeding site	45 (Warrnambool Plain IBRA)	
Cetaceans			
Pygmy blue whale	Bonney upwelling aggregation areas (KEF)	47	C&R
Southern right whale	Head of Bight aggregation / calving area	23–114 (Eucla IMCRA – Nullarbor IBRA)	C&R, hazing
Sperm whale	None	NA	NA
Deepwater and other corals			
Deep water corals	None	NA	NA
Shorelines			
South Australian shorelines	Ceduna to Streaky Bay Southern Eyre Peninsula (Port Lincoln to Coffin Bay) Marion Bay-Point Turton (Southern Yorke) Coast of Bonney Upwelling/ Coorong Kangaroo Island	38–21 21–36 32–36 42 32	Coastal sections (and portions of sections) selected based on areas hit by fastest time to shore and greatest volumes ashore and accessible/protectable. Nearshore C&R, Shoreline Protection, Shoreline clean up
Victorian shorelines	Port Fairy -Portland coastline	44	Nearshore C&R, Shoreline clean up and Shoreline Protection
Socio-economic values			
Commercial fishing – southern bluefin tuna	None	NA	NA
Aquaculture	Port Lincoln SBT ranching	25	South Australian Marine Spill Contingency Action Plan (Dec 2016) Move / harvest SBT ranches

Blue denotes Protection Priority 1 – Consequence category 8 receptors

Appendix 12

Role-specific response checklists

Appendix 12 Role specific action checklists

1.0 Incident commander

Task	Completed?
Initial phase	
Assess the situation and/or obtain a briefing from the prior Incident Commander or initial response team (ICS 201 Incident briefing forms).	
Mobilise Incident Management Team (IMT) as needed to support response.	
Determine the need to assign a Deputy Incident Commander to help manage the incident.	
Direct the completion of the ICS 201 forms, if necessary.	
Review general incident report and ICS 201 forms to understand type and complexity of incident.	
Ensure that adequate safety measures are in place. Ensure safety of public and responders during the initial phase of the incident as safety personnel arrive and communicate with on scene personnel to establish plans and procedures.	
Assume command of incident from On Scene Commander, On Scene Supervisor, qualified individual or outgoing Incident Commander.	
Announce assignment as Incident Commander to IMT personnel/those present.	
Establish immediate priorities and determine/consider incident potential.	
Determine initial incident objectives and general direction for managing the incident.	
Determine if all required internal and external notifications have been completed.	
Determine requirement for State Liaison Officers to act as observers within the Equinor IMT.	
Determine if existing emergency response plans and procedures have been initiated by on scene personnel.	
Establish an appropriate organisational structure including day and night shift.	
Assign qualified IMT members to key positions including command and general staff and set initial shift change schedule.	
Coordinate overall incident response activities.	
Establish an incident command post. Determine if current ICP will support the size and tier of the incident. Consider incident potential.	
Establish incident priorities, decisions, directives, limitations and constraints, critical information requirements and incident objectives.	
Authorise release of information to the news media. Coordinate with Equinor Public Information Officer to ensure appropriate media strategy.	
Coordinate activity for all command and general staff and assign action items from the ICS 233 Open Action Tracker, as appropriate.	
Develop objectives (ICS 202) for the next operational period.	
Obtain periodic briefings and brief command and general staff.	
Ensure planning meetings are scheduled as required. Coordinate with Planning Section Chief to develop briefing schedule until a formal ICS 230 Meeting Schedule is developed.	
Determine need for emergency response partners and contract personnel to assist in managing the incident.	
Ensure the incident event log is maintained.	
Review and approve the ICS 208 Site Safety Plan and ICS 206 Medical Plan.	

Task	Completed?
Coordinate initial response actions with the IMT using the tools available in the Initial Phase portion of the Equinor Incident Management Handbook (IMH).	
Identify trigger points to move response from the Initial Phase to the Proactive Phase. Keep in mind most incidents can be handled by developing and maintaining an Initial Incident Action Plan for up to 72 hours.	
Once the decision is made to move into the Proactive Phase, coordinate with the UC, if established, and the PSC to develop an ICS 230 Meeting Schedule to move the response into the planning cycle.	
ONGOING RESPONSE PHASE	
Coordinate proactive response actions with the IMT using the tools available in the Proactive Phase portion of the Equinor IMH.	
Consult the guidance documents in the Equinor IMH for tools to develop the ICS 202 Incident Objectives, ICS 202A Command Direction, and ICS 202B Critical Information Reporting.	
Monitor overall progress of operations. Coordinate the development of milestones and end points with the IMT.	
Monitor leadership and management capabilities of command and general staff personnel ensuring effectiveness to lead within assigned functional areas. Relieve personnel of responsibilities if needed. Overall goal is a successful response through capable leaders.	
Identify and coordinate with key stakeholders and officials.	
Ensure ICS 209 Incident Status Summary is completed and forwarded to appropriate IMT members	
Keep appropriate agencies/organisations informed of incident status.	
Provide periodic internal updates to Equinor management. Develop ongoing briefing schedule to sync with IMT briefing schedule to ensure most up to date information is communicated.	
Develop an Information Management Plan to establish a process of maintaining situational awareness through formal information flow.	
Assign Deputy Incident Commander the task of managing information from the field and within the IMT using the Planning Section Chief, and Situation Unit Leader.	
Review, approve and sign the Incident Action Plan (IAP).	
Ensure incident funding is available.	
Seek appropriate legal counsel.	
Approve the use of trainees, volunteers, and auxiliary personnel.	
Approve requests for additional resources or for the release of resources.	
DEMOBILISATION PHASE	
Order the demobilisation of the incident when appropriate.	
Maintain ICS 214 Unit Log and forward to Documentation Unit Leader for storage.	

2.0 Public information officer

Task	Completed?
Initial phase	
Receive updated brief by the Incident Commander.	
Determine need for additional staff, organise and brief assistants	
Determine from the Incident Commander if there are any limits on information release.	
Coordinate information sharing and distribution with Liaison Officer and Personnel Officer.	
Brief Incident Commander on PIO issues and concerns.	
Ongoing response phase	
Develop new communications strategy and get approval from IC.	
Attend Incident Command meetings and briefings, contribute updates on media landscape and reputational issues.	
Represent/advise Incident Commander on all public information matters relating to the incident.	
Coordinate communications resources.	
Make sure material for use in media briefings locally is developed.	
Revisit and update crisis communications strategy and plan as needed when the situation develops.	
It directed by Incident Commander, ensure State Liaison Officers are notified and mobilised to the Equinor IMT.	
Make sure that Equinor interface with the public, media and other agencies on the local level.	
Demobilisation phase	
Ensure that all required agency forms, reports and documents are completed prior to demobilisation.	
Have debriefing session with the Incident Commander.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader (DOCL) for storage.	

3.0 Legal officer

Task	Completed?
Initial phase	
Review common and leadership responsibilities.	
Obtain briefing from the Incident Commander.	
Advise the Incident Commander, as appropriate, on all legal issues associated with response operations.	
Establish documentation guidelines for and provide advice regarding response activity documentation to the response team.	
Ongoing response phase	
Provide legal input to as requested.	
Review press releases, documentation, contracts and other matters that may have legal implications for the company.	
Participate in Incident Management System meetings and other meetings, as requested.	
Demobilisation phase	
Participate in incident investigations and the assessment of damages (including natural resource damage assessments).	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	

4.0 Personnel officer

Task	Completed?
Initial phase	
Receive briefing from the Incident Commander.	
Identify and advise the Incident Commander on all personnel issues related to those affected by the incident and mobilised responders.	
Determine need for additional support staff, organize and brief assistants, utilise a merged local Personnel Emergency Response team.	
Ongoing response phase	
Obtain an overview of emergency situation and affected personnel regarding: • Maintain list of personnel affected by the incident and their status (personnel on board). • Potential for impact on people – magnitude/complexity of incident with regards to personnel and next of kin care. • Local conditions affecting personnel support (regulations, health care system, police responsibility etc.) in cooperation with Equinor Liaison Officer.	
Assess need for, and mobilise, additional personnel resources to handle: • Evacuation of employees • Notification to contractors/suppliers • Call centre and/or reception centres for employees and their next of kin.	
Consider need for and manage Functional Support Team, if established.	
Coordinate information sharing and distribution with Public Information Officer, medical doctors, Equinor Liaison Officer.	
Work with Public Information Officer to develop information releases to affected personnel next of kin.	
Brief Incident Commander on issues and concerns.	
Attend Unified Command meetings and briefing, as required. Address personnel issues, as appropriate.	
Provide regular updates and advise Incident Commander on all issues related to handling affected employees and follow up of next of kin, including status of evacuation, missing persons, injuries, family assistance and medical doctors.	
Demobilisation phase	
Determine what current and potential personnel support may be needed, also for business continuity matters (in conjunction with Planning Section Chief).	
Maintain ICS 214 Unit Log and forward to Documentation Unit Leader for storage.	

5.0 Safety officer

Task	Completed?
Initial phase	
Determine need for additional staff, organise, brief and assign assistants.	
Identify hazardous situations associated with the incident.	
Brief Incident Command on safety issues and concerns.	
Ongoing response phase	
Exercise emergency authority to stop or prevent observed/reported unsafe acts.	
Develop and circulate the ICS 201-5 Site Safety and Control Analysis.	
Review and approve the ICS 206 Medical Plan.	
Ensure an incident-specific ICS 208 Site Safety Plan is developed for the incident response that complies with local and national safety regulations.	
Develop and implement intervention measures to prevent unsafe acts.	
Review all applicable national, state, and local health and safety regulations.	
During initial response, document hazard analysis process addressing hazard identification, personal protective equipment, control zones, and decontamination area.	
Investigate accidents that have occurred within the incident area.	
Assign assistants and manage the incident safety organisation.	
Assign safety specialist to the field and/or incident location to support, enforce, and manage safety plans and procedures including air monitoring support.	
Establish report/record accidents and mishap using Equinor's Incident Mishap Reporting Record.	
Use established methodologies to address operational risk management in the tactical planning process using the ICS 215a Safety Analysis.	
Provide safety advice in the IAP for assigned responders via the safety message on each ICS 204 Assignment List.	
Review the Incident Action Plan for safety implications.	
Participate in the planning cycle meetings, and other meetings and briefings as required.	
Ensure contractors/volunteers know of and complete appropriate safety training.	
If developed, review, task or provide input (air, land and water) to the Traffic Control Plan, if required.	
The Site Safety Plan shall, at a minimum, address, include, or contain the following elements: • Health and safety hazard analysis for each site task or operation using the Work Safety Analysis Worksheet (ICS 215A) as required • Comprehensive operations work plan • Personnel training requirements • PPE selection criteria • Site-specific occupational medical monitoring requirements • Air monitoring plan: area/personal • Site control measures • Confined space entry procedures (only if needed) • Pre-entry briefings (tailgate meetings), initial and as needed.	
Coordinate daily tailgate safety briefing/pre-operations health and safety conference for all incident participants and field personnel.	
Participate in tactics meetings to identify any health and safety concerns inherent in the operations daily work plan.	
Demobilisation phase	
Ensure all required forms, reports, and documents are completed prior to demob.	
Have debriefing session with the Incident Commander prior to demobilisation.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	

6.0 Equinor liaison officer

Task	Completed?
Initial phase	
Receive briefing from the Incident Commander	
Determine need for additional staff, organise, brief and assign assistants.	
Make required and courtesy notifications to regulatory agencies and potentially affected parties as requested by the Incident Commander.	
Ongoing response phase	
Brief the Incident Commander on agency issues and concerns.	
Serve as the primary coordinator for the liaison network, including State Liaison Officers, government, country or agency representatives, if appropriate, and state/provincial, tribal/first nations and local governments.	
Coordinate activities of visiting dignitaries.	
Maintain a list of assisting and cooperating agencies, including name and contact information. Monitor check-in sheets daily to ensure that all appropriate personnel are identified.	
Prepare for and participate in the planning cycle process meetings and briefings as required.	
Assist in the development of the Information Management Plan, if established.	
Develop stakeholder coordination/engagement plan, including public meeting schedules, if needed.	
Keep agencies supporting the incident aware of incident status.	
Arrange consultation with nationally recognised Aboriginal groups, as appropriate.	
Obtain input on issues and concerns from identified organisations, vet with appropriate response personnel, and communicate resolutions back to the organisations.	
Implement applicable plans, policies and procedures.	
Monitor incident operations to identify current or potential inter-organizational problems.	
Coordinate response resources for environmental impact assessment and response activities to protect EPBC protected matters and priority protection areas with the Operations Section Chief and Environmental Unit Leader.	
Coordinate resource needs for incident investigation activities with the Incident Commander.	
Coordinate with Public Information Officer on media and stakeholder's perception of risk associated to the incident.	
Coordinate information sharing and distribution with the Public Information Officer.	
Coordinate, develop and implement an ICS 205 Communications Plan identifying stakeholder/public interface and usage.	
Coordinate with Environmental Unit Leader to obtain information and materials to address the community's environmental concerns.	
Establish a liaison area near the Command Centre to assist local government agencies.	
Coordinate with the Situation Unit Leader to ensure the incident event log is being maintained regarding liaison related key events and actions.	
Obtain input on issues and concerns from identified organisations, vet with appropriate response personnel and communicate resolutions back to the organisations.	
Be a contact point for non-jurisdictional agencies, NGOs, special interest groups, or other organisations seeking input to the response.	
Demobilisation phase	
Have debriefing session with the Incident Commander prior to departure/demobilisation.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	

7.0 Operations section chief

Task	Completed?
Initial phase	
Obtain briefing from the Incident Commander.	
Ensure public and responder safety is communicated as top priority at all times.	
Evaluate on-scene operations and adjust operations organization, strategies, and tactics as necessary.	
Develop initial phase work assignments and allocate tactical resources based on strategy requirements using established response plans and track using ICS 215 Operational Planning Worksheet.	
Ongoing response phase	
Evaluate and request sufficient section staffing for both operational and planning activities.	
Supervise and adjust operations organisation and tactics as necessary.	
Follow the resource ordering process and document initial callout of resources and personnel and provide updates to the Resource Unit Leader.	
Use organisational components to build the operations section organisation to maintain span of control through functional and geographical operations.	
Develop ICS 201-3 or ICS 207 identifying the operations section organisation and personnel.	
Coordinate with the Safety Officer, ensure that operations section personnel execute work assignments following processes, procedures and best practices.	
Coordinate planned activities with the Safety Officer and appropriate agency representatives to ensure compliance with required safety practices.	
Develop initial phase work assignments and allocate tactical resources based on strategy requirements.	
Identify and use staging areas and request additional facilities as needed.	
Evaluate and monitor current situation for use in next operational period planning.	
Ensure the Situation Unit Leader is advised of changes in the status of operations and resources. Provide input into the Incident Event Log and ICS 209 Incident Status Summary (mass balance, waste management, and resource allocation) as necessary.	
Ensure the Resource Unit Leader is advised of changes in the status of resources assigned to the section.	
Assemble/dissemble task force and strike teams as appropriate.	
Prepare for and participate in planning cycle meetings as required.	
Work with Planning Section Chief to prepare the ICS 234 Work Analysis Matrix to convert operational objectives into strategic and tactical options and ensure those options are in line with ICS 202 Incident Objectives.	
Coordinate and consult with the Planning Section Chief, Safety Officer, technical specialists and review modelling scenarios, oil spill trajectories, NEBA and other data collected to ensure selection of appropriate strategies and tactics to accomplish objectives.	
Determine the need for any type specialised resources.	
Request from appropriate government agencies either safety and security zones or temporary flight restriction declarations around and over the incident response zone, when warranted.	
Determine the need for an Air Operations Branch Director.	
Implement air space de-confliction plans as required.	
Work with Planning Section Chief to develop the ICS 234 Work Analysis Matrix during the preparation for tactics work period.	

Task	Completed?
Prepare (in conjunction with the Resource Unit Leader, Safety Officer, and others) the ICS 215 Operational Planning Worksheet using tactics and work areas identified on the ICS 234 Work Analysis Matrix.	
Communicate overall objectives of response effort to operations personnel.	
Interact and coordinate with Unified Command on achievements, issues, problems, significant changes special activities, events, and occurrences.	
Identify kind and number of resources required to support selected strategies.	
Participate in the planning process and the development of the tactical portions (ICS 204 Assignment List and ICS 220 Air Operations Plan) of the Incident Action Plan.	
Review and approve final ICS 204(s) prior to IAP approval.	
Implement the Incident Action Plan for the operations section.	
Ensure operations section personnel execute work assignments following approved safety practices.	
Update, review or approve changes to the Incident Action Plan during the operational period, as necessary.	
Investigate the possibility of using an approved dispersant to facilitate recovery operations.	
Participate in operational briefings to IMT members as well as briefings to media and visiting dignitaries.	
Demobilisation phase	
Assist with development of long-range strategic, contingency, and demobilisation plans.	
Receive and implement applicable portions of the incident Demobilisation Plan.	
Develop recommended list of section resources to be demobilised and initiate recommendation for release when appropriate.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	

8.0 Air operations branch director

Task	Completed?
Initial phase	
Receive initial briefing from Operations Section Chief or Deputy and/or On-Scene Commander or briefing from person you are relieving.	
On-going response phase	
Obtain the Incident Action Plan from Operations Section Chief, including ICS 220 Air Operations Summary.	
Organise preliminary air operations.	
Coordinate airspace use with the appropriate government agency. Request declaration (or cancellation) of temporary flight restrictions, as appropriate, and post required notices, as required.	
Coordinate air space de-confliction via air task orders or flight schedules for aircraft involved in the incident.	
Attend the tactics and planning meetings to obtain information for completing ICS 220 Air Operations Summary.	
Identify resources and supplies dispatched for the Air Tactical Group.	
Request special air tactical items from appropriate sources through Logistics.	
Participate in preparation of the Incident Action Plan as needed, per the Operations Section Chief or Deputy. Insure that the air operations portion of the Incident Action Plan accounts for air traffic control requirements of assigned aircraft.	
Coordinate with the Communications Unit Leader to designate air tactical and support frequencies. Obtain assigned ground-to-air frequency for airbase operations from Communications Unit Leader or ICS 205 Communications Plan.	
Perform operational planning for air operations.	
Prepare and provide ICS 220 Air Operations Summary to the Air Support Group and Fixed-Wing Bases.	
Supervise all air operations activities associated with the incident.	
Evaluate heli-base and heli-spot locations.	
Establish procedures for emergency reassignment of aircraft.	
Coordinate approved flights of non-incident aircraft in the area of temporary flight restrictions.	
Coordinate agency air assets with the appropriate Command Centre(s) through normal channels on incident air operations activities.	
Consider requests for logistical use of incident aircraft.	
Inform OSC of capability to provide night flying service.	
Report to the OSC/DOSC on air operations activities.	
Report special incidents/accidents.	
Develop aviation ICS 208 Site Safety Plan with the Safety Officer (SOFR).	
Identify locations for possible MEDIVACs.	
Demobilisation phase	
Arrange for an accident investigation team when warranted.	
Debrief with OSC/DOSC as directed at the end of each shift.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader (DOCL) for disposition.	

9.0 Planning section chief

Task	Completed?
Initial phase	
Obtain briefing from the Incident Commander.	
Assign personnel already on-site and request additional personnel to staff planning section positions appropriately (ensure compliance with organisational emergency response plans, as appropriate).	
On-going response phase	
Manage input to the Incident Event Log with the Situation Unit Leader.	
Keep Incident Commander /IMT appraised of any significant changes in incident status.	
Work with Incident Commander and section chiefs to prepare draft ICS 202 Incident Objectives and ICS 202A Command Direction.	
Manage collection, processing, and displaying of incident information with Situation Unit Leader.	
Establish special information collection activities as necessary (e.g., weather, environmental, etc.).	
Supervise the tracking of incident personnel and resources through the Resource Unit Leader.	
Oversee document management process with Legal Officer and Documentation Unit Leader.	
Assist Operations Section Chief to develop response strategies, including appropriate alternative strategies.	
Facilitate planning cycle meetings and briefings.	
Develop ICS 230 Daily Meeting Schedule in conjunction with the Incident Commander and Situation Unit Leader.	
Provide periodic predictions on incident potential.	
Coordinate with Public Information Officer, Equinor Liaison Officer on the current situation and resource status so that release of information is accurate.	
Oversee information management processes and plans, including the development and approval of the Information Management Plan.	
Support information requirements and reporting schedules for planning section.	
Ensure the accuracy of all information being produced by planning section units with special attention to ICS 202B Incident Commander critical information requirements.	
Assist Operations with development of the ICS 234 Work Analysis Matrix and ICS 215 Operational Planning Worksheet. Facilitate tactics development process.	
Supervise preparation of the Incident Action Plan.	
Determine the need to create an Information Management Plan to establish a process of maintaining situational awareness through formal information flow.	
Coordinate with the Deputy Incident Commander to identify internal and external reporting requirements of agencies/organisations within the Unified Command. Assign Deputy Planning Section Chief the task of managing information from the field and within the IMT using the Deputy IC, SITL, and the Public Information Officer.	
Incorporate plans (e.g., Traffic Control Plan, Medical Plan, Communications Plan, Site Safety Plan) into Incident Action Plan.	
Develop other incident supporting plans (e.g., decontamination, demobilisation, TRPs, SCAT plans).	
Assemble information on alternative strategies.	
Confirm required internal and external notifications have been made with Situation Unit Leader and Equinor Liaison Officer.	
Assign technical specialists throughout organisation where needed.	
Demobilisation phase	
Oversee preparation and implementation of the Incident Demobilisation Plan.	
Prepare general plan for long term incident.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	

10.0 Environmental unit lead

Task	Completed?
Initial phase	
Obtain a briefing and special instructions from the Planning Section Chief.	
Evaluate and determine appropriate staffing requirements to meet incident needs.	
On-going response phase	
Coordinate actions with appropriate agencies.	
Identify protection priorities, EPBC protect matters and sensitive areas. Conduct NEBA and recommend associated response strategies and prioritise for protection.	
Develop ICS 232 Resources at Risk and ICS 232a ACP Site Index forms as required to document sensitive areas, resources at risk, and areas of environmental interest.	
Following consultation with natural resource trustees, provide input on wildlife protection strategies (e.g., removing oiled carcasses, pre-emptive capture, hazing, and/or capture and treatment).	
Support the development of the Information Management Plan to ensure appropriate tasking, data, collection, assessment, validation, and dissemination of information is conducted.	
Develop an Environmental Risk Communications section in the Information Management Plan to assess and address stakeholder perceptions and concerns about environmental, safety, health risks, and hazards.	
Coordinate with the Equinor Liaison Officer, Public Information Officer, and Safety Officer to sample, compile, and assess data for stakeholder coordination plan, social media plan, and risk communications appendix (e.g. sample results, pollution transport and fate, seafood safety, and dispersant).	
Coordinate with the Equinor Liaison Officer to develop an academia coordination plan as needed to address pollutant transport, fate, extent of contamination, and potential hazards to the public.	
Determine the extent, fate, and effects of contamination.	
Acquire, distribute, and provide analysis of weather forecasts.	
Monitor the environmental consequences of response actions.	
Participate in the Prep for Tactics timeframe work activities (ICS 234/215/215E) and in development of ICS 204 Assignment Lists to identify potential environmental concerns and associated mitigation measures.	
Work with the Operations Section Chief to determine response actions with the greatest net environmental benefit and monitor the environmental consequences of response actions.	
Prepare ISC 215E Environmental Analysis to develop environmental considerations covering proposed tactics for next operational period.	
Develop shoreline clean-up and assessment plans. Identify the need for and prepare any special advisories or orders.	
Identify the need for, and obtain, permits, consultations, and other authorisations, including government agency provisions.	
Coordinate with the Air Operations Branch Director for the establishment of flight restrictions, if necessary, for sensitive wildlife areas.	
Following consultation with the State Liaison Officer on cultural resources, identify and develop plans for protection of affected cultural resources.	
Evaluate the opportunities to use various response technologies.	
Demobilisation phase	
Develop disposal and decontamination plans.	
Develop a plan for collecting, transporting, and analysing samples.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader (for storage.	

11.0 Logistics section chief

Task	Completed?
Initial phase	
Receive initial briefing from Incident Commander/Unified Command.	
Determine the size, organisation and staffing needs of the Logistics Section as required to support the incident.	
Assign work locations and preliminary work tasks to section personnel.	
Notify the planning section/resources unit of the logistics section units activated, including names and locations of assigned personnel.	
Assemble and brief logistics branch on their duties and expectations.	
Ongoing response phase	
Participate in the planning cycle process as required.	
Determine and supply immediate incident resource and facility needs.	
Coordinate and process requests for additional resources with Resource Unit Leader and Operations Section Chief.	
Develop resource ordering process with Finance Section Chief.	
In conjunction with Incident Command, develop and advise all sections of the IMT resource approval and requesting process, the resource approval process, and use of an ICS 213 Resource Request.	
Participate in the tactical planning process and review proposed tactics for next operational period for ability to provide resources and logistical support using the ICS 215 Operational Planning Worksheet.	
Advise Incident Commander and Section Chiefs on resource availability for incident needs.	
Oversee development and review the ICS 205 Communications Plan, ICS 206 Medical Plan, Traffic Control Plan, Vessel Plan, and Security Plan, as required.	
Establish communications network (computer, radio, phone, etc.) for incident command post and field operations.	
Identify resource needs for incident contingencies.	
Determine the type and amount of resources ordered and en-route to include reporting of status/location.	
Identify service and support requirements for additional resources by Operations.	
Advise Section Chiefs on resource limitations, constraints and appropriateness.	
Provide input to the Information Management Plan.	
Track resource effectiveness and make necessary adjustments.	
Identify contingency locations for incident facilities (i.e. incident command post).	
Coordinate meal support for all incident facilities if staffed.	
Coordinate ICS 206 Medical Plan adjustments with Safety Officer and Medical Unit Leader if staffed.	
Participate in business management meeting with the Finance Section Chief.	
Request and set up expanded ordering processes as appropriate.	
Identify long-term service and support requirements for planned/expected operations.	
Demobilisation phase	
Provide logistics section resources to be included in the demobilised and prioritise release order.	
Receive and implement applicable portions of the Incident Demobilisation Plan which is prepared by planning section.	
Ensure the general welfare and safety of logistics section personnel.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	

12.0 Finance section chief

Task	Completed?
Initial phase	
Receive briefing from Incident Commander.	
Participate in incident planning cycle meetings and briefings as required.	
Ensure the financial recording software is open and access to the accounting line is established for the incident.	
Ongoing response phase	
Ensure that all funding obligation documents initiated at the incident are properly prepared and completed.	
Review operational plans and provide alternatives where financially appropriate.	
Prepare contracts with vendors or contractors as requested by logistics.	
Manage all financial aspects of the incident.	
Identify all funding sources and ceilings for the response operation.	
Provide financial and cost analysis information as requested.	
Gather pertinent information from briefings with responsible agencies.	
Develop operating plan for finance and administration sections and support needs.	
Determine the need to set up and operate an incident commissary.	
Meet with State Liaison Officer as needed.	
Maintain daily contact with agency/organisation management on finance and /administration matters as required.	
Coordinate with the Resource Unit Leader to ensure all personnel time records are accurately completed.	
Brief organisation administrative personnel on all incident-related financial issues needing attention or follow-up prior to leaving incident.	
Participate in business management meeting with the Logistics Section Chief.	
Actively manage incident funds, differentiating between the various funding sources used to carry out response activities.	
Ensure the reconciliation of financial management systems is performed in accordance with Incident Commander guidance.	
Adhere to Incident Commander processes and procedures.	
Conduct finance section status meetings, as required.	
Assess and ensure the adequacy of financial internal controls at the incident site.	
Assure that cost tracking services are provided prior to the arrival of a third-party cost monitoring service group.	
Assess staffing requirements and provide on-site management of third-party monitoring services.	
Serve as financial point of contact for costs incurred at site.	
Ensure that all personnel time records are accurately completed.	
Demobilisation phase	
Receive and implement applicable portions of the incident Demobilisation Plan.	
Provide financial and administrative input to demobilisation plan.	
Develop recommended list of section resources to be demobilised and initial recommendation for release when appropriate.	
Maintain ICS 214a Individual Log and forward to Documentation Unit Leader for storage.	