Appendix C

Excluded

Appendix D: Oil Spill Trajectory Modelling

MEMORANDUM

TO:	[redacted]	**DATE:**	6/12/2013
FROM:	[redacted]	**REFERENCE:**	Q0122
RE:	Oil Spill Modelling for Bight Petroleum Seismic Survey, SA		

1 INTRODUCTION

Bight Petroleum is planning to embark on an exploration seismic survey program within the proposed survey area located south of Eyre Peninsula in Lease Blocks EPP 41 and 42.

The release site selected for this study is situated in the northwest section of the survey area (i.e. closest point to the mainland and islands), approximately 75 km south of Eyre Peninsula and 105 km west of Kangaroo Island, in the Great Australian Bight (Figure 1). The depth of water at the release site is approximately 135 m.

The proposed period of operations is schedule for January to June 2013.

Prior to the commencement of the seismic survey program, Bight Petroleum commissioned Asia-Pacific Applied Science Associates (APASA) to conduct a stochastic hydrocarbon spill modelling study to assess the likely probability of exposure to the sea-surface and contact to the shorelines from a hypothetical, yet plausible scenario. The details of the scenario are provided in Table 1.

Sensitive areas surrounding the survey area are shown in Figure 2.

Exposure to surrounding waters and contact with shorelines was calculated using the advanced trajectory and fates model, OILMAP. The OILMAP physical fates model calculates the transport, spreading, entrainment and evaporation of spilled hydrocarbon over time, based on the prevailing metocean conditions during the January to June and the physical and chemical properties of the marine gas oil (MGO) used in the modelling.

A stochastic modelling approach, involving repeated simulations of the same spill scenario (i.e. 200 for the scenario) under different, randomly sampled, conditions during the January to June period was used. This type of modelling can objectively define the probability of contact to surrounding waters from hydrocarbons, at thicknesses exceeding a minimum threshold.

Please note that the OILIMAP system, the methods and analysis presented herein use modelling algorithms which have been anonymously peer reviewed and

published in international journals. Further, Asia-Pacific ASA warrants that this work meets and exceeds the ASTM Standard F2067-07 "*Standard Practice for Development and Use of Oil Spill Models*".

Note that the modelling does not take into consideration any of the spill prevention, mitigation and response capabilities that Bight Petroleum propose to have in place during the seismic survey. The modelling makes no allowance for intervention following a spill to reduce volumes and/or prevent hydrocarbons from reaching sensitive areas.

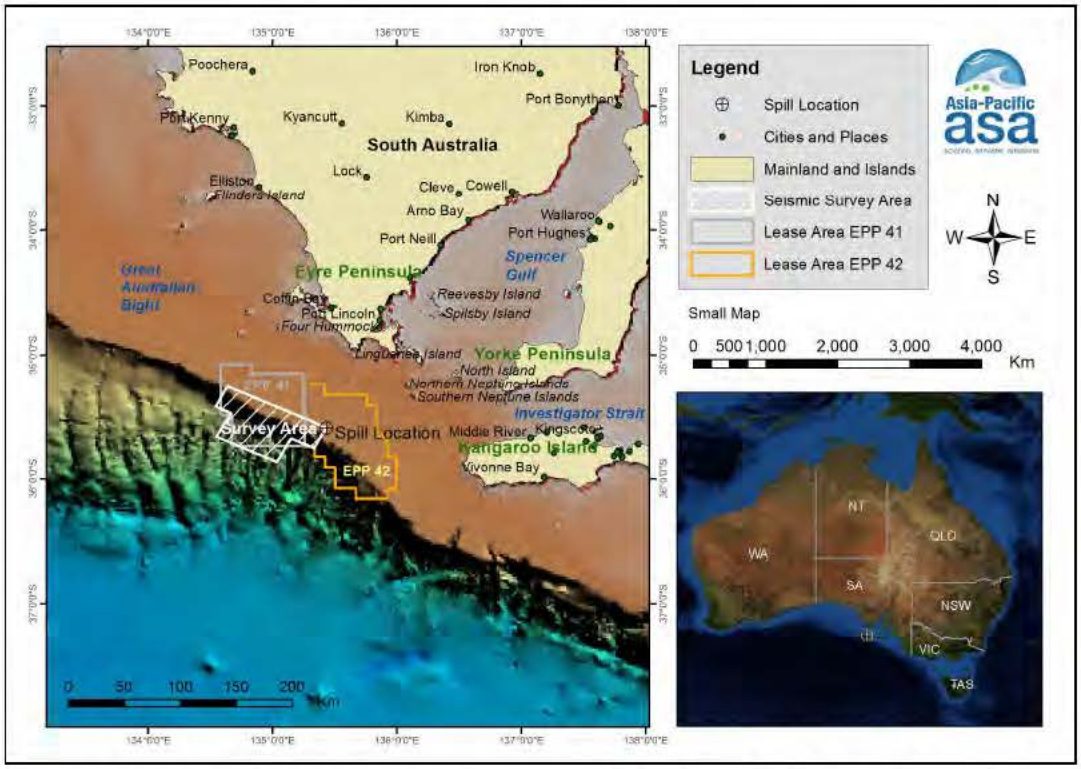

Figure 1: Location of the survey area, lease areas EPP 41 and EPP 42, and the release site used for the seismic survey modelling study.

Table 1: Summary of model settings used for spill modelling.

Scenario description	Loss of fuel tank
Release type	Sea-surface
Release rate	50 m^3/hour
Release duration	6 hours
Total release volume	300 m^3
Oil type	Marine gas oil
Period analysed	January to June
Release location	35°35.71' S, 135°26.05' E
Minimum oil thickness each spill is tracked to on the sea-surface (or zones of sea-surface exposure)	- 0.5 g/m^2 (~ 0.5 µm) (very low exposure) - 10 g/m^2 (~ 10 µm) (moderate exposure)

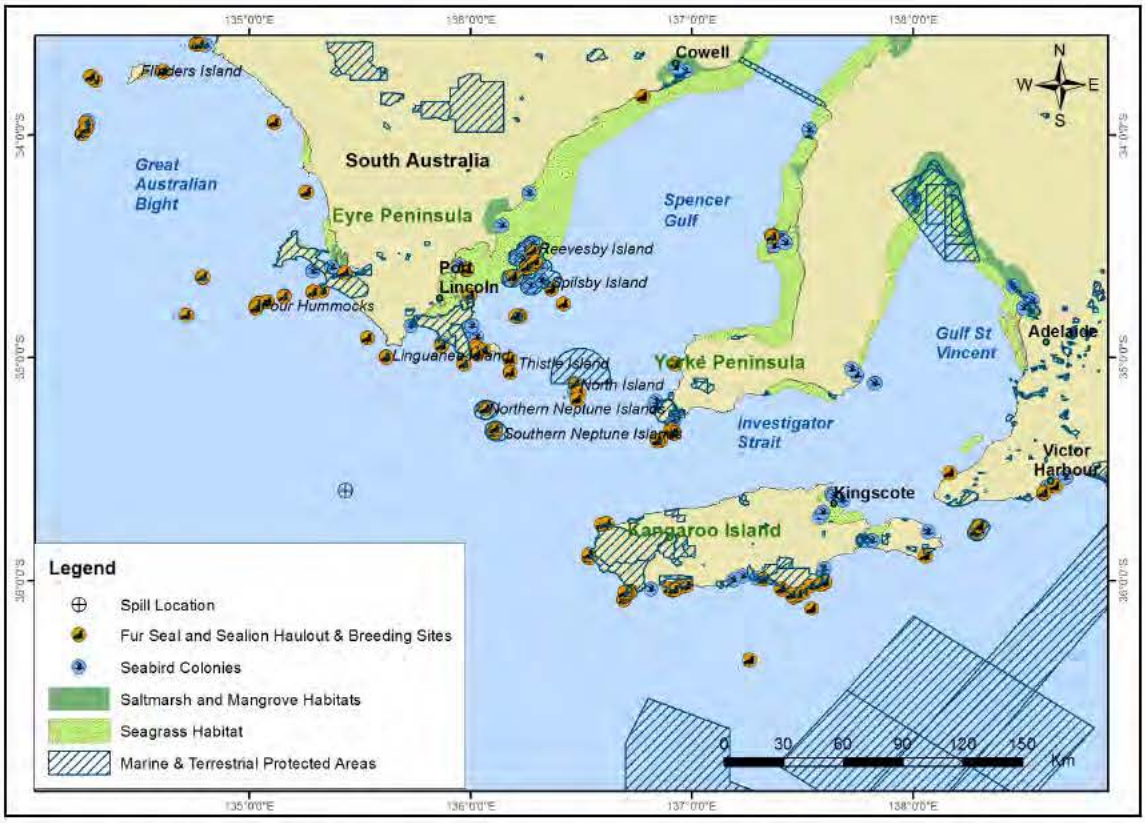

Figure 2: Location of the biological resources surrounding the release site used in the seismic survey modeling study.

1.1 HYDROCARBON PROPERTIES

For the purpose of this study, the oil type used as input into the oil spill model was a marine gas oil (MGO), chosen from the OILMAP database.

MGO has an initial density of 842 kg/m^3 (API 36.5), a dynamic viscosity of 7 cP and a flash point of 73ºC. Diesel is classified as a Group 3 (AMSA, 2012).

Figure 3 illustrates a sample weathering and fates graphs for a 300 m^3 surface release of MGO over 6 hours, under 3 static winds of different magnitudes (5, 10 and 15 knots). As the graph demonstrates, MGO has a strong tendency to physically entrain into the upper water column in the presence of moderate winds (i.e. >12 knots) or waves. When these energies abate, it is expected that entrained MGO resurface, potentially away from the release site.

Within 5 days of simulation, approximately 50 to 60% of the total volume spilled was lost to the atmosphere, under any of the three static wind conditions assessed.

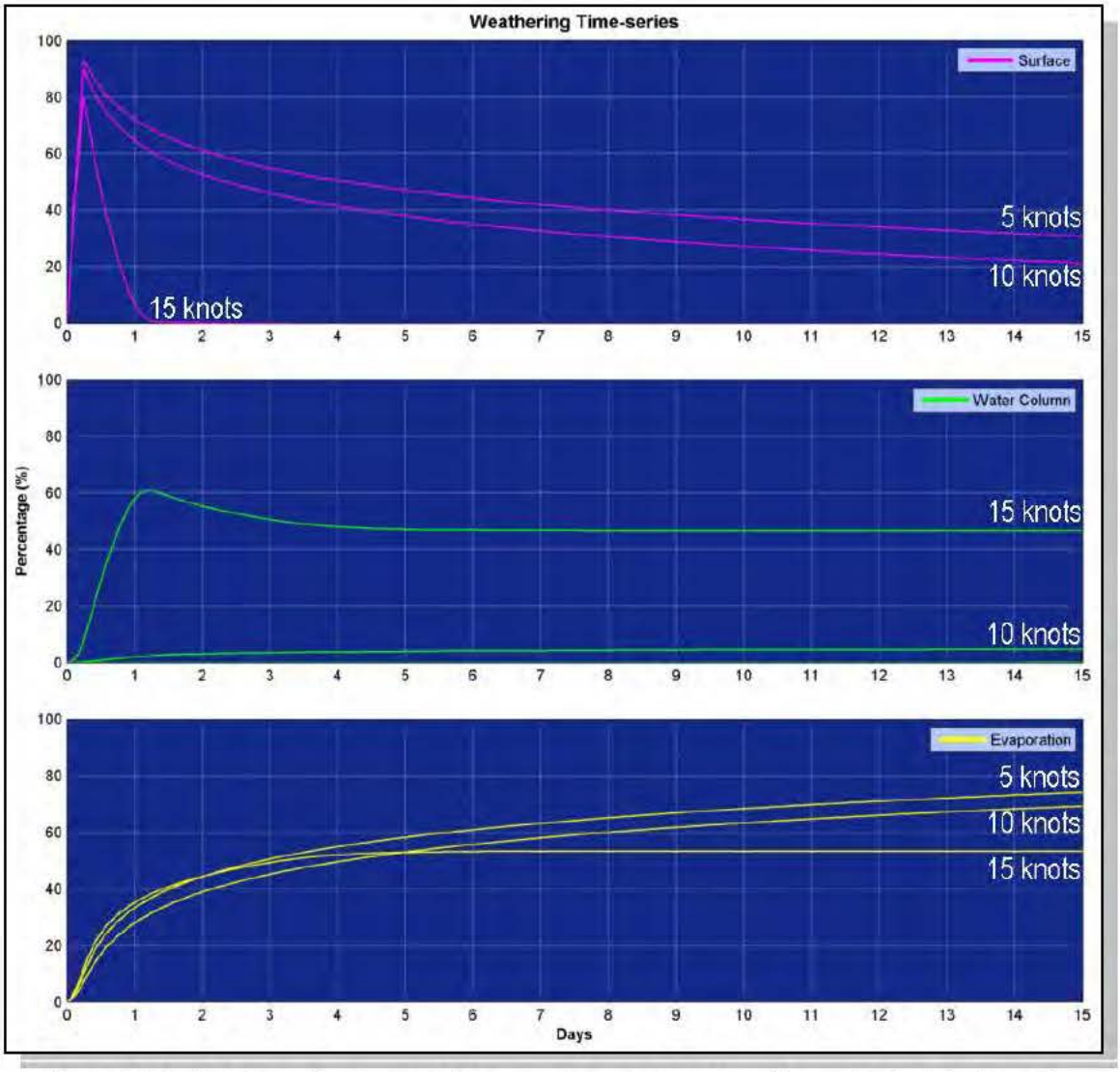

Figure 3: Predicted weathering and fates graphs, as percentage for a selected single spill trajectory under 3 constant wind conditions. Results are based on a 300 m^3 surface release of MGO over 6 hours.

1.2 SEA-SURFACE AND SHORELINE THRESHOLDS

The OILMAP model is able to track hydrocarbons to levels that are lower than biologically significant or visible to the naked eye. Therefore, reporting thresholds have been specified (based on scientific literature) to control the recording of "contact/exposure" to locations when at meaningful levels only.

Based on literature reviews of oil effects on aquatic birds and marine mammals by Engelhardt (1983), Clark (1984), Geraci and St. Aubin (1988), and Jenssen (1994), the threshold thickness of oil that could be harmful to some intersecting wildlife individual is 10 g/m^2 (~10 µm). Hence, 10 g/m^2 has been selected to define the moderate exposure zone. Below 0.5 g/m^2, surface hydrocarbons are unlikely to be visible, even from an aircraft, unless fitted with specialist remote sensing equipment (AMSA, 2012). Figure 4 is a photograph illustrating the difference in appearance of spilled oil in the marine environment. Table 2 provides a summary of the threshold concentrations applied during the modelling study for reporting potential sea-surface and shoreline exposure.

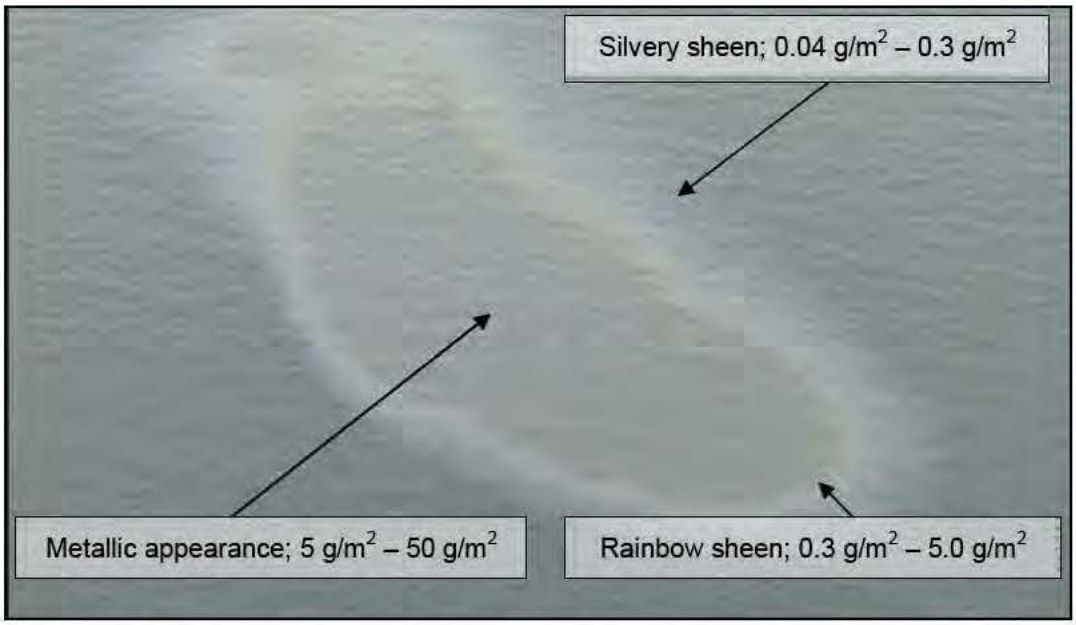

Figure 4: A photograph showing the difference between metallic appearance in the centre and the silvery and rainbow sheen oil around the edges. The thickness of the metallic is between 5 g/m^2 – 50 g/m^2; rainbow sheen is between 0.3 g/m^2 – 5.0 g/m^2; and silvery sheen is between 0.04 g/m^2 – 0.3 g/m^2. (source: Bonn Agreement Aerial Surveillance Handbook, 2004 – Part 3, Annex A).

Table 2: Sea-surface and shoreline threshold values applied as part of the modelling study.

Threshold value (µm or g/m^2)	Potential level of exposure
0.5	Very low exposure
1	Low exposure
10	Moderate exposure
25	High exposure

2 RESULTS

The OILMAP's stochastic module was used to simulate 200 hypothetical trajectories from a 300 m^3 surface release of diesel from the selected release site.

When interpreting the stochastic results, it should be noted that the estimators (probability and load) are calculated independently for each surface location in the model domain. Hence, the plots do not show the extent of effect that would be expected from any single release. Rather, the contours show likelihood of contact, given the predicted weathering rates, wind and current patterns for randomly selected time-periods. For example, areas enclosed by a 0-5% probability contour were exposed (above the chosen thickness threshold of 0.5 and 10 g/m^2) by at least 1 and up to 5% of the total number of simulated spills undertaken.

Locations with higher probability ratings were exposed during a greater number of spill simulations, indicating that the combination of the prevailing wind and current conditions are more likely to result in contact to these locations. The areas outside of the 0-100% contour indicate that contact will be unlikely under the range of prevailing conditions for this region and the respective season. It is important to note that the probabilities are derived from the samples of data used in the modelling. Therefore, a zero value does not necessarily indicate absolutely "no likelihood" of an outcome, but a generally low probability.

Upon completion, the stochastic results for the scenario were reviewed and the spill trajectory with the highest amount of oil reaching shore was identified (see Section 2.1.12.1.1) and displayed as surface oil thicknesses based on the Bonn Agreement thresholds. All stochastic results are provided in Section 2.1.2.

Note the results herein provide the reader with a better understanding of the likely simulated trajectories and weathering, not actual occurrences.

2.1.1 Single Worst Case Trajectory

The "worst case" spill trajectory resulting in the greatest probability of shoreline contact (i.e. the worst case single run) for the 0.5 µm threshold, was identified to occur at 3:00 am, 7th June 2010.

Figure 5 shows screenshots of the surface oil thickness at 10 and 19 hours and at 2, 4, and 5 days after the initial release (3:00 am, 7th June 2010) for the worst case spill trajectory. Following the initial release, the spill trajectory was predicted to travel southeast from the spill site and dropping below 0.05 mm in thickness (50 µm) within 12 hours. The surface plume was driven subsurface by strong winds within 20 hours and didn't appear on the sea surface again until 2 days and 15 hours after the initial spill. Shoreline contact was made within 4 days and 1 hour to the Southern Neptune Islands, followed by contact to the Northern Neptune Islands, 20 hours later. Within

5 days and 11 hours after the initial release, no further diesel remained on the water surface at thicknesses above 0.5 µm.

Figure 6 and Figure 7 illustrates the fates and weathering graph for the identified worst case single spill trajectory. The figures illustrate the high evaporative potential of diesel, especially within the first day after the spill (up to 35%). The graphs also reveal the decline of oil on the water surface, corresponding to the increase of diesel in the water column and the evaporative loss. After 5 days (approximately 140 hours), over 50% of diesel (~160 m^3) was lost to evaporative processes and 90 m^3 (30%) remained within the water column, while there was still 10% on the sea surface, but at levels below the 0.5 µm threshold. A maximum of approximately 20 m^3 of diesel (~8%) stranded on shore during the 10 day tracking period.

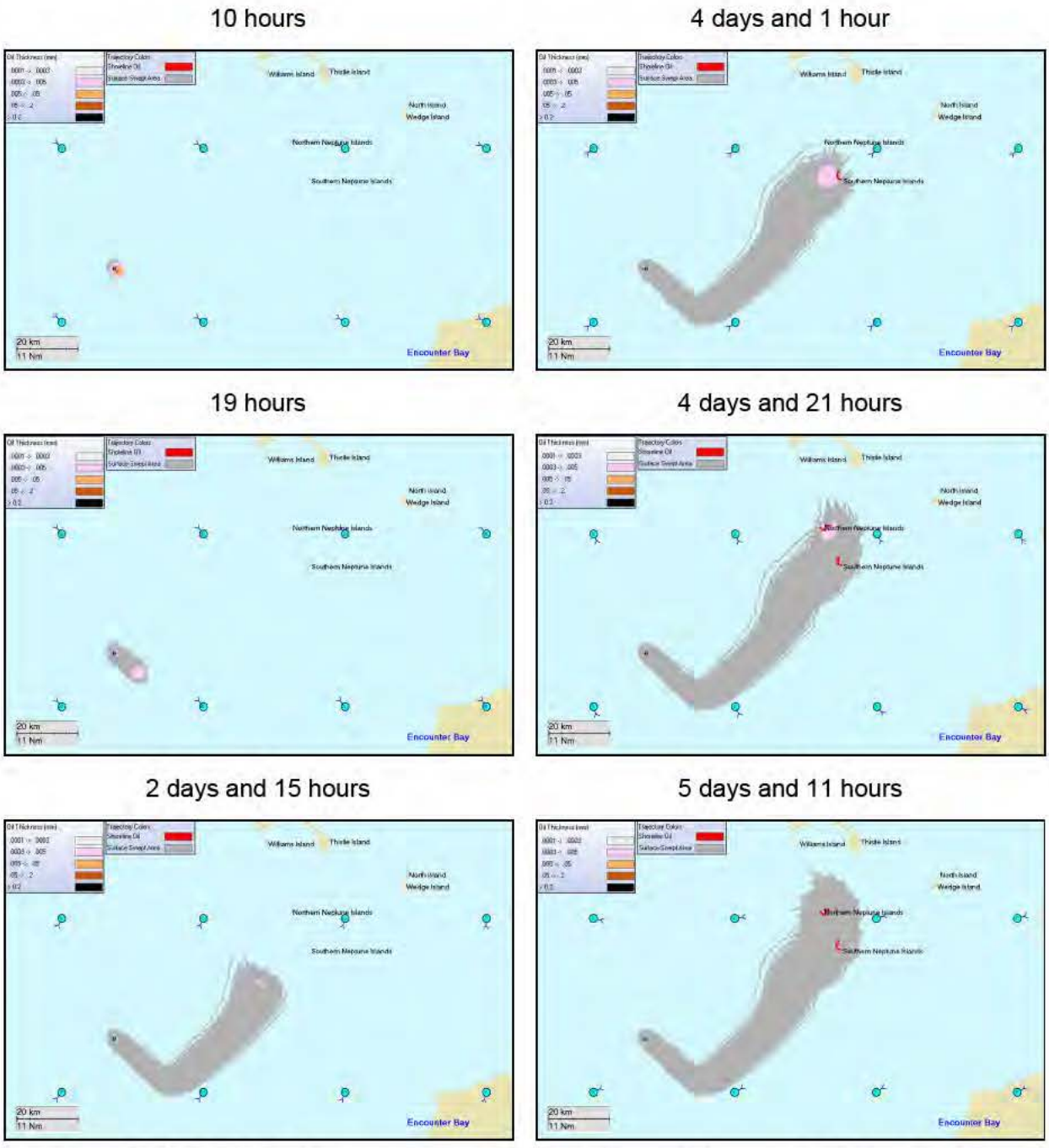

Figure 5: Predicted oil thickness on the sea surface at 10 and 19 hours and at 2, 4, and 5 days after the initial release (3:00 am, 7th June 2010) for the worst case spill trajectory identified from the diesel scenario. Results are based on a 300 m^3 release of diesel over 6 hours, following a vessel spill incident during January to June wind and current conditions.

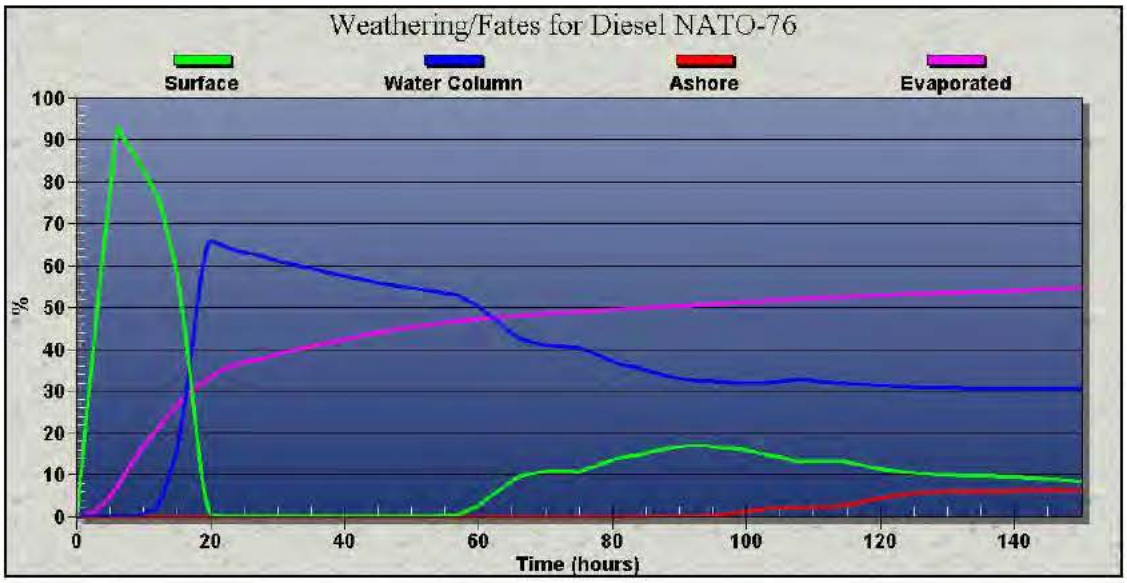

Figure 6: Predicted weathering and fates graph, as a function of percentage, for the worst case spill trajectory identified from the 200 simulations for the 0.5 µm threshold. Results are based on a 300 m^3 release of diesel over 6 hours, following a vessel spill incident. The output is calculated for each grid cell and provides a summary from 200 spill trajectories modelled, during January to June wind and current conditions.

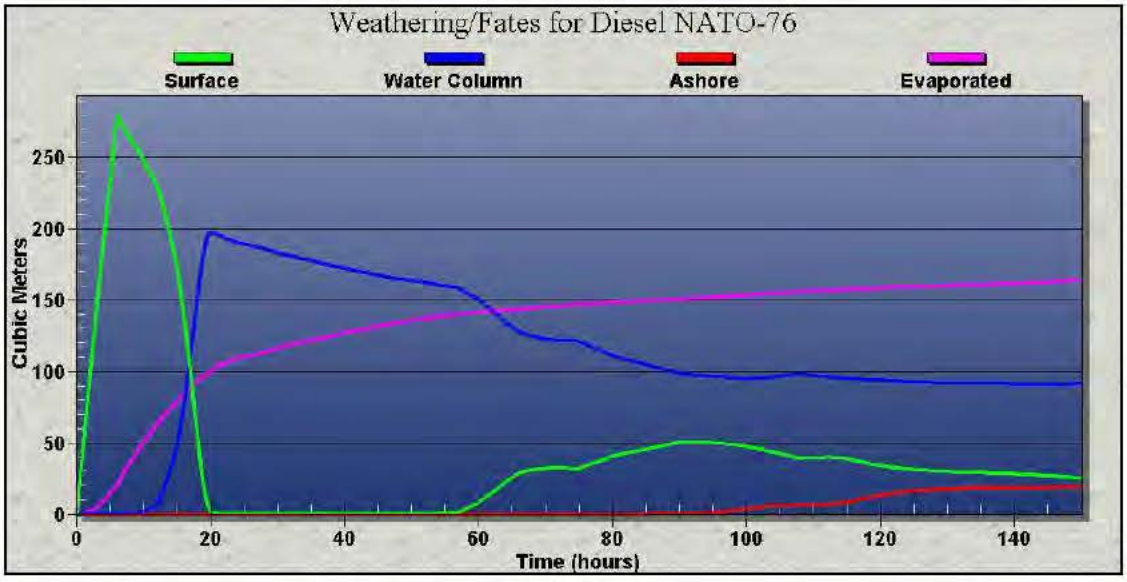

Figure 7: Predicted weathering and fates graph, as a function of volume, for the worst case spill trajectory identified from the 200 simulations for the 0.5 µm threshold. Results are based on a 300 m^3 release of diesel over 6 hours, following a vessel spill incident. The output is calculated for each grid cell and provides a summary from 200 spill trajectories modelled, during January to June wind and current conditions.

2.1.2 Stochastic Trajectory Analysis

Figure 8 shows the probability of sea-surface exposure for January to June conditions, reported for the minimum threshold thickness of 0.5 g/m^2 (very low exposure) and 10 g/m^2 (moderate exposure). The predicted minimum time before sea-surface exposure for both thresholds is presented in Figure 9.

Stochastic modelling for the very low exposure threshold (i.e. 0.5 g/m^2) showed the majority of exposure (i.e. 80%) remained in the vicinity of the selected release site, within a 25 km radius (Figure 8). Less than 5% of trajectories contacted surface waters up to 140 km northwest and south from the spill site. Additionally, a small number of trajectories (i.e. <5%) extended northeast towards the islands located at the mouth of Spencer Gulf and Investigator Strait. Shoreline contact was made for 18 out of 200 simulations (9% of trajectories, see Table 3) at the Northern and Southern Neptune Islands and at the southeast tip of Eyre Peninsula (Lincoln National Park) at the visible oil threshold. However, shoreline contact was not made at levels sufficient to cause environmental harm, as the conservative environmental threshold of 1 um did not make shoreline contact. Visible hydrocarbons were predicted to not persist beyond 7 days.

Stochastic modelling for the moderate exposure threshold (10 g/m^2) revealed a significantly smaller zone of sea surface exposure with the majority of exposure (i.e. 80%) remaining within a 10 km radius. Less than 5% of trajectories extended a maximum distance of 31 km northwest.

Table 3 provides a summary of the predicted shoreline statistics for any coastline and Table 4 provides a summary of the predicted shoreline contact to various mainland and island coastlines, for the 0.5 µm and 1 µm threshold. The minimum time to shoreline contact was 1.3 days and the maximum volume of oil predicted to contact the shore was ~19 m^3. Shoreline contact was only predicted for the 0.5 µm threshold.

Table 3: Summary of predicted shoreline statistics for any coastline. Results were calculated for a 300 m^3 release of diesel over 6 hours following a spill incident. The statistics were calculated from 200 spill trajectories modelled, during January to June wind and current conditions.

Shoreline statistics	***0.5 µm threshold***	***1 µm threshold***
Probability of contact to any shoreline (%)	9	0
Minimum time to shore (days)	1.3	0
Maximum volume of oil ashore (m^3)	18.94	0
Average volume of oil ashore (m^3)	3.63	0

Table 4: Summary of predicted shoreline contact to various mainland and island coastlines. Results were calculated from a 300 m^3 release of diesel over 6 hours, following a vessel spill incident. The statistics were calculated from 200 spill trajectories modelled.

	Minimum time (days) [hours] before shoreline contact above 0.5 µm (light oiling)	*Probability (%) of shoreline contact above 0.5 µm (light oiling)*	*Probability (%) of shoreline contact above 1 µm (moderate oiling)*
Eyre Peninsula – Lincoln National Park	3.6 [85]	1	0
Northern Neptune Islands Conservation Park	1.5 [37]	1	0
Southern Neptune Islands Conservation Park	1.4 [33]	1	0
William Island	0	0	0
Thistle Island	0	0	0
Wedge Island	0	0	0
Yorke Peninsula	0	0	0
Kangaroo Island	0	0	0
Rowley Shoals	0	0	0

Under the January to June conditions, predicted zones of heavy exposure from spilled hydrocarbons could potentially extent to a maximum of 18 km southeast of the release site (refer to Table 5 and Figure 10).

Table 5: Summary table of the potential zones of exposure from surface diesel, resulting from a 300 m^3 release of diesel over 6 hours following a spill incident. The output is calculated for each grid cell and provides a summary from 200 spill trajectories modelled, during January to June wind and current conditions.

Distance & direction of each zone	***Very low exposure***	***Low exposure***	***Moderate exposure***	***High exposure***
Max. distance from spill site (km)	140	126	31	18
Direction	WNW	WNW	NW	SSE

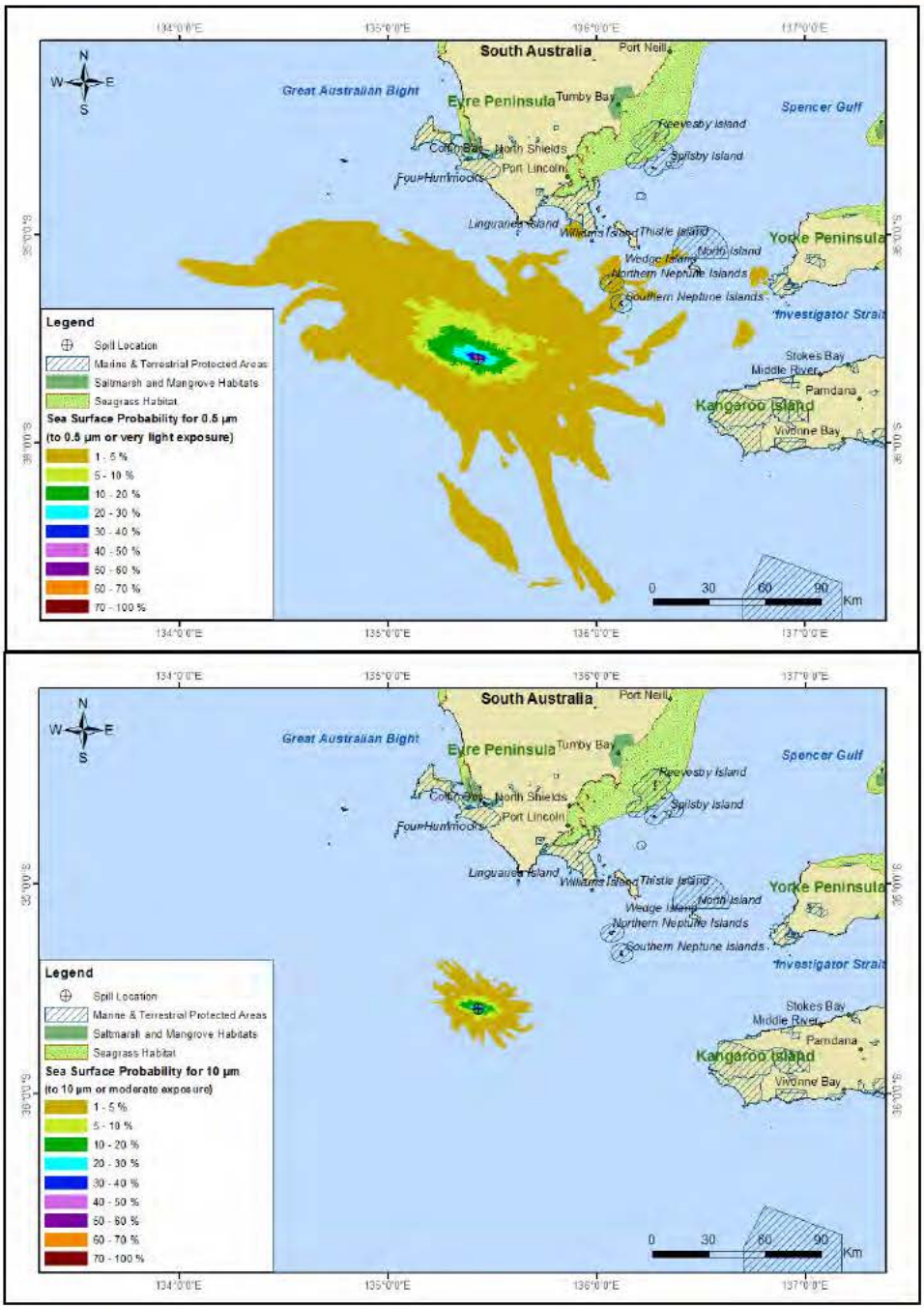

*Figure 8: Map showing the **probability of sea surface exposure** (reported to **0.5 g/m^2** (top) and **10 g/m^2** (bottom)), in the event of a 300 m^3 release of diesel over 6 hours, following a vessel spill incident. The output is calculated for each grid cell and provides a summary from 200 spill trajectories modelled, during **January to June** wind and current conditions.*

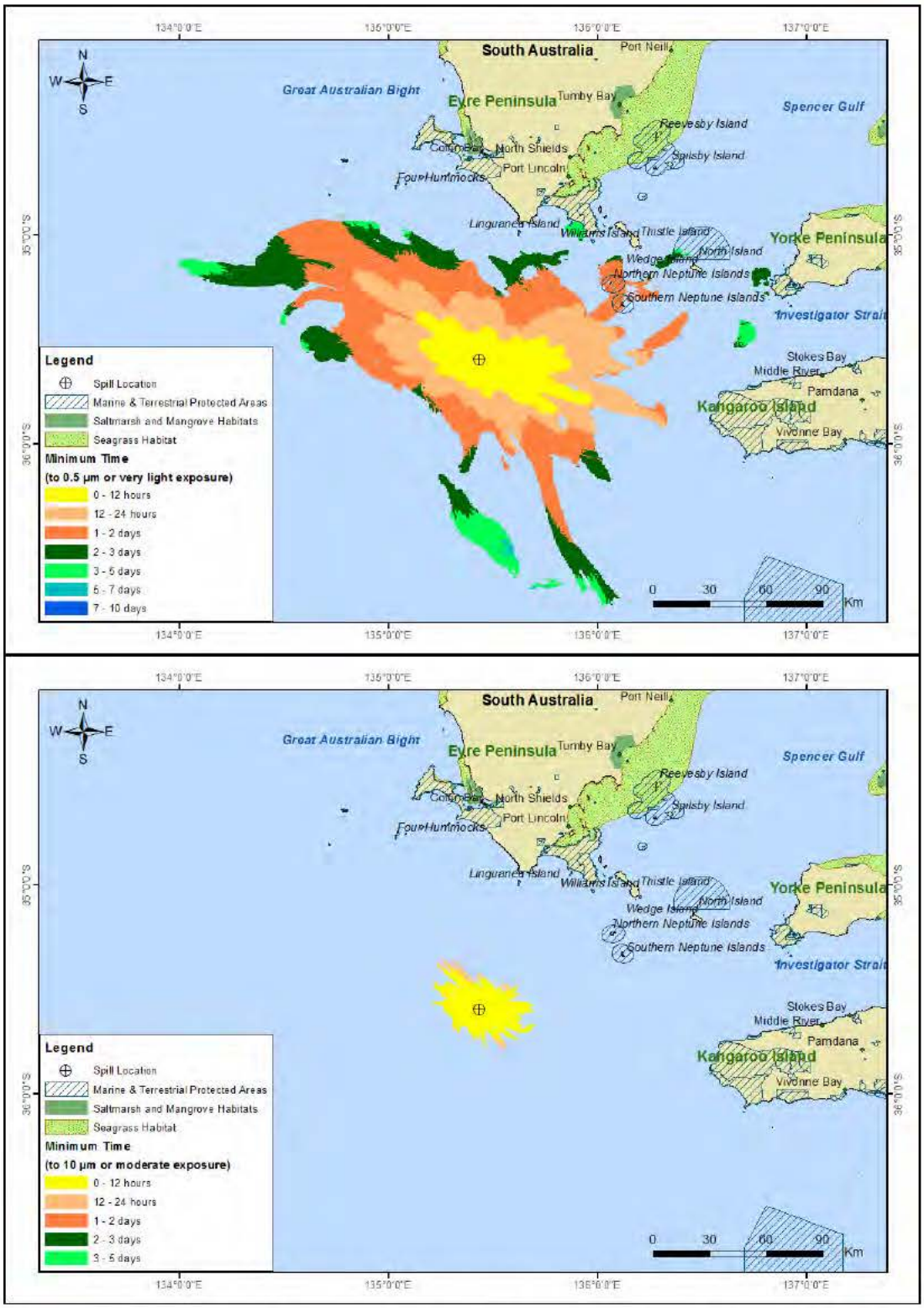

*Figure 9: Map showing the **minimum time to sea surface exposure** (reported to **0.5 g/m^2** (top) and **10 g/m^2** (bottom)), in the event of a 300 m^3 release of diesel over 6 hours, following a vessel spill incident. The output is calculated for each grid cell and provides a summary from 200 spill trajectories modelled, during **January to June** wind and current conditions.*

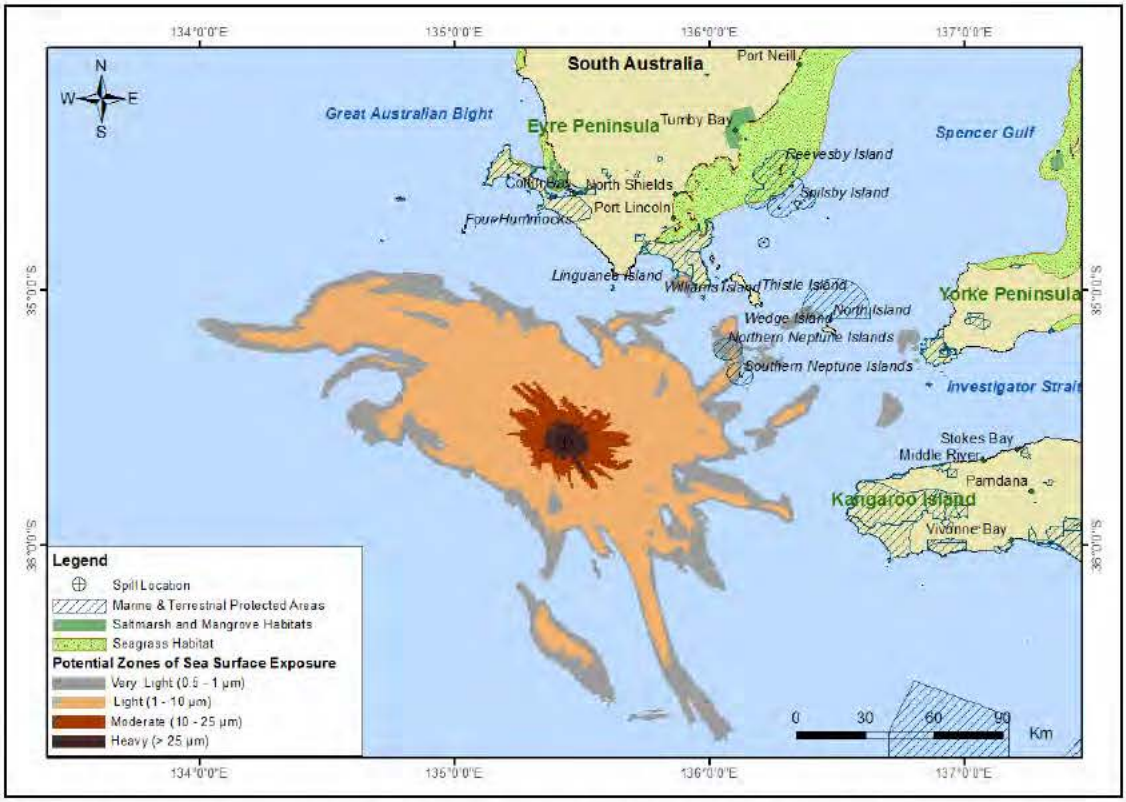

*Figure 10: Map showing the **potential zones** and **level of sea-surface exposure** in the event of a 300 m^3 release of diesel over 6 hours, following a vessel spill incident. The output is calculated for each grid cell and provides a summary from 200 spill trajectories modelled, during **January to June** wind and current conditions.*

3 REFERENCES

Australian Maritime Safety Authority (AMSA), 2012. Interim Technical Guideline for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities, 1-63.

Bonn Agreement, 2004. Part 3: Guidelines for oil pollution detection, investigation and post flight analysis/evaluation for volume estimation – Annex A: The Bonn Agreement oil appearance code in Bonn Agreement Aerial Surveillance Handbook. 96p.

Clark, R.B., 1984. Impact of Oil Pollution on Seabirds. Environmental Pollution 33, 1–22.

Engelhardt, F.R., 1983. Petroleum Effects on Marine Mammals. Aquatic Toxicology 4,199–217.

Geraci, J.R. and St. Aubin, D.J., 1988. Synthesis of Effects of Oil on Marine Mammals. Report to U.S. Department of the Interior, Minerals Management Service, Atlantic OCS Region, OCS Study, MMS 88 0049, Battelle Memorial Institute, Ventura, CA, 292 p.

Jenssen, B.M., 1994. Review article: Effects of Oil Pollution, Chemically Treated Oil, and Cleaning on the Thermal Balance of Birds. *Environmental Pollution* 86, 207–215.

Appendix E: Oil Spill Dispersed Oil Calculation

Assumptions:

1. Volume of MDO/MGO released to the marine environment (over 6hrs) is 300m^3
2. Review of Wind Data for region between March to May (EP Figure 3-4) indicates the most common wind speed band is between 12-24knots
3. Review of current information for region between March and May (EP Figure 3.5) is 0.2-0.4m/s (most likely) but 0.4-0.6m/s (possible) - parallel to coastline
4. Density of MGO/MDO is 0.842 kg/l [tonnes/m^3] (APASA, 2013)
5. Weathering data for MDO, based on regional conditions, at 15knots windspeed are (APASA, 2013):
   - After 1 Day: 40% evaporated, 0% surface, 60% entrained in water column
   - After 2 Days: 45% evalorpated, 0% surface, 55% entrained in water column
   - After 3 Days: 50% evaporated, 0% surface, 50% entrained in water column
   - After 4 Days: 55% evaporated, 0% surface, 45% entrained in water column
6. Concentration required for 96hrs to trigger a 99% species protection threshold = 700ppb (µg/l or g/ML) [Refer Section 5.7.1.1]
7. Dispersed oil, due to density differential with water, will be in the upper levels of the water column. Calculations are made for 1m (highly conservative) and 5m water depths.

Footprint Calculation:

Volume of MDO/MGO released to Environment =	300.00	m^3	
Volume of entrained (dispersed) oil in marine waters after 24hrs =	180.00	m^3	
Equivalent mass of oil =	151.56	tonnes	
	151560000.00	g	
Volume of Water affected by 180m^3 MDO/MGO after 24hrs based on 700ppb concentration =	216514.29	ML	
	216514285.71	m^3	
- Assuming entrained oil is evenly distributed across top 5m of water column: Area =	43302857.14	m^2	(6.6km x 6.6km)
	4330.29	Ha	

Distance Travelled Calculation:

Utilising current information to determine how far this leading edge (worst case concentration) may move parallel to the coastline
Note this does not account for:
- Additional dilution of concentrations which may occur due to minor cross currents
- Additional degradation/evaporation of the MDO/MGO which occurs over subsequent days
- Dispersion effects which will occur as the plume travels in the down-current direction

Most likely current speed is approximately 0.3m/s. Distance travelled in a 24hr period =	25920	m
	25.92	km
Possible current speed is approximately 0.5m/s. Distance travelled in a 24hr period =	43200	m
	43.2	km

Appendix F: Preliminary Master Commitments Listing

Invasive Marine Species (S5.3.1)	Vessels will undertake ballast water exchange in accordance with the vessel's Ballast Water Management Plan which conforms with the Australian Ballast Water Management Requirements (DAFF, 2011a) prior to entry into Australian waters.	Ballast Water Exchange Records show adherence to DAFF Requirements for international transit.	Seismic Contractor	Pre-MSS	No
		Records show that QPAR form submitted to AQIS is accepted prior to entry into port facilities	Seismic Contractor	Pre-MSS	No
	A risk assessment undertaken in accordance with the *National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (2009)* determines the IMS risk level of the vessels with corrective actions undertaken (as appropriate) reduces the IMS risk to low.	Biofouling Risk Assessment Records identify for non-local vessels all corrective actions have been implemented and the vessel carries a low risk	Seismic Contractor	Pre-MSS	No
	All in-field equipment has been removed from the water, inspected and cleaned prior to deployment in South Australian waters.	Records identify that the in-field equipment has been cleaned and inspected prior to deployment if mobilising from waters outside South Australia	Seismic Contractor	Pre-MSS	No
Disruption to Fishing Activities (S5.4.1)	The MSS vessel will deploy/retrieve equipment off the continental shelf to avoid fisheries interaction (in water depths greater than 500m).	Vessel log verifies streamer deployment occurred in deep waters off continental shelf.	MSS Vessel Master	Pre-MSS	No
	AHO is advised 6 weeks prior to Lightning MSS commencement to allow for the issue of a Notice to Mariners. The notification will describe the location, activity and duration of the survey.[121].	Records verify that Notice to Mariners issued by AHO prior to Lightning MSS commencement	BIGHT Project Manager	Pre-MSS	No
	Mobilisation notifications are issued to relevant stakeholders (as defined in **2**) five days prior to MSS commencement.	Records verify that mobilisation notifications have been sent to all relevant stakeholders (Section 6.4.2) within nominated timeframe.	BIGHT Project Manager	Pre-MSS	No
	Demobilisation notifications are issued to relevant stakeholders (as defined in **2**) three days after MSS completion.	Records verify that demobilisation notifications have been sent to all relevant stakeholders (Section 6.4.2) within nominated timeframe	BIGHT Project Manager	Post-MSS	No

[121] Also a requirement for Section 5.4.2 (Disruption to Commercial Fishing Activities) and for Section 5.7.1 (Oil Spill due to Fuel Tank Rupture/Leak)

Disruption to Fishing Activities (S5.4.1) (Con't)	AMSA RCC will be notified two weeks prior to the MSS activity commencing to allow for an AusCoast warning to be raised. The notification will describe the locations, activities and durations of the MSSs[122].	Records verify that the AMSA RCC AusCoast warning is issued for the duration of the MSS activity.	BIGHT Project Manager	Pre-MSS	No
	Routine bulletins provided to fishermen who fish in the area updating details on activities in sections (e.g. racetracks) of the survey area together with how long the vessel is likely to be operating in that section. This will include schedule changes to relevant fishermen.	Routine bulletin records issued to fishermen verify activity information has been provided.	BIGHT Offshore Representative	Ongoing during MSS	Yes
	A support vessel will scout within the MSS area for the duration of the MSS activity to ensure that possible spatial conflicts between MSS/fishing vessels are avoided[123].	Vessel logs verify the support vessel is present in the MSS area for the duration of MSS activities.	Vessel Master(s)	Ongoing during MSS	Yes
	Fishing Compensation for Temporarily Displaced Fishing Equipment: Compensation is paid to affected fishermen within the stated timeframe within Fishing Displacement Compensation Agreement.	Records of compensation confirm payment within stated timeframes.	BIGHT Project Manager	Post MSS	Yes
	In the event of spatial conflict towed SBT pontoons are given right-of-way over the seismic vessel	Vessel log verifies that on encounter with SBT Pontoons, vessel allows right-of-way of pontoons	Vessel Master(s)	Ongoing during MSS	Yes
	The acoustic array will not commence soft-start activities, and if operational will be shut-down, in the event that the seismic vessel is within 3km of a towed pontoon	MMO Master Sheet indicates that procedures for soft-start and shutdown are implemented appropriate to the towed pontoon presence	MMO	Ongoing during MSS	Yes
Disruption to Commercial Shipping Activities (S5.4.2)	The Vessel Master shall define based upon prevailing weather and sea-state conditions, the 'safe distance' to be implemented as separation distance between third party vessels and the MSS Vessel/Equipment. Marine crews shall adopt this distance and communicate with/warn third party vessels on this basis.	Vessel log records the 'safe distance' to be adopted between the MSS Vessel/Equipment and Third Party Vessels. Vessel log contains communication records to third parties based upon the 'safe distance' requirements.	Vessel Master	Ongoing during MSS	Yes

[122] Also a requirement for Section 5.4.2 (Disruption to Commercial Fishing Activities) and for Section 5.7.1 (Oil Spill due to Fuel Tank Rupture/Leak)
[123] Also a requirement for Section 5.4.2 (Disruption to Commercial Fishing Activities) and for Section 5.7.1 (Oil Spill due to Fuel Tank Rupture/Leak)

Disruption to Commercial Shipping Activities (S5.4.2) (Con't)	Vessels selected for the MSS to conform to the hardware requirements of AMSA *Marine Order 30: Prevention of Collisions* for AIS, navigation lighting, sound signals, day shapes, ARPA[124] and *Marine Order 27 – Radio Equipment* for radio equipment to ensure navigation safety equipment is present on vessels to prevent collisions.	Pre-mobilisation audit records verify that navigation safety equipment is present on all MSS vessels.	BIGHT Project Manager (*obtained via records from Seismic Contractor*)	Pre-MSS	No
	Navigation safety equipment (ARPA, AIS, radio, navigation lights – including backups) is maintained in accordance with Manufacturer's Specifications via the Planned Maintenance System (PMS) to ensure functionality for the duration of the MSS[125].	PMS records verify navigation safety equipment - ARPA, AIS, radio, navigation lights - are functional and operating to specification.	Vessel Master(s)	Ongoing during MSS	Yes
	All marine crews are trained, experienced and competent to *International Convention on Standards of Training, Certification and Watch-keeping for Sea-farers* (STCW95) requirements to ensure the identification of and communication with third party vessels during the MSS[126]	Training and competency records indicate that marine crew are competent to STCW95 requirements.	Vessel Master(s)	Pre-MSS & Crew Change	Yes (on Crew Change only)
	All vessels will maintain a 24/7 watch for third party vessels for the duration of the MSS activity[127].	Records of bridge watch activities show adherence to these requirements.	Vessel Master(s)	Ongoing during MSS	Yes
Artificial Lighting Impacts (S5.4.3)	Vessels selected for the MSS conforms to the requirements of AMSA Marine Order 30: Prevention of Collisions which provides for certification of navigation lighting.	Pre-mobilisation audit records verifies navigation lighting is functional in all vessels	BIGHT Project Manager (*obtained via records from Seismic Contractor*)	Pre-MSS	No
	A pre-mobilisation audit identifies opportunities to eliminate deck light spill to the marine environment; and these opportunities are implemented prior to MSS acquisition activities.	Corrective action records verify opportunities to reduce light spill have been implemented.	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS	No
	Vessel equipment planning meetings avoid night-time in-sea equipment inspections to eliminate direct lighting onto marine waters	Written records of vessel equipment inspection planning meetings verify night-time inspection activities are eliminated where practicable.	Party Manager	Ongoing during MSS	Yes

[124] Not required on escort vessel.
[125] Also a requirement for Section 5.4.3 (Artificial Lights [Navigation Lighting] & Section 5.7.1 (Oil Spill due to Fuel Tank Rupture/Leak)
[126] Also a requirement for Section 5.7.1 (Oil Spill due to Fuel Tank Rupture/Leak)
[127] Also a requirement for Section 5.7.1 (Oil Spill due to Fuel Tank Rupture/Leak)

Seismic Acquisition Acoustic Disturbance Impacts to Marine Fauna (S5.5.1)	Three days prior to survey activity commencing (weather permitting) an aerial survey is undertaken to inform the location of MSS activities.	Bight and MMO records indicate that an aerial survey was undertaken 3 days prior (weather permitting) and information was used to determine MSS activities.	BIGHT Project Manager	Pre-MSS	No
	Induction will be provided for all crew members to ensure they are aware and familiar with the environmental sensitivities and activity hazards in the MSS area; the controls to prevent significant impacts to marine fauna from MSS activities and their individual responsibilities throughout the campaign.	Record of the induction program content includes acoustic sound impacts and measures to minimise impacts to marine fauna.	BIGHT Offshore Representative	Pre-MSS	No
		Induction records verify that all marine and seismic crews have participated in the induction.	BIGHT Offshore Representative	Pre-MSS & Crew Change	Yes (on Crew Change only)
	The acoustic source size to achieve data acquisition objectives for the Lightning MSS will be established and the selected source size will be the minimum to achieve data acquisition objectives.	Records indicate that the Lightning acoustic source adopted for the MSS is the minimum size to achieve data objectives.	BIGHT Project Manager	Pre-MSS	No
	MSS vessel procedures with reflect *EPBC Policy 2.1 – Interaction between Offshore Seismic Exploration and Whales* (2008) requirements for soft-start, power-down and shut-down area available on-board the vessel for utilisation during MSS activity.	Pre-mobilisation audit records verify that Vessel Interaction Procedures are available on-board the vessel.	BIGHT Project Manager (*obtained via records from Seismic Contractor*)	Pre-MSS	No
	Procedures for minimising disturbance to marine fauna (i.e. soft start, power-down and shutdown) including relevant distances for power-down and low visibility conditions (as per EPBC Referral *2012/6683) are followed at all times.	MMO master data sheet verifies that all procedures (i.e. soft-starts, power-downs and shutdowns) are observed and implemented for seismic acquisition periods appropriate to the cetaceans sighted.	MMO	Ongoing during MSS	Yes
	Four qualified MMOs will be engaged for the survey to observe for whales. Two will be located on the MSS vessel, with one MMO on each of the scout/survey vessels during daylight hours while acquiring seismic data	POB listing identifies two MMOs present on the MSS vessel, and one MMO on each of the support/scout vessels to undertake MMO observations.	Vessel Master	Ongoing during MSS	No
		Records (CV) verify MMOs are trained and competent to undertake MMO duties.	BIGHT Project Manager	Pre-MSS	No
		MMO Master Data Sheet provides visual observation record for daylight hours while acquiring seismic data.	MMO	Ongoing during MSS	Yes

Seismic Acquisition Acoustic Disturbance Impacts to Marine Fauna (S5.5.1) (Con't)	Passive Acoustic Monitoring (PAM) (towed) will be utilised during the Lightning MSS to detect for during night-time or low visibility conditions.	MMO records indicate that PAM is operational during night-time or periods of low visibility. Records show power-down if whales are within 2km of the operating sources.	MMO	Ongoing during MSS	Yes
	For Blue and Southern Right Whales, support/scout vessel 'scouting' is undertaken if whales are known to be in the area. This includes: • A scout vessel scanning the area 5-10km ahead (30-60minutes) of the MSS vessel; and • Four hours prior to darkness, one scout vessel surveys the area to be traversed by the MSS vessel during the night and if whales are present the vessel will record in the less sensitive part of the survey (i.e. deep water).	MMO records verify that when Blue and Southern Right Whales are known to be in the area, these measures are adopted.	MMO	Ongoing during MSS	Yes
	The acoustic source will be powered-down to the lowest practicable setting on line turns while not acquiring seismic data in the MSS area in accordance with *EPBC Policy 2.1 – Interaction between Offshore Seismic Exploration and Whales (2008)*.	MMO Master Data Sheet indicates that the acoustic source is powered down to the lowest extent during line turns.	MMO	Ongoing during MSS	Yes
Vessel Operation – Sound Impacts to Marine Fauna (S5.5.2)	The vessel(s) propulsion systems are routinely maintained in accordance with manufacturer's specifications to maintain equipment performance with respect to lowest emitted sound levels.	PMS records verify the vessel's propulsion system is operating to specification.	Vessel Master(s)	Ongoing during MSS	Yes
	Vessel Masters observe speed restrictions and proximity distances as required in the EPBC Regulations 2000 (Chapter 8).	MMO Master Data Sheet verifies interaction between the MSS vessel and cetaceans comply with these requirements.	MMO	Ongoing during MSS	Yes
		Support/Chase Vessel Log verifies interactions between the vessel and cetaceans comply with these requirements.	Support/Chase Vessel Master	Ongoing during MSS	Yes

	All crew have completed an environmental induction covering the requirements for cetacean/vessel interaction consistent with EPBC Regulations 2000 (Chapter 8) and are familiar with the requirements.	Induction records verify that all crews have completed an environmental induction.	BIGHT Offshore Representative(*on delegation from Project Manager*)	Pre-MSS & Crew Change	Yes (on Crew Change only)
Helicopter Operation – Sound Impacts to Marine Fauna (S5.5.3)	Helicopter crews have completed an Environmental Induction containing cetacean proximity distances and are familiar with the requirements of the EPBC Regulations 2000 (Chapter 8).	Induction records verify that all helicopter crews have completed the environmental induction.	Seismic Contractor	Pre-MSS	No
	Helicopter activity will observe the required proximity distances (i.e. must not fly within a 500m radius of the cetaceans or hover over that area) with respect to cetaceans.	MMO Master Data Sheet indicates that all interactions of helicopters and cetaceans have been observed and comply with distances.	MMO	Ongoing during MSS	Yes
Routine Vessel Discharges – Oil Water (S5.6.1)	*For Vessels with Oily Water separation systems installed* – vessels will be fitted with oily water treatment systems capable of achieving 15ppm oil in water (OIW) concentrations.	As applicable, current IOPP (or equivalent equipment specification) indicates the system is capable of achieving 15ppm OIW concentration.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	For Vessels with Oily Water separation systems installed – vessels are fitted with an OIW detection system which either shuts-in the discharge or redirects the waste stream on-board if the OIW concentration exceeds 15ppm.	As applicable, current IOPP (or equivalent equipment specification) verifies detection system is available.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
		Oil record book verifies oily water discharges meet a 15ppm discharge criteria.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	For Vessels with Oily Water separation systems installed – the oily water treatment system operates in accordance with the IOPP (or equivalent equipment specification) and is routinely maintained in accordance with manufacturer's specifications (via PMS) to maintain system performance.	PMS records for the oily water treatment verify that the system is operating to specification.	Vessel Master(s)	Ongoing during MSS	Yes

Routine Vessel Discharges – Oil Water (S5.6.1) (Con't)	*For Vessels with Oily Water separation systems installed* - oily water discharges will occur only when the vessel is proceeding *en route*.	The oil record book verifies that all vessel oily water discharges for the petroleum activity have occurred whilst the vessel is preceding en-route.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	For Vessels with Oily Water separation systems installed - ODME is calibrated routinely in accordance with manufacturer's specifications to ensure OIW concentrations overboard do not exceed 15ppm.	Calibration records indicate that the ODME has been calibrated in accordance with manufacturer's requirements and is operating to specification.	Vessel Master(s)	Pre-MSS	No
		Records show the ODME carries current IMO certification.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	For Vessels with Oily Water separation systems installed -whole oils are collected in dedicated tanks and discharged onshore or combusted in an on-board incinerator on the MSS vessel.	Oil Record Book verifies whole oil is disposed onshore or incinerated within MSS vessel incinerator	Vessel Master(s)	Port Calls	Yes (Environmental Compliance Audit)
	For Vessels <u>without</u> Oily Water separation systems installed Oily residues are contained on-board for onshore disposal in accordance with state/territory legislation.	Oil Record Book shows oily water disposed to licenced onshore facilities.	Vessel Master(s)	Port Calls	Yes (Environmental Compliance Audit)
Routine Vessel Discharges – Sewage (S5.6.2)	For vessels with installed Sewage Treatment Plants (STP) compliant to MARPOL 73/78 (R9) sewage may be discharged at any time providing visible floating solids and discolouration is not evident.	As applicable, a current ISPP (or equivalent) verifies the STP can achieve this level of treatment.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
		Vessel log indicates the location of sewage discharge is compliant with these requirements.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	The treatment system is routinely maintained in accordance with manufacturer's specifications (via PMS) to ensure that sewage discharge specifications can be met.	PMS records for the STP verify that the system is operating to specification.	Vessel Master(s)	Ongoing during MSS	Yes
	Vessel masters ensure that the POB does not exceed stated maximum carrying capacity for STP for the duration of the MSS.	Vessel log verifies that POB has not exceeded STP carrying capacity stated on the ISPP (or equivalent).	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)

Routine Vessel Discharges – Sewage (S5.6.2) (Con't)	For vessels without STP but having maceration and disinfection facilities, the vessel will discharge sewage at a distance of more than 3nm from land	Vessel log indicates the location of sewage discharge complies with this requirement	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	For vessels without STP and maceration/ disinfection equipment vessel will discharge untreated sewage at a distance of more than 12nm from land while proceeding *en-route*.	Vessel log verifies the discharge of untreated sewage complies with this requirement.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
Vessel Discharges – Foodscraps (S5.6.3)	Macerated food scraps are discharged from vessels at a distance of at least 3nm from land.	Garbage Record Book verifies the volume and location of macerated food scrap discharge complies with this requirement.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	Equipment used for food scrap maceration is capable of achieving a particle size of 25mm prior to discharge.	The equipment manufacturer's specification verifies that this performance standard can be met.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	Maceration equipment is routinely maintained in accordance with manufacturer's specifications (via PMS) to ensure that discharge specifications can be met.	PMS records for the maceration equipment verify that the system is operating to specification.	Vessel Master(s)	Ongoing during MSS	Yes
	Non-macerated food-scraps are discharged at a distance of at least 12nm from coastline.	Garbage Record Book verifies the volume and location of non-macerated food scrap discharge complies with this requirement	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	Placarding is provided on-board the vessel, consistent with the Shipboard Garbage Management Plan, to provide guidance to personnel on the kinds of garbage which may or may not be disposed from the ship and the conditions of disposal	Environment Plan Compliance Audit verifies that placards are available on all survey vessels identifying garbage handling requirements	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	All personnel are aware and familiar with the vessel garbage management arrangements through information provided in the survey vessel induction.	Induction records verify that all crew have completed the vessel induction which included garbage management plan arrangements.	BIGHT Offshore Representative	Pre-MSS & Crew Change	Yes (on Crew Change only)
Air Emissions (Combustion and Ozone Depleting Substances [ODS]) (S5.6.4)	The vessels shall uses fuel which meet MARPOL Annex VI requirements for sulphur emissions.	Fuel use records indicate use of MDO/MGO	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)

Air Emissions (Combustion and Ozone Depleting Substances [ODS]) (S5.6.4)	Vessel engines will meet NO_x emission levels as required by MARPOL 73/78 Regulation 13.	Pre-mobilisation audit records verify vessel engine certification records meet these emission requirements.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	All combustion equipment (propulsion systems, generator and incinerator) will be maintained in accordance with Manufacturer's instructions via the vessel's Planned Maintenance System (PMS) to ensure that discharge specifications can be achieved.	PMS records for the combustion equipment verify that the equipment is operating to specification.	Vessel Master(s)	Ongoing during MSS	Yes
	The MSS Vessel incinerator will meet the requirements of MARPOL 73/78 Annex VI (Regulation 16)	The MSS vessel will carry incineration equipment approved under MARPOL 73/78 Annex VI	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	During MSS activities, the incinerator is operated in accordance with the requirements of MARPOL 73/78 Annex VI (Regulation 16)	Incinerated waste details recorded in the vessel's Garbage Record Book verify operation in accordance with Regulation 16 requirements.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	Fuel usage on-board the vessels is monitored for abnormal consumption and corrective action initiated in the event of high fuel usage	Monitoring and reporting records record and benchmark fuel usage.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	Personnel undertaking maintenance activities on ODS systems have the appropriate qualification/certification to undertake maintenance activities.	Competency/PMS records verify that personnel undertaking maintenance activities have the relevant training and competencies for the task	Vessel Master(s)	Pre-MSS	No
	Vessels which utilise ODSs manage these systems in accordance with Regulation 12 of MARPOL 73/78 Annex VI to eliminate ODS emissions.	ODS record book verifies that systems are managed in accordance with MARPOL Regulation 12 requirements.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
Oil Spill due to Vessel Fuel Tank Leak/Rupture (S5.7.1)	Vessels selected for MSS activity will provide: • Valid and current class certification; • Crew training which meet STCW95 requirements; • Records verifying vessel maintenance performance; and • Safety audit with evidence of corrective actions (as appropriate).	Records of criteria are provided to the BIGHT Project Manager as part of contract award.	BIGHT Project Manager (*obtained via records from Seismic Contractor*)	Pre-MSS	No

Oil Spill due to Vessel Fuel Tank Leak/Rupture (S5.7.1) (Con't)	Induction program reinforces the Procedural Control standards listed in EP (Vessel Collisions) such that all personnel are familiar with the requirements to prevent interference with streamers and vessels[128].	Records of induction program content contains vessel interaction procedural requirements	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS	No
		Induction records verify all field personnel have completed the Environmental Induction	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS & Crew Change	Yes (on Crew Change only)
	The vessel has an approved current SOPEP consistent with the *IMO Guideline for the Development of Shipboard Marine Pollution Emergency Plans (or equivalent for class)*[129].	As appropriate, records verify the SOPEP (or equivalent) is current and approved	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	Spill response equipment required to respond to vessel spill events is located in accordance with SOPEP requirements	Pre-mobilisation audit records verify spill response equipment is located in accordance with SOPEP requirements	Vessel Master(s) BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre MSS During MSS	During MSS (Environmental Compliance Audit)
	Routine drills involving spills are undertaken in accordance with the Vessel's SOPEP Drills matrix to ensure personnel are familiar with their role during an oil spill event[130].	Pre-mobilisation audit records verify that routine drills have been undertaken in accordance with SOPEP Matrix requirements.	Vessel Master(s)	Pre-MSS	No
	A pre-mobilisation oil spill response exercise will be undertaken to test the oil spill response arrangements as detailed in Section 8 of the EP ensuring all parties are familiar with their role during an oil spill event[131].	Records verify that a pre-mobilisation emergency response exercise has been undertaken.	BIGHT Project Manager	Pre-MSS	No
Chemical/oil spill through deck drain system (S5.7.2)	Chemicals and oils are stored in suitable containers in bunded areas which are isolated from the deck drainage system.	Pre-mobilisation audit records verify chemicals /oils are stored in accordance with these requirements.	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS Audit	No

[128] Also a control for Section 5.7.6 (Seismic Streamer liquid Leak)
[129] Also a control for Section 5.7.2 (Chemical/oil spills through deck system) and Section 5.7.3 (Refuelling Spill)
[130] Also a control for Section 5.7.2 (Chemical/oil spill through deck drain system) and Section 5.7.3 (Refuelling Spill)
[131] Also a control for Section 5.7.3 (Refuelling spill)

Chemical/oil spill through deck drain system (S5.7.2) (Con't)	Material Safety Data Sheets are available for all chemicals and hydrocarbons on-board the survey vessels. Content is in accordance with the *Code of Practice on the Preparation of Safety Data Sheets for Hazardous Chemicals*	Pre-mobilisation audit verifies all chemicals/ oils have MSDSs and this information is accessible to all crew members	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS Audit	No
	Vessels have assessed high-risk spill locations and spill kits have been located adjacent to those areas as nominated in the SOPEP.	Pre-mobilisation audit verifies spill kits are located in accordance with SOPEP requirements	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS Audit	No
	Detergents used for deck wash-down activities are verified to be non-hazardous and biodegradable.	MSDS for detergents used verifies the non-hazardous and biodegradable nature of the product.	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS Audit	No
	A weekly inspection regime is implemented on-board the vessel which monitors for and verifies that: • Spill kits are adequately stocked and clearly labelled; • Bunded areas are clear of residues; and • House-keeping is maintained at high levels.	Pre-mobilisation audit verifies a weekly inspection program is implemented to this standard on survey vessels.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
		Environment Plan compliance audit verifies implementation of the weekly inspection regime.	BIGHT Offshore Representative	During MSS	Yes (Environmental Compliance Audit)
	All field personnel have completed the vessel induction and area aware of chemical/oil spill arrangements associated with deck spills.	Induction records verify all field personnel have completed the environmental Induction.	BIGHT Offshore Representative(*on delegation from Project Manager*)	Pre-MSS & Crew Change	Yes (on Crew Change only)
	All deck spills are cleaned up immediately in accordance with MSDS requirements.	Incident records verify this action is taken on discovery of a spill event (i.e. clean-up)	BIGHT Offshore Representative	During MSS	Yes (Environmental Compliance Audit)
Oil Spill due to Refuelling (S5.7.3)	Refuelling activities will be fully supervised, undertaken in accordance with documented procedures by trained personnel documented via a 'permit-to-work'.	Activity records (JHA, Permit to Work, Procedures) indicate that offshore fuel transfers are conducted in accordance with documented controls.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)

Oil Spill due to Refuelling (S5.7.3) (Con't)	A Toolbox meeting is undertaken before bunkering operations commence to ensure that all personnel are aware of the safety and environmental controls associated with the activity	Records verify a toolbox meeting was held prior to refuelling activity	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)
	Dry-break couplings on hoses are used for bulk transfer of petroleum products (refuelling).	Pre-mobilisation audit records verify that dry-break couplings are present on vessel bunkering hoses.	BIGHT Offshore Representative (*on delegation from Project Manager*)	Pre-MSS Audit	No
	All transfer equipment (hoses, pumps) will be maintained in accordance with Manufacturer's instructions via the vessel's Planned Maintenance System (PMS) and inspected prior to use to eliminate leaks during transfer.	PMS and task inspection records verify refuelling equipment is fit for purpose.	Vessel Master(s)	Ongoing during MSS	Yes
	Tank levels will be monitored during refuelling to ensure they are not over-filled (i.e. not filled above 90% capacity)	Pre-mobilisation audit records verify these conditions are included in bunkering procedures.	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	The transfer area will be bunded with spill kits in proximity to respond in the event of a spill or leak.				
Solid Non-Biodegradable/ Hazardous Waste Overboard (S5.7.4)	All personnel are aware of, and familiar with, the Vessel Garbage management requirements via the vessel and environmental induction. The induction will cover the following: - No solid or hazardous waste overboard; - Recyclable wastes segregated and compacted (if possible) - Wastes are containerised, labelled in dedicated areas; - Wastes which can be incinerated are identified; - Hazardous wastes are contained and disposed onshore	Induction records verify all field personnel have completed the Vessel and Environmental Induction.	BIGHT Offshore Representative(*on delegation from Project Manager*)	Pre-MSS & Crew Change	Yes (on Crew Change only)
	All vessel garbage disposal activities are compliant with the requirements of the Vessel's Garbage Management Plan.	Garbage Record Book entries verify that the garbage disposal activities are compliant with these requirements.	Vessel Master(s)	During MSS	Yes (Environmental Compliance Audit)

Solid Non-Biodegradable/ Hazardous Waste Overboard (S5.7.4)	Routine inspections are undertaken to ensure that minimum housekeeping standards within waste storage areas with deficiencies corrected.	Pre-mobilisation audit records verify a routine inspection program is implemented on survey vessels	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
		EP Compliance Audit records verify routine inspections are occurring.	BIGHT Offshore Representative	During MSS	Yes (Environmental Compliance Audit)
Seismic Streamer Loss in the Marine Environment (S5.7.5)	Survey vessels operate under approved procedures for streamer deployment and retrieval and these procedures are adhered to at all times.	Pre-mobilisation audit records verify approved procedures are available	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No
	Streamer equipment (bridles and harnesses) are routinely maintained and inspected for wear and tear in accordance with the MSS Vessel's PMS to ensure the equipment is fit-for purpose and will not detach during MSS activities.	PMS and inspection records verify streamer equipment is fit-for-purpose.	Vessel Master	Pre-MSS	No
	Streamers will be fitted with the following equipment while they are deployed from the MSS vessel to allow for easy retrieval: - Buoyancy devices; - Surface Marker Buoys - Secondary retaining devices - Radar Reflectors	Environment Plan Compliance Audit records verify this equipment is utilised during the MSS activities.	Party Chief	During MSS	Yes (Environmental Compliance Audit)
	Marine stakeholder notifications (VHF Channel 16) are made in the event of a streamer loss.	Notifications recorded in the Vessel Log verify this action has been completed in the event of a streamer loss.	Vessel Master	During MSS	Yes
Seismic Streamer Liquid Leak (S5.7.6)	The MSS will utilise solid streamers containing 'low environmental' hazard chemicals (e.g. ISOPAR) during survey activities.	Pre-mobilisation audit records verifies this streamer type will be used for the survey	BIGHT Project Manager (*on information obtained from seismic contractor*)	Pre-MSS	No

	Streamers are routinely maintained and inspected for wear and tear in accordance with the MSS Vessel's PMS to ensure the equipment is fit-for purpose and will not leak during MSS activities.	PMS and inspection records verify streamer equipment is fit-for-purpose.	Vessel Master	Pre-MSS	No
Cetacean Collision (S5.7.7)	Vessel operations to conform with proximity distances, speeds and management measures contained in the EPBC Regulations 2000 (Chapter 8) when in the operational survey area.	MMO Master Data Sheet verifies interaction between the MSS vessel and cetaceans comply with these requirements.	MMO	Ongoing during MSS	Yes
		Support/Chase Vessel Log verifies interactions between the vessel and cetaceans comply with these requirements.	Support Vessel Log	Ongoing during MSS	Yes
	All crew have completed an environmental induction covering the requirements for cetacean/vessel interaction consistent with EPBC Regulations 2000 (Chapter 8) and are familiar with the requirements.	Induction records verify that all crews have completed an environmental induction.	BIGHT Offshore Representative(*on delegation from Project Manager*)	Pre-MSS & Crew Change	Yes (on Crew Change only)
Oil Spill Response (Section 8)	An oil spill capability audit will be undertaken prior to mobilisation to confirm the following: - Vessels have access to current SOPEPs; - Port and Emergency Contact details in the event of an oil spill are complete and correct; - Response equipment is available and located at locations designated in the SOPEP (or equivalent appropriate to class); - Crews are competent and familiar with SOPEP implementation verified through SOPEP drill exercises; - All personnel are familiar with OPEP requirements for the Lightning MSS. Corrective actions arising from this audit shall be close-out prior to MSS activity commencement.	Records indicate audit has been undertaken and corrective actions completed prior to mobilisation.	BIGHT Project Manager	Pre-MSS	No
	Radio notification of the spill incident occurs on Channel 16 to alert third parties such that they avoid the impacted area and are not within 500m of the vessel releasing hydrocarbon	Incident log verifies that no third party vessels are present within a 500m radius for the duration of the response.	Vessel Master	During MSS (as appropriate)	Yes

	AMSA is notified as soon as possible but within 30minutes of a spill event	Incident log verifies AMSA notification occurs with 15minutes of a spill event	Vessel Master	During MSS (as appropriate)	Yes
	DPTI is notified as soon as possible but within 30minutes of a spill event	Incident log verifies DoT notification occurs with 15minutes of a spill event	Vessel Master	During MSS (as appropriate)	Yes
	NOPSEMA is notified as soon as possible but within 2hrs of a spill event	Notification records verify this notification is provided with 2hrs of spill event.	BIGHT Project Manager	During MSS (as appropriate)	Yes
	Spill mitigation measures as detailed in the Vessel's SOPEP (or equivalent to class) are implemented to minimise hydrocarbon release to the marine environment.	Incident log verifies that mitigation measures adopted during spill response align to the requirements of the SOPEP.	Offshore BIGHT Representative	During MSS (as appropriate)	Yes
Section 6.6.1 (Emission/Discharge Monitoring)	Record discharges as per Table 6-2 for all vessel s while they are in the MSS Working Area	Quantified discharges per vessel	Offshore BIGHT Representative	During MSS	Yes
Section 6.6.2 (Audit): Pre-mobilisation	Vessel audit to ensure that survey vessel and seismic contractor management systems meet EP requirements; and an on-board oil spill response capability audit to verify spill preparedness.	Pre-mobilisation audit report	BIGHT Project Manager	Pre MSS	No
Section 6.6.2 (Audit): Environment Plan Compliance Audit	Compliance Audit against EP requirements; performance objectives monitored; discharges monitored; control strategies implemented.	Environment Plan Compliance Report	Offshore BIGHT Representative	During MSS	Yes
Section 6.6.2 (Review): Environment Plan Implementation Review	Undertake an implementation review against the Lightning-specific HSE Plan to assess the effectiveness of the 'bridged' Bight requirements to the Contractor's Management Systems	Environment Plan Implementation Review Report	Offshore BIGHT Representative	During MSS (early in survey)	Yes
Section 6.6.3 (Review): End of Survey HSE Review	Review of management and mitigation strategies implemented during the MSS including reviews of performance, incident investigations, audits and field activity to identify actions for future MSSs which can be implemented on a continuous improvement basis.	Post survey HSE Review Report	BIGHT Project Manager	Post MSS	No

Section 7.2.1 (Recordable Incident Reports)	Monthly NOPSEMA 'Recordable Incident' Report where performance objectives or control performance standards have not met requirements.	Submitted Monthly Recordable Incident Report ASAP but within 15days of the ned of calendar month	Offshore BIGHT Representative (Preparation)	During MSS	Yes
Section 7.2.2 (Reportable Incident Reports)	NOPSEMA Notification within 2hrs of becoming aware of incident. Witten notification record ASAP to NOPSEMA, NOPTA and DMITRE after NOPSEMA verbal notification.	Notification Record	BIGHT Project Manager	During MSS	Yes
Section 7.2.2 (Reportable Incident Reports)	Witten incident report to NOPSEMA within 3 days of incident. Copy of report to NOPTA and DMITRE within 7days of the report submission to NOPSEMA.	Incident Report	BIGHT Project Manager	During MSS	Yes
Section 7.2.3 (NOPSEMA Closeout Report)	Preparation of the activity environment performance close-out report within three (3) months of the completion of the petroleum activity.	Submitted NOPSEMA Closeout Report	Offshore BIGHT Representative (Preparation)	Post MSS	No
Section 7.2.4 (DoE Closeout Report)	Preparation of a Compliance and Sighting Report required by EPBC Policy Statement 2.1 within two months of activity completion.	Submitted DoE Closeout report	Offshore BIGHT Representative (Preparation)	Post MSS	No