ENVIRONMENT PLAN SUMMARY

Davros Phase II Multi-client 3D Marine Seismic Survey

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Report No: N1514701
Version/Date: Rev 0, March 2016

Prepared for:

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Document Status

Version	Purpose of Document	Orig	Review	Review Date	Format Review	RPS Release Approval	Issue Date	CGG Release Approval	Issue Date
Draft A	Draft for Review	TamAl-H	JerFit	17.2.2016					
Draft B	Draft for Review	TamAl-H	JerFit/ AIMS	18.2.2016					
Draft C	Draft for NOPSEMA review	JerFit	IanHay	19.2.2016				IanHay	19.2.2016
Rev 0	Final for submission	TamAl-H	JerFit	22.03.2016				IanHay	22.03.2016

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1.0 INTRODUCTION

1.1 Overview

Geophysical company CGG MultiClient and New Ventures (CGG) proposes to acquire a multi-client three-dimensional (MC3D) marine seismic survey (MSS) over the North West Shelf (NWS) offshore from Western Australia (Figure A). The Davros Phase II MC3D MSS (the "activity") will comprise acquisition of approximately 1,693 km^2 of 3D seismic data in Exploration Permits WA-1-P, WA-458-P, Retention Lease WA-48-R, Production Licences WA-03-L, WA-04-L, WA-20-L, and adjacent open acreage areas. The permit areas in which the activity is planned to occur lie within Commonwealth waters and exploration activities in these waters are subject to the *Offshore Petroleum and Greenhouse Gas Storage Act 2006* (OPGGS Act) and the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGS(E) Regulations).

1.2 Location

The Davros Phase II MC3D MSS area lies entirely in Commonwealth waters within the North-west Marine Region (NWMR) in Exploration Permits WA-1-P, WA-458-P, Retention Lease WA-48-R, Production Licences WA-03-L, WA-04-L, WA-20-L, and adjacent open acreage areas (Figure A).

The registered title holders for each of the petroleum titles overlapped by the Davros Phase II MC3D survey area are provided in Table 1-1.

Table 1-1: Davros Phase II MC3D MSS Acquisition – Offshore Title Holders

Permit Title	Title Holder
Exploration Permits	
WA-1-P	Apache Northwest Pty Ltd
WA-208-P	Santos Offshore Pty Ltd
WA-458-P	Lightmark Enterprises Pty Ltd
Production Licence Areas	
WA-03-L	Woodside Energy Ltd
WA-04-L	Woodside Energy Ltd
WA-20-L	Apache Northwest Pty Ltd
Retention Lease Areas	
WA-48-R	Santos Offshore Pty Ltd

The Davros Phase II MC3D MSS survey area is located approximately 92 km north of Dampier and approximately 190 km north-west of Port Hedland, at its closest points to the mainland (Figure A). Rosemary Island in the Dampier Archipelago is approximately 65 km to the south-east of the survey area. The south-west corner of the survey area is

approximately 123 km north-east of Trimouille Island (in the Montebello Islands group) and approximately 150 km north-east of Barrow Island. The Dampier Commonwealth Marine Reserve is approximately 52 km to the south-east of the survey area.

Boundary coordinates for the survey area are listed in Table 1-2. The survey area is the area within which data will be acquired. A buffer around the survey area is also required for activities including sail line run-ins and run-outs (required to obtain full fold coverage), soft-start procedures, streamer deployment and retrieval, maintenance and recovery and vessel manoeuvring (line turns) will occur. Transit to and from the survey area is excluded from the scope of this EP.

Table 1-2: Boundary Coordinates for the Davros Phase II MC3D Survey Area (Datum: WGS84)

Location ID	Latitude (Decimal Degrees)	Longitude (Decimal Degrees)
A	-19.415338	116.751313
B	-19.415336	116.834646
C	-19.498670	116.834647
D	-19.498669	116.917979
E	-19.665332	116.917978
F	-19.665333	116.834645
G	-19.748665	116.834644
H	-19.748666	116.751311
I	-19.831998	116.751311
J	-19.832001	116.584645
K	-19.582005	116.584645
L	-19.582006	116.501314
M	-19.332006	116.501312
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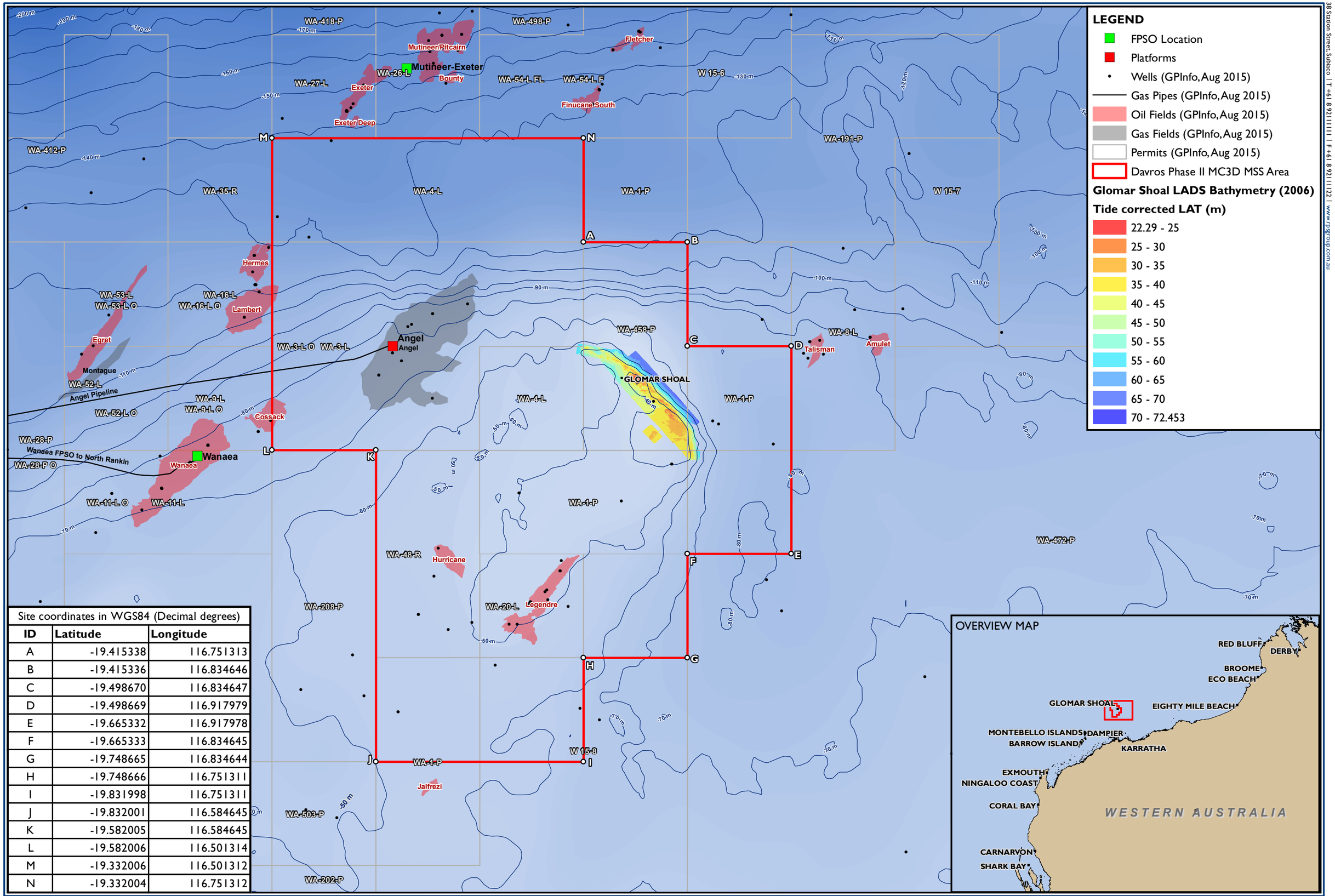

Site coordinates in WGS84 (Decimal degrees)		
ID	**Latitude**	**Longitude**
A	-19.415338	116.751313
B	-19.415336	116.834646
C	-19.498670	116.834647
D	-19.498669	116.917979
E	-19.665332	116.917978
F	-19.665333	116.834645
G	-19.748665	116.834644
H	-19.748666	116.751311
I	-19.831998	116.751311
J	-19.832001	116.584645
K	-19.582005	116.584645
L	-19.582006	116.501314
M	-19.332006	116.501312
N	-19.332004	116.751312

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Job Number: N1514701
Doc Number: 001
Date: 14.09.15
Scale: 1:300,000 @ A3
Created by: MA
Source: CGG, 2015 RPS, 2015

GCS WGS 1984

0 2.5 5 10 15 20 km

Figure A

Location of the Davros Phase II MC3D MSS Marine Seismic Survey Area

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2.0 DESCRIPTION OF THE RECEIVING ENVIRONMENT

The spatial extent of the existing environment described within this section was selected to encompass the maximum extent of potential environmental impacts associated with the Davros Phase II MC3D MSS. A diesel fuel spill was identified as having the largest zone of potential influence of all credible environmental risks. Therefore, the area over which potential effects from an oil spill could occur encompasses the entire extent of all other potential impacts. The survey will occur between Q1 2016 and Q4 2016 for a period of two months, and as such, the existing environment description focuses on environmental sensitivities throughout the year.

2.1 Regional Overview

The Davros Phase II MC3D MSS survey area lies entirely in Commonwealth marine waters in the North-west Shelf Province of the North-west Marine Region (NWMR) off the coast of Western Australia. The survey area is approximately 92 km north of Dampier and 190 km north-west of Port Hedland, at its closest points to the mainland (Figure A).

2.2 Physical Environment

The survey area is located within the NWMR which has a tropical climate with hot, humid summers and warm winters over two distinct seasons – the summer monsoon (November to March) and the winter monsoon (May to September), with a short transitional period between each season. Tropical cyclones typically occur between the months of November and May. Along the central Pilbara coast, cyclone activity peaks in March and April where wind gusts can exceed 90 km/h.

Average monthly wind data has been collected for the period of 2005 to 2013 for the offshore region north of Dampier, which includes the survey area. From September to March, the prevailing winds are predominantly from the south-west and west, with peak wind speeds of 10 to 12 m/s. The period from May to July is characterised by moderate to strong winds from the east and south-east, with peak wind speeds of up to 10 to 12 m/s. April and August are the transitional periods when winds are lighter and more variable.

Water depths across the survey area range from approximately 22 m (over Glomar Shoal) based on LADS data collected in 2006 to approximately 140 m, with the deepest water in the northern section of the survey area. However, seismic data acquisition will not occur in water depths of <30 m.

Water circulation over the North West Shelf (NWS) is affected by seasonal and inter-annual variation in the eastern Indian Ocean and the Indonesian Throughflow currents. The major surface currents influencing the region include the ITF, the Leeuwin Current and the seasonal Holloway Current, the latter flows south-west across the North West

Shelf in May and June. During the summer monsoon season, the ITF and Leeuwin Current are weakened by the prevailing south-westerly winds.

Tides in the region are semi-diurnal (two high and two low tides each day) with a spring tidal range of 4 m and a neap tidal range of 1.8 m. Tidal currents are a component of the broader circulation in the region, with tidal currents of up to 0.6 m/s and 0.2 m/s for spring and neap tides respectively. Surface waves in the region comprise locally generated surface wind waves and distant swell waves. Tides over the survey area were predicted for the 12-month survey period from Q1 2016 to Q4 2016 using tidal data regularly collected at the Legendre oil field. The tidal range is predicted to be 3.8 m, ranging from 1.9 m below lowest astronomical tide (LAT) to 1.9 m above LAT.

The NWMR consists of slope, shelf, and abyssal plain/deep ocean floor and rise geomorphic provinces. The geomorphology of the North-west Shelf Province differs to the north and south, with smooth, shelly, sandy and wide shelf and slope habitats to the north, and a narrower shelf and slope with more hard substrates, numerous islands, and seamounts to the south.

Geoscience Australia sampled sediments on Glomar Shoal in 1967 and found them to have a much higher gravel content and presence of coarse sands of weathered coralline algal and shell material than surrounding areas. The accumulation of coarse shelly sand at Glomar Shoal indicates a high-energy environment subjected to strong sea floor currents.

AIMS[1] sampled sediments around the base of Glomar Shoal in November 2013 in water depths ranging from 50 to 171 m. Sediments from the shoal were dominated by sand and gravel, with significant muds only present at the deeper or more protected north-west, north-east and south-east sites off the shoal. Sediments in the more exposed areas, for example on the south-west side of the shoal, comprised sand and gravel. The study concluded that sandy sediments of Glomar Shoal are similar to those observed on other submerged shoals of the NWS region. The shallower parts of the shoal (22 to 50 m) are typically exposed to higher wave energy than the sites sampled by AIMS and are likely to be similarly characterised by sand and gravel.

2.3 Biological Environment

Glomar Shoal is listed as a Key Ecological Feature (KEF) and is the only area of potentially higher biodiversity value in the survey area (Sections 2.3.1.2 and 2.5.2). The KEF comprises the entire shoal, which rises up from 80 m depth and shallows more gradually to a plateau region lying within 22 m of the sea surface at its shallowest depth (Figure B). At the 60 m depth contour, Glomar Shoal covers an area of 14,700 hectares (AIMS 2014).

[1] Australian Institute of Marine Science (2014). Glomar Shoal and Rankin Bank Environmental Survey 2013. Report prepared by the Australian Institute of Marine Science (AIMS) for Woodside Energy Ltd. Final Report 2014.

2.3.1 Marine Habitats and Communities

No Critical Habitats or Threatened Ecological Communities (TECs), as listed under the EPBC Act, are known to occur within the survey area.

2.3.1.1 Regional Benthic Communities

At the continental shelf margin and shelf edge in the NWMR (approximately 100 to 200 m water depth), benthic habitats are composed of muddy sand with gravel, rubble, cobbles, boulders and occasional rock outcrops. Epibenthic fauna commonly found at these depths includes echinoderms, crustaceans and sponges. Exposed rock or lumps of hard substrate often support isolated patches of filter-feeding organisms such as gorgonians, hydrozoans, sponges and soft corals. Epibenthic faunal assemblages across the continental shelf margin are generally sparse and of low diversity, with localised 'hotspots' of biodiversity on outcropping reef.

On the inner shelf, in depths of 0 to 50 m, communities of seagrass and macroalgae are important sources of primary production. On the middle and outer shelf, below the photic zone and beyond the influence of terrestrial ecosystems, primary producers are largely absent. Coral reefs of the NWMR support diverse assemblages with 184 species of corals, 264 species of molluscs, 82 species of echinoderms and 389 species of finfish identified, many of which have high commercial and conservation significance.

2.3.1.2 Glomar Shoal

Benthic Communities

Benthic habitats were mapped by AIMS (2014) using multi-beam data and towed video footage along 53 transects over the shoal, from 32 to 83 m water depth. Benthic communities were similar to those seen on other shoals on the NWS, although percentage cover of fauna was much lower at Glomar than at any other shoal (Heyward et al. 2011, 2013). Overall the shoal is characterised by a high proportion of sand/silt (approximately 41%) and consolidated reef (approximately 44%), with relatively low cover of epibenthic organisms (approximately 53%), of which only 4.5% was marine fauna, the remainder being algae. Hard coral cover was patchy and mostly restricted to the shallower parts of the shoal. Cover in patches was variable, but mean cover across the entire bank was very low (<1%). Most other shoals in the region supported higher hard coral cover. Rankin Bank, the closest reference shoal, had a much higher proportion of its area supporting hard coral and a much higher mean cover of hard coral (AIMS 2014; AIMS pers. comm.).

Consolidated reef comprises consolidated substrate, reefal substrate, turf and crustose coralline algae (algal turf community), and filamentous algae. Consolidated reef covered around half of the total seabed surveyed in the north-east (NE), north-west (NW) and south-east (SE) quadrants, and almost two thirds of the benthic category in water depths of <40 m. There was less consolidated reef coverage on the exposed SW side of the shoal (AIMS 2014), where sand/silt comprised almost 75% coverage. There was also a

transition from consolidated reef in shallow water (<40 m) to a higher relative proportion of sand/silt in deeper water (>40m).

Pelagic and Demersal Fish Populations

Glomar Shoal lies in a high-energy environment and localised upwelling has resulted in enhanced productivity, which supports significant populations of commercially and recreationally important fish species, including Rankin cod, brown-striped snapper, red emperor, crimson snapper, bream and yellow-spotted triggerfish. These taxa are highly mobile. Productivity of commercially and recreationally important fish is a defining value of the Glomar Shoal KEF.

AIMS conducted Stereo Baited Remote Underwater Visual Stations (SBRUVS) surveys at Glomar Shoal in 2013. The AIMS (2014) study partly aimed at comparing the fish assemblages of Glomar Shoals and Rankin Banks. In this context the term 'site-attached' was used by AIMS to describe those fish which are unlikely to move between the shoals, or are restricted to the shoal, and describes the entire fish fauna recorded on baited cameras, including highly mobile species. In the Davros Phase II MC3D MSS EP, for the purposes of the underwater noise impact assessment, CGG used the term 'site-attached' to describe fish species with strict and localised habitat dependence, e.g. dascyllids which show a high degree of site fidelity to shelter in coral heads. Under stress, individuals of these species are less likely to flee the area, but will seek refuge within their preferred habitat shelter instead.

The AIMS report characterises the Glomar Shoal fish community as 'bare ground' or 'sand-associated' based on the large expanse of sand/silt habitats in deeper parts of the shoal (>40 m). The most abundant families on the shoal were the Carangidae (jacks, trevallys), Nemipteridae (threadfin breams), Lethrinidae (emperors) and Labridae (wrasse). Of these families, the most common species were the threadfin bream (388), a species of wrasse (290) and coastal trevally (178). Of these, none are known to be truly restricted to small home-ranges and isolated habitat patches.

When the dataset was examined by habitat, this showed there were suites of fish species that characterised different habitats across the shoals. As expected, reef-associated species were amongst the suite characterising shallow reef areas. The "Shallow" assemblage of reef-associated fish included taxa with limited home-ranges and stronger reef habitat dependence such as small wrasse, butterfly fish and damsel fish.

AIMS used statistical modelling and predictive mapping to develop an objective and robust, quantitative map of the areas on Glomar Shoal supporting the highest fish species richness and abundance. The AIMS modelling confirms that shallow areas of reef (particularly the NW-SE ridge in around 25 to 40 m water depth) supported the greatest abundance and species richness of fish. Richness declined rapidly from 50 m with increasing depth. Total fish abundance was more closely correlated with depth and was highest in the 20 to 30 m depth range and declined quickly from 30 to 60 m (AIMS

2014). The decline in abundance at >30 m depth coincided with declining levels of epibenthic cover.

The AIMS survey was undertaken during spring (September) as a 'snap-shot' survey, with less survey effort (i.e. SBRUVS locations) in the more topographically complex (or more rugose) shallow water habitats on top of the shoal. This suggests that fish species in the shallowest parts of shoal may have been under-sampled. AIMS suggested that increased sampling effort would be required in these shallow, rugose areas to better document the full species richness of the shoals. Such under-sampling of shallow reef areas does not affect the impact assessment, but rather reinforces the conclusion from the modelling that the shallowest and most rugose parts of the shoal support the highest relative richness and density of fish.

CGG recognises that while there is some uncertainty in the actual species and abundances of fish inhabiting the shallow reefal habitats, there is good evidence that the shallowest part of the shoal is of the highest conservation significance. While the available data indicate that site-attached species with strict habitat dependency and very limited home ranges are uncommon, it is recognised that some of these species may not have been adequately sampled. Therefore, additional controls have been implemented to reduce potential impacts in this key area, assuming site-attached species may be present. CGG has modified the survey area to significantly reduce the risk of impacts to the shallow water reef fish assemblage.

The acquisition area now incorporates a Fish Protection Area (FPA) which encompasses the areas of (mostly reefal) seabed in <30 m water depth and surrounding areas predicted by AIMS to support relatively high fish species richness and abundance. This protection area is considered to represent the area of highest conservation value in the Glomar Shoal KEF. CGG established a 250 m width buffer area around the FPA to ensure seismic sound levels did not have adverse impacts on fish within the FPA. The width of the buffer was derived from the modelling with added precaution. The seismic airgun will NOT be discharged within the FPA or buffer zone.

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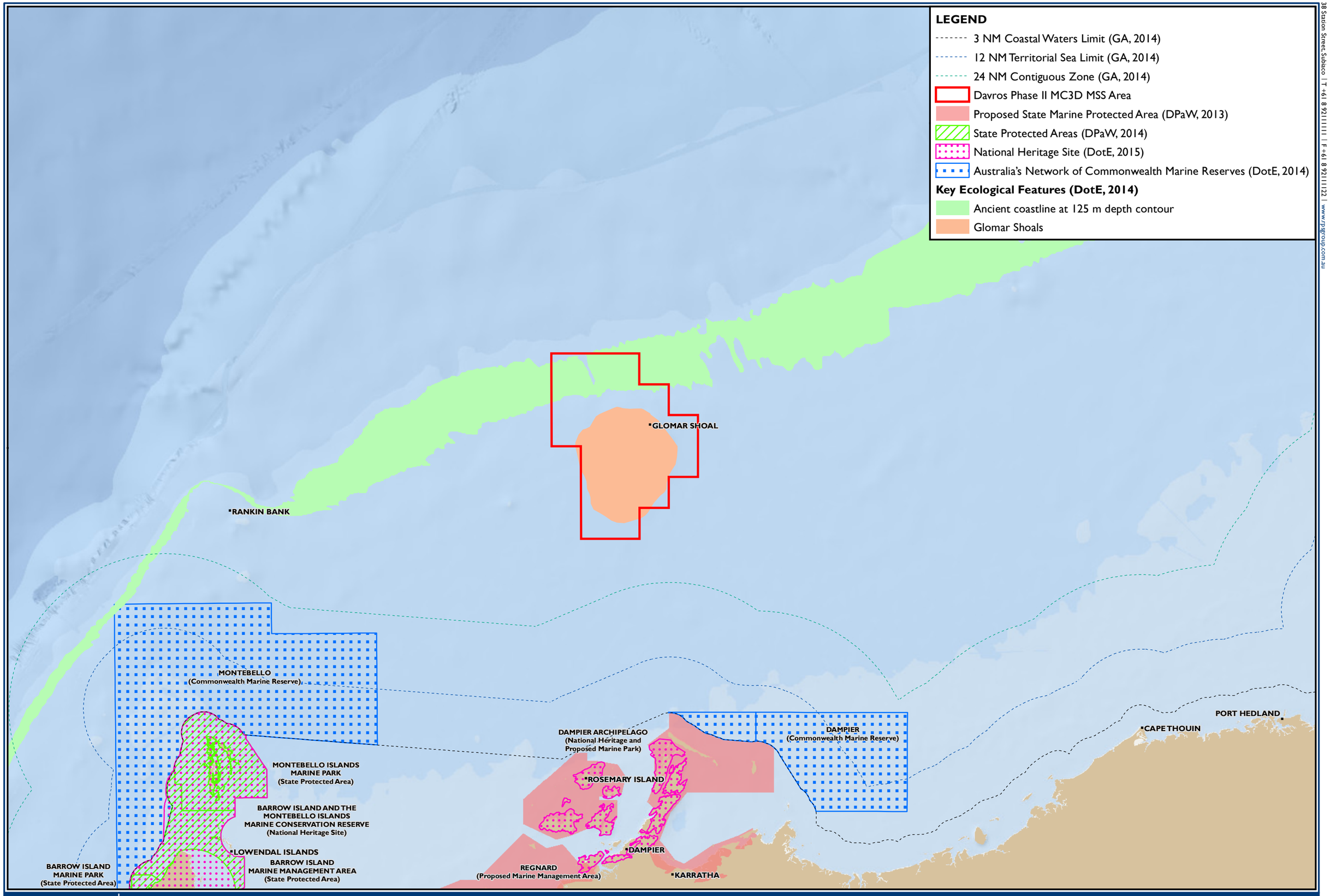

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Doc Number: 002
Date: 15.09.15
Scale: 1:1,000,000 @ A3
Created by: MA
Source: CGG, 2015 RPS, 2015

GDA 1994 MGA Zone 50

0 5 10 20 30 40 km

Figure B
Marine Protected Areas and Key Ecological Features in the Vicinity of the Davros Phase II MC3D MSS

2.3.1.3 Fish Spawning

Consultation with the Western Australian Department of Fisheries (DoF) indicated the Davros Phase II MC3D survey area might overlap the spawning range of several species that may be exploited commercially within the region. However, there is no indication that the area includes any important fish spawning sites. No other fishery stakeholders consulted identified concerns over fish spawning in the survey area (Section 7.0). The survey area, including Glomar Shoal, does not include known spawning aggregation areas for any of these species and the spread of spawning periods throughout the year indicates there are no periods of higher sensitivity with respect to fish spawning.

2.3.2 Protected Species

A search using the EPBC Act Protected Matters Search Tool (PMST) was conducted for the Davros Phase II MC3D survey area, including a 1 km buffer.

2.3.2.1 Cetaceans

A search of the EPBC Act PMST identified 22 cetacean species that may occur in the vicinity of the survey area. Of these, the blue whale (*Balaenoptera musculus*) and the humpback whale (*Megaptera novaeangliae*) are listed as Threatened and Migratory. Five other cetaceans are listed as Migratory, and may be seasonally present (Table 2-1).

Table 2-1: EPBC Act Listed Marine Mammals Potentially Occurring in the Davros Phase II MC3D Survey Area

Scientific Name	Common Name	EPBC Act Listing
Megaptera novaeangliae	Humpback whale	Vulnerable, Migratory
Balaenoptera musculus	Blue whale	Endangered, Migratory
Balaenoptera bonaerensis	Antarctic minke whale	Migratory
Balaenoptera edeni	Bryde's whale	Migratory
Orcinus orca	Killer whale, orca	Migratory
Physeter microcephalus	Sperm whale	Migratory
Tursiops aduncus (Arafura/Timor Sea)	Indo-Pacific bottlenose dolphin/ spotted bottlenose dolphin	Migratory

Conservation Advice has been prepared by the Threatened Species Scientific Committee and approved on 1 October 2015 (Conservation Advice, *Megaptera novaeangliae*, humpback whale). The Conservation Advice provides updated distribution (including calving, resting, feeding areas) and migratory route maps for humpback whales. The Davros Phase II MC3D survey area lies within the mapped 'species core range', i.e. humpback whales travel through this area on a seasonal basis as part of their migratory movements, although the migrating whales are largely confined to within 50 km of the coast. Peak northward migration is identified as from late July to early August, and peak southward migration from late August to early September. There is potential for

encounters with humpback whales within or in the vicinity of the survey area; however this is limited given the survey area does not overlap any confined migratory pathway, or any known feeding, calving or resting areas. The key threats identified by the Conservation Advice of relevance to the activity have been assessed in Section 4.2 and include noise interference, habitat degradation, entanglement and vessel disturbance and strike.

The survey area is within the area of "known occurrence" for blue whales; however there are no known or possible foraging areas in, or close to, the survey area. Furthermore, the acquisition area water depths are shallower (up to 140 m) than the depths in which the pygmy blue whales generally pass along the shelf edge; they typically travel at between 500 and 1,000 m water depth. However, there is the potential for encounters with migrating individual pygmy blue whales within or in the vicinity of the survey area.

The Conservation Management Plan for the Blue Whale (2015 - 2025) includes four interim management objectives. The fourth objective is "anthropogenic threats are demonstrably minimised". The key threats identified under the plan of relevance to the activity have been assessed in Section 4.2 and include noise interference and vessel disturbance and strike.

2.3.2.2 Fish

A search of the EPBC Act PMST indicated that 27 listed teleost fish might occur within the vicinity of the survey area. All of these species are from two families, Syngnathidae (seahorses, seadragons and true pipefishes) and Solenostomidae (false pipefishes, ghost pipefishes and tubemouth fishes), none of which are listed as Threatened. The EPBC Act PMST identified four species of shark and one species of ray as Threatened or Migratory that may be occur or be seasonally present in the vicinity of the survey area (Table 2-2).

Table 2-2: Sharks and Rays Listed Under the EPBC Act as Potentially Occurring in the Davros Phase II MC3D Survey Area

Scientific Name	Common Name	EPBC Act Status
Rhincodon typus	Whale shark	Vulnerable, Migratory
Carcharias taurus	Grey nurse shark	Vulnerable
Carcharodon carcharias	Great white shark	Vulnerable, Migratory
Isurus oxyrinchus	Shortfin mako	Migratory
Isurus paucus	Longfin mako	Migratory
Manta birostris	Giant manta ray	Migratory

Whale sharks are broadly distributed in tropical and temperate seas worldwide, feeding on phytoplankton, macroalgae, plankton, krill, small squid and vertebrates. Whale sharks aggregate annually off the Western Australian coast at Ningaloo Reef between March and June. The whale shark recovery plan identifies this aggregation site as critical habitat. They are highly migratory, travelling from aggregation sites at the North West Cape

north-east along the continental shelf, before moving offshore into the north-eastern Indian Ocean, around the Dampier Terrace and Argo Abyssal Plain. The survey area lies within the foraging ground BIA that has been identified along the north-west coast of Western Australia (from Exmouth to Cape Talbot) where whale sharks are likely to be present between July and November. Outside of the aggregation periods, whale sharks are generally solitary and only low numbers are expected to be encountered in the survey area during July to November.

The survey area is at the northern limit of the known distribution of great white sharks in WA, and they are likely to be rare visitors to the survey area. Grey nurse sharks may occasionally transit through the survey area and surrounding waters, however the area is unlikely to contain any critical habitats.

2.3.3 Marine Reptiles

Five Threatened and Migratory species of marine turtle species and one Critically Endangered sea snake species are listed under the EPBC Act as potentially occurring in the survey area (Table 2-3).

Table 2-3: EPBC Act Listed Marine Reptiles

Scientific Name	Common Name	EPBC Act Status
Marine Turtles		
Caretta caretta	Loggerhead turtle	Endangered, Migratory
Chelonia mydas	Green turtle	Vulnerable, Migratory
Dermochelys coriacea	Leatherback turtle	Endangered, Migratory
Eretmochelys imbricata	Hawksbill turtle	Vulnerable, Migratory
Natator depressus	Flatback turtle	Vulnerable, Migratory
Sea Snakes		
Aipysurus apraefrontalis	Short-nosed sea snake	Critically Endangered

The waters of northern Western Australia support important nesting, inter-nesting and foraging areas for green, hawksbill, loggerhead and flatback turtles. Leatherback turtles forage in Western Australian waters but are not known to breed in the region. Turtle nesting periods vary between species and BIAs have been identified for inter-nesting turtles travelling around important nesting sites within Western Australia. No nesting beaches occur in the survey area and only the inter-nesting BIA for flatback turtles overlaps the survey area. Post-nesting marine turtles for all species travel greater distances and individuals may visit the survey area between breeding events.

The nesting season of the NWS flatback turtle breeding unit peaks in the Pilbara from December to January, with the peak period for inter-nesting flatback turtles between December and February. The inter-nesting BIA for flatback turtles overlaps the southern portion of the Davros Phase II MC3D survey area. It is therefore possible that inter-

nesting flatback turtles will be encountered in the survey in December to February; however, it will likely be limited to individuals transiting through the survey area.

The short-nosed sea snake has an estimated distribution that ranges from the Exmouth Gulf to the Arafura Sea, occurring on reef flats and shallow waters of outer reefs in water up to 10 m deep. Short-nosed sea snakes are not known to occur at Glomar Shoal and are unlikely to be present in the deeper parts of the survey area.

2.3.4 Seabirds and Migratory Shorebirds

Many seabirds forage widely across the NWMR, with some species breeding on offshore islands. A search of the EPBC PMST did not identify any Threatened or Migratory species in the vicinity of the survey area. One "listed" species, the eastern osprey (*Pandion cristatus*), was identified by the PMST as potentially occurring in the survey, however, this species is found in littoral and coastal habitats and on offshore islands and is unlikely to be present in the survey area due to the absence of emergent features.

The EPBC Act PMST did not list the wedge-tailed shearwater (*Puffinus pacificus*) as potentially present; however, this species has a foraging BIA that overlaps a portion of the survey area. It is likely to be encountered occasionally in the survey area. Three species of tern have breeding and foraging BIAs around coastal islands of the North West Shelf, however these are all distant to the survey area.

2.4 Socio-economic Environment

2.4.1 Commercial Fishing

There are four Commonwealth and six Western Australian fisheries that overlap the Davros Phase II MC3D survey area and are described in the following sections.

2.4.1.1 Commonwealth Fisheries

The survey area lies outside the boundary of the North-west Slope Trawl Fishery; however, the zone of potential influence (ZPI) in the event of an oil spill overlaps the northern boundary of the survey area. Interactions with fishing vessels during the survey are therefore unlikely to occur.

Fishing effort for Southern Bluefin Tuna Fishery is concentrated in temperate Australian waters, with the majority of catch taken in the Great Australian Bight. Interactions with fishing vessels during the survey will not occur.

Fishing effort in the Western Skipjack Fishery is confined to temperate waters off southern Australia and effort in the fishery is considered very low. Interactions with fishing vessels during the survey will not occur.

The Western Tuna and Billfish Fishery licence area extends to the Australian exclusive economic zone boundary. No significant effort in the vicinity of the survey area has been documented. Interactions with fishing vessels during the survey are therefore unlikely to occur.

2.4.1.2 West Australian Fisheries

Commercial abalone fishing takes place in southern Western Australia, although the fishery management plan states that all WA waters are part of the fishery. Fishing methods are dive and wading. Interactions with fishing vessels during the survey will not occur.

The majority of catch in the Mackerel Managed Fishery is taken in Area 1, Kimberley. The survey area overlaps with Area 2 of the fishery, with 13 vessels reported as being active in this zone during 2013–2014. Given the small number of vessels and the large area over which Area 2 of the fishery extends, encounters between fishing vessels and the survey vessel are considered unlikely.

This North Coast Prawn Managed Fisheries fishing gear consists of otter trawls typically restricted to depths less than 60 m. The fishery is currently not actively fishing and therefore interactions during the survey are unlikely.

The Northern Shark Fishery is not currently active; no activity has been reported in either of these fisheries from 2009 to 2014, with low levels of activity reported prior to these years. Interactions with fishing vessels during the survey will not occur.

The WA Pearl Oyster Managed Fishery is operates in shallow coastal waters along the NWS from Exmouth to the NT border. The harvest method is drift diving, harvesting legal sized oysters by hand. *P. maxima* are mostly found in shallow waters of the littoral (5 to 10 m) and sub-littoral zone, occasionally reaching the maximal recorded depths of 100 m to 120 m. The survey area is located in Fishing Zone 1 of the fishery. There are five licences within this zone. However, no fishing has been undertaken in Zone 1 since 2008 and given that the POMF is a dive fishery operating in shallow coastal waters (<35 m water depth), it is extremely unlikely that there will be any activity in this fishery in the offshore waters of the survey area.

The Pilbara Demersal Scalefish Managed Fishery includes the Pilbara Fish Trawl (Interim) Managed Fishery (PFTIMF), Pilbara Trap Managed Fishery (PTMF) and the Pilbara Line Fishery (PLF). While it is possible that vessels operating in the PFTIMF and PTMF could operate in the vicinity of the survey area during the proposed activity, it only represents a small portion of the fishery's licence area. Interactions with these fisheries are unlikely. The survey area is located entirely in the PLF management area; therefore encounters with fishing vessels during the survey are possible.

The Pilbara Developing Crab Fishery operates in inshore waters from Onslow to Port Hedland. Due to fishing occurring in shallow inshore waters east of Onslow, interactions with fishing vessels during the survey will not occur.

The survey area is located entirely within Zone 1 of the West Coast Deep Sea Crustacean Managed Fishery, however due to the restriction of operations to >150 m water depth and the majority of fishing occurring >500 m water depth, interactions with fishing vessels during the survey is unlikely.

2.4.2 Recreational Fishing and Tourism Activities

Recreational fishing is concentrated around key population centres, with a seasonal peak in activity during winter months. Occasional recreational fishing occurs at Glomar Shoal (located within the survey area); however, due to the distance from land (92 km north of Dampier port) it is sporadic. Encounters with recreational fishers are therefore unlikely.

Recreational boating in the vicinity of the proposed survey may also include cruising yachts sailing along the coast between the mainland and islands. Cruising yachts may occasionally traverse the survey area. Encounters between the survey vessel and nature based tourism activities in the survey area are considered unlikely as the majority of tourism activities are carried out within the reserve boundaries and along the coast.

2.4.3 Heritage

There are no known Indigenous cultural heritage values or issues for the waters and seabed within or in the vicinity of the survey area or ZPI.

No listed National Heritage Places or listed historic places were identified by the EPBC Act PMST in the vicinity of the survey area. The nearest National Heritage Place is the Dampier Archipelago, which includes Rosemary Island, approximately 65 km to the south-east of the survey area and is outside the ZPI.

A search of the Australian National Shipwreck Database and the Western Australian Museum Shipwreck Database found no historic shipwrecks within the survey area. The nearest wreck is that of the *Tryal,* which was wrecked in 1622 on Tryal Rocks, approximately 135 km south-west of the survey area, near the Montebello Islands and is outside the ZPI.

2.4.4 Shipping

There are several major harbours in the region including the ports of Broome, Port Hedland and Dampier. The Davros Phase II MC3D MSS may encounter shipping traffic, both commercial and locally based vessels, throughout the duration of the survey.

2.4.5 Petroleum Activities

The Davros Phase II MC3D MSS will acquire seismic data in Exploration Permits WA-1-P, WA-458-P, Retention Lease WA-48-R, Production Licences WA-03-L, WA-04-L, WA-20-L, and adjacent open acreage areas. There have been a large number of marine seismic surveys conducted in the NWMR. A number of production facilities are located within in this region including Floating Production Storage Offshore (FPSO) facilities, manned and unmanned monopods, and larger production platforms (Figure A). There is one pipeline within the vicinity of the survey area, the Angel Project pipeline, to the North Rankin A platform.

2.4.6 Defence

There are no designated defence or military exercise areas (MEA) in the vicinity of the survey area.

2.5 Particular Values and Sensitivities

2.5.1 Marine Protected Areas

There are no listed World Heritage Properties or Ramsar Wetlands of International Importance within or in the vicinity of the Davros Phase II MC3D survey area. The Davros Phase II MC3D survey area lies approximately 52 km to the north-west of the Dampier Commonwealth Marine Reserve (DCMR) and this reserve lies outside the ZPI in the event of an oil spill during the activity. No state protected areas occur in the vicinity of the Davros Phase II MC3D survey area. The closest is the proposed Dampier Archipelago Marine Park, approximately 52 km to the south.

2.5.2 Key Ecological Features (KEFs)

The NWMR bioregional plan identifies 13 key ecological features (KEFs), two of which occur within or immediately adjacent to the survey area (Figure B):

- Glomar Shoals - regionally important shoals for their high biological diversity and high localised productivity for both its benthic and pelagic communities. Benthic habitats and communities and fish populations have been surveyed at Glomar Shoal and are described in Section 2.3.1.2.
- Ancient coastline at 125 m depth contour - parts of the KEF, particularly the rocky escarpment, are thought to provide biologically important habitats in areas otherwise dominated by soft sediments. The topographic complexity of these escarpments may also facilitate vertical mixing of the water column, providing relatively nutrient-rich local environments.

2.5.3 Biologically Important Areas (BIAs)

Biologically important areas (BIAs) are areas identified by the DotE as important in the maintenance of biologically essential behaviours of species protected under the EPBC Act (such as breeding, foraging, resting or migration). BIAs that overlap some portion of the survey area are:

- migration routes for humpback whales
- low density foraging area for whale sharks
- inter-nesting buffer area for flatback turtles
- foraging areas for wedge-tailed shearwaters.

3.0 DESCRIPTION OF THE ACTIVITY

3.1 Survey Parameters

The amount of seismic energy required to meet survey objectives is a factor of the depth of the geological target, the geology itself, as well as the water depth. One of the aims of the Davros Phase II MC3D MSS is to image the basement accurately, which is understood to be at a depth of 20 km below the seabed. In order to achieve optimal imaging at this depth, it is essential to use an acoustic source configured according to the acquisition parameters above. A volume of 4,630 cui has been nominated as the minimum volume capable of achieving the survey objectives for data imaging for the survey, and is based on previous surveys in the Carnarvon Basin. Survey data must also tie in with previous data collected along lines surveyed as part of the Davros Phase I MSS across adjacent permits for which the same size array was employed.

During the proposed activities, the survey vessel will traverse a series of pre-determined sail (survey) lines within the survey area at a speed of approximately 8 to 9 km/hr (4.5 knots), towing an acoustic energy source. Survey lines across Glomar Shoal will run in a north-west to south-east orientation. A summary of the seismic survey parameters is provided in Table 3-1. The acoustic source (airgun array) will be towed at a water depth of 5 to 9 m (+/-1 m) below the sea surface, and the streamer tow depth will be 6 m at the head of the streamers and 50 m at the tail. In shallower waters of the survey area (e.g. over Glomar Shoal and in <60 m water depth), steamers will be towed at a depth that will not allow them to be closer than 10 m from the seabed. Seismic data will not be acquired in water depths of <30 m over Glomar Shoal.

Table 3-1: Davros Phase II MC3D MSS Acquisition Parameters

Survey Parameter		Description
General Parameters	Survey acquisition area	1,693 km^2
	Range of survey water depths in survey area	~22 m to 140 m below lowest astronomical tide (LAT)
	Planned survey commencement date	Between Q1 2016 and Q4 2016 [1]
	Survey duration	Two months
Seismic Airgun Array Parameters	Airgun array volume (maximum)	4,630 cubic inches (cui)
	Operating pressure	2,000 psi
	Source depth	5 to 9 m (±1 m)
	Source (shot point) interval	18.75 or 25.0 m
	Line spacing	500 to 1,000 m
	Peak sound pressure level	260 dB re 1 µPa at 1 m (SPL peak) 234.6 dB re 1 μPa^2.s at 1 m (SEL) [2]
	Frequency range	0–200 Hz
	Number of streamers	8 to 12

Survey Parameter		Description
	Streamer length	8,100 m
	Streamer spacing	50 to 100 m
	Streamer depth	8 m at head of streamers, 50 m at tail (except in shallow waters where the tail will be at least 10 m above the seabed)
	Streamer type	Solid

3.2 Survey Vessels

3.2.1 Seismic Vessel

The contract for the Davros Phase II MC3D MSS is yet to be awarded and therefore it is not possible to define the exact seismic and support vessels. CGG proposes to conduct the activity using a purpose-built seismic survey vessel, similar to the M/V *Viking Vision*, which is owned by Volstad Maritime AS and operated by CGG. However, any vessel used will have all necessary certification/registration and be fully compliant with all relevant MARPOL and SOLAS convention requirements for a vessel of this size and purpose. The vessel be required to operate in accordance with CGG's Environmental Policy and this EP and will have an approved and tested Shipboard Oil Pollution Emergency Plan (SOPEP).

3.2.2 Support Vessel(s)

One or more support vessels will accompany the seismic survey vessel to maintain a safe distance between the survey array and other vessels, to manage interactions with other vessels and fishing activity interactions, and to assist with streamer recovery if required. The support vessel(s), which each have a crew of approximately 15 personnel, will also resupply the survey vessel with fuel, victuals and other logistical supplies. Support vessels over 400 GRT will also have an approved and tested SOPEP and all vessels will comply with this EP.

The survey is expected to run for two months. Therefore, it is likely that the seismic vessel will be refuelled within the survey area from the support vessel. At sea refuelling will only take place during daylight hours and will be subject to strict control measures (procedural and equipment) as described within the impact and risk assessment in Section 4.0. In addition, the OPEP described in Section 6.0 will be implemented in the unlikely event of a fuel spill.

3.3 Time Frame

The commencement date of the Davros Phase II MC3D MSS is yet to be decided, however, the activity is planned to run for two months between Q1 2016 and Q4 2016. The timing of the activity is subject to availability of the survey vessel for conducting the

survey, client data requirements, sea state conditions suitable for marine seismic acquisition, and granting of the required regulatory approvals and access authorities.

Seismic data will be acquired over a 24-hour period, with shut-downs for routine and reactive maintenance, repairs, transit and line turns, fauna and stakeholder avoidance and weather.

4.0 ENVIRONMENTAL RISK AND IMPACT ASSESSMENT

4.1 Methodology

CGG's risk management methodology is based on the principles, framework and processes defined by the Australian/New Zealand Standard AS/NZS International Standards Organization (ISO) 31000:2009 Risk Management – Principles and Guidelines. Environmental risks associated with the Davros Phase II MC-3D MSS have been assessed in accordance with CGG's risk management process shown in Figure C.

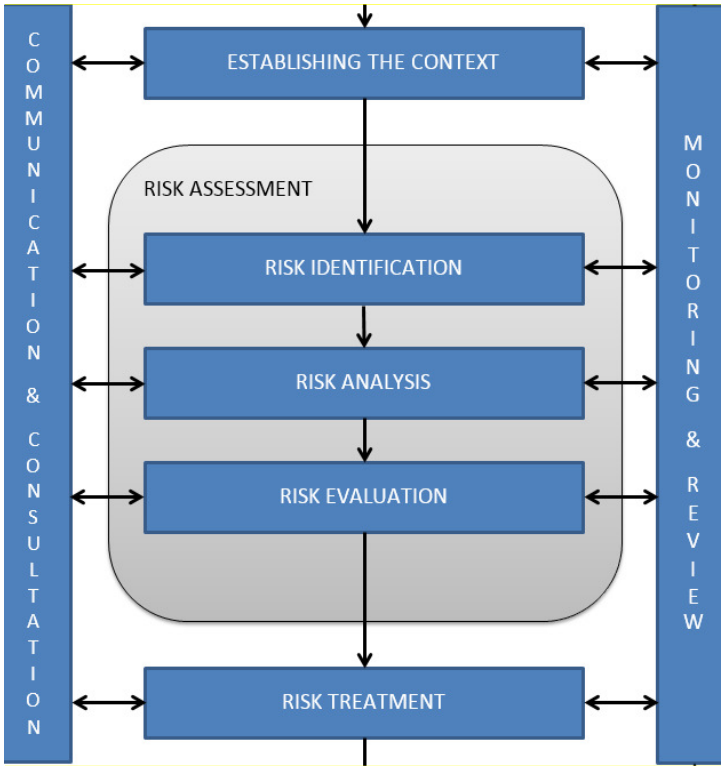

Figure C: CGG's Risk Management Flowchart

4.1.1 Establishing the Context

The purpose of establishing the context in the risk management process is to define the external and internal parameters to be taken into account when managing risk, and to define the risk criteria. The external context comprises the description of the activity, the physical, biological and socio-economic environments and associated potential environmental impacts specific to the nature and scale of the activity, the legislative framework and applicable management plans, standards, guidance and the perceptions and values of external stakeholders. The internal context relates to CGG's culture, processes, structure and strategy, reflected in CGG's Health, Safety and Environment (HSE) Management System, and includes anything within the organisation that can influence the way in which risk is managed.

4.1.2 Risk Assessment

The environmental risks and impacts associated with activities to be undertaken under the EP have been assessed using the following steps:

- definition of the activity and associated environmental aspects (Section 3.0)
- identification of the environmental values at risk within and adjacent to the survey area, i.e. the environmental context of the activity (Section 2.0)
- identification of sources of risk, potential impacts (from both routine and non-routine events) and inherent risk (Section 4.1.2.1 and Table 4-1)
- identification of control measures to be implemented for each risk in order to reduce the impacts and risk to 'as low as reasonably practical' (ALARP) (Table 4-1)
- determination of the residual risk of each environmental risk with identified control measures adopted (Section 4.1.2.3 and Table 4-1)
- determination of whether the residual risk is ALARP and acceptable, with the control measures implemented. In the event that a risk was not considered ALARP, further practical control measures were proposed and adopted in order to reduce the risk to ALARP (Section 4.1.3.1).
- determination of the acceptability of the risk (Section 4.1.3.2).

4.1.2.1 Risk Identification

Risks were identified for both routine (planned) operations and non-routine (unplanned accidents/incidents) events. The process used to identify risks with the potential to harm the environment included the following sources:

- the description of the location, timing of survey and activities to be undertaken in acquiring seismic data (e.g. airgun discharges, sail lines)
- an understanding of general vessel activities/operations during seismic surveys and the potential threats to stakeholders and the marine environment
- literature reviews on the environmental sensitivity of the receiving environment with respect to species' presence, "biological calendars", habitat distribution and location of environmentally sensitive areas (breeding, migration, resting areas)
- feedback from marine stakeholders to understand possible socio-economic activities that may be affected by the proposed survey operations.

4.1.2.2 Risk Analysis

Risk analysis involved further developing the understanding of the risk by defining the potential impacts and assessing appropriate control measures to reduce impacts to acceptable levels. Specifically risk analysis considers the causes and sources of risk, their positive and negative consequences, the likelihood that those consequences can occur and the identification of risks requiring treatment (i.e. application of control measures).

The risk analysis is based on the assessment of risks that are both credible and realistic, and appropriate to the nature and scale of the specific activity and the values and

sensitivities of the existing environment. Wherever possible, site-specific and activity-specific data has been used in the risk assessment however, in order to address areas of uncertainty, a precautionary approach has been taken and a conservative or "worst case" approach has been applied.

4.1.2.3 Risk Evaluation

Based on the outcomes of the risk analysis, risks were evaluated to determine which risks require treatment (additional control measures), and the priority of implementation of risk treatment. Evaluation of the residual risk considers a range of factors, including regulatory compliance, environmental impacts, social and cultural impacts, and reputational. Each risk identified in Table 4-1 has been analysed by determining the likelihood and consequence (including the scale of the impact and the sensitivity of the receptors affected), as well as evaluating other attributes of the risk (such as extent, duration, timing and reversibility). The analysis considered the degree of confidence in the predictions made, including uncertainty, limitations and assumptions on modelling and availability of data over the survey area.

4.1.3 Risk Treatment

Risk treatment involves a process of selecting additional control measures for reducing risks that have not been demonstrated to be ALARP during the risk analysis and evaluation processes, and then establishing whether the risk can be deemed acceptable.

4.1.3.1 Demonstration of ALARP

Where the residual risk is low, good industry practice (including recognised guidelines and standards) has been assessed to determine if additional control measures are appropriate. Where the residual risk is medium, good practice and engineering (or environmental) risk assessment methods (e.g. cost benefit analysis, professional judgement) have been considered in introducing additional controls to reduce the risk further. Where the residual risk is high or very high, then additional control measures have been developed from a combination of good practice, risk assessment and a precautionary approach. The latter precautionary approach requires conservative assumptions to be made in the development of additional control measures where there is uncertainty in the process. Once additional control measures have been identified, each has been assessed on its merits of risk reduction and the proportionality of the sacrifice associated with each measure. This assessment considers the practicality, effectiveness and the cost benefit of implementing the control measure.

4.1.3.2 Risk Acceptance

In accordance with Regulation 10A(c) of the OPGGS(E) Regulations, CGG applies the following process to demonstrate that environmental impacts are of an acceptable level:

- Low residual risk: Good industry practice (including legislation and standards) have been applied and the risk is acceptable without further reduction measures being required. Further effort towards risk reduction is not reasonably practicable without sacrifices (costs, loss of opportunities, or loss of technical quality) grossly disproportionate to the risk reduction benefit.
- Medium residual risk: Acceptable (tolerable), providing that it can be shown that all practicable control measures have been implemented, if the sacrifices are not grossly disproportionate to the environmental benefit gained, with continual review of these measures and any potential new ones.
- High residual risk (undesirable): CGG management decision required to accept risks and proceed. Additional control measures are required to be considered and implemented, if the sacrifices are not grossly disproportionate to the environmental benefit gained, to prevent or reduce the risk to ALARP and be acceptable.
- Very high residual risk (intolerable): May require re-design of project and/or its parameters, additional control measures are required to be implemented (regardless of sacrifice) to prevent or reduce the risk to ALARP and be acceptable.

CGG's criteria for acceptance of residual risks following demonstration of ALARP includes consideration of legislative requirements, industry good practice, the principles of ecological sustainable development, CGG's internal context and stakeholder perceptions and concerns.

4.1.4 Communication and Consultation

The extent to which identified stakeholders have an interest in the decision depends upon the nature of the risk (e.g. magnitude, complexity, uncertainty) and their perception of the risk. The values, views, concerns of stakeholders consulted for the Davros Phase II MC3D MSS have been assessed for merit and, where relevant in the determination of the decision context, used to identify appropriate control measures. These stakeholder concerns and associated control measures relevant to each risk are summarised in the individual risk assessments in Section 7.0. CGG is committed to consulting with relevant stakeholders who may be affected by the activity, to identify and understand any concerns and issues, to address those issues as appropriate and to inform stakeholders as to how their concerns have been addressed.

4.2 Summary of Risk and Impact Assessment

A summary of the environmental risks, potential impacts and proposed control measures to reduce risks to ALARP and for the risk to be deemed acceptable for the Davros Phase II MC3D MSS is presented in Table 4-1.

Table 4-1: Risk and Impact Assessment Summary for Routine and Non-routine Operations

Sources of Risk (Hazard)	Potential Environmental Impacts to Identified Values / Sensitivities	Control Measures	Residual Risk			Risk Acceptance
			Likelihood	Consequence	Risk	
Routine (Planned) Operations						
Underwater noise emissions from operation of the seismic source	Physical injury to auditory tissues or other air-filled organs Hearing loss; temporary threshold shift (TTS) or permanent threshold shift (PTS) Direct behavioural effects through disturbance or displacement and consequent disruption of natural behaviours or processes, e.g. migration, resting, calving Indirect behavioural effects by impairing/masking the ability to navigate, find food or communicate or by affecting the distribution or abundance of prey species.	Seismic airgun array designed to direct sound energy downwards and reduce horizontal spreading; this will reduce horizontal sound propagation.	Unlikely	Minor	Low	Acceptable
		Establishment of an exclusion area comprising the Fish Protection Area (FPA), which has been based on areas <30 m deep and surrounding areas of high fish species richness and abundance as modelled by AIMS, and a 250 m buffer zone around the FPA. Sail lines will be orientated in a NW-SE direction to avoid the shallow parts of Glomar Shoal while maximising data coverage. Seismic data acquisition will NOT be undertaken within the FPA or buffer zone.				
		Vessel operations will adhere to EPBC Policy Statement 2.1 and Part A management measures (below).				
		Pre-start up visual observation: extended visual observations for whales / whale sharks undertaken in the 3 km "observation zone" by MFO for 30 minutes prior to commencement of soft start procedures				
		Soft start procedures: may only commence if no whales or whale sharks have been sighted within the low power or shutdown zone during the pre-start up visual observations. Soft start procedures will be used each time the acoustic source is initiated gradually increasing power over a 30-minute period.				
		If a whale is sighted within the 3 km observation zone during the soft start, an additional trained crew member will be brought onto the bridge to monitor the whale.				
		If the whale or whale shark enters the "low power zone" the source will be powered down to the lowest possible setting; and if it enters the "shut-down zone" (<500 m) the acoustic source will be shut down completely				
		Soft start procedures will only resume after the whale or whale shark has moved outside the low power zone, or when 30 minutes have elapsed since the last sighting				
		Power down of the acoustic source to the lowest possible setting when not collecting data, or undertaking soft start procedures (e.g. during line turns or when moving to another part of the survey area).				
		At night or at other times of low-visibility, start-up of the seismic source will occur: ▪ providing that there have not been three or more whale / whale shark instigated power-down or shut-down situations during the preceding 24 hour period ▪ if operations were not previously underway during the preceding 24 hours, the vessel has been in the vicinity (approximately 10 km) of the proposed start-up position for at least two hours (under good visibility conditions) within the preceding 24-hour period, and no whale / whale shark shut-downs were required.				
		One trained MFO will be stationed on an elevated platform and observing during all seismic survey activities conducted in daylight hours				
		Avoid concurrent seismic surveys by other operators, with time share operations implemented if required.				
		Survey vessel crew are inducted in their responsibilities as required regarding vessel / marine fauna interactions.				
		The precaution zones for the survey are based on a precautionary approach and will be as follows: ▪ observation zone: 3 km+ horizontal radius from the acoustic source ▪ low power zone: 2 km horizontal radius from the acoustic source ▪ shut-down zone: 500 m horizontal radius from the acoustic source.				
		Implementation of an adaptive management program during the full survey duration. The following additional management measures, as identified in Part B of the EPBC Act Policy Statement 2.1, will be implemented to minimise impacts to humpback and pygmy blue whales: ▪ At least one dedicated MFO must be observing for whales during daylight hours (standard practice) during May to November period ▪ If there have been 3 or more whale instigated power-downs or shut-downs in the preceding 24 hour period; or ▪ If operations were not previously underway during the preceding 24 hours, the vessel (or a support vessel) has been in the vicinity (approximately 10 km) of the proposed start up position for at least 2 hours (under good visibility conditions) within the preceding 24 hour period, and whales have been sighted; ▪ Then the following measures shall be implemented: o increased precaution zones (Observation zone: >3 km; Shut-down zone: 2 km); and o increased Pre Start-up Visual Observation of 45 minutes.				
		In the event that another vessel is acquiring seismic data in the region, the survey vessel shall not acquire data simultaneously within 50 km of the other seismic vessel in order to avoid cumulative impacts to marine fauna.				
Underwater noise emissions from vessel operations	Direct behavioural effects through disturbance or displacement of marine megafauna, with potential for disruption of natural behaviours or processes,	All internal combustion engines on board the vessel will be well maintained in accordance with the manufacturer's specifications and hence noise emissions will typical of vessels in the region.	Rare	Minor	Low	Acceptable
		The interaction of seismic and support vessels with cetaceans during the survey will be managed consistently with the Part 8				

Sources of Risk (Hazard)	Potential Environmental Impacts to Identified Values / Sensitivities	Control Measures	Residual Risk			Risk Acceptance
			Likelihood	Consequence	Risk	
	e.g. migration, resting, calving. Indirect behavioural effects by temporarily reducing the ability of marine fauna to navigate, find food or communicate or by affecting the distribution or abundance of their prey species.	of the EPBC Regulations (2000): ▪ seismic survey and support vessels will not travel at greater than 6 knots within 300 m of a cetacean (caution zone) ▪ seismic survey and support vessel will not approach closer than 50 m for a dolphin and/or 100 m for a whale (with the exception of animals bow riding).				
		One trained MFO will be stationed on an elevated platform on the seismic vessel and observing during all seismic survey activities conducted in daylight hours.				
Interference with Other Marine Users	Temporary and intermittent displacement of other marine users from the survey area. Risk of fishing gear, particularly fish traps and long lines, snagging on the seismic streamers. Indirect effects of underwater noise disturbance on target fish populations.	CGG will undertake an additional consultation round upon approval of the Davros Phase II MC3D MSS EP to advise all relevant persons of details of the survey including, timing, location, duration.	Unlikely	Minor	Low	Acceptable
		Vessel to maintain appropriate lighting, navigation and communication at all times to inform other users of the position and intentions of the survey vessel, in compliance with the *Navigation Act 2012* and Chapter 5 of the International Convention on the Safety of Life at Sea (SOLAS Convention).				
		Adherence to Marine Orders Part 30: Prevention of Collisions (Issue 8) and Part 21: Safety of navigation and emergency procedures (Issue 8) specifically, use of standard maritime safety procedures (including radio contact, display of navigational beacons and lights).				
		Continuous (24 hour) survey operations with multiple trained crew (STCW95/Elements of Shipboard Safety), and monitoring of vessel position (radar) at all times during seismic acquisition.				
		The Australian Hydrographic Service (AHS) advised of the survey details (survey location, timing) at least two weeks prior to mobilisation and following demobilisation for issue of Notice to Mariners.				
		AMSA Rescue Coordination Centre (RCC) to be advised of the survey details (survey vessel, location, timing etc.) prior to the start of the survey to ensure that AUSCOAST warnings can be issued and kept up to date.				
		Survey vessel will be equipped with Automatic Radar Plotting Aid (ARPA) for detection of vessels, speed and heading.				
		Ongoing consultation with stakeholders three weeks prior to the survey, and during the survey, including notifications of mobilisation/demobilisation, and any changes to survey plan.				
		Support vessel(s) to manage vessel interactions.				
		Tail buoys clearly marked to identify streamer ends to other users.				
		In-water equipment lost will be recovered, if retrievable.				
		AMSA and AHS to be advised of the loss of large items of buoyant waste or lost equipment (potential navigational hazards).				
		Access agreements will be agreed with oil and gas titleholders.				
		Recfishwest, relevant recreational fishing groups / organisations and commercial fishers will be issued a seven to 10 day forecast prior to activities commencing adjacent to Glomar Shoal.				
		In the event that another vessel is acquiring seismic data in the region, the survey vessel shall not acquire data simultaneously within 50 km of the other seismic vessel.				
		The seismic vessel will adhere to specific “concurrent operations” (CONOPS) procedures when operating within the Cautionary Zone around the Angel platform or any other facility/vessel. Note that the standard Cautionary Zone is 5 km, however during diving operations this is increased to 10 km.				
		During CONOPS, communications will be maintained with the other facilities/vessels.				
		The maximum duration for which recreational and commercial fishers will be displaced from any location on Glomar Shoal will be approximately three weeks.				
		Payment of compensation to the rightful owner for any fishing equipment that has been damaged beyond repair by the survey and cannot be re-used.				
		Prohibition of recreational fishing from the seismic and support vessels.				
Artificial light spill	Disorientation, attraction or repulsion of sensitive marine fauna (particularly turtle hatchlings, juvenile seabirds). Disruption to natural behavioural patterns and cycles, e.g. nocturnal foraging.	Non-essential lighting will be switched off at night when not in use.	Rare	Negligible	Low	Acceptable
		External lighting will be directed onto the deck, reducing light spill to the environment				
Routine discharges	Temporary localised decline in water quality in the immediate vicinity of the discharge. Localised increase in biological oxygen demand (BOD). Localised increase in turbidity of surrounding waters. Temporary toxicity to marine flora and fauna (bilge water discharges).	Compliance with MARPOL 73/78 Annex IV (sewage) and Annex V (garbage), (as applied in Australia under Commonwealth *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*)); and AMSA Marine Orders – Part 96: Marine Pollution Prevention – Sewage, as required by vessel class: ▪ vessel will have a Garbage Management Plan (GMP) and Garbage Record Book ▪ operational on-board sewage treatment plant approved by the International Maritime Organization (IMO). ▪ operational on-board organic waste macerator compliant with MARPOL Annex V ▪ ISPP Certificate ▪ segregation facilities on all vessels including integral waste oil tank for oils and sludge and tanks for storage bilge water.	Rare	Negligible	Low	Acceptable
		All waste holding tanks are to be fully operational prior to survey commencement.				
		Survey vessel crew will be inducted in waste management and made familiar with the vessel GMP.				

Sources of Risk (Hazard)	Potential Environmental Impacts to Identified Values / Sensitivities	Control Measures	Residual Risk			Risk Acceptance
			Likelihood	Consequence	Risk	
		Compliance with MARPOL 73/78 Annex I (as applied in Australia under Commonwealth *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*)); and AMSA Marine Order – Part 91 Marine Pollution Prevention – Oil): ▪ Oil content of any discharged water to be <15 ppm. ▪ Bilge water contaminated with hydrocarbons must be contained and disposed of onshore, except if the oil content of the effluent without dilution does not exceed 15 ppm or an IMO approved oil/water separator (as required by vessel class) is used to treat the bilge water. ▪ Seismic vessel has an International Oil Pollution Prevention (IOPP) certificate.				
		The vessel must not be stationary (and travelling at >4 knots) when undertaking discharge and oil in water (OIW) separator shut off value must be maintained and operational.				
		Deck drain scupper plugs available.				
		Minor oil/lubricant spills will be mopped up immediately with absorbent materials that will be stored on board and disposed of onshore as hazardous waste in accordance with the survey vessel SOPEP.				
		No routine discharges (sewage, putrescibles, grey water, bilge water) within 40 m depth contour of Glomar Shoals KEF; any discharge must be at a speed of >4 knots.				
Introduction and establishment of invasive marine species (IMS)	Increased competition, and other ecological effects, with native species. Threats to endemic diversity and abundance within the Glomar Shoals KEF.	No planned ballast water exchanges, but if required, ballast water exchange will occur >12 NM from land ▪ No discharge of ballast water from survey and support vessels within 12 NM of land without prior authorisation from the DAWR. ▪ Ballast water discharges recorded as >12 NM from land in Ballast Water Management Summary Sheet. ▪ Adherence to Australian Ballast Water Management Requirements.	Rare	Minor	Low	Acceptable
		Adherence with National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Commonwealth of Australia 2009): ▪ Biofouling Record Book kept, outlining marine fouling management actions ▪ biofouling risk assessment shows low risk of IMS presence prior to entry into Australian waters ▪ recent hull inspections (if required based on biofouling risk assessment) ▪ survey vessel has a certified antifouling coating on the hull and coating is in sound condition.				
		Routine cleaning and inspection of all wet equipment (e.g. airgun array, streamer, workboats), consistent with the requirements of the National Biofouling Management Guidance for the Petroleum Production and Exploration Industry (Commonwealth of Australia 2009).				
Atmospheric emissions	Minor deterioration of local and regional air quality due to emission of pollutants such as NO_X and SO_X.	Compliance with MARPOL 73/78 Annex VI as applied in Australia under Commonwealth *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and Marine Order – Part 97 (Part IIID Marine Pollution Prevention – Air Pollution), where applicable to vessel class including: ▪ Vessels will hold a valid International Air Pollution Prevention (IAPP) Certificate. ▪ The sulphur content of any fuel oil used on board ships shall not exceed 3.5% by mass.	Rare	Negligible	Low	Acceptable
		Survey vessel only uses MGO grade fuel.				
		All engines to be well maintained in accordance with manufacturers specifications				
Non-routine (Unplanned) Events						
Vessel collision / equipment entanglement with marine fauna	Vessel collision with marine fauna such as cetaceans, whale sharks and turtles. Equipment entanglement with marine fauna such as cetaceans, whale sharks and turtles. Disturbance leading to behavioural changes or displacement of fauna.	The interaction of seismic and support vessels with cetaceans during the survey will be managed consistently with the Part 8 of the EPBC Regulations (2000): ▪ seismic survey and support vessels will not travel at greater than 6 knots within 300 m of a cetacean (caution zone) ▪ seismic survey and support vessel will not approach closer than 50 m for a dolphin and/or 100 m for a whale (with the exception of animals bow riding).	Rare	Moderate	Low	Acceptable
		Support vessel(s), in addition to the seismic survey vessel, will comply with procedures to manage interactions with marine fauna, e.g. Australian National Guidelines for Whale and Dolphin Watching and AMSA Marine Notice 12/2011 (Minimising the risks of ships colliding with cetaceans).				
		Buoys and automatic recovery devices attached to streamer to facilitate recovery in the event of loss.				
		Soft start procedures will be conducted prior to acquisition commencing. This will encourage noise sensitive marine fauna to move away from the vessel, reducing the likelihood of collision or entanglement.				
		MFO on seismic vessel to maintain watch for marine fauna during the day when the seismic source is active, with observed fauna to be avoided if possible.				
		Slow speed of vessel during seismic acquisition (4 to 5 knots) will reduce collision risk.				
		Seismic and support vessels will apply CGG's Contingency Procedure for Marine Animal Event - Standard Operating Procedure.				
		Seismic and support vessel crew are inducted in their responsibilities as required regarding marine fauna interactions.				
		All entangled marine fauna recovered to the seismic or support vessels will be returned to the sea as quickly as practicable.				

Sources of Risk (Hazard)	Potential Environmental Impacts to Identified Values / Sensitivities	Control Measures	Residual Risk			Risk Acceptance
			Likelihood	Consequence	Risk	
		Use of streamer tail buoys fitted with appropriate turtle guards, if un-guarded buoy presents entrapment hazard.				
		Where possible, in-water equipment lost will be recovered so not to cause entanglement with marine fauna.				
		Support vessel available to assist with recovery of lost streamers.				
		All vessel strike incidents are reported in the National Ship Strike Database at https://data.marinemammals.gov.au/report/shipstrike.				
Seabed disturbance due to loss of equipment and/or emergency anchoring	Localised disturbance to/loss of benthic habitats and associated biota.	Operational procedures will be in place on board the seismic vessel for deployment and retrieval of towed equipment on board, to reduce potential for steamer loss.	Rare	Minor	Low	Acceptable
		Streamers equipped with streamer recovery devices (SRDs) designed to bring the equipment to the surface if lost accidentally.				
		Any lost equipment will be recovered where safe and practicable to do so.				
		Buoys and automatic recovery devices attached to streamer to facilitate recovery in the event of loss.				
		Encounters with marine archaeological resources / wrecks are recorded and reported to the WA Maritime Museum in accordance with the *Historic Shipwrecks Act 1976*.				
		In the event of emergency anchoring all measures will be taken to avoid Glomar Shoal shallow areas of <40 m water depth.				
Loss of hazardous and non-hazardous wastes	Localised decline in water and sediment quality. Toxicity to marine fauna. Potential injury to fauna if disposed overboard (e.g. ingestion of plastics). Seabed disturbance resulting in localised loss of benthic habitat in footprint of dropped object. Creating navigation hazards for other vessels if object floats.	Compliance with MARPOL 73/78 Annex V as applied in Australia *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* (Part IIIB, Division 2, Section 26D) and have a vessel GMP (Regulation 10.2) that must contain as a minimum: ▪ Waste handling equipment, waste storage containers, and closed bins for storing spill response equipment appropriate to the type and volume of waste will be provided at waste storage areas.	Rare	Minor	Low	Acceptable
		Hazardous wastes materials will be handled and stored in accordance with the corresponding MSDS.				
		All waste receptacles in locations with potential for overboard waste loss covered with tightly fitting, secure lids or netting to prevent any solid wastes from blowing overboard.				
		Solid streamer (or gel-filled), no fluid filled streamer to be used, reducing potential for toxicity from lost streamer.				
		Survey vessel crew will be inducted in waste management and made familiar with the vessel GMP.				
		AMSA and AHS to be advised of the loss of large items of buoyant waste (potential navigational hazards).				
		Any accidental release of significant wastes to the marine environment will be recovered where safe and practicable to do so.				
Release of oily wastes and chemical spills	Temporary localised decline in water quality in the immediate vicinity of the discharge. Temporary toxicity to marine flora and fauna.	Compliance with MARPOL 73/78 Annex I (as applied in Australia under Commonwealth *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*)); and AMSA Marine Order - Part 91 Marine Pollution Prevention - Oil): ▪ current Shipboard Oil Pollution Emergency Plan (SOPEP) in place ▪ survey vessels hold a valid IOPP certificate, where required, under vessel class.	Rare	Minor	Low	Acceptable
		Chemicals and/or hydrocarbons will be stored with a form of secondary containment to contain leaks or spills in accordance with their MSDS and CGG's Survey Vessel Handling and Storage of Dangerous Products procedure.				
		All hazardous substances will have an MSDS in place that is readily available on board the survey and support vessel.				
		Deck scupper plugs available.				
		Equipment located on deck utilising hydrocarbons (e.g. cranes, winches or other hydraulic equipment) will have as a minimum primary bunding (i.e. deck edge lips or up-stands).				
		Spill response bins/kits are maintained and located in close proximity to hydrocarbon storage areas and deck areas for spill recovery / containment.				
		Spills from fixed internal equipment, such as engines and generators, are enclosed and spills captured via bilges that drain via the OIW separator.				
		Minor oil/lubricant spills will be mopped up immediately with absorbent materials that will be stored in covered containers and disposed of onshore as hazardous waste in accordance with the survey vessel SOPEP.				
		Survey vessel crew are inducted in their responsibilities for chemical storage and handling and under the SOPEP.				
Accidental oil spill (refuelling and vessel collision)	Acute toxicity to marine and intertidal biota from toxic (typically volatile, low molecular weight hydrocarbons such as aromatics) resulting in injury or death. Chronic toxicity to marine and intertidal biota from persistent hydrocarbon fractions. Physical disturbance (e.g. smothering, blocking of gills) to marine and intertidal biota resulting in injury	Compliance with MARPOL 73/78 Annex I (as applied in Australia under the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983*)); and AMSA Marine Orders - Part 91 Marine Pollution Prevention – Oil): ▪ current SOPEP in place ▪ survey vessels hold a valid IOPP Certificate, where required, under vessel class.	Rare	Moderate	Low	Acceptable
		Survey vessel will be compliant with Marine Orders Part 30: Prevention of Collisions (Issue 8) and Marine Orders Part 21: Safety of navigation and emergency procedures, Issue 8, specifically the use of standard maritime safety procedures (including radio contact, display of navigational beacons and lights).				
		The SOPEP and OPEP are approved, tested (emergency response drills) and they can be implemented in the event of a				

Sources of Risk (Hazard)	Potential Environmental Impacts to Identified Values / Sensitivities	Control Measures	Residual Risk			Risk Acceptance
			Likelihood	Consequence	Risk	
	or death. Displacement of other users (e.g. commercial fishing) due to spill or spill response activities. Indirect impacts from spill response.	spill.				
		The AHS will be advised of the survey details two weeks prior to the start of the survey so that AHS can then issue a Notice to Mariners.				
		The AMSA RCC is notified of the seismic vessel movements prior to the start of the survey				
		Support vessel(s) will undertake surveillance (during a spill) and manage interactions with other marine users' vessels transiting near the seismic vessel or streamers				
		AMSA will be notified immediately (via RCC Australia using a POLREP form) in the event of any oil or diesel spills (>80 L) to sea to ensure prompt and appropriate mobilisation of relevant response plans				
		Survey vessel only uses MGO fuel oil				
		Responsibilities of survey crew under the OPEP and SOPEP are included as part of the project induction.				
		Vessel to maintain appropriate lighting, navigation and communication at all times to inform other users of the position and intentions of the survey vessel, in compliance with the *Navigation Act 2012* and Chapter 5 of the SOLAS Convention.				
		Refuelling at sea subject to CGG Bunkering Offshore Instruction and Resupply Operations at Sea Standard Operating Procedure: ▪ Refuelling of vessels will be undertaken under favourable wind and sea conditions as determined by the Vessel Master. ▪ Refuelling will take place during daylight hours only. ▪ Job Hazard Analysis (JHA), bunkering checklist or equivalent in place and reviewed in toolbox meeting before each fuel transfer. ▪ All valves and flexible transfer hoses checked for integrity prior to use; dry break couplings (or similar) in place for all flexible hydrocarbon transfer hoses.				
		Continuous (24 hour) survey operations, with survey team and bridge crew monitoring for other vessels at all times during seismic acquisition.				
		Spill response bins/kits are maintained and located in close proximity to hydrocarbon storage areas and deck areas for spill recovery / containment.				
		All material used in a spill clean up to be stored on board and disposed appropriately onshore.				
		All spills >80 L of fuel and oil to the marine environment during the survey from refuelling are reported to NOPSEMA.				
		Application of 3 NM exclusion zone from the shallowest parts of Glomar Shoal (3 nautical miles from 25 m depth contour) for at-sea refuelling operations.				
		Implementation of response measures within the CGG Event Management Standard Operating and Crisis Management Procedures in the event of a spill.				
		Undertake a net environmental benefit assessment (NEBA) of spill response strategies in conjunction with AMSA (if required).				
		CGG will ensure adequate forms of financial assurance in place to meet the cost of spill response and rehabilitation.				

5.0 ONGOING MONITORING OF ENVIRONMENTAL PERFORMANCE

The activity will be managed in compliance with the accepted EP for the activity, all applicable laws and regulations, CGG's Environment Policy, and the HSE Management System of the seismic vessel contractor.

The objective of the EP is to identify, mitigate and manage potentially adverse environmental impacts associated with the activity, during routine operations and non-routine events, to ALARP and an acceptable level.

Ongoing monitoring and review is essential to ensure the risk assessments that have been conducted remain relevant. Introduction of new risks due to changes in the activity or context, or changes in the severity of risks, will be addressed via CGG's Management of Change – Management of Deviation Procedure. This procedure is designed to provide control in case changes need to be made to operations, and will ensure that changes are assessed and approved by staff with the correct level of expertise and authority.

5.1 Environmental Performance Monitoring

CGG's overall environmental performance outcome for the activity is to avoid or minimise environmental risks, as outlined in the CGG Environment Policy. Environmental performance outcomes, standards and measurement criteria for each environmental risk associated with the activity that has the potential to cause adverse environmental impact have been identified within the EP. The performance standards are the control measures identified in Table 4-1. Environmental performance will be measured and reported against these standards and measurement criteria, as part of CGG's commitment to continuous improvement of environmental, health and safety performance.

The implementation strategy for the EP, and including during emergencies or potential emergencies, describes in detail the arrangements in place to allow CGG to continually manage the environmental impacts and risks of their activities to acceptable levels and ALARP. It includes:

- details of when the titleholder will report to NOPSEMA in relation to the titleholder's environmental performance
- a description of the environmental management system for the activity, including specific measures to ensure that:
  - the environmental impacts and risks of the activity continue to be identified and reduced to a level that is ALARP
  - control measures detailed in the EP are effective in reducing the environmental impacts and risks of the activity to ALARP and an acceptable level

  - environmental performance outcomes and standards set out in the EP are being met
- chain of command, and roles and responsibilities in relation to the implementation, management and review of the EP
- training and competencies, including induction into the EP
- monitoring, recording, audit, management of non-conformance and review of the environmental performance and the implementation strategy, and quantitative records of emissions

CGG will develop and maintain an Environmental Compliance Register for the activity, which details the environmental commitments, performance outcomes and criteria outlined in this EP. This Compliance Register will be submitted to NOPSEMA as part of the Post-survey Environmental Performance Report (PEPR) within two months following the completion of the survey.

Prior to the survey, CGG will undertake:

- a vessel audit to confirm that the vessel management systems are consistent with the environmental management controls detailed in this EP. The audit will be documented and any corrective actions closed out where possible
- a review of the IMS Risk Assessment, potentially including an inspection report, to confirm that the vessel does not pose an unacceptable risks of introducing marine pest species
- an audit of the on-board spill response capability of the CGG vessel against its SOPEP and relevant controls in this EP, to verify spill preparedness.

Compliance will be monitored on a regular basis by the Client Site Representative, or delegate, via mechanisms such as audits and inspections during the activity. Compliance auditing or inspection during the Davros II MC3D MSS will be based on the Compliance Register and will target the following:

- compliance with regulatory requirements detailed in the EP
- demonstrating that performance objectives have been monitored, measured and evaluated in accordance with the Compliance Register
- emissions and discharges are being monitored, measured and documented
- management strategies and procedures to achieve the environmental performance objectives are in place and being implemented effectively.

All survey personnel are required to report all environmental incidents and non-conformance with environmental performance outcomes and standards in the EP. Incidents will be reported using the CGG Event Reporting Management procedure, which includes details of the event, immediate action taken to control the situation, and corrective actions to prevent reoccurrence. Incident corrective actions are monitored to ensure they are closed out in a timely manner. Any required remedial actions will be followed up immediately. A copy of the environmental audit will be forwarded to

NOPSEMA upon request. Lessons learnt will be included in the Environmental Performance Report.

5.2 Review of the EP

Changes in the risk profile of the activity will be assessed in the context of the OPGGS(E) Regulation 17 regarding the need to submit a revised EP due to significant changes in the level of risk. The EP will be reviewed and a proposed revision submitted to NOPSEMA if:

- the activity is changed, significantly modified, or a new stage added, or
- any significant new environmental impact or risk, or a significant increase in an existing environmental impact is identified, or
- if requested by NOPSEMA.

6.0 OIL POLLUTION EMERGENCY PLAN (OPEP) RESPONSE ARRANGEMENTS

The OPEP for the Davros Phase II MC3D MSS comprises the National Plan for Maritime Environmental Emergencies (NATPLAN) and relevant components of the seismic vessel contractor's SOPEP, examples of which are given in this EP from the Viking Vision's approved SOPEP. Once the seismic vessel has been selected for the activity, the vessel's approved SOPEP will be incorporated into the OPEP arrangements for the activity under this EP. CGG will make arrangements for testing of the vessel's SOPEP, including response arrangements prior to the commencement of the survey.

For all spill incidents from ships in Commonwealth waters, the NATPLAN applies. The NATPLAN integrates Commonwealth and state government response frameworks to facilitate effective response to marine pollution incidents through the Australian Emergency Management Arrangements. AMSA is the Control Agency (CA) in Commonwealth waters and manages the NATPLAN, working with state governments (who have equivalent state plans that integrate into the NATPLAN), the shipping, oil, exploration and chemical industries, and emergency services, to maximise Australia's marine pollution response capability. The NATPLAN applies in Commonwealth waters seaward of the Western Australian state waters boundary (3 nautical miles).

The vessel's SOPEP recognises the divisions of responsibility as defined under NATPLAN to provide effective response to marine pollution incidents. The vessel SOPEP would be the principal working document for vessel and crew in the event of a marine oil spill, providing specific management response provisions to mitigate oil spills originating from vessels. Specific emergency procedures include steps to control discharges for bunkering spills, hull damage, fire and explosions, collisions, tank failure, sinking and vapour release.

6.1 Spill Scenarios

Marine oil spills are classified under international classifications according to size or Levels. This assists with identifying the level/nature of assistance required to combat spills. The spill scenarios identified for the Davros Phase II MC3D MSS are identified as:

- Level 1 (<125 L): the loss of the contents of 125 L from arising from the loss of the contents of the transfer hose during refuelling.
- Level 2 (268.5 m^3 marine gas oil (MGO)): the loss of the full contents of the largest fuel tank across CGG's fleet of vessels, due to vessel collision.

AMSA's Technical Guideline for the Preparation of Marine Pollution Contingency Plans for Marine and Coastal Facilities suggests that the ZPI should include the area (including subsurface) over which a release of oil and/or chemicals will potentially have an environmental effect. The ZPI for a Level 1 refuelling spill is expected to be limited to

the immediate vicinity of the offshore release point, due to rapid dilution and evaporation of the spilled diesel fuel. A 50 km ZPI buffer around the entire survey area has been used as a conservative estimate of the range of potential effects from a worst case (Level 2) diesel spill during the Davros Phase II MC3D MSS.

6.2 Oil Spill Response Preparedness

The Survey Vessel Master will ensure that all relevant vessel personnel are inducted, familiar with the oil spill response arrangements described in the SOPEP, and that they are trained to carry out their individual responsibilities under the SOPEP. The Survey Vessel Master and CGG's Technical Operations Manager shall ensure that all relevant survey commencement notifications have been provided to the relevant stakeholders and agencies prior to the survey commencement.

6.3 Testing of the OPEP

The OPEP will be tested prior to commencing the Davros Phase II MC3D MSS to ensure that it is appropriate to the nature and scale of the activity and that the response arrangements can be effectively implemented. Following testing, CGG will review the outcome of the test and identify non-conformances and opportunities for improvement, with corrective actions tracked to completion using CGG's Incident Reporting Procedure. CGG will carry forward any non-conformances identified during the survey for consideration in future surveys to assist with continuous improvement in control measures and performance standards.

6.3.1 Training, Drills and Updates

Once the seismic vessel is selected for the activity, CGG will make arrangements for testing of the vessel's SOPEP, including response arrangements prior to the commencement of the survey. All personnel on board the vessel will be trained (inducted) in the application of the vessel's SOPEP. Regular drills and exercises will be carried out, as dictated by the SOPEP, to maintain the crew's currency in response equipment use and in incident response procedures. These drills will include, but will not be limited to, spill response, collision, and fire and explosion. All drills will be documented, debriefings held and corrective actions identified (including revisions to SOPEP) and tracked to completion by the Survey Vessel Master.

6.4 Oil Spill Response Strategy

Priority actions in the event of a large fuel spill are to make the area safe and to stop the leak and ensure that further spillage is prevented, for example by transferring fuel to another tank.

The first external point of contact in the event of an oil spill is AMSA. If a spill occurs in Western Australian State waters, the first contact is the WA Department of Transport, and if within a port, the relevant Port Authority must be contacted.

Given the offshore location of the survey area, the preferred strategy for a diesel spill will be to allow the spilled fuel to disperse and evaporate naturally, and to monitor the position and trajectory of any surface slicks to confirm it does not pose a risk to sensitive receptors. Physical break up using propeller wash from the support vessel running repeated transits through the slick may be considered for larger slicks (following consultation with AMSA); however, this may affect evaporation rates and increase entrainment, so would generally be avoided. No shoreline contact is expected and diesel rapidly spreads to a very thin sheen, so no clean-up is feasible for spilled diesel on the sea surface. In addition, dispersants would not be used as they are unlikely to be effective on a diesel spill and may reduce the effectiveness of natural degradation processes. This passive response and reliance on natural processes greatly reduces the potential for impacts associated with spill response activities.

Commercial and recreational fishers and other users in the area would be advised of any large spill and associated response activities via CGG's 24-hour 'look-ahead' correspondence. This would minimise the potential for interference with their activities or unnecessary risks to personnel or property.

6.4.1 Commonwealth Waters Response

For spills in Commonwealth waters, initial actions will be undertaken by the survey vessel in accordance with its SOPEP and the survey OPEP. Under the OPEP, Type I operational monitoring will be carried out, which would be coordinated by AMSA and CGG, for example in collecting initial field measurements to characterise the plume (if safe to do so), (refer to Section 6.5.1). Type II scientific monitoring would be led by CGG if contact with sensitive receptors is expected (refer to Section 6.5.2). CGG would implement the Operational and Scientific Monitoring Plan (OSMP) which will include vertical profiling of hydrocarbon concentrations in the water column and real-time modelling as precautionary measures in order to determine whether the entrained elements of the spilled oil reach benthic habitats on Glomar Shoal. If the concentrations are of concern for reef biota, aspects of the OSMP relating to benthic impact monitoring will be implemented.

Subsequent actions will be determined in consultation with AMSA, having regard to the low potential for impacts posed by the spill. AMSA has indicated that it does not require titleholders to directly consult on OPEPs for seismic surveys or those addressing the operations of offshore supply vessels. Such operations are already covered by existing NATPLAN arrangements. AMSA is the responsible Combat Agency for oil spills from vessels within the Commonwealth jurisdiction and will respond in accordance with its Marine Pollution Response Plan, as approved by the AMSA Executive. Upon notification

of an incident, AMSA will assume control of the incident. CGG will support the response as required.

All selected response strategies will be in accordance with the NATPLAN. Recognising that there is potential for impacts associated with spill response activities, these risks would be assessed as part of any Net Environmental Benefit Analysis (NEBA) coordinated by AMSA, to which CGG would contribute if requested. The Survey Vessel Master will continue to provide situation reports (SITREPs), at the direction of AMSA, throughout the response activity. AMSA will maintain the response until relevant termination criteria are achieved. Any reportable fuel or oil spills will be reported using CGG's Event Reporting Management Procedure.

6.4.2 State Waters Response

Due to its remote location, a spill in the Davros Phase II MC3D survey area is not anticipated to enter State waters; the State waters boundary lies approximately 50 km from the southern boundary of the survey area.

6.5 Operational and Scientific Monitoring

The OPEP contains the provisions for the OSMP that will be implemented in the event that the OPEP requires monitoring to be undertaken. AMSA as the CA will direct and lead the spill response arrangements and monitoring requirements in the event of an oil spill as described in the OPEP.

6.5.1 Type I Operational Monitoring

In the event of an accidental event that resulted in a diesel spill to waters surrounding the seismic or support vessels, CGG would be responsible for undertaking Type I "Operational Monitoring" with the primary objective of spill surveillance and tracking. This monitoring will be implemented to:

- determine the extent and character of a spill;
- track the movement and trajectory of surface diesel slicks;
- identify areas/ resources potentially affected by surface slicks; and
- determine sea conditions/ other constraints.

This monitoring will enable the Vessel Master to provide the necessary information to the AMSA, via an oil pollution report (POLREP) form, to assist in planning appropriate response actions under the NATPLAN. Operational monitoring and observation in the event of a spill will inform an adaptive spill response, and may include real-time spill modelling and scientific monitoring of relevant key sensitive receptors, if required in consultation with AMSA.

Specific monitoring and data collection would include aspects of the following as agreed with AMSA:

- estimation of sea state
- estimation of wind direction and speed
- characterising surface diesel slicks (thickness and areal extent)
- measuring concentrations of entrained diesel through water column
- aerial surveillance (if aircraft available offshore)
- GPS tracking using satellite drift trackers
- computer modelling predictions
- GIS mapping.

This operational monitoring will be restricted to daylight hours only, when surface slicks will be visible from either vessels or via aerial surveillance. The information gathered from this monitoring will be passed on to AMSA, via the POLREP form, but also via ongoing SITREP reports following the initial spill notification to AMSA Rescue Coordination Centre (RCC) Australia.

In the event of a catastrophic vessel collision that resulted in a diesel spill to the waters surrounding a survey or support vessel, CGG would implement additional Type I monitoring given the sensitivity and value of the Glomar Shoal KEF. This would include real-time modelling and water sampling to track the plume of entrained diesel and to determine the risk of hydrocarbon toxicity impacts to the shallow reef assemblages of Glomar Shoal.

In the unlikely event that GPS tracking using satellite drift trackers, real-time spill modelling, aerial surveillance, water quality sampling or visual slick estimation is required, CGG can engage RPS Environment and Planning under existing contractual arrangements to provide urgent specialist response services. Given the remote likelihood of the need to implement field response activities using external parties, a response logistics plan has not been developed for the project, but this would be initiated immediately on notification of the spill. The plan would detail logistics, equipment personnel and detailed OSMP plans.

CGG will implement, assist with, or contribute to (including funding if required) any other operational or scientific monitoring as directed by AMSA or outlined in the EP.

6.5.2 Type II Scientific Monitoring

The specific environmental monitoring undertaken following an oil spill would depend on the location of the spill, its size and the potential for it to have an impact upon sensitive resources. CGG will provide immediate on-site first strike response and AMSA as the Combat Agency will direct and lead any ongoing spill response arrangements and monitoring requirements in the event of an oil spill.

Type II Scientific Monitoring would be implemented if there is a reasonable expectation that there may be adverse impacts to marine biota or habitats in the area. The key receptors for which Scientific Monitoring Studies would be considered are:

- benthic sediments (soft sediments able to retain hydrocarbons)
- subtidal marine benthos (filter-feeders, macroalgae)
- seabird populations (foraging individuals)
- non-avian marine wildlife (cetaceans, marine reptiles and fish).

6.5.2.1 Initiation of Scientific Monitoring

After the Vessel Master provides notification to AMSA, CGG would implement scientific monitoring in accordance with the initiation criteria. CGG would engage RPS to undertake the NEBA in association with AMSA and to assist with preparation for monitoring. A detailed OSMP Implementation Plan would then be developed to ensure an efficient and technically defensible response.

The OSMP Implementation Plan would detail the equipment required for each study, travel and freight arrangements, notifications, vessel support, HSE planning, sampling and analysis plan. Within 12 hours of RPS being notified, a teleconference will be held between the CGG, AMSA, the nominated Scientific Personnel and the Vessel Master to finalise the requirements for implementation. Scientific teams can be on site within 48 to 72 hours of the implementation plan and budget being approved. Given the extremely low probability of a catastrophic spill and diesel subsequently contacting sensitive biota, CGG considers the costs associated with pre-emptive development of the Implementation Plan and full assembly and preparation of the response team to be grossly disproportionate to the benefit of a more rapid response; this control has not been adopted.

It is recognised that diesel is only likely to remain measurable on the water surface for a few days and that realistically a response team would not be on site until it had dispersed. The area of potential impact to be targeted in the Type II scientific monitoring plan would therefore be based on observations of the slick trajectory, water quality samples and real-time modelling.

Type II scientific monitoring would focus on determining short and long-term environmental impacts (both from the spill and from the response), post-spill and post-response recovery studies. Scientific monitoring may continue for some time following the termination of the operational monitoring response. Scientific monitoring studies could include some, or all, of the elements described in

Table 6-1 depending on the size, timing and location of the spill.

Table 6-1: Scientific Monitoring Tasks and Key Receptors

Description/Objective	Key Receptors
Monitoring for Hydrocarbons in Benthic Sediments To understand the behaviour, persistence and fate of hydrocarbons in sediments to provide data to assist in assessing and verifying predicted impacts on key habitats and sensitive receptors.	Subtidal sediments on Glomar Shoal
Monitoring of Subtidal Marine Benthos to Determine Impacts of Oil Spill and Recovery To enable assessment of impacts and subsequent recovery of benthic marine habitats (soft and hard substrate habitats) and associated macro epibenthic organisms (e.g. corals, macroalgae, seagrass, sponges and other filter feeders, motile invertebrates and associated fishes) in response to a spill event and associated response activities. Monitoring to document recovery of affected biota and habitats	Filter feeders, macroalgae, demersal fishes on Glomar Shoal
Undertaking Wildlife Surveys to Determine Impact of Oil Spill on Seabird Populations and Recovery To assess any short-term or longer term environmental effects on seabird populations within the study area that may have resulted from the oil spill (i.e. damage extent and recovery). Monitoring to document recovery of affected biota and habitats.	Foraging seabird populations
Undertaking Surveys of Non-avian Marine Wildlife to Determine Impacts of Oil Spill and Recovery To assess any short-term or longer term environmental effects on non-avian marine wildlife that may have resulted from the oil spill (i.e. damage extent and recovery). Monitoring to document recovery of affected biota and habitats.	Sea snakes, marine turtles, marine mammals, sharks, rays, bony fishes

7.0 DETAILS OF CONSULTATION

Stakeholder consultation is an essential part of project planning, and CGG recognises that effective stakeholder consultation and engagement is critical to project success. CGG has developed an ongoing, iterative stakeholder consultation process in relation to activities carried out under the EP.

7.1 Consultation Already Undertaken

CGG undertook a stakeholder identification exercise at the beginning of the consultation process for the Davros Phase II MC3D MSS to identify 'relevant persons'. Consultation with all relevant persons identified in the stakeholder identification process included three consultation rounds, where letters were sent out in September 2014, November 2014 and February 2015, and face-to-face meetings where requested by a stakeholder. The information sent out in September 2014 introduced the Davros Phase II MC3D MSS, providing survey details, location map, information on proposed activities, and details of how feedback/comment could be provided by the stakeholder. All stakeholders were offered the opportunity for a face-to-face meeting with CGG. Meetings were also requested in advance of this initial consultation date with all fisheries industry stakeholders. Meetings were held with the Pearl Producers Association, MG Kailis Group, the Western Fishing Industry Council, WestMore Seafoods, the WA Department of Fisheries, Recfish West, with several fishers licence holders and also with the WA Department of Transport.

The second and third rounds of consultation communicated changes to the Davros Phase II MC3D survey to stakeholders, including confirmation of streamer tow depth in shallow waters, a small increase to the spatial extent of the survey, new map of the survey area and information regarding provision of a 7 to 10 day forecast of operations immediately prior to and during the survey. At each consultation round stakeholders were requested to provide feedback and/or comments on potential interactions/concerns or perceived risks. Each letter further stated that if no response was received then feedback would be welcomed and accepted at a later date, at which time CGG would assess any concerns or issues through the merit assessment to determine if there are any new risks identified or any change to the risk profile of existing risks. All stakeholders' merited concerns have been addressed in the risk assessment in the EP and no outstanding concerns remain. A summary of key stakeholder concerns and actions undertaken is provided in Table 7-1.

Table 7-1: Summary of Consultation Already Undertaken

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	Date Sent	Date	Stakeholder Response	
Commonwealth Government					
Australian Hydrographic Services (AHS)	Initial Consultation Follow-up Email	25 Sep 14 17 Oct 14		No response No response	
	Second Consultation	26 Nov 14		No response	
	Third Consultation	17 Feb 15		AHS to be advised of survey details two weeks prior to commencement to enable Notice to Mariners to be circulated	CGG will provide the requested information to AHS two weeks prior to survey commencement to enable Notice to Mariners to be circulated.
Australian Maritime Safety Authority (AMSA)	Initial Consultation Follow-up Email	25 Sep 14 17 Oct 14	20 Oct 14	▪ AMSA provided a chart for the Davros Phase II polygon, and noted that the polygon covers extensive regions of the major shipping fairway. It has been requested that the Pilbara Ports Harbour Master be informed to assist with safety messages. ▪ Support/ chase vessel will need to be active and maintain exceptional communication with all commercial shipping, noting that there will be a considerable speed difference between commercial and survey vessels during operations. ▪ Survey vessel must display appropriate day shapes, lights and streamers, and reflective tail boys to indicate towing. ▪ Visual and radar watches must be maintained on the bridge at all times. ▪ AMSA's RCC to be contacted for Auscoast warning broadcasts before operations commence. AMSA's RCC will require vessel details, area of operations and start/ end dates. ▪ AHS must be contacted no less than 2 weeks before survey commencement ▪ AMSA to be contacted after the survey with lessons learned. ▪ Revised contact details were also provided.	CGG will adhere to the requests of AMSA.
	Second Consultation	26 Nov 14		No response	-
	Third Consultation	17 Feb 15		▪ New polygon traffic chart provided ▪ Previous advice reiterated	Information incorporated into the EP.
Western Australia Government					
Department of Fisheries (DoF)	Meeting	11 Aug 14	-	CGG and Scope Resources held a meeting with DoF to discuss a number of concerns of different licensing areas. DOF provided information on the PFTIMF DOF suggested CGG contact the DoF Pilbara Demersal Fish Trawl Licence officer, as they are more familiar with the details of the PFTIMF management plan. DoF suggested that, when referring to "loss of time", licence holders are likely referring more to displacement and loss of time during the optimal time of year to fish, and not to any limitations placed by their licence conditions.	CGG met with the DoF to discuss the proposed Davros Phase II MC3D MSS, and included in the agenda the concerns raised by Fat Marine and RNR Fisheries in the meeting on 06/07/14, and MG Kailis and Westmore Seafood in the meeting on 07/08/14 (see below). CGG noted that they have already suggested a time-share arrangement to PFTIMF, whereby all companies involved maintained communications and worked together accordingly during the pre-survey data acquisition planning phase to minimise loss of access for the fishing licence holders. They would be interested to find out which months of the year have the lowest productivity for Zone 2, Areas 1 and 2, so that we may advise our client on which months may be a potential "window of opportunity" for data acquisition and the least amount of fishers displaced.
	Initial Consultation	25 Sep 14	28 Oct 14	An initial email confirming receipt of the consultation letter (received on 25/09/14) was followed up by an official response letter from DoF (28/10/14). DoF acknowledges that fish and fishers are regularly impacted by environmental, social and commercial drivers and this can result in significant changes to the fishing industry over relatively short timescales. The DoF does not consider that enough information has been provided to assess the	Via email (29/10/14), CGG acknowledged receipt of DoF letter, and presented a formal response to all queries raised. Consultation ▪ WAFIC and Recfishwest were consulted as part of the consultation during EP preparation. ▪ All communication and consultation with individual licence holders in the Pearl Oyster

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	Date Sent	Date	Stakeholder Response	
				potential effects of proposed activities on the Department or stakeholder's interests, functions or activities. In line with this position, no specific advice has been provided, as there is no current start/end date, or a confirmed spatial extent for individual components of the overall activity. DoF acknowledges the need for certainty and forward planning and provided some overarching information. The DoF requested that the overarching issues contained within the advice letter (listed below) be addressed along with all mitigation measures prior to submission of the EP. ▪ CGG should consult with WAFIC, Recfishwest, and individual licensed fishers ▪ Full range of mitigation strategies should be presented in the EP, in line with the Department's Guidance Statement on Undertaking Seismic Surveys in WA Waters. In particular, the Department requests that analysis be undertaken to ensure that CGG uses the minimum required acoustic capacity to achieve its objectives. ▪ Following EP approval, further consultation with DOF and other stakeholders on individual components of the EP are expected, a minimum of three months prior to survey commencement, including provision of the following – start and end dates – spatial extent of proposed activities, including exclusion zones – information on identified fishing interests, including previous consultation with individual licensed fishers. ▪ A number of commercial fishing interests exist in the bioregion associated with the survey, along with customary, recreational and charter fishing ▪ Spawning grounds and nursery areas for key fish species should be considered, and mitigation measures provided for any potential interactions. ▪ CGG are reminded of biosecurity risks associated with the proposed activity, and referred to the relevant legislation. DOF requested that all issues raised in their letter were addressed in writing, along with proposed mitigation measures, prior to submission of the EP.	Managed Fishery (POMF) was via the peak industry body for this fishery (PPA). ▪ Letters were sent to 67 licence holders on 26 September 2014. (Note: original correspondence stated 68, which was corrected to 67 by CGG on 07/11/14 via email) ▪ Further consultation will be undertaken prior to commencement of the survey (a minimum of three weeks prior to planned commencement date). At this point, specific start and end dates will be provided. ▪ Ongoing consultation with stakeholders prior to, and during, the survey, including notifications of mobilisation/demobilisation, and any changes to survey plan. **Fishing Activities in the Area** CGG has conducted analysis of the state and Commonwealth managed commercial fisheries that overlap the survey area and determined which fisheries may directly or indirectly be affected by the survey. Mitigation measures to deal with the issue of potential impacts on fishers proposed as follows: ▪ forecast of operations including survey vessel positions – to assist recreational and charter boat fishers with planning fishing trips out to Glomar Shoal while the eight week survey is being undertaken ▪ communications protocol to manage interactions with fishing and shipping vessels ▪ use of support vessels to manage vessel interactions ▪ risk assessment of the impacts of the discharge the seismic pulses over the Davros Phase II survey area. **Fish Spawning** Specific control measures have been included in the EP to minimise the potential impacts of the proposed survey on fish spawning, including: ▪ use of the smallest possible seismic source ▪ use of soft starts. CGG acknowledges that the DoF has provided an extensive list of the key fish species that may be spawning within the proposed survey area and has requested that seismic activities do not occur during the time of year that represented spawning/ aggregation times. However, the spawning/ aggregation times identified cover every month of the year, and the Department has not provided specific spatial data of the extent of spawning grounds. Without this information, CGG is unable to implement this request. **Biosecurity** CGG will ensure that all relevant mitigation strategies presented in the Department's *Guidance Statement on Undertaking Seismic Surveys in WA Waters* are considered and included where appropriate.
	Second Consultation	26 Nov 14		No response	No response or action required.
Commercial Fishing Industry Groups and Associations					
Austral Fisheries	Email	5 Aug 14	7 Aug 14	Austral Fisheries replied to confirm that no fishing is conducted in the survey region at present. CGG was provided with the contact details for the Communications and Programs Officer with WAFIC. It was recommended to contact this person.	08/08/2014: CGG replied to acknowledge the response received, and confirmed that CGG was already in the process of consulting with this WAFIC officer.
	Initial Consultation	25 Sep 14		No response	No response or action required.
	Second Consultation	26 Nov 14		Acknowledged information received	No response or action required.
Deep Sea Water Services and Southern Trading	Meeting	13 Aug 14		CGG conducted a meeting with representatives from Deep Sea Water Services and Panorama Management, and Southern Trading, to discuss the concerns of licence holders in the Western Australian West Coast Deep Sea Crustacean Managed Fishery (WCDSCF). Main concerns with exploratory activities involving towed equipment: ▪ vessel interactions	CGG sent a formal response to WCDSCF via email (21/08/14) to acknowledge concerns and outline management and mitigation procedures. No action required, as WCDSCF are not currently fishing in the area

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	Date Sent	Date	Stakeholder Response	
				▪ safety and entanglement of fishing equipment. No specific concerns with Davros Phase II MC3D MS survey, as they are not currently fishing in the area of the proposed survey. Note: for future surveys conducted south of Exmouth, WCDSCF require advance notification prior to commencement of operations in order to plan the placement of fishing equipment to avoid entanglement.	
	Initial Consultation	25 Sep 14		No response	
	Second Consultation	26 Nov 14		No response	
	Third Consultation	17 Feb 15		No response	No further response or action required.
Fat Marine and RNR Fisheries	Meeting	6 Aug 14		A meeting was held between Fat Marine, RNR Fisheries and CGG to discuss concerns of licence holders within the Pilbara Line Fishery (PLF). The PLF informed CGG that their main concerns are: ▪ loss of access to fishing grounds ▪ reduction of catch after seismic survey has been undertaken in the area ▪ reduction of catch over the past five years ▪ complaints from fish market that product is being affected (quality and appeal) ▪ direct noise effects on target fish species and their food resources ▪ concerns are being ignored by DOF and WAFIC. The PLF stated they usually do not fish north of Rankin Bank, which is ~100 km to the east of the Davros Phase II MC3D survey area, therefore CGG do not anticipate any interactions with fishers of the PLF during the survey. The PLF stated that they would not support any activity occurring in the PLF licence area unless they can be assured their catch will not be affected.	In response to the PLF concerns of impacts to fish and fish behaviour, CGG provided the PLF with hard copies of the Woodside Maxima 3D MSS monitoring program for information.
	Email	20 Aug 14			Via email (20/08/14), CGG sent a formal response to the PLF concerns raised during the meeting on 06/08/14 acknowledging their concerns, and outlined the management and mitigation measures in place to address their concerns as follows: ▪ forecast of operations including survey vessel positions - to assist fisheries licence holders with planning, ▪ communications protocol to manage interactions with fishing and shipping vessels, ▪ a risk assessment of the impacts of the underwater discharge of seismic pulses over the Davros Phase II survey area ▪ graph of the annual number and area acquired of previously 3D marine seismic surveys in the NWS region up to the 500 m depth contour ▪ maps of the previously acquired 2D and 3D marine seismic surveys on the NWS (2007–2013) in relation to the Davros MC3D MSS and proposed Davros Phase II MC3D MSS. In addition, CGG provided a graph of annual number and area acquired by previous 3D marine seismic surveys in the NWS region up to the 500 m depth contour, and a map of the previously acquired 2D and 3D marine seismic surveys on the NWS (2007–2013) in relation to the proposed activity area. Analysis performed by CGG on this data was also provided, which shows that 2D and 3D MSS have been consistently acquired within the NWS region on an almost annual basis for over 20 years.
	Email		20 Aug 14	PLF acknowledged receipt of the information received from CGG and stated that they will review the information.	-
	Initial Consultation	25 Sep 14	-	No further response	-
	Second Consultation	26	-	No further response	-

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	Date Sent	Date	Stakeholder Response	
		Nov 14			
	Third Consultation	17 Feb 15		No further response	CGG will notify fishers of activity details to commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders that were identified in the stakeholder consultation process three weeks prior to the survey commencing, to inform them about the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlaps any key fishing grounds.
MG Kailis Group and Westmore Seafoods	Meeting	7 Aug 14	7 Aug 14	During the meeting held between CGG, MG Kailis Group and Westmore Seafoods, the following were raised as the main concerns: ▪ declining catch rates ▪ loss of access to fishing grounds ▪ vessel interactions and safety ▪ cumulative impacts i.e. knock on effects such as the placement of wells in Pilbara trawl fishing licence area ▪ increased amount of vessels transiting the fishing area due to vessel servicing offshore rigs. CGG acknowledges concerns, and expressed willingness to maintain communications with MG Kailis throughout the planning stages of the activity in order to plan operations to minimise the potential displacement of fishermen. MG Kailis and Westmore Seafoods strongly objected to the idea, and informed CGG that while they are displaced from the area they lose time, loss of catch and loss of revenue. MG Kailis and Westmore Seafoods stated that they will not work with CGG in the planning stages of the project, and they do not want any boats in their licence area.	In a formal email response (20/08/14), CGG acknowledged concerns raised and outlined management and mitigation measures which will be in place: ▪ forecast of operations including survey vessel positions – to assist fisheries licence holders in planning ▪ communications protocol to manage interactions with fishing and shipping vessels ▪ risk assessment of the impacts of the underwater discharge of seismic pulses over the activity area In addition, CGG provided a graph of annual number and area acquired by previous 3D marine seismic surveys in the NWS region up to the 500 m depth contour, and a map of the previously acquired 2D and 3D marine seismic surveys on the NWS (2007–2013) in relation to the proposed activity area. Analysis performed by CGG on this data was also provided, which shows that 2D and 3D MSS have been consistently acquired within the NWS region on an almost annual basis for over 20 years.
	Formal response (email) to acknowledge concerns and outline management and mitigation procedures which will be in place	20 Aug 14	4 Sep 14	MG Kailis acknowledged receipt of information provided, and informed CGG that they consider the response from CGG inadequate, and expect CGG to take note of the possibility that they may have to suspend fishing operations in the area during seismic operations.	In a formal email response (16/09/14), CGG informed MG Kailis that they have noted their concerns and they will respond in due course to discuss their position and hopefully begin working towards a mutually beneficial outcome. In a follow-up email (30/09/14), CGG responded to acknowledge the information received on 04/09/14 from MG Kailis. CGG informed MG Kailis that they have attempted to undertake consultation with the PFTIMF licence holders in order to find out when the majority of fishing will be undertaken within the operational area, so that they can begin working towards an outcome that will allow both industries to conduct their activities under their licensing arrangements. CGG also presented their findings following consultation with the DoF, particularly that: ▪ the Pilbara Fish Trawl Interim Managed Fisheries Management Plan (1997) is in place to specifically manage the sustainable level of catch/ take in the Pilbara Fish Trawl licence area ▪ licence holders under an entitlement that sets out the total number of fish trawl hours that are permitted in each zone ▪ licence holders must not accumulate more fish trawl hours in each zone than their entitlement permits, however they can fish their entitlement at any time of the year and there is no time of year restrictions ▪ licence holders operated with a Vessel Management System (VMS) which tracks where the survey vessel conducts its operations under the licence conditions and the total number of hours accumulated. CGG reiterated the planned management measures, and expressed a desire to work together towards an outcome that will allow both industries to conduct their activities under their licensing arrangements. CGG will notify fishers of activity details to commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders that were identified in the stakeholder consultation process three weeks prior to the survey commencing, to inform them about the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlaps any key fishing grounds.
	Initial Consultation	25 Sep 14	-	No further response	-

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	**Date Sent**	**Date**	**Stakeholder Response**	
	Second Consultation	26 Nov 14	-	No further response	-
	Third Consultation	17 Feb 15	-	No further response	No further response or action required.
Pearl Producers Association (PPA)	Meeting	13 Aug 14		Meeting held with representatives of PPA and Western Australian Fishing Industry Council (WAFIC) to discuss the concerns of licence holders in the POMF. WAFIC informed CGG of recent meetings between APPEA and WAFIC and a memorandum of agreement (MOA) between the two organisations was in the process of being signed and approved. PPA informed CGG that they met with NOPSEMA recently to discuss the consultation process and how to improve it. PPA requested a map of the operational area with the 50m isobath clearly identified.	In a formal email response (20/08/14), CGG provided a map with the 50 m isobath clearly marked, as requested.
			22 Aug 14	In an email, PPA formally responded to the meeting held between PPA, CGG and representatives from WAFIC on 13 August 2014. PPA stated that their main concerns are: ▪ potential for impacts on – pearl oyster stocks – recruitment to the fishery – quality of pearl oysters ▪ risk of pollution and treatment of spills ▪ potential marine pests from rig and support vessels ▪ stress on a developing pearl oyster ▪ impact on pearl oyster eggs and larval stages within 17 m of the airgun ▪ impact on food web supporting pearl oysters.	Via email (16/09/14), CGG informed that PPA that they have noted their concerns and will respond in due course. In a formal email response (10/10/14), CGG responded to the PPA acknowledging their concerns and outlining the management and mitigation procedures in place to address their concerns. They also provided information of previously acquired MSS in the vicinity of the activity, and extracts of the EP relevant to Oyster Managed Fisheries: ▪ draft assessment of impacts and risks – discharge of underwater seismic pulses on planktonic organisms and bivalve molluscs ▪ larval distribution analysis. CGG investigated the proposed implementation of an exclusion zone proposed by the PPA for waters shallower than the 100 m isobath, and have deemed it an unworkable option as it would cut out more than 90% of the proposed survey area. CGG informed the PPA that they have met with the DoF, who confirmed that they would not be conducting scientific research into the distribution of pearl oysters anytime in the immediate future. CGG has also contacted the IAGC via email and made a recommendation in support of the PPA and its efforts in driving research into the effects of seismic on pearl oysters. CGG informed the PPA that existing controls are assessed in the EP as reducing the impact by ALARP.
			16 Oct 14	In an email response, PPA referred to the letter of 10/10/14. The PPA stated that on several occasions across multiple projects they have expressed concerns about the impacts on pearly oysters from any seismic survey inside the 100 m depth contour between NW Cape and Lacepede Islands. PPA states that this depth is the best estimate of the outer range of the *P. maxima* pearl oyster species. The PPA reiterated that they are concerned with the impacts on all pearl oysters in the area as they support the major fishery around Eighty Mile Beach, and that there are several small but important pearl oyster fishing grounds situated right along this coastline. PPA appreciates CGG's efforts with the IAGC. PPA acknowledges that CGG does not expect a scientific research study to be completed and made available for inclusion in the Davros Phase II MC3D MSS EP. PPA expressed that they appreciate the impact of excluding seismic survey inshore of the 100 m isobath, however they believe that failure of the pearl oyster stocks to effectively provide recruits into the fishery (adjacent to Eighty Mile Beach) or condition of adult pearl oysters being compromised by seismic activity would be severely detrimental to business. PPA stance is that, until research into impacts on pearl oysters from seismic activity is complete, the pearling industry view is that the risk around seismic survey activity in this area of the coast is too high, and the industry position is that they cannot support any proposals for seismic survey activity in the region.	In a formal email response (17/10/14), CGG thanked PPA for their response. CGG will comply with the PPA request for no seismic activity within the 100 m isobath adjacent to the Eighty Mile Beach region. However, as the operational area is approx. 345 km from the boundary of the Eighty Mile Beach Marine Reserve, this request is not relevant for this survey. CGG will notify fishers of activity details to commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders that were identified in the stakeholder consultation process three weeks prior to the survey commencing, to inform them about the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlaps any key fishing grounds.
	Second Consultation	26 Nov 14		No further response	-

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	**Date Sent**	**Date**	**Stakeholder Response**	
	Third Consultation	17 Feb 15		No further response	No further response or action required.
Recfishwest	Meeting	5 Aug 14		CGG met with Recfishwest, representatives of recreational and charter boat fishermen, to discuss the concerns of licence holders in POMF. Recfishwest informed CGG that the billfish recreational fishermen tend to fish closer to the mainland, in and around Legendre Island. Recfishwest foresees the main concerns as: ▪ displacement from key fishing grounds ▪ loss of access.	
	Email	-	12 Aug 14	Via follow-up email (12/08/14), Recfishwest informed CGG that the concerns of the charter boat operators and recreational fishermen are as follows: ▪ loss of access to Glomar Shoal by recreational fishers who have undertaken a two day trip to reach the shoals ▪ importance of a potential spawning location as large aggregations of billfish species have been reported surrounding the shoals. Recfishwest proposed a 10 nautical mile exclusion zone from the centre of the shoal	In a formal response email (21/08/14), CGG acknowledged Recfishwest concerns and outlined the management and mitigation procedures in place to address their concerns: ▪ forecast of operations including survey vessel positions – to assist fisheries licence holders in planning ▪ communications protocol to manage interactions with fishing and shipping vessels ▪ risk assessment of the impacts of the underwater discharge of seismic pulses over the activity area.
	Email		27 Aug 14	Recfishwest welcome the forecast of operational management and mitigation measures in place. Recfishwest acknowledged that their initial proposal of a 10 NM exclusion zone may result in operational difficulties, but given the uncertainty of seismic activity impact on fish and fish behaviour, Recfishwest believes a level of protection must be applied to the Shoals itself. Recfishwest requested clarification on the 1,500 m buffer zone around the 50 m isobath surrounding Glomar Shoals, and proposed an increase to 3,000 m buffer zone.	Via email (16/09/14), Scope Resources apologies for the delay in response, and confirmed that a formal response would be sent shortly. On 02/10/14, CGG requested the contact details for the fishing organisations who wish to receive the weekly forecast of operations. CGG agreed with Recfishwest that there is little understanding of spawning areas and durations for most key indicator species in the NWMR and that Glomar Shoal has been identified as a potential area of importance for spawning events due to its high species diversity and productivity. CGG noted that they have met with DoF to seek information about the significance of Glomar Shoals as a spawning area, but this could not be confirmed by DoF. CGG conducted an investigation into the proposed 3,000 m buffer surrounding the 50 m isobath. CGG informed Recfishwest that this is an unworkable option, as it would cut out 50% of the survey area. A shallow water exclusion zone will be implemented within which no seismic acquisition will occur. CGG will notify fishers of activity details to commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders that were identified in the stakeholder consultation process three weeks prior to the survey commencing, to inform them about the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlaps any key fishing grounds.
	Second Consultation	26 Nov 14		No further response	
	Third Consultation	17 Feb 15		No further response	No further response or action required.
Western Australian Fishing Industry Council (WAFIC)	Email	30 Jul 14		No response	CGG contacted WAFIC to request a meeting with them and to forward consultation material to members of the PLF, Pilbara Trap Managed Fishery (PTMF), PFTIMF and WCDSCF.
	Email to follow-up for a response	4 Aug 14		WAFIC confirmed the email had been received and forwarded on to the Executive.	CGG followed up the meeting request email to WAFIC on 4 August 2014 and requested the following information: ▪ Has the information for the meeting request been sent out to the requested stakeholders? ▪ If so, have any responses been received from stakeholders? ▪ Have any stakeholders indicated that they would like to participate in face-to-face meetings with CGG? CGG requested the information be forwarded to members of the MMF: WAFIC did not reply to this email request.

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	**Date Sent**	**Date**	**Stakeholder Response**	
	Email	11 Aug 14			CGG forwarded the two email requests sent to WAFIC on 30 July and 4 August 2014 to WAFIC CEO. CGG informed WAFIC CEO that WAFIC has not responded to either of the two requests.
	Meeting	13 Aug 14		During the meeting with representatives of the CGG, PPA and WAFIC on 13 August 2014, CGG queried WAFIC as to why their emails had not been replied. The WAFIC representatives at the meeting were unaware of the email correspondence sent and that a response from WAFIC was still outstanding.	CGG forwarded copies of the email requests sent to WAFIC on 30 July and 4 and 11 August 2014 to the WAFIC communications manager.
	Email		14 Aug 14	WAFIC Communications and Programs Officer confirmed they will be sending out the meeting requests and requested clarification on the offer of face-to-face meetings.	Via **email** (14/08/14), CGG confirmed WAFIC's queries that stakeholders can contact CGG via Scope Resources to organise the face-to-face meetings at a time that is convenient for them. CGG asked WAFIC if they would like to be kept informed of the schedule of meetings. WAFIC did not reply to this email.
	Initial Consultation	25 Sep 14		WAFIC confirmed they will be sending out the meeting requests and requested clarification on the offer of face-to-face meetings.	Via email (14/08/14), CGG confirmed WAFIC's queries that stakeholders can contact CGG to organise the face-to-face meetings at a time that is convenient for them. CGG asked WAFIC if they would like to be kept informed of the schedule of meetings. WAFIC did not reply to this email.
	Second Consultation	26 Nov 14		No response	No response or action required.
	Email	28 Nov 14			CGG requested a teleconference to discuss the Phase II seismic survey with licence holders in the Pilbara Trap Managed Fishery. CGG requested discussion of potential concerns of licence holders and that they would be willing to work collaboratively with interested parties to find mutually acceptable outcome. CGG stated that they will maintain communications throughout the proposed Davros Phase II MC3D MSS in order to minimise the potential displacement of fishing activities and avoid entanglement with set fishing gear.
	Third Consultation	17 Feb 15		No response	CGG will notify fishers of activity details to commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders that were identified in the stakeholder consultation process <u>three weeks</u> prior to the survey commencing, to inform them about the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlaps any key fishing grounds.
Westmore Seafoods	Meeting	7 Aug 14	7 Aug 14	Meeting held between CGG, MG Kailis Group and Westmore Seafoods. *Refer to MG Kailis consultation above for further information.*	CGG will notify fishers of activity details to commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders that were identified in the stakeholder consultation process <u>three weeks</u> prior to the survey commencing, to inform them about the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlaps any key fishing grounds.
	Initial Consultation	25 Sep 14		No response	
	Second Consultation	26 Nov 14		No response	
	Third Consultation	17 Feb 15		No response	
Woodside	Email	9 Jan 15		Woodside agreed to development of a concurrent operations (CONOPS) plan for the Davros MC3D MSS (Phase I and Phase II) surveys. Woodside provided contact details for all affected facilities (including the Angel platform) for the CONOPs communications guideline.	CGG contacted the Woodside Compliance Manager Exploration Permits and Ventures regarding the Davros MC3D MSS survey program and in particular regarding potential survey activity around the Angel platform.
	Email		13 Jan 15	Woodside advised amendment to previously provided contact details for the CONOPs plan.	-
	Email	10 Jul 15		No response.	CGG advised that the Davros MC3D MSS Phase 1 survey was complete for that season, and outlined the permits which would no longer be entered. Marine fauna data and advising that the vessel would return for subsequent phases under new ingress approvals.

Stakeholder	Engagement by CGG		Response from Stakeholder		CGG Merit Assessment and Action/ Response
	Consultation Type	Date Sent	Date	Stakeholder Response	
	Email	18 Jan 16	19 Jan 16	Woodside have confirmed that they are satisfied with the consultation undertaken to date and have no concerns.	CGG will notify Woodside of the surveys dates when the EP is accepted and survey dates are known. The CONOPS Plan will be revised at this stage in consultation with Woodside.

7.2 Ongoing Consultation

Consultation with stakeholders will be ongoing throughout the period the Davros Phase II MC3D MSS EP is valid. CGG will facilitate ongoing consultation through the following:

- Undertaking an additional round of consultation on approval of the EP.
- Encouraging stakeholders to provide feedback at any time during the period the Davros Phase II MC3D MSS EP is valid.
- Provide a number of mechanisms by which relevant persons can provide feedback, including email and written correspondence.
- Notifying commercial fisheries management agencies, fishing industry bodies and individual companies and licence holders three weeks prior to the survey commencing to inform them of the location of the survey area, survey and support vessel specifications, timing of operations, contact phone numbers and to ascertain if proposed operations overlap any key fishing grounds. CGG will also ensure all stakeholders are made aware of how concerns raised during consultation in preparation of the EP have been addressed.

CGG has committed to undertaking another round of consultation once the EP has been approved to advise all relevant persons of details of the survey including, timing, location, duration. During this consultation round, each relevant person will have the opportunity to identify whether there are any new concerns since the last consultation round. CGG will assess the merit of each objection or claim provided by relevant persons and, where deemed necessary, will implement additional control measures to ensure all impacts and risks are managed to ALARP and acceptable.

In the event that an objection or claim is presented by a stakeholder either prior to or during the activity, CGG will assess the merit of the objection/claim provided by relevant person and, where deemed necessary, will implement additional control measures to ensure all impacts and risks are managed to ALARP and acceptable.

Where CGG becomes aware of the potential to affect a relevant person's functions, interests or activities that are identified and control measures introduced within this EP, they will contact those stakeholders with sufficient information and time to address their concerns. If CGG becomes aware of the potential to affect a stakeholder's functions, interests or activities at any time during the Davros Phase II MC3D MSS that was not identified prior to commencing the activity, CGG will immediately attempt to contact and consult with the stakeholder. CGG will provide sufficient information to allow the stakeholder to make an informed decision as to how the activity may affect them and will address any concerns or claims raised during such consultation. If consultation identifies a new environmental risk not identified in the Davros Phase II MC3D MSS EP, or an increase in the residual risk of an already identified risk, CGG will immediately inform NOPSEMA and introduce additional control measures to ensure the risk is managed to ALARP and is acceptable.

8.0 DETAILS OF THE TITLEHOLDER'S NOMINATED LIAISON PERSON FOR THE ACTIVITY

CGG will be the Title Holder of the Special Prospecting Authority (SPA) and Access Authority (AA) under the OPGGS Act.

The details of the titleholder are:

Title Holder:	CGG Services (Australia) Pty Ltd
Business Address:	Level 1, 1 Ord Street, West Perth WA 6005
Telephone:	+61 8 9214 6200
Fax:	+61 8 9214 6222
ACN:	081 777 755

The title holder's nominated liaison person is:

Title Holder Liaison Person:	Ian Hay
Business Address:	Level 1, 1 Ord Street, West Perth WA 6005
Direct Telephone:	+61 8 9219 6624
Email Address:	Ian.hay@cgg.com

NOPSEMA will be notified according to the requirements of Regulation 15(3) of the OPGGS(E) Regulations of changes to the title holder, the nominated liaison person, or contact details for either the title holder or liaison. CGG will submit written notice of changes to NOPSEMA within 30 days of the change.