



Ningaloo Vision Operations WA-35-L Environment Plan Summary

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1. INTRODUCTION

Apache Northwest Pty Ltd (Apache), on behalf of the Van Gogh Joint Venture participants (Apache PVG Pty Ltd [52.501% ownership] and Inpex Alpha Ltd [47.499% ownership]) has recovered oil from the Van Gogh oil reservoir since 2009, in production licence area WA-35-L using the *Ningaloo Vision* floating production, storage and offloading (FPSO) vessel (refer **Figure 1-1**).

Operational activities are to be expanded to include the recovery of hydrocarbons from the additional Coniston and Novara fields. Production from the Coniston and Novara fields (approximately 5 km north of the Van Gogh production wells and associated subsea infrastructure, **Figure 1-1**) is planned to commence in Quarter 2 2014). The estimated operational life of the Van Gogh, Coniston and Novara fields is 15 to 20 years.

Apache Energy Limited (Apache) is the appointed Operator of Activity responsible to the instrument holders for the overall management and operation of the activity.

The Ningaloo Vision Operations Environment Plan WA-35-L (the EP) has been written to meet the statutory requirements of the Commonwealth Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (OPGGs (E) Regulations). The EP ensures that activities are conducted in line with Apache environmental policies and standards (including the corporate Environmental Policy), all applicable legislation and in line with relevant stakeholder expectations. The EP has been reviewed and approved by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) on 3 April 2014. This EP summary has been prepared in accordance with the requirements of regulation 11 (7) and (8) of the OPGGS (E) Regulations for public disclosure.

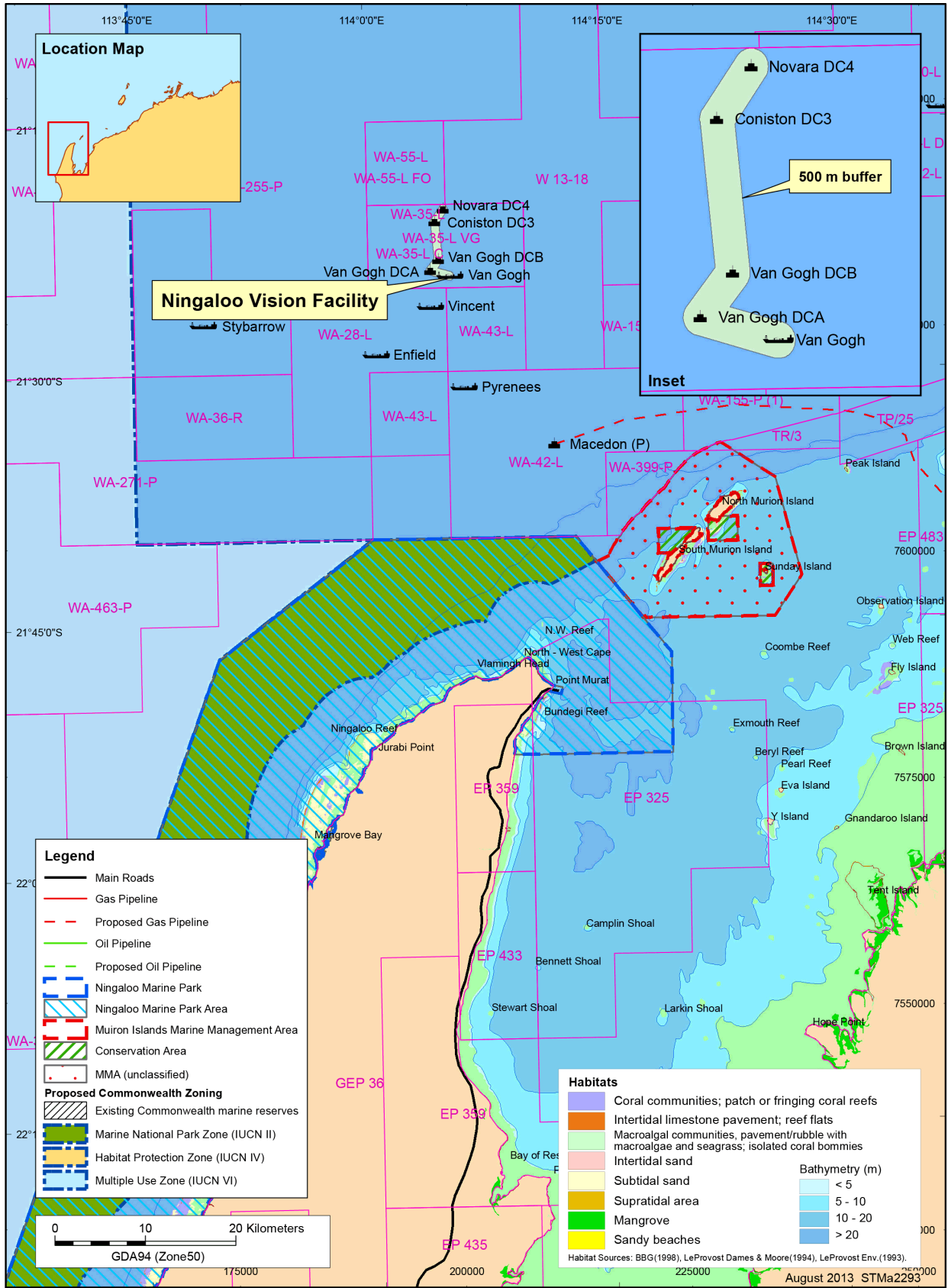


Figure 1-1: Location of Ningaloo Vision and associated infrastructure

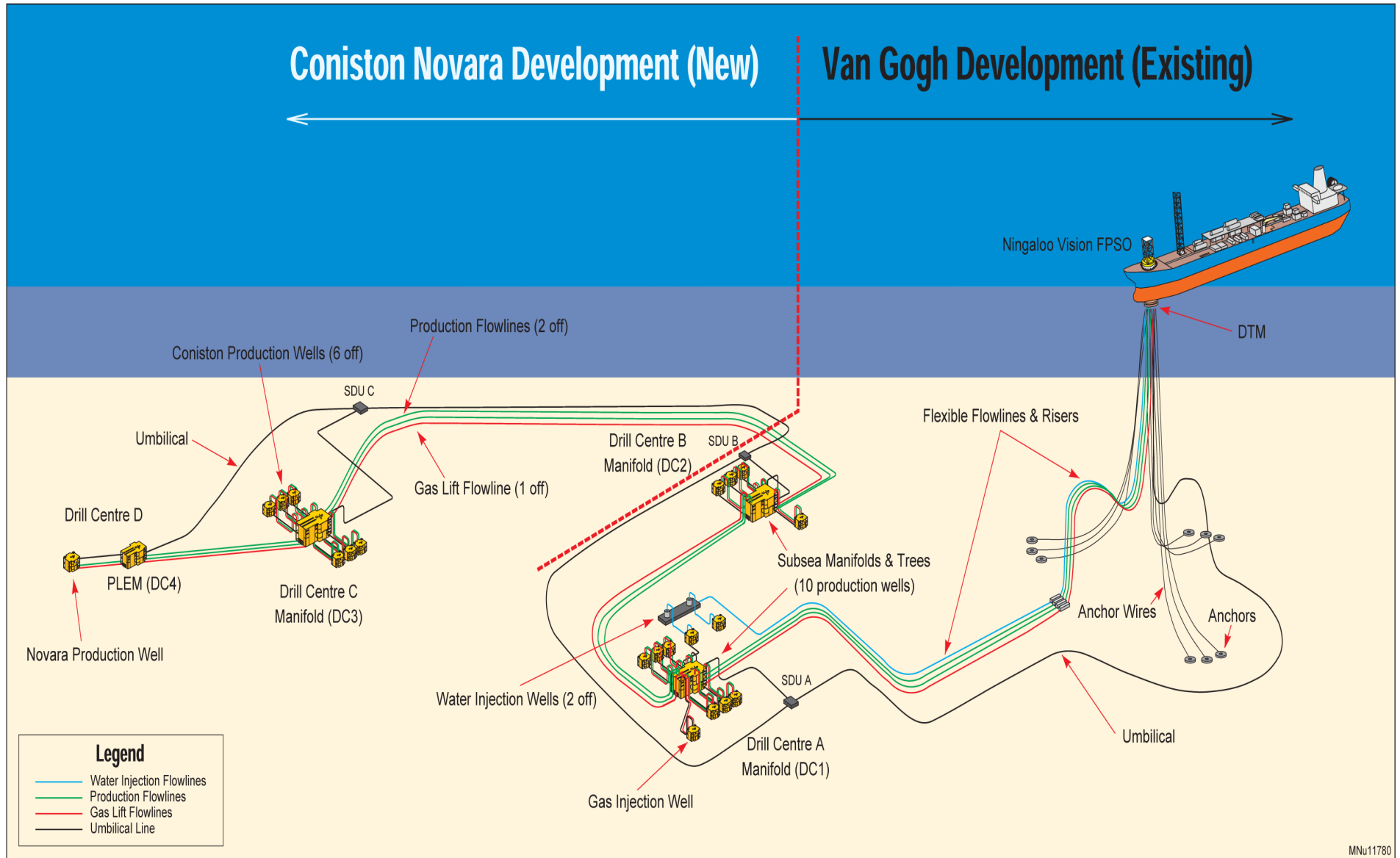


Figure 1-2: Schematic of the Ningaloo Vision Operations subsea infrastructure

2. ACTIVITY LOCATION AND COORDINATES

The FPSO and subsea infrastructure are located within Production Licence WA-35-L in Commonwealth waters, 45 km north-northwest off the Cape Range Peninsula in Western Australia. The FPSO is located 53 km north-northwest of the Exmouth township and 29 km from the northern boundary of Ningaloo Marine Park (**Figure 1-1; Figure 1-2**). The development occurs in water depths ranging from 340 m in the east of the production licence to 400 m depth in the west, with the FPSO moored in a water depth of 341 m. The EP covers all activities within a 500 m buffer, termed the Operational Area, around the FPSO and subsea infrastructure (**Figure 1-1; Figure 1-2**). The proximity of the development area to other key coastal or mainland features is:

- State/Commonwealth waters boundary – 30 km southeast.
- Ningaloo Marine Park boundary – 30 km southeast.
- Muiron Islands Marine Management Area – 35 km southeast.
- Ningaloo Reef proper – 45 km south.
- North West Cape – 45 km south.
- Barrow Island – 140 km northeast.

Coordinates of the *Ningaloo Vision* FPSO mooring position are provided in **Table 2-1**.

Table 2-1: Coordinates of the *Ningaloo Vision* FPSO

Infrastructure Locations	Coordinates (Datum/Projection: GDA 94 Zone 50)			
	Latitude (South)	Longitude (East)	Easting (m)	Northing (m)
FPSO mooring position	21°24'12.39"	114°05'17.22"	198096	7630400

3. DESCRIPTION OF THE ACTION

Oil from the Van Gogh, Coniston and Novara fields will be recovered via subsea production wells and equipment which direct the production liquids to the FPSO for processing and storage (**Figure 1-2**). As part of production, produced water and excess gas produced (excludes gas required for fuel and gas lift) are reinjected, and offtake tankers load the recovered oil from the FPSO on a regular basis. Support vessels provide logistical support for loading of supplies, offloading of wastes, oil spill response and carrying out maintenance and inspection activities. Helicopters are used for transport of personnel to and from the facility. Collectively, these activities are referred to as the Ningaloo Vision Operations in this EP. Further detail on key equipment and activities is provided below

3.1 Subsea System

The subsea system for Ningaloo Vision Operations includes oil production, gas injection and water injection wells (trees and spools connected), and subsea manifolds connected to the FPSO via flexible flowlines and risers (**Figure 1-2**).

3.2 Disconnectable Turret Mooring System (DTM)

The DTM buoy's main function is to collect the risers, connect them to the FPSO and provide the mooring system for the FPSO and tandem-moored offload tankers (**Figure 1-2**). The DTM buoy is anchored to the seabed at three mooring points. The anchors are Stevshark type, rated at 400 tonne holding capacity and designed to self-bury 3 to 4 m below the surface.

3.3 Moonpool and Turret

The moonpool is a water tight void created within the bow area of the FPSO through conversion of the forward most oil storage tank into a caisson. The moonpool houses the DTM buoy when the FPSO is moored and is arranged with internal inspection, access and escape ways.

The turret, being the topsides structure of the DTM buoy, sits directly above the moonpool. The turret serves as the junction point between the DTM buoy and the topsides production and treatment systems. Risers in the buoy are connected to a series of corresponding piping on the deck of the FPSO, leading to the processing and treatment facilities.

3.4 Ningaloo Vision: Floating Production, Storage and Offloading Vessel (FPSO)

The vessel is configured to meet the Flag State requirements, International Association of Classification Societies (IACS) class requirements (third party validation and classification by Lloyds Register of Shipping) and IMO (MARPOL and SOLAS) requirements. In accordance with IACS class requirements, the rebuild of the tanker resulted in an "as new condition" FPSO.

The FPSO maintains an In Water Survey (IWS) class notation, which means the vessel can remain at its mooring location for its entire service life without requiring dry-docking, subject to class UWILD inspections.

The FPSO is designed to withstand the anticipated environmental and operating conditions for the design life of the facility.

3.5 Offloading

Crude offloading operations take place on average every 15-20 days. The maximum offloading parcel size is 84,263 m³ (530,000 bbl), and takes in the order of 30 hours to offload, excluding mooring and disconnection time of the offtake tanker. Offloading parcels to date have averaged about 400,000 bbl.

3.6 Vessel Based Support Activities

A number of vessel based support activities (VBSA) are undertaken from time to time to ensure the efficient day-to-day operation of the Ningaloo Vision FPSO. This includes logistical support for loading of supplies, offloading of wastes, oil spill response and carrying out maintenance and inspection activities. The vessels used for these activities depend on the specific requirements of the proposed activity, the water depth and the availability of vessels. The vessels are vetted by Apache to ensure appropriateness for the required activities. Most of the vessels are typically locally sourced from the northwest shelf region.

4. DESCRIPTION OF THE RECEIVING ENVIRONMENT

The following provides a description of the physical, biological and socio-economic environment within an area that could potentially be affected by planned or unplanned events associated with the activity.

4.1 Physical Environment

Salinity in the region is relatively uniform at 34-35 parts per thousand (ppt) throughout the water column. Due to the low average rainfall in the region there is little freshwater run-off from the adjacent mainland (Blaber *et al.*, 1985).

During summer (October–March), the prevailing non-storm winds in the region are from the southwest, west and northwest at an average speed of less than 10 knots, peak average speeds of 15–25 knots, and maximum speeds of 30 knots. In winter (May – August), winds are generally lighter and more variable in direction than in summer. Non-storm winds prevail from the northeast through to southeast at average speeds of 5–6 knots, peak average speeds of 10–15 knots, and maximum speeds of 20 knots.

Mean sea wave heights of less than 1 m with peak heights of less than 2 m are experienced in all months of the year (WNI, 1995). Mean swell heights are low at around 0.4–0.6 m in all months of the year. Tropical cyclones have generated significant swell heights of up to 5 m in this area, although the predicted frequency of swells exceeding 2 m is less than 5% (WNI, 1995).

The tides in the region have a strong semi-diurnal signal with four tide changes per day (Holloway and Nye, 1985). Measurements of tidal currents mid shelf are predicted to attain average speeds of approximately 0.25 knots during neap tides and up to 0.5 knots during spring tides (NSR, 1995; WNI, 1995).

The dominant sea surface offshore current (typically seaward of the 200 m isobath) is the Leeuwin Current, which carries warm tropical water south along the edge of WA's continental shelf, reaching its peak strength in winter and becoming weaker and more variable in summer.

4.2 Biological environment

Within the Operational Area, soft sediment is the dominant habitat. A survey of seabed habitat has previously been conducted at the Coniston/Novara fields (RPS, 2011a) and at the Van Gogh Field (Apache, 2009). The seabed survey at the Coniston/Novara fields, along the flowlines and production manifold locations, has revealed a flat soft sediment habitat comprising sand, silt and mud with a sparse epibenthic fauna (including anemones, sea stars, soft corals, crabs, shrimp and sea urchins) and an infaunal community dominated by polychaetes and crustaceans. This survey found no unique communities or communities of particular regional significance (RPS, 2011a). Similarly, a seabed survey at the Van Gogh field has revealed a flat substrate comprising mud and silts sediments with sparse epifauna (including sponges, echinoderms and crustaceans) and an infaunal community comprising mainly polychaetes and crustaceans (Apache, 2009). The depth of the Operational Area (~340-400 m) precludes the existence of benthic primary producers (i.e. photosynthetic organisms including hard corals, seagrasses and macroalgae), which are typical of shallower coastal areas, as seabed light availability at these depths is insufficient to support photosynthesis.

Five marine key ecological features (KEFs) of the North-west Marine Region have boundaries that overlap areas that may be impacted by planned or unplanned events. These KEFs are considered to be of regional importance for either the region's biodiversity or ecosystem function and integrity, they include: Ancient coastline at 125 m depth contour, Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula, Commonwealth waters adjacent to Ningaloo Reef, Exmouth Plateau and Continental Slope Demersal Fish Communities.

Two world heritage properties, The Ningaloo Coast and Shark Bay, overlap areas within which impacts from accidental hydrocarbon spills could occur, or have shorelines that may be impacted from hydrocarbon spill scenarios based on spill modelling. Four National Heritage Places overlap one or more areas of potential impact from planned or unplanned events, or have shorelines that could be contacted by oil based on

results from spill modelling. These are the Ningaloo Coast and Shark Bay, the HMAS Sydney II and HSK Kormoran Shipwreck Sites and the Dirk Hartog Landing Site 1616 – Cape Inscription Area.

A search of the EPBC Act Protected Matters Database on 18th July 2013 identified 26 marine or coastal species listed as threatened (endangered or vulnerable) under the EPBC Act that could occur within the area potentially impacted by planned or unplanned events. The search identified 44 marine or coastal species listed as migratory, 22 of these are also listed as threatened. No listed threatened ecological communities were identified within the based on the EPBC Protected Matters Database search.

One Commonwealth Reserve was identified from the EPBC Act Protected Matters search tool, the Ningaloo Marine Reserve. However, an additional three reserves (Gascoyne, Carnarvon Canyon and Shark bay) have been identified from overlaying the areas of potential impact on current known Commonwealth Marine Reserves. Two State marine reserves, Muiron Islands Marine Management Area and Ningaloo Marine park, have been identified within the areas potentially impacted by planned or unplanned events, or which could have oil accumulating on shorelines (APASA, 2013).

4.3 Socio-economic environment

Socio-economic activities that may occur within the Operational Area and surrounds include commercial fishing, oil and gas exploration and production; and to a lesser extent, recreational fishing and tourism.

Local residents seeking aquatic recreation such as boating, diving and fishing use the coast and islands of the Exmouth Gulf, such as the Muiron Islands and Sunday Island. The deep open waters of the Commonwealth permit support limited recreational or tourism activity.

Offshore and coastal waters in the North-west Marine Region support a valuable and diverse commercial fishing industry. However, there is expected to be limited fishing effort in the vicinity of the Operational Area given the depth of water (340-400 m) and benthic habitat (bare sediments).

Commonwealth fisheries, such as the Western Tuna and Billfish Fishery (WTBF), Southern Bluefin Tuna Fishery (SBFTF) and Western Skipjack Tuna Fishery (WSTF), although licensed to fish within the Operational Area have had no recent fishing effort reported (AFMA, 2011). The North West Slope Trawl Fishery (NWSTF) has no current effort in the Operational Area and limited effort in the area potentially impacted by planned or unplanned events. State fisheries within the Operational Area that may be active include the Pilbara Demersal Scalefish Fishery.

There is a shipping route heading northeast approximately 40 km to the west of the FPSO location however, a relatively small number of vessels use this (AEL, 2010; Woodside 2006).

The airspace above the proposed activity location lies within a designated military exercise area. When activated by a Notice to Airmen (NOTAM), the restricted airspace can operate down to sea level.

The Operational Area and surrounding waters are predominantly used for petroleum exploration and development. The nearest FPSO is the Woodside Vincent Development (in production licence WA-28-L).

Four existing FPSO developments are currently operating in the region besides the Ningaloo Vision:

- Vincent Development (Maersk Ngujima-Yin FPSO) in WA-28-L, approximately 4 km south of the Operational Area;
- Pyrenees Development (Pyrenees Venture FPSO) in WA-42-L, approximately 13 km south east of the Operational Area;
- Enfield Development (Nganhurra FPSO) in WA-28-L, approximately 12 km south west of the Operational Area; and
- Stybarrow Development (Stybarrow Venture MV16 FPSO) in WA-32-L, approximately 28 km south west of the Operational Area.

In addition to the FPSOs and in close proximity to the Operational Area the BHPBP operated Macedon Gas Development, including an offshore pipeline, is located ~20 km south east of the Ningaloo Vision Development at its closest point.

5. ENVIRONMENTAL HAZARDS AND CONTROLS

The EP identifies all hazards (planned and unplanned events) that will or could potentially result in an environmental impact from the proposed activities (both routine and non-routine activities). The EP identifies the controls that will be used to reduce impacts and the risk of unplanned impacts to as low as reasonably practicable (ALARP) and to an acceptable level. Hazard identification (HAZID) workshops have been used to capture relevant expertise within Apache and to identify impacts, risks and appropriate management controls for the activity. The impact and risk assessment identified seven planned events and associated impacts arising from operational activities, and a further eight unplanned events with an associated risk of an impact occurring. These environmental hazards and control measures to be applied are detailed in **Table 5-1** and **Table 5-2**. Commitments arising from these control measures will be used to assess Apache's environmental performance throughout the operational activities.

Table 5-1: Summary of hazards (planned events) and mitigation controls

Hazard	Mitigation Controls
Disturbance to the seabed and marine environment	<ul style="list-style-type: none"> • Vessels undertaking subsea inspection activities will be ‘in Class’ dynamic positioning (DP2) vessels. • A risk-based assessment is used to determine the frequency of subsea inspections • No anchoring activities take place in the Operational Area, by support vessels or offtake tankers • FPSO and support vessel lifting equipment will be tested, certified and maintained in a lifting equipment register • The paint coating on the FPSO and DTM follows the <i>Protection of the Sea (Harmful Anti-fouling Systems) Act 2006</i> requirements for not using organotin compounds in the anti-fouling paint system • Any FPSO in-water cleaning will be performed in line with <i>Anti-fouling and In-water Cleaning Guidelines</i> (DAFF, 2013): • Lifting personnel have all required certifications and required levels of competency
Marine fauna disturbance from vessel and helicopter movements	<ul style="list-style-type: none"> • Support vessel masters and crew are to abide by EPBC conditions of approval for Van Gogh and Part 8 of the <i>EPBC Act Regulation 2000</i> with respect to whale shark and cetacean interactions. • Helicopters will only flight during daylight hours, unless required in an emergency. • Except for landing and take offs, helicopters must not be operated at a height lower than 1650 feet or within a horizontal distance of 500 metres from a cetacean. • Death or injury to EPBC Act listed marine fauna (including cetaceans or whale sharks) recorded in an incident report from operational activities within the Operational Area
Artificial lighting attracting marine fauna	<ul style="list-style-type: none"> • Floodlights on the FPSO use Sodium vapour lights • The maximum flaring volume targets for the FPSO will be adhered to. • Aft FPSO mooring light is turned inboard when not required for offloading crude • External lights on FPSO are shielded where practicable and consistent with safety requirements to reduce overboard light spill
Acoustic disturbance to marine fauna from FPSO, support vessels and helicopter operations	<ul style="list-style-type: none"> • FPSO computerised maintenance management system (CMMS) includes testing and maintenance of noise generating equipment in accordance with manufacturer’s specifications • Supply/maintenance vessel engines maintained as per vessel’s planned maintenance system • Helicopter engines maintained as per the helicopter’s planned maintenance system • Support vessel masters and crew are to abide by EPBC conditions of approval for Van Gogh and Part 8 of the EPBC 2000 Regulation with respect to whale shark and cetacean interactions. • Except for landing and take offs, helicopters must not be operated at a height lower than 1650 feet or within a horizontal distance of 500 metres from a cetacean. • Maintenance activities that will generate additional underwater noise (e.g. from an activity such as sidescan sonar, sub bottom profiling) are risk assessed and managed in line with Part 2 Div. 2.1 of <i>OPPGS(E) Regulations 2009</i> prior to activity being carried out

Hazard	Mitigation Controls
Reduction of water quality and impacts to sensitive receptors from planned discharges	<ul style="list-style-type: none"> • Sewage discharge and FPSO/support vessel sewage systems is compliant with relevant MARPOL and Marine Order requirements. • Sewage systems, food macerators, fresh water makers, oily water separators and cooling water systems (including boilers) on vessels are maintained as per the vessels planned maintenance system • Vessel food waste discharge, recording and macerators are compliant with relevant MARPOL and Marine Order requirements • Scale inhibitors used in fresh water systems and boiler water treatment chemicals are deemed to have low environmental risk under Apache's Operations Chemical Selection Evaluation and Approval Procedure • Oily water discharge and oily water separation equipment is compliant with relevant MARPOL and Marine Order requirements. • On the FPSO, oily water is directed to the slops tank system and not discharged overboard • For the FPSO and support vessels, secondary containment is present around all rotating equipment, equipment containing hydrocarbon products (e.g. refuelling points) and chemical/hydrocarbon storage areas • FPSO drainage and bunding systems are regularly inspected and maintained as per the FPSO computerised maintenance management system (CMMS). • Main deck on the FPSO is totally enclosed by coaming (also called kick-boarding or freeboard), and scupper plugs have been fitted at drainage points and kept closed during normal operations (except during heavy rainfall events) • All hazardous materials on FPSO are labelled, securely stored and have a current Material Safety Data Sheet (MSDS) is available near storage location • Harmful substances transported by support vessels in packaged form, are marked, labelled and stowed in accordance with MARPOL requirements • Spill kits and equipment are located near high risk spill areas on the FPSO/support vessels and inspected regularly • Continuous cooling water temperatures onboard the FPSO are recorded daily and turbo alternator condenser overboard discharge triggers alarm when temperature exceeds 50°C • Tankers and the FPSO have segregated ballast tanks in line with MARPOL requirements • Only water/glycol based subsea hydraulic control fluid is used for control of subsea valves on Van Gogh, Coniston and Novara wells • Any proposed new subsea hydraulic fluids will be risk assessed using Apache's Operations Chemical Selection Evaluation and Approval Procedure • No Produced Formation Water (PFW) is disposed overboard • During process upset where PFW reinjection is not possible, PFW will be hold in slop tanks on FPSO prior to reinjection.
Reduction of air quality from air emissions during normal operations	<ul style="list-style-type: none"> • NOx and SOx emission levels for applicable vessels meet MARPOL requirements • All engines, compressors and machinery (including burners) on the FPSO and support vessels are maintained on a regular basis as outlined in the planned maintenance system • Produced gas is re-injected unless gas re-injection system is out of service • Primary fuel used on FPSO is produced gas

Hazard	Mitigation Controls
	<ul style="list-style-type: none"> • Diesel with sulphur content of 3.5% m/m is the only fuel oil used on FPSO • Cargo tanks are blanketed with inert gas
Loss of access to the area by other users of the sea or of visual amenity due to the presence of the FPSO and its support activities	<ul style="list-style-type: none"> • The Ningaloo Vision FPSO is charted on Australian Hydrographic Service (AHS) nautical charts • External stakeholder consultation continues throughout the production phase of the Ningaloo Vision Operations • Any external stakeholder complaints regarding operational activities will be reported and managed • FPSO and support vessel navigation equipment is compliant with relevant SOLAS and Marine Order requirements • Visual bridge-watch on all vessels 24 hours per day (during marine mode only) • Crew undertaking vessel bridge watch are qualified as per applicable STWC and Marine Order requirements

Table 5-2: Summary of hazards (unplanned events) and prevention/mitigation controls

Hazard	Prevention & Mitigation Controls
Accidental disposal of non-hazardous solid wastes to the marine environment	<ul style="list-style-type: none"> • Waste segregation is in place onboard the FPSO and supply/maintenance vessels • All bins (except scrap metal and wooden pallets) have covers and are kept closed • FPSO solid non-biodegradable and non-hazardous wastes are transported to shore and disposed to a licensed disposal facility • Vessels have Garbage Management Plans as required under relevant <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i> /MARPOL/Marine Order requirements • An incident notification is completed for any non-hazardous wastes accidentally disposed overboard
Accidental disposal of hazardous materials to the marine environment	<ul style="list-style-type: none"> • All stored hazardous materials are packaged and labelled, securely stored in bunded areas and current SDS are available near storage location • All chemicals onboard vessels are listed within a chemical inventory register containing information on product name, quantity, hazard class, and storage location in line with <i>Work Health and Safety Regulations (2011)</i> • Dangerous goods / harmful substances transported in packaged form, are marked, labelled, stowed and documented in accordance with relevant MARPOL / IMDG Code / Marine Order requirements • FPSO hazardous wastes are transported to shore and disposed to a licensed disposal facility • All disposed wastes from the FPSO and support/maintenance vessels have been manifested and/or tracked with volumes/weights recorded. • Vessels have Garbage Management Plans as required under relevant <i>Protection of the Sea (Prevention of Pollution from Ships) Act 1983</i> /MARPOL/Marine Order requirements • Offsite NORMS testing (U- and Th- series elements) of FPSO produced sands is conducted annually at a NATA accredited lab • Any NORMs contaminated waste is to be stored and disposed of as outlined in the Radiation and Naturally Occurring Radioactive Material (NORMS) Procedure and in accordance with the Apache Controlled Waste Procedures • As per Apache's Operations Chemical Selection Evaluation and Approval Procedure, chemicals selected for use on the FPSO are risk assessed to favour chemicals with low toxicity • An incident notification is completed for any hazardous material (liquid or solid) accidentally discharged overboard.
Accidental introduction of marine pests	<ul style="list-style-type: none"> • Vetting process for out-of-State contracted support / maintenance vessels identifies a 'low risk' of introducing marine pest species of concern into the Operational Area • FPSO manages ballast in accordance with a Ballast Water Management Plan and the Ballast Record Book is up to date • Support vessels arriving from international waters to the Operational Area will have a Ballast Water Management Plan and Ballast Water Record Book • The FPSO's internal seawater intake systems are treated via the marine growth prevention system which is maintained to prevent fouling growth within the seawater intake pipework • Marine growth removed during inspection / maintenance of FPSO internal seawater systems is not disposed to the marine environment

Hazard	Prevention & Mitigation Controls
	<ul style="list-style-type: none"> • No vessel hull cleaning, except that required for Class inspection of the FPSO will be carried out in the Operational Area • Inspections of in-water surfaces to assess marine 'fouling' growth thickness on the FPSO are carried out in line with CMMS • When the FPSO is within the Operational Area, an in-water cleaning self-assessment is carried out as per 'In-water Cleaning Guidelines (DAFF, 2013a) • A Biofouling Management Plan will be in place for the FPSO for management of marine pest during overseas shipyard activities • FPSO follows requirements of the Biofouling Management Plan. • The FPSO has a Biofouling Record Book including details of any in-water and dry-dock inspections and inspection / maintenance of anti-fouling systems and marine growth areas
Unplanned release of diesel	<ul style="list-style-type: none"> • The FPSO and cautionary zone is marked on Australian Hydrographic Service (AHS) marine charts • The FPSO is fitted with an automatic radar plotting aid (ARPA) System integrated with an Automatic Identification System (AIS), to SOLAS requirements, to identify and track collision threats • The FPSO communication and navigation equipment complies with relevant IMO requirements and is regularly tested. • Support vessel communication and navigation equipment complies with relevant IMO requirements • A procedure for support vessels entering FPSO 500 m exclusion zone is in place. • Offtake tanker will follow the procedures outlined within the Berthing and Terminal Handbook during berthing and cargo loading • Offtake tanker berthing to be coordinated by a Pilot/Mooring Master • Consultation with stakeholders including the commercial fishing industry is undertaken • Vessel hulls comply with and are surveyed as per Class requirements. • Seagoing qualifications of vessel crew comply with relevant STCW / Marine Order requirements • FPSO diesel bunkering hose has dry-break coupling • FPSO bunkering equipment including valves, tanks and connections, shutdown systems, and hoses maintained as per CMMS • All FPSO refuelling operations will comply with Ningaloo Vision Bunkering Operation Procedure • Testing of FPSO main and essential diesel engines, diesel generators, pumps, quick closing valves, and diesel oil tanks occur every 5 years • Vessels have Shipboard Oil Pollution Emergency Plan (SOPEP) or Shipboard Marine Pollution Emergency Plans (SMPEP) as required by MARPOL • Ningaloo Vision Operations Oil Spill Contingency Plan is located onboard the FPSO • Spill kits contents are checked as per CMMS and restocked after usage • Weekly inspection of support vessel spill kits is undertaken and recorded • Unplanned hydrocarbon release to the marine environment is reported, investigated and managed in line with Apache Hazard Reporting Incident Notification and Investigation Procedure and Environmental Reporting Procedure
Unplanned release of HFO	<ul style="list-style-type: none"> • Offtake tankers are double-hulled as per MARPOL and Class requirements • Other prevention and mitigation controls are include in the above (Unplanned release of diesel)

Hazard	Prevention & Mitigation Controls
Unplanned surface release of crude oil	<ul style="list-style-type: none"> • FPSO has double sides protecting crude oil storage tanks (as per Class requirements) • FPSO and offtake tanker hulls are inspected as required for Class certification • Offtake tanker activities and equipment will adhere to the Berthing and Terminal Handbook • FPSO will adhere to the offtake operations procedures within the Offtake Operational Procedure • FPSO Offtake hose is fitted with quick release dry-break coupling • The performance of FPSO mooring hawser, cargo system pumps and the cargo pump and piping system is regularly tested against Apache documentation. • FPSO Offtake equipment is maintained as outlined within the computerised maintenance management system (CMMS) • Dropped object protection is present at pipe racks and inert gas headers and regularly inspected • Limit switches are present on FPSO cranes to prevent lifting over process equipment • Process system vessels and process system pump are regularly inspected and assessed • Process system equipment (including vessels, piping, valves and pumps) are inspected and maintained as per the CMMS • The performance of FPSO Process System Pressure Safety Valves (PSVs), the Emergency Blowdown System, Emergency Shutdown System (ESD) and ESD valves are regularly tested against relevant Apache documentation. • ESD push buttons are available on the FPSO • A permit to work system is in place where isolation and maintenance of process system is required • Other relevant prevention and/or mitigation controls are include in the above (Unplanned release of diesel) and in Table 5-1 (Reduction of water quality and impacts to sensitive receptors from planned discharges)
Unplanned subsea release of crude oil	<ul style="list-style-type: none"> • The FPSO has current Class certification • The Disconnectable Turret and Mooring (DTM) Buoy is regularly inspected and assessed • The FPSO riser system integrity and control functionality is regularly inspected/tested • A working copy of the Dis-connection Procedure is available onboard the FPSO • PTW and JSA completed for each DTM disconnection event • Vessels undertaking subsea inspection activities will in Class dynamic positioning (DP2) vessels. • Subsea production system inspection, monitoring and maintenance (IMM) conducted at a frequency determined by a risk based assessment. • The performance of ESD Valves, Subsea ESD Valves and ESD Control Logic System is regularly tested against relevant Apache documentation. • ESD pushbuttons are available on the FPSO • Ningaloo Vision Operations Oil Spill Contingency Plan is located onboard the FPSO • Other relevant prevention and/or mitigation controls are include in the above (Unplanned release of diesel) and in Table 5-1 (Disturbance to the seabed and marine environment)

Hazard	Prevention & Mitigation Controls
Impacts from oil spill response activities	<ul style="list-style-type: none">• Relief well drilling activities implemented as per approved EP for the activity• Spill response plans implemented as per the Ningaloo Vision Operations Oil Spill Contingency Plan

6. MANAGEMENT APPROACH

The Ningaloo Vision operations will be managed in compliance with all measures and controls detailed within the EP and accepted by NOPSEMA under the OPGGS (E) Regulations, all relevant EPBC Act referral conditions, other environmental legislation and Apache's Management System (e.g. Apache Environmental Management Policy).

The objective of the EP is to ensure that all environmental impacts and risks associated with the activity are identified and assessed, and to stipulate prevention and/or mitigation controls to avoid and/or reduce any adverse impacts to the environment to ALARP and to an acceptable level.

The EP details specific performance standards associated with each control which are to be met in order to achieve the environmental performance objectives of the EP. The controls for the activity are summarised in **Section 5**. The EP also identifies the specific measurement criteria and records to be kept to demonstrate the achievement of performance standards and objectives.

The EP, contains an implementation strategy which demonstrates how performance standards and objectives will be met and includes the following:

1. Details on the systems, practices and procedures to be implemented;
2. Key roles and responsibilities;
3. Training, competencies and on-going awareness;
4. Monitoring, auditing, management of non-conformance and review;
5. Incident response including an Oil Spill Contingency Plan;
6. Records Keeping;
7. Stakeholder Consultation; and
8. Details of reporting arrangement to relevant regulatory authorities with respect to recordable and reportable incidents and overall environmental performance

7. STAKEHOLDER CONSULTATION

Apache recognises that its activities have the potential to impact the community and the environment, particularly in locations which feature or are near sensitive receptors, or that overlap with other economic, cultural or community uses.

To facilitate informed assessment by stakeholders of the likely potential impact of Apache's activities, Apache seeks to establish long-term and meaningful dialogue with those stakeholders who have an interest in its present and planned future activities in Australia.

To achieve this, Apache clearly articulates engagement and consultation standards, goals, and mechanisms, seeks to effectively manage change during the life of its projects and activities, and strives to continuously improve all aspects of its stakeholder engagement processes.

The identified stakeholders are commercial fishers in the region, fishing bodies, federal departments, regulators and non-government organisations. Relevant stakeholders identified for the activity are summarised in **Table 7-1**.

Table 7-1: Summary of stakeholders consulted

Group	Stakeholder
Commercial fisheries	<ul style="list-style-type: none"> • Australian Fisheries Management Authority (AFMA) • Department of Fisheries (DoF) • Western Australian Fishing Industry Council (WAFIC) • Commonwealth Fisheries Association (CFA) • A Raptis and Sons • Austral Fisheries • WestMore Seafoods • Shark Bay Seafoods • MG Kailis • Pearl Producers Association • State commercial fishing licence holders
Recreational fisheries	<ul style="list-style-type: none"> • Recfishwest • Marine Tourism WA
Marine conservation	<ul style="list-style-type: none"> • Department of Parks and Wildlife (DPaW)
Tourism	<ul style="list-style-type: none"> • Marine Tourism WA (formerly Charter Boat Association)
Shipping safety and security	<ul style="list-style-type: none"> • Australian Maritime Safety Authority (AMSA) • Department of Defence (DoD)
Hydrocarbon spill response	<ul style="list-style-type: none"> • Australian Marine Oil Spill Centre (AMOSC) • Department of Transport (DoT)
Adjacent Regulator	<ul style="list-style-type: none"> • Commonwealth Department of the Environment (DoE) • Department of Mines and Petroleum (DMP)
Exmouth Stakeholder Reference Group	<ul style="list-style-type: none"> • Cape Conservation Group • DPaW (Exmouth) • DoT (Exmouth) • Exmouth Chamber of Commerce • Exmouth District High School • Exmouth Game Fishing Club • Gascoyne Development Commission • Member of the Legislative Assembly • Ningaloo Station owners • North West Cape Exmouth Aboriginal Corporation • Shire of Exmouth Council • Toll Exmouth

The consultation methods planned for the life of *Ningaloo Vision Operations* includes consultation in accordance with regulatory guidelines (NOPSEMA), regular briefings and meetings as requested or required with stakeholders and two-way communication with Apache's Exmouth SRG, including project briefings regarding *Ningaloo Vision Operations* and other Apache projects.

Prior to the specific *Ningaloo Vision Operations* Stakeholder Information Pack distribution to stakeholders in June 2013, stakeholders have received extensive consultation relating to the Van Gogh and Coniston/Novara Developments. This includes two information packs relating to the drilling phases of the Coniston Novara development, Phase I consulted on in September 2012 and Phase II in May 2013 and well as Coniston Construction and Installation consulted on in February 2013.

Stakeholders have received regular updates regarding the Coniston Novara Development and *Ningaloo Vision Operations* through Apache's Quarterly Project Updates. These are provided in response to stakeholder requests for a more streamlined consultation process, and include information previously requested by stakeholders.

At each contact point, stakeholders are urged to contact Apache should they require more information or have concerns with any activities showcased. While correspondence was received in response to a number of the Quarterly Updates, no specific concerns with the *Ningaloo Vision Operations* have been raised.

No major concerns were raised by stakeholders between distribution of the *Ningaloo Vision Operations* consultation package and the submission of this EP.

8. NOMINATED LIASON PERSON

The Nominated Liaison Person for the activity is:

Mr Jack Goodacre
Director of Operations
Apache Energy Ltd
100 St Georges Terrace, Perth WA 6000
Phone: 08-6218 7100

9. REFERENCES

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