Santos

# Simpson Offshore Assets and All Platforms Environment Plans

## Information for Relevant Persons

### Activity Overview

Santos is planning to progressively decommission the Harriet Joint Venture (HJV) offshore assets no longer required for production, commencing with the removal of 15 HJV platform/ structures and the Simpson facility pipelines.

The Harriet Joint Venture (HJV) assets are located in Western Australian State waters in the Carnarvon Basin, with the Operational Area approximately 102 km west of Dampier and 105 km northeast of Onslow, Western Australia (see **Figure 1**).

Activities are proposed to commence in Q1 2024.

### Consultation & Feedback

All petroleum activities in Western Australian State waters must have an Environment Plan (EP) accepted by the Department of Mines, Industry Regulation and Safety (DMIRS) before any activities can take place.

Under State Environmental Regulations, Santos is required to consult with relevant authorities and other relevant interested persons and organisations about proposed activities when preparing an EP. This may include you if, for example, you have spiritual or cultural connections to land and sea country in accordance with Indigenous tradition that might be affected by our proposed activity, if you otherwise carry out recreational or commercial fishing, tourism or other activities that might be affected by our proposed activity or if you are part of a local community that might be affected by our proposed activity.

Santos is now consulting with relevant authorities and other relevant interested persons and organisations for activities proposed to be managed under two Environment Plans (EP) – one for the Simpson assets and one for all other platforms. If you consider you may be a relevant authority or a relevant interested person or organisation, please contact us as soon as possible if you require any further information or if you think you are not on our consultation list.

We are asking for relevant persons to provide feedback by **26 July 2023**.

Details on how to contact us are included in the **Providing Feedback** section of this information sheet.

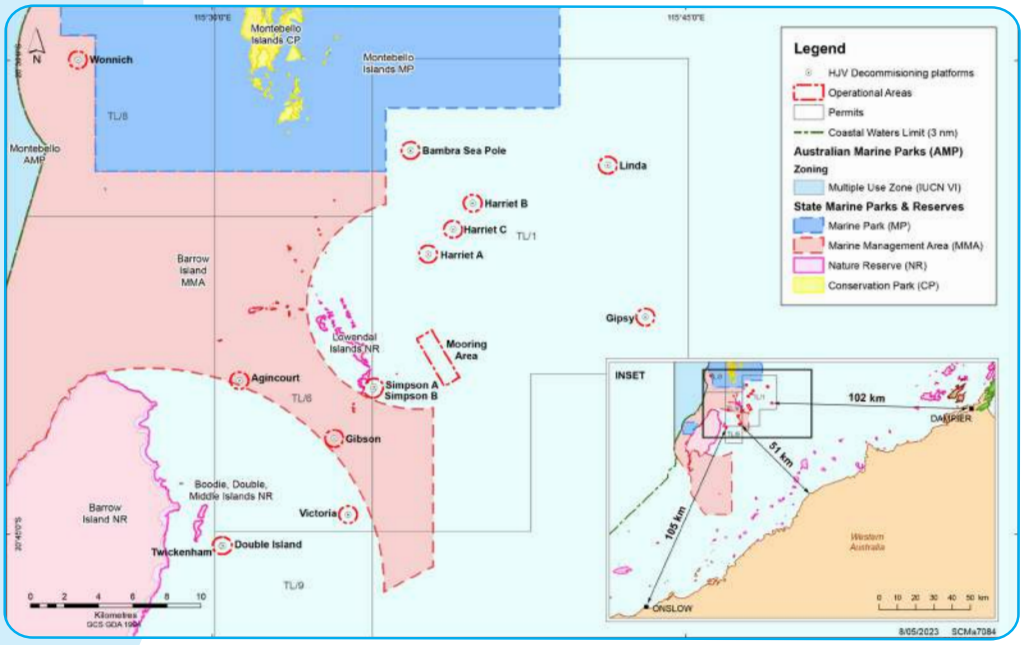


***Figure 1.*** *Harriet Joint Venture decommissioning activity location.*

## Activity Description

| ACTIVITY DETAILS | | |
|---|---|---|
| **Location** | Approximately 102 km west of Dampier and 105 km northeast of Onslow, Western Australia. | |
| **Timing** | Activities are currently planned to commence from Q1 2024 for preparatory/ inspection type activities, and Q1 2025 for decommissioning execution. Activities could be conducted in a single or multiple campaigns | |
| | **Simpson assets** | **All other platforms** |
| **Estimated Durations** | + Platform removal - up to six weeks.<br>+ Subsea infrastructure removal up to 20 weeks. | + Each platform removal operation could take approximately 15 to 120 days to complete and may be conducted in single or multiple campaigns. |
| **Water depth** | Approximately 0 m to 6 m. | Approximately 0 m to 40 m. |
| **Asset descriptions** | + Two identical normally unmanned mini-platforms - Simpson Alpha and Bravo.<br>+ Four suspended pipelines (two oil, one gas and one water disposal well) from Varanus Island to Simpson Alpha and Bravo (approximately 2.7 km each). | + Two monopods, five mini platforms, a conventional eight-legged platform, two platforms, two remote structures and a subsea template.<br>Each platform is composed of various equipment/infrastructure, including:<br>+ Topsides and Substructures (jackets/caissons)<br>+ Conductors and risers, anode skids, grout bags, mudmats and piles |
| **Planned activities** | + Subsea and topside surveys to assist planning and engineering activities.<br>+ Cutting operations and removal of the platforms and substructures.<br>+ Cutting and removal of pipeline strapping and rock bolts with internally embedded Kevlar strapping, will be cut at, or as close as possible to the seabed.<br>+ Cutting, disconnection and recovery of the pipelines and other subsea infrastructure. | + Subsea and topside surveys to assist planning and engineering activities.<br>+ Preparatory works (subsea & topside) prior to platform removal.<br>+ Removal of plugged and abandoned well infrastructure.<br>+ Cutting and capping/plugging of pipelines.<br>+ Topsides cutting and removal.<br>+ Substructure cutting and removal. |
| | + Securing of removed structures on a project vessel(s).<br>+ Transport of the recovered structures to a disposal location outside of the Operational Area in either Australia or South-East Asia.<br>+ Once equipment arrives onshore it will be prepared for disposal, recycling, or reuse in accordance with applicable legislation. | |
| **Proposed end states** | Santos proposes partial removal of the substructures to a point as low as practical for each individual structure (<2 m and made safe, although it will be different for each platform see **Table 2**).<br>This allows for minimal localised environmental disturbance based on the technical design of the substructure interface with the seabed.<br>**Figures 2 to 9** illustrate the proposed end states and structures left above seabed for each of the platforms. | |
| **Exclusion zones** | A 500 m radius Petroleum Safety Zone (PSZ) (exclusion zone) will be in place around the Simpson platforms. A 500 m radius PSZ around each platform for the duration of the activity. | |

| | | |
|---|---|---|
| **Operational Area** | + A 500m PSZ around each platform center (see Activity Coordinates)<br>+ A corridor of 250 m each side of the Simpson pipelines from the boundary of PL 12 to the subsea tie in skid on TL/6;<br>+ The onshore area within PL 12 that covers Varanus Island, to provide for land-based support and decommissioning activities; and<br>+ An area within TL/1 and TL/6 to provide a dedicated area for temporary (and removable) vessel moorings. This mooring area will have up to six moorings for vessels undertaking the activity. | |
| **Vessels** | A range of vessels suitable for shallow and deeper water work primarily barges, vessels, or heavy lift vessels. Additional support will be provided using vessels for dive support, anchor handling, and crew transfers, as well as transportation barges and tugs. | |
| **Aircraft** | Helicopters may be used for crew changes, critical equipment supply and emergency response uses. | |
| **Description of natural environment** | Subtidal benthic habitats that occur adjacent to HJV offshore facilities comprise a mixture of macroalgae and seagrass, hard corals, filter feeding communities, hard substrates, and soft sediments. However, most of the seabed habitat around the platforms is relatively devoid of hard corals. Seagrasses are sparsely interspersed between macroalgae, that grow on soft sediments, subtidal sands and in intertidal pools.<br>The Simpson activities will include the use of Varanus Island to support the Simpson Pipelines removal activities. Varanus Island is an existing operational plant on a Class C Nature Reserve. | |
| **Petroleum production licences** | The Simpson offshore assets are located within Production Licence TL/1. | The HJV offshore platforms are located within Production Licences TL/1, TL/5, TL/6, TL/8, and TL/9. |

## ACTIVITY COORDINATES

| Points | Latitude (GDA94) | Longitude (GDA94) | Water depth |
|---|---|---|---|
| Simpson Alpha | 20° 40' 20.00" S | 115° 35' 07.76" E | 5.9 |
| Simpson Bravo | 20° 40' 24.27" S | 115°35' 05.66" E | 5.6 |
| Agincourt | 20° 40’ 07.70" S | 115° 30’ 51.56" E | 6 |
| Bambra Sea Pole | 20° 32' 50.45” S | 115° 36' 16.88” E | 25.2 |
| Double Island | 20° 45' 21.00" S | 115° 30' 20.00" E | 6 |
| Gibson South Plato | 20° 41' 57.54” S | 115° 33' 51.86” E | 5.8 |
| Gipsy | 20° 38' 11.83" S | 115° 43' 38.85” E | 28 |
| Harriet Alpha | 20° 36’ 06.47" S | 115° 36’ 51.12" E | 22.8 |
| Harriet Alpha Flare | 20° 36’ 05.016"S | 115° 36’ 53.98" E | 22.8 |
| Harriet Bravo | 20° 34’ 30.71“S | 115° 38’ 15.28” E | 26.6 |
| Harriet Charlie | 20° 35’ 20.52” S | 115° 37’ 38.03” E | 24.6 |
| Linda | 20° 33' 18.58” S | 115° 42' 31.86” E | 31.4 |
| Twickenham | 20° 45' 21.19” S | 115° 30' 19.86” E | 6.6 |
| Victoria | 20° 44' 22.24” S | 115° 34' 18.18” E | 5.3 |
| Wonnich | 20° 29' 58.83” S | 115° 25' 44.70” E | 30 |

## MOORING AREA COORDINATES

| Mooring corner point | Latitude (GDA94) | Longitude (GDA94) |
|---|---|---|
| Point 1 | 20° 38’ 48.603” S | 115° 36’ 28.522” E |
| Point 2 | 20° 38’ 31.859” S | 115° 36’ 57.032” E |
| Point 3 | 20° 40’ 1.657” S | 115° 37’ 49.771” E |
| Point 4 | 20° 40’ 18.402” S | 115° 37’ 21.260” E |

## About decommissioning activities

Decommissioning is a normal and inevitable stage in the lifetime of an offshore petroleum project that is planned and matured throughout the life of operations.

Decommissioning involves the timely, safe and environmentally responsible removal of, or otherwise satisfactorily dealing with, infrastructure from the offshore area that was previously used to support oil and gas operations.

Key aspects for consideration in planning decommissioning activities are:

+ **Navigation** – ensuring that property does not cause an unacceptable impact and risk to other marine users.
+ **Contamination** – consideration of any pollution or contamination resulting from the deterioration of property.
+ **Impact on marine environment** – consideration of impacts and risks from the activity to the marine environment.
+ **Stability** – consideration of movement of infrastructure.
+ **Technical Feasibility** – review of the technical feasibility of implementing the decommissioning activity.

The Western Australian Government base case for offshore decommissioning is the complete removal of all infrastructure. Options other than complete removal may be considered, where the alternative decommissioning approach delivers equal or better environmental outcomes compared to complete removal. More information about decommissioning can be found here.

## Activity Purpose and Approvals

The HJV facilities consist of a total of 15 platforms/structures, their associated wells and approximately 211 km of pipelines with associated stability structures. The offshore infrastructure is tied back via a series of pipelines to onshore processing and export facilities on Varanus Island, collectively known as the Varanus Island (VI) hub operations.

Production commenced from the HJV fields as early as 1986, with assets now at the end of their economically viable production life. All operations in the HJV fields are suspended, depressurised, flushed and cleaned following the cessation of production activities, except for the last two remaining operational facilities, Linda, and Harriet Bravo.

Under Western Australian legislation, Santos is required to remove facilities no longer required for production. Further, asset specific Government approvals require the Simpson assets to be removed by **31 October 2025**.

Two Environment Plans (EP) are being prepared for the planned decommissioning activities (one for the Simpson Assets, and one for all other platforms), under which all activity impacts and risks are proposed to be managed to a level as low as reasonably practicable (ALARP) and acceptable over the life of the activity.

The EPs will be submitted to the Department of Mines, Industry Regulation and Safety (DMIRS) for acceptance in accordance with the *Petroleum (Submerged Lands) Act 1982* and related *Petroleum (Submerged Lands) (Environment) Regulations 2012* and the *Petroleum and Geothermal Energy Resources (Management of Safety) Regulation 2010*.

All facilities will be suspended, with all wells will be plugged and abandoned (P&A) prior to the execution of any decommissioning of platform assets. Suspension and P&A activities will be subject to separate Environment Plans. The future decommissioning of other offshore pipelines, onshore assets, and the ultimate permit surrender requirements will be subject to future Environment Plans and separate consultation.

## Proposed end states for all assets

Santos proposes partial removal of the substructures to a point as low as practical for each individual structure to minimise localised environmental disturbance based on the technical design of the substructure interface with the seabed. As a result, cut heights will be different for each platform (see **Table 1**). No structure is planned to be higher than 2 m above the seabed.

**Figures 2 to 8** provide examples of the current structures and proposed end states for some/each of the platforms.

## TABLE 1
## PROPOSED SUBSTRUCTURE END STATES

| PLATFORM / STRUCTURE | PROPOSED SUBSTRUCTURE END STATE AND APPROXIMATE CUT HEIGHTS ABOVE SEABED | |
|---|---|---|
| Simpson A | Cut height as low as practical but no more than 2 m above seabed* and made safe | 1500 mm |
| Simpson B | | 1500 mm |
| Agincourt | | 250 mm |
| Bambra | | 800 mm |
| Double Island | | 250 mm |
| Gibson & South Plato | | 1800 mm |
| Gipsy Subsea Template | | 500 mm |
| Harriet Alpha | | 900 mm |
| Harriet Alpha Flare | | 1200 mm |
| Harriet Bravo | | 1000 mm |
| Harriet Charlie | | 1000 mm |
| Linda | | 660 mm |
| Twickenham | | 250 mm |
| Victoria | | 800 mm |
| Wonnich | | 700 mm |

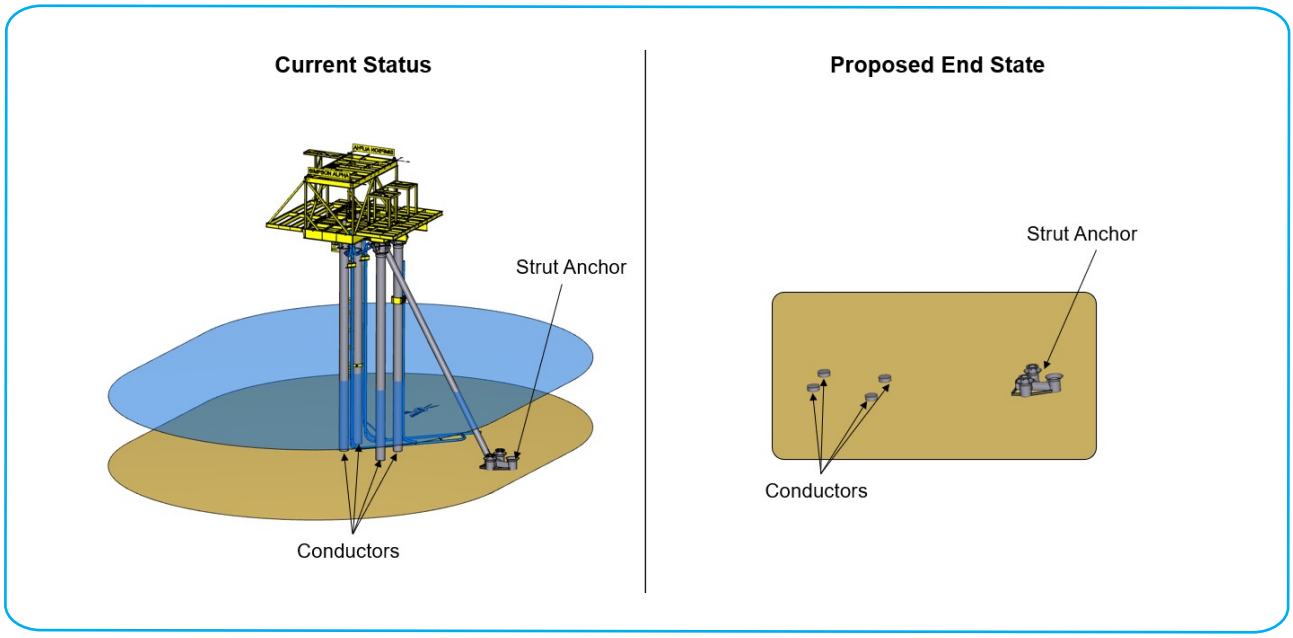


***Figure 2.*** *Simpson Alpha and Bravo – proposed end state strut anchor 1.5 m above seabed, conductors 0.25 m above seabed.*

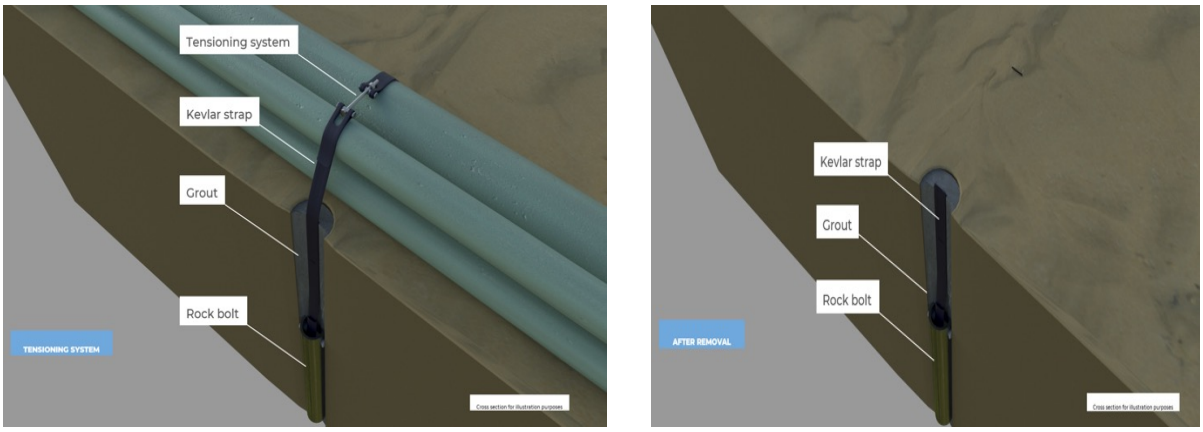


***Figure 3.*** *Simpson pipeline and rockbolts current status and proposed end state.*

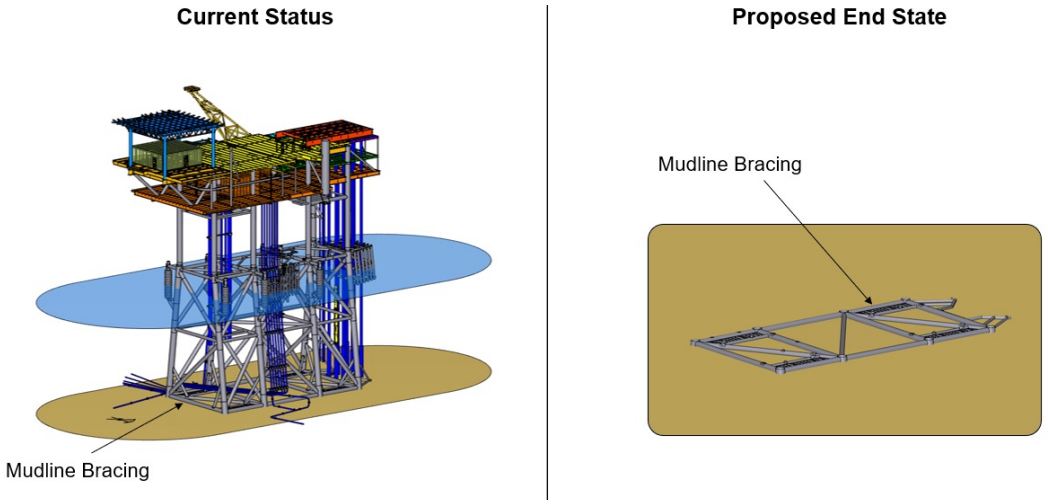


***Figure 4.*** *Harriet Alpha - proposed end state 0.9 m above seabed.*

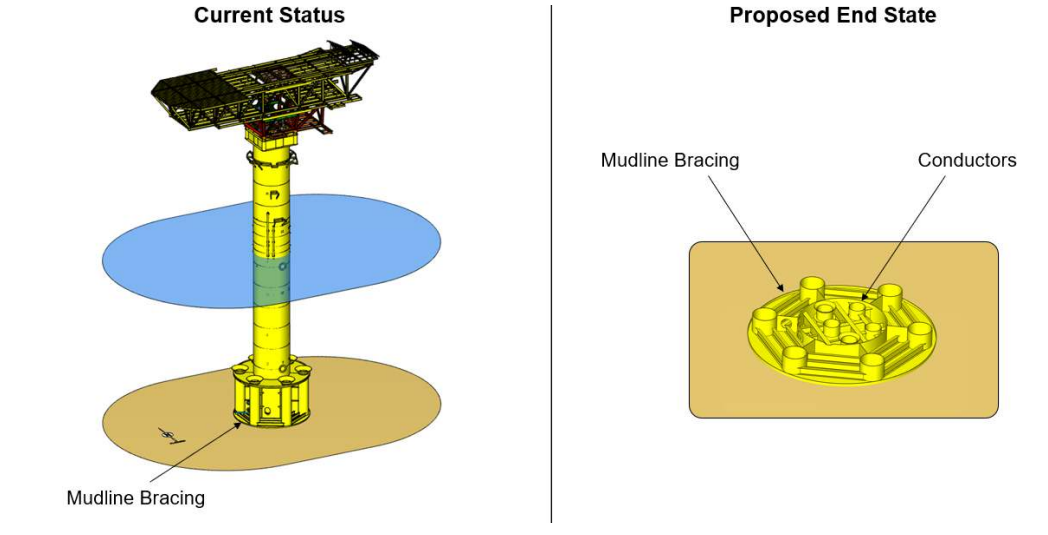


***Figure 5.*** *Harriet Bravo (also representative of Harriet Charlie) – proposed end state 1.0 m above seabed.*

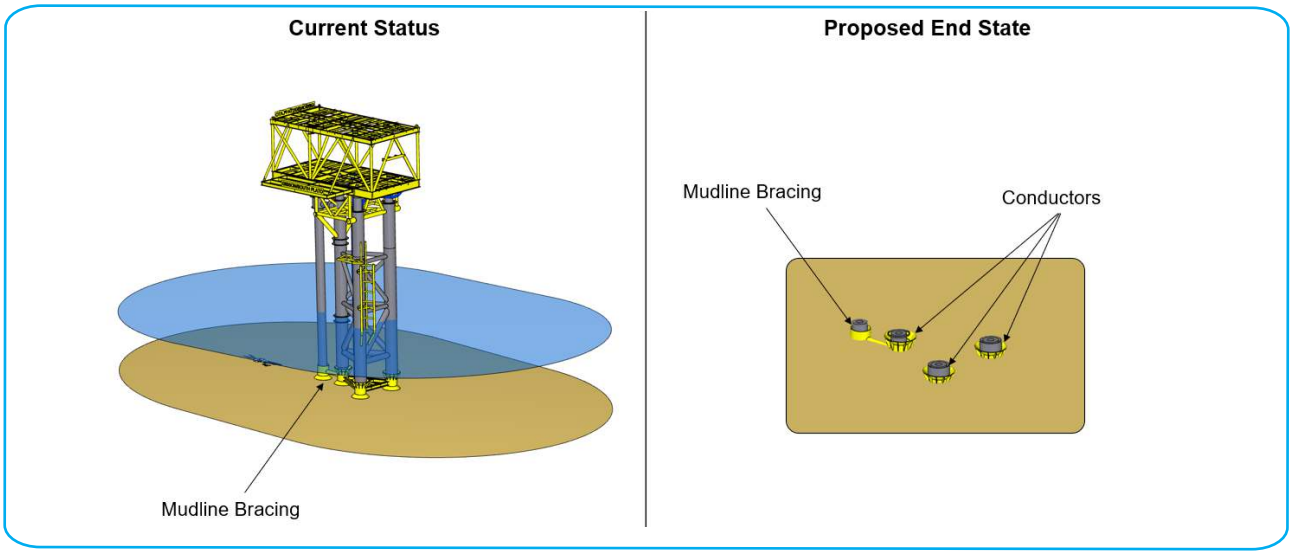


***Figure 6.*** *Gibson South-Plato – proposed end state 1.8 m above seabed*

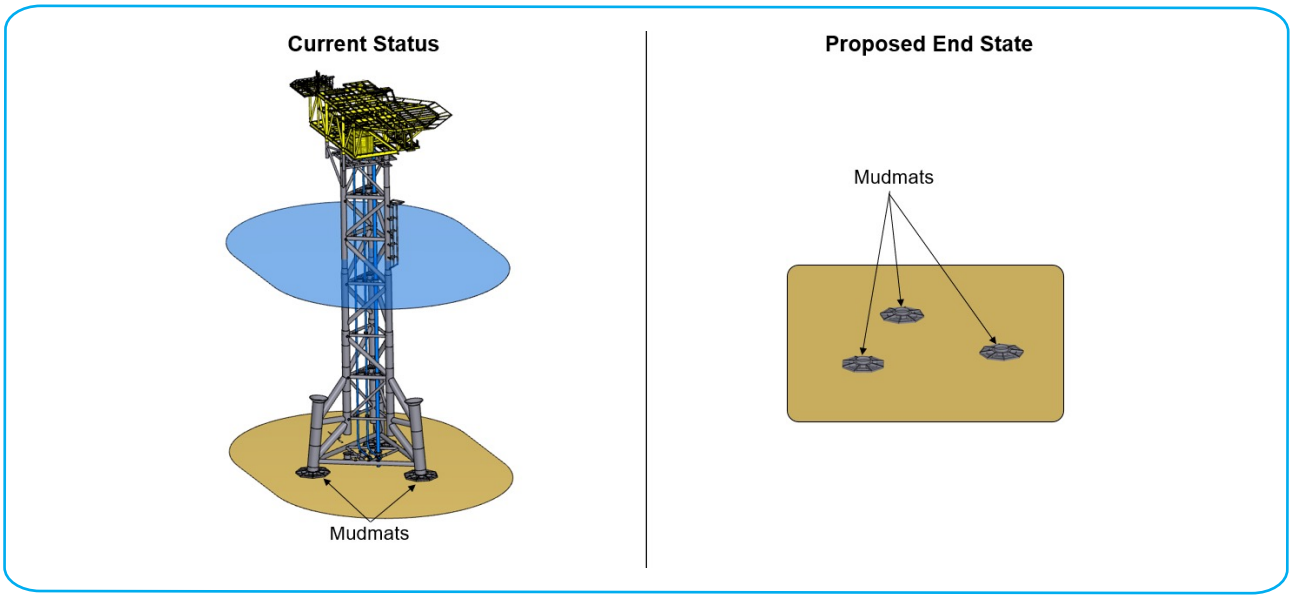


***Figure 7.*** *Wonnich Platform (also representative of Linda) – proposed end state 0.7 m above seabed*

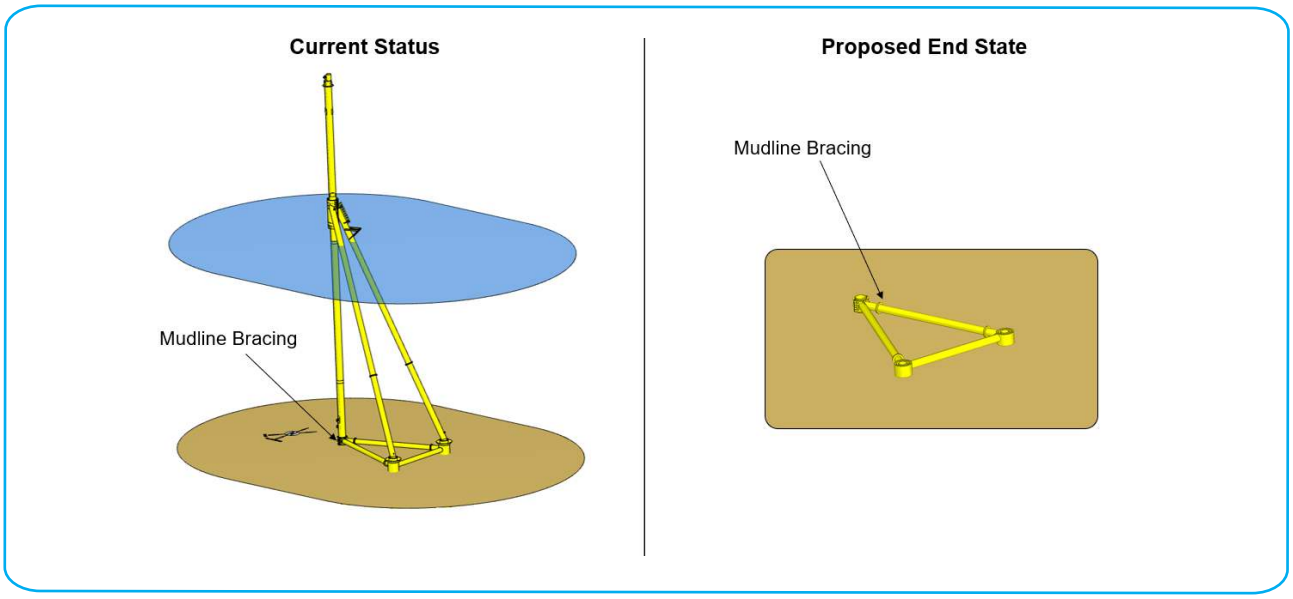


***Figure 8.*** *Bambra Sea Pole – proposed end state 0.8 m above seabed.*

## Defining the Environment Area for Proposed Activities

Santos has undertaken an assessment to define the environmental, social, economic and cultural aspects that may be affected by proposed activities.

To do this we have considered the totality of the areas where activity impacts and risks may occur. These areas are summarised in **Table 1**. The widest extent of these areas is called the Environment that May Be Affected (EMBA), which for this activity is the outer boundary of worst-case marine diesel oil spill resulting from a vessel collision during decommissioning activities. The EMBA for proposed decommissioning activities is illustrated in **Figure 9**.

Oil spill EMBAs are defined by overlaying a great number (usually hundreds) of individual, computer simulated, hypothetical oil spill events into a single map. Each simulation run starts from the same location (release point) but each run will be subject to a different set of wind and weather conditions derived from historical data. The use of advanced and sophisticated models enables us to present all the areas that could be affected.

While the EMBA represents the largest possible spatial extent that could be contacted by the worst-case spill events modelled, an actual spill event is more accurately represented by a single simulation run, resulting in a smaller spatial extent in the event of an actual spill. Often one or more simulation runs are selected to be representative of the 'worst-case' based on the nature and scale of the activity and the local environment.

Please see the NOPSEMA Spill Modelling Video for more information on oil spill modelling and why it is required for the preparation of Environment Plans.

The EMBA for proposed decommissioning activities is illustrated in **Figure 9** and represents the consolidation of EMBAs modelled at four separate, representative release points – Double Island, Wonnich, Harriet A and Simpson A.

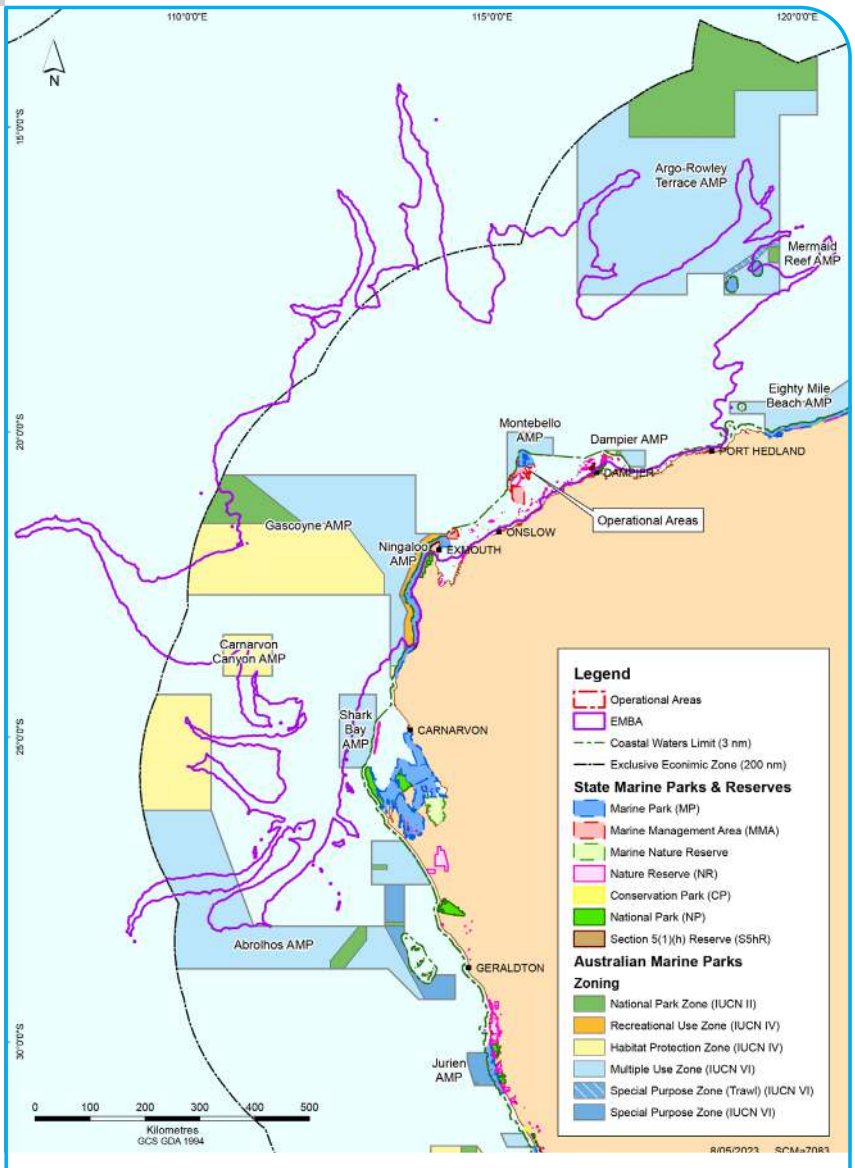


***Figure 9.*** *Activity location map with EMBA*

### TABLE 2 ENVIRONMENT AREA FOR PROPOSED ACTIVITIES

| ENVIRONMENT AREA | |
|---|---|
| **Operational Area** | The area in which vessels will operate. |
| **Environment that May Be Affected (EMBA)** | The spatial extent of activity impacts (e.g., facility presence, light, noise) and risk (e.g., hydrocarbon spill). |

## Environmental, Social, Economic and Cultural Features

We have undertaken a review of publicly available information to identify environmental, social, economic and cultural features that may be affected by activity impacts and risks, which are summarised in **Table 3**.

### TABLE 3
### ENVIRONMENTAL, SOCIAL, ECONOMIC AND CULTURAL FEATURES

| FEATURES | DESCRIPTION | OPERATIONAL AREA | EMBA | PUBLIC INFORMATION REVIEW |
|---|---|---|---|---|
| **Aboriginal Heritage** | Registered Aboriginal heritage sites protected under the:<br>+ *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*<br>+ *WA Aboriginal Heritage Act 2021* | No | Yes | The closest registered Aboriginal Heritage site is on Delta Island within the Montebello Islands, approximately 25km to the west of the operational area. |
| **Cultural Heritage** | Registered cultural sites under the:<br>+ *Underwater Cultural Heritage Act 2018* | No | Yes | The closest registered underwater cultural heritage (shipwreck) is within the Montebello Islands Group approximately 22km to the west. |
| **Defence** | Designated defence activity areas | Yes | Yes | Defence activities may take place within the Operational Area. |
| **Fishing** | Commercial fishing | Yes | Yes | A number of Commonwealth, State and Territory fisheries overlap the EMBA, of which some are active in the Operational Area. |
| | Indigenous, subsistence or customary fishing | No | Yes | Traditional Australian Indigenous fishing activities are generally concentrated within 3 nm of the Northern Territory / Western Australian coastline. |
| | Recreational and charter boat fishing | No | Yes | Recreational fishing is not allowed within 500 m radius PSZ's around Platforms but recreational fishing is present within the EMBA. |
| **Oil and Gas Operations** | Petroleum operations | No | Yes | Petroleum exploration and production activities have been undertaken within the EMBA. Barrow Island facilities are approximately 10km to the west. |
| **Protected Areas (nearest Commonwealth and State marine parks)** | Australian Marine Park (Cwth) | No | Yes | The Montebello AMP is approximately 3 km west of the Operational Area at the Wonnich Platform. |
| | Marine Park (State) | Yes | Yes | The Operational Area overlaps the Barrow Island Marine Management Area to the south. |

| | | | | |
|---|---|---|---|---|
| **Shipping** | Shipping fairway | No | Yes | The Operational Area does not overlap any shipping fairways, though is adjacent to vessel traffic. |
| **Telecommunications** | Subsea telecommunications cables | No | Yes | The JASURAUS cable system and the North West Cable System and are located approximately 300km north east of the operational area |
| **Tourism** | Tourism operations | No | Yes | Recreational fishing, diving and other charter vessels may operate within the EMBA. |
| **Towns / communities** | Dampier | No | Yes | The Operational Area is approximately 102 km west of Dampier, Western Australia. |
| | Onslow | No | Yes | The Operational Area is approximately 105 km northeast of Onslow, Western Australia |

## Activity Impacts and Risk Management

We have summarised in **Table 4** the potential environmental impacts risks and associated management measures for the proposed activity. These aspects will be risk-assessed with the Environment Plan on a case-by-case basis.

### TABLE 4
### ACTIVITY IMPACT AND RISK MANAGEMENT

| POTENTIAL ACTIVITY IMPACTS | |
|---|---|
| **Physical presence and interaction with other marine users** | |
| **Description of potential impacts**<br>Interaction with other marine users may occur as a result of:<br>+ Vessel Operations.<br>+ Helicopter activities. | **Compliance with the following key management measures**<br>+ If requested, stakeholders will be notified prior to the commencement of, and on cessation of each activity.<br>+ Maritime notices.<br>+ A 500 m radius PSZ (exclusion zone) will be in place around the platforms for the duration of the activity.<br>+ A visual and radar watch will be maintained on the support vessel bridge.<br>+ Lighting compliance with National Standard for Commercial Vessels or Marine Orders (SOLAS) requirements.<br>+ Support vessels will be prohibited from recreational fishing within the operational area. |
| **Seabed and benthic habitat disturbance** | |
| **Description of potential impacts**<br>Activities may disturb seabed and benthic habitat through direct physical disturbance of seabed and associated habitats and biota (from anchor spread and sweep, ROV operations, divers, wet storage, infrastructure cleaning and preparation, cutting and removal of infrastructure), and indirect disturbance to benthic habitats and associated marine fauna (from increases turbidity and sedimentation as a result of sediment disturbance). | **Compliance with the following key management measures**<br>+ Site survey prior to vessel arrival to identify and avoid any environmentally sensitive seabed features.<br>+ Operational surveys, including as left surveys.<br>+ Vessel navigation procedures and an anchoring, mooring and equipment deployment management plan.<br>+ Pipeline and umbilical recovery procedure.<br>+ Objects dropped overboard are recovered (where possible and safe to do so) to mitigate the environmental consequences from objects remaining in the marine environment. |

## Light emissions

**Description of potential impacts**

Light emissions in the marine environment will occur as a result of:

+ Vessel operations; and
+ ROV / Diver Operations and activities.

Light emissions in the onshore environment will occur as a result of:

+ Lights being used on vehicles, machinery and
+ equipment used as part of the onshore spread as a potential recovery method for the Simpson Pipeline.

**Compliance with the following key management measures**

+ Santos vessel navigation lighting and equipment is compliant with the Convention on the International Regulations for Preventing Collisions at Sea, 1972 / Marine Orders 30: Prevention of Collisions, and with Marine Orders 21: Safety of Navigation and Emergency Procedures.
+ Santos vessel Light Management Procedures noting that if works are within 3 km of a known turtle nesting beach or Wedge-tailed Shearwater rookery decommissioning activities will limited to daylight hours only from 1 October to 30 April.

## Acoustic disturbance to fauna

**Description of potential impacts**

Potential impacts from noise emissions may occur in the onshore and offshore operational area from the following sources:

+ Vessel, helicopter and RoV activities.
+ Equipment positioning, Cutting / deburial activities.
+ Removal of infrastructure and marine growth.
+ Use of vehicles and equipment onshore.
+ Use and removal of an onshore spread.

**Compliance with the following key management measures**

+ Santos vessel Planned Maintenance System (PMS) to maintain vessel dynamic positioning engines and machinery.
+ Santos procedures for interacting with marine fauna.
+ Santos Marine Assurance Procedure.
+ Activity on VI, to support offshore decommissioning will only take place in already cleared areas.

## Atmospheric emissions

**Description of potential impacts**

Potential impacts from atmospheric emissions may occur in the operational area from the following sources:

+ Combustion through the engines and incinerators on project vessels.
+ Operation of vessel engines, helicopters, vehicles used to support the onshore spread at VI (Section 3.12.3), generators, mobile and fixed plant and equipment.

**Compliance with the following key management measures**

+ Santos vessel fuel oil sulphur content is compliant with the International Convention for the Prevention of Pollution from Ships (MARPOL).
+ Pursuant to MARPOL Annex VI, vessels will maintain a current International Air Pollution Prevention (IAPP) Certificate as relevant to vessel class. Waste (garbage) management procedure.

## Operational discharges

**Description of potential impacts**

Planned operational discharges include all discharges that are not chemical/hydrocarbon related e.g chemicals that are used in desal/cooling water/deck drainage /sewage treatment. Planned operational discharges will occur as a result of:

+ Cleaning and preparation activities.
+ Removals of topside and substructure.
+ Vessel Operations.

Indirect discharge associated with transport and towing assets to port and onshore disposal.

**Compliance with the following key management measures**

+ Santos waste management procedures.
+ Routine vessel discharge (sewage, bilge water, food waste) will meet MARPOL requirements.
+ Deck cleaning products that may be discharged to the ocean will meet MARPOL requirements.
+ Santos general chemical management procedures.
+ Onshore disposal of platform and pipeline assets by experienced contractor and only at a licensed waste facility.

## Chemical and hydrocarbon discharges

**Description of potential impacts**

The activities that will result in the discharge of chemicals and residual hydrocarbons to the marine environment are:

+ Field management activities.
+ Preparatory works.
+ Asset / infrastructure removal activities.
+ Abandonment of remaining structures in situ.

Chemical and hydrocarbon discharges into the marine environment include:

+ Acid wash.
+ Residual hydrocarbons/fluids.
+ Treated seawater.

**Compliance with the following key management measures**

+ Implementation of the Offshore Division Operations Chemical Approval Procedure.
+ DMIRS Accepted Operational Pipeline Management Plan (OPMP)/Safety Case.
+ Procedure for management of naturally occurring radioactive materials.

## Degradation of abandoned seabed equipment

**Description of potential impacts**

Potential impacts from the degradation and corrosion of abandoned seabed equipment may occur in the marine environment from:

+ Degradation and corrosion of steel (platform substructure, conductors, piles & strut anchor), (pipeline rock bolts).
+ Degradation and corrosion of concrete (pipeline rock bolt grouting, grouted piles below seabed level).
+ Degradation of plastics (pipeline polyurethane encapsulated kevlar strapping grout encapsulated and below seabed).

**Compliance with the following key management measures**

+ Consultation with persons relevant to end state during Santos' decision making to inform proposed end states that are the subject of the EP.
+ Detailed Environment Impact Assessment using a multi criteria analysis to help inform end state risk and impact assessment (CEIA).
+ An as left survey of the seabed where equipment has been removed, or abandoned will be undertaken at completion of the works.
+ Infrastructure left in situ marked on nautical charts.
+ Application is made to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) for a sea dumping permit (legal requirement).

## Physical disturbance of land

**Description of potential impacts**

Sources of impact to land from activities on VI may include:

+ Installation and/or storage of equipment and materials including mooring blocks to support pipeline removal activities.
+ Minor earthworks for installation and removal of mooring blocks.
+ Pouring of concrete (if required for mooring blocks).
+ Movement of vehicles, equipment, and personnel.

**Compliance with the following key management measures**

+ Vehicle movement and speed restrictions.
+ Implementation of the Santos Quarantine Management Plan.
+ Access restrictions outside lease areas.

## Spill response operations

**Description of potential impacts**

In the event of a hydrocarbon spill, response strategies will be implemented where possible to reduce environmental impacts to ALARP but may include

+ light, noise and atmospheric emissions.
+ Physical presence and disturbance.
+ Disruption to other users of marine and coastal areas and townships.

**Compliance with the following key management measures**

+ In the event of a hydrocarbon spill, the Oil Pollution Emergency Plan (OPEP) requirements are implemented to mitigate environmental impacts.

# POTENTIAL ACTIVITY RISKS

## Unplanned oil spill resulting from a vessel collision

**Description of risks**

+ A worst-case credible scenario for the proposed activity is a marine diesel oil (MDO) / marine gas oil (MGO) spill resulting from a vessel collision.
+ This worst-case estimated volume would be typical for similar vessel-based or maintenance activities and significantly less than for commercial shipping activities in the region.

**Compliance with the following key management measures**

+ In the event of a hydrocarbon spill, an activity-specific OPEP will be implemented to mitigate environmental impacts.
+ The OPEP sets out environmental protection priorities and appropriate response measures for a range of spill scenarios.
+ The OPEP is developed in conjunction with the Regulator assessing the plan and in accordance with National, State and Territory marine pollution plans.

## Unplanned hazardous and non-hazardous discharges

**Description of risks**

Sources of risk from a minor hydrocarbon release may occur as a result of:

+ Vessel and vehicle and equipment Operations.
+ ROV/Diver Operations.
+ Refuelling of equipment / machinery (on deck and onshore).
+ Onshore vehicle and equipment (crane) operations and refuelling.

Accidental loss of non-hydrocarbon liquids or chemicals to the marine environment could occur via tank pipework failure or rupture, inadequate bunding and/ or storage, insufficient fastening or inadequate handling.

**Compliance with the following key management measures**

+ Dropped object prevention procedures.
+ Hazardous and general chemical management procedures.
+ International Maritime Dangerous Goods Code.
+ Subsea hydraulic equipment, including ROV and cutting tools, maintenance procedures.
+ Vessel spill response plans (SOPEP/SMPEP).
+ Remotely operated vehicle (ROV/tooling) inspection and maintenance procedures.
+ Equipment refuelling procedures.

## Unplanned release of solid objects

**Description of risks**

Solid objects, such as those listed below, can be accidentally released to the marine environment, and potentially impact on sensitive receptors:

+ Non-hazardous solid wastes, such as paper and packaging.
+ Hazardous solid wastes, such as oily and contaminated materials (such as sorbents, laboratory waste, oily rags), batteries, medical waste, fluorescent tubes, and aerosol cans.
+ Equipment and materials, such as hard hats, tools, or infrastructure parts.
+ Dropped equipment to the seabed during asset recovery.

**Compliance with the following key management measures**

+ Solid object storage inventory.
+ Objects dropped overboard are recovered (where possible and safe to do so) to mitigate the environmental consequences from objects remaining in the marine environment.

## Accidental introduction of invasive marine species (IMS)

**Description of risks**

Introduction of invasive marine species (IMS) may occur due to:

+ Biofouling on support vessels and external/internal (e.g., sea chests, seawater systems) niches.
+ Biofouling on equipment that is routinely submerged in water (e.g., ROVs).
+ Discharge of high-risk ballast water.
+ Cross contamination between vessels.

Introduction of terrestrial non-indigenous flora and fauna may occur due to:

+ Non-indigenous flora and fauna present on vessels and submersible equipment and entering the operational area.

**Compliance with the following key management measures**

+ Implementation of the Santos Quarantine Management Plan.
+ Vessels are managed to low risk in accordance with the Santos Invasive Marine Species Management Plan prior to movement/transit into or within the invasive marine species management zone, which requires:
    + assessment of applicable vessels using the Department Primary Industry and Regional Development (DPIRD) Vessel Check Tool.
    + the management of immersible equipment to low risk.

## Unplanned interaction with marine fauna

**Description of risks**

Marine fauna interactions may occur as a result of:

+ Vessel operations including ROV / diver activities.
+ Entanglement caused by mooring lines.

**Compliance with the following key management measures**

+ Santos procedures for interacting with marine fauna.
+ Vessel navigation procedures, including constant bridge watch.

## Interaction with other marine suers (equipment left in situ)

**Description of risks**

Interaction with other marine users may occur as a result of:

+ the continued presence of seabed assets (substructure up to 1.8 m.

The physical presence of the seabed equipment abandoned in situ on or above the seabed may interfere with third party activities including:

+ current and future commercial fishing activities (accidental damage to fishing equipment such as trawl fishing gear).
+ future petroleum activities.
+ future commercial shipping activities.
+ recreational users.

**Compliance with the following key management measures**

+ Notify Australian Hydrographic Office (AHO) of locations for equipment abandoned in situ for marking on navigational charts.

## Unplanned release of solids to the terrestrial environment

**Description of risks**

+ Non-hazardous solid wastes such as packaging materials may be dropped unintentionally to the receiving environment; and
+ Naturally Occurring Radioactive Materials (NORMs) may be released to the environment when cutting and removing pipelines.

**Compliance with the following key management measures**

+ Santos waste management controls for onshore activities.

## Introduction of Non-indigenous flora and fauna

**Description of risks**

Introduction of non-indigenous flora and fauna species may occur from the transportation of equipment and personnel to VI.

**Compliance with the following key management measures**

+ Implementation of the Santos Quarantine Management Plan.

## Consultation

Consultation provides Santos with an opportunity to receive feedback from authorities, persons and organisations whose functions, interests or activities may be affected by proposed petroleum activities.

This feedback helps us to refine or change the management measures we are planning to address potential activity impacts and risks. Santos' objective for proposed activities is to reduce environmental impacts and risks to a level that is As Low As Reasonably Practicable (ALARP) and acceptable over the life of the activity.

Consultation also helps us to identify values and sensitivities where information is not publicly available, such as spiritual and cultural connection to land and sea country, as well as first-hand feedback on commercial and recreational fishing, tourism and local community activities and interests.

## Providing feedback

If you consider you may be a relevant authority or interested person, please contact us as soon as possible if you require any further information or if you think you are not on our consultation list.

We are asking for relevant persons to provide feedback by **26 July 2023**.

Feedback provided by relevant authorities and relevant interested persons and organisations will be considered during development of two separate Environment Plans (EPs) for assessment by DMIRS and through the life of the activity. A report on the feedback received will be included in the EP submitted to DMIRS for assessment.

Santos

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