Santos

WA-20-L Environment Plan

Information for Relevant Persons



Santos is preparing for the final phase of decommissioning in production licence WA-20-L in Commonwealth waters, approximately 101 km north of Dampier, Western Australia (see **Figure 1**).

A number of decommissioning activities were undertaken in 2011 under approvals granted by the Regulator at that time, the Western Australian Department of Mines and Petroleum.

Santos now proposes to leave in situ the Legendre-1 wellhead. WA-20-L also contains small gas bubble seepages at three locations. No further decommissioning activities are planned.

Consultation & Feedback

All petroleum activities in Commonwealth waters must have an Environment Plan (EP) accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) before any activities can take place.

Under Commonwealth
Environmental Regulations, Santos
is required to consult with relevant
persons about proposed activities
when preparing an EP. A relevant
person includes authorities, persons
or organisations whose functions,
interests or activities may be
affected by the proposed activity.

You might be a relevant person 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 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 persons for activities proposed to be managed under the WA-20-L Environment Plan. If you consider you may be a relevant 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.

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

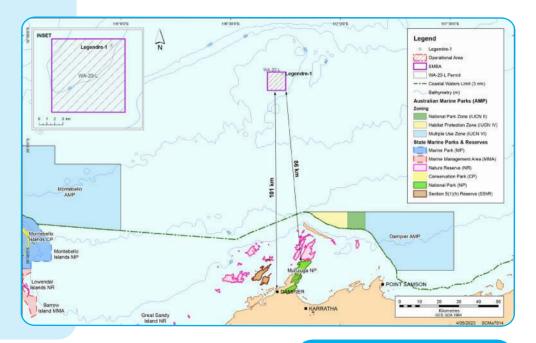


Figure 1. WA-20-L activity location

Activity Description

ACTIVITY DETAILS		
Location	tion The Operational Area is approximately 101 km north of Dampier.	
Water depth	Approximately 49 m to approximately 54 m across.	
Description of the Legendre-1 wellhead	The Legendre-1 wellhead is made predominantly of iron (98%) and sits approximately 3.6 m above the seabed.	
Planned on-water decommissioning activities	Nil	
Description of natural environment	The seabed in permit area WA-20-L is generally flat and featureless.	
Petroleum production licence	WA-20-L	

ACTIVITY COORDINATES

Aspect	Latitude (GDA94)	Longitude (GDA94)	Water depth
WA-20-L extent	19.74867	116.75131	49-53 m
	-19.74867	116.66798	
	-19.66534	116.66798	
	-19.66534	116.7513	
Legendre-1 wellhead	-19.67300	116.73622	50 m
Gas bubble release site (Legendre Hub)	-19.68724	116.72624	52 m
Gas bubble release site (Legendre South-1)	-19.72176	116.69792	54 m
Gas bubble release site (Legendre South-3)	-19.70394	116.70870	54 m



About decommissioning activities (source NOPSEMA)

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 Australian Government base case for decommissioning is the complete removal of all infrastructure.

Options other than complete removal may be considered, however the titleholder must demonstrate that the alternative decommissioning approach delivers equal or better environmental outcomes compared to complete removal and meets all applicable requirements under the Offshore Petroleum and Greenhouse Gas Storage Act 2006 and regulations, including well integrity and safety related matters, and other applicable laws.

More information about decommissioning can be found here.

Activity Purpose and Approvals

The Legendre reservoir was discovered in 1968 with the drilling of the Legendre-1 exploration well. The discovery was followed by appraisal drilling activities, with production commencing in 2001.

Oil from the Legendre reservoir was produced from 2001 to 2011, with operations comprising 20 production wells drilled from a central location and connected to a mobile offshore production unit (MOPU).

Production ceased in 2011, following which facilities were decommissioned in accordance with the Legendre Field Decommissioning Environment Plan (EP) approved by the regulator at that time, the WA Department of Mines and Petroleum.

All production wells were plugged and abandoned in 2011. The subsea infrastructure associated with the oil production was removed between 2011 and 2012, with the approved EP allowing for the following equipment to remain on the seabed:

- Anti-scour mats repositioned to cover the former production conductors.
- Six concrete caps placed over pad-eyes and shackles of the remnant anchor piles associated with the former facility mooring system.

Exploration and appraisal wells were drilled at a further eight locations within the permit.
All appraisal and exploration wells have been confirmed as being plugged and abandoned in accordance with requirements of the designated authority at the time.

In total, 30 wells were drilled within WA-20-L, the first being the Legendre-1 exploration well, a vertical exploration well drilled, plugged, and abandoned in 1968, with records indicating that the wellhead was left in place.

Santos is proposing to leave the wellhead in situ given the age of the structure and the considerable technical risks and challenges in executing its removal wellhead.

A post-decommissioning site survey in 2013 confirmed the presence of gas bubbles seeping from under the anti-scour mats, which was reported to NOPSEMA. Santos undertook site surveys in 2019, 2021 and 2022, with the last survey identifying gas seepages at three separate locations in proximity to the surface locations of plugged and abandoned wells.

Small gas bubbles, ranging in size from 1 to 10 mm diameter at the seafloor, were observed at each location in highly localised continuous or intermittent streams

Santos has assessed that the gas bubble seepage is not a risk to human safety, given the small gas volumes and low rates observed and considers the risk to the marine environment and impacts to fish, including commercial species, is very low to negligible.

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.

We call the widest extent of these areas the Environment that May Be Affected (EMBA). Typically, the outer boundary of the EMBA is defined by computer-based modelling for a worst-case hydrocarbon spill. As the Legendre-1 well has been plugged and abandoned and no on-water decommissioning activities are planned, there is no credible oil spill risk.

As such, Santos has nominally chosen for planning purposes the spatial extent of WA-20-L as being the EMBA, acknowledging the ongoing presence of the wellhead and the gas bubble (see **Figure 1**).

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 1**. These aspects will be risk-assessed within the EP on a case-by-case basis.

TABLE 1
ENVIRONMENTAL, SOCIAL, ECONOMIC AND CULTURAL FEATURES

	REGIONAL FEATURE	EMBA	INITIAL ASSESSMENT
Aboriginal Heritage	Registered Aboriginal heritage sites protected under the: + Aboriginal and Torres Strait Islander Heritage Protection Act 1984 + WA Aboriginal Heritage Act 2021	No	A search of the Department of Planning, Lands and Heritage Aboriginal Heritage Inquiry System was undertaken and indicated there are no registered cultural heritage sites within WA-20-L.
Cultural Heritage	Registered cultural sites under the: + Underwater Cultural Heritage Act 2018	No	A search of the Department of Agriculture, Water an the Environment Australasian Underwater Cultural Heritage Database was undertaken and indicated there are no registered shipwrecks within WA-20-L.
Defence	Designated defence activity areas	No	There are no Defence restricted areas within WA-20-L.
Fishing	Commercial fishing	Yes	A number of Commonwealth, and State fisheries overlap WA-20-L, of which four State fisheries are active.
	Indigenous, subsistence or customary fishing	No	Traditional Australian Indigenous fishing activities are generally concentrated within 3 nm of the Northern Territory / Western Australian coastline.
	Recreational and charter boat fishing	No	No interaction with recreational or charter boat fishers is anticipated given the remoteness of the Operational Area.
Oil and Gas Operations	Petroleum operations	No	Santos is Operator of WA-20-L.
Protected Areas (nearest Commonwealth and State marine parks)	Montebello Islands Marine Park	No	The Montebello Islands Marine Park is approximate 139 km to the wellhead, and 131 km to the area of grelease.
	Dampier Marine Park	No	The Dampier Marine Park is approximately 70 km to the wellhead, and 65 km to the area of gas release.
Shipping	Shipping fairway	No	No designated shipping fairways are within WA-20-
Telecommunications	Subsea telecommunications cables	No	No telecommunications cables are within WA-20-L.
Tourism	Tourism operations	No	No recreation or tourism is expected to occur withi WA-20-L owing to the water depth and distance offshore.

Activity Impacts and Risk Management

We have summarised in **Table 2** the potential environmental impacts 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 2 ACTIVITY IMPACT AND RISK MANAGEMENT

POTENTIAL ACTIVITY IMPACTS

Physical presence of wellhead

Description of potential impacts

The risk of the physical presence of the Legendre-1 wellhead to other users is considered low given that the wellhead's location is documented on nautical charts.

Santos engaged a subject matter expert, the Australian Maritime College (AMC), to undertake an assessment of the potential impacts of the wellhead on commercial trawl fisheries. In summary, the review found that there would be sufficient time and room for trawl fishers to manoeuvre to avoid the obstacle.

The AMC also confirmed that release measures could be undertaken at relatively low risk to vessel safety in the event of a hook up, though vessel risk would be increased if the hook up occurred in rough seas.

Compliance with the following key management measures

+ The wellhead is charted on Australian Hydrographic Service nautical charts so that marine users are aware of its location.

Marine users are not excluded from the area.

+ Santos will continue to engage with stakeholders in relation to its activities in the area.

Physical presence of wellhead - environmental consequences

Description of potential impacts

Indirect impacts may be limited to within 20 m of the structure. The value of the wellhead as artificial benthic habitat would continue until the wellhead has completely degraded.

Santos has assessed degradation of the wellhead for the EP. In summary, iron, the main constituent (~98%) of the wellhead and casing material, is not considered a significant contaminant in the marine environment and is only toxic to marine organisms at extremely high concentrations. Given the slow breakdown process of the products, toxic levels are not expected to occur any time in the future.

Compliance with the following key management measures

+ No control measures are considered necessary.

Gas release - environmental consequences

Description of potential impacts

Santos engaged CSIRO to undertake an extensive review of the potential environmental impacts and consequences to the marine environment from the gas bubble release and in the context of other known seeps in Australian marine waters. This review underpins the assessment of impacts and risks in the EP. Methane, the main constituent of the gas, is not toxic to marine life and will not accumulate in the tissues of fish that reside or traverse in close proximity to the gas bubbles.

Santos considers the risk to the marine environment and impacts to fish, including commercial species, is very low as:

- + Most gas will be released to air at sea surface.
- + Gas is only detectable within meters of the source in the water column.
- + Gas is rapidly dispersed by tides and currents.
- + Methane is non-toxic to marine biota.
- + Only benthic communities within meters will be exposed to the gas bubbles.

Compliance with the following key management measures

- + Santos engaged CSIRO to undertake a surveillance and monitoring plan to further quantify the occurrence, magnitude and temporal changes to the gas bubble seepage.
- + Monitoring data will provide input into the Adaptive Management Plan, detailed in the EP.



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 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 persons will be considered in an update to the WA-20-L
Environment Plan currently under assessment by NOPSEMA and through the life of the activity. Feedback from relevant persons will be included in the updated EP that is submitted to NOPSEMA for assessment.

Please let us know if you would like your personal/organisational details or any part of your feedback to remain private and we will ensure this remains confidential to NOPSEMA.

Santos

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