Barossa Gas Project
Frequently Asked Questions

Santos is committed to providing all Relevant Persons access to information about the Barossa Gas Project in a timely and consistent manner. The following list of Frequently Asked Questions (FAQs) has been developed based on questions provided to Santos. This document will be updated on an ongoing basis during the development and delivery of the project as new information becomes available. The answers provided in this document are intended to provide clear, summary responses to the questions. Should you require more detailed information, further explanation or have any other questions, please ask one of the Santos team, contact us via telephone on 1800 267 600 or via email at offshore.consultation@santos.com.

This document was updated on 21/07/2023 with answers to additional questions and minor changes to questions previously asked. FAQs that have been added or changed are marked in blue text.

Question	Answer
Spill (oil, gas, condensate)	
We've already seen the impacts of the Montara oil spill. Is there a chance of an oil spill for this project?	Santos was not involved in the Montara oil spill in August 2009. It resulted from a series of operator and regulatory failures which have now been comprehensively addressed through improved practices across the industry and improved regulatory regimes, now administered by NOPSEMA. More detail as to the initiatives undertaken by governments, regulators and industry following the Montara oil spill are available in the Australian Government Report on the implementation of the recommendations from the Montara Commission of Inquiry (September 2017) https://www.industry.gov.au/sites/default/files/2022-09/australian-government-report-on_the_implementation_of_the_recommendations_from_the_montara-commission-of-inquiry.pdf. Barossa is very different from Montara. Barossa is a gas and condensate field rather than oil. The well design and type of drilling rig for the Barossa field are different to those used at the Montara field. For example, the Barossa wells will not be suspended for the rig to depart the field and return at a later date (as occurred at Montara). Further, the aspects of well design and operations at Montara which were significant contributors to the Montara spill are not permitted under the current regulatory regime and Santos' drilling standards and procedures. The likelihood of a gas and condensate spill event during Barossa drilling is remote. The drilling at Barossa is subject to strict regulation, including in respect of the design of the wells and safety shutdown systems, regular inspection and maintenance schedules and operation by well-trained and highly competent staff.

Question	Answer
	Well blowout events during development drilling, that could result in a spill, have been reported at a frequency of approximately one event for every 29,000 wells drilled. The Australian Government, along with PTTEP Australasia (operator of the Montara oil field), developed a long-term environmental monitoring program to understand the longer-term impacts of the Montara oil spill on the marine environment. There were seven scientific monitoring studies under the environmental monitoring program. Santos understands the key findings include: ○ no confirmed reports of impacts to marine wildlife in the vicinity of the oil spill. ○ presence of hydrocarbons in submerged marine banks in the region of the spill but the levels identified were very low and significantly lower than would be expected to cause biological effects. ○ no evidence of hydrocarbon residue on beaches, coral reefs or seagrass beds at any of the study sites. ○ no evidence of the Montara spill having long-term impacts on seas snakes or marine turtles in the region. More detail as to the scientific monitoring following the Montara oil spill can be found at: https://www.dcceew.gov.au/environment/marine/marine-pollution/montara-oil-spill/scientific-monitoring-studies
How do you plan to clean up a spill?	Barossa is a gas and condensate field. Condensate is a very low viscosity (thin) and low density (light weight) liquid that evaporates quickly, particularly considering both the atmospheric and sea surface temperatures in the Arafura Sea. As such, if spilt on the sea surface, condensate would be expected to rapidly spread out, with a large proportion evaporating. Condensate spills are usually left to evaporate and dissipate at sea rather than using containment or dispersants. The International Tanker Owners Pollution Federation (ITOPF), which advises industry and governments worldwide about marine hydrocarbon spill cleanup, states: "*Condensates typically break up naturally in wind and waves with the majority evaporating within a matter of days. Traditional containment and recovery operations are not typically recommended. Any attempt to concentrate the condensate would reduce the rate of evaporation and, if the concentration of vapour becomes high, could cause the oil to ignite."* ITOPF goes on to say: *"Dispersants are ineffective on condensate spills as they will 'herd' the sheen rather than promote the formation of droplets in the water column. Spills of condensate in the marine environment are best left to evaporate and dissipate at sea.* In the event of a spill, up to 57% of the condensate is expected to evaporate over the first few hours/days and up to 79% after a few days, depending on weather conditions, sea state and time of year. Santos is required to prepare an Oil Pollution Emergency Plan (**OPEP**) for each activity, which forms part of the Environment Plan (**EP**) and is assessed by the offshore regulator (**NOPSEMA**). The OPEP sets out the process to manage a spill. The OPEP identifies and prioritises spill response strategies for all potential

Question	Answer
	spill events and describes how Santos prepares to respond in the remote event of a spill. The response strategies in the OPEP are based on spill modelling, which is used to forecast the potential extent of a range of spill scenarios for each drilling activity. The first priority under the OPEP when responding to a spill event is to employ source control strategies, which include shutting in the well at the Blow Out Preventers to prevent loss of gas and condensate from the well into the environment. For condensate that has already been released to the environment the recommended primary response strategy under the OPEP is to monitor and evaluate the situation. Numerous resources are used to monitor the behaviour and direction of any released condensate, such as real-time, updated spill trajectory modelling, tracking buoys, vessel surveillance, aerial surveillance, satellite imagery and water quality monitoring to determine the effectiveness of the source control methods which may be required. Because of the low viscosity (thin nature) of condensate, natural weathering processes are most effective and have the highest net environmental benefit when compared to other recovery strategies which require human intervention. It is unlikely that condensate from a spill at Barossa associated with drilling and completions activity would reach any shoreline. The closest distance from the edge of the predicted movement of a spill to the edge of the Tiwi Islands (Seagull Island) is 54km. Marine Diesel Oil (**MDO**) Spill Information MDO is a thin liquid which will evaporate quickly. Up to 60% will generally evaporate over the first two days. Approximately 5% of MDO is unlikely to evaporate and will instead decay over time. MDO spills are usually left to spread out, evaporate and naturally dissipate. Chemical dispersants are not recommended for MDO spills. Because the MDO spreads and thins out, it evaporates quickly, and chemical dispersants would have little to no environmental benefit whilst potentially increasing localised toxicity in the water. Spill response options are included in the SURF OPEP and will be implemented in the event of a spill.

Question	Answer
Can you provide insurance to cover all costs to clean up a spill and rehabilitate the sea and coastline affected? And compensate us for our loss of food?	Santos and its Barossa joint venture partners are required to demonstrate a minimum level of financial assurance to be able to cover costs when responding to a spill event. The offshore regulator, NOPSEMA, will not accept the Drilling and Completions Environment Plan without Santos first demonstrating a minimum level of financial assurance for a spill response. Santos relies on a combination of its own financial resources and insurance to meet its financial assurance requirements, including third party liability insurance for its activities. For each OPEP there is a comprehensive scientific monitoring program to measure impacts to the physical/biological environment and socio-economic receptors. The results of monitoring inform the extent of impacts. Whether any claim or any compensation may be available will depend on the specific circumstances. Any claim would be determined based on the evidence (as with any claim).
Who will receive the insurance and the compensation?	Whether any claim or any compensation may be available will depend on the specific circumstances. Any claim would be determined based on the evidence (as with any claim).
Will you provide training to local communities on the coastline to be able to respond immediately? And will you provide us with the equipment needed to clean up the spill. Who decides where this equipment will be located and stored? We understand that in your Environment Plan you've said that the equipment will be stored in Darwin – how long will it take for you to get this equipment to the spill site which is 260km from Darwin?	Santos has access to a wide network of spill response equipment across Australia and internationally to support its primary and secondary response strategies, which are outlined in the Barossa OPEPs, to monitor and evaluate any spill. Depending on the spill response resources required, Santos would be able to mobilise these resources rapidly, relying on its established logistics networks. Due to natural weathering and based on conservative modelling, it is unlikely that condensate from a spill at Barossa would reach any shoreline. Santos will make rapid assessment kits available on the Tiwi Islands, to perform sampling and monitoring (in the unlikely event a D&C spill occurs that has the potential to reach the Tiwi Islands). The kits will contain: 1. Rapid Assessment Team Document Holder – Containing all the relevant documentation and 'How to Guides'. 2. Rapid Oil Sampling Kit – Used to take samples of possible hydrocarbons for lab analysis. 3. Wildlife Sampling Kit – Used to take samples of deceased wildlife for lab analysis. 4. PPE Kit – To protect team members when collecting samples. Currently we are in discussions with Tiwi Resources and the TLC about inviting the Tiwi Rangers to meet about what's involved in the Rapid Assessment Testing activities and the training that's involved.

Question	Answer
How will you tell us when something goes wrong? Where does it say in the Environment Plan how many days after an oil spill that you are required to tell us that the spill has happened and who will you notify?	Santos is required to notify NOPSEMA, the offshore regulator, and a number of other government agencies, as soon as practicable if a spill was to occur. Santos is aware that Tiwi Island communities will want to know about any spill event. Santos therefore proposes to include Tiwi Island community organisations in its first round of notifications if a spill was to occur.
What is condensate?	Condensate is a very low viscosity (thin) and low density (light weight) liquid, which is referred to as a light "hydrocarbon". It is straw-coloured, flammable and is similar to cigarette lighter fluid. Condensate evaporates quickly when it is spilled into the sea, especially in environments such as those surrounding the Barossa field.
How does a spill of condensate impact marine life?	Condensate has the potential to impact marine life in the event of an unplanned release of condensate from a well during well construction. Many factors affect the extent of condensate impact on marine life, including the spill location, volume, duration, type, trajectory, season and atmospheric and oceanic conditions. Depending on how much condensate is released and the extent of exposure, condensate can cause stress to marine life, such as seabirds and marine mammals, including irritation of eyes/mouth and illness. In extreme situations with large volumes of condensate spill in an enclosed area, the impact could be fatal. Two areas are relevant to marine life impact associated with the drilling and completions activity at Barossa: • The MEVA" is an area surrounding the drilling site of the Barossa project which is used to inform environmental assessment, identify potential environmental consequences and develop spill response plans. • The EMBA" is a broader area surrounding the MEVA which represents the broadest area which could be affected by an unplanned 'worst case' spill event during drilling without any spill response actions. The EMBA is larger than the MEVA. A condensate release could impact on benthic organisms, fish, coral and invertebrates. Other marine life such as turtles, whales (including the pygmy blue whale) and seabirds which infrequently transit through the MEVA or EMBA may also be adversely impacted by a spill of condensate, but these species are less likely to be present in the MEVA. A spill is not anticipated to impact key areas for marine turtle breeding and nesting. The impacts of one of Australia's largest oil spills have been assessed over a number of years. The results of scientific monitoring after the Montara oil spill can be found at: https://www.dcceew.gov.au/environment/marine/marine-pollution/montara-oil-spill/scientific-monitoring-studies. Environmental monitoring following the Montara oil spill has found no significant long-lasting impacts.

Question	Answer
What happens if there is a gas leak?	If a gas leak from a well was to occur during well construction, any escaped gas would rapidly float to the sea and then disperse into the atmosphere. Operations would be suspended to identify and control the source of the leak. The greatest risk from a gas leak is the safety of the workers on the drilling rig, nearby support vessels and their crew, due to the potential ignition of gas resulting in fire or explosion. Santos has detailed emergency response and evacuation procedures designed to protect the safety of all in such a situation, including trained firefighting teams.
Marine life	
How will you stop turtles getting killed by your ship's propellers? Our turtles are already suffering from climate change – can you guarantee that the Barossa project won't make this worse? What will you do to make sure they survive this?	Santos must adhere to practices under relevant legislation and regulations to avoid collisions with turtles and other marine fauna. This includes reducing vessel speeds and maintaining minimum distances when marine fauna is sighted. Interactions between vessels associated with the drilling and completions activity for the Barossa project and marine fauna are considered under the current Drilling and Completions EP. Any unplanned interactions with marine fauna in the drilling operational area are expected to be limited to a small number of individual animals transiting through the area. The operational area does not intersect any biologically important area or habitat critical to the survival of any marine fauna species. The risk to marine turtles in the drilling operational area is very low. All Santos contracted vessels are required to maintain a marine fauna sighting record and record any interactions with marine fauna.

Question	Answer
We don't want your choppers flying over the Tiwi Islands – we don't want to be able to hear the helicopters. We also don't want you to fly near Seagull Island so that our seagulls don't get killed.	Santos will not fly any helicopters directly over the Tiwi Islands* (including Seagull Island), unless there is an emergency. The only time Santos contracted helicopters would need to overfly or land on the Tiwi Islands would be due to the following scenario's: • To maintain the safety of the Aviation operation (aircraft emergency, fuel issue etc). In these circumstances, due to the urgency there will be no time to engage with or notify the Tiwi Island community prior. This includes landing at any of the Tiwi Island airfields, or on the islands themselves (in the bush). • In an event where there is a requirement for the flight time to be completed as quickly as possible such as is in the unlikely event of an emergency (for example if someone falls into the water and Santos needs to conduct a search and rescue operation) or during evacuation of offshore installations due to cyclone activity, overflight of the Tiwi Islands will be required to enable rapid evacuation of personnel for their safety. Like all aircraft, helicopters will need to comply with all relevant aviation standards and regulations. * Santos, with agreement from some Tiwi people and the Environmental Defenders Officer, used helicopters recently to assist with an important cultural heritage assessment. This was used because there were no other viable transport options available at the time. The helicopter flew over the Tiwi Islands but not over Seagull Island.
Consultation	
We want you to keep us updated on the whole process. We want you to come in person and host clan group meetings to share these updates. What is your plan for ongoing consultation with us?	Santos is committed to developing a strong, beneficial relationship with Tiwi Islands People and your feedback is important to achieving this. Your input during consultation is important to assist Santos to understand and evaluate environmental impacts and risks and to develop control measures to reduce these impacts and risks to as low as reasonably practicable and acceptable levels. At our sessions in February 2023, Tiwi Island communities told us that they would like to consult on environmental plans through clan group consultation sessions and for Santos to use videos and other visual aids to help explain the Barossa project. We have taken on board that feedback. We will keep you informed through, for example: • clan or community meetings (to be scheduled considering feedback as to appropriate regularity/frequency). • project updates/newsletters. • notices or updates posted on Tiwi community notice boards. • updates or articles in the Tiwi Newsletters. • social media posts. • the Santos website and "Barossa Hub" (https://www.santos.com/barossa/).

Question	Answer
	We will provide opportunities for feedback, including through: • talking to our team when they are on the Islands. • talking to us at any scheduled Santos community meetings. • telephoning us on 1800 267 600. • emailing us at offshore.consultation@santos.com. • using the relevant person nomination/feedback form and portal at https://www.santos.com/barossa/. • the Tiwi Land Council. If you have any other suggestions, please let us know.
When this consultation happens, we want to have Santos, Environment Centre NT, Tiwi Land Council senior management (CEO and Chairperson), Tiwi Islands Regional Council members and we want to be able to engage any relevant expert advisors based on the information provided to us before the meeting happens.	The Tiwi Islands consultation sessions have been well attended with Tiwi Islanders, senior representatives from Santos, Tiwi Land Council, Tiwi Regional Council and ECNT present. Anyone is welcome to attend the consultation sessions (though in the case of clan meetings, with clan Trustee consent). Experts such as internal expert Benjamin Fischer (Drilling Superintendent), and external expert Dr Kellie Pendoley (marine turtle expert), have attended consultation sessions. Santos will continue to bring both internal and external experts to the consultation sessions to assist with explaining the detail of, and answering questions about, our proposed activities.
If it's about turtles, we want a local expert such as professors or scientists from CDU and As Turtle. We will not accept desktop reviews from interstate.	Santos has engaged a world-renowned marine turtle expert Dr Kellie Pendoley, of Pendoley Environmental, to provide expert advice on marine turtle impacts and management. Dr Pendoley has more than 30 years' experience in marine conservation biology and artificial light assessment. Dr Pendoley has visited the Tiwi Islands on two occasions in the context of consultation and has been assisting Santos with additional data and information collection and assessment to develop the understanding of marine turtle behaviours around the Tiwi Islands. Dr Pendoley is familiar with the turtle habitats in the region as a result of contributions to Barossa environmental impact assessment studies and from her extensive experience studying marine turtles around Australia and other locations globally.

Question	Answer
Will you provide an interpreter?	Santos has engaged a qualified interpreter referred by, and engaged through, the NT Government's Aboriginal Interpreter Service (**AIS**) to attend consultation sessions (including the upcoming April 2023 sessions), wherever feasible. Interpreters qualified through AIS are trained to interpret accurately and be impartial. We have been advised by the AIS that Tiwi culture is focused on oral storytelling and as such there is no agreed written language. The AIS has recommended that Santos provide audio translation of materials where appropriate, and Santos is taking the necessary steps to do so. Santos welcomes feedback from the local community as to the best means of communicating in a productive manner throughout the consultations.
Has Santos been involved in consultation with any non-English speaking communities?	Yes. Santos has positive relationships with non-English speaking communities in the areas in which it operates throughout Australia, Papua New Guinea, Timor-Leste and North America. Santos has partnerships with a range of local, non-English speaking communities, including providing local jobs and business opportunities. Santos wants to build strong, positive and productive relationships with the Traditional Owners and communities of the Tiwi Islands. We're here to learn more and seek input and feedback on cultural values in the context of the Barossa project.
Did Santos prepare the Offshore Project Proposal?	The Offshore Project Proposal (**OPP**) for the Barossa Development was prepared by the ConocoPhillips Australia-West Business Unit that Santos now owns. NOPSEMA, the offshore regulator, accepted the Barossa Development OPP in 2018. When Santos acquired ConocoPhillips' Australia-West Business Unit in 2020, all associated licences, permits and approvals were included in the acquisition (including the Barossa Development OPP) and became the responsibility of Santos following the acquisition.

Drilling	
What happens to the wells if there is an earthquake, tsunami or other natural disasters?	The wells are all designed and drilled so that they meet government regulations and international standards for well design and operations. Historical evidence shows that wells do not leak because of earthquakes (both in the area where the Barossa wells are planned, which is not near any major faults, and around the world). Since 1969, approximately 880 wells have been drilled in the area to the west of the Tiwi Islands and none of these have experienced issues related to earthquakes or tremors. The closest long-term producing oil and gas wells are located at the Bayu-Undan Field, where 29 wells have been in production at different times since 2004 and none have been affected by earthquakes. The Bayu-Undan field is approximately 400km from the Barossa field. Tsunamis do not affect drilling rigs or vessels located in deeper water such as the Barossa field, where the water depth is over 200m. Waves created by tsunamis cause damage when the wave reaches land, and the shallower water causes a large wave to form above the normal level of the ocean.
Can drilling cause earthquakes?	This is very unlikely based on the depth of the wells, the relatively small number of wells being drilled into the field, the location of the operations, the low level of seismic activity in the area, and on historical effects of drilling activities in Australia.
What lubricates the drill?	A drilling fluid (sometimes referred to as “drilling mud”) is circulated in the borehole and provides cooling and lubrication to the drill bit and carries the rock cuttings/chips out of the well.
What is in the drilling fluid?	A water-based drilling fluid (or drilling mud) is planned to be used to drill the wells for the Barossa project. This mud is mainly a mixture of fresh water and salt that is then combined with other additives that make the mud thicker, heavier or control how the mud affects the natural clays in the rocks that are drilled. The additives are not harmful to humans nor sea life in small quantities and in diluted form (as they are used in the drilling mud). Santos relies on a recognised industry chemical classification system run by a specialist agency, the UK Government Department of the Environment Food and Rural Affairs and uses additives in the mud which have the lowest environmental impact rating. Sometimes water-based drilling fluid or drilling mud is insufficient for drilling activities in deep water. In that case, Santos will use a Non-Aqueous Fluid (**NAF**). NAF uses a base fluid that is a synthetic oil. The additives used in the NAF are, on the whole, the same as those used in the water-based mud. Where NAF is required to be used, equipment is used on the rig to remove the NAF from the drilled-up pieces of rock that come out of the well, so that the NAF can be reused. This equipment is similar to a clothes dryer. The drilled-up pieces of rock are returned to the sea only when the amount of NAF is below a certain amount. The process is the same as that for other wells that use NAF offshore in Australia and in many parts of the world.

When you are drilling, what do you hit first (before you reach the gas)?	The drill bit goes through a series of limestone and claystone rocks before reaching the sandstone reservoir that contains the gas. The limestone and claystone rocks above the gas reservoir are impermeable and have trapped the gas and condensate in the Barossa reservoir for tens of millions of years. The steel pipe (casing) is cemented into place before drilling into the gas reservoir contained within the sandstone formation. The steel pipe is cemented into place like this to seal off the shallower rock formations from the gas reservoir. None of the eight exploration wells drilled so far in the Barossa field have found any oil reservoirs and reviews conducted by our geologists of the area indicate that no oil exists in the Barossa field.
Why haven't you spoken about climate change as a risk (of the drilling and completions environment plan)?	Santos is very conscious of limiting the impact of its operations on the environment. Santos will follow industry practices and procedures to minimise greenhouse gas emissions from fuel combustion and flaring during drilling operations. The current Drilling and Completions Environment Plan considers the impact and risk of greenhouse gases and atmospheric emissions from drilling and completion operations. Likewise, emissions from production operations will be further considered and assessed in the Barossa Production and Operations Environment Plan.
How long will the drilling consultation process take? When will you start drilling and will you advise us before you start?	The regulations require that Santos provide a reasonable period for relevant persons to consider information provided by Santos about the proposed drilling and completions activity, environmental impacts and risks and control measures before commencing such activity. As advised at the March 2023 clan group consultation meetings, Santos is holding another series of meetings in late April and early May 2023 to invite input and feedback and also to provide feedback on questions and requests for information received so far. There will be another series of meetings later in May 2023 to explain how the feedback from consultation is proposed to be addressed in the revised Drilling and Completions EP to be submitted to NOPSEMA, the offshore regulator, for assessment. Once acceptance of the revised Drilling and Completions EP by NOPSEMA has occurred, this will be communicated. Following acceptance by NOPSEMA, Santos anticipates commencing drilling, and this will be communicated in advance.
How long will it take to drill the wells?	Each well is expected to take around 90 days to drill and complete (and Santos intends to drill 6 wells, with contingency for two additional wells, if needed). We anticipate that our proposed Drilling and Completions activities will take approximately 2 years, subject to weather and operational performance.

What happened with the exploration drilling?	Eight wells have already been drilled in the Barossa field as part of the initial exploration and appraisal of the field. The first well was drilled in 1973, followed by another in 1998, another in 2006, three more in 2014 and 2015 and then the two final wells in 2017. The wells were evaluated and safely decommissioned as planned. The exploration work confirmed that a large gas reserve exists in the area. After the exploration wells were drilled and safely decommissioned, equipment at the seabed was removed. The decommissioning process for most wells involved plugging the wells with cement, cutting the casing approximately 2 meters below the seafloor and removing all equipment, before inspecting the wellsite and surrounding seabed with a remotely operated vehicle (a small remote controlled submarine). In 1973, oilfield practices were somewhat different, but the well was still safely and permanently decommissioned.
Will you keep drilling more wells if you can't find gas in the wells you have planned?	Santos has a high degree of confidence that the wells planned for the Barossa project will successfully encounter gas. This is based on the information we have gained over a long period of time—since 1973—from different exploration processes, such as seismic acquisition and the exploration wells. There is provision for eight wells in the current Drilling and Completions EP for the Barossa project, but only six are planned to be drilled (with two additional wells being provisioned in case they are necessary).
Will the drilling impact marine life?	Environmental impacts and risks from all planned and unplanned events are assessed in the current Drilling and Completions EP and control measures will be implemented to reduce impacts and risks to as low as reasonably practicable and acceptable levels. We are consulting on these impacts and risks and proposed controls. While there is potential for impacts to marine life from drilling, impacts from planned events are localised and risks from unplanned events such as a condensate spill are very low. With consideration of proposed control measures to mitigate impacts to marine life, the impacts are considered to be reduced to as low as reasonably practicable and an acceptable level.
How far down do you drill?	The wells will be drilled to about 4000m below the surface of the sea.
What category was the storm in the animation? (The animation showed what would happen to the FPSO in a storm)	In the area around the Barossa field, most of the storms are tropical lows or developing storms, with most of them passing to the south of the Barossa field. Fully developed storms (Australian Category 4 and 5) are not normally experienced at the location of the Floating Production Storage and Offloading (**FPSO**) facility. The FPSO is designed to survive a 10,000-year storm (involving the equivalent of wind speeds attributable to a Category 4 cyclone).
How many wells are you drilling?	Six development wells are planned with contingency for two additional wells, if needed. No more than eight wells can be drilled under the current Drilling and Completions EP.

What is a Christmas Tree?	A “Christmas Tree” is the slang name for the arrangement of metal pipes and valves that sit on top of the well to control the flow of gas and condensate out of the well and to allow safe access to the well for maintenance. Its proper name is a “Subsea Vertical Tree”, and it is a piece of equipment installed on top of the well with valves and pressure and temperature gauges that is used to monitor and control the production of gas and condensate from that well.
How many wells has Santos drilled, both locally and internationally?	Founded in 1954, the South Australia Northern Territory Oil Search (**Santos**) has been developing resources first across Australia, then the Asia Pacific and is now a global energy company. Since 1954, Santos has drilled and still operates more than 6,000 wells onshore and offshore in Australia and additional wells internationally.
Will the drilling be like Deepwater Horizon?	The drilling activity for the Barossa project is different to the drilling at Deepwater Horizon. Further, Barossa is a gas and condensate field, not crude oil. The well design for the Barossa wells is different from the wells of the Deepwater Horizon which experienced a well blowout. For example, unlike the Deepwater Horizon well, at Barossa the drilling stops before the well is drilled into the gas zone, casing is then installed and cemented into place, then the next smaller hole is drilled into the gas zone. This enables effective barriers to prevent the flow of gas to surface. Further, Macondo, the well that blew out on the Deepwater Horizon, was an over-pressured oil exploration well, not normally pressured gas and condensate like Barossa. The reservoir pressure at Macondo is approximately three times the reservoir pressure in Barossa and these higher-pressure wells have a higher likelihood of well integrity issues. In the event of a loss of well control, the fluids expelled from Barossa would be gas and condensate, not crude oil. These substances have very different impacts and spill response. Santos undertakes drilling activity in a strict regulatory environment. There are numerous control measures in place to control the flow of extracted substances including well design, safety shutdown systems, regular inspection and maintenance and trained and competent personnel.
Will the drilling affect the aquifer we share with PNG?	In simple terms, an aquifer is a body of rock and/or sediment that holds groundwater. There is no connection between the Barossa Gas field and the Tiwi Islands aquifers. For this reason, the Barossa Gas Field is extremely unlikely to impact the Tiwi Islands aquifer. More detail on this is set out below. The Van Diemen Sandstone has been identified as the regional, shallow, unconfined aquifer on Tiwi Islands that is water bearing and the primary target for production bores for human consumption. The hydrocarbon bearing reservoir at the Barossa field (Elang Formation) is not geologically connected to the Tiwi Island aquifers owing to the fact: • The Barossa reservoir does not extend south to the Tiwi Island’s. • The aquifers on the Tiwi Island are at least 65 million years younger than the Barossa reservoir.

	• Complex geological configurations would be required to link up the deeper and older Barossa reservoir unit to the much younger Tiwi Islands aquifer units. Regional mapping does not support this occurrence. • Porosity and permeability preservation across the Malita graben between the Barossa field and the Tiwi Islands is poor due to highly cemented sandstones inhibiting all lateral fluid migration. Drilling fluid used at the Barossa field (sometimes referred to as "drilling mud") will also have no effect on the Tiwi Islands aquifers. Even if the rock surrounding the borehole is permeable and porous the invasion zone of the drilling fluid into the surrounding host rock will only be about 1 meter in diameter. In relation to the shared aquifer, the Tiwi Island aquifers are at least 20 million years older than PNG and Timor-Leste aquifers. Both PNG and Timor-Leste aquifers are hosted within very different geological formations with limited spatial extents, and they do not connect to the ones on the Tiwi Islands.
Pipeline	
How is the Gas Export Pipeline laid?	The Gas Export Pipeline (**GEP**) is approximately 66cm in diameter and will be laid on top of the seabed, using a special vessel that lays the pipe. Onboard the pipelay vessel, single lengths (approximately 12-15m long) of steel pipe (joints) are welded, inspected and coated. As the pipelay vessel moves forward, the pipe gradually curves downward through the water until it reaches the touchdown point on the seabed. The vessel moves slowly, covering approximately 3km per day and will take approximately 3 months to fully install. There is no trenching or dredging required for the GEP installation. The pipeline route was carefully selected to minimise environmental impacts and risks. Independent experts are carrying out further assessment work to identify any cultural heritage places along the pipeline route.
How do you know if the pipeline is damaged, and will you fix it if it is?	To keep the pipeline operating safely, Santos intends to carry out regular remote and on-site inspections and maintenance. Specialist equipment will monitor the pipeline's condition and integrity and provides advanced warning of potential damage. In the unlikely event of damage to the pipeline, Santos would immediately shut-in the wells to prevent any further gas from entering the pipeline and the pipeline would be depressurised. The nature of the damage would then be assessed, and any necessary repairs completed. The pipeline would be restarted following confirmation of a successful repair and once any associated regulatory approvals to restart were secured.
What holds the pipeline down?	The pipeline is not fixed to the seabed. The pipeline will be made from carbon steel, with the thickness and weight of the pipe itself assisting with keeping it stable (holding it down on the seabed). The pipeline also has an external anti-corrosion coating and concrete covering which is designed to provide extra weight and stability (holding it down on the seabed).

What is the pipeline for?	Santos is proposing to extract natural gas from the offshore Barossa field. The gas is intended to be transported via a gas export pipeline to the existing Santos Darwin Liquified Natural Gas (**DLNG**) facility in Darwin, where it will be liquefied and shipped to customers.
Is this pipeline the same as the Bayu-Undan pipeline?	The Bayu-Undan pipeline runs for approximately 502km from the Bayu-Undan gas fields in the Timor Sea to the DLNG plant. At its closest point, the Bayu-Undan pipeline is approximately 20km away from Bathurst Island. The Bayu-Undan pipeline is the same size as the proposed gas export pipeline for the Barossa project, with a diameter of approximately 66cm.
Will the pipeline impact the turtles and dugongs?	The pipeline is not likely to significantly impact turtles and dugongs. Interactions between vessels associated with the Barossa GEP installation activity and marine fauna are considered under the Barossa GEP Installation Environment Plan. The Barossa pipeline installation vessels will be subject to restrictions within designated 'caution zones'. A caution zone is defined as 150m distance from turtles. When operating vessels within a caution zone, vessels are restricted to a vessel speed of less than 6 knots, must have a lookout on the vessel for turtles and must maintain a distance of at least 50m from any turtles. Reduced vessel speeds allow marine life such as turtles to dive and move away from an area where there is vessel activity. All Santos contracted vessels are required to maintain a marine fauna sighting record and record any interactions with marine fauna.
How long will the pipeline installation vessel be located in the vicinity of turtle nesting beaches?	The pipeline installation vessels may be visible from the Tiwi Islands for about one month during pipelay activities. The closest the vessels will be to the Tiwi Islands is approximately 7km (West of Cape Fourcroy). Santos has completed light modelling and impact assessments to better understand the risks to nesting turtles associated with lighting. While light emissions are expected to be visible at turtle nesting beaches, it is unlikely to affect the behaviour of Olive Ridley and Flatback hatchling turtles on the beach.
Have you done checks for underground volcanoes?	As part of our environmental assessment of the pipeline, Santos carried out marine surveys along the entire pipeline route. No underground or subsea volcanoes were detected. Santos has completed a review of records of seismic activity and mapping of geologic fault lines in the region so that the proposed infrastructure locations are away from high-risk areas. The pipeline route was carefully selected to minimise environmental impacts and risks.
How far is the pipeline and Barossa field from the Tiwi islands?	The Barossa field is located approximately 140 km north of Seagull Island. At its closest point, the pipeline will be approximately 7 km from the Tiwi Islands (west of Cape Fourcroy).
How safe are the pipes?	The pipeline to be used for Barossa is designed to international and Australian standards and subject to third party validation. This is a requirement of the Australian Safety Case regulatory regime. It is widely recognised and acknowledged that the regulatory regime that operates in Australia is among the strictest in the world. By designing the pipeline to the required design standard for subsea pipelines the pipeline has a very low probability of failing. For example, death by car crash is approximately 10,000 times more likely an event to occur than a pipeline failing.

Cultural heritage assessment	
How are you protecting our intellectual property rights as part of the cultural heritage assessment process for the Gas Export Pipeline?	Santos has engaged independent experts to undertake an assessment to identify any underwater cultural heritage places along the Barossa pipeline route, also referred to as the Gas Export Pipeline or GEP route, to which people, in accordance with Indigenous tradition, may have spiritual and cultural connections that may be affected by the future activities covered by the GEP Installation Environment Plan. Santos has engaged Dr Brendan Corrigan as an independent anthropologist. Dr Corrigan is leading a team of other independent experts and obtaining information from Tiwi Islanders about any spiritual and cultural connections to any underwater cultural heritage places along the Barossa pipeline, or GEP, route. Santos is confident that, with their expertise, Dr Corrigan and his team will handle all confidential and sensitive information appropriately.
What process are you following for the cultural heritage assessment for the Gas Export Pipeline?	Santos has engaged independent experts to undertake an assessment to identify any underwater cultural heritage places along the Barossa pipeline route, also referred to as the Gas Export Pipeline or GEP route, to which people, in accordance with Indigenous tradition, may have spiritual and cultural connections that may be affected by the future activities covered by the GEP Installation Environment Plan. Dr Brendan Corrigan is the lead independent expert. Dr Corrigan has over 25 years of experience as an anthropologist and has worked on projects identifying and documenting culturally significant places across Australia, including the Northern Territory, Western Queensland, Cape York, Torres Strait and Kimberley regions. Dr Corrigan has an experienced team of independent experts assisting him. As independent experts, they will seek inputs from people who have a spiritual and cultural connection to any underwater cultural heritage place along the Barossa pipeline route which may be affected by the Barossa pipeline (or GEP) installation activities. Santos is confident that the experts will take care that any spiritual and cultural information is collected in a culturally appropriate, respectful and sensitive way. If any information is identified as being confidential, the experts will respect the wishes of the people providing it and keep it confidential. The experts also want to know if there is anyone else in your community who they should be speaking with about cultural and spiritual connections with underwater cultural heritage places along the Barossa pipeline route (or GEP).

We would like you to engage with us before you start laying the pipeline, to map our sacred underwater cultural heritage sites with Traditional Owners so that the impacts can be avoided, especially where you say you want to build the pipeline.	We welcome engagement with you. The pipeline installation has not yet started. We are first causing an assessment to be undertaken to identify any underwater cultural heritage places along the Barossa pipeline route, also referred to as the Gas Export Pipeline or GEP, to which people, in accordance with Indigenous tradition, may have spiritual and cultural connections that may be affected by the future activities covered by the GEP Installation Environment Plan. This is being conducted by independent, appropriately qualified experts. If the process identifies any underwater cultural heritage places along the route that may be affected by future pipeline installation activities, Santos will consider this and will update the Environment Plan as appropriate. That process would involve evaluating impacts and risks to identified underwater cultural heritage places and, if appropriate, updating proposed control measures to reduce any impacts and risks to as low as reasonably practicable and acceptable levels. The pipelay activity will only commence after the assessment is completed and any regulatory obligations are met.
Carbon	
What is CO2?	CO2 is the abbreviation for carbon dioxide, which occurs naturally in most natural gas fields. Carbon dioxide is what we breath out and is naturally present in the atmosphere in small quantities. Barossa gas contains about 18 per cent carbon dioxide. When natural gas is produced or used for industry or to create energy, carbon dioxide is produced as a by-product. It is one of the greenhouse gases and companies like Santos are committed to seeking to reduce SHCO2 emissions through technology such as Carbon Capture and Storage (**CCS**).
How is the Bayu-Undan project supporting the Barossa project?	The Bayu-Undan field in Timor-Leste has a potential future role as a carbon capture and storage facility, following the end of natural gas production from that field. Santos proposes to repurpose the Bayu-Undan pipeline, which connects Darwin LNG to Bayu-Undan, and to transport CO2 from the Barossa project to Bayu-Undan via Darwin LNG. Front-end engineering design (**FEED**) commenced for the project in March 2022.
What are you going to do with the carbon from Barossa?	The CO2 from Barossa will be vented to the air via CO2 removal facilities on the FPSO and at DLNG. The CO2 emissions may be offset by Santos through purchasing carbon credits. Santos is also pursuing the Bayu-Undan CCS project so that the CO2 can be safely and permanently stored in depleted reservoirs at Bayu-Undan instead of being vented to the air. The technical work is almost complete, and Santos is working with the governments of Australia and Timor-Leste to progress regulatory frameworks and approvals.
What CCS projects have been done before?	Today, Santos is aware of 30 commercial CCS facilities operating around the world, with a storage capacity of over 42 million tonnes of CO2 per year. CCS is proven technology, and the International Energy Agency's (IEA) Net Zero by 2050 Roadmap envisages Carbon Capture, Utilisation and Storage growing to 7.6 billion

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<tr><td></td><td>tonnes of CO2 per year by 2050. The IEA’s Executive Director has said that reaching net zero goals without CCS "will become virtually impossible”.</td></tr>
<tr><td>How much CO2 will be captured by the Bayu-Undan CCS project?</td><td>The Bayu-Undan CCS project will be designed for initial injection and storage of approximately 2.3 million tonnes of CO2 per annum from Barossa.</td></tr>
<tr><td>How will you comply with the Safeguard Mechanism to ensure that Barossa is net zero emissions on day one of gas production scheduled for 2025?</td><td>The Government is still finalising the detailed guidelines for the Safeguard Mechanism. Santos expects to comply with the Safeguard Mechanism by storing the CO2 at the Bayu-Undan CCS project once the approvals are in place and the CCS infrastructure is operational. Before then, Santos will purchase carbon credits to offset reservoir CO2 emissions.</td></tr>
<tr><td colspan="2">General</td></tr>
<tr><td>When will the project be completed?</td><td>The Barossa project currently remains on target to commence production in the first half 2025. Drilling and Completions activities are planned to be completed approximately 2 years following commencement of drilling.

Following planned commencement of production in the first half of 2025, production is expected to continue for 25 years.</td></tr>
<tr><td>Is the NT or Federal Governments part of this project?</td><td>The NT Government and Commonwealth Government regulate certain Project activities, with the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) (a Commonwealth government authority) regulating the Project’s offshore activities.</td></tr>
<tr><td>Will the Barossa project significantly increase marine vessel traffic around the Tiwi Islands?</td><td>Over the construction phase of the project, the number of associated vessels between Darwin Port and the activity area will vary depending on the project activity. This is summarised in the table below.
<table><tr><th>Project Activity</th><th>Drilling and Completions</th><th>Subsea Infrastructure Installation</th><th>Darwin Pipeline Duplication</th><th>Gas Export Pipeline</th></tr><tr><td>Vessel Movements</td><td>Approx. 2 per week for 24-32 months</td><td>Approx. 5-7 per week for 8 months</td><td>Appro. 3 per week for 12 months</td><td>Approx. 3 per week for 6-12 months</td></tr></table>Once the construction is complete, approximately 2 vessels per week will service the FPSO for the duration of the project life (~25 years).

For context, Darwin Port currently has on average 30 commercial vessel movements per week.</td></tr>
<tr><td>Legendre gas leak</td><td>The gas seepage at Legendre field in the Carnarvon Basin, offshore from Western Australia (not the Barossa Project) is not a risk to human safety, given the small gas volumes and low rates of seepage observed. Santos has also assessed that this small amount of gas seepage is unlikely to have any significant impact on the marine environment as methane, the main constituent of the gas, is not toxic to marine life.

Santos is taking a responsible approach to the ongoing presence of the gas bubble seepage at this site and has proposed a robust environmental management currently under assessment by the offshore regulator NOPSEMA, which includes for a marine monitoring program.</td></tr>
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