NT WATERS

DARWIN PIPELINE DUPLICATION

CONSTRUCTION ACTIVITIES OVERVIEW FACTSHEET

OVERVIEW

Santos' Darwin Pipeline Duplication (DPD) Project includes the construction, operation and decommissioning of a ~100 km section of pipeline in Northern Territory (NT) waters and land. This is more simply referred to as the 'DPD NT activity'.

The DPD pipeline will effectively be a 'duplication' of a portion of the existing Bayu-Undan to Darwin pipeline. Once in operation it will only be used for transporting natural gas (not oil or condensate) from the Barossa gas field to the existing Darwin Liquified Natural Gas (DLNG) facility.

The NT Government has approved the DPD NT activity under the NT Environment Protection Act (NT EP Act) following assessment by the NT Environment Protection Authority (EPA).

The DPD NT activity has also been assessed and approved under the Commonwealth Environmental Protection and Biodiversity Conservation Act (EPBC Act). Approximately 8 km of the approximately 100 km length of pipeline will be installed within NT coastal waters, defined as a 3 nautical mile band of water between the Commonwealth waters boundary and the Territorial Sea Baseline. Santos is seeking approval from the NT Department of Industry, Tourism and Trade to install this section of pipeline under the NT Petroleum Submerged Lands Act (PSL Act).

Installation of the DPD pipeline in Commonwealth waters, pre-commissioning discharges and connection to the Barossa Gas Export Pipeline (GEP) is not included in this factsheet. That is because those activities sit outside NT Waters. Those activities are included in an Environment Plan requiring acceptance by the National Offshore Petroleum Safety and Environmental Regulator (NOPSEMA).

Activity and location overview

The DPD NT activity is currently scheduled to commence in mid-June 2024, beginning in Darwin Harbour. The total duration of the construction elements of the DPD NT activity are estimated to be less than 12 months, subject to factors including vessel availability, operational efficiencies and weather conditions. The installation of the approximately 8 km of pipeline in NT coastal waters is expected to commence in Q4 2024 once approval under the PSL Act has been granted.

The construction elements of the DPD NT activity include pre-lay trenching and spoil disposal, span rectification and foundation installation, temporary causeway construction, cable and pipeline crossings, pipeline installation, rock installation and the survey, testing and pre-commissioning of the pipeline. These activities are explained in more detail on the following page.

The construction activities will occur within a Project area, encompassing the pipeline route with an approximate 2 km buffer and the spoil disposal ground. The Project area consists of the three distinct areas (Figure 1):

1. Darwin Harbour (i.e. waters within the Darwin Harbour Regional Management Area).
2. Shore crossing and onshore location (where the pipeline crosses the shoreline within the existing DLNG facility footprint).
3. Waters offshore from Darwin Harbour.

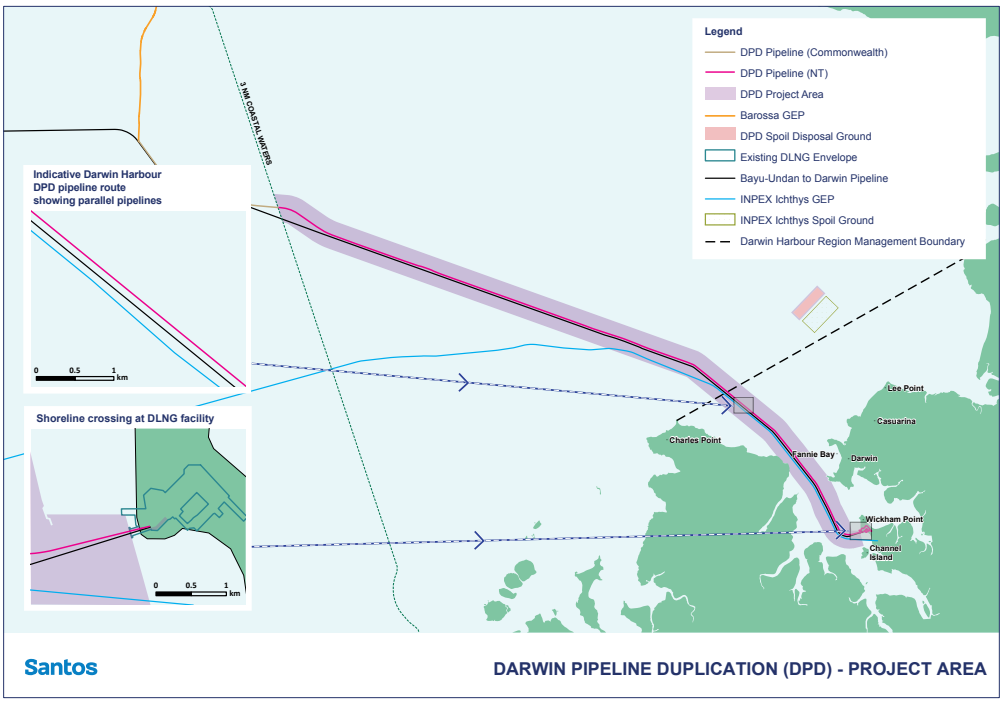

Figure 1: Location of the DPD Project Area in Northern Territory waters and land

Key activities

A summary of key activities is provided below and outlined in Figure 2.

Pre-lay trenching (Figure 3) includes trenching of sections of the pipeline route in Darwin Harbour including at the shore-crossing and onshore at the DLNG facility. Trenching is required in some areas to provide additional stability to the pipeline, and in conjunction with rock installation, provides additional pipeline protection where needed. Trenching in Darwin Harbour is conducted using specialised dredging vessels to remove sand and rock (known as spoil). At the shore crossing and onshore this is undertaken using excavators.

Spoil disposal from the pre-lay trenching will occur at an approved spoil disposal ground, located north-east of Darwin Harbour (Figure 1). The area of the spoil disposal ground is 6.25 km^2 and is adjacent to a pre-existing spoil ground used by the INPEX Ichthys project. Re-use of spoil for the DPD was not considered feasible as the material does not provide the necessary characteristics for pipe stability or erosion protection.

Span rectification & foundation installation is required in some areas to ensure the pipeline is safely supported on the seabed. Materials used include grout bags and premade concrete structures. Pre-sweeping using a dredging vessel may be undertaken for the purpose of span rectification.

Temporary causeway construction will assist pre-lay trenching by excavators at the shore crossing. This temporary structure will be constructed using local quarried rock from the NT (Mount Bundey). The causeway will be removed following use to return the area back to its natural grade. Recovered rock will be disposed offsite.

Cable crossings within Darwin Harbour at four locations will be constructed to support the pipeline and protect existing telecommunication and power cables.

Pipeline crossings at two locations where the DPD pipeline crosses over the Bayu-Undan pipeline.

Offshore and Darwin Harbour pipeline installation will be undertaken by specialised pipelay vessels using a continuous assembly pipe-welding installation method. This involves assembling single pipe joints (approximately 12 m in length) on-board the pipelay vessel. The pipes will be welded together, inspected and then the welded area is coated with corrosion protection on-board before being lowered behind the pipelay vessel. Pipeline installation in deep water (deeper than approximately 20 m) will be undertaken using a deep water pipelay vessel which will lay approximately 2 to 3 km of pipeline per day. This vessel will use dynamic positioning (use of thrusters) rather than anchors to maintain position. Pipeline installation in waters shallower than approximately 20 m, including Darwin Harbour, will be undertaken using a nearshore pipelay barge, which will use anchors to maintain position and will lay at approximately 0.5 to 0.75km of pipeline per day.

Pipeline shore pull will be undertaken using a temporary winch installed at the DLNG facility to pull the pipeline from the nearshore pipelay barge through the trench at the shore crossing to an onshore termination point.

Onshore pipeline installation of approximately 200 m of pipe will be undertaken to extend the pipeline from the shore pull termination point to the beach valve location. The pipe sections will be installed within an onshore trench in sections using a crane and welded together.

Rock installation will occur over the pipeline in some areas to provide additional stability and protection from external impacts (e.g. large anchors). Local rock quarried from Mt Bundey will be installed using specialised vessels (e.g. a fall pipe vessel).

Pre-commissioning (also referred to as flooding, cleaning, gauging & testing or FCGT) will occur once the entire pipeline is installed. The internal surfaces will be pressure and leak tested, cleaned and prepared to carry the natural gas. A device with brushes or blades called a "pig" is put into the pipeline to clean and prepare the pipeline for use. Pigs are pushed through the pipeline using Darwin Harbour seawater, which has been treated with chemicals to help preserve the pipeline. Once the pipeline is cleaned and all the water has been removed, the pipeline is conditioned with an organic liquid called monoethylene glycol (MEG) and lastly, packed with nitrogen. There will be no planned discharges of treated seawater or MEG within NT waters.

PRE-LAY TRENCHING

Pre-lay trenching using specialised dredging vessels will occur with spoil disposed at an offshore spoil ground.

SHORE CROSSING CONSTRUCTION

Trenching will occur at the shore crossing at the DLNG facility using onshore excavators supported by temporary causeways.

SHORE PULL

Pipe will be pulled from the nearshore pipelay barge through the shore crossing using a winch.

SHALLOW WATER PIPELAY

The first nominal 30km of pipe from shore (water <20 m deep) will be installed using an anchored nearshore pipelay barge.

FLOOD, CLEAN, GAUGE, TESTING

The pipeline will be flooded with treated seawater, cleaned, gauged and tested, and then dewatered in Commonwealth waters.

ROCK INSTALLATION

Rock will be installed over the pipeline in some areas to provide additional protection and stabilisation.

DEEP WATER PIPELAY

The deep water dynamically-positioned pipelay vessel will install the pipeline in water depths greater than nominally 20 m outside Darwin Harbour.

Figure 2. DPD NT construction activities

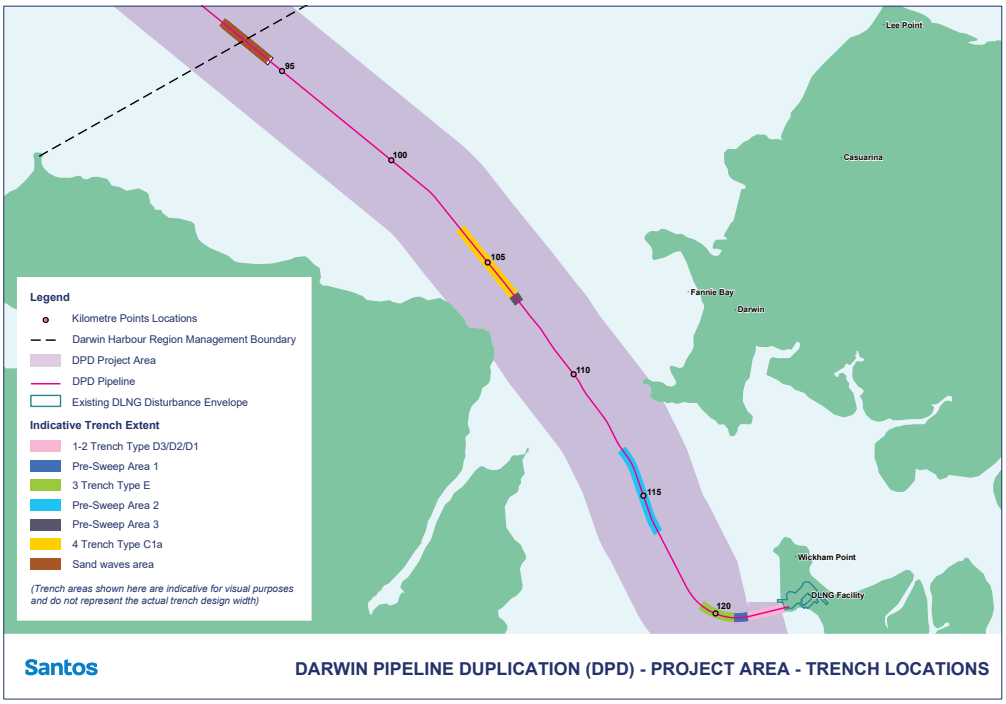

Figure 3. DPD trenching locations

Environmental considerations

Santos has conducted an environmental impact and risk assessment (including assessment of cumulative impacts) to support the development of management measures within the approval documents and EMPs and has also considered stakeholder feedback where relevant. Formal public comment periods were held to date under the EPBC Act and NT EP Act assessment processes.

The environmental impact assessment identified the following key environmental impacts and risks associated with DPD construction activities:

- Seabed disturbance
- Underwater noise emissions
- Light emissions
- Air emissions
- Marine discharges
- Dropped objects
- Invasive marine species
- Other marine user interactions
- Marine fauna disturbance
- Unplanned diesel and dry gas releases.

Construction activities associated with the DPD NT activity will be managed to ensure that environmental impacts and risks are avoided or mitigated to meet Santos and regulatory requirements.

A number of environmental approvals were obtained prior to DPD construction activities commencing. These include:

- Primary approval (received March 2024) under the EPBC Act through Department of Climate Change, Energy, the Environment and Water (DCCEEW) assessment and Ministerial approval, informed by Santos' DPD Preliminary Documentation Report.
- Primary approval (received December 2023) under the NT EP Act through NT EPA assessment and Ministerial approval, informed by Santos' DPD Supplementary Environmental Report.

The primary approval documents, environmental management plans (EMPs) and a cultural heritage management plan (CHMP) have been developed to demonstrate that the following regulatory requirements will be met:

- EPBC Act approval conditions.
- Residual impacts and risks to Matters of National Environmental Significance (MNES) are not significant.
- Impacts and risks are reduced to as low as reasonably practicable and an acceptable level.
- NT EP Act approval conditions.
- The DPD NT activity meets the objectives of NT EPA Environmental Factors, including Marine Environmental Quality, Marine Ecosystems, Atmospheric Emissions and Culture and Heritage.

CONTACT US

For further information or queries on the DPD NT activity, please contact Santos on 1800 267 600 or email offshore.consultation@santos.com