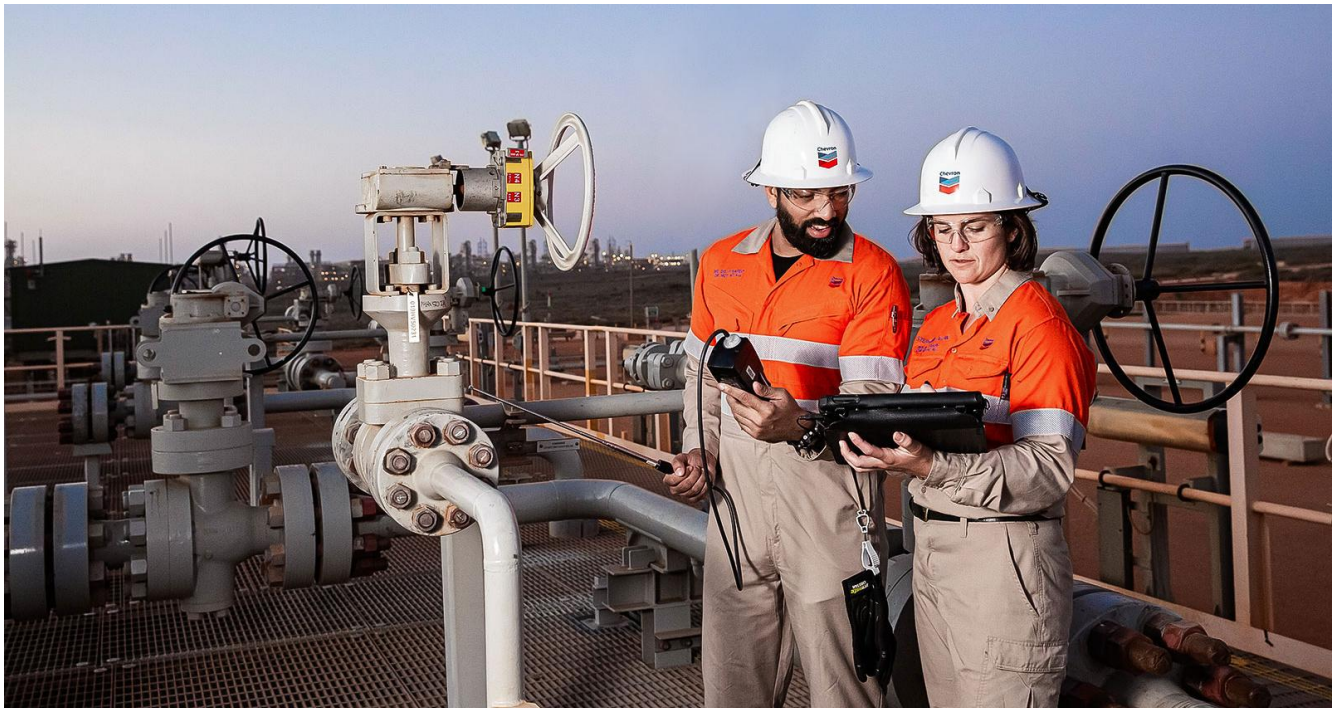
information sheet

Gorgon CO_2 Injection System Well Maintenance



overview

Chevron Australia, on behalf of the Gorgon Joint Venture, operates the Gorgon Project located off the northwest coast of Western Australia (WA).

Since 2015, offshore production wells and pipeline infrastructure have gathered natural gas from the Jansz-Io and Gorgon gas fields and transported it to the Gorgon Gas Plant (the Gas Plant) on Barrow Island. From the Gas Plant, gas is processed for export as liquefied natural gas (LNG) or piped to the mainland for WA domestic gas users.

The Gorgon CO_2 Injection System is a critical part of environmental management for Gorgon. Carbon dioxide (CO_2), which occurs naturally in the feed gas, is separated during the LNG production process and injected into deep rock formations below Barrow Island.

Chevron Australia is currently undertaking a revision of the Gorgon CO_2 Injection System Well Maintenance Environment Plan (the revised EP) to incorporate the upgrade of existing pressure management infrastructure to improve CO_2 injection rates.

The CO_2 Injection System includes pressure management infrastructure designed to regulate pressure in the Dupuy Formation following CO_2 injection, by withdrawing, treating and re-injecting water into the Upper Barrow Group, a large formation located more than 1000 metres (m) underground and isolated from the surface environment.

This information sheet is intended to assist interested persons and organisations to make an informed assessment of the environmental impact and risks of our activities and to provide input and feedback to enhance the revised EP.

Interested persons and organisations include those whose functions, interests or activities may be affected by our activities.

This includes Traditional Custodians with a spiritual and cultural connection to Country, relevant authorities and non-government organisations.

The revised EP will be submitted to the WA Department of WA Department of Mines, Petroleum and Exploration (DMPE) for review and approval.

location

The CO_2 Injection System wells are located within the PL93 Licence Area on Barrow Island [Figure 1] at each of the drill centres.

The Operational Area (OA) associated with this petroleum activity is within previously disturbed and/or surveyed areas, and includes the following drill centres:

- CO_2 injection DC-A, DC-B, and DC-C.
- CO_2 Data Well (nearby DC-B).
- Pressure management DC-D and DC-E.

activity summary

The routine inspection, maintenance and repair (IMR) of the CO_2 Injection System wells infrastructure [Table 1] will continue under the revised EP, with primary activities including:

Wellhead and Christmas tree maintenance

- Inspection of wellhead and Christmas tree systems and associated components.
- Greasing, repairing and / or changing out components.
- Pressure testing and inflow testing valves and pressure retaining cavities.
- Function testing systems, valves and components.

Well intervention and / or well workover

- Slickline/wireline intervention using tools which are run and pulled on small diameter slick, braided, or electric wirelines to perform activities such as monitoring, logging, flow control.
- Coiled tubing intervention using continuous coiled tubing from a reel to perform activities such as pumping, clean out and/ or reservoir stimulation.
- Well workover performed with lifting and pulling equipment or rig unit, to repair or replace wellbore equipment, or to reconfigure a wellbore.
- Well remediation, testing or flowback to evaluate or improve well performance.

Well plug and abandonment (P&A)

- Well P&A activities to seal off a wellbore using cement or cement alternative material to permanently isolate reservoir zones, protect any water bearing zones, mitigate actual or potential pathways for hydrocarbon migration associated with the well and otherwise reduce the risk of unplanned releases from the well to the environment.

Support operations

- Use of machinery (e.g. workover rig), vehicles, and other equipment will be required within the drill centres, including refuelling equipment and movement of vehicles and trucks.

schedule and duration

The Gorgon CO_2 Injection System is intended to operate 24 hours a day, 365 days a year and is expected to continue for the duration of Gorgon's approved operating life (ending ~2070).

Well maintenance and intervention activities may occur at any time, typically during daylight hours.

Some well maintenance and intervention activities are expected to involve 24-hour operations.

cultural heritage values

Chevron Australia acknowledges that Traditional Owners in the northwest region of WA have expressed a cultural and spiritual connection to Barrow Island and its surrounding Sea Country. This encompasses an obligation to protect cultural values and features — including songlines, dreaming stories, and the flora and fauna connected to them.

We are committed to ongoing surveys and consultation with relevant groups to manage impacts and risks to cultural values (tangible and intangible). This process will continue to inform our understanding and help facilitate the co-design of appropriate controls to manage impacts.

Chevron Australia's Cultural Heritage Management System (CHMS) sets out processes and procedures to manage risks to cultural heritage, and Chevron Australia's obligations under relevant legislation including the *Aboriginal Heritage Act 1972* (WA) and the *Underwater Cultural Heritage Act 2018* (Commonwealth).

The CHMS includes governance of ongoing cultural heritage survey and monitoring programs, spatial data, compliance and assurance, heritage assessment, inadvertent discovery procedures, incident management, training and induction materials.

approvals process

Operation of the CO_2 pipeline and wells on Barrow Island require an EP to be submitted to DMPE for approval in accordance with the requirements of the *Petroleum Pipelines (Environment) Regulations 2012* (WA) (the Regulations).

The Regulations require Chevron Australia to consult with stakeholders whose functions, interests and activities may be affected by the petroleum activity.

Following consultation, we will submit to DMPE a revised version of the Gorgon CO_2 Injection System Well Maintenance Environment Plan, which will:

- describe the environment in which well maintenance activities are planned to take place;
- include an assessment of environmental impacts and risks arising from those petroleum activities;
- identify control measures to manage the potential impacts and risks to levels that are as low as reasonably practicable (ALARP) and acceptable; and
- outline how Chevron Australia has engaged with stakeholders and how their feedback has been considered and addressed.

DMPE will assess whether the revised EP satisfies the Regulations, including whether the environmental impacts and risks of operations will be managed so that they are acceptable and ALARP before approving the revised EP.

In addition to the revised EP, our Gorgon operations are subject to approvals under State and Commonwealth environmental legislation covering a range of other environmental management requirements including the management of wastes, emissions and discharges, and execution of environmental monitoring and quarantine programs on Barrow Island.

your input

We are now seeking your feedback and input in relation to the revised EP if you consider your functions, interests, or activities may be affected based on the information provided, including the summary of the key environmental impacts and risks identified to date in Table 2.

We encourage you to provide additional details about the environment, aspects, consequences of the activity or control measures or to ask for further information or consultation.

You can contact us with any questions, requests for information, or feedback at:

- 1800 225 195
- australia.chevron.com/feedback
- or scan the QR code

To subscribe to Chevron Australia consultation email or text message updates relating to our proposed activities, please visit go.chevron.com/subscriptions

Stakeholders may request that the information they provide be treated as confidential.

what's next?

The feedback we receive during consultation will be used to inform and enhance the EP before it is submitted to DMPE for assessment.

Once approved, a summary of the revised EP will be published on the DMPE website.

We commit to keeping you informed and providing responses to any relevant person who so requests.

privacy notice

If you choose to provide feedback, Chevron Australia will collect your name and contact details, for the purposes of maintaining contact with you and including your feedback in our submission to DMPE. Provision of this information is purely voluntary, however if you choose not to provide it, we may not be able to contact you in the future. Chevron may transfer your information to DMPE if required and it will be included in the summary of the revised EP published on the DMPE website, and may be shared with other Chevron affiliates including our head office in the United States. For further information regarding how we protect your personal information, and your rights, please refer to our privacy notice at australia.chevron.com/privacy

Table 1: CO_2 Injection System wells infrastructure.

infrastructure	details	
CO_2 Injection Drill Centres	Each drill centre comprises a central manifold connected by flowlines to 'Christmas tree' structures on multiple CO_2 injection wells. Reservoir surveillance wells monitor and log changes in CO_2 saturation across the injection interval.	
	DC-A	2 x CO_2 injection wells 1 x surveillance well
	DC-B	4 x CO_2 injection wells 1 x surveillance well ('CO2 Data Well' ~ 600 m west of DC-B)
	DC-C	3 x CO_2 injection wells 1 x surveillance well
Pressure Management Drill Centres	The pressure management drill centres are linked to the CO_2 injection system via power and fibre-optic communications cables. Water production wells are fitted with pumps that primarily extract water and smaller amounts of liquid hydrocarbons and hydrocarbon gas from the Dupuy Formation. Once treated, the water is sent to the water injection wells where it is injected into the Upper Barrow Group Formation.	
	DC-D	2 x water production wells 2 x water injection wells Associated surface facilities
	DC-E	2 x water production wells 2 x water injection wells Associated surface facilities

Table 2: Summary of key impacts and risks and key proposed control measures for well maintenance activities.

aspect	key impacts/risks	key proposed control measures1
Cultural heritage (tangible and intangible) ***Note:*** *other aspects identified in this table below (e.g. ground disturbance) could have potential impacts or pose risks to cultural heritage, with the proposed control measures listed here also applicable.*	• Potential impacts to cultural heritage sites, materials or values (including songlines, dreaming stories and culturally important flora/fauna) during IMR activities.	• Well maintenance activities are restricted to occur within the OA (no cultural heritage sites or materials have been found within the OA). • Personnel must undertake a Barrow Island specific induction which covers cultural heritage information, awareness and procedures. • In accordance with the Chevron Australia Inadvertent Aboriginal Cultural Heritage Discovery Procedure, if any suspected heritage material is found, work is stopped, relevant parties notified, and appropriate management actions implemented. *Control measures related to fauna/flora and other cultural values and features are outlined in sections below.*
planned activities		
Light emissions	• Artificial lighting may result in a temporary and localised change in ambient light. • Change in ambient light levels may result in temporary and localised behavioural changes in light sensitive fauna, potentially affecting fitness or reproductive success.	• Lighting limited to the minimum required (subject to operational safety), with light location and direction to be: – directed onto work areas – mounted as low as feasible – shielded – orientated inland. • Long wavelength and low wattage light sources used (least disruptive to sensitive fauna), subject to operational and safety requirements.
Noise emissions	• Maintenance activities, including use of vehicles and equipment and gas venting, may result in a temporary and localised increase to ambient sound levels. • Change in ambient sound levels may result in temporary and localised behavioural changes in noise sensitive fauna, potentially affecting fitness or reproductive success.	• Venting procedures to reduce noise emissions.
Atmospheric emissions	• Maintenance activities, including combustion of fuel (e.g. vehicles/equipment) and gas venting may result in a temporary and localised reduction in air quality with potential to impact sensitive receptors. • Greenhouse gas (GHG) emissions within the OA result in contribution to the reduction of the global atmospheric carbon budget.	• Venting conducted in accordance with the relevant well program. • Compliance with GHG emissions reduction targets outlined in the approved Gorgon Greenhouse Gas Management Plan and subject to the Federal Government's Safeguard Mechanism.
unplanned events (accidents/incidents)		

[1] Proposed control measures are subject to change through consultation with interested persons and organisations and the subsequent DMPE assessment process.

aspect	key impacts/risks	key proposed control measures1
Fauna interaction	• Removal of well cellar coverings to undertake well intervention activities may entrap terrestrial fauna, potentially resulting in injury or mortality. • Movement of vehicles, equipment and machinery may result in terrestrial fauna strike, potentially resulting in injury or mortality.	• Each 'well program' (works for the specified well intervention activity) requires a risk assessment and permit approval. • Fauna handling, where required, undertaken by trained fauna handlers. • Vehicle movement and speed restricted and monitored. • Personnel must complete Barrow Island specific inductions/driver training before driving or operating vehicles.
Unplanned release (e.g. from loss of well control, external impact) during well maintenance activities resulting in the release of CO_2 or formation water or hydrocarbon gas	• A release of CO_2 may result in localised asphyxiation hazard to fauna if exposed to the temporary CO_2 plume. • A release of higher temperature and salinity formation water (containing hydrocarbons) may result in impacts to soil and groundwater, seasonal drainage line vegetation, and sensitive fauna. • A release of hydrocarbon gas may result in temporary and localised reduction in air quality and impact to any sensitive receptors in the immediate vicinity.	• Well /Drill Site representatives hold a valid well control certificate. • Well intervention procedure in place prior to well intervention activities commencing. • Pressure control equipment designed to isolate and seal the well in place and tested prior to well entry. • Fluids program (appropriate for the intervention activity and targeted well) will be in place prior to well intervention activities commencing. • Each 'well program' (works for the specified well intervention activity) requires a risk assessment and permit approval. • Vehicle barriers in place around above-ground infrastructure at drill centres. • Vehicle movement and speed restricted and monitored. • Spill containment and recovery equipment available and response conducted in accordance with the approved Gorgon Project – Barrow Island Onshore Spill Contingency Plan. • In the event of a loss of well control, source control response tactics are implemented in accordance with the Onshore Source Control Emergency Response Plan (SCERP).
Unplanned release during handling / storage of hazardous materials or wastes	• A release of hazardous material may result in soil and groundwater contamination, and possible effects on vegetation and/or fauna.	• Chemicals selected and assessed in accordance with the Chevron Australia Hazardous Materials Management Procedure. • Hazardous materials (including fuel) stored, handled and transferred appropriately, including secondary containment, where required. • Stationary equipment (e.g. generators, pumps) will have spill protection and/or be double skinned. • Chemicals and hazardous substances required for well intervention or maintenance activities will be removed from the drill centre upon completion. • Visual inspection of tank integrity for signs of degradation. • Spill containment and recovery equipment available and response conducted in accordance with the approved Gorgon Project – Barrow Island Onshore Spill Contingency Plan. • Waste managed in accordance with the approved Solid and Liquid Waste Management Plan.

Figure 1: Gorgon CO_2 Injection System Well Maintenance EP Operational Area (OA).