



Report and recommendations of the Environmental Protection Authority



Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve – inquiry under section 46 of the *Environmental Protection Act 1986* to amend Ministerial Statement 800

Chevron Australia Pty Ltd

Report 1649

September 2019

Inquiry under section 46 of the *Environmental Protection Act 1986*

The Minister for Environment has requested that the Environmental Protection Authority (EPA) inquire into and report on the matter of changing the implementation conditions in Ministerial Statement 800 relating to the Chevron Australia Pty Ltd proposal Gorgon Gas Development Revised and Expanded Proposal: Barrow Island Nature Reserve.

Specifically, the Minister requested the EPA inquire into, and report under section 46(1) of the *Environmental Protection Act 1986* on the implementation of Condition 26 of Ministerial Statement 800 for the Gorgon Gas Development, Revised and Expanded Proposal, which relates to the reservoir carbon dioxide injection system.

Following the release of Chevron Australia Pty Ltd's annual Environmental Performance Reporting for the Gorgon Gas Development, it became apparent that there needs to be a clearly defined start point for the commencement of the carbon dioxide injection system.

The Minister has sought the EPA's advice on the implementation conditions and definitions within Schedule 2 of Ministerial Statement 800.

The following is the EPA's Report and Recommendations to the Minister pursuant to s. 46(6) of the *Environmental Protection Act 1986*.



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Executive summary

The Gorgon Gas Development, Revised and Expanded Proposal on Barrow Island is authorised under Ministerial Statement 800 (MS 800), which was published in 2009.

In April 2018, the Minister for Environment requested the Environmental Protection Authority (EPA) inquire into and report on the implementation conditions in MS 800, specifically Condition 26 which relates to the reservoir carbon dioxide injection system.

Condition 26 of MS 800 requires Chevron to design and construct a carbon dioxide injection system that is capable of disposing 100 per cent of the reservoir carbon dioxide removed during routine gas processing operations from the proposal, through underground injection. This condition states Chevron should implement all practicable means to inject underground all reservoir carbon dioxide and ensure at least 80 per cent of reservoir carbon dioxide removed during gas processing operations on Barrow Island must be injected over a five-year rolling average.

In Chevron Australia Pty Ltd's annual Environmental Performance Report released in December 2017 for the Gorgon Gas Development, it was reported no carbon dioxide had been reinjected, and it became apparent a clearly defined start point for the commencement of the Carbon Dioxide Injection System needed to be established.

In view of this, the Minister for Environment requested the EPA conduct an inquiry on implementation conditions, specifically Conditions 26, and provide advice on definitions contained in MS 800.

As a result of this inquiry, the EPA has concluded the current wording in MS 800 does not allow the required starting point for the Carbon Dioxide Injection System to be easily determined.

The EPA has recommended a new version of Condition 26 (Appendix 1) which recommends the starting point for the injection system be the commencement of gas processing operations. The EPA considers gas processing operations for the Gas Treatment Plant are taken to have begun from the first date of issue of Licence under Part V of the *Environmental Protection Act 1986* for the operation of an LNG processing train for the Gorgon Gas Development, being 14 July 2016.

1. The proposal

Chevron Australia Pty Ltd (Chevron) currently operates the Gorgon Gas Development – Revised and Expanded Proposal: Barrow Island Nature Reserve (Gorgon Gas Development), which is a proposal for the construction of facilities for the development of the Greater Gorgon Gas Fields on the North-West Shelf, and the processing and export of the gas at a liquefied natural gas plant to be constructed on Barrow Island. The Environmental Protection Authority (EPA) assessed the proposal at the level of Public Environmental Review, releasing its Report and Recommendations (Report 1323) in 2009. In this report, the EPA considered the following key environmental factors required detailed evaluation in its Report and Recommendations to the Minister for the Environment:

- Marine Turtles
- Dredging, Marine Blasting and Marine Infrastructure
- Introduced Non-Indigenous Organisms
- Subterranean Fauna/Short Range Endemics
- Greenhouse Gases
- Air Quality
- Noise.

The EPA concluded in EPA Report No. 1323, that the proposal could only meet the EPA's environmental objectives if stringent conditions were applied to the proposal. The then Minister for Environment approved the proposal for implementation, subject to the implementation conditions of Ministerial Statement 800 (MS 800) 10 August 2009.

It should be noted that the Gorgon Gas Development was originally authorised under Ministerial Statement 748 (MS 748). The EPA recommended against allowing the Gorgon Gas Development to proceed (Report 1221). However, the then Minister for Environment made a decision to allow the proposal to proceed subject to the conditions in MS 748. The key environmental factors that required detailed evaluation in Report 1221 were:

- Terrestrial Flora, Fauna and Vegetation Communities
- Subterranean Fauna
- Introduced Non-Indigenous Organisms
- Marine Biota, particularly Flatback Turtles and Benthic Primary Producers
- Greenhouse Gas Injection and Emissions
- Light, Noise and Vibration, particularly as they affect Turtles
- Air Quality
- Groundwater as it affects Subterranean Fauna

The proposal approved under MS 800 was a revision of the original proposal approved under MS 748, and MS 800 supersedes MS 748.

The main differences between the revised and expanded proposal from the project approved under MS 748 were:

- revision of the marine facilities by extending the combined length of the causeway and marine offloading facility from 1320 metres to 2120 metres and reducing the jetty length from 2.7 kilometres to 2.1 kilometres
- increasing the number of LNG trains from two to three
- changes to the reservoir carbon dioxide injection system to allow an increase in injection rate by increasing the number of injection wells from seven wells drilled from two or three drill centre locations to eight or nine wells drilled from three or four drill centres
- increased annual rate of emissions of carbon dioxide equivalent greenhouse gases from 4.0 million tonnes per annum (mtpa) to 5.45 mtpa.

Chevron has further revised the proposal, and the EPA assessed the revisions, to include an additional 32 hectares of clearing in 2014 (Report 1499) and the inclusion of a fourth LNG processing train in 2015 (Report 1539). These revisions were authorised under Ministerial Statement 965 and Ministerial Statement 1002, both of which required the conditions of MS 800 to apply to the revised proposals.

In applying the *Statement of Environmental Principles, Factors and Objectives* (EPA 2018a) the factors previously assessed for Gorgon Gas Development are now described as:

- Benthic Communities and Habitats
- Coastal Processes
- Marine Environmental Quality
- Marina Fauna
- Flora and Vegetation
- Subterranean Fauna
- Terrestrial Fauna
- Air Quality
- Social Surroundings.

Previously approved changes to conditions

Since the release of MS 800, there has been two previous amendments to the conditions through s. 46. These two previous s. 46 changes did not relate to the carbon dioxide injection system.

2. Requested changes to conditions

In April 2018, the Minister for Environment requested that the EPA inquire into and report on the matter of changing implementation condition 26 of MS 800 for the Gorgon Gas Development. This report satisfies the requirements of the EPA's inquiry.

The inquiry was requested following the release of the annual Environmental Performance Reporting for the Gorgon Gas Development, as it had become apparent that there needed to be a clearly defined start point for the commencement of the carbon dioxide injection system.

The EPA has discretion as to how it conducts this inquiry. The inquiry has considered:

- the currency of its original assessments (Reports 1221 and 1323)
- Ministerial Statements 748 and 800
- information provided by the proponent
- information provided by key stakeholders
- advice from relevant decision making authorities
- any new information regarding the proposal's potential impacts on the environment.

These documents are instructive in determining the extent and nature of the inquiry under s. 46 of the *Environmental Protection Act 1986*.

EPA policy and procedures

The EPA followed the procedures in the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016* (EPA 2016a) and the *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual 2018* (EPA 2018b).

3. Inquiry findings

The EPA considered the following key environmental factor relevant to the change to conditions:

- Air Quality.

3.1 Air Quality

The EPA's environmental objective for this factor is *to maintain air quality and minimise emissions so that environmental values are protected*.

The EPA considers that the following current environmental policy and guidance is relevant to its assessment of the proposal for this factor:

- *Environmental Factor Guideline – Air Quality* (EPA 2016b).

EPA Reports 1221 and 1323

As noted in Section 1 of this report, the Gorgon Gas Development has been through a number of assessments by the EPA, including the two assessments covered by Reports 1221 and 1323.

In Report 1221, the EPA stated “the EPA does not believe that the proposal could be made environmentally acceptable. Accordingly, the EPA recommends that, from an environmental point of view, the proposal should not be permitted to proceed as proposed”. In forming this view, the EPA considered that the project would be environmentally unacceptable if it did not include a scheme designed to inject a high percentage of the reservoir carbon dioxide, or implement alternative measures to abate the equivalent amount of reservoir carbon dioxide vented to the atmosphere.

In Report 1323, the EPA stated that “Gas from the Gorgon field is high in carbon dioxide. A fundamental justification by the proponent for using Barrow Island was the need for access to a suitable aquifer beneath the island for long term carbon dioxide storage. The EPA also notes that sequestration of carbon dioxide was a Government requirement for access to Barrow Island for the Gorgon project and that this requirement is contained in binding conditions applied to the approved Gorgon project. If injection and long term storage of carbon dioxide produced with gas that is processed at the Gorgon plant is not achieved (for whatever reason, including the introduction of carbon markets) then the decision to permit gas processing on Barrow Island nature reserve should be reconsidered”.

To ensure that sequestration of carbon dioxide was undertaken for the Gorgon Gas Development a condition was imposed (condition 26 of MS 800) that required the implementation of a Carbon Dioxide Injection System

Status of the Carbon Dioxide Injection System

The Minister for Environment requested the inquiry following the release of the annual Environmental Performance Reporting for the Gorgon Gas Development, as it was reported that no carbon dioxide had been reinjected utilising the Carbon Dioxide Injection System.

In the early stages of this inquiry, Chevron indicated that the injection of carbon dioxide through the Carbon Dioxide Injection System had yet to commence as there was a number of pre-start up technical issues that needed to be resolved before the system is able to be implemented. In its October 2018 submission to this inquiry, Chevron stated that modifications to the system would be completed by the end of 2018 and injection would commence in the first quarter of 2019. This would initially be through a single well centre, with additional wells brought on-line over the following three to four-month period.

In August 2019, following resolution of the technical issues and the receipt of all outstanding Government approvals, operation of the carbon dioxide injection system finally commenced.

EPA's assessment

The EPA still considers the operation of a Carbon Dioxide Injection System to be fundamental in justifying the use of Barrow Island for the Gorgon Gas Development. The original condition framework recommended by the EPA for the Gorgon Gas Development (in Appendix 4 of Report 1221) refers to the disposal of carbon dioxide removed from reservoir gas for the life of the proposal.

It is clear that the existing wording of condition 26 and the definitions in MS 800 do not allow for the required start date to be easily determined. What is also clear from the EPA's previous statements is that the implementation of the system is vitally important and the expectation is that a very high proportion of reservoir carbon dioxide is injected via the injection system, or offset if this injection does not occur or long term storage of carbon dioxide is not achieved.

Chevron's submission to the EPA

Chevron contends that the start of gas processing operations should be defined as the grant of the *Environmental Protection Act 1986* (EP Act) Part V licence for the three LNG processing trains for the Gorgon Gas Development. Chevron's basis for forming this view is that it is consistent with the Department of Water and Environmental Regulation's draft *Industry Regulation Guide to Licensing* and also represents a transition to steady state operations following commissioning.

EPA's consideration

The EPA acknowledges that the Gorgon Gas Development is a very large, highly technical, and multifaceted project, which adds complexity in determining when the proposal is considered to be operational.

In carrying out this inquiry, the EPA has considered that there are a number of different points which could be reasonably argued to represent the start of operations for the Gorgon Gas Development. The EPA has taken into account these different views in forming a conclusion on what the EPA considers the most appropriate start point for the purposes of condition 26.

It is the EPA's understanding that most large resource projects, whether it be oil and gas, or mining, go through a process whereby construction and commissioning finishes, operations commence, and then there is a ramp up to full production levels. Chevron acknowledges that there is a progressive increase in production rates in their submission to the EPA as part of this inquiry.

The EPA notes the following statement from the proponent's Environmental Impact Statement document for the Gorgon Gas Development that was prepared for the EPA's assessment that was addressed in Report 1221. In Section 6.5.2 Operation of the Gas Processing Facility of the Environmental Impact Statement it notes that experience shows during the first year the gas process typically has lower availability than in previous years. That is to say that during early operations of the proposal, unplanned equipment outages are expected. The EPA holds the view that if a proposal commenced operations and then encountered unplanned outages, it does not mean the proposal can be considered to have reverted back to the commissioning phase.

The Department of Water and Environmental Regulation draft *Industry Regulation Guide to Licensing* also states that when a project is staged (as is the case for the Gorgon Gas Development) then aspects of the proposal can transfer to operational status whilst other stages of the projects are still in commissioning (i.e. Trains 2 and 3). The fact that Chevron applied for environmental approval for Trains 1 and 2, and then Trains 3 and 4 separately is taken to demonstrate that these are separate stages of the proposal.

Under Part V of the EP Act, Works Approvals are required to construct the Gorgon Gas Development and Licences are required to operate the gas processing facility. The EPA notes that a Part V licence has been granted for the Gorgon Gas Development. In 2016, a Licence (L8952/2016/1) was issued that allowed for the operation of Train 1, and another licence was issued in the 2018 (L9102/2017/1) that superseded the previous licence and provided for operation of Trains 1, 2 and 3.

The EPA does not agree with the argument that operations do not commence until all stages of the proposal are constructed and operating at full capacity. Chevron has authorisation to construct a fourth gas processing train for the Gorgon Gas Development (Ministerial Statement 1002). If the view is taken that routine or steady state operations are not achieved until all processing trains are in production then it is possible to construct the view that 'operations' may never commence if plans exist for future trains to come online.

The EPA accepts it is standard practice that there is some processing of gas required during commissioning to allow testing of the gas treatment plant. The EPA notes that this gas needs to be dealt with somehow as it is not possible to store it until the gas processing plant is operational, and so it needs to be vented or loaded on a ship (with the gas then sold). The EPA also notes that lower carbon dioxide gas from the Jansz Field was used for the early stages of commissioning and greenhouse gas emissions released during venting was lower than would have been the case if gas from the Gorgon Field was used. During the EPA's previous

assessments of the Gorgon Gas Development, the EPA's main concern was the higher reservoir carbon dioxide levels associated with gas from of the Gorgon Field.

The EPA does not agree with Chevron's view that steady state operations, whereby all gas processing trains are operating, represents the point at which operations can be said to have commenced for the Gorgon Gas Development.

The EPA has taken into account the various views for the different points on which operations could be considered to have commenced. On balance, the EPA considers that operations, for the purpose of Condition 26, are when at least one gas processing train has commenced operations, and that this is to have occurred when a EP Act Part V Licence has been issued for the operation of the first gas processing train.

To ensure consistent application of this interpretation across the proposal, and to recognise the staging of the Gorgon Gas Development, the use of the grant of the Part V Licence as the date that operations commences should apply to each individual train when determining the dates for calculating the five-year rolling average under condition 26. The recommended conditions in Appendix 1 reflect this approach.

4. Conclusions and recommendations

Conclusions

In relation to the environmental factors, and considering the information provided by the proponent and relevant EPA policies and guidelines, the EPA concludes that:

- The current wording in MS 800 does not allow the required starting point for the Carbon Dioxide Injection System to be easily determined.
- Gas processing operations can be considered to have commenced on the first date of issue of a Licence under Part V of the EP Act for the operation of an LNG processing train for the Gorgon Gas Development.

Recommendations

Having inquired into this matter, the EPA submits the following recommendations to the Minister for Environment under s. 46 of the EP Act:

1. It is appropriate to change implementation condition 26, by amending condition 26-2 to contain the term “Commencement of Gas Processing Operations” of the Gas Treatment Plant and to define this term.
2. For the purposes of condition 26-2, Gas Processing Operations of the Gas Treatment Plant are taken to have begun from the date of the first grant of the licence to operate under Part V of the *Environmental Protection Act 1986*, being 14 July 2016.

From 14 July 2016 to 30 July 2018, reservoir carbon dioxide removed during gas processing operations pursuant to the 14 July 2016 Licence would be calculated for the purposes of the condition. From 30 July 2018 reservoir carbon dioxide removed during gas processing operations pursuant to the 30 July 2018 Licence would be calculated for the purposes of this condition.

3. After complying with s. 46(8) of the EP Act, the Minister may issue a statement of decision to change condition 26-2 of MS 800 in the manner provided for in the attached recommended Statement (Appendix 1).

References

Chevron Australia Pty Ltd 2005, *Draft Environmental Impact Statement/ Environmental Review and Management Programme for the Proposed Gorgon Development*. September, 2005. Chevron Australia Pty Ltd, Perth.

EPA 2006, *Gorgon Gas Development, Barrow Island Nature Reserve*, Bulletin 1221, Environmental Protection Authority, Perth, WA

EPA 2009, *Gorgon Gas Development Revised and Expanded Proposal, Barrow Island Nature Reserve*, Bulletin 1323, Environmental Protection Authority, Perth, WA.

EPA 2016a, *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2016*, Environmental Protection Authority, Perth, WA.

EPA 2016b, *Environmental Factor Guideline – Air Quality*, Environmental Protection Authority, Perth, WA.

EPA 2018a, *Statement of Environmental Principles, Factors and Objectives*, Environmental Protection Authority, Perth, WA.

EPA 2018b, *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual*, Environmental Protection Authority, Perth, WA.

Appendix 1: Identified Decision-Making Authorities and recommended environmental conditions

Identified Decision-making Authorities

The following decision-making authorities have been identified for the purposes of s. 45 as applied by s. 46(8) of the *Environmental Protection Act 1986*:

1. Minister for Lands
2. Minister for State Development
3. Minister for Mines and Petroleum
4. Minister for Environment

RECOMMENDED ENVIRONMENTAL CONDITIONS

**STATEMENT TO CHANGE THE IMPLEMENTATION CONDITIONS APPLYING TO
A PROPOSAL**

(Section 46 of the *Environmental Protection Act 1986*)

GORGON GAS DEVELOPMENT REVISED AND EXPANDED PROPOSAL:
BARROW ISLAND NATURE RESERVE

Proposal: The construction of facilities for the development of the Greater Gorgon Gas Fields on the North-West Shelf, and the processing and export of the gas at a liquefied natural gas plant to be constructed on Barrow Island, as more generally described in the Draft Environmental Impact Statement / Environmental Review and Management Programme for the Proposed Gorgon Development, the Final Environmental Impact Statement/ Response to Submissions on the Environmental Review and Management Programme; as amended under Section 45C; and as expanded and revised in the Public Environmental Review for the Gorgon Gas Development Revised and Expanded Proposal and the Response to Submissions: Gorgon Gas Development Revised and Expanded Proposal, Public Environmental Review

Proponent: Chevron Australia Pty Ltd
Australian Company Number 086 197 757

Proponent Address: Level 24 QV1 Building, 250 St George's Terrace, Perth,
Western Australia 6000

Report of the Environmental Protection Authority: 1649

Preceding Statement/s Relating to this Proposal: 748, 800, 865, 965, and 1002

Pursuant to section 45 of the *Environmental Protection Act 1986*, as applied by section 46(8), it has been agreed that the implementation conditions set out in Ministerial Statement No. 800, be changed as specified in this Statement.

Condition 26-2 of Ministerial Statement 800 is amended and replaced with:

26-2 From the Commencement of Gas Processing Operations of the Gas Treatment Plant, the Proponent must:

- (1) implement all practicable means to inject underground all reservoir carbon dioxide removed during gas processing operations; and

- (2) ensure that, calculated on a 5 year rolling average, at least 80 percent of reservoir carbon dioxide removed during gas processing operations that would otherwise be vented to the atmosphere is injected underground.

Commencement of Gas Processing Operations: For the purposes of condition 26-2, gas processing operations of the Gas Treatment Plant are taken to have begun from the date of the first grant of the licence to operate under Part V of the *Environmental Protection Act 1986*, being at the date of this Statement, 14 July 2016.

From 14 July 2016 to 30 July 2018, reservoir carbon dioxide removed during gas processing operations pursuant to the 14 July 2016 Licence would be calculated for the purposes of the condition. From 30 July 2018 reservoir carbon dioxide removed during gas processing operations pursuant to the 30 July 2018 Licence would be calculated for the purposes of this condition.