

s. 22(1)(a)(ii)

From: Office of Water Science Advice
Sent: Wednesday, 26 May 2021 5:28 PM
To: s. 22(1)(a)(ii) ; Office of Water Science Advice
Cc: s. 22(1)(a)(ii); s. 22(1)(a)(ii) ; s. 22(1)(a)(ii); s. 22(1)(a)(ii); s. 22(1)(a)(ii)
Subject: RE: Request for advice on the Fairview Water Release Scheme (EPBC 2021/8914) [SEC=OFFICIAL]
Attachments: Fairview Water release Scheme OWS Advice Final .docx

Good afternoon ^{s. 22(1)(a)(ii)}

Please find attached for your consideration OWS technical advice on the Fairview Water Release Scheme.

As always, our Section is happy to discuss the advice further.

Kind regards,

s. 22(1)(a)(ii)

Hydrogeologist | Office of Water Science
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From: s. 22(1)(a)(ii) <s. 22(1)(a)(ii)@environment.gov.au>
Sent: Wednesday, 12 May 2021 10:45 AM
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Subject: RE: Request for advice on the Fairview Water Release Scheme (EPBC 2021/8914) [SEC=OFFICIAL]

Hi ^{s. 22(1)(a)(ii)}

Apologies for the incorrect SPIRE link. Please see the documents linked below. The MNES Supporting Report provides the most relevant information on water quality monitoring and assessments.

[2021-8914 Referral](#)

[2021-8914 Att A-MNES Supporting Report](#) - provides detailed information on water quality monitoring and assessments.

[2021-8914 Att B-Figures 1 to 3](#) – Maps of the proposed action site.

[2021-8914 Att C-REMP](#) – Watercourse release management plan.

[2021-8914 EPBC 2012-6615 Notice](#) – Approval notice for the related GLNG GFD project.

[2021-8914 QLD Environmental Authority EPPG00928713](#) – Queensland approval for the GLNG (EPBC 2008/4059) and GLNG GFD (EPBC 2012/6615) projects.

Thank you,

s. 22(1)(a)

From: Office of Water Science Advice <OWS.Advice@environment.gov.au>

Sent: Wednesday, 12 May 2021 10:26 AM

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Subject: RE: Request for advice on the Fairview Water Release Scheme (EPBC 2021/8914) [SEC=OFFICIAL]

Hi s. 22(1)(a)(ii)

An OWS Technical Officer will review the request for advice.

Could you please list the documents to be considered in the RFA or provide actual links to the documents, there seems to be only MNES documents in the SPIRE link.

Thank you kindly

s. 22(1)(a)(

s. 22(1)(a)(ii)

Acting Assistant Director

Limnologist/Geologist

Office of Water Science – Technical Analysis Team

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From: s. 22(1)(a)(ii) <s. 22(1)(a)(ii)@environment.gov.au>

Sent: Wednesday, 12 May 2021 9:07 AM

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Subject: Request for advice on the Fairview Water Release Scheme (EPBC 2021/8914) [SEC=OFFICIAL]

Good morning,

Please see attached the request for advice on the Fairview Water Release Scheme, Queensland (EPBC 2021/8914).

The referral and supporting documentation can be found in SPIRE: [2021-8914 Fairview Water Release Scheme, 50km east of Injune, QLD \(environment.gov.au\)](#)

A decision on the referral is required by 8 June 2021. We would appreciate your advice by COB Wednesday 26 May. Please let me know if any further information is needed.

Kind regards,

s. 22(1)(a)(ii)

Assessment Officer | Queensland North Assessments

Environment Assessments Queensland and Sea Dumping Branch

**OFFICE OF WATER SCIENCE ADVICE
FAIRVIEW WATER RELEASE SCHEME, 50 KILOMETERS (KM) EAST OF INJUNE,
QUEENSLAND**

Requesting section	Queensland North Assessments	Requesting officer	s. 22(1)(a)(ii)
Date of request	12/05/2021		
EPBC reference	EPBC 2021/8914	OWS reference	OWS 2021-037
Project assessment stage	Referral		
OWS contact officer	s. 22(1)(a)(ii) , s. 22(1)(a)(ii) , s. 22(1)(a)(ii)		
Cleared by	s. 22(1)(a)(ii) Director / Senior Principal Research Scientist Technical Analysis Team	Date	26 May 2021

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This document, prepared at the request of the Environment Assessments Division, outlines the Office of Water Science's (OWS) technical advice on the Fairview Water Release Scheme QLD, in relation to the proposed action of controlled releases of desalinated and event-based untreated coal seam water associated with the Gladstone Liquefied Natural Gas Project Gas Field Development (GLNG GFD) into the Dawson River via a floodplain oxbow lake (the lake) and ephemeral watercourse.

The proposed action is situated within the Santos Fairview gas fields, approximately 50 km east of Injune, 65 km west of Taroom and 90 km south east of Wandoan in the upper Dawson River sub-catchment within the Fitzroy River Basin, central southern Queensland. The proposed action area development footprint includes 286 ha of watercourse up to Yebna Crossing located 8.5km downstream of the proposed release points on the Dawson River, with a 50-meter buffer of the receiving wetland.

The proposed action consists of releasing up to 18 ML/day of desalinated water into a drainage tributary of the Dawson River. Transient, event-based releases of both treated and untreated co-produced water into the Dawson River are proposed when flow exceeds a specified flow trigger of 100 ML/day (EPBC Act Referral, 2021, p 9). Desalinated wastewater release and event-based releases into the Dawson River were approved by the Queensland under Environmental Authority (EA) EPPG00928713. The EA applies to the GLNG GFD

Projects; however, does not include event-based wastewater releases and no infrastructure is currently in place to enable such releases (FRC Environmental, 2021, p. 1).

The Independent Expert Scientific Committee on Coal Seam Gas and Coal Mining Development (IESC) previously provided advice (IESC 2014-061, EPBC 2012/6615) for the GLNG GFD Project. Key potential impacts identified by the IESC include:

- reduced water supply to groundwater dependent ecosystems (GDEs), including those listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act);
- cumulative impacts of Surat and Bowen Basin CSG activities;
- hydrological and ecological consequences of surface water discharge into the tributary gully and changes to groundwater; and
- surface water quality changes due to direct project activities and management of co-produced water.

Question 1: What does the OWS consider are the likely nature and extent of impacts, including downstream impacts, on water resources as a result of the proposed action?

1. The proponent developed a conceptual model for the desalinated water release to Dawson River. In this model, the local geology of the Dawson River tributary comprises low permeability Evergreen Formation overlying the Precipice Sandstone aquifer. Based on this conceptual model the Dawson River is interpreted to be geologically isolated from the Precipice Sandstone aquifer (AECOM, 2016 a, p.42).
 - a. The Bureau of Meteorology's GDE Atlas indicates that the Fairview project area contains high potential for terrestrial and aquatic GDEs. Any groundwater contamination and/or groundwater depletion may have an adverse impact on GDEs in the area.
 - b. The proponent has provided little information in its documentation to demonstrate a disconnection between the Dawson River and the Precipice Sandstone and so OWS cannot confirm the veracity of the interpretation presented in the conceptual model. Refer to Paragraph 6 for discussion on information gaps in groundwater and surface water interactions at the site.
2. The proponent proposes discharging desalinated water (maximum 18 ML/day) into the dry tributary gully at the site. The gully is a linear feature situated between the proposed outfall location and the floodplain oxbow lake (the lake). The lake has an approximate 500 ML volume capacity and overflows into the Dawson River via an ephemeral channel to the east of the lake during extended or high rainfall events (Figure 3 – AECOM, 2021 a, p 17, AECOM, 2021 a, p 53). Desalinated water from the outfall location will flow for 2.9 km before discharging into the lake.
 - a. The constant releases of water into the currently dry tributary gully will produce changes in stream hydrology of this gully and increase sedimentation, turbidity and suspended solids in the Dawson River and the Lake through erosion of the gully (FRC Environmental, 2018, pp. 27-29).

- c. Increased sedimentation and changes to water quality, (as are going to occur as part of this project), are likely to have a significant impact on the white-throated snapping turtle (DAWE, 2020, pp. 19 – 20). For OWS discussion on further conditions regarding turtles at the site refer Paragraph 10.

Cumulative Impact Assessment

4. The proponent considers the possible impacts and risks associated with event-based releases and desalinated water release to Dawson River to be low and concluded that a quantitative cumulative impact assessment is unnecessary (AECOM, 2016, p 98).
 - a. OWS acknowledges that the proponent has considered the potential impacts of downstream water quality and quantities from event-based releases. However, releases of desalinated and untreated event-based water may indirectly impact the aquatic ecology of the Dawson River via cumulative impacts due to the assimilative capacity of the Dawson River (FRC Environmental, 2018, p 26).
 - b. A cumulative impact assessment would provide greater assurance that the high concentrations of contaminants will have no significant impacts on downstream land users/riparian environments of the Dawson River or the Fitzroy River and white-throated snapping turtles.

Question 2: Does the OWS consider the proponent's monitoring regime as outlined in the referral is adequate to understand potential water quality impacts? Are there any key information or data gaps?

5. After review of the proponent's water quality monitoring regime OWS makes the following observations.
 - a. The proponent's receiving environment is limited to 8.5 km downstream of the site to Yebna Crossing (FRC Environmental, 2021, pp. 15 - 17). The furthest downstream water quality monitoring point (monitoring site S4) is located at the eastern point of this 8.5 km area (Figure 3 – AECOM, 2021 a, p 17).
 - b. The discharged water has water quality levels for a number of contaminants which exceeds 2018 ANZECC guideline for 95% species protection (Table D.3 FRC Environmental, 2021, App D, pp. D6-D7, and FRC Environmental, 2021, p.9). For discussion on condition relating to water quality at the site refer to Paragraph 8, 9 and 11.
 - c. The proponent's REMP monitoring design for the Dawson River Watercourse Releases Desalinated Releases Program (Table 6.3, FRC Environmental, 2021, p 47) has twice-yearly monitoring (notionally pre-wet season and post wet season) for physico-chemical parameters (nutrients, metals, major ions, and metalloids) of and

- weekly monitoring for total and dissolved boron for the ROP1 monitoring site (Attachment A).
- i. OWS considers weekly monitoring of boron to provide adequate temporal coverage to identify potential contamination issues which may occur. If monitoring sites S3a, S1a, S4, DRR1, DRMP1 and WLMP 1 – 5 (Attachment B and Map 6.1. FRC Environmental, 2021, p 44). were monitored more frequently (e.g. weekly) for all physico-chemical parameters than what is currently proposed (Table 6.3, FRC Environmental, 2021, p 47), potential contamination events would be identified earlier.
 - d. The proponent states they will monitor for signs of potential calcium and magnesium deficiencies in the exoskeletons of relevant invertebrate specimens (FRC Environmental, 2021, p G4).
 - i. OWS suggests the proponent monitor calcium concentrations within the receiving environment on a weekly to monthly basis (FRC Environmental, 2021, p 8), as co-produced water is substantially lower in calcium than the natural concentrations in the lake (by an order of magnitude).
 - e. The sediment quality and biological component monitoring frequency is only proposed to be twice per year (Table 6.3, FRC Environmental, 2021, p 50).
 - i. OWS considers that the proponent also monitor these components on a weekly to monthly basis, as the habitat of the two EPBC Act listed turtles are susceptible to increased sedimentation (DAWE, 2020, p. 19).
 - f. Condition B21 and B33 of the Permit require the notification of irrigators 20 km and 300 km downstream respectively, from the project site if boron exceeds trigger limits.
 - i. Noting Condition B21 and B33, OWS suggests having additional water quality monitoring stations further downstream will provide greater clarity on the likely impacts on the downstream environment, for example at 20km and 300km from the discharge point.
6. Noting the discussion on the proponent's conceptual model in Paragraph 1, OWS considers that the proponent should provide more recent data on the potential surface water and groundwater interaction at the site. This data will provide greater certainty on the likely impacts to GDEs should possible contaminants be introduced to groundwater at the site (particularly boron).
- a. This data should include the geological logs, hydraulic properties and, if applicable, the level of fracturing in the Evergreen Formation.
 - b. Further, the proponent should develop a simple, potentially analytical, groundwater model based on this data to investigate surface and groundwater interaction.

Question 3: Does the OWS consider any further conditions would be required in addition to those imposed by Queensland Environmental Authority EPPG00928713?

7. The Legislative Requirements and Conditions of the Environmental Authority EPPG00928713 Permit (the Permit) relevant to the GLNG and Santos GLNG Gas Field Development Project (Environmental authority, 2020) are broadly considered by OWS to be satisfactory. However, additional conditions which build on those outlined in the Permit would assist in providing an early warning of potential impacts to the EPBC Act listed turtles, as well as a better understanding of the nature of these impacts.
8. Water quality limit-values for contaminant limits outlined Schedule B Table 4 of the Permit appear consistent the ANZECC 95% species protection values, with the exception of boron which is significantly higher.
 - a. OWS notes that the contaminant limits used in Schedule B Table 5 of the Permit exceed those of the 2018 ANZECC freshwater 95% species protection values. The adoption of 2018 ANZECC guidelines over those presented in Schedule B Table 5 would likely provide greater protection to the EPBC Act listed turtles.
9. Most conditions in Schedule B of the Permit rely on the monitoring of only one monitoring station. Multiple monitoring points under relevant conditions in Schedule B will provide greater contingency in monitoring contaminants, this will provide greater assurance from a cumulative impact assessment perspective for the catchment.
10. The proponent should clarify if the white-throated snapping turtle has a continuous presence in the lake. Further, as both the white-throated snapping turtle and Fitzroy River turtle are listed as critically endangered and vulnerable under the EPBC Act respectively, the proponent should include the white-throated snapping turtle into their Receiving Environment Monitoring Program and conduct a more detailed impact assessment for the proposed action on the EPBC Act listed turtles.
11. Noting conditions B2 and B23 of the Permit, further conditions may provide for greater avoidance of potential impacts on the EPBC Act listed turtle species (e.g., sedimentation, algae blooms, water contaminants) associated with the proposed action of discharging desalinated water into the dry tributary gully.
 - a. Specifically, requesting the proponent provide detailed information on what alterations will be made to the dry tributary gully to prevent impacts would provide greater confidence.

[Water Assessment Information Portal \(WAIP\)](#): for more information on water-related environmental impacts, please see the WAIP (accessible on the intranet via Home ⇒ Themes ⇒ Water ⇒ Water Assessment Information Portal).

References

AECOM services Pty Ltd, 2016. *Appendix A - Dawson River Event Release Technical Impact Assessment Report*. Prepared for Santos LTD

AECOM services Pty Ltd, 2019. *Appendix G - Memorandum regarding Revised Boron Site Specific Water Quality Criterion*. Prepared for Santos LTD

AECOM services Pty Ltd, 2021 a. *Produced Water Releases – Fairview, Assessment of Matters of National Environmental Significance*. Prepared for Santos LTD

AECOM services Pty Ltd, 2021 b. *Appendix E - Water Quality Parameters*. Prepared for Santos LTD

Department of Agriculture, Water and the Environment, December 2020. 'The National Recovery Plan for the White-throated Snapping Turtle (*Eseya albagula*), Commonwealth of Australia. Accessed on 24 May 2021, Accessed at: <https://www.environment.gov.au/system/files/resources/5d409ae7-a726-4fec-b50b-d54b88bd6e31/files/national-recovery-plan-white-throated-snapping-turtle.pdf>

Ecotox Services Australia, 2012. *Appendix F - Toxicity Assessment of Three Samples from the Dawson River, Acqua Della Vita Pty Ltd*. Prepared for Santos LTD

Ecotox Services Australia, 2013. *Appendix F - Toxicity Assessment of Boron in River Water, Acqua Della Vita Pty Ltd*. Prepared for Santos LTD

Environmental authority, 2020. *Appendix D - Fairview Arcadia Project Area Environmental Authority, EPPG00928713 Permit*.

EPBC Act Protected Matters Report, 2019. *Appendix C - EPBC Protected Matters Search*. Prepared for Santos LTD

EPBC Act Referral, 2021. *2021/8914 - Fairview Water Release Scheme, 50km east of Injune, QLD*, Australian Government – Department of Agriculture, Water and the Environment.

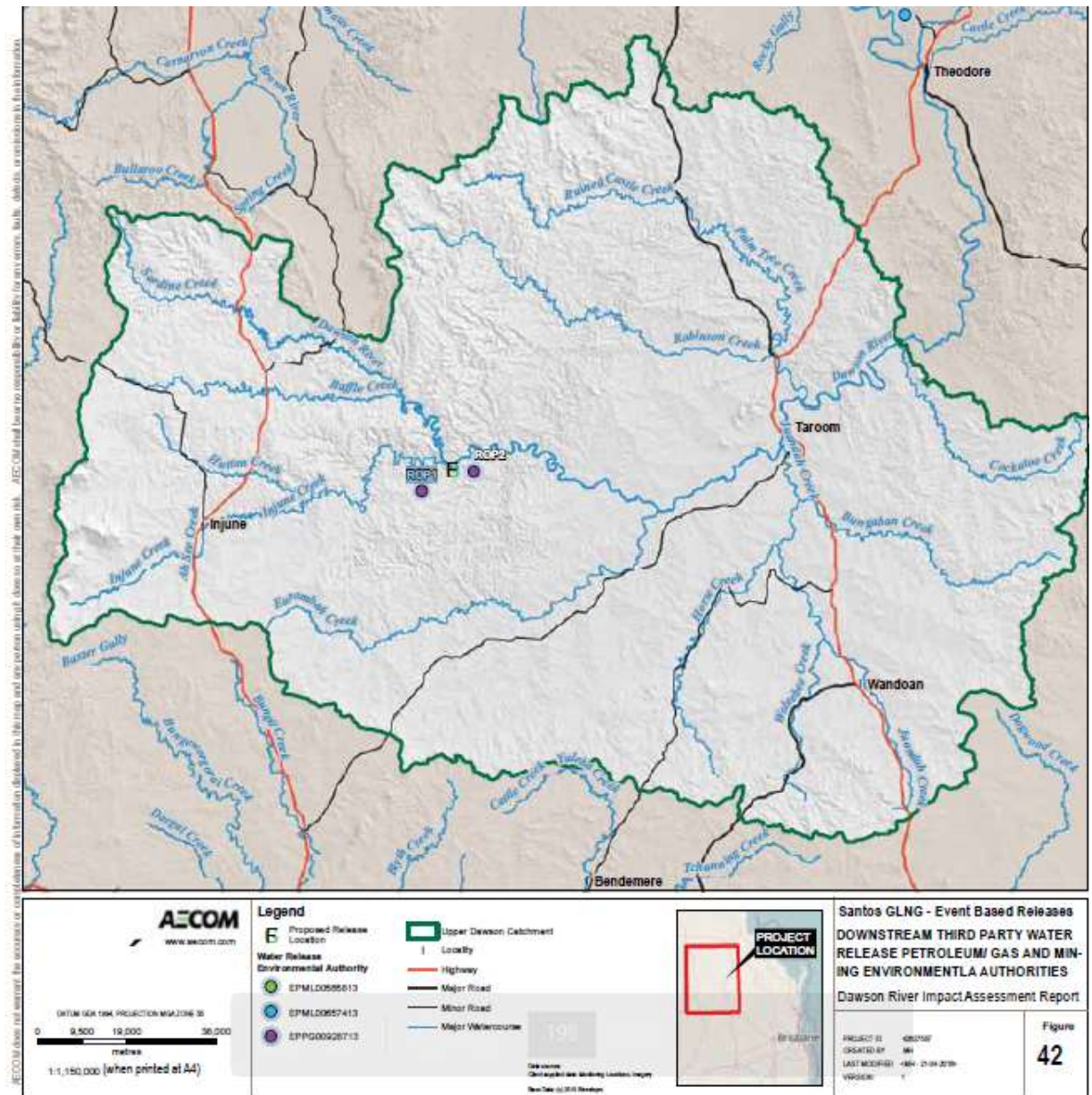
FRC Environmental, 2018. *Appendix B - Fairview Watercourse Releases – Dawson River*. Prepared for Santos LTD

FRC Environmental, 2021. *Santos Ltd Dawson River Watercourse Releases, Receiving Environment Monitoring Program*. Final Report Prepared for Santos GLNG

Halcrow Pacific Pty Limited, 2012. *Appendix F - Dawson River Release Scheme, Direct Toxicity Assessment*. Prepared for Santos GLNG Project

Halcrow Pacific Pty Limited, 2013. *Appendix F - Dawson River Release Scheme, Direct Toxicity Assessment: Fish Test*. Prepared for Santos GLNG Project

Attachment A –Monitoring Locations Water Storage Dams



Attachment B – Surface Water Monitoring Locations

