Appendix 1: Additional information requirements for the Supplementary Environmental Report

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Attachment 1 – Additional information requirements for the Supplementary Environmental Report Santos - Darwin Pipeline Duplication Project

Environmental Factor	Context	Additional Information Required
WHOLE OF ENVIRONMENT		
General	Section 42(c) of the *Environment Protection Act 2019* (EP Act) requires that the environmental impact assessment process considers the potential for less environmentally damaging alternative approaches, methodologies or technologies for actions. The potential significant impacts of the proposal to construct and operate a new pipeline to provide gas to DLNG have not been compared to the potential significant impacts of alternatives to the project, including providing gas to DLNG utilising existing pipelines.	1. Provide the rationale for duplication of the existing Bayu-Undan pipeline, given that the potential significant environmental impacts of the proposal could be avoided through use of the existing pipeline. 2. Provide a detailed analysis of the potential significant environmental impacts of alternative approaches, methodologies or technologies for the action, demonstrating how the decision to proceed with the preferred option has been made with consideration of section 42(c) of the EP Act, and application of the environmental decision-making hierarchy, waste management hierarchy and principles of ecologically sustainable development. The analysis of alternatives must include the option of repurposing the existing Bayu-Undan pipeline for transport of gas to DLNG.
	Section 43 of the EP Act includes general duty of proponents.	3. Provide an update to demonstrate how the general duty requirements have been met in relation to information in the SER.
AIR		
Atmospheric processes	The extent of the impact from greenhouse gas emissions is uncertain and the ability to meet the NT EPA's environmental objective for atmospheric processes requires assessment. The emission of greenhouse gases would be an indirect consequence of the operation of the DPD, and the DPD is a substantial cause of those emissions[1].	4. Provide details of the greenhouse gas emissions over the life of the proposal (from extraction from the reservoir through to completion of liquefaction) including: a) estimates of annual and total scope 1, scope 2 and scope 3 emissions over the life of the proposal b) a breakdown of scope 1, scope 2 and scope 3 emissions according to the emission source locations within the NT and / or elsewhere in Australia and / or outside of Australia

[1] The Environment Protection Act 2019 (Section 10(1)(b)) definition of an impact includes 'an event or circumstance that is an indirect consequence of the action and the action is a substantial cause of that event or circumstance'.

Environmental Factor	Context	Additional Information Required
	The referral does not account for operational greenhouse gas emissions from the extraction and supply of natural gas from Barossa through the pipeline to DLNG. The referral does not discuss the avoidance, minimisation or offset of greenhouse gas emissions associated with the extraction and supply of product that would be transported through the pipeline.	c) a breakdown of emissions by source, including but not limited to stationary energy, fugitives and transport d) a comparison of estimated emissions from the proposal against the proponent's emissions across its entire business, and Northern Territory and Australian greenhouse gas emissions as reported in Australia's National Greenhouse Accounts. 5. Demonstrate how the proposal will be implemented to meet the NT EPA's objectives for the Atmospheric Processes environmental factor and the NT Government's goal of achieving net zero greenhouse gas emissions by 2050. 6. Provide overarching long-term emissions target trajectory and proposed interim targets, and the measures and methods that will be used to meet the targets. 7. Demonstrate application of the decision-making hierarchy (part 2 of the EP Act), and that all reasonable and practicable measures would be applied to avoid and/or reduce emissions, including through best practice design, technology and management. 8. Provide a description of any regulatory frameworks (including any licences, approvals or permits required), for greenhouse gas emissions within the NT, elsewhere in Australia or outside of Australia.
SEA		
Marine environmental quality	Increased suspended sediment generated during the construction of the proposal has the potential to cause significant direct and indirect impacts on water quality and benthic fauna and habitats. The referral suggests that trenching is expected to result in 'pulses' of increased turbidity, causing reduced impacts compared to continued high turbidity. The basis for this assumption is unclear. The proponent has not conducted sediment dispersion modelling. The proponent committed to conduct sediment dispersion modelling to predict the extent, intensity and persistence of dredge generated sediment plumes, and the extent, severity and	9. Provide interpreted outcomes of proposal-specific sediment dispersion / plume modelling. The model must be developed using relevant contemporary modelling methodology, and address all proposal activities that have the potential to generate turbid plumes. 10. Revise the impact assessment for sedimentation in the context of: a) proposal-specific data, b) sediment dispersion/plume modelling outputs, and c) updated habitat data (see below). 11. Provide a draft trenching/dredging and spoil disposal management plan (DSDMP) for sub-sea trenching activities that includes:

Environmental Factor	Context	Additional Information Required
	duration of resultant impacts on water quality and biota.	a) baseline (pre-construction) condition of habitats within the zone of influence of the proposal (as required above) and relevant parameters to be monitored to detect impacts b) quantitative trigger levels for relevant parameters (and description of their derivation) corresponding to investigative and/or adaptive management actions that must be taken in the event that monitoring indicates trenching/dredging activities are likely to impact sensitive receptors c) quantitative limit values relevant parameters (and description of their derivation) corresponding to stop work, recommencement and/or investigative actions if sensitive receptor monitoring results exceed limit values.
Marine environmental quality	The referral indicates that a cofferdam and / or temporary groyne may be required at the proposed pipeline shore crossing (~30 m north of the existing Bayu-Undan pipeline crossing). Construction and operation of these structures has the potential to impact water quality and would potentially involve the removal of sensitive mangrove habitat.	12. Provide details of any infrastructure and methods required for construction of the pipeline at the shore crossing 13. Identify and map potential impacts (including cumulative impacts) and proposed measures that would be applied to ensure construction impacts are not significant.
Marine environmental quality	Hydrotest water which may contain biocide, oxygen scavengers, dye and / or other chemicals may be used during scheduled flood / clean / gauge / testing (FCGT) and dewatering, or in the case of an unexpected failure in the pipeline during installation, or wet buckle event. Section 3.5.2.7 of the referral specifies that during planned activities all FCGT fluids would be discharged to Commonwealth waters, but that in the case of an unexpected event discharge to NT waters could occur.	14. Demonstrate how marine environmental quality would be protected in the event of discharge of hydrotest water in NT waters. 15. Demonstrate that any discharge of hydrotest water in Commonwealth waters would not cause an exceedance of the 99% species protection level in any NT waters e.g. if a discharge were to be near the jurisdiction boundary. 16. Describe the proposed mitigation measures to manage potential impacts of hydrostatic test water discharges to the marine environment. Include detail about hydrostatic test water discharge characterisation, dispersion modelling, physical and toxicity impacts, marine fauna impacts, chemical selection and dosing, discharge volume and rate, and criteria for toxicant concentrations in discharge water. Include consideration of how the 99% species protection concentration (ANZG) would be met for high conservation ecosystems or chemicals that have a tendency to bioaccumulate.

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Marine ecosystems	The works proposed, including but not limited to trenching/dredging, spoil disposal, and pipeline trench backfill activities, have the potential to cause direct and indirect impacts to benthic habitat including through removal, smothering or reduction of photosynthetically active radiation. In the referral these impacts are addressed on the basis of predictive habitat modelling, data collected for the INPEX project, and data collected by RPS. However, these data are not considered adequate to assess the potential impact of the proposal on benthic habitats within the pipeline footprint and the zone of influence.	17. Provide the outcome of additional benthic habitat surveys of the proposal footprint and the zone of influence in Darwin Harbour, at the proposed spoil disposal site, and on knolls and rocky/mixed sedimentary environments within the zone of influence outside of Darwin Harbour. Surveys should use appropriate methods, with sufficient sampling intensity to provide robust understanding of baseline extent and composition of benthic primary producer habitats (see submission from the Department of Environment, Parks and Water Security). Survey design should be developed in consultation with the Flora and Fauna Division of Department of Environment, Parks and Water Security. 18. Revise the assessment of potential impacts to benthic habitats (including seagrass meadows in Fannie Bay, Shoal Bay and Casuarina Coastal Reserve) using the benthic habitat survey data and sediment dispersion model outputs.
Marine ecosystems	Noise generated during the construction of the proposal has the potential to cause significant direct and indirect impacts on marine megafauna including turtles, dugongs and dolphins. The proponent has committed to conducting underwater noise modelling.	19. Provide an underwater noise assessment conducted using contemporary best practice, including interpreted outcomes of underwater noise modelling, and modelling of cumulative noise resulting from the proposal and existing activities at sensitive receptors. 20. Provide a detailed draft marine megafauna management plan for construction activities that includes: a) baseline (pre-construction) cumulative noise within the zone of influence of the proposal and relevant parameters to be monitored to detect impacts b) noise trigger levels for relevant parameters (and description of their derivation) corresponding to actions that must be taken in the event that monitoring indicates that construction activities are likely to impact protected species c) management actions to be applied if noise triggers are exceeded in accordance with the environmental decision-making hierarchy.
Marine ecosystems	The proposal may have significant environmental impacts on marine biota through disturbance of the Charles Point Reef Fish Protection Area.	21. Provide an assessment of potential impacts to important subsea structure/s within the Charles Point Reef Fish Protection Area and the measures that would be applied to ensure impacts are not significant.

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	The referral states that the only disturbance in the area would be a localised and temporary decrease in water quality, however Fisheries has advised that the reef protection area contains important subsea structure which was the primary reason for the declaration of the area for protection. Fisheries has provided Santos a spatial layer of the important area.	
Marine environmental quality Marine ecosystems	Cumulative impacts have been given perfunctory attention in the referral. There are a number of proposed actions being considered by the NT EPA that are proposing dredging in Darwin Harbour, and there will be ongoing maintenance dredging requirements for existing projects in the harbour. The pressures on the harbour environment are increasing and must be appropriately considered and managed by proponents.	22. The monitoring program for the draft DSDMP must provide for the assessment of cumulative impacts associated with trenching/dredging and spoil disposal, including from the addition of concurrent or consecutive dredging programs. The DSDMP should include: a) a communications strategy for engaging with government authorities and other proponents undertaking or proposing to undertake dredging in the harbour; and b) a proposed approach to managing dredging in coordination with other proponents/dredging projects to avoid significant cumulative impacts to Darwin Harbour from dredging activities.