

Acceptance of the Santos WA Northwest Pty Ltd Dorado Development Offshore Project Proposal

Document No: A903279

Date: 10 February 2023

The National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) provides the following Statement of Reasons for its decision to accept the Dorado Development Offshore Project Proposal (OPP), in accordance with regulation 5D of the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the Environment Regulations).

Relevant terms

1. In this statement, in addition to the above, the following words and phrases have the following meaning:
 - a. The *Offshore Petroleum and Greenhouse Gas Storage Act 2006* is referred to as the OPGGS Act.
 - b. The offshore project is the Dorado Development Offshore Project Proposal (Ref: 7800-011-PRP-001, Revision 7, dated 19 December 2022).
 - c. The *Environment Protection and Biodiversity Conservation Act 1999* is referred to as the EPBC Act.
 - d. The proponent is Santos WA Northwest Pty Ltd.
 - e. Principles of ecological sustainable development (ESD) means the principles set out in section 3A of the EPBC Act.
 - f. Other terms used in this Statement of Reasons may be defined in the Environment Regulations and the OPGGS Act.
 - g. EPBC Program refers to environmental management authorisation process for petroleum and greenhouse gas storage activities administered by NOPSEMA under the Environment Regulations endorsed by the Minister for Environment under section 146 of the EPBC Act.
 - h. The Strategic Assessment Report for strategic assessment of the environmental management authorisation process for petroleum and greenhouse gas storage activities administered by NOPSEMA under the OPGGS Act is referred to as the SAR.
2. Terms used in this Statement of Reasons which are defined in the Environment Regulations or the OPGGS Act have the same meaning as under the Environment Regulations or OPGGS Act.

Decision

3. On 10 February 2023, NOPSEMA decided pursuant to regulation 5D(5)(a) of the Environment Regulations to accept the Dorado Development OPP.
4. Notice of the decision was provided to the proponent on 10 February 2023.

Authority

5. The decision maker for the purposes of regulation 5D of the Environment Regulations is the 'Regulator'. The Regulator is defined in regulation 4 of the Environment Regulations to mean NOPSEMA.
6. I, Stuart Smith, am the decision maker responsible for this decision. I hold the position of Acting Chief Executive Officer (CEO) within NOPSEMA. Pursuant to subsection 666(2) of the OPGGS Act, anything done by the CEO in the name of NOPSEMA is taken to have been done by NOPSEMA.
7. In this Statement of Reasons:
 - a. When I refer to NOPSEMA having made a request, I am referring to a request made by me.
 - b. When I refer to NOPSEMA having considered or having had regard to a matter, whether it be expressed in those words or similar phrasing, I am referring to a matter that I have considered or taken into account; and
 - c. When I refer to NOPSEMA making a finding of fact or accepting a submission, I am referring to a finding made by me.
8. In making this decision, I have taken into account and accepted advice and recommendations from the assessment team within NOPSEMA.

Legislative framework

9. Part 1A of the Environment Regulations concerns offshore policy proposals. This section of the statement of reasons summarises this legislative framework, in so far as it is relevant to the current decision.
10. Subregulation 5A(1) provides that before commencing an offshore project, a person must submit an offshore project proposal to the Regulator (except in the limited circumstances specified in subregulation 5A(2)). Regulation 5A stipulates that the proposal must be in writing (subregulation 5A(4)), and must contain particular information (subregulations 5A(5) to (8)). The Regulator may request further information about any matter required by regulation 5A to be included in the proposal under regulation 5B.
11. Subregulation 5C(2) sets out specific criteria that a proposal must meet for it to be suitable for publication. Once the Regulator is reasonably satisfied these criteria are met, it must decide that the proposal is suitable for publication, publish the proposal and invite public comments (subregulations 5C(1)(a) and (3)).

Subregulation 5D(1) provides that as soon as practicable after the end of the period of public comment for an offshore project proposal mentioned in subparagraph 5C(3)(b)(ii), the proponent:

- a. may alter the content of the proposal; and
- b. must give the Regulator another copy of the proposal (whether or not the proponent has altered its content); and
- c. must include with the copy of the proposal:
 - i. a summary of all comments received; and
 - ii. an assessment of the merits of each objection or claim about the project or any activity that is part of the project; and

- iii. a statement of the proponent's response or proposed response to each objection or claim, including a demonstration of the changes, if any, that have been made to the proposal as a result of an objection or claim.

13. Subregulation 5D(2) provides that the Regulator may request the proponent provide further written information about any matter required to be included in the proposal under regulation 5A or paragraph 5D(1)(c). Subregulations 5D(3) and (4) set out how these requests must be made, and provides that the Regulator must have regard to the information as if it had been included in the proposal.

14. Subregulation 5D(5) and (6) are the key provisions for the purposes of this decision. They provide:

(5) Within 30 days after the proponent gives the Regulator a copy of the proposal as described in paragraph 5D(1)(b):

- a. if the Regulator is reasonably satisfied that the proposal meets the criteria set out in subregulation (6), the Regulator must accept the proposal; or
- b. if the Regulator is not reasonably satisfied that the proposal meets the criteria set out in subregulation (6), the Regulator must refuse to accept the proposal; or
- c. if the Regulator is unable to make a decision on the proposal within the 30 day period, the Regulator must give the proponent notice in writing and set out a proposed timetable for consideration of the proposal; and

(6) For subregulation (5), the criteria are that the proposal:

- a. adequately addresses comments given during the period for public comment; and
- b. is appropriate for the nature and scale of the project; and
- c. appropriately identifies and evaluates the environmental impacts and risks of the project; and
- d. sets out appropriate environmental performance outcomes that:
 - i. are consistent with the principles of ESD; and
 - ii. demonstrate that the environmental impacts and risks of the project will be managed to an acceptable level; and
- e. does not involve an activity or part of an activity being undertaken in any part of a declared World Heritage property within the meaning of the EPBC Act.

15. Section 3A of the EPBC Act provides:

The following principles are principles of ecologically sustainable development:

- a. Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social, and equitable considerations.
- b. If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- c. The principle of inter-generational equity—that the present generation should ensure that the health, diversity, and productivity of the environment is maintained or enhanced for the benefit of future generations.

The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making.

- d. Improved valuation, pricing and incentive mechanisms should be promoted.

The assessment process

16. On 22 September 2020, in accordance with regulation 5A of the Environment Regulations, the proponent submitted an OPP (Revision 0, 22 September 2020) for assessment by NOPSEMA in relation to its suitability for publication in accordance with regulation 5C.
17. In accordance with regulation 5B of the Environment Regulations, NOPSEMA requested the proponent provide further written information about matters required by regulation 5A on two occasions: 22 October 2020 and 22 June 2021.
18. On 19 August 2021, NOPSEMA decided that Revision 2 of the OPP (which had been provided by the proponent on 20 July 2021) was suitable for publication in accordance with regulation 5C of the Environment Regulations.
19. Following publication of Revision 2 of the OPP and a six-week public comment period, and in accordance with regulation 5D of the Environment Regulations, the proponent submitted another copy of the OPP to NOPSEMA on 3 December 2021 (Revision 3, 3 December 2021).
20. A NOPSEMA assessment team assessed the OPP against the criteria set out in subregulation 5D(6). The findings and conclusions of the general assessment and each topic assessment were considered together to form a view as to whether the OPP, as a whole, met the criteria in subregulation 5D(6).
21. The assessment team comprised an assessment manager, lead assessor and appropriately experienced NOPSEMA environment specialists with expert knowledge in environmental and marine science relevant to the OPP and its associated environmental impacts and risks. The assessment included an examination of higher order environmental impacts and risks, with the specialist NOPSEMA assessors paying particular attention to those matters. The assessment included a general assessment of the whole OPP and three detailed topic assessments of the OPP content, as follows:
 - a. matters protected under Part 3 of the EPBC Act, focussing on potential environmental impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise, listed threatened and migratory marine turtles arising from artificial light and whale shark foraging;
 - b. unplanned emissions and discharges; and
 - c. planned emissions and discharges (greenhouse gas emissions).
22. NOPSEMA made four requests under subregulation 5D(2)(a) of the Environment Regulations for further information. In response to each request, the proponent submitted a further revised copy of the OPP, in accordance with subregulation 5D(4) of the Environment Regulations:
 - a. On 1 February 2022, NOPSEMA requested the proponent to provide further written information, including in relation to the following environmental management themes:
 - i. greenhouse gas emissions reduction, assessment, evaluation of impacts and risks, and management;
 - ii. evaluation of alternative energy efficiency/emissions reduction technologies;
 - iii. evaluation of environmental impacts and risks of unplanned hydrocarbon and chemical spills;

- iv. further evaluation of, and evidence to demonstrate that the offshore project will be undertaken in a manner that will prevent hydrocarbon spills from occurring;
- v. evaluation of produced water management options;
- vi. evaluation of environmental impacts to fauna, including birds, blue whales, and marine turtles;
- vii. further demonstration that the OPP is not inconsistent with and has regard to relevant species conservation requirements;
- viii. appropriate environmental performance outcomes that are consistent with the principles of ESD; and
- ix. decommissioning requirements.

On 18 March 2022, the proponent responded to NOPSEMA's request with further information which was incorporated into a resubmitted OPP (Revision 4, 18 March 2022).

- b. On 6 May 2022, NOPSEMA requested the proponent to provide further written information, including in relation to the following environmental management themes:
 - i. greenhouse gas emissions reduction, assessment, evaluation of impacts and risks, and management;
 - ii. evaluation of impacts from bioaccumulating contaminants in waste discharges.
 - iii. evaluation of impacts to commercial fishers;
 - iv. evaluation of light and noise impacts;
 - v. evaluation of environmental impacts and risks of unplanned hydrocarbon spills; and
 - vi. appropriate environmental performance outcomes relating to fugitive emissions, decommissioning, and management of the offshore project to minimise impacts on whales.
- c. On 30 May 2022, the proponent responded to NOPSEMA's request with further information which was incorporated into a resubmitted OPP (Revision 5, 27 May 2022).
- d. On 29 June 2022, NOPSEMA requested the proponent to provide further written information, including in relation to the following environmental management themes:
 - i. greenhouse gas emissions reduction, assessment, evaluation of impacts and risks, and management; and
 - ii. appropriate environmental performance outcomes relating to interactions with other marine users, bioaccumulation of contaminants in waste discharges, and managing impacts of underwater noise on whales.
- e. On 14 July 2022, the proponent responded to NOPSEMA's request with further information which was incorporated into a resubmitted OPP (Revision 6, 14 July 2022).
- f. On 15 August 2022, NOPSEMA requested the proponent to provide further written information, including in relation to the following environmental management themes:
 - i. greenhouse gas emissions reduction, assessment, evaluation of impacts and risks, and management; and

- ii. appropriate environmental performance outcome relating to the management of impacts on key ecosystems in Australia.
 - g. On 19 December 2022, the proponent responded to NOPSEMA's request with further information which was incorporated into a resubmitted OPP (Revision 7, dated 19 December 2022).
23. On 10 February 2023, under subregulation 5D(5)(a) of the Environment Regulations I accepted the assessment team's recommendation that the OPP met the criteria in subregulation 5D(6). In so doing, I have considered and agree with each of the findings and conclusions made by the assessment team in relation to the general assessment and each topic assessment. Notice of this decision was provided to the proponent on 10 February 2023.

Key materials considered in making the decision

24. The key materials that NOPSEMA considered in making this decision included:
- a. The OPP, comprising:
 - i. the proposal submitted to NOPSEMA by Santos, as revised from time to time including Revision 7, dated 19 December 2022; and
 - ii. supporting documentation (Attachments 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 and 14).
 - b. The legislative framework relevant to OPP assessments:
 - i. the OPGGS Act;
 - ii. the Environment Regulations; and
 - iii. the Endorsed EPBC Program¹.
 - c. NOPSEMA policies, guidance, information papers, bulletins, and procedures:
 - i. NOPSEMA, PL1650 – Offshore Project Proposal assessment, (August 2020);
 - ii. NOPSEMA, N-04790-GN1663 – Offshore project proposal content requirements, (August 2020);
 - iii. NOPSEMA, GN1488 – Oil pollution risk management (February 2021);
 - iv. NOPSEMA, N-04790- IP1664 – Information paper – Making public comment on offshore project proposals (August 2020);
 - v. NOPSEMA, N-04750-IP1765 – Information Paper - Acoustic impact evaluation and management (June 2020);
 - vi. NOPSEMA, N-04750-IP1899 – Information Paper – Reducing marine pest biosecurity risks through good practice biofouling management (October 2020);
 - vii. NOPSEMA, Environment Bulletin – Oil Spill Modelling (April 2019); and
 - viii. NOPSEMA, N-04790 – SOP1678 - Offshore project proposal assessment standard operating procedure (Revision 3, May 2020).
 - d. Comments received from the public on the OPP during the statutory public comment period, 20/08/2021 – 29/10/2021.

¹ <https://www.environment.gov.au/protection/assessments/strategic/offshore-petroleum-greenhouse-gas>

- e. Technical advice from the former Department of Industry, Science, Energy and Resources (DISER) and its successor Department of Industry, Science and Resources (DISR) on the case made in the Dorado Development OPP (Revision 5) that new oil fields can be developed while achieving the intent of International Energy Agency's (IEA's) Sustainable Development Scenario (SDS) and not foregoing meeting the goals of the Paris Agreement.
- f. Recorded findings of NOPSEMA's assessment team regarding assessment of how the OPP was considered to meet the requirements of the Environment Regulations.

Project summary

- 25. The proponent intends to develop and produce oil from the Dorado field which is part of the Bedout Sub-basin approximately 140km offshore from Port Hedland in Western Australia and is within petroleum titles WA-437-P and WA-438-P (Phase 1). Phase 1 will include:
 - a. a wellhead platform (WHP) with up to sixteen wells (production and gas injection);
 - b. a floating production, storage and offloading (FPSO) facility;
 - c. subsea flowlines and umbilicals between the WHP and the FPSO facility; and
 - d. potential future tie-backs.
- 26. Any future tie-backs will connect back to the WHP and FPSO. Recovered gas will be reinjected to the Dorado reservoir to enhance oil recovery.
- 27. The proponent confirmed that the matters set out in Attachment 1 of this SOR provide an accurate summary of the key characteristics of Phase 1 of the Dorado Development Offshore Project covered by the OPP.

Consideration and findings of material facts

- 28. NOPSEMA considered the OPP and made the following findings of fact.

Consideration and findings of material facts in relation to the content [regulation 5A]

Proponent's name and contact details [regulation 5A(5)(a)]

- 29. NOPSEMA considered the OPP and found that:
 - a. Santos WA Northwest Pty Ltd is identified in the OPP as the proponent for the offshore project; and
 - b. The proponent's contact details provided in the OPP include an address, phone number, facsimile number, and email, as well as a web link to the proponent's website.
- 30. Based on the above findings (clause 29), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(a) are met.

Project summary: description of each activity part of the project [regulation 5A(5)(b)(i)]

- 31. NOPSEMA considered the project summary in the OPP, including the description of each activity that is part of the offshore project, and found that:
 - a. The OPP explains that the proponent's business strategy is to produce oil from the Dorado field and potentially from future tie-backs (Phase 1). In this phase, the recovered gas will be reinjected to the

Dorado reservoir to enhance oil recovery. There is potential for a second phase of development to recover and export the gas however, Phase 2 of the Dorado Development would require separate assessment and regulatory approval.

- b. The OPP provides details of key characteristics of the offshore project, including geographic locations of infrastructure and activities as well as their scale, duration, and timing. The project description has also informed the understanding of the extent of the environment that may be affected (EMBA) and the nature and scale of the offshore project.
- c. It was clear that the offshore project involves the use of up to three WHPs and a FPSO facility to develop the Dorado field. A comprehensive description of the project activities, as identified by the proponent, was provided; and
- d. There is an emphasis in the OPP on both infrastructure and activities. It was clear that all infrastructure and activities that are part of the project are in Commonwealth waters.

32. Based on the above findings (clause 31), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(b)(i) are met.

Project summary: description of the location of each activity [regulation 5A(5)(b)(ii)]

33. NOPSEMA considered the project summary in the OPP, including the description of the location or locations of each activity that is part of the project, and found that:

- a. The location or locations of each activity are detailed in diagrams, figures and coordinates depicting the geographic areas within which:
 - i. the proposed Project Area for the Dorado Development will take place (Figure 1-2); and
 - ii. the EMBA from planned and unplanned aspects of the offshore project (Figure 3-1).
- b. The exact locations of the WHP and FPSO facility are indicative at this stage and accurate infrastructure lay out and locations within the proposed Project Area will be refined during future project design phases and will be subject to future EP assessments. The exact locations of any future tie-backs are also not defined at this stage but will be located within the Project Area.
- c. With reference to the diagrams, figures and coordinates depicting the location of the proposed activities, it is evident that:
 - i. the Project Area does not intersect any Australian Marine Parks (AMPs); and
 - ii. the project does not involve any planned activity or part of an activity within any part of a declared World Heritage property.

34. Based on the above findings (clause 33), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(b)(ii) are met.

Project summary: proposed timetable [regulation 5A(5)(b)(iii)]

35. NOPSEMA considered the project summary in the OPP, including the proposed timetable for carrying out the project, and found that:

- a. The project schedule is summarised in Table 6-3 of the OPP which includes the indicative duration of each phase of the project; and
- b. The OPP contains a target start date for the commencement of operations of 2027 with a project life of 20 years.

36. Based on the above findings (clause 35), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(b)(iii) are met.

Project summary: description of facilities proposed for each activity [regulation 5A(5)(b)(iv)]

37. NOPSEMA considered the project summary in the OPP, including the description of the facilities that are proposed to be used to undertake each activity, and found there is a clear description of facilities. For example:

- a. The WHP (and up to two other WHPs for potential future tie-backs) will be positioned over the Dorado field. They will be designed as not normally crewed platforms that are remotely powered and operated from the FPSO facility. The WHP will be a steel substructure that will accommodate 16 slots for production and gas reinjection wells with associated instrumentation, gathering manifolds and metering of production fluids.
- b. Up to 38 wells may be drilled at the Dorado oil field, being a combination of oil and gas development wells and gas reinjection wells. These will be comprised of up to 16 wells on the WHP (six oil production, two gas production, two gas reinjection, and up to six additional wells that are a combination of production and gas reinjection wells), and up to 22 wells for potential future tie-backs.
- c. Initially, 10 wells will be drilled and completed using a jack-up mobile offshore drilling unit (MODU). Production wells for potential future tie-backs may be drilled with either a semi-submersible or jack-up MODU, depending on water depth.
- d. For the WHP and FPSO facility, the subsea system will consist of flowlines (initially two hydrocarbon production flowlines and one gas reinjection flowline), risers and an umbilical. The flowlines will transport production fluids from the WHP to the FPSO facility and will transport reinjection gas from the FPSO facility to the WHP. The umbilical will transfer electrical signals, hydraulic fluids, chemicals and communication signals to wellheads and other equipment requiring remote control from the FPSO facility.
- e. The FPSO facility will be located approximately 2.2km from the WHP and will enable the production fluids to be processed and exported periodically from the Project Area. The export of product from the FPSO facility is expected to occur up to once a week during the initial stages of production, before transiting to a less frequent schedule.
- f. The FPSO facility will be double hulled and have a disconnectable turret mooring (DTM) system to allow the FPSO facility to move away from the field under its own power if required (such as during adverse weather conditions and planned and unplanned maintenance requirements). Prior to the DTM arriving on site, some or all the anchor piles may be pre-laid using support vessels. Pre-laid anchors will be connected to the DTM mooring lines on arrival with the tension of the mooring lines being adjusted into the required position. The FPSO facility will have thrusters for positioning under offloading conditions.

38. Based on the above findings (clause 37), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(b)(iv) are met.

Project summary: description of actions proposed following project completion [regulation 5A(5)(b)(v)]

39. NOPSEMA considered the project summary in the OPP, including the description of the actions proposed to be taken following completion of the project in relation to the facilities, and found that:

- a. The OPP states that the project will be decommissioned in accordance with the prevailing legislation at the time.
 - b. The OPP recognises that the complete removal of infrastructure and the plugging and abandonment of wells is the default decommissioning requirement under the OPGGS Act and that this is consistent with Australia's international obligations to remove disused installations and structures.
40. Based on the above findings (clause 39), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(b)(v) are met.

Description of existing environment that may be affected [regulation 5A(5)(c)]

41. NOPSEMA considered the OPP content that describes the existing environment that may be affected by the project and found that:
- a. The OPP describes the environment in section 3 of the OPP.
 - b. The description includes the ecosystems and their constituent parts, including people and communities, natural and physical resources, the heritage value of places and the social, economic, and cultural environment and their associated values and sensitivities.
42. Based on the above findings (clause 41), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(c) are met.

Details of the particular relevant values and sensitivities of the environment that may be affected [regulation 5A(5)(d)]

43. NOPSEMA considered the particular relevant values and sensitivities of the existing environment detailed in the OPP, including matters protected under Part 3 of the EPBC Act, and found that:
- a. The OPP includes details of the particular relevant values and sensitivities within the environment that may be affected by the project (section 3 of the OPP).
 - b. Examples included, threatened and migratory marine mammals, fishes, marine reptiles, birds, Australian Marine Parks, Western Australian State marine and terrestrial protected areas, Ramsar wetlands, Western Australian State and Commonwealth commercial fisheries, World Heritage Places, Commonwealth Heritage Places, National Heritage Places, and cultural heritage, including First Nations.
44. Based on the above findings (clause 43), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(d) are met.

Environmental performance outcomes for the project [regulation 5A(5)(e)]

45. NOPSEMA considered the Environmental Performance Outcomes (EPOs) for the project and found that the OPP sets out EPOs which:
- a. are relevant to all identified environmental impacts and risks arising from the project, including the higher order environmental impacts and risks arising from planned discharges including GHG emissions, anthropogenic underwater noise, artificial light and hydrocarbon spill risks; and
 - b. establish measurable levels for management of environmental aspects of activities that are part of the offshore project.

46. Key considerations relating to the appropriateness of the EPOs set out in the OPP are provided at clauses 63-136 below.

47. Based on the above findings (clauses 45 and 46), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(e) are met.

Description of feasible alternatives [regulation 5A(5)(f)]

48. NOPSEMA considered the description in the OPP of feasible alternatives to the project, or activity that is part of the project, including the comparison of the environmental impacts and risks arising from the project or activity and the alternatives, as well as the detailed explanation of why the alternatives were not preferred, and found that:

- a. feasible alternatives to the project are described, including three different project concepts:
 - i. WHP with an FPSO facility;
 - ii. WHP with a central processing platform and a floating, storage and offloading facility; and
 - iii. WHP with a gravity-based storage structure.
- b. an assessment of these options is provided including environmental, technical feasibility, safety, economic and social criteria resulting in the first project concept, option (i) above, being selected.
- c. alternatives within the preferred overall project design are also described. Such alternatives included consideration of options associated with production trees, facility, mooring design, power supply, reservoir management, flaring management, and produced water treatment and disposal. The OPP also provides a comparison of environmental impacts from these alternatives with reasons given as to why the selected options for the offshore project elements and activities were preferred.
- d. an explanation, in adequate detail, as to why each feasible option was not preferred is provided in the OPP.

49. Based on the above findings (clause 48), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(5)(f) are met.

Description of requirements [regulation 5A(7)]

50. NOPSEMA considered the description in the OPP of the requirements, including legislative requirements, that apply to the project and are relevant to the environmental management of the project and found that:

- a. The OPP includes details of the requirements, including legislative requirements, that apply to the project and are relevant to the environmental management of the project. These include, but are not limited to:
 - i. OPGGS Act and Environment Regulations;
 - ii. EPBC Act and Regulations;
 - iii. *Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (MARPOL)* and *Protection of the Sea (Prevention of Pollution from Ships) (Orders) Regulations 1994*;
 - iv. *Biosecurity Act 2015*, Australian Ballast Water Management Requirements 2020, and Quarantine Regulations 2000;

- v. National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015 (Cth) (SGM) made under the *National Greenhouse and Energy Reporting Act 2007* (Cth) (NGERS);
- vi. listed threatened species recovery plans, conservation advice and threat abatement plans;
- vii. management plans for places and areas approved under the EPBC Act;
- viii. other approvals required under the OPGGS Act besides the OPP, relevant Commonwealth legislation, and relevant international agreements; and
- ix. other relevant Commonwealth legislation.

b. The OPP describes how those requirements will be met.

51. Based on the above findings (clause 50), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(7) are met.

Environmental impacts and risks: details and evaluation [regulation 5A(8)]

52. NOPSEMA considered the OPP and found that it details the environmental impacts and risks for the project. This content is provided in sections 7.2, 7.3 and 7.4 of the OPP, and covers environmental impacts and risks relating to:

- a. planned events, including from:
 - i. discharges – drilling fluids and cuttings discharges;
 - ii. discharges – produced water discharges;
 - iii. discharges – wastewater discharges;
 - iv. emissions – artificial light;
 - v. emissions – acoustic emissions;
 - vi. emissions – greenhouse gas;
 - vii. emissions – atmospheric;
 - viii. physical presence – interactions with other users; and
 - ix. physical presence – seabed disturbance; and
- b. unplanned events and potential emergency conditions, including from:
 - i. accidental release – hydrocarbon and chemical spills;
 - ii. accidental release – loss of solid material;
 - iii. physical presence – introduction of invasive marine species; and
 - iv. physical presence – interaction with marine fauna.
- c. cumulative impacts.

53. NOPSEMA found that the evaluation of all the environmental impacts and risks in the OPP (refer to clause 62), are appropriate to the nature and scale of each impact or risk. Key considerations relating to the proponent's evaluation of the environmental impacts and risks are provided at clauses 63-136 below.

54. Based on the above findings (clauses 52 and 53), NOPSEMA is reasonably satisfied that the requirements of regulation 5A(8) are met.

Consideration and findings of material facts in relation to regulation 5D(6) criteria

Adequately addresses public comments [regulation 5D(6)(a)]

55. NOPSEMA found that the proposal adequately addresses comments given during the period for public comment because the OPP:
- a. Comprehensively identified and appropriately characterised the three public comments in Attachment 13 of the OPP (Dorado Development - Public Comment Report) and a submission received via third party consultation after the public comment period ended.
 - b. Included an assessment of the merits of each objection or claim raised through public comment about the project or any activity that is part of the project (Attachment 13) and considered the facts, reasons, and evidence to supporting conclusions of the assessment.
 - c. Included a statement of the proponent's response or proposed response to each objection or claim raised through public comment and suitable reasoning to support the response. Where objections and claims were determined to have merit, the OPP summarised the changes that were made to the OPP, e.g. EPO7 was revised (Attachment 13).
56. Based on the above findings (clause 55), NOPSEMA is reasonably satisfied that the requirements of regulation 5D(6)(a) are met.

Appropriate for nature and scale [regulation 5D(6)(b)]

57. NOPSEMA considered the OPP and found that the proposal is appropriate for the nature and scale of the project. NOPSEMA found that the OPP:
- a. Describes a clear and logical process for identifying the various key characteristics and activities of the project, particularly those that have potential to impact the environment and demonstrate that the process is followed consistently. For example:
 - i. Section 6 of the OPP describes the Dorado Stage 1 development in detail including the project concept, location, project area definition, the field and target hydrocarbon, Dorado Phase 1 facilities and future tie-backs and key project stages and activities (see also clauses 31 to 40).
 - ii. Project characteristics have been described in sufficient detail to inform the evaluation of potential impacts and risks to the environment, including project characteristics that result in emissions and discharges to the atmosphere or Commonwealth marine area. For example, section 7.2.6.1 of the OPP describes the sources of GHG emissions associated with stages of the Dorado Phase 1 development.
 - b. The description of activities that make up the offshore project provides a sound basis for the proponent to evaluate all environmental impacts and risks, including potential for cumulative impacts. Key activities associated with the offshore project include:
 - iii. studies undertaken in the Project Area to inform the design of the Dorado Development, such as meteorological, oceanographic, geotechnical and geophysical studies. The final locations of the WHP and FPSO facility are dependent on further geotechnical studies and detailed engineering.

- iv. geotechnical surveys of future tie-back well locations which may be undertaken to assess the suitability of the seabed for infrastructure installation. This may consist of techniques that use high-frequency sonar to provide high resolution bathymetry and geophysical data, such as side-scan sonar, sub bottom profiler or multibeam echo sounder.
 - v. initial drilling activities (10 wells) which are expected to take approximately 24 months. A maximum of 38 wells (including 22 wells for potential future tie-backs), being a combination of oil and gas development wells and gas reinjection wells, may be located in the Project Area.
 - vi. a jack-up MODU will be used to drill the Dorado reservoir, as well as accessing and constructing wells over and through the WHP. Production wells for potential future tie-backs may be drilled with either a semi-submersible or jack-up MODU, depending on water depth in the Project Area.
 - vii. activities associated with the installation, hook-up and commissioning phase include the installation of the WHP and FPSO mooring, installation, stabilisation and commissioning of the subsea system (flowlines, risers and an umbilical), and hook-up of the subsea system to the WHP and FPSO facility.
 - viii. production wells for future tie-backs within the Project Area will be either via subsea wells with subsea trees, tied-back to the WHP through a subsea system or via a new WHP installed and tied-back to the first WHP or directly to the FPSO facility. Up to two additional WHPs may be installed for potential future tie-backs.
- c. Uses a clear and logical process for identifying and describing relevant values and sensitivities of the environment that may be affected and provides a description of the environment that is adequate to inform the evaluation of impacts and risks.
- d. Includes a well-founded basis in the review and analysis of scientific evidence to support the description of the environment including protected matters, benthic habitats, sediment and water quality and other features of the environment. For example:
- i. uses EPBC Act protected matters search tool (PMST) reports (OPP Attachment 1) that identify matters of national environmental significance and other matters protected by the EPBC Act in the Project Area and EMBA (for the predicted worst-case unplanned hydrocarbon spill scenarios);
 - ii. uses benthic habitat survey (OPP Attachment 2) which characterises the existing benthic habitats and communities in the Project Area;
 - iii. uses benthic habitat modelling (OPP Attachment 3) which analyses areas with characteristic biological assemblages and environmental properties, spatial patterns and composition of the biological assemblages in the Project Area;
 - iv. uses sediment quality assessment (OPP Attachment 4) which analyses sediment samples for contaminants, nutrients and particle size distributions in the Project Area;
 - v. uses marine water quality survey (OPP Attachment 5) to measure a range of physical and chemical analytes throughout the water column at sampling locations within the Project Area;
 - vi. uses drill cuttings and fluids modelling (OPP Attachment 6) that presents the results of drill cuttings and muds discharge modelling for the Dorado Development;

- vii. uses produced formation water (PFW) modelling (OPP Attachment 7) that presents the results of PFW modelling for the Dorado Development;
 - viii. uses hydrocarbon spill modelling (OPP Attachment 8) that predicts the movement and fate of spilled hydrocarbons that would result in the event of accidental, uncontrolled releases and predicts risks to sensitive environments based on the probability of exposure above defined exposure concentrations;
 - ix. uses artificial light emissions modelling (OPP Attachment 9) that provides predictions of received levels of light for the Dorado Development in relation to the defined biologically relevant thresholds for relevant environmental receptors including marine fauna;
 - x. uses underwater noise modelling (OPP Attachment 10) that provides predictions of received levels of noise for the Dorado Development in relation to the defined biologically relevant thresholds for relevant environmental receptors including marine fauna;
 - xi. references a report on underwater noise impacts on marine fauna (OPP Attachment 11) which characterises Dorado Development noise sources, describes marine fauna sensitivity to noise, and describes potential noise-induced effects on marine fauna;
 - xii. relies upon greenhouse gas emissions quantification (OPP Attachment 12) which presents the method and results of the estimation of greenhouse gas emissions for the Dorado Development;
 - xiii. assesses and responds to public comment consultation (OPP Attachment 13); and
 - xiv. uses underwater noise modelling for vertical seismic profiling (VSP) (OPP Attachment 14) that provides predictions of received levels of noise for VSP activities associated with the Dorado development in relation to the defined biologically relevant thresholds for relevant environmental receptors including marine fauna.
- e. Adequately describes the features of the existing environment within the defined Project Area (the area defined to include the extent of all planned activities) and the worst-case unplanned hydrocarbon release EMBA (the largest spatial area predicted by modelling that could be contacted by hydrocarbons, at levels that may cause socio-economic or environmental effects from worst-case unplanned releases (LOWC scenarios) from the project). Examples include descriptions of:
- i. ecosystems, habitats, listed threatened and migratory species, biodiversity values and their constituent parts including planktonic assemblages, benthic habitats and communities (such as epifauna and infauna), banks, reefs and shoals, coastal habitats, and demersal and pelagic biota.
 - ii. Biologically important areas and habitats critical for survival for listed threatened species.
 - iii. Socio-economic features are identified and described including marine and coastal industries, i.e., commercial shipping, defence, petroleum exploration and production, marine tourism and recreation, and Commonwealth and State managed commercial fisheries.
 - iv. known cultural features and heritage values.
- f. Describes relevant values and sensitivities of the receiving environment in both a local and regional context, with detail provided on environmental sensitivities most likely to be impacted or at risk due to the project. In particular:

- i. Physical aspects of the environment such as water and sediment quality, bathymetry, seabed features in the Commonwealth marine area.
 - ii. benthic habitats and communities within the Project Area including the predominate soft sediment substrate of fine sediment characterised by low or no cover of epibenthic biota, and the areas of hard pavement reef with discrete areas of filter feeder communities.
 - iii. biologically important habitats for threatened and migratory species and ecological features regarding information from the Marine Bioregional Plan for the North-west Marine Region.
- g. Describes matters protected under Part 3 of the EPBC Act. The description of those matters was informed by relevant documents published on the Department of Climate Change Energy Environment and Water's (DCCEEW) website such as those that are identified in Table 2-2 of the OPP and a protected matters search report for the defined EMBA is included in Attachment 1 of the OPP.
- h. Recognises that the Project Area (where planned environmental impacts are predicted to occur):
- i. overlaps biologically important areas (BIA) for the humpback whale, whale shark, flatback turtle, brown booby, and lesser frigatebird.
 - ii. overlaps the distribution range for the pygmy blue whale but does not overlap with BIAs for the pygmy blue whale and is not considered to be within a confined migration pathway.
 - iii. does not overlap any key ecological features (KEFs), although there are a number of KEFs that are known to occur within the EMBA.
- i. Describes protected areas and places within the broader EMBA in the unlikely event of a hydrocarbon spill (section 3.4.2 of the OPP) including the values of Australian Marine Parks, Western Australian marine and terrestrial protected areas, and RAMSAR wetlands.
- j. Describes existing pressures on the environment including commercial shipping, commercial fishing, defence activities and other oil and gas activities.
- k. Provides an adequate description of the climate vulnerable features of the EMBA from the impacts of climate change including observed global warming trends and the current and projected impacts of climate change on receptors within the Australian jurisdiction (section 7.2.6.6 of the OPP) with reference to reputable and authoritative reports such as CSIRO State of the Climate Report 2022 and various reports of the Intergovernmental Panel on Climate Change (IPCC).
- l. Describes feasible alternatives to the project (or activities) and compares the environmental impacts and risks predicted for the project and the alternative with the level of assessment effort afforded to project / activity design elements and engineering controls that have the greatest potential for avoiding or substantially reducing impacts of the project from the outset.
58. The OPP demonstrates that the detail given when addressing each of the content requirements set out in Regulations 5A(5), (6), (7) and (8) is reasonably matched to the project and its environmental impact and risk profile so that it is appropriate for the nature and scale of the project. In particular, the OPP demonstrates that the effort and scientific rigour applied to the descriptions of the project, receiving environment, requirements that apply and the evaluation of environmental impacts and risks, is greater for those project aspects more likely to have a substantial adverse or irreversible effect on biodiversity, ecological, social or cultural environmental values.

59. Based on the above findings (clauses 57-58), NOPSEMA is reasonably satisfied that the requirements of regulation 5D(6)(b) are met.

Appropriately identifies and evaluates the environmental impacts and risks [regulation 5D(6)(c)]

60. NOPSEMA considered the OPP and found that it:

- a. Applies a clear and logical process for defining the acceptable levels of environmental impact and risk that is appropriate and relevant to the EMBA by the project, including activities that are part of the project (section 4 of OPP). This process includes:
 - i. the identification and evaluation of environmental impacts and risks of the offshore project that considers aspects of the offshore project and the sources of impact and risk.
 - ii. evaluating the environment that may be impacted and at risk.
 - iii. defining acceptable levels of environmental impact and risk that are consistent with relevant external context.
 - iv. the establishment of EPOs that are consistent with the principles of ESD and reflect the defined acceptable levels of impact and risk.
- b. Provides defined accepted levels of environmental impact and risk with a clear basis in the analysis of relevant facts and evidence that:
 - i. have taken into account the ecological, biodiversity, social, economic and cultural features of the EMBA.
 - ii. are supported by relevant scientific literature as appropriate.
 - iii. have taken into account relevant facts and circumstances of the project and are consistent with relevant external context such as international and national standards, laws, policies and statutory instruments (e.g. plans of management and recovery plans relevant to matters protected under Part 3 of the EPBC Act).
- c. The OPP provides defined acceptable levels of environmental impact and risk for biodiversity and ecological values and sensitivities that are set at or below the significant impact criteria (defined in the Department of the Environment, Water, Heritage, and the Arts (DEWHA), Significant Impact Guidelines 1.1 - Matters of National Environmental Significance, EPBC Act Policy Statement (2013)), including ecological values and sensitivities of the Commonwealth marine area and listed threatened and migratory species. The acceptable level of impact set out in the OPP is specific to the sensitivity, vulnerability, and recoverability of receptors and was determined by whether the receptor is listed as a matter of national environment significance (MNES) and the level of protection it is afforded under the EPBC Act.
- d. The OPP applies an evidence-based evaluation process to demonstrate that the project can be managed such that environmental impacts and risks will be acceptable including:
 - i. Applying the mitigation hierarchy to identify where further risk and impact treatment beyond good practice and legislative control measures are needed to provide confidence that the environmental impacts and risks will be managed to acceptable levels.
 - ii. Where applicable, undertaking an assessment of predicted environmental impacts in the context of requirements of relevant statutory instruments for biodiversity conservation to

support demonstration that the Dorado Phase 1 development would not be inconsistent with these instruments, including recovery plans for listed threatened species.

- iii. Providing conclusions supported with scientific literature, with greater rigor afforded to supporting aspects of the evaluation where there is a higher degree of uncertainty in the predicted environmental impacts and/or higher severity of potential consequences.
- iv. Documenting evaluations of higher order environmental impacts and risks using appropriate impact prediction tools (e.g. empirical modelling) to inform the management needed.
- v. Using appropriate impact prediction tools to predict environmental impacts and risks on matters protected under the EPBC Act from uncontrolled hydrocarbon release, artificial light and anthropogenic underwater noise emissions.
- vi. A comparison of the predicted environmental impacts and risks with defined acceptable levels including consideration of the proposed EPOs.
- vii. Acknowledges and accounts for uncertainty associated with predicted environmental impacts of the project and identifies both likelihood and consequence metrics for all risks to the environment associated with unplanned events. Consideration has been given to how the OPP accounts for uncertainty, commensurate with the degree of predictive uncertainty, intensity, severity and duration of impacts and the environmental value of the receptors that may be affected. Examples of where uncertainty has been addressed in the OPP include:
 - A. there is uncertainty in relation to the reliability of the predictions of impact and risk for underwater noise associated with the piling and VSP activities for future tie-backs because they have been informed by the extrapolation of acoustic modelling results for piling and VSP activities specific to the Dorado field location. The OPP addressed this uncertainty by committing to undertake 'Acoustic emissions modelling for piling, 3D VSP and drilling VSP activities for potential future tie-backs' (CM17). This commitment will be undertaken during the preparation of future activity-specific EPs that will be subject to an assessment by NOPSEMA. NOPSEMA will need to be reasonably satisfied that all impacts and risks, including from underwater noise where relevant, will be managed to ALARP and an acceptable level before accepting an EP which covers these activities.
 - B. there is uncertainty in relation to the reliability of predictions of impact and risk for some artificial light sources associated with the project (e.g. MODU development drilling lighting) because they have been informed by the extrapolation of light modelling resulting specific to light sources for FPSO facility operations which may have different lighting characteristics. The OPP addressed this uncertainty by providing reasonable evidence showing the modelled scenarios for light sources from FPSO facility operations (particularly the facility lighting plus flaring scenario) are representative of the worst-case lighting to be generated by the project, and it is therefore conservative for the OPP to have used this modelling to inform the impact and risk predictions for other light sources associated with the project. It is noted that future activity-specific EPs that will be subject to an assessment by NOPSEMA will need to provide detailed evaluations of all environmental impacts and risks from activities that form part of the project, including from artificial light where relevant. NOPSEMA will need to be reasonably satisfied that all impacts and risks will be managed to ALARP and an acceptable level before accepting an EP which covers these activities.

C. for hydrocarbon spill risks, the OPP contains a commitment to consider the “full range of worst-case scenario LOWC consequences based on the best available oil-spill modelling” in future EPs and Oil Pollution Emergency Plans (OPEPs). Future EPs must contain future spill modelling based on appropriate input parameters including for example, contemporary metocean data and hydrocarbon characteristics derived from laboratory assays and/or weathering studies. EP assessments will also consider if an appropriate level of conservatism has been applied to the modelling outputs to inform risk assessments and spill response planning.

e. Demonstrates that the environmental impacts and risks of the project would not contravene a plan of management for a World Heritage property; a plan of management for a National heritage place; or a plan of management for a Ramsar wetland (sections 2, 4 and 7).

61. NOPSEMA’s assessment of the OPP’s evaluation of environmental impacts and risks included a focus on the higher order environmental impacts and risks which are covered in detailed assessment topics below, including in relation to:

- a. potential environmental impacts and risks to the Commonwealth marine area (refer to clauses 66-74);
- b. potential environmental impacts and risks arising from greenhouse gas emissions and climate change (refer to clauses 75-92);
- c. potential environmental impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise (refer to clauses 93-102);
- d. potential environmental impacts and risks to listed threatened and migratory marine turtles arising from artificial light (refer to clauses 103-113);
- e. potential environmental impacts and risks to whale shark foraging (refer to clauses 114-123); and
- f. unplanned hydrocarbon discharges risk (refer to clauses 124-136).

62. Based on the above findings (clauses 60 and 61), NOPSEMA is reasonably satisfied that the requirements of regulation 5D(6)(c) are met.

Sets out appropriate environmental performance outcomes consistent with ESD and which demonstrate that environmental impacts and risks will be managed to an acceptable level [regulation 5D(6)(d)]

63. NOPSEMA found that the EPOs in the OPP are consistent with the principles of ESD and that the EPOs in combination with the proponent’s evaluation of environmental impacts and risks, demonstrate that they will be managed to an acceptable level. An overview of how NOPSEMA has considered the ESD principles in the review of the proposed EPOs as well as their management to acceptable levels is provided below:

- a. Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations (the ‘integration principle’).
 - i. NOPSEMA has considered the proponent’s evaluation of the social, economic and ecological values that may potentially be affected by the project. The OPP has demonstrated an integrated approach to considering all environmental features, including relevant social, cultural and economic features that make up the environment as defined under regulation 4 of the Environment Regulations. Specifically, the OPP includes an evaluation of the potential

- environmental impacts and risks of the project on Commonwealth and State managed fisheries, tourism and recreation, marine and coastal industries taking into account both long-term and short-term considerations. For example, long-term considerations such as decommissioning approaches have been applied, including commitments to comply with section 572 of the OPGGS Act.
- ii. The OPP has demonstrated that environmental impacts and risks to these socio-economic and ecological values will be of an acceptable level. For example, the OPP includes EPOs such as EPO10A that there will be no impacts from Dorado Phase 1 acoustic emissions to pre-existing commercial fish stocks that occur within the project area that could be subject to existing or future fishing effort, EPO16A that there will be no adverse interactions between Santos' activities and other maritime users within the Project Area, and EPO6A that seafood caught within the project area remains safe for human consumption.
- b. If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the 'precautionary principle').
- iii. NOPSEMA has considered the proponent's evaluation of environmental impacts and risks as well as its case for why these environmental impacts and risks will be of an acceptable level. NOPSEMA has considered the threat of serious or irreversible environmental damage and how the proponent has addressed uncertainty.
 - iv. The OPP has demonstrated with sufficient certainty that environmental impacts and risks will be of an acceptable level, for example, for EPO's that put limitations on the extent of impacts to water, sediment and benthic habitat quality (EPOs 1A, 2A, 4A, 5A, 7A, 2B, 19A) or where relevant has proposed appropriate EPOs and management commitments to mitigate potential for serious or irreversible harm such as for unplanned impacts (EPOs 20A, 21A, 22A, 23A, 27A). Where there is uncertainty, the precautionary principle will have to be applied whereby proposed management measures will need to be further defined through environment plans for each activity that forms part of the project to ensure the EPOs are met via the implementation of suitable controls, environmental performance standards, and application of monitoring so that impacts and risks are continually reduced to ALARP and an acceptable level over the life of the project.
- c. The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the 'intergenerational principle').
- v. NOPSEMA has considered the proponents evaluation that the health, diversity and productivity of the environment, as defined in the environment regulations to include social, economic and cultural features, is maintained or enhanced for the benefit of future generations.
 - vi. The OPP has set out appropriate EPOs and committed to effective management measures to demonstrate that the project can be undertaken to ensure intergenerational equality. These management measures will need to be further defined through environment plans for each activity that forms part of the project to ensure that all of the EPOs are met via the implementation of suitable controls, environmental performance standards, and application of monitoring to ensure that impacts and risks are continually reduced to ALARP and an acceptable level over the life of the project.

- d. The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision-making (the 'biodiversity principle').
 - i. NOPSEMA has considered the proponent's evaluation in the OPP of environmental impacts and risks to the biodiversity and ecological values of the Commonwealth marine area, including listed threatened and migratory species under the EPBC Act, and the EPOs defined in the OPP. The EPOs are consistent with relevant EPBC Act statutory recovery plan and plans of management and the evaluation of impacts and risks from the project demonstrates that they can be managed to an acceptable level, consistent with the biodiversity principle.
 - A. For example, EPOs are consistent with requirements in recovery plans for threatened species (e.g. EPO8A - Artificial light emissions do not result in the displacement of marine turtles from habitat critical to their survival, EPO12A - Noise generating activities of Dorado Phase 1 are managed in such a manner to prevent PTS and reduce the risk of TTS and biologically important behavioural disturbance to all whales in the Commonwealth marine area and EPO11A - No injury to pygmy blue whales in a pygmy blue whale BIA.
 - B. There are EPOs that demonstrate that the ecological integrity of the Commonwealth marine area will be maintained and that impacts will be of an acceptable level. Examples include a suite of EPO's (EPO 3A, 3B, 3C, 3D, 3E, 3F, 3G, 24A, 28A) that commit to ensuring no mortality or significant impacts to EPBC Act listed threatened, migratory or cetacean species or benthic habitats and communities as a result of light and acoustic emissions, discharges and seabed disturbance from the Dorado Development. Where "significant" is defined by the Department of the Environment, Water, Heritage, and the Arts (DEWHA), Significant Impact Guidelines 1.1 - Matters of National Environmental Significance, EPBC Act Policy Statement (2013), and EPO's that protect the ecological integrity of the Commonwealth Marine Area in relation to produced water discharges by applying ANZG water and sediment quality guidelines for management (EPO4A and 5A).
 - e. Improved valuation, pricing and incentive mechanisms should be promoted (the 'valuation principle').
 - i. NOPSEMA has considered that the proponent is required to bear the costs relating to management of environmental aspects of the project and its activities to ensure that environmental impacts and risks will be of an acceptable level. NOPSEMA considers that the onus is on the proponent to protect ecological services and capital associated with the EMBA by the Dorado Development. To the extent that the valuation principle is relevant for an individual offshore petroleum project, the OPP demonstrates compliance with Australian government legislation and policy requirements relating to environmental management.
64. NOPSEMA found that the EPOs in combination with the proponent's evaluation of environmental impacts and risks, demonstrate that:
- a. The environmental impacts and risks to the values of the Commonwealth marine area will be managed to acceptable levels, which have been set below significant impact levels, where 'significant' is understood by having regard to the Significant Impact Guidelines 1.1 - MNES.
 - b. The offshore project will not be carried out in a way that is inconsistent with relevant EPBC Act management plans for listed threatened species. For example, EPOs for acoustic emissions (EPO3E, EPO9A, EPO11A and EPO12A) are consistent with recovery plans and conservation advice for listed threatened and migratory cetaceans.

- c. Relevant policy, background and guidance documents have been used by the proponent to support the evaluations of environmental impacts and risks to demonstrate that the offshore project is able to be managed to ensure environmental impacts and risks will be of acceptable levels. Relevant information considered includes the Marine Bioregional Plan for the North-west Marine Region (SEWPaC 2012) and EPBC Act Policy Statement 2.1 (DEWHA 2008).
- d. The oil spill risk will be of an acceptable level with EPOs that set a level of performance to prevent the identified spill risks being realised including "Undertake Dorado Phase 1 in a manner that will prevent an accidental release of reservoir fluids to the marine environment due to a loss of well control, or failure of a flowline or FPSO cargo tank". Further consideration of controls applied to prevent and respond to spills will be required through NOPSEMA's EP assessment process, specific to the activity risks, to further demonstrate that EPOs be achieved.

65. Based on the above findings (clauses 63 and 64), NOPSEMA is reasonably satisfied that the requirements of regulation 5D(6)(d) are met.

Detailed assessment focus: Appropriately identifies and evaluates the environmental impacts and risks [regulation 5D(6)(c)]; and sets out appropriate environmental performance outcomes consistent with ESD and which demonstrate that environmental impacts and risks will be managed to an acceptable level [regulation 5D(6)(d)]

Detailed assessment focus: Potential environmental impacts and risks to the Commonwealth marine area

66. Quantitative estimates have been included in the OPP for the potential extent of seabed that will be disturbed due to the placement of subsea infrastructure, drilling and flowline installation and potential future tie-backs (approximately 57.1km²). The benthic habitat within the Project Area consists of soft sediment and some areas of exposed limestone pavement which are widely represented throughout the Northwest Shelf.
67. The environmental impacts from the proposed project have been evaluated according to the values and sensitivities on the seabed that will be disturbed. The Project Area does not overlap with any known shoals or banks, KEFs or AMPs.
68. The OPP presents an evaluation that is supported by relevant scientific literature and surveys conducted in the region that concludes that the physical presence of the Dorado Development is unlikely to have any adverse impact on fish habitats including on the availability of food sources within the foraging BIA for whale sharks, and therefore will not result in an unacceptable impact to fish habitat values of the Commonwealth marine area.
69. The OPP presents an evaluation of planned drilling and operational discharges (e.g. drilling fluids, cooling water and produced formation water) that is supported by scientific literature and technical studies, and considers the implementation of adaptive management measures where relevant. The OPP concludes that environmental impacts from planned discharges will not result in a substantial change in water or sediment quality which may adversely impact on biodiversity, ecological integrity, social amenity or human health, and therefore will be of an acceptable level.
70. NOPSEMA considered the potential for cumulative environmental impacts to the Commonwealth marine area. Cumulative impacts refer to the changes to the environment that are caused by an action in combination with other past, present and future human actions (as outlined in the SAR for the EPBC Program at p65). For an OPP assessment, 'cumulative impacts' refers to the impacts associated with the activities of a proposed development interacting with existing and other proposed developments and future uses in the environment of the immediate locality or region (SAR, p65). The environmental impacts of the Dorado Development combined with existing and proposed future pressures on the

Commonwealth marine area must be demonstrated to be of an acceptable level and consistent with the principles of ESD.

71. The OPP has considered the environmental impacts resulting from multiple aspects of the Dorado Development in combination with other pressures on the environment. For example, the OPP evaluates the visible light exposure areas for the Dorado Development with adjacent oil and gas facilities. The OPP also provides an evaluation of potential cumulative impacts on climate, water quality, sediment quality, air quality, acoustic environment, communities and habitats, fish, marine mammals, reptiles, and birds.
72. The OPP sets out appropriate EPOs for the Commonwealth marine area that are consistent with ESD and which demonstrate that environmental impacts and risks will be managed to an acceptable level because EPOs for the values of the Commonwealth marine area
 - a. Provide confidence that the environmental impacts of the Dorado Development, when considered in the context of other anthropogenic pressures (seabed disturbance, planned discharges, noise, light and vessel activity), will be of an acceptable level.
 - b. Are appropriate and demonstrate that the offshore project can be managed consistent with the principles of ESD and to an acceptable level.
73. A detailed evaluation of the environmental impacts and risks to the Commonwealth marine area for each activity that makes up the Dorado Development will need to be undertaken during the EP assessment process. NOPSEMA will need to be reasonably satisfied that each activity that forms part of the offshore project will be managed to ALARP and an acceptable level with supporting control measures, environmental performance standards and measurement criteria before accepting an Environment Plan for that activity.
74. Based on the above findings (clauses 65-73), NOPSEMA is reasonably satisfied that potential environmental impacts and risks to the Commonwealth marine area arising from the Dorado Phase 1 Development are appropriately identified and evaluated (regulation 5D(6)(c) criteria) in the OPP. In addition, NOPSEMA is reasonably satisfied that the OPP sets out appropriate EPOs consistent with the principles of ESD and demonstrate they will be managed to an acceptable level.

Detailed assessment focus: Potential environmental impacts and risks arising from Greenhouse gas (GHG) emissions and climate change

75. The OPP identifies sources of GHG emissions for the different stages of the project from development drilling through to decommissioning. It also outlines activities that generate GHG emissions during each of the identified project stages and provides estimates of GHG emissions for these. Assumptions made in estimating Dorado Phase 1 GHG emissions are set out in the OPP.
76. GHG emissions estimates are delineated as being scope 1 or 3. Scope 2 GHG emissions are not generated by Dorado Phase 1. A technical report supporting the proponent's evaluation of GHG emissions impacts for Dorado Phase 1 is included as Attachment 12 to the OPP.
77. Scope 1 GHG emissions estimates were calculated adopting the calculation method in the *National Greenhouse and Energy Reporting (Measurement) Determination 2008* together with the emission factors outlined in the National Greenhouse Accounts (NGA) factors (Department of Industry, Science, Energy and Resources August 2021). Scope 3 GHG emissions estimates are identified, categorised and quantified using guidance provided in the GHGP Corporate Value Chain (Scope 3) Accounting and Reporting Standard. The OPP estimates the volumes of total lifecycle GHG emissions with a total

estimate of 15.6 MtCO₂-e for scope 1 emissions (direct emissions) and 153 MtCO₂-e for scope 3 emissions (indirect emissions), most of which is associated with the combustion of the sold product.

78. The OPP identifies and describes key international arrangements, domestic legislative framework and the company strategy and actions relevant to GHG emissions reduction. For example, the OPP outlines the intent and processes associated with the Paris Agreement, which Australia has ratified, the key domestic legislation and policy frameworks for regulation of GHG emissions (e.g. Safeguard Mechanism, National Greenhouse and Energy Reporting (NGER) Scheme) and Santos' Climate Change Strategy, including its associated commitments to emissions reduction targets and actions within the Santos Climate Transition Action Plan.
79. Using GHG emissions estimates made for the project and drawing on published Australia and international GHG emissions data, the OPP sets out details that place the estimated quantity of Dorado Phase 1 GHG emissions in domestic and international contexts. For example, the OPP estimates that Dorado Phase 1 Scope 1 GHG emissions equate to 0.203% of the 2021 Australian energy-related CO₂-e emissions, while the estimated total annual average Dorado Phase 1 emissions (estimated annual scope 1 and scope 3 combined), CO₂-e emissions from all stages of Dorado Phase 1 equate to 0.023% of the 2021 global emissions from fossil fuel.
80. In accordance with the OPP, oil produced from Dorado Phase 1 is proposed to be exported and is predicted to be used primarily as fuel for transportation with some potentially used as feedstock for petrochemical manufacturing, though it is stated that it is not expected to be used for the generation of electricity. According to the OPP the likely export countries include Thailand, Papua New Guinea, Japan and Singapore.
81. The OPP acknowledges that the consumption of oil resources results in the emission of GHGs that contribute to climate change. The OPP acknowledges that predicted environmental impacts from climate change pose a risk to the maintenance of the health, diversity and productivity of the environment and states that 'the unmitigated consumption of fossil fuel resources is inconsistent with the principle of intergenerational equity [found within] the EPBC Act'.
82. The OPP defines two receptor-specific acceptable levels of impact for GHG emissions and provides analysis as to why the proponent considers these are able to be met. The OPP also applies the process used for other impacts and risks, which considers various acceptability criteria such as meeting the principles of ecologically sustainable development, internal and external context, matters of national environmental significance and other relevant requirements. The relevant receptor specific acceptable levels are:
- No significant impacts to key Australian ecosystems attributable to Dorado Phase 1 GHG emissions, where significant impacts are defined as per *Matters of National Environmental Significance – Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment 2013); and
 - Dorado Phase 1 is an insignificant CO₂-e emissions contributor to Australian and Global CO₂-e emissions.
83. Informed by relevant published literature, the OPP includes an evaluation of the impacts and risks to the environment in Australia associated with the whole of project GHG emissions. The evaluation considers existing and potential future climate change-related impacts at functional groups/taxa (e.g. mammals, birds, reptiles, plants) and ecosystems (e.g. coral reefs, oceanic system, tropical rain forests, alpine areas) levels.

84. In assessing the OPP, NOPSEMA has had regard to the EPBC Act Policy Statement 'Indirect consequences of an action: Section 527E of the EPBC Act' (SEWPaC 2013), in relation to GHG emissions, including scope 3 emissions. NOPSEMA considers that scope 3 GHG emissions and climate change impacts that will be generated in transport and use of the Dorado Phase 1 petroleum product to be indirect consequences of the proposed activity that will likely fall within the definition of 'impact' under the Environment Regulations and within the context of the EPBC Act Policy Statement.
85. NOPSEMA has taken into account the predicted GHG emissions of the Dorado Phase 1 development including those indirect GHG emissions generated from refinement and end use, the projected impacts of climate change documented in the 2021 State of the Environment report (<https://www.dcceew.gov.au/science-research/soe>) State of Climate Report (CSIRO, 2022), Intergovernmental Panel on Climate Change 2022 report (IPCC, 2022), IPCC Special Report 2018, has had regard to the International Energy Agency's World Energy Outlook 2022 including the Net Zero Emissions by 2050 scenarios and has considered the proponent's proposed management of GHG emissions attributed to the project. NOPSEMA's considerations include:
- a. The unequivocal connection of climate change to human influences including the use of fossil fuels (The IPCC Special Report on the impacts of global warming of 1.5 °C (2018) (<https://www.ipcc.ch/sr15/>). The IPCC uses climate models to project robust differences in regional climate characteristics between present day and global warming of 1.5°C, and between 1.5°C and 2°C.
 - b. Predictions that if global warming transiently exceeds 1.5°C in the coming decades or later (overshoot), then many human and natural systems will face additional severe risks, compared to remaining below 1.5°C (high confidence) (IPCC Sixth Assessment Report: Climate Change 2022: Impacts, Adaptation and Vulnerability). Depending on the magnitude and duration of overshoot, some impacts will cause release of additional greenhouse gases (medium confidence) and some will be irreversible, even if global warming is reduced (high confidence).
 - c. Projections that Australia will continue to experience warming and acidification of surrounding oceans with impacts on biodiversity and ecosystem processes and increase the likelihood of more frequent and severe bleaching events in coral reefs around Australia, including the Great Barrier Reef and Ningaloo Reef (World Heritage properties) (The CSIRO State of the Climate Report 2022 (<https://www.csiro.au/en/research/environmental-impacts/climate-change/State-of-the-Climate>)).
 - d. Australia is party to the Paris Agreement and that the Paris Agreement is currently the world's most comprehensive climate action multilateral agreement underpinned by broad international support with 192 countries party to the agreement as of July 2022. One of the key aspects of the Paris Agreement is Article 2 which aims to strengthen the global response to climate change, including by holding the increase in the global average temperature to well below 2 °C above pre-industrial levels, while pursuing efforts to limit the increase to 1.5°C above pre-industrial levels.
 - e. The Paris Agreement (Article 4, paragraph 2) requires each Party to prepare, communicate and maintain successive nationally determined contributions (NDCs) that it intends to achieve. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement obligates each country to outline and communicate their post-2020 climate actions, known as their NDCs. Together, these climate actions determine whether the world achieves the long-term goals of the Paris Agreement. The OPP provides an overview of the NDCs and / or climate change action commitments for likely Dorado Phase 1 oil customer countries (Table 7-50).

86. NOPSEMA found that the OPP has applied an evidence-based evaluation process to demonstrate that the project is able to be managed such that environmental impacts and risks will be acceptable including:
- a. A detailed evaluation of the impacts and risks of GHG emissions and climate change with reference to relevant scientific literature and reports from authoritative sources
 - b. Defined acceptable levels of impact that are relevant to environmental receptors in the Australian jurisdiction and are consistent with ensuring that the project will not result in significant impacts to the Australian environment.
 - c. An analysis of how the acceptable level of impact can be met through achieving EPOs and control measures that are consistent with the Paris Agreement, recognising the Paris Agreement as the most comprehensive global agreement to seek to limit global temperature increase.
 - d. The OPP recognises the complex and dynamic natural processes within the ecosphere and that there is substantial uncertainty in determining a specific increase in global temperature due to the Dorado project and its emissions. The OPP determines that it is not possible to isolate the influence of Dorado emissions to any conclusive impact on the Australian environment and therefore there is a lack of full scientific certainty about the potential impacts of Dorado GHG emissions.
87. NOPSEMA's assessment of the evaluation of the appropriateness of EPOs placed greater attention on the GHG emissions and climate change. NOPSEMA's assessment and conclusion relating to EPOs that are relevant to managing the projects impacts from GHG emissions and climate change are provided below.
88. To address the impacts and risks of Dorado Phase 1 Scope 1 emissions, the following EPO and management commitments (CM14 and CM29-CM31) have been included in the OPP.
- a. **EPO13A:** *Dorado Phase 1 Scope 1 GHG emissions managed in accordance with the Safeguard Mechanism benchmark baseline set by the Clean Energy Regulator, in support of meeting the Australian Government's Paris Agreement Nationally Determined Contribution (NDC) of net zero emissions (NZE) by 2050.*
 - b. The control measures identified to demonstrate **EPO13A** can be met include:
 - i. *Optimise facilities design to reduce Dorado Phase 1 Scope 1 GHG emissions to ALARP and acceptable.*
 - ii. *The vapour recovery system on the Dorado FPSO will be designed to capture low pressure, continuous sources of vented gas that would otherwise be sent to flare and direct them to be reinjected with the produced gas.*
 - iii. *Design facilities in a manner that can accommodate the adoption of economically and technically viable emission reduction technologies that may become available during the operating life of the facilities.*
 - iv. *During routine operations, reinject produced gas (other than safety flare and fuel gas) to recover liquids.*
 - v. *Embed fugitive emissions surveillance and management into facilities operations and maintenance*

- vi. *Undertake fuel and flare analysis, baselining and forecasting throughout Dorado Development operational life.*
- vii. *Establish annual setting of energy efficiency improvement and targets throughout the life of Dorado Phase 1 facilities.*
- viii. *Throughout the life of Dorado Phase 1 facilities undertake optimisation of energy efficiency through periodic opportunity identification workshops or studies, evaluation and implementation.*
- ix. *Dorado Phase 1 will report on Scope 1 GHG emissions as required per the National Greenhouse and Energy Reporting (NGER) Scheme.*
- x. *Dorado Phase 1 will comply with the requirements of the Safeguard Mechanism, including purchase and/or surrender of Australian carbon credit units for any emissions above the baseline for the year, to support achievement of Australia's NDC emissions targets.*
- xi. *Dorado Phase 1 will implement a GHG management plan and energy management program that incorporates an adaptive management approach that facilitates a continuous cycle of monitoring, evaluating, and implementing improvements to minimise GHG emission to ALARP and acceptable levels over the life of field operations.*

89. The NOPSEMA assessment team considers that **EPO 13A** sets an appropriate environmental performance outcome relevant to the potential climate change impacts of scope 1 GHG emissions generated by Dorado Phase 1 because:

- a. **EPO13A** is aligned with Australia's commitments to achieving NZE by 2050 and is consistent with Australian legislative mechanisms to reduce and offset GHG emissions.
- b. There are management controls in place to monitor, reduce and manage scope 1 emissions of the project to demonstrate **EPO13A** can be met including (though are not limited to) complying with the Safeguard Mechanism, limited flaring to flare pilot during steady state operations, reinjecting produced gas (other than safety flare and fuel gas) to recover liquids during routine operations, annual energy efficiency improvements and a GHG management plan and energy management program that incorporates adaptive management.

90. To address the impacts and risks of Dorado Phase 1 indirect emissions (scope 3 GHG emissions), the following EPO and management commitments have been included in the OPP:

- a. **EPO14A:** *As the Paris Agreement is the most comprehensive global agreement to seek to limit global temperature rise as specified in Article 2 of the Agreement and no significant* impacts to the environment globally, including in Australia, Dorado Phase 1 oil is only sold to customers from countries that have:*
 - vii. *a net-zero emissions by 2050 (NZE) commitment; and/or*
 - viii. *are signatories to the Paris Agreement and have Nationally Determined Contributions (NDC) in place to reduce or offset GHG emissions.*

** As defined by the significant impact criteria in Matters of National Environmental Significance – Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999 (Department of the Environment 2013).*

- b. To demonstrate **EPO14A** will be met, the OPP makes the following management commitments:

- i. **CM32:** *Dorado Phase 1 will limit sales to customers from countries that have a NZE commitment or are signatories to the Paris Agreement, and will cease to supply customers in countries that withdraw from the Paris Agreement or NZE commitments.*
- ii. **CM33:** *Regular monitoring of Dorado Phase 1 customer country compliance with NZE or NDC emissions targets (Article 4) through the Paris Agreement monitoring and assurance mechanisms:*
 - *the enhanced transparency framework 5-yearly reporting (Article 13)*
 - *the 5-yearly Global Stocktake (Article 14); and*
 - *implementation and compliance committee annual reporting (Article 15).*
- iii. **CM34:** *If results of CM33 identify gaps in customer country compliance against NZE or NDC emissions targets, Dorado will cease to supply those customers or take mitigation actions to offset their Dorado Phase 1 product emissions.*

91. NOPSEMA is satisfied that **EPO14A** provides an appropriate environmental performance outcome relevant to the potential climate change impacts of indirect emissions (scope 3), as required by reg 5D(6)(d) of the Environment Regulations and that the balance of the statutory criteria is met. The reasons that support this conclusion are provided below:

- a. **EPO14A** requires Santos to only sell Dorado Phase 1 oil to countries that have either a net zero by 2050 commitment or are signatories to the Paris Agreement and have Nationally Determined Contributions (NDC) in place to reduce or offset GHG emissions.
- b. By monitoring Dorado Phase 1 customer country compliance with NZE or NDC emissions targets, Santos will ensure that any gaps in customer compliance against NZE or NDCs emission targets are identified (**CM33**). If gaps are identified in customer compliance with NDCs or NZE targets, Santos will cease to supply those customers or take mitigation actions to offset their Dorado Phase 1 emissions.
- c. These commitments demonstrate that Santos has measures in place to ensure that the indirect emissions from the Dorado Phase 1 development will be managed consistent with the Paris Agreement and provides NOPSEMA with reasonable satisfaction that the impacts from scope 3 emissions will be managed to an acceptable level i.e. 'No significant* impacts to the environment globally, including in Australia'.²
- d. The proposed program of management in Revision 7 of the OPP focuses on working with customer countries only if there are gaps in customer country compliance against NZE or NDC. This leaves some residual uncertainty as to whether the OPP demonstrates Dorado Phase 1 indirect emissions (scope 3 overseas) will not further exacerbate already significant impacts of human induced climate change on the Australian environment, that the project's related environmental impacts will be managed to an acceptable level and that the environmental performance outcomes are consistent with the principles of ESD.
- e. Because of the requirement to have an environment plan in force for any proposed activity that is part of the Dorado Phase 1 project, NOPSEMA will be able to assess future EPs, if they are

² * Significant - As defined by the Commonwealth marine environment significant impact criteria in Matters of National Environmental Significance - Significant impact guidelines 1.1. *Environment Protection and Biodiversity Conservation Act 1999* (Department of the Environment 2013).

submitted, within a regulatory framework to address this residual uncertainty. The project cannot proceed without this EP assessment process, which will:

- i. Require a detailed evaluation of all activity-specific environmental risks and impacts considering any new legislative or policy context, including those associated with GHG emissions and global climate change, and will also require demonstration that GHG emissions and associated impacts will be reduced to ALARP.
 - ii. Provide for NOPSEMA to further assess measures the proponent proposes to meet the established EPOs, which will be subject to regular review and compliance monitoring.
 - iii. Address specific monitoring and management actions that would need to be taken by the proponent to address uncertainties in the adequacy of relying on NDCs and NZEs of customer countries to ensure the acceptable level 'No significant impacts no significant* impacts to the environment globally, including in Australia'. Examples of the types of management actions that the proponent will need to consider and evaluate in future EPs for the project include:
 - A. Work with the value chain to reduce emissions in customer systems.
 - B. Work with customers, investors, technology developers and governments to build new cleaner energy, clean fuels, and carbon markets.
 - C. Work with customers to implement CCS and high-quality offset opportunities.
 - D. Pro-actively work with customer countries to advocate for regulatory frameworks to drive demand shifts, set standards for clean fuels and carbon markets, and enable the economic development of carbon abatement and affordable, reliable, lower-emissions energy and fuels on the supply side.
 - E. Monitor global, country and customer-scale emissions reduction performance and use results to inform the need for, and the form of, management to achieve required levels of emissions reduction in customer systems to ensure impacts will be of an acceptable level.
 - f. Any future EP assessment and compliance monitoring processes are mechanisms for NOPSEMA to provide regulatory oversight and verification of the case made that impacts and risks arising from petroleum activities that are part of the project will be reduced to an acceptable level and managed in accordance with the principles of ESD. All activities that are part of the project will need to have an accepted EP that meets the criteria for acceptance under the Environment Regulations before they can proceed. If the activities in the project are no longer being managed to ensure impacts are consistent with the principles of ecologically sustainable development and are of an acceptable level, the regulatory permissions required to undertake activities would not be given, or if already approved could be withdrawn in accordance with the regulations and NOPSEMA's compliance monitoring activities.
 - g. Through assessment of relevant EPs for the project, NOPSEMA would have confidence in a regulatory process to ensure that the residual uncertainty outlined above would be addressed and that approving the OPP could be considered consistent with the principles of ESD and that the environmental impacts would be managed to acceptable levels.
92. Based on the above findings (clauses 75-91), NOPSEMA is reasonably satisfied that potential climate change impacts and risks to the Australian environment arising from the GHG emissions of the Dorado Phase 1 Development, are appropriately identified, and evaluated (r5D(6)(c) criteria) in the OPP. In

addition, NOPSEMA is reasonably satisfied that the OPP sets out appropriate EPOs consistent with the principles of ESD and demonstrate they will be managed to an acceptable level.

Detailed assessment focus: Potential environmental impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise

93. The OPP identifies and describes, with reference to DCCEEW's PMST and relevant and contemporary peer reviewed scientific literature, the listed threatened and migratory whale species that may occur within and in the vicinity of the Project Area, including the spatial areas (e.g., BIAs) and temporal periods where these species are expected to undertake biologically important behaviours (e.g., migration, foraging and resting).
94. The OPP identifies and describes the sources of anthropogenic underwater noise associated with the offshore project (including expected operating frequencies and source levels for both impulsive and non-impulsive noise sources) and used a suitably qualified subject matter expert, with reference to relevant and contemporary peer reviewed scientific literature, to make predictions of the distance over which sound effect thresholds for listed threatened and migratory whales may be exceeded.
95. The OPP identifies and describes the legislative requirements that are relevant to the environmental management of impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise. This includes the conservation objectives and actions associated with the threat of noise interference in EPBC Act recovery plans and conservation advice for the listed threatened and migratory whales that may occur within and in the vicinity of the Project Area.
96. The OPP includes a thorough evaluation of the potential impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise that:
- a. considers all credible effect pathways for anthropogenic underwater noise to whales, including those that may occur both directly and indirectly (e.g., auditory impairment including permanent threshold shift and temporary threshold shift, behavioural responses, masking and plankton abundance alteration), with consideration of the potential for cumulative impacts and risks;
 - b. has been informed by relevant and contemporary peer reviewed scientific literature and project specific studies including underwater acoustic modelling undertaken by a suitably qualified subject matter expert. This provides predictions of received levels of noise in relation to the defined biologically relevant thresholds for the functional hearing group of low-frequency cetaceans (applicable to the listed threatened and migratory whales that may occur within and in the vicinity of the Project Area); and
 - c. is appropriate to the nature and scale of the offshore project by appropriately considering the relevant environment, project and legislative settings that are identified and described in the OPP.
97. The OPP defines acceptable levels of impacts and risks that are applicable to the effects of noise on listed threatened and migratory whales. The OPP has applied a clear and logical process to define these acceptable levels that includes consideration of relevant context such as the relevant conservation objectives and actions in EPBC Act recovery plans and conservation advices for the listed threatened and migratory whales that may occur within and in the vicinity of the Project Area.
98. The OPP implements an evidence-based evaluation process to demonstrate that potential impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise will be managed to an acceptable level through the implementation of suitable control measures (e.g., the OPP includes a commitment to implement mitigation measures for seismic activities aligned with EPBC

Act Policy Statement 2.1 – Interaction Between Offshore Seismic Exploration and Whales (DEWHA 2008).

99. The evaluation process includes a comparison of predicted impacts and risks with the relevant defined acceptable levels of impacts and risks with sufficient evidence provided to demonstrate that predicted impacts and risks will not be inconsistent with EPBC Act recovery plans and conservation advice for the listed threatened and migratory whales that may occur within and in the vicinity of the Project Area. For example, the Conservation Management Plan for the Blue Whale includes an action that requires anthropogenic noise in BIAs to be managed such that any blue whale may continue to utilise the area without injury and is not displaced from a foraging area.
100. The OPP demonstrates that the project can be managed so that anthropogenic noise impacts and risks will not be inconsistent with the Conservation Management Plan for the Blue Whale because noise levels will not exceed behavioural disturbance or injury thresholds within any blue whale BIAs or foraging areas and commitments are in place to implement mitigation measures to manage impacts and risks of noise such that there will be “No injury to pygmy blue whales in a pygmy blue whale BIA” (EPO11A).
101. NOPSEMA notes that a detailed evaluation of the environmental impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise for each activity that makes up the Dorado Development will need to be undertaken during the EP assessment process. NOPSEMA will need to be reasonably satisfied that each activity that forms part of the offshore project will be managed to ALARP and an acceptable level with supporting control measures, environmental performance standards and measurement criteria before accepting an EP for that activity.
102. Based on the above findings (clauses 93-101), NOPSEMA is reasonably satisfied that potential environmental impacts and risks to listed threatened and migratory whales arising from anthropogenic underwater noise are appropriately identified and evaluated (regulation 5D(6)(c) criteria) in the OPP. In addition, NOPSEMA is reasonably satisfied that the OPP sets out appropriate EPOs consistent with the principles of ESD and demonstrate they will be managed to an acceptable level.

Detailed assessment focus: Potential environmental impacts and risks to listed threatened and migratory marine turtles arising from artificial light

103. The OPP identifies and describes, with reference to DCCEEW's PMST and relevant and contemporary peer reviewed scientific literature, the listed threatened and migratory marine turtle species that may occur within and in the vicinity of the Project Area, including the spatial areas (e.g. BIAs and habitats critical for survival) and temporal periods where these species are expected to undertake biologically important behaviours (e.g. nesting, internesting, foraging, migration, mating and aggregation).
104. The OPP identifies and describes the sources of artificial light associated with the offshore project that have the potential to expose listed threatened and migratory marine turtles to levels of light exceeding biologically relevant thresholds that have been defined in the OPP by a suitably qualified subject matter expert with reference to relevant and contemporary peer reviewed scientific literature.
105. The OPP identifies and describes the legislative requirements that are relevant to the environmental management of light emissions impacts and risks to listed threatened and migratory turtles. This

includes the conservation objectives and actions associated with the threat of light pollution in the Recovery Plan for Marine Turtles in Australia.

106. The OPP includes a thorough evaluation of the potential impacts and risks to marine turtles arising from artificial light that:
 - a. considers all credible effect pathways for artificial light to marine turtles (e.g., behavioural responses including at different life stages), with consideration of the potential for cumulative impacts and risks;
 - b. has been informed by relevant and contemporary peer reviewed scientific literature and project specific studies including artificial light emissions modelling undertaken by a suitably qualified subject matter expert that provides predictions of received levels of light in relation to the defined biologically relevant thresholds for marine turtles; and
 - c. is appropriate to the nature and scale of the offshore project by appropriately considering the relevant environment, project and legislative settings that are identified and described in the OPP.
107. The OPP defines acceptable levels of impacts and risks that are applicable to the effects of artificial light on marine turtles. The OPP has applied a clear and logical process to define these acceptable levels that includes consideration of relevant context such as the conservation objectives and actions associated with the threat of light pollution in the Recovery Plan for Marine Turtles in Australia.
108. The OPP implements an evidence-based evaluation process to demonstrate that potential impacts and risks to marine turtles arising from artificial light will be managed to an acceptable level through the implementation of suitable control measures (e.g. the OPP includes a commitment to align lighting design of Dorado development facilities with light design principles described in the *National Light Pollution Guidelines for Wildlife including Marine Turtles, Seabirds and Migratory Shorebirds* (Commonwealth of Australia 2020)).
109. The evaluation process includes a comparison of predicted impacts and risks with the relevant defined acceptable levels of impacts and risks with sufficient evidence provided to demonstrate that predicted impacts and risks will not be inconsistent with the Recovery Plan for Marine Turtles in Australia. For example, the recovery plan requires that the management of light should ensure marine turtles are not displaced from habitats critical for survival and that anthropogenic activities in BIAs are managed so that the biologically important behaviour can continue.
110. The OPP includes an EPO that is consistent with the requirements of the Recovery Plan for Marine Turtles in Australia (i.e., "EPO8A: Artificial light emissions do not result in the displacement of marine turtles from habitat critical to their survival").
111. The OPP demonstrates that impacts and risks of the project will not be inconsistent with requirements of the Recovery Plan for Marine Turtles in Australia through:
 - a. appropriate light modelling which predicts that light emissions above biologically relevant thresholds will not extend into any habitats critical for survival;
 - b. demonstration that the extent of light emissions within the flatback turtle interesting BIA can be managed to prevent disturbance to biologically important behaviour within that BIA; and
 - c. a reasonable evaluation of the impacts of light to interesting flatback turtle behaviour demonstrating that it is unlikely light emissions would prevent interesting flatback turtles from undertaking biologically important behaviours.

112. NOPSEMA notes that a detailed evaluation of the environmental impacts and risks to listed threatened and migratory turtles arising from light emissions for each activity that makes up the Dorado Development will need to be undertaken during the EP assessment process. NOPSEMA will need to be reasonably satisfied that each activity that forms part of the offshore project will be managed to ALARP and an acceptable level with supporting control measures, environmental performance standards and measurement criteria before accepting an EP for that activity.
113. Based on the above findings (clauses 103-112), NOPSEMA is reasonably satisfied that potential environmental impacts and risks to listed threatened and migratory marine turtles arising from artificial light are appropriately identified and evaluated (regulation 5D(6)(c) criteria) in the OPP. In addition, NOPSEMA is reasonably satisfied that the OPP sets out appropriate EPOs consistent with the principles of ESD and demonstrate they will be managed to an acceptable level.

Detailed assessment focus: Potential environmental impacts and risks to whale shark foraging

114. The OPP identifies and describes, with reference to DCCEEW's PMST and National Conservation Values Atlas, that whale sharks (listed as vulnerable and migratory under the EPBC Act) may occur within and in the vicinity of the Project Area which overlaps with a whale shark foraging BIA.
115. The OPP identifies and describes, with reference to relevant and contemporary peer reviewed scientific literature, the spatial areas where whale sharks are expected to congregate and where critical foraging habitat is likely to occur within and in the vicinity of the Project Area (relative to the whale shark foraging BIA). There are no known congregation areas or critical foraging habitat for whale sharks within and in the vicinity of the Project Area.
116. The OPP identifies and describes the sources of impacts and risks arising from the offshore project to whale sharks including their food sources and foraging habitat.
117. The OPP identifies and describes the legislative requirements that are relevant to the environmental management of impacts and risks to whale shark. This includes the conservation objectives and actions associated with the key threats relevant to the offshore project in the Conservation advice *Rhincodon typus* (Whale Shark) (DoE 2015).
118. The OPP includes a thorough evaluation of the potential impacts and risks to whale shark foraging arising from the offshore project that:
 - a. considers all credible impact and risk pathways to whale sharks including their food sources and foraging habitat, with consideration of the potential for cumulative impacts and risks;
 - b. has been informed by relevant and contemporary peer reviewed scientific literature and relevant project specific studies undertaken by suitably qualified subject matter experts; and
 - c. is appropriate to the nature and scale of the offshore project by appropriately considering the relevant environment, project and legislative settings that are identified and described in the OPP.
119. The OPP defines acceptable levels of impacts and risks that are applicable to disturbance to whale shark foraging arising from the offshore project. The OPP has applied a clear and logical process to define these acceptable levels of impacts and risks that includes consideration of relevant context such as the conservation objectives and actions associated with the threats relevant to the offshore project in the Conservation advice *Rhincodon typus* (Whale Shark) (DoE 2015).
120. The OPP includes an EPO that requires the project to be managed such that there is "No mortality or significant impacts to EPBC Act listed, threatened, migratory or cetacean species because of Dorado

Phase 1 acoustic emissions" (EPO3E). There are similar EPOs provided for other Dorado Phase 1 Development aspects.

121. The OPP implements an evidence-based evaluation process to demonstrate that potential impacts and risks to whale shark foraging arising from the offshore project will be managed to an acceptable level through the implementation of suitable control measures. The process includes a comparison of predicted impacts and risks with the relevant defined acceptable levels of impacts and risks with sufficient evidence provided to demonstrate that predicted impacts and risks will not be inconsistent with the Conservation advice *Rhincodon typus* (Whale Shark) (DoE 2015).
122. NOPSEMA notes that a detailed evaluation of the environmental impacts and risks to whale shark foraging arising from each activity that makes up the Dorado Development will need to be undertaken during the EP assessment process. NOPSEMA will need to be reasonably satisfied that each activity that forms part of the offshore project will be managed to ALARP and an acceptable level with supporting control measures, environmental performance standards and measurement criteria before accepting an EP for that activity.
123. Based on the above findings (clauses 114-122), NOPSEMA is reasonably satisfied that potential environmental impacts and risks to listed threatened and migratory whale sharks from the Dorado Phase 1 Development are appropriately identified and evaluated (regulation 5D(6)(c) criteria) in the OPP. In addition, NOPSEMA is reasonably satisfied that the OPP sets out appropriate EPOs consistent with the principles of ESD and demonstrate they will be managed to an acceptable level.

Detailed assessment topic: Unplanned hydrocarbon discharges risk

124. The OPP presents an assessment of risks associated with worst-case hydrocarbon spill scenarios.
125. The OPP (Attachment 8-1) presents oil spill modelling of worst-case hydrocarbon spill scenarios, predicting the distribution of hydrocarbons and providing information to determine potential impacts to environmental receptors within the EMBA. It utilises appropriate exposure thresholds for surface and sub-surface (entrained and dissolved) hydrocarbons to inform the risk evaluation. The spill scenarios presented are appropriate given the nature and scale of the project, and for informing the level of controls that would be required to demonstrate the risk can be managed to an acceptable level.
126. The OPP defines the EMBA based on the maximum predicted extent of hydrocarbons at low exposure values in the marine environment and identifies and describes features of the existing environment within the EMBA.
127. The OPP identifies the residual risk of unplanned events including hydrocarbon spills based on the likelihood and consequence of those events. The likelihood of an unplanned event occurring was based on all controls functioning effectively while the consequence was based on a worst-case event occurring where all controls failed.
128. The OPP applies a systematic process to assess potential consequences of unplanned hydrocarbon releases by considering receptor sensitivity and predicted extent, duration, frequency and scale of impacts of hydrocarbons at the surface and in the water column from worst-case spill scenarios utilising outputs of spill modelling.
129. Changes made to the OPP in response to public comments included a re-evaluation of potential environmental consequences due to hydrocarbon pollution in the event of a LOWC.

130. The OPP contains appropriate EPOs for unplanned hydrocarbon discharges including “EPO20A Undertake Dorado Phase 1 in a manner that will prevent unplanned discharge of chemicals or hydrocarbons to the marine environment”.
131. The OPP identifies a range of controls that are intended to reduce the likelihood of hydrocarbon spills occurring during the construction and operation of the project activities to demonstrate that that EPO20A (and other relevant EPOs) can be met.
132. The OPP identifies the potential consequences of worst-case hydrocarbon spills from LOWC scenarios during Dorado Phase 1 as being unacceptable and that such spills have potential to result in major long-term effects on local population, industry, or ecosystem receptors. The OPP considers the likelihood of worst-case hydrocarbon releases (ranked “unlikely”) and the reduction of impacts should one occur from Dorado Phase 1 to be acceptable (Table 7-87).
133. The risk evaluation for hydrocarbon spills (Table 7-85) ranks all residual spill risks as “low” and are considered acceptable.
134. The OPP (Table 7-86) refers to future regulatory approval processes required before activities can commence, that are relevant to hydrocarbon spill risk. These include the requirement for a Well Operations Management Plan, Safety Cases and an EP with oil spill contingency and emergency arrangements.
135. The Environment Regulations provide the mechanism for EP assessments that, if submitted:
 - a. require a detailed evaluation of all activity-specific environmental risks associated with unplanned hydrocarbon and chemical discharges, and a demonstration that those risks will be acceptable and reduced to ALARP; and
 - b. provides for NOPSEMA to further assess measures the proponent proposes to meet the established EPOs, which will be subject to regular review and compliance monitoring.
136. Based on the above findings (clauses 124-135), NOPSEMA is reasonably satisfied that potential environmental risks of an unplanned hydrocarbon discharge arising from the Dorado Phase 1 Development, are appropriately identified, and evaluated (regulation 5D(6)(c) criteria) in the OPP. In addition, NOPSEMA is reasonably satisfied that the OPP sets out appropriate EPOs consistent with the principles of ESD and demonstrate they will be managed to an acceptable level.

Does not involve an activity undertaken in a World Heritage property [regulation 5D(6)(e)]

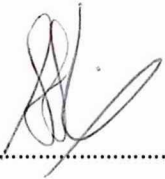
137. NOPSEMA considered the OPP and found that the proposal does not involve an activity or part of an activity that will be undertaken in any part of a declared World Heritage property within the meaning of the EPBC Act.
138. Based on the above findings (clause 137), NOPSEMA is reasonably satisfied that the requirements of regulation 5D(6)(e) are met.

Summary of findings on regulation 5D(6) criteria

139. NOPSEMA is reasonably satisfied that the OPP:
 - a. adequately addresses comments given during the period for public comment (refer to clause 55); and
 - b. does not involve an activity or part of an activity being undertaken in any part of a declared World Heritage property within the meaning of the EPBC Act (refer to clause 137).

- c. is appropriate for the nature and scale of the project (refer to clauses 57-58); and
 - d. appropriately identifies and evaluates the environmental impacts and risks of a project (refer to clauses 60-61, 66-74, 75-92, 93-102, 103-113, 114-123 and 124-136) and
 - e. sets out appropriate environmental performance outcomes that:
 - i. are consistent with the principles of ESD (refer to clauses 63-64 and clauses identified in (d)); and
 - ii. demonstrate that the environmental impacts and risks of the project will be managed to an acceptable level (refer to clauses 63-64 and clauses identified in (d)).
140. As NOPSEMA is reasonably satisfied that the OPP meets the all of the criteria set out in subregulation 5D(6) of the Environmental Regulations, NOPSEMA has accepted the OPP pursuant to subregulation 5D(5)(a) of the Environment Regulations.

Signed



Stuart Smith
Chief Executive Officer
10 February 2023

Attachment 1

Key characteristics of proposed Dorado Phase 1 development Table 6-1 from OPP (Rev 7, 19/12/2022)

Project element	Maximum extent or range
Project area	The Dorado Development Project Area is spatially defined in Figure 6-4 of the OPP.
Wells	<p>A maximum total of 38 wells, being a combination of oil and gas development wells and gas reinjection wells, located within the Project Area, will be comprised of:</p> <ul style="list-style-type: none"> • Up to 16 wells with dry trees on the Dorado WHP, being: <ul style="list-style-type: none"> • 6 x oil production; • 2 x gas production; • 2 x gas reinjection; and • Up to 6 additional wells that are a combination of production and gas reinjection wells. • Up to 22 wells will be future tie-backs located within the Project area, with the breakdown of production and gas reinjection wells to be determined by tie-back reservoir characteristics.
Well head platform(s) (WHP)	<p>A maximum of three (3) not normally manned (NNM) WHPs, comprising:</p> <ul style="list-style-type: none"> • One (1) gravity based NNM WHP located in the Dorado field, in the vicinity of the site described in Table 6-2 of the OPP, with 16 slots for production and gas reinjection wells. • Up to an additional two (2) NNM WHPs located in the Project Area.
Floating Production, Storage and Offtake (FPSO) facility	<p>One (1) FPSO located at the Dorado field, in the vicinity of the site described in Table 6-2 of the OPP moored by a disconnectable turret mooring (DTM) system used for processing and treatment of recovered liquids for export, reservoir gas for power generation, pilot flare and gas reinjection.</p> <p>FPSO connected to the WHP via flowlines (initially two hydrocarbon production and one gas reinjection), an umbilical and risers.</p>
Future tie-backs - pipelines and subsea system	Comprising flowlines, umbilicals and potentially manifolds depending on tie-back concept, providing for two future tie-backs.
Dorado Phase 1 hydrocarbons	Light oil and condensate as described in section 6.4 of the OPP, with a total export volume of 350 MMbbls over 20 years.
Project life	Described in Table 6-3 of the OPP, including operation of the FPSO for a 20-year period.