Bedout Multi-Well Drilling Environment Plan

1. Purpose of this report

NOPSEMA accepted the Bedout Multi-Well Drilling Environment Plan (the EP) submitted by Santos WA Northwest Pty Ltd (the titleholder) for an exploratory drilling activity in the Bedout Basin over a 5 year period commencing in 2021.

As required by the Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009 (the Environment Regulations), the public was provided with an opportunity to comment on the EP. After this period, Santos WA Northwest Pty Ltd took into account the public comment and prepared a Report on Public Comment which is published on NOPSEMA's website.

Following the public comment period, the titleholder submitted the EP for assessment by NOPSEMA on 11 June 2021. NOPSEMA has since completed its assessment of the EP and has determined that it is satisfied that the EP meets the criteria for acceptance[1].

This report explains how NOPSEMA took into account comments received from the public during the public comment period in making its decision[2]. Comments have been grouped into 'matters' and 'claims' that capture the issues, concerns or new information provided during the public comment process. This report also contains other 'key matters' that were of importance in the NOPSEMA assessment and that may also be of interest to the public.

This report references the accepted Bedout Multi-Well Drilling Environment Plan, Revision 3 submitted by Santos WA Northwest Pty Ltd, which is available on the NOPSEMA website and should be referred to for further information.

1.1. Information relevant to NOPSEMA's decision:

In making the decision to accept this EP, NOPSEMA took into account:

- the Environment Regulations;
- NOPSEMA Assessment Policy (PL0050), Environment Plan Assessment Policy (PL1347) and Environment Plan Decision Making Guidelines (GL1721);
- the Bedout Multi-Well Drilling Environment Plan, which includes the titleholder's Oil Pollution Emergency Plan and Operational and Scientific Monitoring Plan;
- the information raised by relevant persons, government departments and agencies that is relevant to making a decision;
- the 1 public comment submission received during the public comment period with issues raised predominantly in relation to the matters outlined in the below report; and
- relevant plans of management and threatened species recovery plans developed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and relevant policy statements and guidance published by the Department of the Agriculture, Water and the Environment.

[1] Environment Regulations, Regulation 10A Criteria for acceptance of environment plan
[2] Environment Regulations, Regulation 11(3) Publication of notice, etc.

2. Next steps

Responsibility for the ongoing environmental performance of the exploratory drilling activity remains, at all times, with Santos WA Northwest Pty Ltd (Santos).

NOPSEMA has legislated responsibilities to inspect and investigate offshore petroleum and greenhouse gas storage activities, and to enforce compliance with environmental law. These functions will be applied to this activity in accordance with NOPSEMA's policies.

3. Sensitive Information

Sensitive information received during the public comment period, such as the names and contact details of commenters and specific information identified by the commenter or relevant person as 'sensitive', is not published in this report. Sensitive information is contained in a sensitive information part of the EP which has been considered by NOPSEMA during its assessment process.

4. Further information

If you would like further information about the activity, please contact the titleholder's nominated liaison person specified in the EP and on NOPSEMA's webpage for the Bedout Multi-Well Drilling Environment Plan.

If you would like to be notified of regulatory information on the activity, such as start and end dates and enforcement actions (if any), please subscribe to updates from the Underway Offshore page on NOPSEMA's website.

How NOPSEMA has taken into account key matters raised during public comment (and relevant persons consultation), the assessment and decision-making process for the Bedout Multi-Well Drilling EP

#	Issues raised	Titleholder response	NOPSEMA's assessment and decision
1	***Matter:*** *Fundamental issues* Claim considers that the activity, and therefore the EP, is inconsistent with these key principles (outlined below). ***Claim*****:** Refer below	Santos' Environmental Hazard Identification and Assessment Guideline (EA-91-IG-00004) includes consideration of the principles of Ecologically Sustainable Development (ESD). For each of the identified aspects in Sections 6 and 7, Santos has considered whether the associated risks and impacts are consistent with the principles of ESD. No changes have been made to the EP regarding this matter.	In reaching a decision on the acceptability of the environment plan in relation to these matters, NOPSEMA took into account the content of the EP, NOPSEMA's Decision Making Guidelines (GL1721), and the requirements of the Environment Regulations. The drilling activity proposed is for 2 exploration and up to 6 appraisal wells in permits WA-437-P and WA-438-P. The concern presented relates primarily to the potential future exploitation of petroleum resources. The exploration permits issued to Santos by the Joint Authority do not confer rights to produce petroleum. Issue of relevant titles to support project development is subject to separate approvals by the Joint Authority. Evaluation of environmental impacts and risks associated with offshore projects are considered separately through additional approvals should Santos progress to project development. NOPSEMA has assessed the potential impacts of GHG emissions arising from the Bedout Multi-Well Drilling activity and concluded that with the described measures and controls, impacts will be of an acceptable level and reduced to ALARP in accordance with the Environment Regulations. The EP has identified the National Greenhouse and Energy Reporting Act 2007 (NGER Act). The EP has adequately addressed the GHG emissions associated with undertaking the activity and applies controls to minimise GHG emissions, such as use of low-sulphur fuels and no incineration of waste.
1.1	***Matter:*** *Precautionary Principle* Claim that this activity is fundamentally inconsistent with the principles of Ecologically Sustainable Development (**ESD**) including the Precautionary Principle ***Claim*****:** The EP does not identify any climate change risks associated with the activities of exploring and developing new fossil fuel resources. That is, the EP fails to identify that there is a threat of serious and irreversible damage associated with anthropogenic climate change	Santos' Environmental Hazard Identification and Assessment Guideline (EA-91-IG-00004) includes consideration of the principles of Ecologically Sustainable Development (ESD). Santos clarifies that this EP is only for an exploration drilling activity and not for the development of fossil fuels which would be subject to separate approvals which are required to consider the effects of atmospheric emissions from development and fossil fuel production. For each of the identified aspects in Sections 6 and 7, Santos has considered whether the associated risks and impacts are consistent with the principles of ESD. No changes have been made to the EP regarding this matter.	
1.2	***Matter:*** *Intergenerational Equity Principle* Claim that development of additional petroleum and gas resources is fundamentally inconsistent with long-term health, diversity and productivity of the environment due to the long term and irreversible impacts of climate change. ***Claim*****:** The EP cannot be made consistent with the aim of maintaining and enhancing the health, diversity and productivity of the environment for the benefit of future generations, as required by the Intergenerational Equity Principle.	Santos' Environmental Hazard Identification and Assessment Guideline (EA-91-IG-00004) includes consideration of the principles of Ecologically Sustainable Development (ESD). For each of the identified aspects in Sections 6 and 7, Santos has considered whether the associated risks and impacts are consistent with the principles of ESD. No changes have been made to the EP regarding this matter.	
1.3	***Matter:*** *Conservation Principle* Claim that a proper application of the conservation principle must prioritise conservation of biological diversity and ecological integrity. ***Claim:*** The EP does not achieve the "fundamental" aims of the Conservation Principle.	Santos' Environmental Hazard Identification and Assessment Guideline (EA-91-IG-00004) includes consideration of the principles of Ecologically Sustainable Development (ESD). For each of the identified aspects in Sections 6 and 7, Santos has considered whether the associated risks and impacts are consistent with the principles of ESD. No changes have been made to the EP regarding this matter.	

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2	***Matter:*** *The titleholder has not included explicitly required content in the activity Description section of EP, in accordance with NOPSEMA policy* ***Claim*****:** The titleholder has not disclosed information about the projected future of the oil field in the EP, as explicitly required by NOPSEMA's policy guidelines.	Santos understands the requirements of Environment plan content requirement guidance note (2020) and submits that the activity description is adequately and appropriately described (the drilling of exploration and/or appraisal wells) for the petroleum activity to be assessed. Santos is unable to provide a detailed description of the "projected future of the oil field" until exploration is undertaken. Assessment of projected future of the oil field would be information provided in any future EPs for development drilling and/or operations, if any field discovered was assessed as being commercially viable. No changes have been made to Section 2 or elsewhere within the EP regarding this matter.	The activity covered by this EP is limited to exploration drilling. Given that the titleholder is still at the exploratory phase and is yet to determine the nature of hydrocarbons resources or its viability for commercial development, it is not feasible to provide a detailed description of the future oil field development. Any future development of the oil field will be subject to relevant titles being granted and subsequent regulatory approvals. NOPSEMA is satisfied that the description of the current activity meets the requirements of the Environment Regulations.
3	***Matter****: OPEP does not include content explicitly required to address specific risks involved with a multiple campaign drilling program, in accordance with OPGGS Regulations and NOPSEMA Policy.* ***Claim***: The titleholder has not demonstrated that the proposed management measures are sufficient for reducing the increased environmental risks associated with multiple campaign drilling and has failed to include source control plans in the EP.	Santos notes that the EP describes the activities as a multi-well campaign whereby the wells are not drilled concurrently, but sequentially across the life of the EP. The EP has been written in accordance with the OPGGS Environmental Regulations and NOPSEMA guidance publications on the required content and therefore the EP addresses the environmental impacts and risks of a loss of well control event. The EP is not required to assess the well integrity aspects of a loss of well control event and consequently has no requirements that need to be met with regard to Section 5 of the OPGGS(RMA) Regs. These relate specifically to Well Operations Management Plans and are not relevant to Environment Plans. The WOMPs, which are also assessed by NOPSEMA, provide a description of the measures and arrangements that will be used to regain control of the well if there is a loss of integrity. This includes details on source control planning. For any well drilled under this EP, the Source Control Plan is encompassed by that well's Well Operations Management Plan, not the EP The EP therefore provides a high-level description of the function of the source control plan as it is implemented via the OPEP, and how this relates to a reduction in environmental impacts. No changes have been made to the EP regarding this matter.	During the course of the assessment, NOPSEMA sought clarification on the drilling program. As a result, the EP has been updated since first submitted to clarify that while it contains a multi-well campaign only one drilling activity will occur at any one time. While NOPSEMA considers there can be benefits from concurrent drilling in terms of reducing mobilisation times for relief well drilling, the accepted EP/OPEP describes appropriate arrangements for the timely procurement and mobilisation of a capable relief well rig in the event of a loss of well control (see item 8). The OPEP includes a chapter for the "Source Control Plan" which reviews the key scenario details, methods, tools, schedule, arrangements, and performance standards. References are made in the submission to more detailed Santos procedures, whether corporate or campaign-specific. Through the assessment process NOPSEMA focused on ensuring adequacy of arrangements for source control (See Key matter 8 below).
4	**Matter:** The titleholder has not provided sufficient baseline information in relation to ecological values of the nearby Bedout Island, nor demonstrated technical confidence that the risk to those values has been reduced to ALARP in the event of a loss of well control ***Claim*****:** The assessment of acceptability lacks any precision	Assessment of acceptability The EP describes how the modelling is used to identify the high environmental value (HEV) receptors contacted by surface, subsurface (entrained hydrocarbon and DAH's), and shoreline accumulation (Section 7.5.5). Bedout Island is identified as a high environmental value	NOPSEMA recognises that there was concern about the adequacy of the assessment of baseline information on ecological values of Bedout Island and that impacts and risk to those values in the event of a loss of well control had not been reduced to ALARP. In making a decision on this matter, NOPSEMA took into account the content of the EP and OPEP; relevant scientific literature, views expressed by relevant persons (e.g. WA Department of Biodiversity, Conservation and Attractions (DBCA)), and NOPSEMA's Decision Making Guidelines (GL1721) and Oil Pollution Risk Management

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	whatsoever and is assumed to apply to all identified ecological values across the NWMR. That the Proponent has not 'thoroughly assessed' what baseline information is required commensurate with the level of risk associated with the proposed activities and to ensure that all impacts on these values can be fully remediated. Additionally, the proposed measures are not sufficiently detailed in the OPEP to demonstrate any technical confidence that the titleholder is in possession of sufficient baseline information	receptor (Value of 4 based on its ecological values) and a hotspot and priority protection area (based on the spill modelling). To ensure that all the HEVs identified within the EMBA are assessed appropriately, a consequence assessment is conducted in line with the Santos risk assessment approach (detailed in Section 5) against all HEVs. This is provided in Appendix G2 and clearly shows the consequence assessment against all the HEVs, noting that Bedout Island is assessed as potential consequence of Moderate (III). Within Table 7-18, the overall worst-case consequence is provided (IV – Major) against any one of the HEVs; the likelihood does not change as this relates to the event occurring as discussed above. No changes have been made to the EP or the likelihood or risk assessment outcomes Baseline Information A recent review of the operational and scientific monitoring (OSM) baseline data by Santos in 2021 showed that recent surveys (2016 and 2017) conducted at Bedout Island by DBCA are rated as being of fair quality (in the context of application for OSM purposes). Santos acknowledges the concerns regarding baseline data for operational and scientific monitoring for Bedout Island and has updated the details within the Scientific Monitoring Capability Assessment in Appendix R of the OPEP to provide further information on the various methodologies available for collecting baseline data in the unlikely event of a major oil spill, which includes post-spill pre-impact scientific monitoring, use of reference sites, a gradient approach, and potential use of remote sensing data. The techniques selected will be appropriate to the receptor type. The extent of ecological baseline data information gathering for OSM purposes is commensurate to activity risk profiles. The worst-case MDO oil spill modelling releases indicate that out of a total of 450 modelled oil spill scenarios, less than 3% show shoreline contact with Bedout Island in less than the 72 hours required to mobilise OSM resources. The equivalent figure for a loss of well control (LOWC) is 4%. This shows that post-spill pre-impact monitoring can be conducted well within this time in 94% and 96% of modelled worst-case release scenarios for MDO and LOWC, respectively. Proposed control measures A worst-case LOWC scenario is not a planned discharge; it is an unlikely accidental event given the control measures that are put in place to reduce the risk of LOWC. These control measures are based on industry best practices. The control measures in the EP and OPEP are commensurate with the	Guidance Note (GN1488). During the assessment NOPSEMA required Santos to provide further information and to modify its submission to address potential impacts and risks of worst-case LOWC scenarios on Bedout Island. Santos provided further clarification on its baseline data review and methods to be adopted to detect environmental impacts where sufficient baseline data is not currently available (OPEP Appendix Q). The oil spill scientific monitoring plans provide information on the monitoring objectives and the process for selecting receptors and sites to be monitored. NOPSEMA is satisfied that Santos has provided an adequate review and description of existing baseline data for Bedout Island and has provided for appropriate arrangements for pre-emptive baseline in the unlikely event of a spill. Relevant to the above, it is noted that the operational area was amended during the assessment (see Key Matter #6) which increased the distance between potential drilling locations and Bedout Island from 10 to 35 km. Santos re-modelled potential LOWC scenarios and outputs of this modelling were applied to update the assessment of spill response needs and response planning for priority for protection areas including Bedout Island (see Key Matter 12 below). Santos has additionally committed to a develop a tactical response plan (TRP) for Bedout Island prior to the drilling activity commencing. Taking into consideration the revised spill modelling and spill response planning for priority for protection areas, including a commitment to develop a TRP, NOPSEMA is satisfied that oil pollution impacts and risks to Bedout Island have been reduced to ALARP.

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		level of risk associated with the Bedout Multi-well drilling project. The OPEP also commits to the provision of well/campaign specific SCPs, which will be submitted as part of the WOMP(s), as detailed in response 5 above. No changes have been made to the EP	
5	***Matter:*** *Cumulative impacts of acoustic emissions on migratory species in the area has not been fully addressed* ***Claim*****:** That the compounding effect of noise emissions from nearby oil and gas drilling pre-exist the proposed activities in the EP, and the validity of the argument that cumulative effects from the activity are not expected is questionable and relies on outdated knowledge.	Santos notes that, as part of the activity, Vertical Seismic profiling (VSP) is planned. However, there will be no vessel-based seismic activities occurring and hence, that does not form part of the scope of the activity as outlined in Section 2 of the EP. VSP has a much shorter transmission pathway compared with seismic surveys and air guns, therefore VSP has a smaller total volume and impact on marine fauna compared with seismic surveys (Kent et al., 2016). Cumulative impacts will only occur where the effects of previous activities overlap the same area and when recovery of the impacts from these activities has not occurred prior to the Bedout multi-well activity commencing. Duarte et al (2021) states that noise is typically a point-source pollutant, the effects of which decline swiftly once sources are removed. Due to the low sound levels emitted during the proposed drilling activity including from VSP, as described within Section 6.1.2 of the EP, and the proposed control measures, the potential impacts to marine fauna are limited to behavioural impacts confined within the short durations when VSP is conducted (12-18 hour windows). Therefore, recovery of marine fauna from noise emitted by the proposed activity will occur within a short duration and when they have moved away from the area. Therefore no long term effects are predicted. Given the time and distance between other drilling activities there is not considered to be any potential for cumulative effects due to the short-term nature of the VSP operations and the low sound levels generated by continuous noise sources during drilling and vessel based activities. In addition, control measures proposed will limit the potential impacts to migratory species such as whales and whale sharks.	The activity overlaps biologically important areas for a number of species, including pygmy blue whales, humpback whales and whale sharks. A focus of NOPSEMA's assessment was to ensure that the activity will be managed in a manner that will not have an unacceptable impact on matters protected under Part 3 of the EPBC Act. In making a decision regarding this matter, NOPSEMA took into account the content of the EP; relevant scientific literature; Approved Conservation Advice for Megaptera novaeangliae (humpback whale) (DoE 2015), Conservation Management Plan for the Blue Whale (DoE 2015), Recovery Plan for Marine Turtles in Australia (DoEE 2017), EPBC Act Policy Statement 2.1 (DEWHA 2008), and the EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA 2013). During the course of the assessment process, Santos revised the EP to clarify that only one MODU would be used for the activity, and that no concurrent drilling would occur under this EP. Santos evaluated the potential for cumulative impacts, considering other activities planned in the region and concluded that cumulative impacts are not expected to occur. Santos conducted an evaluation of noise emissions on marine fauna from the MODU/vessel operations, helicopters, ROV operations and VSP. The evaluation predicted no injury or mortality to marine fauna and behavioural impacts are expected to be temporary and localised. Santos has committed to manage the activity in a manner that will not result in injury or mortality to EPBC Act (1999) and WA Biodiversity Conservation Act (2016) listed marine fauna [DC-EPO-05]. The primary control measures that will be implemented to ensure there is no physical injury to listed marine fauna are Santos' procedures for interacting with marine fauna [BD-CM-001] and MODU seismic survey procedures [BD-CM-018]. Considering the location of the drilling activity, the predicted area in which behavioural responses to noise from VSP operations may occur (up to 2.42 km), the short duration of VSP operations (12-18 hours) and the adopted control measures, NOPSEMA has concluded that the activity will not cause unacceptable impacts to matters protected under Part 3 of the EPBC Act.
6	**Key matter:** The scale of the operational area requires appropriate definition and certainty in relation to environmental management.	Santos conducted an evaluation of the impacts and risks related to the activity and described how these will be managed. The nature and scale of the original activity submitted to NOPSEMA was substantial and lacked sufficient activity definition (multiple exploration wells to be drilled at undefined locations within an extensive operational area at any time of the year over a 5-year period)	NOPSEMA was initially not satisfied the project had sufficient definition to inform the appropriate evaluation and management of impacts and risks to ensure the project would not adversely impact the environmental values of the Bedout Basin region of the Northwest Shelf. During the assessment process NOPSEMA required improved project definition in relation to the scale of the operational area, proximity to sensitive locations, and lack of specificity relating to well locations. Santos revised the scope of the activity to substantially reduce the size of the operational area, and as a result: • two smaller discrete operational areas were identified • the activity was limited to two permit areas (Permit area WA-541-P was removed from scope)

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			• The EP was adjusted accordingly to account for the changes to the activity scope. For spill scenarios: • The LOWC scenarios were revised and re-modelled using updated well configuration data. • Oil pollution response requirements and arrangements were re-evaluated based on the new oil spill modelling. • Revised oil spill response needs and capabilities are detailed in the OPEP and additional controls have been evaluated where relevant For drilling discharge management: • Whereas previously well locations were potentially as little as 130 m from the Ancient Coastline KEF and 150 m from the Eighty Mile Beach AMP, the nearest drilling locations is now 24 km from the KEF respectively, and at least 87 km from Eighty Mile Beach AMP. • An improved description of the benthic environment was provided, with reference to a seabed characterisation and mapping study that was conducted for the Dorado development OPP has been included to provide a basis for the description provided. • Additional controls for drilling discharges were added, such as controls restricting the levels of heavy metals in barite. NOPSEMA has concluded that after taking into consideration all the environmental management requirements, in the context of the refined operational area, that the activity will not result in unacceptable environmental impacts and risks.
7	**Key matter:** Ensuring light emissions from the drilling activity do not result in unacceptable impacts to marine turtles and seabirds.	Santos conducted an evaluation of the impacts of light emissions from the drilling activity on marine fauna, in particular to marine turtles and seabirds.	The activity overlaps several biologically important areas for marine turtles and seabirds. A key focus of NOPSEMA's assessment was to ensure that the activity will be managed in a manner that will not have an unacceptable impact on marine turtles and seabirds. In making a decision regarding this matter, NOPSEMA took into account the content of the EP; relevant scientific literature; Recovery Plan for Marine Turtles in Australia (DoEE 2017), National Light Pollution Guidelines for Wildlife (DoEE 2020) and the EPBC Act Significant Impact Guidelines 1.1 – Matters of National Environmental Significance (DEWHA, 2013). In response to NOPSEMA's assessment, Santos revised the operational area for the activity. The closest point of the operational area to Bedout Island was increased from 9 km to 35 km. The increased separation distance means that seabird roosting/breeding behaviour is not expected to be interrupted and impacts to marine turtles limited to localised attraction from activity lighting. The assessment concluded that the activity will not compromise the objects set out in the Recovery Plan for Marine Turtles (DoEE 2017). NOPSEMA has concluded that the activity will not result in unacceptable impacts to marine turtles and seabirds.
8	**Key matter:** Ensuring source control arrangements and capability are adequate to reduce the risks of worst-case loss of well control to ALARP.	Santos provided an evaluation of the risks associated with a loss of well control and described source control arrangements.	NOPSEMA expects titleholders to provide a demonstration within the EP that there are adequate arrangements in place for a timely response to oil pollution. The primary control measure for drilling activities is source control to mitigate the consequences of a loss of well control. Throughout the assessment process NOPSEMA required that Santos provide improved detail and better explanation of arrangements for source control. This included evaluating options for reducing potential worst case discharge volumes, improving response timeframes, and exploring options for improved relief rig availability. Additionally, NOPSEMA required demonstration that well design, reservoir, and other relief well planning preparations would be completed in preparation for drilling, including introduction of an adaptive management

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			process for monitoring and taking action in response to any limitations to rig availability that may arise before or during a drilling campaign. Santos updated the EP/OPEP relating to loss of well control risk and/ or source control strategy and arrangements with more detail and better explanation which included suitable arrangements with Well Control specialists, preparation of SCERP & well specific source control plan etc, relief well planning, rig monitoring, commitment to ensuring relief rig available, and importantly, includes relevant commitments to confirm relief well MODU availability in the timeframes of the accepted EP/ OPEP, acknowledging that in the event that a suitable MODU for relief well drilling is not available within required timeframes, the drilling schedule would be delayed. Additionally, Santos evaluated potential for alternate well design, semi-sub relief MODU and concurrent drilling and supported a case that the options were not feasible for the activity Taking into consideration the additional information and modifications to the OPEP, NOPSEMA is satisfied that there are adequate source control arrangements in place for timely response to a loss of well control incident.
9	**Key matter:** Ensuring oil spill response arrangements and capability are adequate to reduce the potential impacts and risks of worst-case loss of well control.	Santos described arrangements in place for responding to an oil spill.	NOPSEMA expects that titleholders consider alternative, additional and improvements to oil spill response control measures and that an EP demonstrates that the costs of any further improvements to the quality, quantity or timeliness of adopted controls would be grossly disproportionate to the environmental benefit gained. In making a decision on this matter, NOPSEMA took into account the EP and OPEP, views expressed by relevant persons, relevant oil spill response guidance documents and NOPSEMA's Oil Pollution Risk Management Guidance Note (GN1488). Based on the first submission NOPSEMA required that Santos provide a more detailed and quantified description of the proposed arrangements and capability for dispersant, containment and recovery, and shoreline clean-up operations so as to demonstrate that Santos is in a position to reduce risks from an oil pollution incident to ALARP and acceptable levels. In response Santos updated the EP to include: • an expanded "Chemical dispersant application plan" which provides more information on the literature on dispersant use, dispersant selection, dispersant effectiveness monitoring, dispersant supply and logistics. • an ALARP demonstration for containment and recovery; this proposed a specific level of operations (i.e. 21 response units) and presented detail on potential sources of vessels and equipment (including liquid waste storage). • an updated shoreline clean-up plan which provides for estimates of shoreline resource requirements based on modelling predictions of worst-case shoreline oiling at priority protection areas, consideration of logistical response requirements of working on offshore islands, identification of cumulative field-response personnel requirements across all response strategies, allowances for redundancies in personnel estimates, identification of shoreline response arrangements and capability to meet the ongoing response needs for the duration of any response, further details of existing shoreline tactical response plans (TRPs), and commitments to develop additional TRPs for Bedout Island and Karratha-Port Hedland prior to drilling. Taking into consideration the additional information and modifications to the OPEP, NOPSEMA is satisfied that the arrangements and capability presented are commensurate to the risk presented.
10	**Key matter:** Ensuring incident management personnel arrangements and capability to manage the response	Santos outlined incident management team arrangements and capability to respond to a loss of well control.	Titleholders must demonstrate access to a sufficient Incident Management Team (IMT) capability to meet the requirements of worst-case oil pollution scenarios and to manage the response operations described in the

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	operations described in the OPEP are adequate to reduce the impacts and risks of a worst-case loss of well control to ALARP.		OPEP. In making a decision regarding this matter, NOPSEMA took into account the EP and OPEP, views expressed by relevant persons, relevant oil spill response guidance documents, and Oil Pollution Risk Management Guidance Note (GN1488). During the assessment NOPSEMA required Santos to provide further information and make modifications to its assessment of the incident response requirement and Incident Management Team capability and arrangements. Santos revised the assessment of its incident response requirements and updated its arrangements and capability to access and deploy Incident Management Team (IMT) personnel to include: • Cumulative assessment of overall incident response personnel requirements to address competing demands of the different response strategies for the duration of a worst-case LOWC scenario. • Sufficient incident management personnel to "scale-up" a response to meet peak personnel requirements of an ongoing LOWC scenario. • Availability of additional IMT personnel including provision for operating separate IMT day and night shifts. • Details of internal and external sources of incident management personnel to meet response needs for the duration of a response. • A revised ALARP assessment of potential alternative and additional arrangements to meet the IMT personnel requirements. Taking into consideration the additional information and modifications to the OPEP, NOPSEMA is satisfied that sufficient trained and competent incident response personnel will be available to manage the identified response operations, and that potential impacts and risk of worst-case spill scenarios have been reduced to ALARP.