



ENVIRONMENT PLAN

Beehive Multi-Well
Exploration Drilling:
Public Comment Report

WA-488-P

September 2024
Rev 0



1. Introduction

In accordance with Regulation 28(1) of the OPGGS(E), the multi-well drilling environment Plan (EP) was published on NOPSEMA's website, along with an invitation for public comment on the plan, for 30 days from the 9th of July 2024; closing at midnight on the 7th of August 2024.

2. Titleholder Contact Details

The nominated liaison person for this EP is:

Name: Jonathan Chung

Position: Director, Business Development International

Address: 1111 Bagby Street, Sky Lobby 2, Houston, Texas 77007 USA

Ph: +1 713-651-7000

Email: australia@eogresources.com

3. Public Comments

The public comments and EOG's responses are provided in Table 1. The titleholder response has been prepared in accordance with the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA's) Guidance Note *Responding to public comment on environment plans* (N-04750-GN1847, A662607, 10 January 2024) using the template provided by NOPSEMA document N-04750- FM1846.

Table 1. EOG Resources Australia Block WA-488 Pty Ltd ('EOG') Beehive Multi-Well Exploration Drilling Environment Plan – titleholder response

Matter	EOG Response
<p>(1) An unplanned spill event from the Proposal would present high risk to sensitive environmental receptors.</p> <p>Claim that “oil and gas developments in the neighbouring Commonwealth waters as a threat to water and sediment quality in the North Kimberley Marine Park.”</p> <p>Claim that “Prior to commencement of the Proposal, the environment supporting important ecological values should be mapped, establishing baseline survey data. This is critical for monitoring purposes, and in the event of an unplanned spill.”</p>	<p>The proposed activity is consistent with the relevant management plans for the Joseph Bonaparte Gulf Australian Marine Park, the North Kimberley Marine Park and the Ord River Floodplain Ramsar Site.</p> <p>A detailed description of all environmental, heritage and socio-economic receptors and values within the activity area is presented in Chapter 5 of the EP, and the same information for the Environment that May Be Affected (EMBA) by a loss of well containment (LoWC) is presented in Appendix 11 of the EP.</p> <p>The Operational and Scientific Monitoring Program (OSMP), which outlines the baseline environmental monitoring that would be undertaken in the event of a LoWC, is presented in Appendix C of the Oil Pollution Emergency Plan (OPEP). Table 2.1 of the OSMP lists the key sensitivities of each shoreline sector within the spill EMBA, while Chapter 4 of the OSMP presents a detailed assessment of baseline data, in recognition that this knowledge is important in the event of monitoring in the event of an unplanned spill.</p>
<p>(1) Claim that a worst-case LoWC scenario “gives a maximum spill volume of 786,794 m3, producing widespread and temporary reduction in water quality and sub-lethal to lethal toxicity impacts to marine life. The significant impacts from an unplanned oil spill from the Proposal would be unacceptable” and “given the high risk presented to the surrounding environment by the Proposal, a clean-up contingency plan is critical.”</p>	<p>Chapter 9 of the EP describes the potential hydrocarbon spill response strategies and sets spill response environmental performance standards (EPS) (with the EPS for preparedness contained within the Oil Pollution Emergency Plan, OPEP).</p> <p>Where a real-time Net Environmental Benefit (NEBA) for the actual spill scenario determines that one or more of the spill responses will have a net environmental benefit, they will be implemented.</p> <p>The background information, scope of activity, known and potential environmental impacts and risks, evaluation of environmental impacts and risks and impact and risk assessment for each of the hydrocarbon spill response options for the multi-well drilling campaign does not differ to that for the Beehive-1 drilling campaign. As such, EOG refers the reader to the following sections of the NOPSEMA-accepted Beehive-1 drilling EP (996161-2022-Beehive#1-Drilling EP-Rev6) that provides the background information, scope of activity, known and potential environmental impacts and risks, evaluation of environmental impacts and risks and impact and risk assessment for each of the hydrocarbon spill response options:</p> <ul style="list-style-type: none"> ○ Source Control – Section 9.1 ○ Monitor and Evaluate – Section 9.2 ○ Dispersant Application – Section 9.3

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	<ul style="list-style-type: none"> ○ Containment and Recovery – Section 9.4 ○ Shoreline Protection and Deflection – Section 9.5 ○ Shoreline Clean-up – Section 9.6 ○ Oiled Wildlife Response – Section 9.7 and ○ Waste Management (Support Activity) – Section 9.8. <p>The Beehive-1 Exploration Drilling OPEP describes the arrangements for responding to and monitoring pollution in the event of a hydrocarbon spill during drilling for the Beehive-1 well. The OPEP is supported by a series of field response guidance documents and site-specific Tactical Response Plans (TRPs) for the implementation of applicable response strategies as identified via the strategic NEBA process.</p> <p>The Beehive-1 Drilling OPEP was accepted by NOPSEMA for the Beehive-1 drilling campaign. Given that the loss of well containment scenario for the multi-well campaign remains the same as that for Beehive-1, there is no reason to ascertain that the accepted Beehive-1 OPEP is not suitable for the multi-well campaign.</p>
<p>(1) One claim was made that the proposal has the potential to produce direct and indirect impacts to ecologically significant offshore, nearshore and onshore ecological communities, including impacts to coral reefs, seagrass communities, mangroves, migratory birds, sea turtles, dugongs, Australian snubfin dolphins, diverse finfish communities, all reliant on healthy marine ecosystem.</p>	<p>This claim has not been substantiated with examples from the Beehive Multi-Well Exploration Drilling Environment Plan (EP).</p> <p>EOG believes impacts and risks to all relevant receptors in the operational area and in the EMBA by a LoWC have been thoroughly addressed in the EP, demonstrating that impacts and risks will be acceptable and ALARP. For example:</p> <ul style="list-style-type: none"> • In Chapter 7 (impacts), all residual impacts are predicted to be ‘negligible’. • In Chapter 8 (risks), risks from an oil spill caused by a LoWC are assessed as having ‘low’ to ‘medium’ residual risk rankings to various ecological receptors.
<p>(1) Threat to the marine environment and coastline in the event of a spill</p> <p>Claim that there was a lack in the use of “detailed local sourced data in undertaking the oil spill modelling and in the</p>	<p>The spill EMBA for the Beehive Multi-well Drilling campaign is the same as that for the Beehive-1 drilling campaign. The Beehive-1 EP and associated OPEP was accepted by NOPSEMA on 10 June 2024. There are no substantial changes between these activities.</p> <p>a) Appendix 16 of the EP shows the shoreline types occurring within the EMBA including:</p> <ul style="list-style-type: none"> ○ Alluvial sediment / plain

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<p>assessment of possible impacts used as the basis for this EP” including:</p> <p>a) The use of rocky shoreline as the default shoreline for the modelling (despite mudflats, mangroves and estuaries making up such a distinctive and large part of the wider coastline).</p> <p>b) The use of global data sets for input data where local conditions are so highly idiosyncratic (particularly on sedimentation and salinity).</p> <p>c) The literature review on the impact on mangrove systems seemed to take a specific interpretation of the conclusions of the reference material presented and did not include more recent and critical studies of oil spill impact of mangroves. This literature review also focussed largely on the impact on mangroves themselves rather than on the impacts of ecosystem function of ancillary elements such as mudflats or shallow waters, or on other groupings of species that occur there.</p> <p>d) The thresholds presented are insufficiently tailored to the receiving environment and guided by Australian studies, let alone local ones.</p>	<ul style="list-style-type: none"> ○ Beach sediment / ridges ○ Colluvium ○ Tidal flats (sand, mud, sediment) / mangroves ○ Hard bedrock / cliff (>5 m) / hard rocky shore ○ Marshy sediment flats / marshy saline sediment flats ○ Mixed sandy shore / mixed sandy sediments on bedrock ○ Muddy sediments / alluvium / sediment flats ○ Reef / coral outer with sandy shore ○ Rocky shore ○ Saltpans / saline mudflats ○ Sandy beach / alluvium / shore / dune / foredune ○ Sediment plain / sediment deposits ○ Soft bedrock. <p>A rocky shoreline was assumed as the default shoreline type for the modelling in this study, as a large part of the shoreline in the study area (especially the western part of the Joseph Bonaparte Gulf) is characterised by exposed rocky shorelines (as shown in Appendix 16).</p> <p>b) Appendix 13 (Oil Spill Trajectory Modelling Report) provides a comprehensive explanation of the methodology and data sets used to undertake spill modelling. The modelling meets the ASTM Standard F2067-13 “Standard Practice for Development and Use of Oil Spill Models”.</p> <p>c) The Oil Spill Monitoring Handbook (Hook <i>et al.</i>, 2016) is one of the more recent reference documents for reference with regard to the effects of oil on various shorelines, and was used in the preparation of the oil spill impact assessment for mangroves. There is a fine balance between presenting volumes of literature research and providing a synthesis of such research for the purposes of an EP. EOG determined that the information represents such a balance.</p>

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	<p>d) The spill EMBA for the Beehive Multi-well Drilling campaign is the same as the Beehive-1 drilling campaign. The Beehive-1 EP and associated OPEP was accepted by NOPSEMA on 10 June 2024. There are no substantial changes between these activities. The modelling methodology presented meets the ASTM Standard F2067-13 “Standard Practice for Development and Use of Oil Spill Models” and the modelling thresholds represent the latest scientific knowledge.</p>
<p>(1) Claim that “the capacity to carry out any emergency response to protect this environment goes little beyond booms in some circumstances and offshore aerial use of dispersant” and that “there is no ability to mitigate the impact of a moderate or large spill in this environment from potential sources so close to shore.”</p> <p>Claim that the EOG should implement the following:</p> <ul style="list-style-type: none"> a) The permanent presence of a relief drill to be on standby throughout the operations (the current intent of being able to mobilise a drill from Australia or South East Asia in 77 days is unacceptable). b) The permanent presence of a dedicated spill/or fire response vessel with sufficient booms and surfactant stored locally to facilitate immediate use. c) CSIRO or AIMS are commissioned to review the oil spill modelling and risk assessment and to publish the review or 	<p>The spill EMBA for the Beehive Multi-well Drilling campaign is the same as the Beehive-1 drilling campaign. The Beehive-1 EP and associated OPEP was accepted by NOPSEMA on 10 June 2024. There are no substantial changes between these activities.</p> <ul style="list-style-type: none"> a) Table 2.11 describes the relief well schedule and states that the rig would be mobilised within 23-24 days and the blowout killed within 77 days. An assessment of the risks associated with LoWC and potential control measures was undertaken and described in Table 8.20 of the EP. It was determined that while maintaining a second MODU in standby for relief well drilling would reduce the mobilisation time for drilling a relief well, thereby minimising the volume of crude spilled to the sea, it is not feasible nor practicable as the significant cost is grossly disproportionate to the low risk of a LoWC when taking into consideration all other control measures in place. b) An assessment of the risks associated with LoWC and potential control measures was undertaken and described in Table 8.20 of the EP. It was determined that while maintaining a support vessel on standby would reduce the mobilisation time for deploying spill response equipment, thereby potentially minimising the impacts of spilled crude oil, it was not feasible nor practicable as with all other control measures in place, the significant cost of this measure is grossly disproportionate to the low risk of a LoWC. c) The modelling methodology presented meets the ASTM Standard F2067-13 “Standard Practice for Development and Use of Oil Spill Models”. The consultancy that undertook the spill modelling, RPS, is independent to EOG, highly reputable and used by Australian Government to conduct spill modelling and forecasting and hindcasting for marine search and rescue activities. As such, EOG believes that an independent review of the spill modelling is not warranted. d) EOG undertook extensive consultation during the development of the OPEP for Beehive-1 drilling campaign, and worked closely with the WA Department of Transport (DoT) and the Australian Marine Oil Spill Centre (AMOSOC) in the development of the OPEP, which is very comprehensive. Local councils do not have the expertise to

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<p>actually to do their own modelling and risk assessment.</p> <p>d) That the company is required to develop a ground-up oil spill response plan where the local council and First Nations groups are given the opportunity to genuinely cooperate in the development of the plan that they are apparently likely to have some responsibility to implement.</p> <p>e) That no drilling occurs unless the Director of National Parks has signed off on the oil spill response.</p>	<p>contribute to the development of an OPEP. First Nations groups adjacent to the spill EMBA have been consulted to determine if and how they can contribute to spill response activities (for example, via Sea Ranger groups).</p> <p>e) NOPSEMA has responsibility for safety, well integrity and the environmental management of the offshore petroleum industry within Commonwealth waters in accordance with the Australian Government Offshore Petroleum and Greenhouse Gas Storage Act 2006 (OPGGSA) and associated regulations. NOPSEMA is responsible for the assessment, acceptance and compliance of OPEPs related to petroleum activities in Commonwealth waters. The Director of National Parks does not have jurisdiction over the activity area or oil spill response, but has been consulted for the activity and has not provided any feedback.</p>
<p>(2) Artificial light emissions from the Proposal present high risk to threatened turtle species.</p> <p>Claim that “To meet policy requirements, it is advised that the Proponent avoid producing artificial light emissions between August and September, which is the peak nesting period for flatback turtles (2024 Beehive MW Drilling Rev0, p.121). It is also recommended to set curfews for artificial light at peak nesting times, such as after 8 pm.”</p>	<p>EOG undertook an assessment of the light management options for turtle nesting beaches from the National Light Pollution Guideline for Wildlife (DCCEEW, 2023) as provided in Table 7.7 of the EP. This assessment determined that the use of light curfews was not achievable as drilling operations are conducted 24-hours a day and light is necessary for navigational and personnel safety.</p> <p>It was also determined that a seasonal exclusion would not avoid all turtle nesting, inter-nesting and hatchling activity but may avoid the known peaks. The impact assessment determined the risk to hatchlings from light emissions is low and consistent with the requirements of the Recovery plan for marine turtles in Australia 2017–2027. Furthermore, the nearest shoreline (and thus potential nesting location) is 76 km away, therefore there is a large dark zone between the potential nesting location and the activity, with MODU and support vessel lighting not visible from the beach.</p> <p>The impacts to turtle species within the activity area from light emissions has been assessed as having ‘negligible’ residual risk ranking. The controls in place have reduced the risk to ALARP (Table 7.8).</p>
<p>(3) The Proposal’s noise emissions require further assessment.</p> <p>Claim that “the total EMBA for noise impacts is unclear in the provided EP.”</p>	<p>Section 7.5 of the EP provides the EIA for underwater sound.</p>

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<p>(3) Claim that “EPBC Act Policy Statement 2.1 provides guidance for inclusion in the Proposal’s noise management plan:</p> <ul style="list-style-type: none"> ○ precaution zones for seismic activities operating in cetacean habitat: 3+ km observation zone from the acoustic source, a 1 km low power zone and a 500 m shut-down zone (EPBC Act Policy Statement 2.1, p.7) ○ a suitably qualified marine mammal spotter ○ avoidance of breeding periods and ○ ongoing monitoring of environmental values.” 	<p>Vertical seismic profiling (VSP) is described in Section 2.7.4 of the EP (pg. 22) and is assessed in Section 7.5. As described in Section 5.4.5 of the EP, the activity area is not important habitat for cetaceans and there are no biologically important areas (BIAs) for cetaceans in or around the activity area.</p> <p>Control measures listed in Table 7.14 adopt certain controls from EPBC Act Policy Statement 2.1 for VSP activities.</p>
<p>(3) Claim that as the Proposal includes multiple sound sources (i.e. vessel thrusters while on DP, VSP, helicopter) the risk of sound emissions on marine fauna needs to consider the impact should all sound sources be operated at the same time.</p>	<p>The risk of cumulative impacts of noise emissions is not addressed because it is not a risk. Drilling with a jack-up rig does not generate much underwater sound.</p> <p>Sound generated by the support vessel when it is within the operational area (within a 500-m radius of the rig) has been assessed. The time that is spent within the operational area is limited.</p> <p>When helicopters are landing and taking off, the support vessel is generally just outside the 500-m zone and therefore not considered part of the activity. As such, cumulative sound from concurrent rig, helicopter and vessel operations is not relevant in this scenario.</p> <p>Section 7.5.4 of the EP includes an assessment of the environmental impacts from noise emissions. This assessment concluded that the drilling of three wells in succession would result in negligible cumulative underwater sound impacts.</p> <p>Given the short time of audibility underwater (0.14% of a day) and low frequency of helicopter flights, impacts from helicopter sound to sound-sensitive marine fauna are assessed as negligible.</p>

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	<p>Undertaking three rounds of VSP (should all three wells be drilled) will not result in cumulative impacts to marine fauna because there will be significant time between these VSP events (more than 55-150 days required to drill each well) where ocean sound will be at ambient levels. Woodside (2003) found that vessel noise levels rarely (<1% of the time) exceeded a threshold of 120 dB re 1µPA (i.e., slightly less than ambient underwater sound intensity in the activity area) from an acoustic monitoring site 5.1 km from the source when a drilling support vessel was holding position using dynamic positioning bow thrusters.</p>
<p>(4) The risk to Matters of National Environmental Significance (MNES) from ship movements must form part of the environmental assessment of the Proposal.</p> <p>One claim was made that the impact of increased ship movements on MNES has not been assessed.</p>	<p>Section 8.2 of the EP discusses the risk of vessel collision with marine megafauna and includes an assessment of the activity against the following:</p> <ul style="list-style-type: none"> ○ Conservation Management Plan for the Blue Whale (Table 8.7) ○ Approved Conservation Advice for the Sei Whale and Fin Whale (Table 8.8) ○ Approved Conservation Advice for the Humpback Whale (Table 8.9) ○ National Strategy for Reducing Vessel Strike on Cetaceans and Other Marine Megafauna (Table 8.10) ○ Recovery Plan for Marine Turtles 2017-2027 (Table 8.11) ○ Conservation Advice for Whale Sharks (Table 8.12) <p>The risks to the species within the activity area from increased vessel movements have been assessed as having 'negligible' residual risk ranking. The controls in place have reduced the risk to as low as reasonably practicable (ALARP) (Table 8.13).</p>
<p>(5) Further assessment of the Proposal's greenhouse gas emissions is required.</p> <p>One claim was made that the EP is limited to the drilling component of the Project (considering only impacts from scope 1 and scope 2 emissions) and should have included Scope 3 emissions, meaning the full GHG impacts of the project have not been assessed.</p>	<p>We note that the submitter raised this issue for the Beehive-1 EP and the same general response applies for the multi-well drilling campaign.</p> <p>The EP relates to drilling activity that will determine whether there are in fact recoverable hydrocarbons in the part of the reservoir to be drilled and any future possibility of production. As a result, only Scope 1 emissions are assessed in this context.</p> <p>Section 7.4.2 of the EP provides a detailed outline of expected Scope 1 greenhouse gas emissions from the drilling campaign.</p>

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<p>(6) Fossil fuel expansion is inconsistent with climate action</p> <p>Claim that “Any fossil fuel expansion is inconsistent with Australia’s commitment to the Paris agreement and limiting global temperature increases to 1.5 degrees Celsius. Further, the International Energy Agency has affirmed that no new oil, gas and coal projects can be built if the energy sector is to reach net-zero emissions by 2050. Beach energy should abandon this project and seek more responsible investments.”</p>	<p>We note this claim refers to Beach Energy’s activity. We assume the submitter meant to refer to EOG’s proposed activity and note their general objection to these activities.</p>