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SUBMISSION: Beach Energy - Onshore Otway Basin Petroleum Production Operations

AUTHOR: Environmental Protection Authority, South Australia



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Mr Jarrod Spencer
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Department for Energy and Mining
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Dear Mr Spencer

RE: Beach Onshore Otway Basin Production Operations EIR/SEO

Thank you for the opportunity to provide comment on the following documents:

- 1) Environment Impact Report, Beach Energy, Onshore Otway Basin Production Operations, October 2018 (EIR); and
- 2) Draft Statement of Environmental Objectives, Beach Energy, Onshore Otway Basin Production Operations, October 2018 (SEO);

The Environment Protection Authority (EPA) has assessed the documents and now provides its comments. The EPA highlights that the Otway basin (when compared to other regions in South Australia that are permitted to conduct similar activities) is considered to be a more environmentally sensitive area. This is due to the higher population density, that groundwater is the principal water supply for region, and the importance of groundwater to the diverse range of industries in the area. This has been taken into account while conducting the assessment.

The EPA has assessed the Onshore Otway Basin Production Operations as it relates to protection (and prevention) of the following:

- Surface Waters;
- Groundwater;
- Site Contamination;
- Noise; and
- Air Quality.

Comments are provided below:

Surface Waters

It has been proposed that the Produced Formation Water (PFW) will be either directed to evaporation ponds at the Katnook Gas Plant or stored in tanks on the site. If the water is to be stored in tanks, then bunding will be required and should be sized to capture 120% of the largest tank, in accordance with the EPA's guidelines *Bunding and Spill Management 2016*. If evaporation ponds are to be used, the EPA supports the upgrade of these ponds and re-lining them with a double membrane to assist in preventing leakage to groundwater. These evaporation ponds should be constructed (upgraded) and managed in accordance with the EPA guideline *Wastewater Lagoon Construction* (October 2018).

The EPA supports the use of new groundwater monitoring bores to monitor any leakage from the ponds. A groundwater monitoring program should be designed which specifies the environmental rationale for the location of the monitoring bores, their location, the analytes to be tested and frequency of monitoring. An upgradient bore/s should also be monitored to determine the expected concentrations for the local groundwater.

All condensate stored on site should be sufficiently banded to prevent leaks and spillage during tanker filling. If existing condensate tanks at the Katnook Gas Plant are to be used to store condensate their integrity should be tested as part of the refurbishment process.

Domestic wastewater is proposed to be stored in an underground tank constructed of concrete with treated wastewater removed from site. A monitoring system is proposed to be located within the unit, although it is not clear as to what is being monitored. As the tanks are existing, their integrity should be checked before reusing and nearby bores should be monitored on an ongoing basis to allow for leakage detection. Records should be kept of any pump out events from service providers.

As the trenching required to lay the pipework may reach a depth of 2m, interaction with the local groundwater is possible. Rain and runoff could also enter the trench in volumes that would require dewatering. Details should be provided in the EIR as to how this potential dewatering will occur and how the water will be disposed. This water should not be allowed to enter watercourses or be disposed of onto land where it is reasonably likely to enter waters unless it is tested prior to disposal and shown to comply with the *Environment Protection (Water Quality) Policy 2015*.

As the hydrotest water may contain biocides or other chemicals this water must also not be discharged to a watercourse or onto land where it is reasonably likely to enter waters (including groundwater) if it does not comply with the *Environment Protection (Water Quality) Policy 2015*. Where discharge onto land is considered, the depth to groundwater should be determined and testing of the hydrotest water should occur to determine remaining concentrations of any chemicals that have been added to the test water and the suitability for discharge to land.

Further information is required in the EIR to explain how watercourses will be protected from boring/horizontal drilling while laying pipework across those watercourses. A detailed description should be included on how the watercourses will be protected from sediment transport downstream or pollutants entering the watercourse during the drilling operations. If any dredging is required an EPA licence must be sought.

No information has been provided in the EIR regarding contaminated stormwater management on the Katnook Gas Plant site. All contaminated runoff should be captured and appropriately managed.

Groundwater

Regarding the existing pond/s reconstruction and refurbishment, the EPA guideline *Wastewater Lagoon Construction* (October 2018) advises on construction techniques. The guideline aims to assist proponents in meeting obligations under the Environment Protection Act 1993 and relevant Environment Protection Policies. While this guideline applies to new lagoon proposals, proponents who are upgrading existing lagoons should have regard to this guideline also. Given the Katnook facility ponds have not been in use for a number of years, and given the sensitivity of the local environment and the input, the EPA strongly advises that these guidelines are followed.

In applying these guidelines to the Katnook pond scenario, the EPA completed the risk assessment matrix within the guideline. The risk assessment takes into account a number of factors including depth to groundwater, groundwater use and quality. Data/information used in the risk assessment has been obtained from waterconnect.sa.gov.au. The result obtained from the risk assessment was a category 5 rating. When this rating is applied to Appendix 2 'Table of suggested construction and lining categories' of the EPA guideline *Wastewater Lagoon Construction* (October 2018), a Category 5 approach of double HDPE lining with a Construction Quality Assurance Plan is referred to. As a result, this construction approach would be an expectation of the EPA.

Management strategies for PFW including any testing carried out on the pond water and the maintenance of freeboard within the pond to prevent overflow should also be discussed. Overflows may result from high stormwater activity, blockages and structural defects in pond walls. Section 5.2, Appendix A of the SEO should reference these items as a means of how Objective 5 can be achieved.

Section 6.6, Appendix of the SEO should include a reference to minimising PFW volumes held on site (in ponds and/or tanks) as a means of how Objective 6 can be achieved.

Beach Energy hold a water licence which allows extraction of 110ML per annum. A summary should be provided on the site water balance (use), including volumes used and what the water is used for.

Reference within the draft SEO and EIR should be made to the updated 2018 EPA guideline *Wastewater Lagoon Construction* (and not the 2014 version).

Site Contamination

The EIR has identified the multiple situations in which impacts of contaminants to soil and/or groundwater may occur. Under each of these circumstances, where there is a loss of contaminants which potentially results in threatening serious or material environmental harm, the EPA should be notified as soon as reasonably practicable (in accordance with section 83 of the Environment Protection Act 1993). The proponent should also determine that if any impacts results in site contamination of soil and/or groundwater, environmental harm can be adequately managed (during site operations) to prevent any harm to human health or the environment, or if remediation is required. Any site contamination of soil and/or groundwater resultant from the activities at site should be also assessed and remediated (if required) in accordance with SA EPA's Guideline for the assessment and remediation of site contamination (July 2018) to prevent any harm to human health or the environment as appropriate (for the intended future use of the land). This statement refers to the operations at the Katnook Gas Plant, in addition to pipeline and well head operations.

Noise

The zoning of the subject land and all land nearby is Primary Production (Rural Industry) with a noise policy indicative noise level of 57dB(A) for daytime (7am to 10pm) and 50dB(A) for night-time (10pm on any day until 7am on the next day).

Because the information provided is not adequate to make a noise assessment, it is recommended that Beach Energy be requested to provide a report prepared by a suitably experienced, professional acoustic engineering consultant*, and to the satisfaction of the Environment Protection Authority, demonstrating that worst case predicted noise from the proposal can meet the following Noise Criteria. The report should state what the overall predicted noise will be at the most noise affected premises after adjustment for any noise character**.

The report must include modelling that includes all new plant and equipment proposed for the Katnook Gas Plant site.

If the report cannot demonstrate that the worst case predicted noise from the proposal can meet the following Noise Criteria, it should give details and specifications of what treatments, procedures and/or practices are required on the subject land to achieve compliance.

Worst case predicted noise includes, but not limited to, the overall noise from all equipment operating and activities being carried out and vehicles (including commercial vehicles, refrigeration units on trucks, staff cars, forklifts, reversing alarms) entering, leaving, moving and operating on site that could occur simultaneously.

Predictions should include worst case acoustic and meteorological conditions for the transmission of noise from source to noise affected premises (including CONCAWE meteorological category 5 day and CONCAWE meteorological category 6 night) and at maximum operating potential.

If meeting the Noise Criteria relies on certain, installations, barriers, separation distance and procedures (e.g. limited operating hours, acoustic treatments, and doors being kept closed) then the report should give precise details and specifics about the type and location of these on the subject land.

The report should specify the highest resultant predicted noise level (adjusted for noise character) at the nearest noise affected premises after implementing any attenuation practices and/or installations. If the noise criteria will be met without the need for attenuation practices and/or installations, the report should still specify the resultant predicted noise level adjusted for noise character.

The report should be accompanied with a statement from the applicant that any recommendations in the report will be implemented by the applicant.

**An acoustic engineer is defined as a person eligible for full Member status of both Engineers Australia and the Australian Acoustical Society.*

***likely noise character should be discussed and results of predicted noise, with and without adjustment for character penalty, should be provided.*

Air Quality

The location of the Beach Energy facilities in the Otway Basin around Katnook appears to be separated from the nearest sensitive receivers by some reasonable distances (>500m).

Air Pollutants

The air pollutants that could be of concern to the EPA are:

- Oxides of nitrogen, carbon monoxide and sulphur dioxide from combustion (presumably the flare);
- Dust from roadways and construction activities;
- Volatile organics vented and from the flare (not combusted); and
- Hydrogen sulphide and carbon monoxide from vented gas.

It doesn't appear that Beach Energy have undertaken a quantitative assessment regarding at what concentrations and emission rates these pollutants may be released, nor what their likely ground level concentrations are predicted to be at the nearest sensitive receivers.

Statement of Commitment

It appears that both the Statement of Environmental Objectives (SEO) and the Environmental Impact Report (EIR) include a risk assessment of the objective of meeting all legal expectations with regard to air quality without a satisfactory amount of rigour.

For example, Beach Energy commit to meeting all the legal requirements for air quality in the *Environment Protection Act* and *Environment Protection (Air Quality) Policy 2016 (the "Air EPP 2016")*, yet when it comes to compliance with this commitment, one "goal" is "to minimise the generation of dust", and that's done by "compliance with relevant speed restrictions..." for vehicular movements. The point here is that there doesn't appear to be any assessment of the possibility of non-compliance relating to dust impacts due to vehicle usage of roads since somehow compliance appears to be assured if no-one goes above the speed restrictions. So, how can compliance with air quality standards be met if the measures in place

are arbitrary? There doesn't appear anything to support the measures as being enough to result in compliance.

Another example of the paucity of information relates to hydrogen sulphide venting and its likely impacts. The Air EPP 2016 requires industrial emissions to be assessed against Schedule 2 ground level concentrations (GLC) at 100th percentile and, in the case of hydrogen sulphide, this includes an odour GLC for H₂S of 0.15µg/m³. This is extremely low (and considered at around the odour detection threshold for a human nose), which essentially means that if H₂S is detected at any of the nearest sensitive receivers Beach Energy will be in breach of the Air EPP 2016. Again, this hasn't been fully assessed.

Recommendation

Beach Energy fully commits to meeting all legal air quality requirements without appearing to have undertaken any assessment of likely air quality impacts of their facilities in the Otway Basin. Given the apparent significant separation between the Beach Energy activities (and their likely level of air emissions) and their nearest sensitive receivers, it may not be an issue, but without more rigour this remains in doubt.

Consequently, air pollution dispersion modelling is required to be undertaken by a suitable qualified and experienced air quality modeller. The model should:

- include oxides of nitrogen, carbon monoxide, sulphur dioxide, particulates (TSP, PM₁₀ and PM_{2.5}), volatile organics and hydrogen sulphide;
- clearly identify of the locations of the nearest sensitive receivers (and their distances from the Beach Energy facilities);
- be based on robust scientifically defensible estimates of emission rates of pollutants;
- include appropriately derived background levels of all pollutants (from best available information); and
- be based on 2009 meteorological year (considered a 'typical' year by the EPA), either sourced from local data or generated by an appropriate model.

The EPA acknowledges that the total emissions of the Katnook Gas Plant will depend on the extent and nature of future gas discoveries and cannot be quantified in the EIR, however modelling should occur on a worst case operational scenario.

The EPA requests the EIR, SEO and other relevant proponents documentation is updated to incorporate these comments. Should you require any further information, please contact

David Daminato via telephone 82042195 or email david.daminato@sa.gov.au

Yours sincerely



Greg Tyczenko

MANAGER RESOURCES AND ENERGY

MINING AND ENVIRONMENT

ENVIRONMENT PROTECTION AUTHORITY

Date: 1 February 2019

SUBMISSION: Beach Energy - Onshore Otway Basin Petroleum Production Operations

AUTHOR: Department of Environment and Water, South Australia

Onshore Otway Basin Petroleum Production Operations October 2018

Draft Environmental Impact Report

Section	Comment
Groundwater comments	
Section 3	General comment - A water licence is required under the Lower Limestone Coast water allocation plan for both production formation water and process water purposes. One water licence stated. EIR states water licence 9085 for 100 ML/y (p 17).
Section 3.1.3, pg 14	General Comment – Well construction permits will be required (if well depths are greater than 2.5m) for the monitoring wells. May have been addressed elsewhere, but does not appear to be documented in EIR/SEO. Where is the current / historical monitoring data located? Results from any previous monitoring should have been presented in the EIR to show a history of previous operations.
Section 3.1.3, pg 14	To consider adding text that their current water licence of 110 ML annum includes PFW and that it is sufficient for future activities.
Section 3.2.4, pg 16	What volumes of water are involved in the deliquification process and are they included in the water licence
Section 3.4.1	Shallow water tables exist in the area and has this been considered with trenching, pipeline installation and pipeline integrity? HDD – if depth of HDD greater than 2.5m a well construction permit is required for the drilling of the hole.

Section 4.3, figure 7	The diagram should also indicate that potential aquifer occur in the Katnook, Pretty Hill and Sawpit sandstones.
Section 4.6.2, pg 36	The section should also acknowledge the likely groundwater resources that occur beneath those currently in use. Eg: Sherbrook Gp, Katnook, Pretty Hill and Sawpit sandstones
Section 5.1	Other potential impacts to shallow groundwater are the installation of pipelines and HDD activities. If these are included in the existing potential impacts then perhaps the text in section 5.1.1 could be modified to include them.
Table 11	Well operations and well integrity management, 1st risk event, 1 st potential Environmental impacts, to consider removing the term 'shallow' to encompass all groundwater resources. Down hole loss of control could result in contamination of deeper groundwater resources.
Surface Water Comments	
4.6.1 + Table 11	A monitoring and assessment plan is recommended to investigate any potential surface water-groundwater impacts resulting from the construction and operation of the proposed Katnook plant.

Draft Statement of Environmental Objectives

Section / Objective	Comment
Table of Contents	Text edit – Appendix A is listed 2x in the table of contents.

SUBMISSION: Beach Energy - Onshore Otway Basin Petroleum Production Operations

AUTHOR: Department for Energy and Mining, South Australia

Section	DEM-ERD Comment
EIR – 3.1	Suggest including a general overview or indication of the expected products/ compositions of gas that will be processed at the proposed facility.
EIR – 3.1.1	Suggest that this section is reviewed now that further information is known about what will be removed and what will stay at the current plant. This section would be more useful written in past tense, with details about the future operation of the plant (e.g. potential for 24-7 operation) moved to the following section.
EIR – 3.1.2	<p>It is suggested that Beach Energy provide further detail and elaborate more precisely on the proposed works to be undertaken within the Katnook Facility, including how any infrastructure is designed Fit For Purpose (FFP).</p> <p>While the exact extent of future works may not be known at this stage, the description should be firm enough that the types and extent of potential environmental impacts can be understood, and the design <i>process/philosophies</i> used to ensure that these are avoided should be outlined at a high level (as detail is provided in the later sections of the report).</p>
EIR - 3.1.3	It is DEM’s expectation, to ensure compliance with the EPA Guideline <i>509/14 Wastewater lagoon construction</i> that as a minimum, leak detection systems are installed to monitor potential leaks from the ponds, in addition to the proposed groundwater monitoring network.
EIR – 3.2	It is suggested that Beach Energy provide additional information on how well integrity issues are managed and in particular provide clarity on who undertakes the risk assessments and puts forth the recommendations to act on any well integrity related risks. Further clarity should also be provided within this section regarding who will be executing well interventions and integrity work i.e. experienced and specialist contractors.
EIR – 3.2.4	This section discusses gas well deliquification and wording suggests venting may be required during this process, but the word “venting” is not used. DEM suggest if venting is proposed during this process that it is made clear within this section i.e. “short term controlled venting”.

Section	DEM-ERD Comment
EIR – 3.3	The last paragraph discusses possibility of some wellsite processing operations. DEM suggest some wording be included regarding the process to design, install and validate fitness-for-purpose of all equipment design and operation if this is to be undertaken.
EIR – 3.8.2	Suggest providing further information and detail on “how” (operationally) the downhole decommissioning following production will be undertaken.
EIR – 5.1.2	If Beach intend to include buried tanks/sumps in their design, this section should include mention of what forms of secondary containment and/or leak detection may be used for these cases.
EIR – 5.3.1	Suggest including information on Beach Energy’s emergency response processes which escalate based on the severity of the event. Or some further information around the processes which are employed when an incident occurs.
EIR – 5.6	Suggest that in addition to relevant standards for design, mention should be made of appropriate dispersion and radiation studies undertaken for flare design/selection.
EIR – 5.8	The visual amenity of the flare is not currently addressed. Suggest that the considerations in selection of a flare be discussed within this section.
EIR – Section 5 and Table 12	The risk for security of supply of gas has not been considered. Whilst this may be deemed low risk given it should be considered as part of the risk assessment process.
EIR – Table 12 – Page 64 – Loss of Well Control	It is suggested that under key management measures ‘workover/completion program in place’ that reference to industry leading practice and relevant industry standards be made. It is generally noted throughout the document that industry standards from a well operations/ management standpoint are not referenced. A further key management measure under this risk event could include something akin to “periodic review of management systems to ensure alignment with international leading practice”.
EIR – Table 12 – Page 66 – Well integrity manage....	Under the key management measures for the event Well integrity management - down hole production equipment failure (e.g. casing, packer,

Section	DEM-ERD Comment
	seal assembly) it is suggested that consideration be given to using wording similar to the wording “barrier verifications in line with industry standards”
EIR – Table 12 – page 62	The current management measures to prevent loss of containment do not appear to address buried tanks/sumps. If Beach intend to use these in their future plant design, additional management measures should be included.
EIR – Appendix 4 Issue No 150	Suggest the provision of more information in response to this issue as it doesn't adequately address the community concern. DEM suggest further elaboration on information provided within section 5.3.1.
SEO – Table 2	It is suggested that Serious Incident 3(e) be reworded to the actual event that may lead to cross flows or uncontrolled flow to surface. DEM suggest the rewording to the following - Identification of a critical barrier failure that could lead to the potential for cross flow between aquifers in natural isolation, or uncontrolled flows to the surface.
SEO – Appendix A – Objective 1 – Gola 1.3	Consideration should be given to the visual amenity of flaring and how this will be managed.
SEO – Appendix A – Objective 3	For the following assessment criteria ‘No native fauna casualties that could have reasonably been prevented through management measures described in the guide’ it is suggested that the guide to how section include the following – Measures to facilitate escape of smaller fauna from ponds or below ground structures provided where required (e.g. geofabric or textile matting ‘ladders’)
SEO – Appendix A – Objective 6 – Goal 6.8	Within the guide to how section, it is outlined that ‘Appropriate barrier controls put in place to prevent crossflow, contamination or further pressure reduction occurring.’ DEM suggest the following wording - ‘Appropriate controls implemented and verified to prevent crossflow, contamination or further pressure reduction occurring in line with industry standards.’
SEO – Appendix A – Objective 6 – Goal 6.8	Within the guide to how section, it should be outlined that specialist contractors are contracted to undertake the downhole decommissioning of wells

Section	DEM-ERD Comment
SEO – Appendix A – Objective 6 – Goal	DEM request the following as an assessment criteria – ‘Well decommissioning program submitted to the satisfaction of DEM prior to well decommissioning.’
SEO – Appendix A – Objective 8 – Goal 8.1	<p>The assessment criteria – ‘Reasonable practical measures implemented in design and operation to minimise emissions’ is difficult to measure. DEM suggests that the assessment criteria should reference the measures outlined within the “guide to how” section (see goal 3.3 criteria for an example of wording).</p> <p>DEM also request that assessment criteria be developed around appropriate monitoring and modelling of emissions and air quality to demonstrate compliance with the EP (Air Quality) Policy.</p>
SEO – Appendix A	Consideration should be given to ensuring that security of supply is not impacted and how this will be managed within the SEO