GOVERNMENT OF WESTERN AUSTRALIA

Environmental Protection Authority

Cervantes-01 Conventional Well Drilling Proposal

RCMA Australia Pty Ltd

Report 1702

June 2021

This assessment report has been prepared by the Environmental Protection Authority (EPA) under s. 44 of the *Environmental Protection Act 1986* (WA). It describes the outcomes of the EPA's assessment of the Cervantes-01 Conventional Well Drilling Proposal by RCMA Australia Pty Ltd.

This assessment report is for the Western Australian Minister for Environment and sets out:

- what the EPA considers to be the key environmental factors identified in the course of the assessment
- the EPA's recommendations as to whether or not the proposal may be implemented and, if the EPA recommends that implementation be allowed, the conditions and procedures, if any, to which implementation should be subject.

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Chair
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Summary

Proposal

The proposal is to drill one conventional oil exploration well to determine if there is oil in the prospect, located 11 kilometres south of Dongara / Port Denison in the onshore Perth Basin. The proposal includes all activities associated with drilling a conventional oil exploration well including site preparation, equipment mobilisation, drill, case and cement, decommissioning, demobilisation, site restoration and rehabilitation. The anticipated life of the proposal is three to six months.

This assessment is for one conventional exploration well only and no assessment of full production is undertaken. Should future production be proposed separate assessment and approvals processes will apply.

Context

The proposal is located within the Beekeepers Nature Reserve, which is an unclassified reserve, reserved for the for the purpose of the protection of apiculture and the conservation of flora.

Mitigation hierarchy

The mitigation hierarchy is a sequence of proposed actions to reduce adverse environmental impacts. The sequence commences with avoidance, then moves to minimisation/ reduction/ rehabilitation, and offsets are considered as the last step in the sequence.

The proponent has considered the mitigation hierarchy in the development and assessment of its proposal, and as a result has utilised existing cleared access tracks and avoided clearing of conservation significant communities and fauna habitat.

The proponent has also proposed substantive measures to minimise potential impacts related to fire, weeds, dieback, feral animals, vehicle strikes, light pollution, noise and dust.

Assessment of key environmental factors

The EPA has identified the key environmental factors (listed below) in the course of its assessment, has assessed that the proposal and concluded there are:

Flora and vegetation

- Direct impacts to 5.3 hectares (ha) of excellent to good quality vegetation including 0.99 ha of a priority 1 ‘Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora*’ Priority Ecological Community (PEC).
- Unlikely to be material impacts to other flora and vegetation, provided minimisation measures for fire, weeds and dieback are complied with.

Terrestrial fauna

- Unlikely to be material impacts to terrestrial fauna, provided minimisation measures for fire, weeds, dieback, feral animals, vehicle strikes, light pollution, entrapment in excavation and artificial water bodies, noise and dust are complied with.

Terrestrial environmental quality

- Unlikely to be material impacts to soil quality, provided minimisation measures for drilling chemicals and spillage are complied with.

Holistic impact assessment

The EPA has also considered connections and interactions between relevant environmental factors to inform a holistic view of impacts to the whole environment. The EPA formed the view that the holistic impacts would not alter the EPA's conclusions about consistency with the EPA's factor objectives.

Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- the location of the proposal within Beekeepers Nature Reserve
- environmental values likely to be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely residual impacts which can be minimised with the imposition of conditions
- EPA's confidence in the proponent's proposed mitigation measures
- the impacts can be managed consistent with the EPA's objectives for the key environmental factors
- whether other statutory decision-making processes that can mitigate the potential impacts of the proposal on the environment
- principles of the *Environmental Protection Act 1986*.

It is the EPA's view that reasonable conditions could be imposed on the proposal to ensure its implementation is consistent with the EPA's objectives for the key environmental factors.

The EPA has recommended that the proposal may be implemented subject to the conditions recommended in Appendix A.

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1 Proposal

The proposal is to drill one conventional oil exploration well to determine if there is oil in the prospect, located 11 kilometres (km) south of Dongara / Port Denison in the onshore Perth Basin, within the Beekeepers Nature Reserve. The proposal includes all activities associated with drilling a conventional oil exploration well including site preparation, equipment mobilisation, drill, case and cement, decommissioning, demobilisation, site restoration and rehabilitation. The anticipated life of the proposal is three to six months.

The proposal includes one conventional exploration well only and does not include full production. Hydraulic fracture stimulation is not proposed and does not form part of the proposal. Should future production or hydraulic fracture stimulation be proposed separate assessment and approvals processes will apply.

The proposal will have a disturbance footprint of 7 hectares (ha) which will require the clearing of 5.3 ha of native vegetation for the well pad and road widening, within a development envelope of 36.5 ha.

The proponent, RCMA Australia Pty Ltd, referred the proposal to the EPA on 9 July 2020. The referral information was published on the EPA website for 7 days public comment. On 10 February 2021, the EPA decided to assess the proposal and set the level of assessment at Referral Information.

The proposal is set out in sections 3 and 4 of the proponent's referral supporting documentation (RCMA 2020), which is available on the EPA website.

The elements of the proposal which has been subject to the EPA's assessment are included in Table 1.

Table 1: Location and proposed extent of proposal elements

Proposal element	Location	Maximum extent or range
Physical elements		
Development envelope	Figure 2	36.5 ha
Disturbance footprint	Figure 2	Up to 7 ha
Direct disturbance of native vegetation	Figure 2	Up to 5.3 ha
Direct disturbance of priority 1 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora'* PEC	Figure 2	Up to 0.99 ha
Operational elements		
Extraction method		Conventional
Rehabilitation		Rehabilitation consistent with an approved Rehabilitation management plan

Proposal element	Location	Maximum extent or range
Decommissioning		Removal of all drilling and exploration related infrastructure and equipment
Timing elements		
Project life		Up to 6 months

Proposal alternatives

The proponent did not provide alternative locations to the proposal as the resource prospect is not able to be re-located. The proponent did consider alternatives within the proposal, which resulted in the avoidance measures described in the sections below. The well has been located specifically to avoid the sensitive dunes in the Beekeepers Nature Reserve and minimise clearing by utilising existing tracks to the well pads.

Proposal context

The proposal is located in Beekeepers Nature Reserve (R24496). The nature reserve is unclassified and reserved under the *Conservation and Land Management Act 1984 (CALM Act 1984).* The nature reserve is vested with the Conservation and Parks Commission and managed by the Department of Biodiversity, Conservation and Attractions (DBCA) for the purpose of the protection of apiculture and the conservation of flora. The area of the nature reserve is approximately 69,161 ha.

Beekeepers Nature Reserve contains large areas of honey and pollen producing plants. For these reasons, the nature reserve contains many apiary sites. Further information on Beekeepers Nature Reserve is provided in section 2.1.

Previous environmental approvals have been granted in the nature reserve which include:

- a seismic survey by Norwest Energy NL which disturbed 55 ha of native vegetation
- a seismic survey by ARC Energy Limited and Origin Energy Developments Pty Ltd Limited which disturbed up to 117 ha of native vegetation
- an exploration well by Origin Energy Resources Limited which disturbed up to 6.5 ha of native vegetation.

An exploration permit is needed to drill the exploration well for the proposal. The Minister for Mines and Petroleum in consultation with the Minister for Environment will determine whether a permit for exploration may be issued under the *Petroleum and Geothermal Energy Resources Act 1967* (PGER Act). The proponent is also required to develop and obtain approval for an Environment Plan in accordance with the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012.

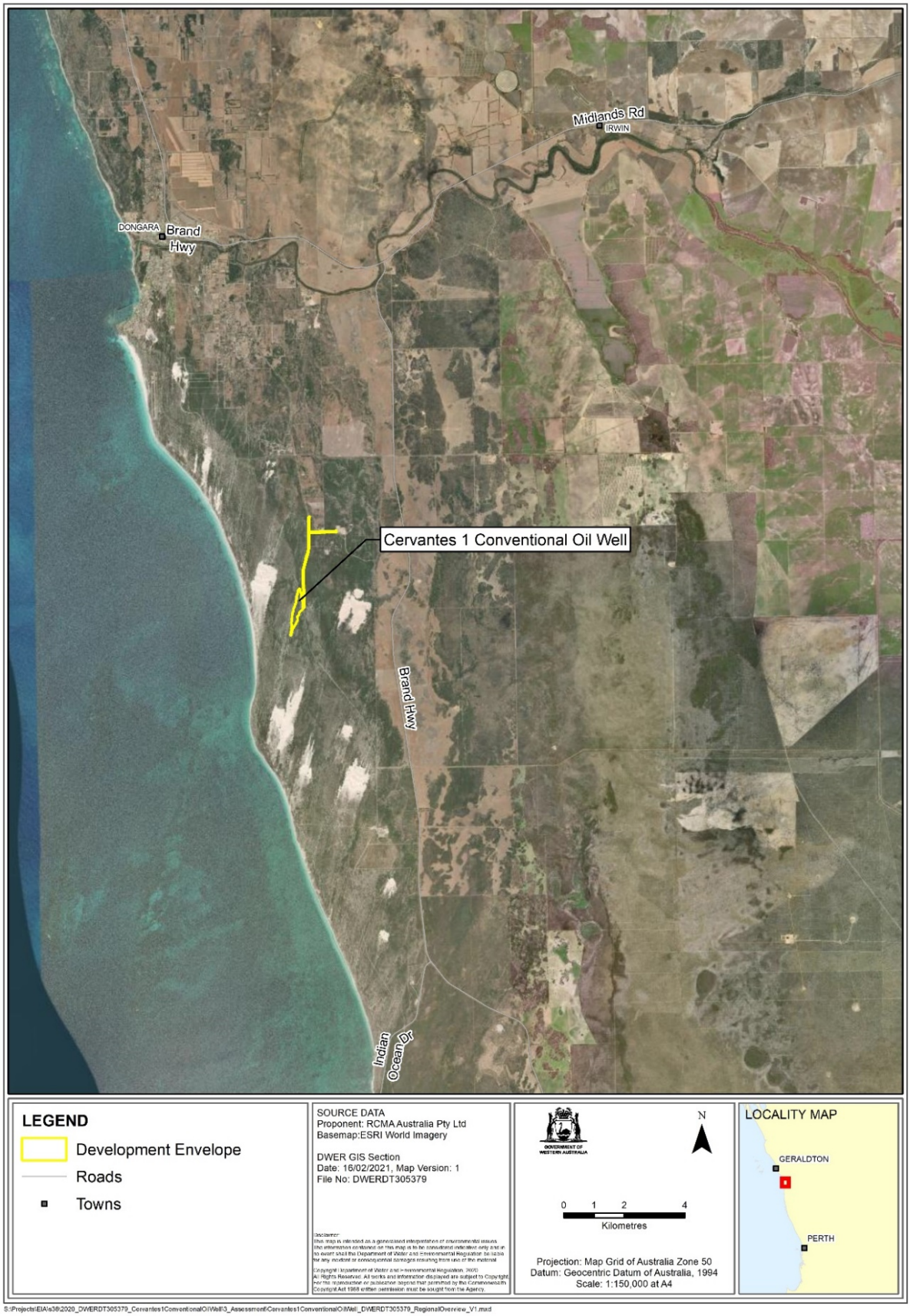

Figure 1: Proposal location

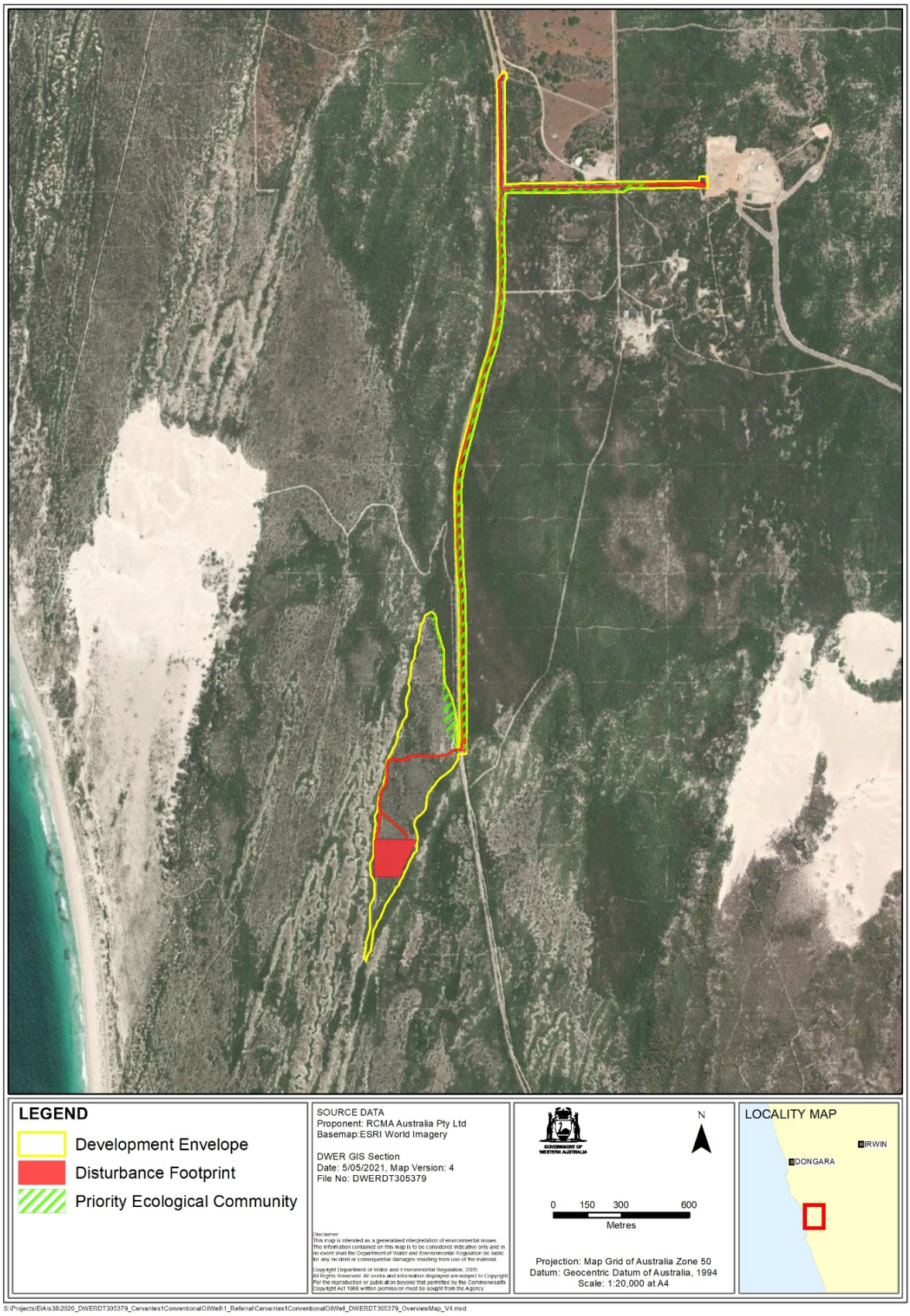

Figure 2: Development envelope and disturbance footprint

2 Assessment of key environmental factors

2.1 Flora and vegetation

2.1.1 Environmental objective

The EPA's environmental objective for flora and vegetation *is to protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2016a).

2.1.2 Surveys

The proponent undertook a flora and fauna reconnaissance and targeted survey in February 2020 and a targeted spring flora surveys of the disturbance footprint in September 2020. The reconnaissance survey was initially conducted to determine the current knowledge of the flora and vegetation factors potentially located in the desktop study area (Woodman Environmental 2020), to inform the level required for field survey. The surveys were generally consistent with the EPA's *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016e).

2.1.3 Proposal context: existing environment

The proposal is within the Geraldton Sandplains IBRA (Interim Biogeographic Regionalisation for Australia) Bioregion and within the Geraldton Sandplains 3 (Lesueur Sandplain) subregion (Commonwealth of Australia 2012).

As noted in section 1, the proposal is located predominantly within the Beekeepers Nature Reserve, managed by the DBCA for the purposes of apiculture and the conservation of flora. The disturbance footprint is 7 ha of which there is 5.3 ha of native vegetation clearing including 0.99 ha of PEC, within a development envelope of 36.5 ha. Information on Beekeepers Nature Reserve is provided in section 1.

No conservation significant flora species have been recorded within the disturbance footprint. Two priority flora species were recorded within the development envelope in the Spring 2020 targeted flora survey. These were *Eucalyptus zopherophloia* (P4) and *Thryptomene sp. Lancelin* (P3). Only one individual plant of each were recorded and they do not occur in the areas proposed to be cleared.

Surveys undertaken by the proponent identified one vegetation community representing state listed Priority Ecological Community (PEC) 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora*' within the development envelope. This PEC is described as floristically similar to other *Acacia rostellifera* communities but is differentiated in structure, being dominated by mallee eucalypts. The vegetation community occurs on limestone ridges, in some swales in the coastal dunes between Cape Burney and Dongara, on the Greenough Alluvial Flats on limestone soil and near Tarcoola Beach. Some very small occurrences have also been recorded on the limestone scarp north of the Buller

River (DBCA 2019). The PEC was predominantly in Good to Excellent condition with minimal disturbances recorded and weed cover generally less than 1 per cent.

The vegetation within the development envelope is mostly in excellent condition with little to no weed coverage and no evidence of dieback infestation (*Phytophthora cinnamomi*) (Woodman Environmental 2020a). Small areas consisting of the existing access tracks and adjacent surrounds, are rated as Degraded to Good condition (Woodman Environmental 2020b).

2.1.4 Consultation

During the 7-day public consultation on the referral, concerns were raised regarding clearing within the Beekeepers Nature Reserve and impacts to conservation significant species, communities and fauna habitat.

2.1.5 Potential impacts from the proposal

The EPA identified the following proposal activities which could impact on its environmental objective for flora and vegetation:

- direct impact through clearing
- potential impacts from introduction of weeds, dieback, and changes to fire regimes.

2.1.6 Avoidance measures

The proponent has committed to locate the proposed oil well to avoid the sensitive dunes in the Beekeepers Nature Reserve and to avoid priority flora.

2.1.7 Minimisation measures (including regulation by other DMAs)

The proposal includes the following mitigation measures:

- using existing access tracks where possible
- locating the exploration well near an existing road to reduce the amount of clearing
- accommodating personnel in an offsite camp to avoid additional clearing of vegetation
- demarcating areas to be cleared prior to clearing activities to ensure that only specified areas are cleared
- imposing speed limits, and not permitting off-track driving (including dedicated parking spaces) for all proposal areas
- stockpiling vegetation and topsoil separately in low profile mounds to maximise rehabilitation success
- implementing management plans to minimise the impacts from changes in fire regime, dieback and weeds
- sourcing limestone marl for the tracks and drill pad from a nearby quarry to minimise the risk of dieback introduction.

2.1.8 Rehabilitation

The proponent has prepared a rehabilitation management plan (29 April 2021) which describes how the proposal will be decommissioned and rehabilitated to meet the agreed end land uses. The plan has been prepared in consultation with DBCA and includes a commitment to rehabilitate all cleared areas at the completion of the proposal. The plan must be approved prior to ground disturbance.

2.1.9 Residual impact assessment

The EPA considered the key environmental values for flora and vegetation likely to be impacted by the proposal are the priority 1 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora*' PEC and potential impacts if the proponent fails to decommission and rehabilitate the site.

Coastal sands dominated by Acacia rostellifera, Eucalyptus oraria and Eucalyptus obtusiflora PEC (P1)

Up to 0.99 ha of the priority 1 PEC 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora*' will be cleared. DBCA's Threatened and Priority Ecological Community database currently holds records for 22 occurrences of the PEC. These records cover a total area of approximately 68 ha over 88 km between Bowes and Bonniefield. None of the 22 occurrences recorded in the database are found within *Conservation and Land Management Act 1984* managed reserves. However, Woodman Environmental Consulting recorded an additional 681 ha of the PEC during a 2005 flora and vegetation survey for the Denison 3D seismic survey project (Woodman Environmental 2005). The Woodman 2005 survey represents a range extension as it is approximately 14 km south of the currently mapped area recorded on the database.

Based on the mapped occurrence of the PEC through the Denison 3D Seismic Survey, the area of impact within the proposed development envelope constitutes less than one per cent of the regional extent of the PEC.

Due to the small impact the proposal will have on a regional scale for the PEC, the proposal is unlikely to change the status of the priority 1 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora*' PEC.

Decommissioning and rehabilitation

The Conservation and Parks Commission has advised that proposals involving impacts on conservation reserves, such as site clearing and potential contamination, warrant due consideration of risk and application of rehabilitation performance bond, such as bank guaranteed performance bonds, that can be accessed in the event of the default on decommissioning and rehabilitation requirements. There are no provisions under the PGER Act or subsidiary regulations; under Part V Division 2 of the *Environmental Protection Act 1986* (EP Act); or clearing regulations that allow for the application of performance bonds. The EPA therefore considers it is necessary to recommend a condition for a rehabilitation performance bond.

The proponent provided the EPA with a complete list of abandonment and rehabilitation costs that could be anticipated for the proposal. The costs of

decommissioning and rehabilitation of the well site and access tracks was estimated at $324,500. This includes all costs to investigate, remediate and rehabilitate the wellsite and access tracks. This cost does not account for the proponent encountering hydrocarbons during drilling.

Should hydrocarbons that have the potential to lead to a commercial field development be encountered, the additional cost of plug and abandonment is estimated to be $275,000. This activity is only required where the well is cased and completed after drilling activities due to encountering hydrocarbons.

The proponent also indicated that should rehabilitation fail, a contingency cost to rehabilitate the area would be $93,000.

DBCA has reviewed these costings and is satisfied that the proposed rehabilitation performance bonds include the necessary works to be completed by a third party in the event that the proponent becomes insolvent or is otherwise not in a position to undertake the decommissioning and rehabilitation works.

The EPA also determined that given cleared areas will be rehabilitated and the proposal impacts are temporary and of short duration, the impacts to apiculture are not likely to be significant.

Likely residual impacts of the proposal

The EPA has assessed the likely residual impacts of the proposal on flora and vegetation and conclude there are:

1. significant direct impacts to 0.99 ha of priority 1 PEC ‘Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora’*
2. potential material impacts to Beekeepers Nature Reserve if the proposal is not rehabilitated
3. potential material impacts to other flora and vegetation, provided minimisation measures for fire, weeds and dieback are implemented.

2.1.10 Consideration of conditions

The EPA has considered whether the residual impacts are consistent with the EP Act principles (Appendix C) and the EPA factor objective for flora and vegetation.

In doing so, the EPA has considered whether reasonable conditions could be imposed to ensure consistency with the EP Act principles and EPA’s factor objective. The EPA’s findings are presented in Table 2.

The EPA has recommended a condition to ensure that the rehabilitation management plan (29 April 2021) is updated and subject to approval, implemented. The EPA has also recommended a condition for a rehabilitation performance bond which is linked to the completion criteria detailed in the rehabilitation management plan (29 April 2021). The rehabilitation performance bond, such as bank guaranteed performance bonds, can be accessed in the event of default on decommissioning and rehabilitation requirements.

The EPA has recommended a condition for decommissioning and closure of the well should hydrocarbons be encountered. This is considered further under section 2.3.

The EPA has recommended that a rehabilitation performance report be required each year with the compliance assessment report. The rehabilitation performance report shall determine whether the proposal is meeting the completion criteria. DBCA recommended a contingency offset be applied to the proposal, should rehabilitation not meet completion criteria for all areas of clearing. The EPA has recommended the proponent be required to provide a contingency offset to counterbalance any significant residual impact on the Beekeeper Nature Reserve shown in the rehabilitation performance report.

For the EPA's assessment of whether the significant residual impacts are likely to be able to be counter-balanced by offsets, and whether an offsets package provided by the proponent to assess whether it is likely to counter-balance the significant impacts, see section 4.

Table 2: Summary of assessment, recommended conditions and DMA regulation for flora and vegetation

Residual impact		Assessment finding	Recommended conditions and DMA regulation
1.	Direct impacts of 0.99 ha of priority 1 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora'* PEC.	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures are complied with.	Direct regulation through: • condition 1 'Limitations and Extent of Proposal' • condition 3 'Flora and Vegetation Outcomes' • condition 8 'Environmental Management Plans: Monitoring and Adaptive Management Program' • condition 9 'Environmental Management Plans: General Provisions'.
2.	Potential material impacts to Beekeepers Nature Reserve if the proposal is not rehabilitated.	Not likely to be a material impact or be inconsistent with the EPA factor objective provided an approved rehabilitation management plan is implemented and a rehabilitation performance bond is provided.	Direct regulation through: • condition 5 'Rehabilitation Plan' • condition 6 'Rehabilitation Performance Bond' • condition 7 'Offsets' • condition 8 'Environmental Management Plans: Monitoring and Adaptive Management Program • condition 9 'Environmental Management Plans: General Provisions'.

3.	Potential material impacts to other flora and vegetation from fire, weeds and dieback.	Not likely to be a material impact or be inconsistent with the EPA factor objective provided minimisation measures for fire, weeds and dieback are implemented	Direct regulation through: • condition 3 'Flora and Vegetation Outcomes' • condition 8 'Environmental Management Plans: Monitoring and Adaptive Management Program' • condition 9 'Environmental Management Plans: General Provisions'.

2.2 Terrestrial fauna

2.2.1 Environmental objective

The EPA's environmental objective for terrestrial fauna is *to protect terrestrial fauna so that biological diversity and ecological integrity are maintained* (EPA 2016c).

2.2.2 Surveys

The proponent conducted a desktop study, followed by a reconnaissance survey to verify the accuracy of the desktop study, to characterise fauna and faunal assemblages and identify potential impacts. Targeted black cockatoo surveys were undertaken and included a breeding tree assessment, foraging/roosting habitat assessment and opportunistic observations for black cockatoos. The fauna assessment considered the *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020e).

2.2.3 Proposal context: existing environment

The proposed development envelope is comprised mostly of heath vegetation that supports a reptile assemblage and understorey-associated birds. The strip of Melaleuca thickets in the east may support additional middle-storey birds and some larger mammals. The small area of mallee woodland in the east is expected to support woodland-associated species.

Desktop surveys identified 207 fauna species as potentially occurring in the project area. This included nine frogs, 50 reptiles, 122 birds, 16 native and ten introduced mammals.

The fauna assemblage includes a total of 15 vertebrate species and four invertebrate species of significance potentially using the proposal area. However, only the Carnaby's black cockatoo (*Calyptorhynchus latirostris*), which is endangered under *Biodiversity Conservation Act 2016* (BC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), was identified as a potential regular migrant in the proposed development envelope.

2.2.4 Consultation

During the 7-day public consultation on the referral, concerns were raised regarding clearing of fauna habitat within the Beekeepers Nature Reserve.

2.2.5 Potential impacts from the proposal

The EPA identified the following proposal activities which could impact on its environmental objective for terrestrial fauna:

- death, injury and/or displacement of fauna species, due to clearing and construction activities
- presence of artificial water bodies may result in the loss/injury of individual fauna
- unplanned fire and the spread of weeds and dieback within fauna habitat

- light, noise and dust emissions could disrupt fauna behavior or reduce the value of fauna habitat
- risk of injury from vehicle strikes
- increased feral animal activity
- fauna entrapment in excavations and artificial water bodies.

2.2.6 Minimisation measures (including regulation by other DMAs)

The proponent has committed to minimise proposal impacts through:

- minimising the clearing of fauna habitat by using existing access tracks
- minimising light spill where lighting is required
- minimising the likelihood of vehicle strike to fauna by ensuring construction will be undertaken during daylight hours only
- applying fauna exclusion fencing and fauna escape mechanisms for excavations such as the mud sump and turkey's nest
- ensuring all waste will be stored in appropriately covered receptacles to exclude fauna before being removed from site.

2.2.7 Rehabilitation

The proponent has prepared a rehabilitation management plan (29 April 2021) which describes how the proposal will be decommissioned and rehabilitated to meet the agreed end land uses. The rehabilitation management plan has been prepared in consultation with DBCA and includes a commitment to rehabilitate all cleared areas at the completion of the proposal. The rehabilitation management plan must be approved prior to ground disturbance.

2.2.8 Residual impact assessment

The EPA considered that the key environmental value for terrestrial fauna likely to be impacted by the proposal is foraging habitat for Carnaby's black cockatoo.

Foraging habitat for Carnaby's black cockatoo

The Carnaby's black cockatoo (*Calyptorhynchus latirostris*), which is endangered under the BC Act and EPBC Act was identified as a potential migrant in the proposed development envelope. The fauna survey included a breeding tree assessment, foraging/roosting habitat assessment and opportunistic observations for black cockatoos. The development envelope is located within the non-breeding range of the species and lacks large trees suitable for breeding and/or roosting. The closest confirmed roost site is located 17 km east of the development envelope.

The survey area is expected to provide very little foraging value for Carnaby's black cockatoo. This is predominantly due to the lack of proteaceous species (especially banksia) and/or Marri (*Corymbia calophylla*) known to be a predominant part of the Carnaby's black cockatoo diet. The species tend to forage in native shrubland, kwongan heathland and woodland dominated by proteaceous plant species such as

Banksia spp., *Hakea spp.* and *Grevillea spp*. They can also forage in pine plantations (*Pinus spp.*), eucalypt woodland and forest that contains foraging species (Department of Sustainability, Environment, Water, Population and Communities 2012).

No evidence of foraging by Carnaby's black cockatoo was identified during the survey. The only vegetation that was considered to provide potential foraging value was that associated with the PEC 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora*' due to the presence of some eucalyptus species. As discussed in the flora and vegetation section, the proposal will impact the PEC by less than one per cent of its regional population.

Due to the low value of the PEC for potential foraging and the small impact the proposal will have on a regional scale for the PEC, the proposal is not considered likely to have a material impact on Carnaby's black cockatoo.

Likely residual impacts of the proposal

The EPA has assessed the likely residual impact of the proposal on terrestrial fauna and concludes there are:

1. potential material impacts to terrestrial fauna habitat from fire, weeds, dieback, feral animals, vehicle strikes, light pollution, noise and dust.

2.2.9 Consideration of conditions

The EPA has considered whether the residual impacts are consistent with the EP Act Principles (see Appendix C) and the EPA factor objective for terrestrial fauna.

In doing so, the EPA has considered whether reasonable conditions could be imposed to ensure consistency with the EP Act principles and EPA's factor objective. The EPA's findings are presented in Table 3.

Table 3: Summary of assessment, recommended conditions and DMA regulation for terrestrial fauna

Residual impact		Assessment finding	Recommended conditions and DMA regulation
1.	Potential material impacts to terrestrial fauna habitat from fire, weeds, dieback, feral animals, vehicle strikes, light pollution, noise and dust.	Not likely to be a material impact or be inconsistent with the EPA objective provided minimisation measures are implemented.	Direct regulation through: • condition 4 'Terrestrial Fauna Outcomes' • condition 8 'Environmental Management Plans: Monitoring and Adaptive Management Program' • condition 9 'Environmental Management Plans: General Provisions'.

2.3 Terrestrial environmental quality

2.3.1 Environmental objective

The EPA's environmental objective for terrestrial environmental quality is *to maintain the quality of land and soils so that environmental values are protected* (EPA 2016b).

The objective recognises the fundamental link between soil quality and the protection of ecological and social values that good soil quality supports. Therefore, the focus of this factor and its associated objective is how changes to soil quality impact environmental values.

The EPA considers that the key existing terrestrial environmental quality elements for this assessment are soil quality impacts to flora and fauna habitat.

2.3.2 Surveys

Desktop surveys and a review of the following data sets were completed to provide an overview of the existing environment and environment values for the proposal area:

- DMIRS 2019, WAPIMS Petroleum & Geothermal Information Management System, Western Australian Department of Mines, Industry Regulation and Safety.
- DoW 2017, Northern Perth Basin: Geology, hydrogeology and groundwater resources, Department of Water Hydrogeological bulletin series Report no. HB1.
- Department of Primary Industries and Regional Development (DPIRD) (2019a) Soil-landscape zones Western Australia. Zones derived from soil-landscape *mapping (best available*) Version April 2018.

The development envelope is located on a site that has no history of disturbance and therefore is unlikely to have contaminated soils.

2.3.3 Proposal context: existing environment

The development envelope is located in the Northern Sandplains region as defined by Beard (1990), which is broadly equivalent to the Geraldton Sandplains Interim Biogeographic Regionalisation for Australia (IBRA) region (Commonwealth of Australia 2012). The Northern Sandplains region consists of mainly sedimentary basins exposing Permian to Cretaceous sediments and horsts of Proterozoic rocks. Sandplains are covered with leached sandy soils near the coast, and yellow sands with an earthy fabric further inland, both overlying laterite (Beard 1990). The development envelope occurs within the Geraldton Coastal Soil-Landscape Zone of the Greenough Province which consists of dunes with alluvial plains and sand sheets, low hills of Pleistocene Tamala Limestone and recent calcareous and siliceous dunes (Purdie *et al.* 2004).

The proposed Cervantes reservoir lies within the sedimentary Perth basin. This basin lies onshore and offshore and extends for about 700 km along the southern portion of the west coast of Western Australia. The basin is bounded to the east by the Darling

Fault, which extends the full length of the basin. The onshore portion of the basin averages 65 km in width and extends from the southern coast to Geraldton in the north (DoW 2017). The northern Perth basin in the region contains sedimentary rocks of early Permian to late Jurassic age and reaches thicknesses greater than 5,000 metres.

2.3.4 Consultation

During the 7-day public consultation on the referral, concerns were raised regarding the potential for spills and hazardous waste impacting on the environment.

2.3.5 Potential impacts from the proposal

The EPA identified the following proposal activities which could impact on its environmental objective for terrestrial environmental quality:

- soil contamination from drilling chemicals
- soil contamination from a potential hydrocarbon spill
- failure to manage waste satisfactorily.

2.3.6 Minimisation measures (including regulation by other DMAs)

The proponent has proposed the following mitigation measures for potential impacts from drilling chemicals:

- the well will be constructed with cemented casing strings to maintain wellbore stability and ensure containment of drilling chemicals
- pressure gauges will be installed on the wellhead
- the well design will be according to a Well Management Plan that will be required by the Department of Mines, Industry Regulation and Safety (DMIRS)
- exploration activity will be carried out in accordance with an Environment Plan required by DMIRS.

The proponent has proposed the following mitigation measures to reduce potential impacts from spillage of hydrocarbons:

- the large storage tank is self-bunded
- diesel transfer operations are manned
- spill trays are utilised for all diesel transfers
- spill kits are located as per the oil spill contingency plan
- the oil spill contingency plan will be in place and an induction will be mandatory requirement for personnel
- contaminated material is taken offsite for reuse or disposal
- standard operating procedures in place for handling and use of hazardous materials
- bunding of liquid chemicals in accordance with Safety Data Sheet requirements

- bunds are inspected during housekeeping inspections to determine integrity and maintenance of capacity
- drilling sump materials will be taken offsite for disposal/reuse offsite
- groundwater and soil sampling will be undertaken prior to and after proposal activities to confirm that no contamination of soil or groundwater has occurred.

The proponent has proposed the following mitigation measures to manage waste satisfactorily:

- use of covered waste receptacles
- specific waste segregation onsite
- bunding of waste hydrocarbon products
- site inductions cover waste management requirements
- offsite disposal through licensed contractors.

2.3.7 Rehabilitation

The proponent has prepared a rehabilitation management plan (29 April 2021) which describes how the proposal will be decommissioned and rehabilitated to meet the agreed end land uses. Decommissioning will require the well to be plugged and isolated with cement followed by rehabilitation. The rehabilitation management plan has been prepared in consultation with DBCA and includes a commitment to rehabilitate all cleared areas at the completion of the proposal. The rehabilitation management plan must be approved prior to ground disturbance.

2.3.8 Likely residual impacts of the proposal

The EPA has assessed the likely residual impacts of the proposal on terrestrial environmental quality and concludes there are:

1. potential material impacts to soil quality, from contamination from drilling chemicals and hydrocarbons

2.3.9 Consideration of conditions

The EPA has considered whether the residual impacts are consistent with the EP Act principles (see Appendix C) and the EPA factor objective for terrestrial environmental quality.

In doing so, the EPA has considered whether reasonable conditions and regulation by other decision-making authorities could be imposed to ensure consistency with the EP Act principles and EPA's factor objective. The EPA's findings are presented in Table 4.

Petroleum and Geothermal Energy Resources Act 1967

Under the Petroleum and Geothermal Energy Resources (PGER) (Environment) Regulations 2012 an Environment Plan must be accepted by DMIRS for petroleum related activities (including decommissioning and rehabilitation) before such activities

can commence. The Environment Plan must evaluate all impacts and risks that are associated with an activity, and demonstrate that with the control measures identified, the impacts and risks are reduced to levels that are as low as reasonably practicable. Further to this, the Environment Plan must demonstrate that the environmental impacts and risks are acceptable. Included with an Environment Plan is an oil spill contingency plan which covers all spill scenarios associated with the activity. The Environment Plan will need to be developed in consultation with relevant stakeholders including the DBCA.

DMIRS and DBCA has advised that all the environmental impacts and risks associated with the proposal can be adequately regulated under the PGER (Environment) Regulations 2012. DBCA advised that it is the view of the Conservation and Parks Commission that proposals involving impacts on conservation reserves warrant due consideration of risk and application of financial assurances that can be accessed in the event of a default on decommissioning and rehabilitation requirements.

The EPA has concluded that the impacts to terrestrial environmental quality can be managed under complimentary regulation. For this reason, the EPA has not recommended a condition for this factor beyond the requirement for a financial assurance bond for plugging, decommissioning and abandonment of the well.

Table 4: Summary of assessment, recommendations conditions and DMA regulation for terrestrial environmental quality

Residual impact		Assessment finding	Recommended conditions and DMA regulation
1	Potential material impacts to soil quality from contamination from drilling chemicals and hydrocarbons	Not likely to be a material impact or be inconsistent with the EPA objective provided minimisation measures are implemented	Direct regulation through: • condition 6 ‘Rehabilitation Performance Bond’ requiring an unconditional performance bond should hydrocarbons be encountered that have the potential to lead to a commercial field development. Complementary regulation of the construction and operation of the proposal by the DMIRS under the PGER Act.

3 Holistic assessment

While the EPA assessed the impacts of the proposal against the key factors individually, given the inextricable link between flora and vegetation, terrestrial fauna and terrestrial environmental quality, the EPA also considered connections and interactions between parts of the environment to inform a holistic view of impacts to the whole environment.

Figure 3: Intrinsic interactions between key environmental factors

The proposal has been designed, as far as practicable, to avoid clearing of native vegetation and fauna habitat and maximise the use of existing cleared access tracks. By applying this mitigation to flora and vegetation within the development envelope, the proponent has minimised impacts to the health of other elements of the environment including the values associated with terrestrial fauna.

The proposal will result in the minor and short-term loss of flowering plant species in the Beekeepers Nature Reserve. However, all cleared areas with the nature reserve are required to be rehabilitated following completion of the proposal. As part of the assessment, the EPA determined that given cleared areas will be rehabilitated and the proposal impacts are temporary and of short duration, the impacts to apiculture are not likely to be significant.

The EPA has also considered the high degree of connectivity between the terrestrial environmental quality and the health of vegetation. Flora and vegetation, terrestrial fauna and terrestrial environmental quality are linked as a result of the potential contamination from the spillage of hydrocarbons, which could potentially impact flora and vegetation and terrestrial fauna habitat. The EPA considers that the regulation of the PGER Act will adequately mitigate potential impacts to other environmental factors, and the holistic connections between factors.

When the separate environmental factors of the proposal were considered together, the EPA formed the view that, due to the relatively small size of the proposal, and application of the mitigation hierarchy, the impacts from the proposal would not be inconsistent with the EPA's factor objectives.

4 Offsets

Environmental offsets are actions that provide environmental benefits which counterbalance the significant residual impacts of a proposal. Consistent with the *WA Environmental Offsets Guidelines* (Government of Western Australia 2014) the EPA has considered whether offsets can counter-balance, and are appropriate for, the proposal residual impacts which are likely to be significant. In the case of this proposal, likely (and potential) significant impacts are:

- direct impacts to 5.3 ha of excellent to good quality vegetation within the Beekeepers Nature Reserve.

Under the Residual Impact Significance Model (RISM) impacts to areas reserved under statute or managed for the purpose of conservation (for example National Parks, Marine Parks, Bush Forever Sites and conservation covenants) may be considered significant. The proposal is located predominantly within the Beekeepers Nature Reserve, managed by the DBCA for the purposes of apiculture and the conservation of flora.

There is a potential significant residual impact associated with clearing within a conservation area if the rehabilitation were to fail. The EPA notes that the proponent has provided a rehabilitation management plan and that rehabilitation performance bonds will be conditioned. However, should significant residual impacts be identified after six years from initial rehabilitation, a contingency offset, rather than an immediate offset, would be appropriate.

The DBCA has provided advice on the offsets proposed by the proponent. DBCA comments support the above approach to offsets, however the EPA notes that the required offset strategy will be subject to consultation with DBCA.

Environmental offsets are not appropriate in all cases. In this case the EPA considers offsets are appropriate as it may cause a significant impact to a pre-existing conservation area. However as the proposal has a short timescale (six months) and the impact is relatively small (5.3 ha of native vegetation), rehabilitation is preferable in the first instance. To incentivise rehabilitation, a performance bond is conditioned for the proposal, which has been agreed to by DBCA. Should after six years there are still areas that have not met the rehabilitation performance criteria, the proponent will have to offset any residual significant impact.

The EPA has recommended condition 7 ‘Offsets’ that requires the proponent to, implement offsets to counter-balance any significant residual impacts on the nature reserve if completion criteria have not been fulfilled after decommissioning and rehabilitation, and a further three (3) years following additional works, resulting in residual impacts on Beekeepers Nature Reserve.

5 Conclusion and recommendations

The EPA has taken the following into account in its assessment of the proposal:

- the location of the proposal within Beekeepers Nature Reserve
- environmental values likely to be significantly affected by the proposal
- assessment of key environmental factors, separately and holistically (this has included considering cumulative impacts of the proposal where relevant)
- likely residual impacts which can be minimised with the imposition of conditions
- EPA's confidence in the proponent's proposed mitigation measures
- the impacts can be managed consistent with the EPA's objectives for the key environmental factors
- whether other statutory decision-making processes that can mitigate the potential impacts of the proposal on the environment
- EP Act principles.

It is the EPA's view that reasonable conditions could be imposed on the proposal to ensure consistency with the EPA's objectives for the key environmental factors.

Given the above, the EPA recommends that the proposal may be implemented subject to the conditions recommended in Appendix A.

Appendix A: Recommended conditions

Section 44(2) of *Environmental Protection Act 1986* specifies that the EPA's report must set out (if it recommends that implementation be allowed) the conditions and procedures, if any, to which implementation should be subject. This appendix contains the EPA's recommended conditions and procedures.

STATEMENT THAT A PROPOSAL MAY BE IMPLEMENTED
***(Environmental Protection Act 1986*)**

CERVANTES-01 CONVENTIONAL WELL DRILLING PROPOSAL

Proposal: The proposal is to drill one conventional oil exploration well to determine if there is oil in the prospect, located 11 kilometres south of Dongara / Port Denison in the onshore Perth Basin, within the Beekeepers Nature Reserve. The proposal includes all activities associated with drilling a conventional oil exploration well including site preparation, equipment mobilisation, drill, case and cement, decommissioning, demobilisation, site restoration and rehabilitation. The anticipated life of the proposal is three to six months.

Proponent: RCMA Australia Pty Ltd
Australian Company Number 612 244 827

Proponent Address: 3/49 Ord Street West Perth 6005 WA

Assessment Number: 2283

Report of the Environmental Protection Authority: 1702

Pursuant to section 45 of the *Environmental Protection Act 1986,* it has been agreed that the proposal described in sections 3 and 4 of the proponent's referral supporting documentation (9 July 2020), may be implemented and that the implementation of the proposal is subject to the following implementation conditions and procedures:

1 Limitations and Extent of Proposal

When implementing the proposal, the proponent shall ensure the proposal does not exceed the following extents:

Physical element	Location	Limitation or maximum extent
Development envelope	Figure 2	36.5 hectares
Disturbance footprint	Figure 2	Up to 7 hectares
Direct disturbance of native vegetation	Figure 2	Up to 5.3 hectares

Direct disturbance of priority 1 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora'* Priority Ecological Community *(***PEC)**	Figure 2	Up to 0.99 hectares
Operational elements		
Extraction method		Conventional
Rehabilitation		Rehabilitation consistent with an approved Rehabilitation plan
Decommissioning		Removal of all drilling and exploration related infrastructure and equipment not required to remain under the *Petroleum and Geothermal Energy Resources Act, 1967*
Timing elements		
Site preparation and drilling activities		Up to 6 months from substantial commencement
Rehabilitation		Up to 3 years from plugging of the well

2 Time Limit Authorisation

2-1 The proponent shall not commence implementation of the proposal after five (5) years from the date of this Statement, and any **commencement**, prior to this date, must be substantial.

2-2 Any **commencement** of implementation of the proposal, on or before five (5) years from the date of this Statement, must be demonstrated as substantial by providing the CEO with written evidence, on or before the expiration of five (5) years from the date of this Statement.

3 Flora and Vegetation Outcomes

3-1 The proponent shall ensure the following outcomes are achieved:

(1) no more than 0.99 ha to Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria and Eucalyptus obtusiflora* **PEC**; and

(2) avoid impacts from the implementation of the proposal to flora and vegetation from changes to fire regime, dieback (*Phytophthora spp*) and weeds.

4 Terrestrial Fauna Outcomes

4-1 The proponent shall ensure the following outcome is achieved:

(1) avoid impacts from the implementation of the proposal to terrestrial fauna from changes to fire regime, introduction of feral animals, spread of dieback and weeds, vehicle strikes, entrapment in excavation and artificial water bodies, light pollution, noise and dust.

5 Rehabilitation Plan

5-1 The proponent shall update and implement the Rehabilitation Management Plan (29 April 2021) for approval by the CEO, on advice from **DBCA**. The Rehabilitation Management Plan shall contain provisions for update and review.

5-2 The proponent must not commence ground disturbing works until the CEO has endorsed the Rehabilitation Management Plan (29 April 2021) in writing.

5-3 The proponent shall implement the Rehabilitation Management Plan referred to in condition 5-1 until such time as the CEO agrees that the proponent's rehabilitation completion criteria have been fulfilled.

6 Rehabilitation Performance Bond

6-1 As security for the due and punctual observance and performance by the proponent of the requirements of condition 5 to be observed, conformed and complied with, the proponent shall lodge with the CEO prior to commencement of site preparation activities, an irrevocable Performance Bond as nominated and approved by the CEO in his sole unfettered discretion to a cash value and in a form acceptable to the CEO ("the Security") which Security at the date hereof being $324,500.

6-2 If the proponent encounters hydrocarbons that have the potential to lead to a commercial field development, as security for the due and punctual observance and performance by the proponent of the requirements of condition 5 to be observed, conformed and complied with, the proponent shall lodge with the CEO on demand within three (3) months of the casing and suspension of the proposal, an irrevocable Performance Bond as nominated and approved by the CEO in his sole unfettered discretion to a cash value and in a form acceptable to the CEO ("the Security") which Security at the date hereof being $275,000.

6-3 Upon completion of appropriate decommissioning and rehabilitation works at the site as agreed by the CEO, the Performance Bond referred in condition 6-1 can be reduced to $93,000 as a contingency Performance Bond. Additional works would be required if completion criteria have not been achieved in a period of three (3) years following completion of decommissioning and rehabilitation works as determined by the CEO, on advice of **DBCA**.

6-4 Security required by conditions 6-1, 6-2 and 6-3 may be reviewed at any time under Part VA 'Financial assurances' of the *Environmental Protection Act 1986*.

Note: In the preparation of advice to the CEO in relation to conditions 6-1, 6-2 and 6-3, the **EPA** expects that the advice of the Department of Mines, Industry Regulation and Safety and DBCA will be obtained.

7 Offsets

7-1 If completion criteria have not been fulfilled after decommissioning and rehabilitation, and a further three (3) years following additional works, resulting in significant residual impacts on Beekeepers Nature Reserve, then the proponent shall implement offsets to counter-balance any residual impacts on the nature reserve as determined by the CEO, on advice of **DBCA**.

8 Environmental Management Plan(s): Monitoring and Adaptive Management Program

8-1 Prior to ground disturbance and for approval, the proponent must prepare and submit to the CEO Environmental Management Plan(s) to substantiate that the outcomes of conditions 3, 4 and 5 will be met. The Plans must include:

(1) threshold criteria that provide a limit beyond which the environmental outcomes are not achieved;

(2) trigger criteria that will provide an early warning that the environmental outcomes are not likely to be met;

(3) monitoring parameters, sites, control/reference sites, methodology, timing and frequencies which will be used to measure threshold and trigger criteria. Include methodology for determining alternate monitoring sites as a contingency if proposed sites are not suitable in the future;

(4) baseline data;

(5) data collection and analysis methodologies;

(6) adaptive management methodology; and

(7) contingency measures which will be implemented if threshold or trigger criteria are met.

8-2 The exceedance of a threshold criteria (regardless of whether threshold contingency measures have been or are being implemented), and / or failure to comply with the requirements of the Environmental Management Plan represents a non-compliance with these conditions.

8-3 The proponent must not commence operations until the CEO, on advice from **DBCA**, has confirmed in writing that the Environmental Management Plan(s) satisfies the requirements of this condition.

9 Environmental Management Plan(s): General Provisions

9-1 After receiving notice in writing from the CEO that the management plan(s) for conditions 3, 4 and 5 of this statement satisfy the requirements of conditions 8 respectively, the proponent shall:

(1) implement the proposal in accordance with the management plans; and

(2) continue to implement the approved plans and programs until the CEO has confirmed by notice in writing that it has been demonstrated that the condition requirements have been met and therefore the implementation of the actions is no longer required.

9-2 The proponent may review and revise the management plan(s).

9-3 The proponent shall review and revise the management plan(s) as and when directed by the CEO.

9-4 The proponent shall implement the latest version of the management plan(s), which the CEO has confirmed by notice in writing, satisfies the requirements of conditions 3, 4, 5 and 8 respectively.

9-5 Despite condition 9-4, but subject to conditions 9-6 and 9-7, the proponent may implement minor revisions to a management plan(s) if the revisions will not result in any new or increased adverse impacts to the environment or result in a risk to the achievement of the management plan(s) limits, outcomes or objectives.

9-6 If the proponent is to implement minor revisions to a management plan(s) under condition 9-5, the proponent must provide the CEO with the following at least twenty (20) business days before it implements the revisions:

(1) revised management plan(s) clearly showing the minor revisions;

(2) explanation of reasons for the minor revisions; and

(3) explanation of why the minor revisions will not result in a new or increased adverse impacts to the environment or result in a risk to the achievement of the management plan limits, outcomes or objectives.

9-7 The proponent must cease to implement any revisions which the CEO notifies the proponent in writing may not be implemented.

9-8 Management Plans must be provided in electronic form suitable for publication on the EPA website within ten (10) business days of endorsement, and also be provided on the proponent's website.

10 Contact Details

10-1 The proponent shall notify the CEO of any change of its name, physical address or postal address for the serving of notices or other correspondence within twenty-eight (28) days of such change. Where the proponent is a corporation or an association of persons, whether incorporated or not, the postal address is that of the principal place of business or of the principal office in the State.

11 Compliance and Exceedance Reporting

11-1 The proponent shall prepare and maintain a Compliance Assessment Plan which is submitted to the CEO at least six (6) months prior to the first Compliance Assessment Report required by condition 11-5, or prior to implementation of the proposal, whichever is sooner.

11-2 The Compliance Assessment Plan shall indicate:

(1) the frequency of compliance reporting;

(2) the approach and timing of compliance assessments;

(3) the retention of compliance assessments;

(4) the method of reporting of potential non-compliances and corrective actions taken;

(5) the table of contents of Compliance Assessment Reports; and

(6) public availability of Compliance Assessment Reports.

11-3 After receiving notice in writing from the CEO that the Compliance Assessment Plan satisfies the requirements of condition 11-2, the proponent shall assess compliance with conditions in accordance with the Compliance Assessment Plan required by condition 11-1.

11-4 The proponent must provide an annual Compliance Assessment Report to the CEO for the purpose of determining whether the implementation conditions are being complied with.

11-5 The first annual Compliance Assessment Report must be submitted within twelve months of the issuing of this statement commencing on the first 31 March after the date of this statement, and subsequent Compliance Assessment Reports must be submitted annually from that date, unless a different date is approved by the CEO.

11-6 Each annual Compliance Assessment Report must be endorsed by the proponent's Chief Executive Officer and must:

(1) state whether each condition of this Statement has been complied with;

(2) provide evidence to substantiate statements of compliance, or details of where there has been a non-compliance and describe corrective and preventative actions taken; and

(3) be provided in a form suitable for publication on the EPA website.

11-7 If the proponent becomes aware a limit, outcome or threshold criteria contained in these conditions, or a management plan required in these conditions, has, or is likely to be exceeded, the proponent must:

(1) report this to the CEO within seven (7) days;

(2) implement contingency measures;

(3) investigate the cause of the exceedance;

(4) investigate environmental impacts of the exceedance;

(5) propose rectification measures;

(6) propose measures to ensure no further impact as a result of the exceedance; and

(7) provide a further report to the CEO within twenty-one (21) days of the original report, detailing the measures required under this condition.

12 Public Availability of Data

12-1 Subject to condition 12-2, within a reasonable time period approved by the CEO of the issue of this Statement and for the remainder of the life of the proposal, the proponent shall make publicly available, in a manner approved by the CEO, all validated environmental data (including sampling design, sampling methodologies, empirical data and derived information products (e.g. maps)), management plans and reports relevant to the assessment of this proposal and implementation of this Statement.

12-2 If any data referred to in condition 12-1 contains particulars of:

(1) a secret formula or process; or

(2) confidential commercially sensitive information,

the proponent may submit a request for approval from the CEO to not make these data publicly available. In making such a request the proponent shall

provide the CEO with an explanation and reasons why the data should not be made publicly available.

Table 1: Abbreviations and definitions

Acronym or abbreviation	Definition or term
CEO	The Chief Executive Officer of the Department of the Public Service of the State responsible for the administration of section 48 of the *Environmental Protection Act 1986*, or his delegate.
DBCA	Department of Biodiversity, Conservation and Attractions
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
PEC	Priority Ecological Community as defined under *Biodiversity Conservation Act 2016*

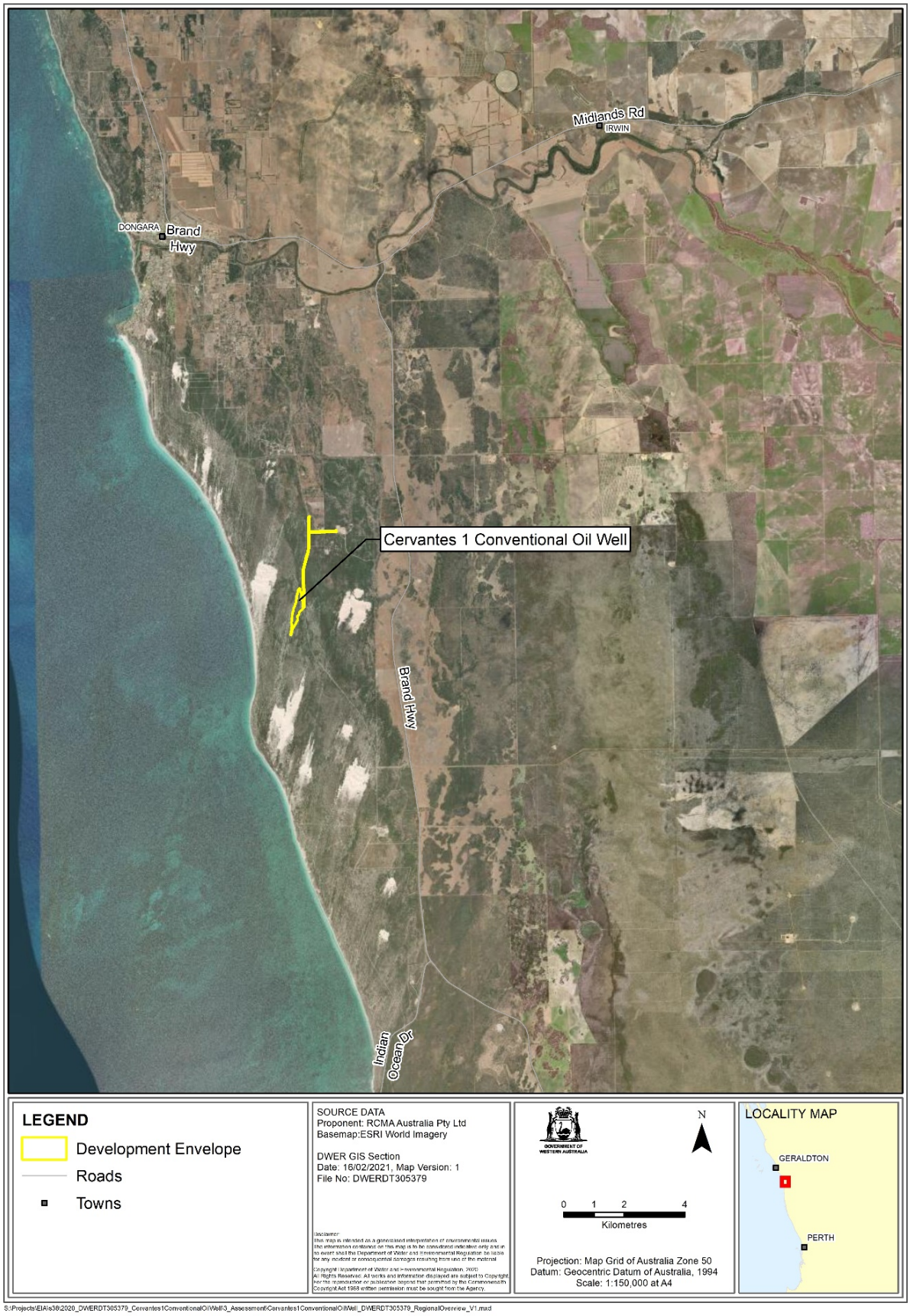

Figure 1: Regional location

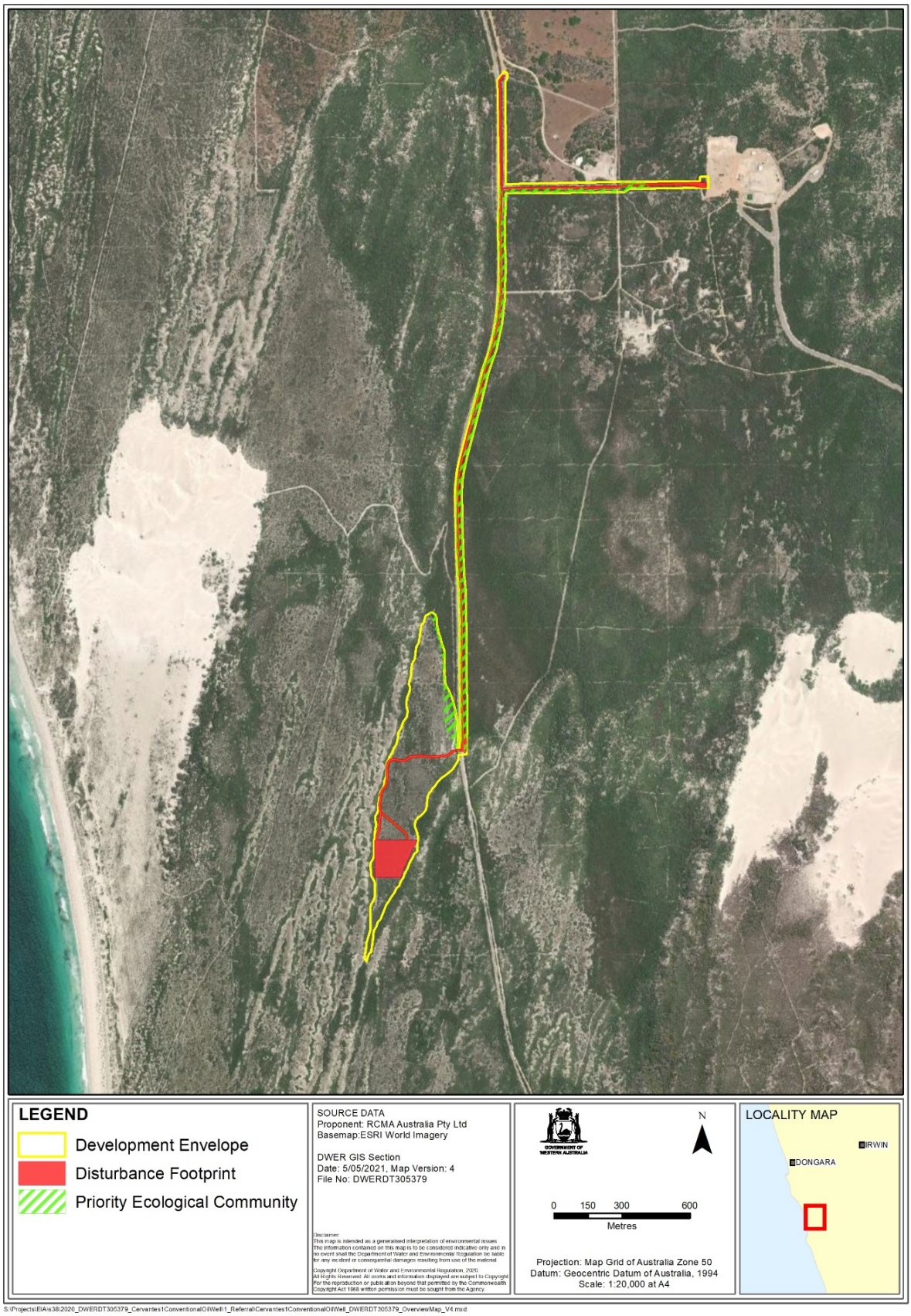

Figure 2: Development envelope and disturbance footprint

Schedule 1

Coordinates defining the areas shown in Figures 1 and 2 are held by the Department of Water and Environmental Regulation, under reference numbers DWERDT428176. All coordinates are in metres, listed in Map Grid of Australia Zone 50 (MGA Zone 50), datum of Geocentric Datum of Australia 1994 (GDA94).

Appendix B: Decision-making authorities

Section 45(1) of the *Environmental Protection Act 1986* requires the Minister for Environment to consult with decision-making authorities (DMAs), and if possible, agree on whether or not the proposal may be implemented, and if so, to what conditions and procedures, if any, that implementation should be subject.

The following DMAs have been identified:

Decision-Making Authority	Legislation (and approval)
1. Minister for Aboriginal Affairs	*Aboriginal Heritage Act 1972* (section 18 permit to impact a registered Aboriginal Heritage site)
2. Minister for Environment	*Biodiversity Conservation Act 2016* (permit to take flora and fauna) (taking or disturbance to threatened species and communities)
3. Minister for Mines and Petroleum	*Petroleum and Geothermal Energy Resources Act 1967* (permit for petroleum exploration)
4. Minister for Water	*Rights in Water and Irrigation Act 1914* (Groundwater extraction licence)
5. Chief Executive Officer, Department of Biodiversity, Conservation and Attractions	*Conservation and Land Management Act 1984* (section 101 granting a licence to use the land reserved as Nature Reserve)
6. Director, Conservation and Parks Commission	*Conservation and Land Management Act 1984* (section 101 granting a licence to use the land reserved as Nature Reserve (Minister for Environment in consultation with Conservation and Parks Commission))
7. Chief Executive Officer, Department of Water and Environmental Regulation	*Environmental Protection Act 1986* (Native vegetation clearing permit)
8. Chief Executive Officer, Shire of Irwin	*Health Act 1911* and Health (Treatment of Sewage and Disposal of Effluent and Liquid Waste) Regulation 1974 *Building Act 2011* (Permit for worker accommodation) Planning and Development Act 2005 (Shire approval)
9. Chief Dangerous Goods Officer, DMIRS	*Dangerous Goods Safety Act 2004* (Dangerous Goods)

Appendix C: Consideration of Environmental Protection Act principles

EP Act Principle	Consideration
1. The precautionary principle *Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In application of this precautionary principle, decisions should be guided by –* *a) careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and* *b) an assessment of the risk-weighted consequences of various options.*	The EPA has considered the precautionary principle when assessing and considering the impacts of the proposal on the environmental factors of flora and vegetation, terrestrial fauna and terrestrial environmental quality. The EPA notes that the proponent has identified measures to avoid or minimise impacts to the priority 1 'Coastal sands dominated by *Acacia rostellifera, Eucalyptus oraria* and *Eucalyptus obtusiflora' PEC.* The EPA has considered these measures during its assessment. The EPA has recommended conditions to ensure that environmental protection outcomes are achieved, through condition 1, 3, 4, 5 and 6– implementation of rehabilitation performance bond in conjunction with rehabilitation management plan. From its assessment of this proposal the EPA has concluded there is no threat of serious or irreversible harm provided that the recommended conditions are implemented.
2. The principle of intergenerational equity *The present generation should ensure that the health, diversity and productivity of the environment is maintained and enhanced for the benefit of future generations.*	In considering this principle, the EPA notes that flora and vegetation, terrestrial fauna, and terrestrial environmental quality could be significantly impacted by the proposal. The assessment of these impacts is provided in this report. In assessing this proposal, the EPA has recommended conditions to manage impacts to flora and vegetation and terrestrial fauna. The EPA has also noted where complementary regulations will manage impacts to terrestrial environmental quality. From its assessment of this proposal, the EPA has concluded that the environmental values will be protected and that the health, diversity and productivity of the environment will be maintained for the

EP Act Principle	Consideration
	benefit of future generations.
3. The principle of the conservation of biological diversity and ecological integrity *Conservation of biological diversity and ecological integrity should be a fundamental consideration.*	The EPA has considered the principle of the conservation of biological diversity and ecological integrity when assessing and considering the impacts of the proposal on the environmental factors of flora and vegetation and terrestrial fauna. In considering this principle, the EPA notes that flora and vegetation and terrestrial fauna could be significantly impacted by the proposal. The assessment of these impacts are provided in this report. The proponent has undertaken comprehensive baseline studies to understand and assess potential threats to biological diversity and ecological integrity. The EPA notes that the proponent has identified measures to avoid or minimise impacts to these factors. Furthermore, the EPA has recommended conditions relating to these factors. From its assessment of this proposal the EPA has concluded that the proposal would not compromise the biological diversity and ecological integrity of the affected areas.
4. Principles relating to improved valuation, pricing and incentive mechanisms *(1) Environmental factors should be included in the valuation of assets and services.* *(2) The polluter pays principles – those who generate pollution and waste should bear the cost of containment, avoidance and abatement.* *(3) The users of goods and services should pay prices based on the full life-cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.* *(4) Environmental goals, having been established, should be pursued in the most cost effective way, by establishing*	In considering this principle, the EPA notes that the proponent would bear the cost relating to management and monitoring of environmental impacts during operation and the management and monitoring of closure activities including earth works, rehabilitation and ongoing monitoring to demonstrate performance against completion criteria. The EPA has had regard to this principle during the assessment of the proposal.

EP Act Principle	Consideration
incentive structure, including market mechanisms, which enable those best placed to maximise benefits and/or minimize costs to develop their own solution and responses to environmental problems.	
5. The principle of waste minimisation *All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.*	In considering the principle of waste minimisation, the EPA notes the proposal will generate minimal waste streams. The proponent has evaluated key waste streams and identified management techniques to minimise impacts on the environment. The proponent will implement the waste minimisation hierarchy of avoid, reuse, recycle and treat/ dispose for the proposal. Some examples of waste minimisation include; cuttings will be shaken from muds, muds will be reused during drilling, oily waste will be taken offsite by an oily waste recycling provider and scrap steel will be recycled. The EPA has had regard to this principle during the assessment of the proposal.

Appendix D: Evaluation of other environmental factors

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
Air			
Air quality	• Diesel combustion emissions • Dust generation from vehicles	During the 7-day public comment period (27 November 2020 to 3 December 2020) on the referral several people raised concern of the impacts of the proposal on air quality.	Air quality was not identified as a preliminary key environmental factor when the EPA decided to assess the proposal. Having regard to: • the nearest resident being 2.6 km from the development envelope and will be unaffected by dust or vehicle emissions • the short duration of the proposal (three to six months) • emissions and discharges to be managed by DMIRS under the PGER Act • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020d) the EPA did not consider the factor air quality to be a key environmental factor at the conclusion of its assessment.
Greenhouse gas emissions	Contributing about 800 tonnes CO2-e per year Scope 1 and 2 including	During the 7-day public comment period (27 November 2020 to 3 December 2020) on the referral several people raised concern of	Having regard to: • the *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020a)

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	site preparation and rehabilitation	the impacts of the proposal on climate change.	which details that greenhouse gas from a proposal will be assessed where it exceeds 100,000 tonnes of scope 1 emissions each year measured in carbon dioxide equivalence (CO2-e) • the proposal contributing about 800 tonnes CO2-e per year Scope 1 and 2 including site preparation and rehabilitation • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020d), the EPA did not consider the factor greenhouse gas emissions to be a key environmental factor at the conclusion of its assessment.
Water			
Inland waters	• Accidental release of environmentally hazardous materials during storage and handling resulting in contamination of land and stormwater runoff. • Excavation of contaminated soils during preliminary earthworks	During the 7-day public comment period (27 November 2020 to 3 December 2020) on the referral several people raised concern over spills and waste impact on the environment and groundwater	Having regard to: • the nearest potential human receptors being 2.6 km north-northeast – up and across hydraulic gradient of the site • no DWER environmentally sensitive areas, DBCA important wetlands, RAMSAR sites, *Rights in Water and Irrigation Act 1914* surface water areas or irrigation districts within 5 km of the site

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
	(construction of the well) • Inappropriate disposal of solid and liquid wastes resulting in contamination of land and stormwater runoff.		• Water for the proposal would be supplied via the proponent's existing licensed groundwater bore off-site. • Impacts to water quality would be managed and regulated under the provisions of the *Petroleum and Geothermal Energy Resources Act 1967* • The proponent is required to disclose all proposed drilling mud chemicals to DMIRS and publicly as per the requirements of the *Petroleum and Geothermal Energy Resources (Environment) Regulations 2012 Regulation 15(9)* • the *Environmental Factor Guideline – Inland Waters* (EPA 2018) • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020d), the EPA did not consider inland waters to be a key environmental factor at the conclusion of its assessment.
People			
Social surroundings	• Potential impacts to Apiculture within Beekeepers Nature Reserve.	During the 7-day public comment period (27 November 2020 to 3 December 2020) on the referral several people raised concern over the potential impact to Apiculture within Beekeepers Nature Reserve.	Having regard to: • the relative size of the impact (5.3 ha) compared to the size of Beekeepers Nature Reserve (120,000 ha)

Environmental factor	Description of the proposal's likely impacts on the environmental factor	Government agency and public comments	Evaluation of why the factor is not a key environmental factor
		Beekeepers Nature Reserve was established in 1979 for the purpose of apiculture and the conservation of flora. It is therefore considered an important resource for apiculture production in Western Australia.	• the proponent's stakeholder engagement and engagement with DBCA's requirements (e.g. rehabilitation and performance bond) • consultation between the proponent and the Yamatji Marlpa Aboriginal Corporation • draft petroleum exploration and heritage protection agreement in development • the *Environmental Factor Guideline – Social Surroundings* (EPA 2016b) • the significance considerations in the *Statement of Environmental Principles, Factors and Objectives* (EPA 2020d), the EPA considers it is unlikely that the proposal would have a significant impact on social surroundings and that the impacts to this factor are manageable. Accordingly, the EPA did not consider social surroundings to be a key environmental factor at the conclusion of its assessment

Appendix E: Relevant policy, guidance and procedures

The EPA had particular regard to the policies, guidelines and procedures listed below in the assessment of the proposal.

- *Environmental Factor Guideline – Air Quality* (EPA 2020)
- *Environmental Factor Guideline – Flora and Vegetation* (EPA 2016)
- *Environmental Factor Guideline – Greenhouse Gas Emissions* (EPA 2020)
- *Environmental Factor Guideline – Inland Waters* (EPA 2018)
- *Environmental Factor Guideline – Social Surroundings* (EPA 2016)
- *Environmental Factor Guideline – Terrestrial Environmental Quality* (EPA 2016)
- *Environmental Factor Guideline – Terrestrial Fauna* (EPA 2016)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures* (State of Western Australia 2016)
- *Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual* (EPA 2020).
- *Statement of Environmental Principles, Factors and Objectives* (EPA 2020)
- *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016)
- *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020)
- *WA Environmental Offsets Policy* (Government of Western Australia 2011)
- *WA Environmental Offsets Guidelines* (Government of Western Australia 2014).

Appendix F: Assessment timeline

Date	Progress stages	Time (weeks)
9 February 2021	EPA decided to assess – level of assessment set	43
19 February 2021	Request for Additional Information	2
5 May 2021	EPA received final information for assessment	6
20 May 2021	EPA board completed its assessment	2
28 June 2021	EPA provided report to the Minister for Environment	6
2 July 2021	EPA report published	3 days
16 July 2021	Close of appeals period	2

Timelines for an assessment may vary according to the complexity of the proposal and are usually agreed with the proponent soon after the Environmental Protection Authority (EPA) decides to assess the proposal and records the level of assessment.

In this case, the EPA met its timeline objective to complete its assessment and provide a report to the Minister.

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