ntepa Northern Territory Environment Protection Authority

Statement of Reasons

IMPERIAL OIL & GAS PTY LTD – ENVIRONMENT MANAGEMENT PLAN (EMP) FOR 2020 DRILLING PROGRAM ON EP187 (IMP002-04)

PROPOSAL

The Environment Management Plan (EMP) for the 2020 Drilling Program on Exploration Permit (EP) 187 (the Proposal)[1] was referred by Imperial Oil & Gas Pty Ltd (the Proponent)[2] to the Northern Territory Environment Protection Authority (NT EPA) on 22 August 2019, for consideration under the *Environmental Assessment Act 1982* (EA Act).

The technical works program involves the drilling of up to two wells and associated ancillary civil activities, such as access track expansion and maintenance, well pad construction, and establishment of accommodation camp on existing roadside camp on EP 187 to evaluate the Kyalla and Velkerri formations. Only one of the proposed well locations is known, with the second well to be drilled at one of four potential sites; all of which are assessed in this EMP. The final site selection is contingent on the results of the seismic data gathered during October and November 2019.

The Proponent is intending to use a mixture of air drilling and underbalanced mud drilling, which requires significantly less water than other processes and, as consequence, no groundwater extraction licence will be required. The small amount of water anticipated to be used (less than 5 megalitres (ML)/year) will be sourced from an existing roadside bore, accessed under an agreement with the Northern Territory Government Department of Infrastructure, Planning and Logistics (DIPL). The activity does not interact with any known surface water features such as drainage lines, creeks, waterholes or other permanent water sites, including groundwater dependant ecosystems. The NT EPA will provide advice to the Minister that the Proponent be required to provide regular data on water use to the regulator to ensure the 5 ML limit for groundwater extraction within a 12 month period, is not breached.

The program will occur at two of the five proposed well sites and will include:

- the upgrade and/or creation of new access tracks
- land clearing, cut and fill of two well pads
- expansion of existing DIPL road side camp clearing for construction of a temporary accommodation camp
- exploration drilling
- well evaluation using mudlogging, wireline logging, coring and leak-off tests
- well integrity verification in accordance with the Code of Practice: Onshore Petroleum Activities in the NT (2019) (the Code)
- cased hole Diagnostic Fracture Injection Testing (DFIT)[3]

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1 'Proposal' has the same meaning as 'Regulated Activity' under the Petroleum Act 1984.

2 'Proponent' has the same meaning as 'Interest Holder' under the Petroleum Act 1984.

3 DFIT is the process involving injecting small volumes of water (without proponent) into the target reservoir at low pumping rates and high pressure until the initiation of a fracture to obtain information on reservoir properties.

- environmental monitoring
- well suspension and/or decommissioning, in accordance with the Code
- ongoing site and well maintenance, monitoring and evaluation as necessary.

No flaring or venting is expected under this EMP unless in an emergency situation for safety purposes. Gas detection monitoring will be conducted during all phases of construction and any flaring will be measured using flow meters compliant with National Greenhouse and Energy Reporting Scheme (NGERS) requirements. All emissions will be reported in accordance with NGERS and to the Northern Territory Government, as specified in the Code.

The Proposal does not include any other petroleum exploration activities on EP 187. Seismic surveys have been previously approved[4], and any proposed hydraulic fracturing or appraisal testing will need to be addressed in a separate EMP for approval by the Minister for Environment and Natural Resources.

Site selection was informed by a range of considerations, including proximity to sensitive receptors, baseline flora and fauna surveys, weed surveys, a seismic survey and subsequent data analysis, heritage and archaeological surveys, as well as based on discussions with Traditional Owners and pastoralists in the area. All sites can be constructed in-situ with no additional material required to create a suitable well-site surface area outside the hardstand area, further minimising the environmental footprint. All proposed access tracks avoid creek crossings and either utilise pre-disturbed areas of vegetation along seismic lines or similar, or are designed to avoid significant vegetation (such as *Acacia shirleyi* -lancewood stands).

The key components of the Proposal are summarised in Table 1.

Table 1: Key components of the Proposal

Component	**Size/capacity/detail**
Total area of exploration lease (EP187)	442,700 ha
Well pad construction	1 ha
Total area of disturbance	17 ha
Existing infrastructure	DIPL road side camp, water bores, partial access track(s)
Number of exploration wells	Drilling of two vertical wells: Total vertical depth (TVD) 2100 +/-50 m for SL-4 (or alternates) and 2100 TVD +/-50 m for SL-3
Timing and duration of works	80 days (May – September 2020)
Operational workforce	~60
Well construction drilling activity	Up to 2 wells, DFIT, well integrity monitoring and well evaluation techniques including mudlogging, wireline, coring and leak off testing
Camp	30 person on existing campsite
Groundwater usage (both well sites)	<5 ML
Waste volume, including drill cuttings and drilling mud– initial predicted	~240 m^3
Fuel usage	~152 kL of diesel
tCO_2-e emissions	~4160 tonnes
Gravel pits	~200 m^3 sourced from existing roadwork gravel pits (approx. 11 km away)
Rehabilitation	Progressive, reported annually

[4] IMP001-03: Environment Management Plan Seismic Work Program on EP187 – September 2019 (https://denr.nt.gov.au/onshore-gas/environment-management-plan/approved-emps)

CONSULTATION

The EMP has been reviewed as a notification under the EA Act in consultation with Northern Territory Government advisory bodies (see Attachment A) and the responsible Minister, in accordance with clause 8(1) of the Environmental Assessment Administrative Procedures 1984.

In accordance with the Petroleum (Environment) Regulations 2016 the EMP was made available for public comment for a period of 28 days. An overview of the key topics raised during the pubic consultation is provided under Public Consultation**.** The NT EPA has reviewed the public submissions as part of its decision-making and in providing advice to the Minister.

JUSTIFICATION

The NT EPA assessed the potentially significant environmental impacts and risks associated with the Proposal in line with the NT EPA's environmental factors and objectives, and in accordance with the requirements under the EA Act. The NT EPA identified three environmental factors that could be significantly impacted by the Proposal (Table 2).

The NT EPA considered the importance of other environmental factors during the course of its assessment. However those factors were not identified as potentially significantly impacted or have been previously assessed in the Imperial 2D Seismic Work Program EP187 EMP. As this activity is restricted to the drilling of two wells, with no production testing and does not include long term land disturbance, the NT EPA considers the greenhouse gas emissions to be minimal and the potential impact not significant.

Table 2: Key environmental factors considered for this assessment

Theme	Environmental factor	Objective
Water	Inland water environmental quality	Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.
Land	Terrestrial environmental quality	Maintain the quality of land and soils so that environmental values are protected.
People and Communities	Social, economic and cultural surroundings	Protect the rich social, economic, cultural and heritage values of the Northern Territory.

1. Inland water environmental quality

Objective: Maintain the quality of groundwater and surface water so that environmental values including ecological health, land uses, and the welfare and amenity of people are protected.

The proposed well sites are part of the Gulf Fall and Uplands Region; and the McArthur River and Tributaries bioregions, both of which drain into the Gulf of Carpentaria. The EMP identifies a number of small ephemeral drainage lines and creeks (stream orders 1, 2 and 3) in the Proposal area. These drainage lines and creeks are overland flow paths that typically only flow for a relatively short period during the wet season, however in significant rainfall events they are able to connect with larger creeks and rivers (such as McArthur River, stream order 7), eventually draining into the Gulf of Carpentaria.

The relatively flat landscape supports a range of wetlands types, including springs, sinkholes and minor depressions. The proposed well sites specifically exclude these areas and appropriate precautions have been taken to minimise interaction, such as designing longer access tracks to avoid gilgai country. Relief Creek, the closest stream order of magnitude 3, is 3km from the nearest proposed well site and over 10km from the furthest proposed site. There are no streams higher than a magnitude 3 in the proposal area.

The site partly overlies the Gum Ridge Formation, which is part of the Cambrian Limestone Aquifer (CLA). The CLA forms the major water resource for the Beetaloo Basin, providing groundwater supply for the communities of Elliot, Daly Waters, Larrimah, Newcastle Waters and the pastoral industry that comprises 90% of land use in the Beetaloo Basin.

The proposed well sites and accompanying access tracks were selected to minimise new disturbance where practicable, with site selection considering flooding, sheet flow pathways, soil drainage, site slope (between 0-2% for all sites) and proximity to watercourses (ranging from between 11km and 3km depending on the site). Selected sites displayed no evidence of overland flow inundation.

Potential impacts to inland water environmental quality from the Proposal include:

- unintended release of wastewater during flooding events
- spills associated with chemicals and wastewater, during storage, handling and transport
- well integrity failure during the drilling operation contaminating groundwater

Unintended release of wastewater

Approximately 90 m^3 of drill cuttings and 150 m^3 of drilling mud will be produced during the activity. Drill cuttings are expected to primarily comprise siliciclastic rocks (mudstones and sandstones) containing predominantly quartz grains and clays and will appear as gravelly sandy or silty material. Naturally Occurring Radioactive Materials (NORMs) are likely to increase above background levels in the cuttings as a result of the organic rich intervals in the Kyalla and Velkerri Formations. The drilling mud will be predominantly comprised of water and clay with minor chemical additives, all approved by the Commonwealth Government Department of Health and the Australian Inventory of Chemical Substances (under the National Industrial Chemical Notification and Assessment Scheme).

As discussed above, potential impacts have been minimised by site selection. The short term nature of the activity and seasonal timing (80 days during the 2020 Dry season) further minimises risks to the environment from the unintended release of wastewater, with the likelihood of a flood event during the activity being very low. The EMP commits to the following measures to avoid water quality impacts to the catchment downstream of the activity and include:

- an engineered well pad that has been constructed to sufficient load bearing capacity that will limit seepage and infiltration as a result of compaction
- recycling of drilling mud to reduce quantity of water and chemicals required and production of waste
- drilling sumps have a designed volume capacity of 360m^3 , which is larger than the estimated total of 240m^3 , leaving ~120m^3 of capacity without encroaching on the minimum 1m freeboard to prevent overtopping
- all sumps have a minimum of 0.5m bund around their edge to avoid water run-off
- the well pad will be sloped, to prevent major pooling of water

- 0.5m high lease pad bunding will be used consistent with the Code, specifically to prevent overland flow and prevent water ingress.

Spill management

The EMP states that this drilling program, including transport of chemicals and wastewater, will only be undertaken during the 2020 dry season, which is defined in the Code as the months May to September inclusive. The Proponent has detailed the emergency response plan in place for responding to spills during transport and any residual drill fluids and cuttings will be transported using waste contractors licensed to handle and dispose of the listed waste in accordance with the *Waste Management and Pollution Control Act 1996.* This reduces the likelihood of a spill during transport of chemicals and wastewater to as low as reasonably practicable.

Wastewater storage capacity will exceed the anticipated requirements by approximately 35%, not including the 1m minimum freeboard required by the Code; and the EMP has identified the ability to manage 1-in-1000 year rainfall events[5]. All fuel, chemicals and other hazardous substances will be stored in accordance with the Code, in a self-bunded (double-lined) area and will meet API (American Petroleum Industry) standards.

The EMP further commits to mitigation measures to reduce the potential risk of spills to inland water quality, including but not limited to:

- an activity specific Spill Management Plan and Wastewater Management Plan (WWMP) that meets the Code requirements
- drilling sumps lined with impermeable membrane, in compliance with the Code
- spill kits will be made available in all spill-potential areas, and drip trays will be used in all refuelling operations
- fuel drums stored on portable bunds with sufficient capacity to hold 100% of the volume of the largest container stored in the area plus 10%.
- Prior to the wet season residual muds will be sampled with the chemical composition analysed at an accredited laboratory. If the results are within the acceptable parameters as set out in the Code, then the cuttings will be disposed of in-situ. If the results fall outside the Code then all residual muds will be transported to a licensed disposal facility

With the demobilisation of the drilling rig and support infrastructure completed before the onset of the wet season, the potential impacts to surface water quality as a result of spills, flooding and run-off from the sites are not considered to be significant.

Well integrity failure and groundwater contamination

Well integrity, with respect to aquifer protection, is an important environmental consideration. The Proponent has committed to complying with the Code standards for well integrity and intends to exceed the Code two-barrier requirement, by installing three barriers to isolate the regional shallow aquifers from anticipated hydrocarbon bearing zones. Additional controls intended to mitigate well integrity failure during the activity include, but are not limited to:

- only air, water or water-based drilling muds will be used in the early stages of drilling and while drilling through aquifers
- chemicals that could leave a residual toxic effect will not be added to drilling mud until the aquifers are isolated and the separation barriers have been independently verified

[5] 60-day 0.1% annual exceedance probability (AEP) for a rainfall event equating to 473 mm in the dry season

- a cement pressure test to ensure overall integrity of the production casing
- a Well Operations Management Plan (WOMP) will be provided for approval by Department of Primary Industry and Resources (DPIR) prior to the commencement of the activity
- results from the recent seismic survey will enable any geohazards (e.g. small faults) to be identified and avoided. Any geohazards encountered during drilling will be risk assessed in the WOMP
- well barrier integrity validation (WBIV) reporting will be provided to DPIR for approval. The WBIV report must be certified by an independent validator and comply with the DPIR Well Barrier Integrity Validation Reporting guideline to demonstrate compliance with the Code
- a Diagnostic Fracture Injection Test (DFIT) will be conducted to validate and update understanding of the geology. This process involves injecting a small volume of water into the well, shutting down the surface pumps and monitoring pressure. This stage is optional and typically only performed in the exploratory or appraisal stages of development, or until localised fracture characteristics are defined. The WBIV Report must be approved by DPIR prior to conducting a DFIT.
- a series of critical control and hold points will be used throughout the well's construction, with the verification of each stage to be approved by a competent person, prior to continued construction. These hold points include, but are not limited to:
  - cementing of casing annulus undertaken in compliance with the cementing procedures specified in the WOMP
  - logging while drilling to identify anomalous sub-surface conditions including loss zones, cave-in and washout areas, small faults, influx areas (e.g. unidentified aquifers) and other geohazards potentially affecting well integrity
  - installation of casing string at completion of each interval
  - conducting a Formation Integrity test (FIT) prior to drilling ahead in the next interval
  - real-time pressure monitoring to detect anomalous behaviour.

The NT EPA will provide advice to the Minister that a cementing completion report for the 13-3/8" and 9 5/8" casing strings through the Gum Ridge aquifer be provided to DENR to demonstrate the Code requirement for isolation of aquifers has been met.

Groundwater quality monitoring of the Gum Ridge Aquifer has been undertaken at five existing pastoralist bores. The bores are located within the extent of the Project area and they provide a representative spread across the tenement. Reported data shows that naturally occurring zinc concentrations are above normal, consistent with natural ore bodies in the area. Total hydrocarbons, and BTEX chemicals were less than laboratory level reporting capability. The Proponent has committed to continuing groundwater monitoring from existing supply bores in the vicinity of the proposed well sites including at RN027848 and RN039574, prior to commencing drilling, as well as ensuring six months of baseline water data is obtained prior to any hydraulic fracturing activities that may be proposed for the area. The baseline dataset will provide well site specific performance targets and be published on the DENR website. As required by the Code and Preliminary Guideline: Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-basin, the Proponent must undertake ongoing groundwater monitoring for three years from the approval date of the EMP, to demonstrate 'no change' to groundwater quality. The groundwater monitoring results will be reported quarterly on the DENR webpage.[6] To ensure a robust groundwater quality baseline dataset, the NT EPA advises a minimum of eight sampling events be completed from the monitoring bores prior to completion of the drilling program.

[6] https://denr.nt.gov.au/onshore-gas/onshore-gas-in-the-northern-territory/industry-compliance-and-reporting/groundwater-monitoring-results.

Provided that the mitigation and management measures outlined in the EMP, including the wastewater and spill management plans are implemented, and independent verification of critical controls and hold points throughout well construction, the NT EPA considers that the proposal is unlikely to have a significant impact on surface water and groundwater quality and the NT EPA's objective for Inland water environmental quality is likely to be met.

2. Terrestrial environmental quality

Objective: Maintain the quality of land and soils so that environmental values are protected.

The soils on EP 187 are described as kandosols and calceaeous earths, tenosol loams, rudosol loams and vertosols. Most soils are rated very low for erosion sensitivity (International Erosion Control Association (IECA) Guidelines, 2008). They are mainly infertile, with near neutral reaction and little to no profile development. Given the very low slope and other factors, the estimated soil loss is expected to be in the Very Low category (which ranges from 0-150t/ha/y) with the anticipated site-specific loss to be <30t/ha/y.

The potential impacts to soils from the Proposal include:

- erosion of exposed soils as a result of a cleared well pad
- soil contamination as a result of spills and leaks associated with storage, handling and transport of chemicals, drilling muds, cuttings and fuel.

Erosion of exposed soils as a result of a cleared well pad

The EMP contains an Erosion and Sediment Control Plan (ESCP) developed by a suitably qualified person. The ESCP has been reviewed by a DENR technical specialist who confirmed it meets the requirements of the Code and is of a satisfactory standard. The NT EPA will provide advice to the Minister that the Proponent provide a geotechnical assessment report across each proposed well site to inform an indicative calculation of the amount of excavation (and stockpiling) and fill required to reach acceptable compaction and load bearing for the well pad.

Key erosion controls identified in the ESCP include:

- stabilisation of high traffic areas on the well pad with gravel
- establishing stabilised entry/exit points where construction tracks intersect public roadways
- utilising existing tracks wherever possible
- a rainfall forecast trigger for the stabilisation of all exposed surfaces (> 60% chance of > 50mm)
- grass, rocks, branches and shrubs be raked to the downslope extent of works, establishing a control similar to a mulch bund
- a minimum 70% cover of exposed surfaces is required for stabilisation.

A rehabilitation plan is essential to minimise the risk of post-activity subsequent erosion and to return the disturbed land to provide an environment similar to original conditions. A rehabilitation plan developed in accordance with section A.3.9 of the Code has been provided in the EMP and includes the following commitments:

- progressive rehabilitation of disturbed areas
- any imported gravel to be returned to source quarry
- topsoil to be evenly spread over any cleared area no longer required for safe operation

- surface to be lightly scarified
- annual monitoring and reporting.

All stages of the regulated activity, including progressive rehabilitation of all disturbed areas to an acceptable standard, will be at the cost of the Proponent. The Proponent will be required to provide an adequate environmental rehabilitation security to ensure rehabilitation objectives are met. The NT EPA will provide separate advice to the Minister that the Proponent be required to demonstrate compliance with the EMP and all aspects of the Code for minimising surface disturbance activities by providing a spatial assessment report on the final disturbance footprint of the Proposal.

Soil contamination as a result of spills and leaks

As noted above, site selection and well pad design will minimise disturbance where practicable, and has considered flooding, sheet flow pathways, soil drainage, proximity to water courses, site slope and soil compaction of the hardstand area, with the intention of minimising environmental harm, should any hazardous material spill or leak on site.

The wells are designed to be drilled using water-based drilling mud which, after circulating the well, are sent to the separators to separate the cuttings from the mud. The mud is then returned to tanks and recirculated down the hole. In addition to shakers, centrifuges will be used to maintain the quality of the fluid and therefore minimise the overall chemical volume used during the activity. The drilling cuttings will be managed in accordance with the Code as outlined above.

Each hazardous substance (fuel, chemicals, drilling waste) will be stored in a bunded containment area at a location protected from escape into the surrounding environment. The EMP contains a Spill Management Plan and Wastewater Management Plan that meet the requirements of section C.7.1 and C.7.2 of the Code. These plans describe the effective response management strategies to be implemented to manage the transport, handling, storage, bunding and clean-up of hazardous substances.

The Proponent has committed to the appropriate disposal of all drilling mud and cuttings at the conclusion of the work program. A chemical analysis of the residual waste will be provided to DENR to make a subsequent decision on the final disposal of drilling waste The tests will determine leachability testing of heavy metals, NORMS and other contaminants of potential concern, as required by the Code to indicate a suitable disposal method: either in-situ via backfill and burial, or transport to Queensland via a licensed transporter to an accredited facility.

The NT EPA considers that the potential impacts and risks to terrestrial environmental quality can be mitigated through implementation of the mitigation measures presented in the EMP. Based on these mitigation measures, the NT EPA considers that its objective for Terrestrial environmental quality is likely to be met.

3. Social, economic and cultural surroundings

Objective: Protect the rich social, economic, cultural and heritage values of the Northern Territory.

Social considerations

The Proponent has undertaken stakeholder engagement with NT Government agencies, landholders and land managers, McArthur River Mine, Traditional Owners, the Northern Land Council (NLC) and the Aboriginal Areas Protection Authority (AAPA). The EMP cites several current agreements and operating consents associated with the Proposal.

The EMP clearly sets out the stakeholder engagement undertaken by the Proponent and summarises the method of contact and the matters raised with landowners/stakeholders in the

Proposal area. Engagement has occurred consistently since 2017 including with Traditional Owners and engaging, at times, in-language.

Potential amenity impacts from the Proposal include nuisance dust and noise impacting sensitive receptors, as well as increased traffic to the proposed well site areas via the Carpentaria Highway. Noise is not considered a significant issue due to the distance to sensitive receptors and dust will be managed through vehicle speed restrictions. The area is sparsely populated with no communities present within the proposed work area, and only one abandoned outstation in the vicinity, which is located on the western boundary of the tenement. The nearest Aboriginal communities are 100km and 180km to the NE and NW from the proposed well pad locations respectively.

The Proponent will require a Traffic Management Plan approved by the DIPL Civil Transport Services prior to commencing for the activity. Mobilisation will follow traffic management measures that meet the requirements of the DIPL approval and will be shared with relevant NT Government agencies and stakeholders prior to commencement of the activity. To minimise traffic the Proponent intends to upgrade an existing DPIL campsite on the Carpentaria Highway, central to the proposed work area, approximately 9km from the furthest highway turn off. The camp has the capacity to accommodate 30 people. The Camp will meet all Department of Health requirements and specifications as detailed in the EMP. While the camp is in operation an onsite screening fence will be installed between the camp and the highway to reduce visual impact.

The EMP adequately considers the increased bushfires risk that may result from the activity. An Emergency Response Plan and Bushfire Management Plan have been developed as part of the EMP. Mapping indicates that the proposed well sites were last burned in 2017 however the increase in cattle to the area has brought a corresponding increase in fence lines and firebreaks throughout the exploration area. The Bushfire Management Plan ensures that the Proposal does not affect the landholder's fire management obligations and strategies.

The Proponent has committed to a Field Liaison Coordinator in the region to be the primary point of contact for all landholder and community members during all staged work phases. The Coordinator will manage day-to-day communication and ensure all stakeholders are kept up to date with respect to progress and status of the program, ensure simultaneous pastoral operations are not impacted, and raise and manage any stakeholder issues during the program, if necessary.

Cultural heritage

An Aboriginal and Historic Cultural Heritage Assessment Report was completed and provided in the EMP and approved under the *Heritage Act* (2011). The Proponent has applied for an AAPA Authority Certificate and a copy of the certificate will be included in the EMP prior to Ministerial consideration. No protected areas or places with historical or cultural significance were found to be within 50km of the proposed well sites. No drilling activities will be conducted in the vicinity of any known Aboriginal cultural or heritage sites.

The EMP commits to management strategies for the protection of Aboriginal and cultural heritage, including cultural heritage site inductions for all personnel; an 'unexpected heritage (artefact) find' stop work procedure; and similar to the previous EMP's commitments and activities, the Proponent will employ cultural advisors from the relevant traditional owner group to work with the team during the activity, to oversee the process should any new artefacts or similar, be discovered.

The NT EPA considers that the potential impacts and risks on social, economic and cultural surroundings can be mitigated through implementation of the management measures presented in the EMP and the receipt of an AAPA Authority Certificate, and that its objective for Social, economic and cultural surroundings is likely to be met.

Cumulative Impacts

The estimated cumulative impacts from the Proponent's 2019 – 2020 exploration program on EP187 have been presented in the EMP and shown in the Tables 3 – 5 below.

Cumulative land clearing is shown in Table 3. The majority of land disturbance for the 2019 exploration program was previously approved under the 2D Seismic Program. Land disturbance for this EMP is limited to up to 17 ha and includes improvement of access tracks, clearing both well sites, the expansion of the campsite and required fire protection breaks.

Table 3: Cumulative land disturbance for the 2019-2020 exploration program in EP 187

Clearing by activity	**Hectares (ha)**
EMP: 2D Seismic Program	130
EMP: 2020 Drilling Program	17
Cumulative hectares cleared	147
Total area of EP 187	442 700

Cumulative groundwater extraction is shown in Table 4. As stated previously, given the very small volume of groundwater required by the proponent, no groundwater extraction licence is required, and impacts to groundwater are negligible.

Table 4: Cumulative water use for the 2019-20 exploration program in EP 187

Source of water use	**Megalitres (ML)**
EMP: 2019 2D Seismic Program	0
EMP: 2020 Drilling Program	<5
Cumulative water use	<5

Total greenhouse gas emissions (GHG) for the Northern Territory in 2017 were 16.5 Mt CO_2-e. The cumulative emissions of greenhouse gases (GHG) for Imperial's 2019-20 exploration program on EP 187 is estimated in Table 5. The total estimated GHG emissions for the Proponent's 2019-20 exploration program is approximately 0.06% of the total annual Northern Territory GHG emissions.

Table 5: Cumulative greenhouse gas emissions for the 2019 exploration program in EP 161

Source of GHG emissions	**tCO_2-e**
EMP: 2019 2D Seismic Program	6638
EMP: 2020 Drilling Program	4158
Cumulative GHG emissions	9868

As outlined previously, flaring will only be done in an emergency situation. Combustion flaring is expected to reduce emissions by approximately 85% compared to venting. GHG mitigation and monitoring measures outlined in the EMP are consistent with requirements of the Code and include:

- measurement of the amount of gas and condensate disposed to flare using flow meters compliant with the National Greenhouse Energy Reporting Scheme (NGERS)
- ongoing emissions reporting compliant with NGERS
- routine well head maintenance
- 6 monthly leak detection monitoring at the well pad.

Public consultation

In accordance with the Petroleum (Environment) Regulations 2016, the EMP was made available for public comment for a period of 28 days from 23 August to 20 September 2019. A total of four public submissions were received on the EMP, one from a community member and three from Non-Government Organisations. Frequent issues raised include:

- water, including concern regarding the quantity and quality of the regional water supply
- climate change, and the need for Australia to turn to a renewable energy
- engagement with Traditional Owners not being genuine or appropriate; and concern that gas companies are taking advantage of Traditional Owners lack of understanding of the industry
- regulatory skills within the Northern Territory Government not commensurate with the risk posed by the industry
- implementation of the 135 recommendations made by the Scientific Inquiry into Hydraulic Fracturing are not complete, so approvals for exploration should not be granted.

The NT EPA notes the EMP does not propose any significant water use, is limited to the drilling of two exploration wells and does not include production testing or hydraulic fracturing of either wells. The EMP demonstrates appropriate stakeholder engagement including with Traditional Owners.

The public submissions are discussed in further detail in the NT EPA's advice to the Minister for Environment and Natural Resources.

CONCLUSION

The EMP has assessed cumulative impacts as they apply to the proposed activities and the broader exploration program, including GHG emissions and groundwater extraction. This EMP deals with exploration activities of short duration and limited scope involving drilling and well testing of two exploration wells. The NT EPA considers that the potential environmental impacts and risks, both proposal-related and cumulative are not significant and that the Proposal does not require assessment under the EA Act. The Proponent has prepared the EMP in accordance with the Petroleum (Environment) Regulations 2016 and to demonstrate how it will also meet compliance with the Code.

Comments from NTG advisory bodies and public submissions have been provided to the Proponent for consideration and amendment during the EMP assessment; these are evaluated during the EMP assessment process.

The Minister for Environment and Natural Resources has asked the NT EPA to provide advice under the Petroleum (Environment) Regulations 2016, as to whether the EMP meets certain requirements of the Regulations, specifically:

- whether the EMP is appropriate for the nature and scale of the regulated activity to which the plan relates; and

- whether the EMP demonstrates that the activity will be carried out in a manner by which the environmental impacts and environmental risks of the activity will be reduced to a level that is as low as reasonably practicable and acceptable; and

- the principles of ecologically sustainable development

As part of the assessment to provide that advice, the NT EPA proposes to make recommendations to the Minister for Environment on conditions to improve environmental outcomes. The NT EPA's decision not to assess the EMP under the EA Act is not reliant on the Minister accepting the NT EPA advice.

DECISION

The proposed action by Imperial Oil & Gas Pty Ltd has been examined by the NT EPA and investigations and inquiries conducted.

The NT EPA has decided that the potential environmental impacts and risks of the Proposal are not so significant as to warrant environmental impact assessment by the NT EPA under provisions of the EA Act at the level of a Public Environmental Report or Environmental Impact Statement. The Proposal will require approval under the Petroleum (Environment) Regulations 2016.

Environmental management of the potential environmental impacts is the responsibility of the Proponent through implementation of procedures and management plans specified in the EMP and any conditions imposed by the Minister for Environment under the Petroleum (Environment) Regulations 2016. Environmental management of the potential environmental impacts is the responsibility of the Proponent through implementation of procedures and management plans specified in the EMP and any conditions imposed by the Minister for Environment under the Petroleum (Environment) Regulations 2016.

This decision is made in accordance with clause 8(2) of Environmental Assessment Administrative Procedures 1984, and subject to clause 14A the administrative procedures under the *Environmental Assessment Act 1982* are at an end with respect to the proposed action.

DR PAUL VOGEL AM MAICD

CHAIRPERSON

NORTHERN TERRITORY ENVIRONMENT PROTECTION AUTHORITY

6 JANUARY 2020

Attachment A: Northern Territory Government Advisory bodies consulted on the Notice of Intent

Department	Division
Department of Environment and Natural Resources	Flora and Fauna Water Resources Weeds Environment Bushfires NT Rangelands
Department of Infrastructure, Planning and Logistics	Lands Planning Infrastructure Transport
Department of Primary Industry and Resources	Fisheries Mining Compliance Petroleum Primary Industry
Department of Tourism and Culture	Heritage Tourism NT Arts and Museums Parks and Wildlife
NT Police, Fire and Emergency Services	Business Improvement and Planning
Department of Health	Environmental Health Medical Entomology
Department of Trade, Business and Innovation	Economics and Policy Strategic Policy and Research
Department of Housing and Community Development	Maintenance Planning Housing supply
Power and Water Corporation	
Aboriginal Areas Protection Authority	Technical
Department of the Attorney-General and Justice	Commercial Division NT Worksafe
Land Development Corporation	
Department of the Chief Minister	Economic and Environmental Policy