

## Approval notice and statement of reasons


### *Petroleum (Environment) Regulations 2016 (NT) (Regulations)*

Interest holder	Sweetpea Petroleum Pty Ltd ABN 42 074 750 879
Petroleum interest(s)	Exploration Permit 136 (EP136)
Environment management plan (EMP) title	Well Drilling, Hydraulic Fracture Stimulation and Well Testing NT Exploration Permit (EP) 136 Beetaloo Sub-basin NT
EMP document reference	SWP4-3
Regulated activity	<ul style="list-style-type: none"> <li>Land clearing of up to 1.2 ha to expand existing camp pad</li> <li>Exploration well drilling and completions at up to seven well pads - vertically to a depth no greater than 4,000 metres</li> <li>Hydraulic fracture stimulation (horizontal wells and associated vertical wells), including water storage</li> <li>Production testing and follow up testing, monitoring and work-over activities and management of wastewater</li> <li>The use of the previously installed groundwater bores for monitoring and extraction of groundwater for exploration activities</li> <li>Routine and ongoing maintenance of any infrastructure and or services</li> <li>All activities associated with the plugging, abandonment, decommissioning and/or remediation of wells after testing and monitoring has been completed</li> <li>Any other minor works ancillary to the above-mentioned works.</li> </ul>
Is the EMP a new plan submitted under reg 6 or a revision of a current plan submitted in accordance with reg 18, or regs 15 and 17?	This is a new plan submitted under reg 6
Was the regulated activity referred <sup>1</sup> for consideration whether environmental impact assessment was required?	No
Was environmental impact assessment <sup>2</sup> required?	N/A
Has an environmental approval <sup>3</sup> been issued for the regulated activity?	N/A
Has an Authority Certificate under the <i>Northern Territory Aboriginal Sacred Sites Act 1989</i> been issued for the regulated activity?	Yes Authority Certificates C2020/072 and C2022/036

<sup>1</sup> This means a referral under the *Environment Protection Act 2019* (NT) (EP Act) and/or the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act).

<sup>2</sup> This means a requirement for an environmental impact assessment to be conducted under the EP Act and/or the EPBC Act.

<sup>3</sup> This means an approval granted under the EP Act and/or the EPBC Act.

Date an EMP compliant with reg 8 was first submitted under reg 6	13 May 2022
Date within which the EMP was published for comment under reg 8A, if applicable	23 May to 20 June 2022
Date further information was required and submitted under reg 10, if applicable	24 June 2022 required, 12 July 2022 submitted (SWP4-2) 20 July 2022 required, 22 July 2022 submitted (SWP4-3)
Date of resubmission notice under reg 11(2)(b), if applicable	28 June 2022
Date EMP was resubmitted under reg 11(3), if applicable	12 July 2022
Date a notice setting out a proposed timetable for consideration of the EMP was issued under reg 11(2A), or reg 11(3)(c), if applicable	N/A
Proposed timetable given in notice under reg 11(2A), or reg 11(3)(c), if applicable	N/A
Where provided under s29B of the <i>Northern Territory Environment Protection Authority Act 2012</i> (NT) (NT EPA Act), the dates the Northern Territory Environment Protection Authority (NT EPA) was requested to, and provided, advice on EMP	Date of Minister's request for advice: 25 February 2019 Date of NT EPA Advice: 5 August 2022 NTEPA2022/0067-006~0001
Date of decision	11 / 8 / 2022
Decision maker	 Signature  Hon Lauren Moss MLA, Minister for Environment

## 1 Approval notice

I approve the EMP under reg 11(3)(a)(i).

1. The approval is subject to the following conditions:

**Condition 1:** The interest holder must submit to the Department of Environment, Parks and Water Security (DEPWS), via Onshoregas.DEPWS@nt.gov.au the following:

- i. Notification of the commencement of hydraulic fracturing activities prior to commencement.
- ii. An updated timetable for the regulated activity that is to be provided on the last day of each quarter (being 31 March, 30 June, 30 September and 31 December each year), that:
  - a) identifies activities completed in the current quarter;
  - b) regulated activities planned for the next quarter, including duration;
  - c) activities based on commitments in the EMP relevant to the stage of the activity planned for the next quarter, including duration;
  - d) due dates for satisfaction of Ministerial approval conditions in the next quarter; and



- e) due dates for regulatory reporting in the next quarter.
- iii. During drilling, daily on-site reports, to be consolidated and provided weekly, indicating:
  - a) status and progress of drilling at each location;
  - b) freeboard available in drill cutting pits (in cm); and
  - c) the outcome of general site inspections relevant to drilling and waste, and corrective actions taken.
- iv. During hydraulic fracturing and flowback, weekly reports indicating:
  - a) status and progress of hydraulic fracturing;
  - b) weekly measurement of stored volume (in ML) and freeboard available (in cm) of wastewater storage tanks, unless operated in the wet season, during which it must be measured daily; and
  - c) the outcome of general site inspections relevant to hydraulic fracturing and waste, and corrective actions taken.
- v. During the wet season, weekly reports indicating:
  - a) the outcome of daily inspections of any secondary containment in use, and corrective actions taken;
  - b) any halt to the regulated activity due to wet season conditions; and
  - c) daily measurements of freeboard available in drill cutting pits and wastewater treatment tanks (in cm) whenever operational.
- vi. For avoidance of doubt, if wastewater is present in tanks or drill cutting pits contain waste drill fluids and cuttings, these are considered to be operational. Reports must continue to be provided as per parts (iii), (iv) and (v) above, irrespective of whether there is manned activity occurring on site if the wastewater infrastructure is operational.
- vii. In the event that multiple regulated activities under the EMP are being conducted concurrently, the weekly submission of consolidated daily reports may be further consolidated to a single submission, but must clearly identify the locations and activities to which the information pertains, in relation to each item listed in conditions (iii) to (vi) above, inclusive.

**Condition 2:** The interest holder must provide an annual report to DEPWS, via Onshoregas.DEPWS@nt.gov.au, on its environmental performance, in accordance with item 11(1)(b) in schedule 1 of the Regulations, noting:

- i. The first report must cover the 12 month period from the date of the approval, and be provided within 3 calendar months of the end of the reporting period.
- ii. Each report must align with the template and Guideline prepared by DEPWS for this purpose and be provided each year until such time a notification is made to the Minister under regulation 14 that the activity is complete, or until the EMP is revised and re-approved.

**Condition 3:** In support of clause D.6.2 of the Code of Practice: Onshore Petroleum Activities in the Northern Territory (the Code), an emissions report must be provided by 30 September each year to DEPWS, via Onshoregas.DEPWS@nt.gov.au, which:

- i. documents actual annual greenhouse gas emissions from conduct of the regulated activity estimated and reported under the Commonwealth *National*

*Greenhouse and Energy Reporting Act 2007 (NGER Act) versus predicted emissions in the EMP;*

- ii. demonstrates the actual emissions have been verified by an auditor registered under the Register of Greenhouse and Energy Auditors established under section 75A of the NGER Act;
- iii. includes a summary of all regulated activities conducted which have contributed to greenhouse gas emissions during the reporting period; and
- iv. accounts for differences between actual and predicted emissions with reference to all parts of the regulated activity with potential to create greenhouse gas emissions.

FOOTNOTE: Clause D.6.2(b) of the Code requires annual actual greenhouse gas emissions to be provided even where emissions are below the NGERs threshold of 25 ktCO<sub>2</sub>-e for scope 1 and scope 2 emissions reporting.

**Condition 4:** The interest holder must:

- i. comply with its Greenhouse Gas Abatement Plan prepared by Sweetpea Petroleum Pty Ltd, dated 4 August 2022 as updated annually in accordance with condition (ii) below;
- ii. by 30 September each year, provide an updated Greenhouse Gas Abatement Plan to Onshoregas.DEPWS@nt.gov.au, which meets the Greenhouse Gas Abatement Plan content requirements of the Greenhouse Gas Emissions Management for New and Expanding Large Emitters Policy version 1.1 dated 1 September 2021 and demonstrates:
  - a) the actual scope 1 and scope 2 greenhouse gas emissions produced, compared to the predicted scope 1 and scope 2 greenhouse gas emissions in the EMP;
  - b) the proposed method/s of offsetting residual cumulative scope 1 and scope 2 greenhouse gas emissions across all active EMPs for the preceding financial year;
  - c) any changes to predicted future cumulative scope 1 and scope 2 greenhouse gas emissions across all active EMPs; and
  - d) annual progress towards achieving net zero emissions by 2050; and
- iii. by 30 November each year, provide evidence of offsets obtained during the previous financial year to Onshoregas.DEPWS@nt.gov.au.

**Condition 5:** To support clause C.7.2 of the Code all accidental releases of liquid contaminant or hazardous chemical must be immediately recorded in a site spill register. The spill register and geospatial files specifying the location of the spill must be submitted to DEPWS via Onshoregas.DEPWS@nt.gov.au three months after the 12 month anniversary of the approval of the EMP each year while the EMP is in force. The register must include:

- i. the location, source and volume of the spill or leak;
- ii. the volume of impacted soil removed for appropriate disposal and the depth of any associated excavation;
- iii. the corrective actions taken or proposed to be taken to prevent recurrence of an incident of a similar nature; and
- iv. GPS co-ordinates of the location of the spill.

**Condition 6:** In support of clause B.4.17.2 of the Code, the interest holder must:



- i. undertake quarterly groundwater monitoring at each control and impact monitoring bore for a minimum of three years after establishment, unless otherwise advised by DEPWS;
- ii. provide to DEPWS, via Onshoregas.DEPWS@nt.gov.au, the results of quarterly groundwater monitoring, as soon as practicable and no later than 2 months after collection, in a format to be determined by DEPWS;
- iii. provide to DEPWS, via Onshoregas.DEPWS@nt.gov.au, an interpretative report of groundwater quality based on the groundwater monitoring required to be conducted at the well site(s) in accordance with Table 6 of the Code. The interpretative report must be provided annually within 3 months of the anniversary of the approval date of the EMP and include:
  - a) identification of any change to groundwater quality or level attributable to conduct of the regulated activity at the well site(s) and discussion of the significance and cause of any such observed change;
  - b) interpretation of any statistical outliers observed from baseline measured values for each of the analytes;
  - c) discussion of any trends observed;
  - d) a summary of the results including descriptive statistics; and
  - e) description of the layout of the groundwater monitoring bores and wells, indicative groundwater flow directions and levels in accordance with the Preliminary Guideline Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-basin; and
- iv. develop site-specific performance standards for groundwater quality and interquartile ranges for analytes at each of the impact monitoring bores established, based on the first 3 years of groundwater monitoring, and provide to DEPWS, via Onshoregas.DEPWS@nt.gov.au within 6 months of the 3 year anniversary of approval of the EMP.

**Condition 7:** In support of clause 16 of the *Water Act 1992 (NT)* and clause B.4.2 of the Code, the interest holder must undertake groundwater level/pressure monitoring at each impact monitoring bore established, using a logger to record water level for 2 weeks prior to, during, and 4 weeks after completion of hydraulic fracturing operations at each well pad. Data logging should record at a minimum of every 4 minutes for the duration of the recording period. The logging data should be provided to DEPWS via Onshoregas.DEPWS@nt.gov.au within 2 weeks of completion of groundwater level monitoring in each impact monitoring bore.

**Condition 8:** Within 30 days of each occasion a groundwater bore is installed under this plan, the interest holder must send to Onshoregas.DEPWS@nt.gov.au:

- i. the registered number (RN) of the groundwater bore;
- ii. the name of the associated groundwater aquifer in which the bore is located and from which groundwater will be extracted or monitored;
- iii. whether the purpose of the groundwater bore is for control monitoring, impact monitoring or water supply;
- iv. whether the bore is proposed to be included on a groundwater extraction licence and the proposed total volume (ML) to be extracted per annum; and
- v. the GPS coordinates of the groundwater bore.

**Condition 9:** The interest holder must provide to DEPWS within 6 weeks of completion of well flowback operations at each new exploration well established

under the EMP a report on the risk assessment of flowback wastewater from the hydraulic fracturing phase, via Onshoregas.DEPWS@nt.gov.au. The risk assessment must be:

- i. prepared by a suitably qualified person; and
- ii. prepared in accordance with the monitoring wastewater analytes specified in section C.8 of the Code.

## 2 Material considered

1. The following material has been taken into account in making this decision:
  - a. Well Drilling, Hydraulic Fracture Stimulation and Well Testing NT Exploration Permit (EP) 136 Beetaloo Sub-basin NT EMP (SWP4-3).
  - b. The principles of ecologically sustainable development referenced in reg 5A and the approval criteria set out in reg 9(1).
  - c. The NT EPA advice provided at my request under s29B of the NT EPA Act.
  - d. The Authority Certificates issued under the *Northern Territory Aboriginal Sacred Sites Act 1989*.
  - e. The Code as set out in reg 4A.
  - f. The Department of Industry, Tourism and Trade advice that the Well Operations Management Plan approved for the regulated activity meets the requirements of the Code.
  - g. The Greenhouse Gas Abatement Plan prepared by Sweetpea Petroleum Pty Ltd, version 2 dated 4 August 2022.
  - h. All public comments submitted under reg 8B.

## 3 Statement of reasons

1. The EMP meets the approval criterion in reg 9(1)(a), because it contains all the information required by Schedule 1 of the Regulations. reg 9(1)(a)
2. I have taken into account the approval criterion in reg 9(1)(b) by noting the nature and scale of the regulated activity and bearing it in mind during my consideration of the impacts and risks. In particular, I note that: reg 9(1)(b)
  - a. The nature of the regulated activity is as follows:
    - i. Land clearing of up to 1.2 ha to expand existing camp pad.
    - ii. Exploration well drilling and completions at up to seven well pads - vertically to a depth no greater than 4,000 metres.
    - iii. Hydraulic fracture stimulation (horizontal wells and associated vertical wells), including water storage.
    - iv. Production testing and follow up testing, monitoring and work-over activities and management of wastewater.
    - v. The use of the previously installed water bores for monitoring and extraction of water for hydraulic fracturing.
    - vi. Routine and ongoing maintenance of any infrastructure and or services.



- vii. All activities associated with the plugging, abandonment, decommissioning and/or remediation of wells after testing and monitoring has been completed.
- viii. Any other minor works ancillary to the above-mentioned works.
- b. The scale of the regulated activity is as follows:
  - i. A total of 1.2 ha of vegetation may be cleared for the purpose of expanding the camp pad.
  - ii. The estimated groundwater usage is 897 ML across seven wells over 3-4 years.
  - iii. Peak traffic movements for all regulated activities is 40-50 per day; truck load-out for wastewater transport is 5-15 per well.
  - iv. Operational workforce will be 60 during drilling and HF activities, and six during well testing.
  - v. Generation of approximately 728,399 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-e) over a four financial years. Diesel combustion will contribute 2093 tCO<sub>2</sub>-e from hydraulic fracturing and completions, 9485 tCO<sub>2</sub>-e from vertical and horizontal drilling, 524 tCO<sub>2</sub>-e from transport on-site, 996 tCO<sub>2</sub>-e from camp operations and 13 tCO<sub>2</sub>-e for civil construction activity to expand the camp. Fugitive emissions from drill cuttings, venting and wastewater storage will produce 20,304 tCO<sub>2</sub>-e.
  - vi. The bulk of the predicted emissions are generated during flaring (416,998 - 694,997 tCO<sub>2</sub>-e). The flaring emissions in the EMP were based on 2 extended production tests (EPTs) up to 300 days, 2 EPTs up to 90 days and 3 EPTs up to 60 days.
  - vii. Rehabilitation will be completed within 12 months of completion of petroleum activities.
- 3. The approval criteria in reg 9(1)(c) requires that I be satisfied 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 both: (i) as low as reasonably practicable; and (ii) acceptable. In assessing whether the EMP meets the approval criteria, I note that my decision is a prescribed decision (under reg 5A) for s 6A of the *Petroleum Act 1984*, and as such requires me to consider and apply the principles of ecologically sustainable development. In accordance with reg 12(3), I provide the following information about how the EMP meets the approval criteria, and the manner in which I have taken into account the principles of ecologically sustainable development when considering whether or not the plan meets the approval criteria. reg 9(1)(c)
- 4. The principles of ecologically sustainable development are defined at sections 18-24 of the *Environment Protection Act 2019*, and I address each in turn:
  - a. The decision-making principle (s 18 *Environment Protection Act 2019*) requires effective integration of long-term and short-term environmental and equitable considerations, and for processes to provide for community involvement in relation to decisions and actions that affect the community. Related to this, I note the following:
    - i. The regulated activity is low impact and of short duration and forms one component of a broader onshore petroleum exploration program in the region. The regulated activity will inform decision-making about longer-term petroleum activities.
    - ii. Public consultation on the EMP was required under the Regulations, as the EMP proposes drilling and hydraulic fracturing activities. The EMP was made

available for public comment for 28 days from 23 May 2022 to 20 June 2022.

- iii. The Department received six public submissions, all of which were unique. The submissions received did not identify new issues that have not already been addressed in this or previously approved EMPs, or the Scientific Inquiry into Hydraulic Fracturing in the NT (HFI). The NTG agencies and NT EPA Onshore Gas Committee comments were addressed by the interest holder via an updated EMP.
- iv. I note the issues raised in public submissions across the following broad environmental themes:

Theme	Overview of issue raised
Chemicals	<ul style="list-style-type: none"> <li>Toxic chemicals proposed to be used by the project were not properly analysed</li> </ul>
Climate change	<ul style="list-style-type: none"> <li>A Greenhouse Gas Abatement Plan (GGAP) was not included with the EMP</li> </ul>
Flora and fauna (environment)	<ul style="list-style-type: none"> <li>Contaminated aquifers causing impacts to stygofauna</li> <li>Desktop review underestimated the impact to threatened fauna</li> <li>Risks to fauna from open treatment tanks/pits not properly addressed</li> <li>Lack of site-specific surveys at locations of proposed regulated activities</li> <li>The rehabilitation plan is over-reliant on natural revegetation</li> </ul>
Regulation and compliance	<ul style="list-style-type: none"> <li>Cumulative impacts not considered from other exploration activities in the region</li> <li>Not all activities in the EMP are covered by the current AAPA certificate</li> </ul>
Social and cultural	<ul style="list-style-type: none"> <li>Lack of stakeholder engagement with Traditional Owners</li> <li>The EMP did not include an assessment of the economic and social impacts of the pastoral activities</li> </ul>
Waste	<ul style="list-style-type: none"> <li>Well casing corrosion from sulphate reducing bacteria</li> <li>The environmental impact and water usage cannot be managed due to the EMP not specifying the number of stages for each well</li> <li>Concentration of chemicals and radioactivity in wastewater</li> </ul>
Water	<ul style="list-style-type: none"> <li>The interest holder did not hold a valid water extraction licence to source water from existing bore</li> </ul>

- v. The specific issues of concern raised in public submissions have been addressed in the NT EPA Advice which I have considered. I recognise the importance the community places overall, on assessment of cumulative impacts, environmental protection and ensuring decisions are based on the principles of ecologically sustainable development. I have taken into account any public submissions in making my decision. The EMP appropriately identifies the risk and potential impacts from the regulated activity and commits to mitigation, management and monitoring measures to address these risks and potential impacts.
- vi. I am satisfied that the community has had a reasonable opportunity to be involved in processes in relation to this decision.



- vii. Next, I have considered short-term and long-term environmental impacts of carrying out the regulated activity. Environmental impacts include direct and indirect effects on the physical, biological, economic, cultural and social aspects of the environment, and may include cumulative impacts or occur over time.
  - viii. The information before me suggests short-term environmental impacts are manageable with the proposed mitigations in place.
  - ix. The information before me suggests long-term environmental impacts are negligible.
  - x. There is no particular contest between economic, social and environmental considerations that requires further mention.
  - xi. Taking an integrated view of long-term and short-term environmental and equitable considerations, I am satisfied that the considerations on balance and taken together support approval of the EMP.
- b. The precautionary principle (s 19 *Environment Protection Act 2019*) applies when there are threats of serious or irreversible environmental damage, and requires that lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. I am satisfied that the regulated activity does not pose a threat of serious or irreversible environmental damage. While conduct of the regulated activity will likely result in minor and short-term impacts, I am satisfied the measures identified by the interest holder are effective to prevent a threat of serious or irreversible environmental damage.
- i. I have carefully evaluated the proposed precautionary measures against the risk-weighted consequences of impacts given the options available, and with a view to avoiding serious or irreversible damage to the environment wherever practicable. The EMP combined with the conditions I have imposed mitigates risks of serious or irreversible damage due to lack of full scientific certainty to a level that is both as low as reasonably practicable and acceptable.
- c. The principle of evidence-based decision-making (s 20 *Environment Protection Act 2019*) requires decisions to be made on the best available evidence in the circumstances that is relevant and reliable. I am of the view that the evidence before me satisfies this requirement for the following reasons: I am satisfied that the best available evidence has been obtained because:
- i. The EMP was developed by engineers, an archaeologist and environmental consultants, with experience in the Beetaloo Sub-basin.
  - ii. The interest holder employed a comprehensive process to obtain relevant information including baseline assessments, archaeological assessments, stakeholder engagement and consultation with relevant NT Government agencies.
  - iii. The EMP was made available for public comment to identify any deficiencies or additional evidence required from 23 May to 20 June 2022.
  - iv. The EMP has undergone review and assessment by a multi-disciplinary team in DEPWS and NT Government agencies, with experience in environmental science, engineering, and risk management options for the regulated activity which has informed my decision on the EMP.
  - v. The interest holder has amended the EMP to address areas of uncertainty or requiring clarification.

- vi. Public submissions raised a range of concerns regarding the proposed regulated activity which I must consider under the principle of evidence-based decision-making. I now turn to consideration of these concerns:
- (1) Some submissions raised concern about contamination of aquifers impacting the biodiversity of stygofauna. Hydraulic fracturing does not interact with groundwater and is unlikely to have an impact on stygofauna. Interest holders are required to use only drilling fluids that are non-toxic while drilling through aquifers, in order to avoid impacts to groundwater. The potential impact on groundwater dependent ecosystems in general is negligible, given the depth to groundwater in the location of the regulated activity (> 2000 m) is greater than 20 m, the typical depth at which terrestrial groundwater dependent ecosystems are found.
  - (2) There was a concern that the low risk attributed of the regulated activity to threatened fauna in the EMP was not justified by the desktop review conducted by the interest holder. The DEPWS Flora and Fauna Division were satisfied that the risks to threatened species and biodiversity are low and the EMP contained sufficient measures to reduce the risks to levels that are 'as low as reasonably practicable' (ALARP). This assessment was based on a search of DEPWS flora and fauna databases (using a 50km buffer), environmental descriptions in the EMP and expert knowledge of species' habitat requirements.
  - (3) There was a concern that the risks to fauna from open treatment tanks and evaporation pits had not been properly assessed. In compliance with the Code, the interest holder has provided control measures in the Wastewater Management Plan (WWMP) included in the EMP to be implemented to prevent interactions of wildlife and stock with wastewater. These controls include:
    - fencing open treatment tanks to prevent fauna access
    - installing escape routes/fauna ladders in pits and tanks as a contingency measure to assist egress of any large or small wildlife.

In addition, open treatment tanks have tall, vertical wells which will limit access by amphibians.

The effectiveness of the proposed controls will be determined by the interest holder conducting:

- General observations recorded of bird and other fauna around wastewater storages.
  - Daily checks of open treatment tanks and pits for fauna mortality
  - Weekly checks of fauna mortality around lease pad (~50 m).
  - Identifying fauna remains during tank and pit emptying or decommissioning.
  - When fauna mortality is triggered further mitigation measures may be required including installation of small fauna-proof barrier, reflective flicker-tape or netting over open treatment tanks and pits.
- (4) A concern was raised that no site-specific assessment has occurred at each regulated activity location and the existing assessment relies on aerial imagery. The EMP summarises the outcomes of the environmental assessment conducted by the interest holder. An aerial survey was



conducted of the project area along the seismic buffer and lease pad locations. On-ground (site-specific) surveys were conducted at the locations around the lease pads.

- (5) A concern was raised that the revegetation plan in the EMP is over-reliant on natural revegetation. The revegetation plan states that disturbed areas will be ripped and scarified to promote natural revegetation. In addition, the plan states that native seed will be used to assist in revegetation where applicable.
- (6) Some concern was raised about the lack of stakeholder engagement with Traditional Owners. The interest holder conducted stakeholder engagement with Traditional Owners through the Northern Land Council (NLC) in accordance with:
  - section 41(6) of the *Aboriginal Land Rights (Northern Territory) Act 1976*, when supplying information to Native Title holders for the purposes of negotiating an onshore gas exploration agreement
  - regulation 7 of the Regulations, during the preparation of an EMP, which outlines the minimum requirements that an interest holder must meet when undertaking stakeholder engagement
  - regulation 9 of the Regulations during the preparation of an EMP, which requires the proponent to include an Authority Certificate in accordance with section 3 of the *Northern Territory Aboriginal Sacred Sites Act 1984* (NT).

The interest holder has engaged with the Traditional Owners, NLC, and the Aboriginal Areas Protection Authority (AAPA) as part of their stakeholder engagement. They also hold AAPA Authority Certificates that cover the proposed regulated activities. The EMP includes a stakeholder engagement report, which makes clear that there are processes to ensure there is no risk or impact to sacred sites and cultural heritage as a result of the proposed work.

- (7) Concern was raised that the EMP did not include an assessment of the economic and social impacts of the pastoral activities occurring on the Tanumbirini and Beetaloo stations. The scope of an EMP is to assess the environmental impact of a regulated activity, not the economic and social impacts.
- (8) Concern was raised that a Greenhouse Gas Abatement Plan (GGAP) was not submitted for assessment with the EMP. Feedback on the EMP included a requirement for a GGAP to be provided, which has been achieved. The Minister will consider the commitments made in the GGAP when making a decision on an EMP.
- (9) A concern was raised that Sweetpea did not have a valid groundwater extraction licence and therefore could not extract water from an existing bore (RN037655). On 23 June 2021, a groundwater extraction licence (GRF10346) was granted to Sweetpea to extract water from bores RN037655 and RN039070, and future installed water monitoring bores. The licence was amended on 15 July 2022 to reflect groundwater extraction from RN042730 approved by DEPWS on June 23 2021 and expires on 31 December 2024.
- (10) A concern was raised that seismic activity could cause saline contaminated groundwater to enter the shallower aquifers. According to the HFI, seismic surveys demonstrate that most of the Beetaloo Sub-

basin contains relatively little internal faulting. The Inquiry also assessed the potential for migration of hydraulic stimulation fluids due to fracture outgrowth out of the production zone and through fractures intersection the geological features such as a permeable faults or pre-existing natural features and found the following:

- The likelihood of fractures growing out of the shale rock region for distances of 1,000 to 3,000 m is extremely low. For example, the majority of fractures in the Marcellus shale basin were found to have heights of less than 100 m, although fracture lengths up to approximately 600 m have been recorded.
- The location of faults is taken into consideration during the design and construction of each well and the gas companies actively avoid faults because their occurrence can seriously compromise the effectiveness of the hydraulic fracturing operation, as well as being a potential environmental risk.

This was the case for the Origin Amungee NW-1H well, where a section of the horizontal bore was not fractured because of the inferred existence of a small fault system.

In relation to management of long chain hydrocarbons and gases, CSIRO reviewed the well barrier and well integrity failure rates reported in the open literature during the Inquiry. The review noted that many studies of well integrity do not make the distinction between failures of individual barriers and well integrity failures, a distinction that is critical because a full integrity failure (that is, the failure of multiple barriers) is required in order to provide a pathway for any contamination of the environment.

The CSIRO, largely using data sets from the US, found that the rate of well integrity failures that have the potential to cause environmental contamination is in the order of 0.1%, with several studies finding no well integrity failures, while the rate for a single well barrier failure was in the order of 1–10%.

In accordance with the Code, all onshore shale gas wells (including exploration wells constructed for the purposes of production testing) be constructed to meet international standards, with cementing extending up to at least the shallowest problematic hydrocarbon-bearing, organic carbon rich or saline aquifer zone.

- (11) Concern was raised about sulphate reducing bacteria causing corrosion of well casing. The Code provides specific detail on mandatory corrosion considerations through the well life cycle including for well design, construction, monitoring and maintenance and well decommissioning. Petroleum wells are designed with multiple barriers, so that a single barrier failure will not lead to a loss of containment. Complete well integrity failure where all well barriers fail is an extremely rare occurrence in contemporary petroleum wells including shale wells.
- (12) Concern was expressed that the environmental impact and water usage cannot be managed due to the EMP not specifying the number of stages for each well. The EMP provides information on the approximate number of stages per well, along with the estimated water and flowback fluid usage per stage. The interest holder has committed to monitor the properties of flowback fluid, and reports will be submitted as required under the Code.



- (13) Concerns have been raised about the concentrations of chemicals and the radioactivity in the wastewater, especially after evaporation. The interest holder is required to undertake a risk assessment within 6 weeks after completion of well flowback. The results of this assessment will indicate the potential risks associated with chemical concentration and radioactivity in the wastewater.
  - (14) Concern was raised about cumulative impacts not being considered from other exploration activities in the region. The Regulations do not preclude an interest holder submitting separate EMP for each activity. Each EMP is assessed on its merits and compliance with the Code in accordance with the Regulations. Cumulative impacts from GHG emissions, water use, flora and fauna, traffic and community have been included in the EMP.
  - (15) Concern was raised that the current AAPA certificate (AC2020/072) does not cover all the regulated activities in the EMP, in particular a creek crossing within a Restricted Work Area and water extraction for hydraulic fracturing. These activities will not be undertaken by the interest holder unless covered under an appropriate AAPA certificate.
  - (16) Some of the submissions raised concern about the toxicity of hydraulic fracturing chemicals and the adequacy of the chemical risk assessment and description of chemicals. The volume and concentration of chemicals proposed to be used in hydraulic fracturing have been identified and a detailed chemical risk assessment (Appendix C) has been undertaken. The assessment included the full life cycle of chemical use (transportation, use and storage) and concluded potential risk of exposure to human and ecological receptors has been eliminated or reduced to as low as reasonably practicable.
- vii. I believe the information regarding the proposed regulated activity adequately provides the best available evidence in the circumstances that is relevant and reliable to the evidence-based decision-making process.
- d. The principle of intergenerational and intra-generational equity (s 21 *Environment Protection Act 2019*) requires that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of present and future generations. I have given consideration to the impact on present and future generations as follows:
- i. This criterion requires me to turn my mind to whether the benefits of the proposal disproportionately burden present or future generations, or particular groups or communities of present or future generations.
  - ii. I have considered the use of groundwater and am satisfied that the proposed use will not result in either short-term or long-term impacts to other groundwater users.
  - iii. I have considered the protection of cultural heritage and am satisfied that conduct of the regulated activity will not impact on preservation of cultural heritage for the benefit of future generations.
  - iv. I have considered the potential benefit for future generations from increased economic activity in the region and am satisfied that exploration is a necessary precursor for future economic gains that may be achieved through a viable onshore petroleum industry.
  - v. I have considered whether the health, diversity and productivity of the environment is maintained or enhanced for the benefit of each of these

relevant groups and conclude that on balance, the health, diversity, and productivity of the environment is not reduced by the regulated activity for each identified group or community.

- vi. The environmental burdens of the regulated activity will not disproportionately affect particular stakeholders.
  - vii. I have considered the effect of greenhouse gas emissions and note that the contribution from this activity is negligible in an NT context. I consider that cumulative emissions are not significant when considered in context of 2019 NT and Australian emissions, which were approximately 20 million tonnes and 519 million tonnes respectively. Sweetpea's total cumulative GHG emissions (across 3 EMPs) over the 2022-2026 period are estimated to be approximately 748,685 tCO<sub>2</sub>-e (between 96,242 and 217,611 tCO<sub>2</sub>-e per annum). The potential emissions of all of Sweetpea's activities in the NT for this EMP represent between 0.47% and 1.06% of the total GHG emissions for 2019 or 0.019% to 0.043% of Australia's total emissions, if emissions are not offset.
  - viii. I also note the interest holder commitment for greenhouse gas emissions offsets in their GGAP are consistent with the principles endorsed by the NT EPA:
    - (1) offsetting should apply to the whole of a project
    - (2) offsetting should apply to exploration phase activities as well as production activities
    - (3) offsetting should adopt a pro-rata approach that links the level of residual emissions to be offset to the net zero by 2050 target
    - (4) offsets should apply for Scope 1 and Scope 2 emissions; and
    - (5) offsets should relate to actual emissions, not forecast emissions in an EMP.
  - ix. Cultural values relating to sacred sites will be protected through the application of Authority Certificates issued to the interest holder under the *Northern Territory Aboriginal Sacred Sites Act 1989* and measures for reporting on discovery of archaeological sites during civil maintenance activities.
  - x. Accordingly I do not believe that the carrying out of the regulated activity in accordance with the EMP would have an effect contrary to the principle of inter or intra-generational equity.
- e. The principle of sustainable use (s 22 *Environment Protection Act 2019*) requires that natural resources should be used in a manner that is sustainable, prudent, rational, wise and appropriate. In applying this principle, I have considered the following:
- i. I note the findings of the HFI that states: "... in the short to medium term, the Australian National Energy Market is likely to require higher levels of flexible, gas-fired generation, which can provide a reliable, low emissions substitute for ageing coal-fired generation, and essential security services to complement variable renewable electricity generation."<sup>4</sup>
  - ii. I note the NT Government's commitment to implementing all the recommendations of the HFI, including working with the Australian

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<sup>4</sup> Refer section 9.7.4 of the *Scientific Inquiry into Hydraulic Fracturing in the Northern Territory*; p 233. Available at: <https://frackinginquiry.nt.gov.au/inquiry-reports?a=494286>



government to seek to ensure that there is no net increase in lifecycle greenhouse gas emitted in Australia from any onshore petroleum produced in the NT.

- iii. I note the EMP has addressed the cumulative impact associated with current and future groundwater takes – addressed in the Water Extraction Licence (WEL) GRF 10346 Statement of Decision, which was assessed to be well within the sustainable yield of the Gum Ridge Formation (1,412,800 to 2,825,600 GL).
  - iv. Accordingly, I am satisfied that the concept of sustainable use of natural resources has been taken into account.
- f. The principle of biological diversity and ecological integrity (s 23 *Environment Protection Act 2019*) requires that biological diversity and ecological integrity should be conserved and maintained. I have applied this principle as follows:
  - i. I believe the information I have regarding the existing biodiversity and ecosystems that are to be affected by the regulated activity; the effects that are likely; and the mitigation measures reasonably available, is sufficient.
  - ii. The EMP identifies 21 fauna species listed as threatened under the EPBC Act and/or the *Territory Parks and Wildlife Conservation Act 1976* (TPWC Act). An assessment of the likelihood of occurrence identified five species as 'possibly' occurring within the regulated activity area and are known to occur in the wider landscape of EP136: Gouldian finch *Erythrura gouldiae* (Endangered EPBC Act, Vulnerable TPWC Act); grey falcon *Falco hypoleucos* (Vulnerable TPWC Act); crested shrike-tit (northern) *Falcunculus frontatus whitei* (Vulnerable EPBC Act, Near Threatened TPWC Act); painted honeyeater *Grantiella picta* (Vulnerable EPBC Act, Vulnerable TPWC Act) and yellow-spotted monitor *Varanus panoptes* (Vulnerable TPWC Act).
  - iii. The Department's Flora and Fauna Division is satisfied that the regulated activity does not pose a significant risk to threatened species, important habitats or significant vegetation types. Further, the mitigation controls identified in the EMP are adequate to reduce risks associated with potential impacts on biodiversity, such as noise, vehicle strike, dust, erosion and spills to be as low as reasonably practicable.
  - iv. The EMP outlines measures to minimise impacts on environmental values, including the management of threatening processes such as weeds and fire. Where relevant, management measures are consistent with the requirements of the Code, the NT Land Clearing Guidelines and the Weed Management Planning Guideline: Onshore Petroleum Projects. Specific precautions to ensure interaction with wildlife is avoided are included in the EMP, including inspections for fauna presence, fauna ladders on storage tanks, fencing around well pads, use of speed limits on access roads, above ground tanks with raised walls, and daily checks of infrastructure. The conservation of biological diversity and ecological integrity is vital to the achievement of ecologically sustainable development. Given the fundamental nature of this consideration, I have given central importance to the conservation of biodiversity and ecological integrity in weighing whether I am satisfied the approval criterion in reg 9(1)(c) has been met.
  - v. It is often the case that the conservation of biological diversity and ecological integrity is vital to the achievement of ecologically sustainable development. By their nature, ecosystems are complex and interdependent; this needs to be considered in relation to what preserves their integrity. Biological diversity also represents a wealth of potential natural resources that may provide

options for present and future generations. I have born this in mind when considering the weight to be given to the evidence before me regarding the potential impacts of the regulated activity on biodiversity and ecological integrity.

- vi. The measures to conserve and maintain biological diversity and ecological integrity in the EMP are appropriate, given the nature and scale of the regulated activity.
- vii. If carried out in accordance with the EMP, the risks of the regulated activity to the conservation of biological diversity and ecological integrity are considered to be mitigated to an acceptable level.
- g. The principle of improved valuation, pricing and incentive mechanisms (s 24 *Environment Protection Act 2019*) requires that environmental factors should be included in the valuation of assets and services, through application of the 'polluter pays' principles, consideration of full life cycle costs of providing goods and services, and pursuing environmental goals in the most cost-effective way. I have applied the principle as follows:
  - i. The pollution and waste that will be generated by the regulated activity in the general course of its operation includes domestic waste, drilling waste, and waste from hydraulic fracturing and emissions.
  - ii. I am satisfied that both hazardous and non-hazardous waste will be disposed of in accordance with the requirements of the *Waste Management and Pollution Control Act 1998* and the *Radiation Protection Act 2004* by the interest holder at its own cost, as outlined in the Wastewater Management Plan (Appendix F).
  - iii. In relation to the risks of a pollution event that may occur unintentionally during the operations of the regulated activity, I consider that the following measures are in place to ensure the interest holder bears the costs of containment, avoidance, and abatement. This includes:
    - (1) impacts and risks associated with contamination of soil, surface water and groundwater, which are managed through meeting mandated requirements for well integrity and clean-up of spills and leaks and remediation of impacted soil
    - (2) impacts and risks associated with loss of containment of wastewater, which are managed through containment measures.
  - iv. In relation to full life cycle costs, it is expected that the regulated activity will have a life cycle of five years, and at the end of this cycle the interest holder will take action to remove any residual pollution and waste as detailed by the EMP.
  - v. In addition, the interest holder is required to provide an environmental security sufficient to allow third party intervention for rehabilitation and remediation should it be required, ensuring the interest holder bears the costs of pollution.
  - vi. The Spill Management Plan (Appendix G) includes commitments to immediately remediate spills and leaks, so as to reduce the risk of long-term contamination of the environment and avoid environmental impact legacies.
  - vii. With these measures are in place, I am satisfied that the EMP ensures that environmental costs are not left as externalities to be paid for by Territory taxpayers or the local community. They will be fairly paid for by those who stand to benefit from the regulated activity, such as the interest holder, and



consumers who choose to purchase the interest holder's products. To the extent there are some costs to the Territory, I am satisfied that this is appropriate given the broader economic benefits.

- viii. In relation to options to pursue environmental goals in relation to the regulated activity, I have taken into account that these goals should be pursued in the most cost-effective way.
- ix. I believe approval of the EMP with the conditions I have imposed is consistent with the principle of improved valuation, pricing and incentive mechanisms.
- h. The NT EPA did not require the EMP to be referred under the EP Act, as the regulated activity does not have the potential to cause a significant impact on the environment. reg 9(3)
- x. The NT EPA reviewed the EMP for the regulated activity against the approval criteria in regulations 9(3)(a) and 9(3)(c) of the Regulations and other matters the NT EPA considered relevant, and has provided advice about the EMP.
- i. The NT EPA has provided the following in relation to the regulated activity and the EMP:
  - i. In accordance with my request under s 29B of the NT EPA Act, the NT EPA reviewed the EMP against the approval criteria in regulation 9(1) of the Regulations and other matters the NT EPA considered relevant, and has provided advice about the EMP. Relevantly:
    - (1) The NT EPA recommended that should the EMP be approved, it be subject to 8 conditions. The NT EPA's recommendations have informed the conditions of this approval. All conditions are outlined in section 1 (2) of this Approval Notice.
    - (2) The NT EPA concluded that the EMP for the regulated activity, subject to the recommended approval conditions, is appropriate for the nature and scale of the regulated activity and demonstrates that the regulated activity can be carried out in a manner that environmental impacts and environmental risks of the activity will be reduced to a level that is as low as reasonably practical and acceptable.
  - ii. I have considered the NT EPA's advice and recommendations and these have been incorporated where relevant into this statement of reasons and the conditions in the Approval Notice.
- j. The existing environment along with its particular values and sensitivities is appropriately identified in section 4 of the EMP, and to the extent I do not agree or there is some uncertainty, I have imposed conditions to address the relevant risk or risks. reg 9(1)(c)
- k. I agree with the risk assessment set out in section 7 and Appendix A of the EMP, and to the extent I do not agree I have imposed a condition or conditions to address the relevant risk or risks.
- l. The interest holder's risk assessment is applicable to activities in all seasons and the outcomes are reflected in the EMP that includes, for example; an erosion and sediment control plan (Appendix B); chemical risk assessment (Appendix C); stakeholder engagement (Appendix D); methane emission plan (Appendix E); wastewater management plan (Appendix F); spill prevention and response plan (Appendix G); weed management plan (Appendix H); bushfire management plan (Appendix I); and emergency response plan (Appendix K). The EMP also includes the required elements for the ongoing management of erosion and sediments.

This is consistent with the requirements of the Code that allows for the regulated activity to occur in the wet season months when contingency planning is provided and minimum freeboard in wastewater infrastructure is maintained.

- m. The anticipated environmental impacts are appropriately identified in section 7 and Appendix A of the EMP. The regulated activities are a continuation of current activities and cumulative effects have been identified and assessed. In EMPs for subsequent stages (if they proceed) the interest holder will need to continue to address cumulative effects.
- n. The EMP demonstrates how the interest holder will comply with relevant requirements of the Code in undertaking these regulated activities. This includes reference to applicable Australian and international standards that have been adopted for regulated activity, as applicable. The EMP cross references relevant sections of the Code that apply to the mitigation and management measures to enable the reviewer to identify and confirm that the proposed activities comply with the Code, as applicable. The EMP provides water management commitments and management plans that meet the requirements of the Code.
- o. I am satisfied that the interest holder has conducted ongoing stakeholder engagement in accordance with the Regulations. The EMP provides details of stakeholder engagement that meets Regulation 7 and Schedule 1, Clause 9 of the Regulations (Section 5 and Appendix D). Stakeholder engagement records (Appendix D) demonstrate that stakeholders did not raise objections about environmental impacts of the proposed activity that required specific changes from the interest holder. The EMP provides details of written feedback and input from stakeholders as part of the stakeholder engagement records. The risk assessment in the EMP details the potential environmental impacts of the activity and proposed environmental outcomes to manage impacts on social and cultural surroundings.
- p. I recognise the importance the community places on the protection of water, human health management of chemicals and waste, stakeholder engagement, social impacts and regulation and compliance. The EMP appropriately identifies the risks and potential impacts from the regulated activity and commits to mitigation and management measures to address these risks and potential impacts.
- q. There are no environmental impacts or environmental risks relating to the proposed regulated activity that I consider to be unacceptable.
- r. Overall, having regard to the above, I am satisfied that the EMP is appropriate for the nature and scale of the activity, and demonstrates that the regulated activity is to be carried out in manner by which the environmental impacts and environmental risks are reduced to a level that is:
  - iii. as low as reasonably practicable; and
  - iv. acceptable.