Appendix J.1.2 NLC Stakeholder Engagement

Appendix J.1.2 01 231026 Tamboran November NTH Work Program Presentation

From: Matt Kernke
To: [redacted]
Cc: Tamboran Contact; Emily Beresford-Cane
Subject: Tamboran work program presentation material
Date: Thursday, 26 October 2023 3:48:34 PM
Attachments: Tamboran November NTH Work Program Presentation 261023.pdf
image001.png

Hi [redacted],

As discussed, please find attached a copy of Tamboran Presentation material for next weeks work program meeting with Native Title holders. We will also be talking to our general story boards during the meeting- you would have seen these previously.

Please let me know if you have any issues or concerns- happy to discuss and make the relevant changes as appropriate.

Kind Regards
Matt

Matt Kernke
Environment and Approvals Manager
tamboran
RESOURCES

M: [redacted]

tamboran
RESOURCES

Draft NLC-Tamboran Beetaloo Joint Venture Project Work Program Meeting

November 2023

Confidential



AMUNGEE NW2H PAD, NORTHERN TERRITORY AUSTRALIA

Agenda

1. About Tamboran
2. Beetaloo exploration
3. [redacted]
4. 2023 work completed/underway
5. Proposed 2024 work program
6. Appraisal gas sale
7. [redacted]
8. Approvals
9. Community projects
10. Near term opportunities
11. Water monitoring update
12. Next steps and Questions

About Tamboran

Introducing Tamboran

We are a publicly listed Australian company with our headquarters in Sydney and staff across Australia and the USA. We are committed to creating value for our shareholders, communities, Territorians and Australians by appraising and developing the gas resources of the Beetaloo Basin. We strive to follow and exceed the example set by Origin in community engagement since 2014 and will continue to focus on economic, development and employment opportunities for Native Title Holders and local communities.

Our Vision

To play a role in the global energy transition by investing in the development of low CO2 unconventional natural gas resources in the Beetaloo Sub-basin of the Northern Territory of Australia and to become a Net Zero carbon emissions gas producer for our equity share of Scope 1 and Scope 2 emissions when the Company achieves commercial gas sales.

Strategy

- Target is to become a Net Zero equity Scope 1 & 2 emissions producer
- Focused, high growth Beetaloo strategy
- High quality assets with significant scale
- Low-cost development targeting multiple markets, premium pricing
- Expertise in unconventional E&P development

Sustainability

- Health & Safety
- Climate Change
- Environment
- People
- Community
- Economic Sustainability



Beetaloo Exploration Project

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Tamboran Resources, together with joint venture partners Daly Waters Energy and Falcon Oil and Gas, is exploring for gas in the Northern Territory's Beetaloo Basin.

The Resource Potential

Our exploration project in the Beetaloo Basin is a multiyear, shale gas project that started in mid-2014. So far, the Beetaloo Joint Venture (previously led by Origin) has drilled seven wells. All within regulations and with the consent of the pastoralists and Native Title holders.

We plan to drill bring a new drilling rig in to Australia this year (2023), which will be used to drill between 2-6 wells for the next 2-3 years.

We think there's a very large gas resource underneath the ground with outstanding potential. Today our project has as much as 61 trillion cubic feet of gas, with 6.6 trillion cubic feet of that already recognised as a contingent resource*. Just how big is this? The Inpex project is 12 trillion cubic feet and the Mereenie gas fields have produced around 240 billion cubic feet since the mid 1980's.

* Amungee well estimate









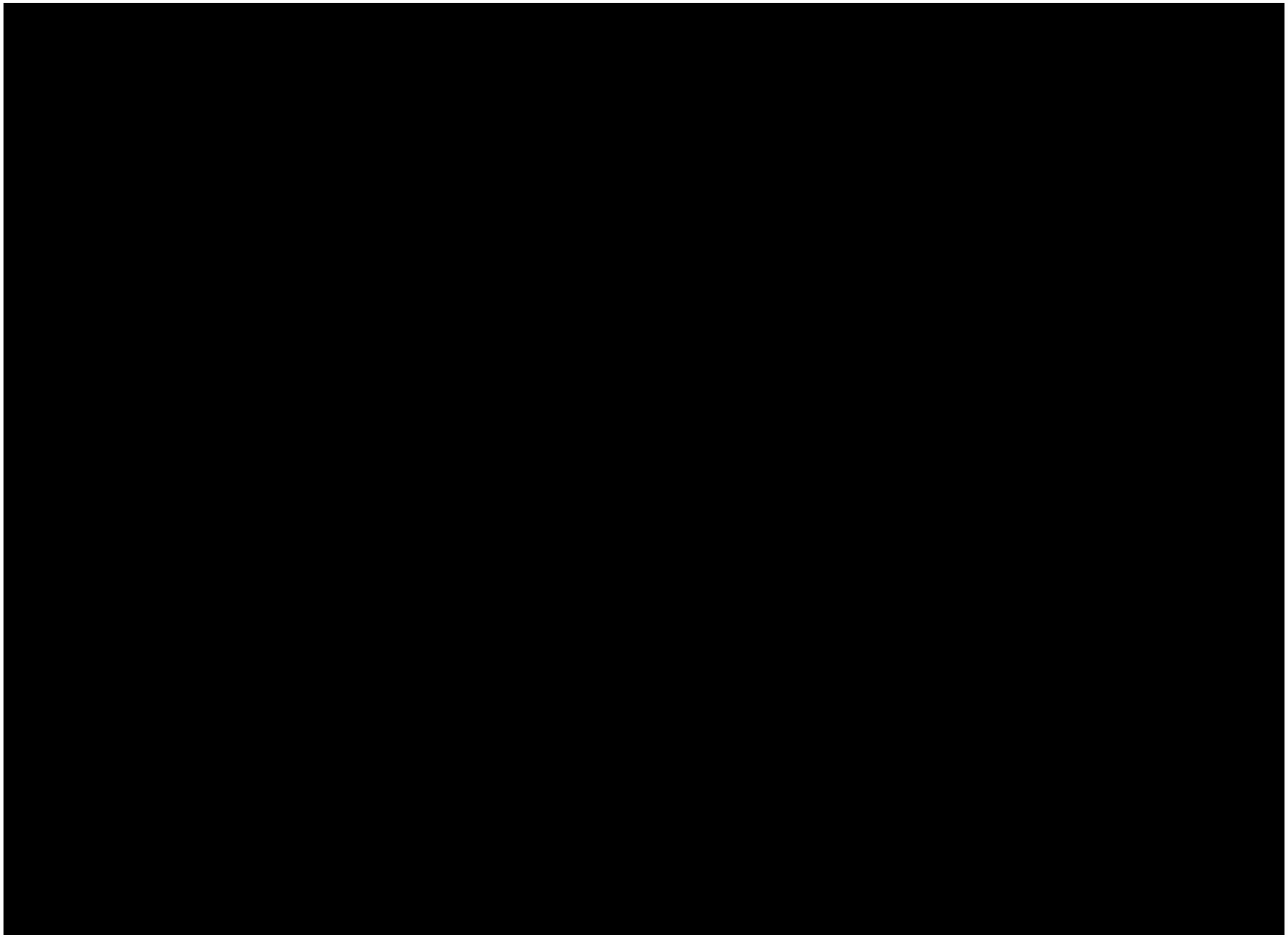




The Benefits

If successful, and development goes ahead, the project means:

- more work for and jobs with local companies, including Aboriginal companies
- the opportunity to supply goods and services to the project
- financial payment for host pastoralists and Native Title holders
- taxes and royalties – providing government with more money that can go to improving community services, infrastructure and telecommunications
- energy security (delivering gas to the Eastern Australia)



Operations update – 2023 program summary

Amungee NW 2H well testing completed

- Well achieved gas breakthrough- with skin believed to have reduced production rates

H&P rig mobilised to site

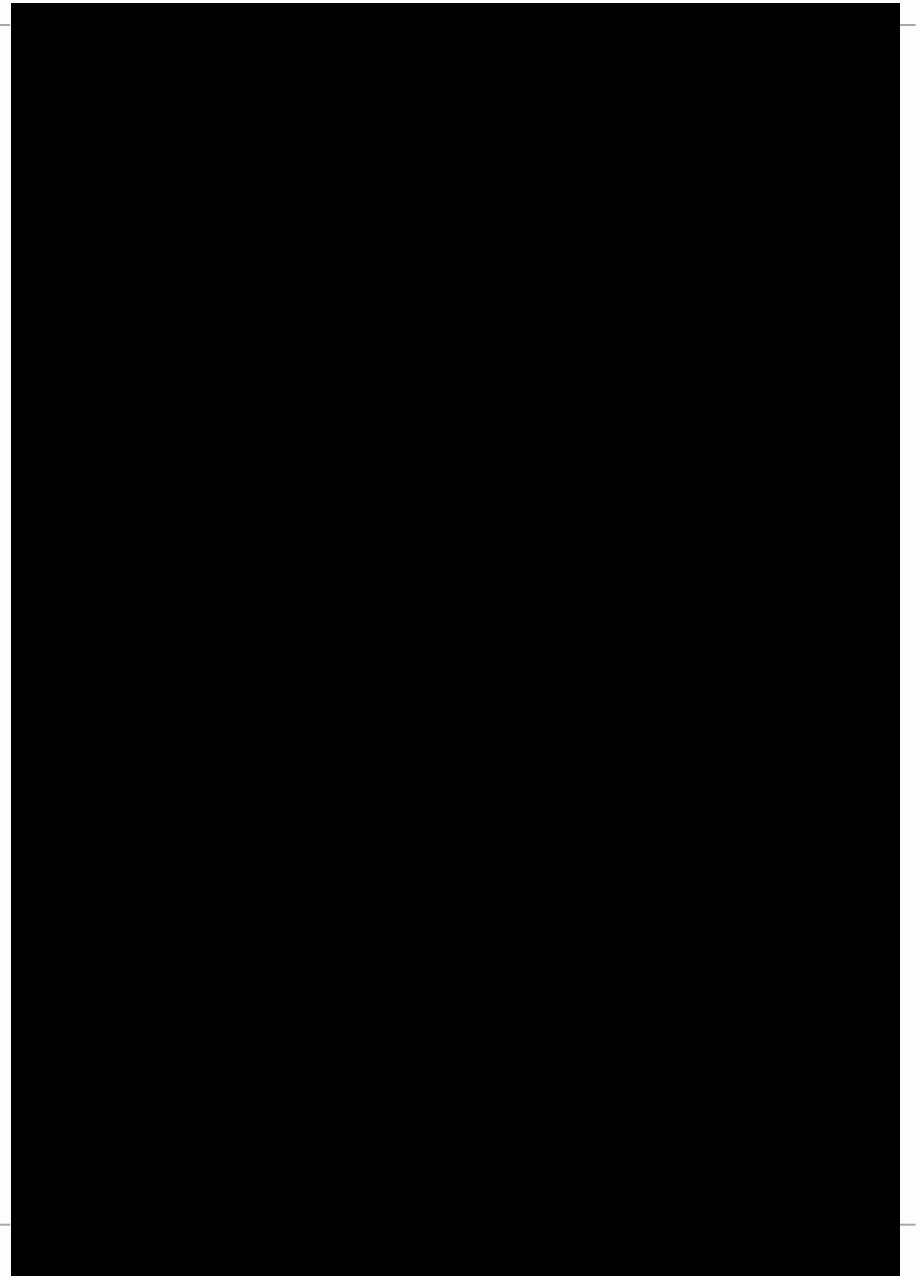
- The H&P super-spec FlexRig® Flex 3 Rig was successfully mobilised into the Basin bringing modern US drilling technology to the Beetaloo Basin

Shenandoah South 1H well drilled

- The SS1H well successfully intersected 90 metres of high quality Mid-Velkerri B Shale, the thickest section to date within the Beetaloo Basin
- Stimulation and well test planned for November 2023

Amungee NW 3H well drilled

- Well successfully drilled and cemented in less than 18 days, the fastest well drilled to Total Depth (TD) with a horizontal section into the Mid Velkerri B Shale to date.
- Stimulation and well test planned for Q2 2024



Indicative 2024 program

Continued focus around Amungee NW and Shenandoah South (Kyalla 117 N2)

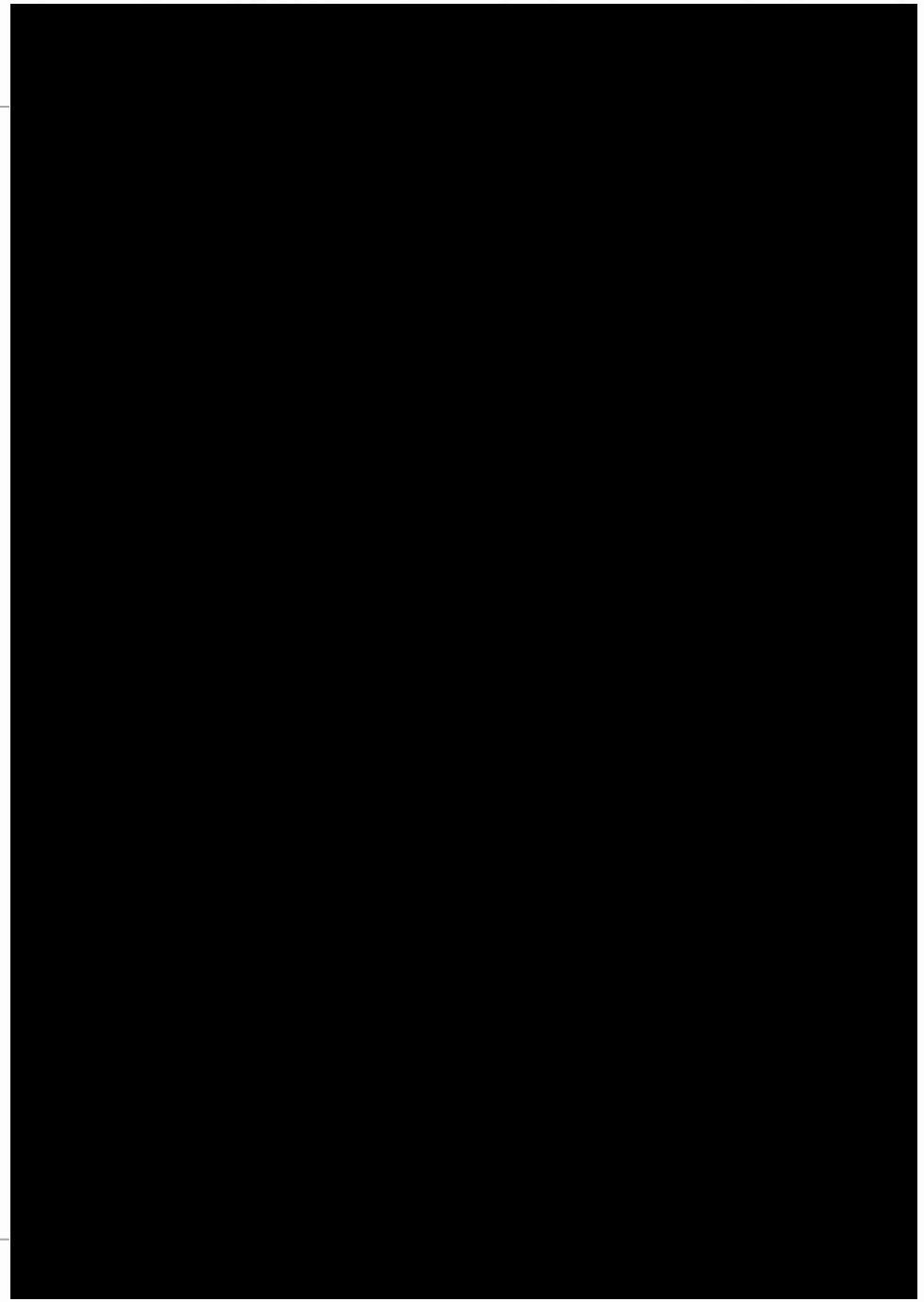
2024 program - pending JV agreement and approvals

- Amungee NW 3H hydraulic fracturing and testing
- 2 additional horizontal wells on the existing Kyalla 117 N2 site and associated pad expansion (drill/frac/test)
- New “Step out” location – Shenandoah S2 – for 2 new wells (civils/water bores/drill/frac/test)

➢Contingent scope

- 2D/3D seismic program within Shenandoah Sth or Amungee NW Delineation area
- Construction of new location Amungee NW3
- Drilling of 2 additional wells on Amungee NW or Amungee NW3

Tamboran will present our firm 2024 work program in Q1 2024



Appraisal gas

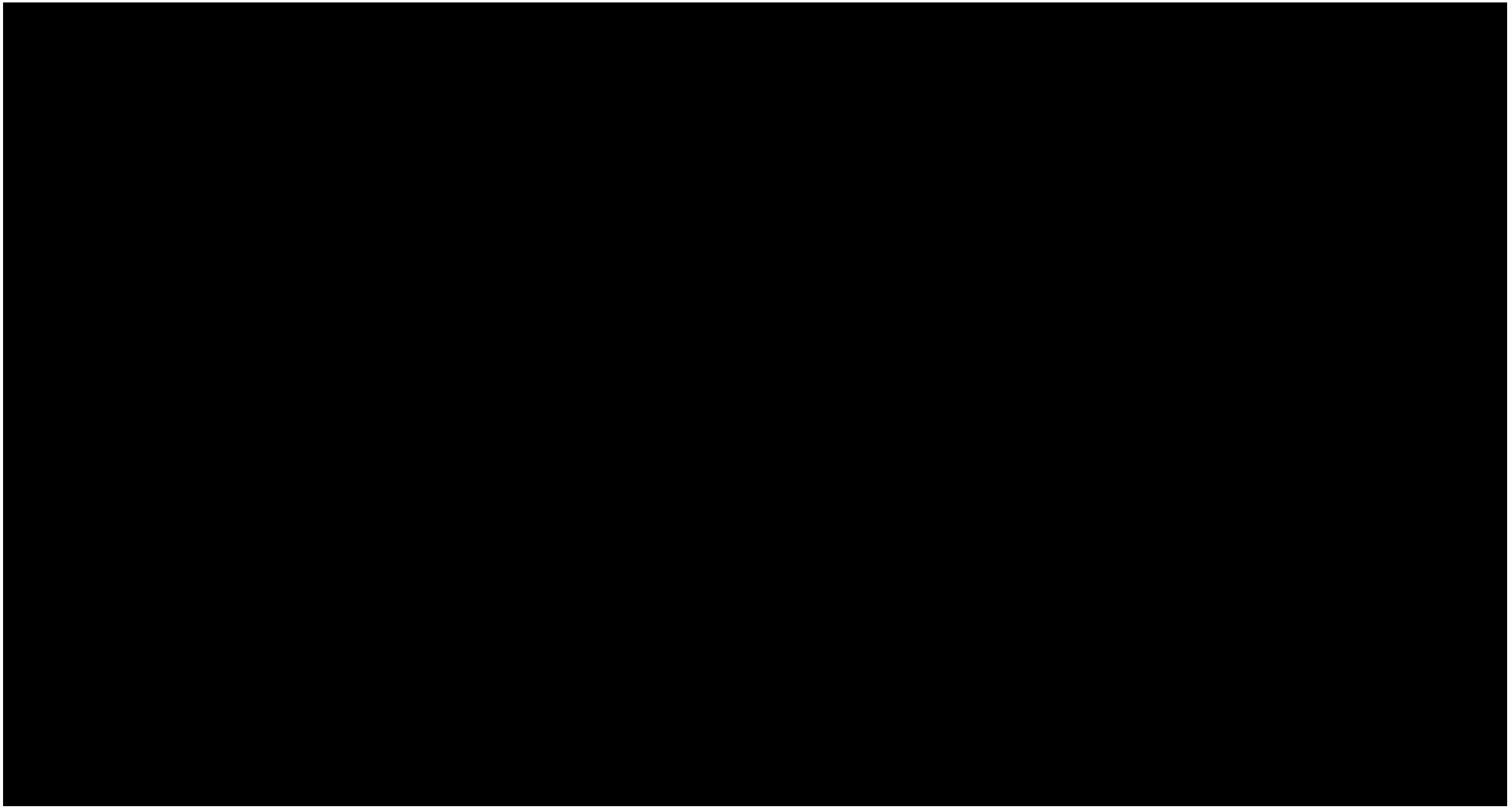
➢Longer term appraisal

- Tamboran needs to flare gas to test the underlying shales
- Future wells will likely require extended testing which will generate greenhouse gasses
- To reduce greenhouse gasses and allow for extended testing- Tamboran proposes to sell appraisal gas via its “Flare Avoidance Project”

➢Appraisal gas sale options

- Locations – likely within Subject land 2 (Shenandoah Sth) and Subject land 5 (Amungee Delineation area)
- Indicative timing – mid-late 2024
- Indicative volumes ~10-40TJ/day depending on well productivity
- Could be via a pipeline and compression facility [redacted]
- Schedule imperatives – we seek early indication from NTHs



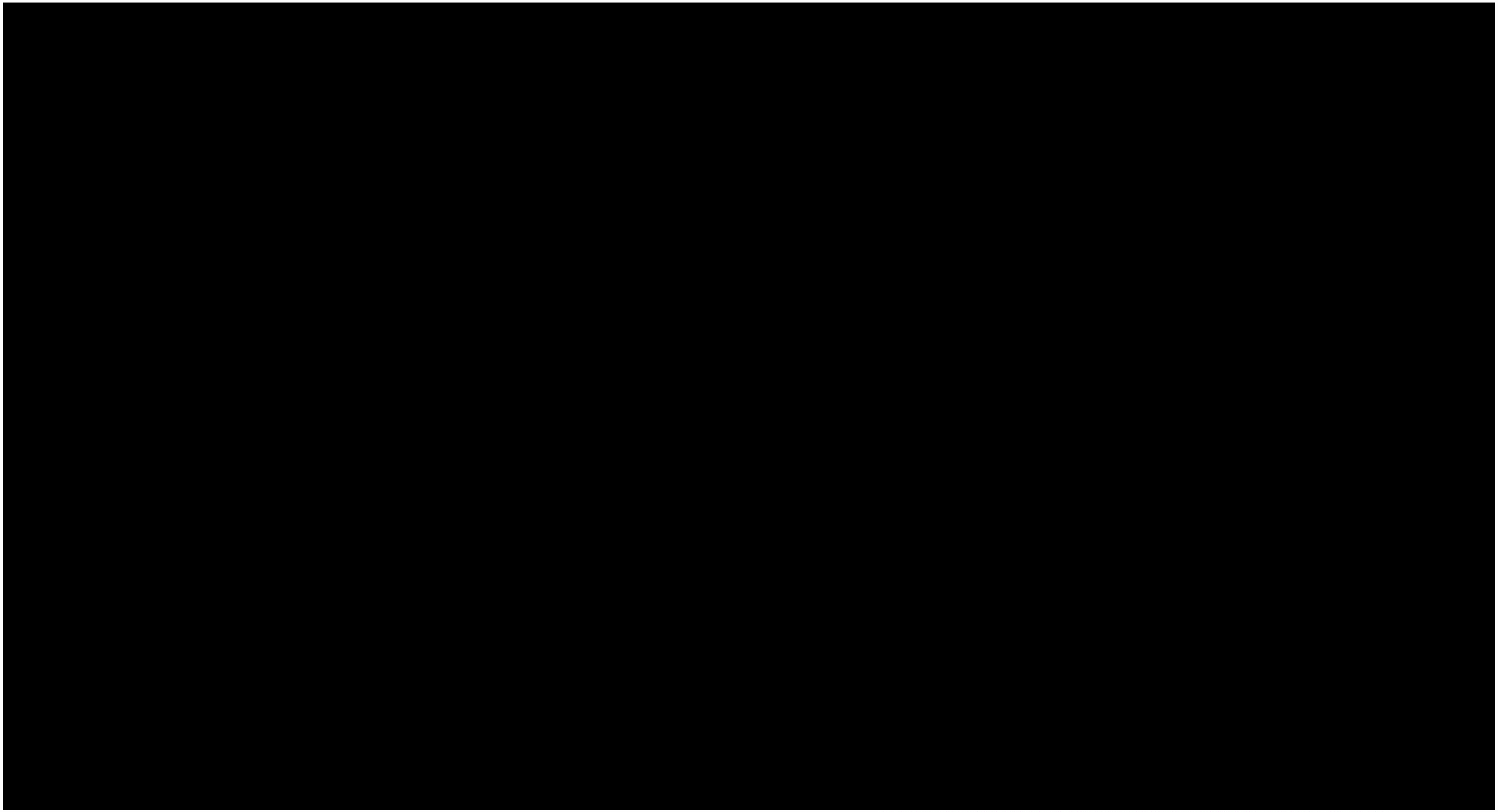


Other regulatory approvals

Tamboran continues to consult with the NLC in obtaining the relevant approvals required for its Explorational and appraisal Activities. Consultations underway in 2023 include:

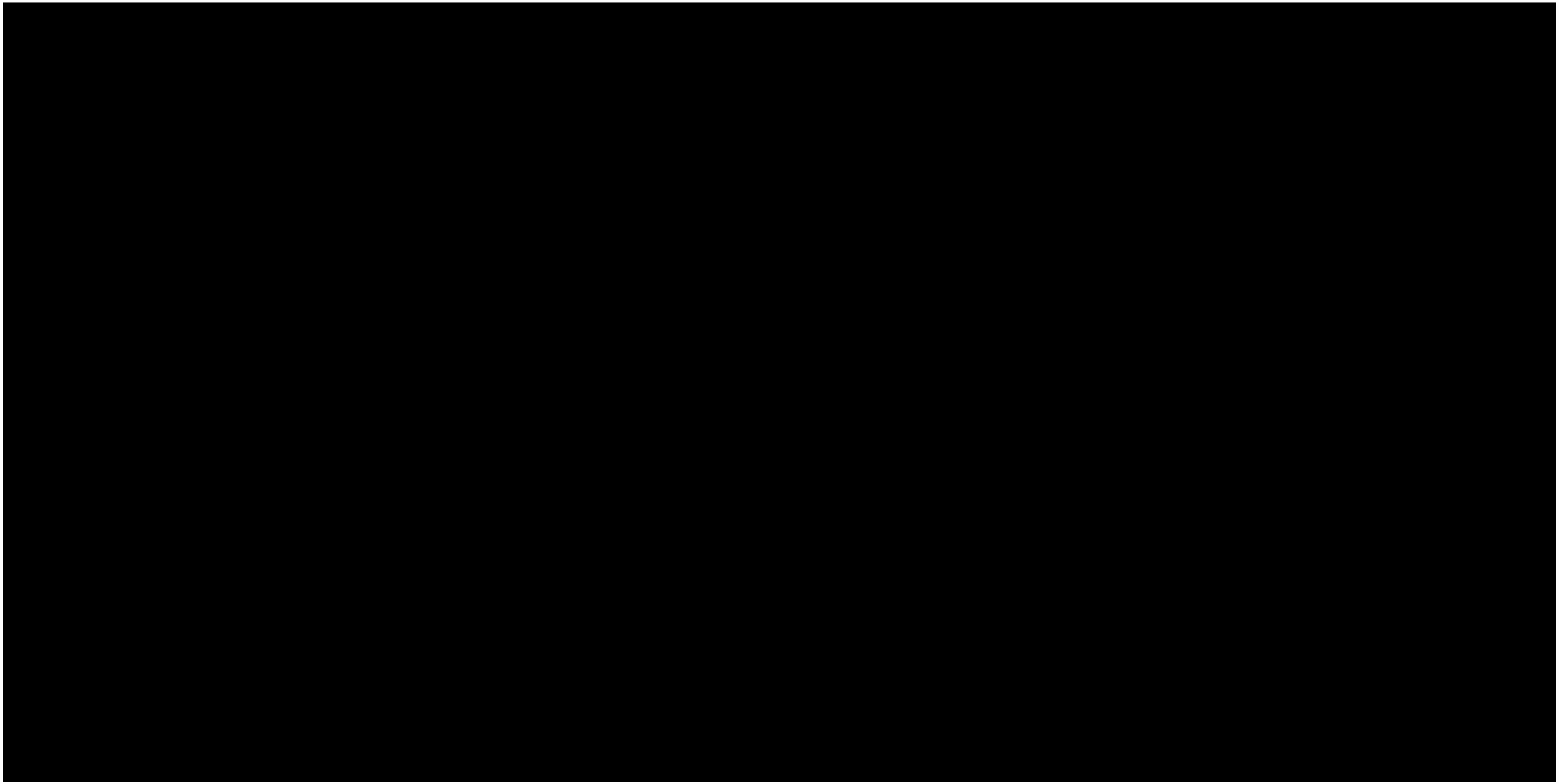
- **New Water Extraction Licence** – increase the current WEL level from 175ML/year to 450ML/year
- **Environmental Management Plan-** submission of new EMP covering:
  - 3 new Exploration locations in Shenandoah South (subject land 2)
  - 1 new Exploration location at Shenandoah North A
  - 15 New E&A wells- 14 new horizontals wells and 1 new vertical
  - Gathering lines connecting sites to allow for water and gas transfers

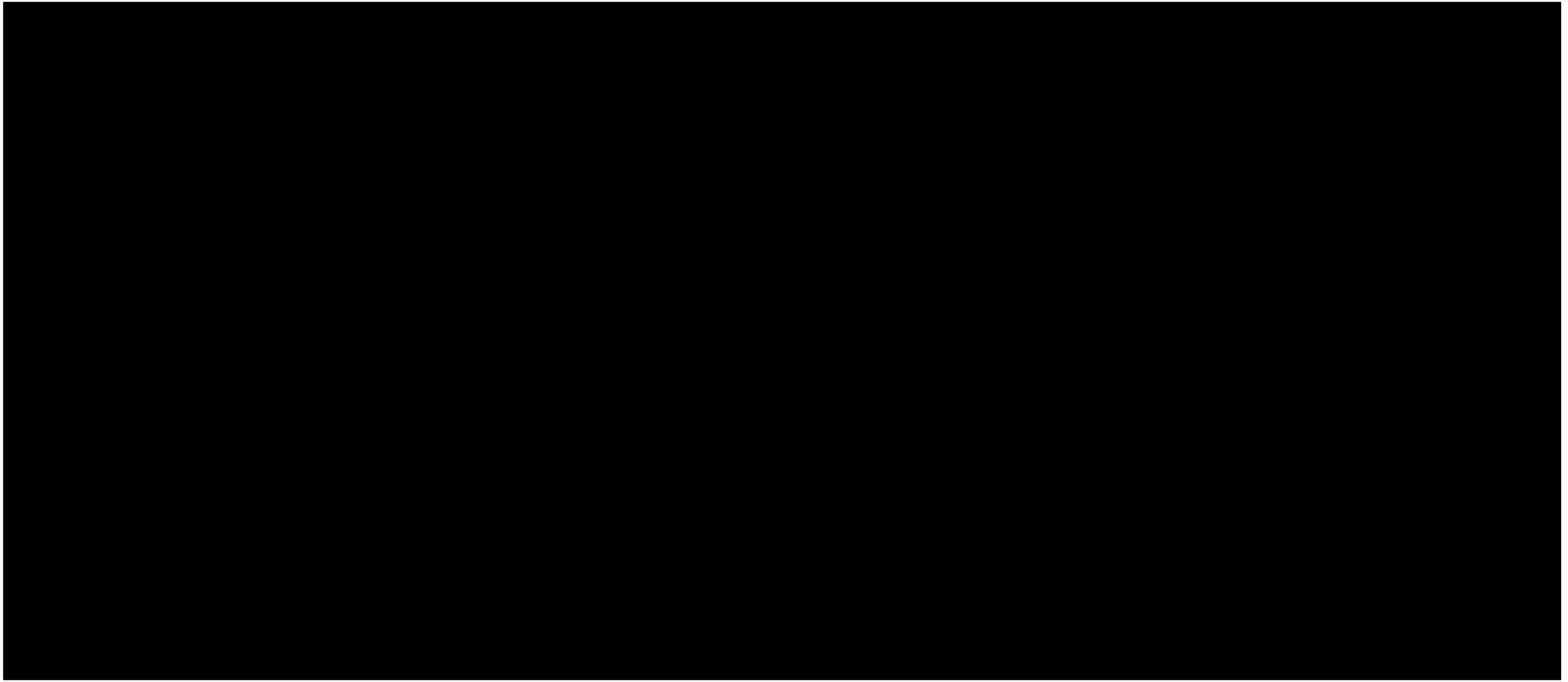
[redacted]



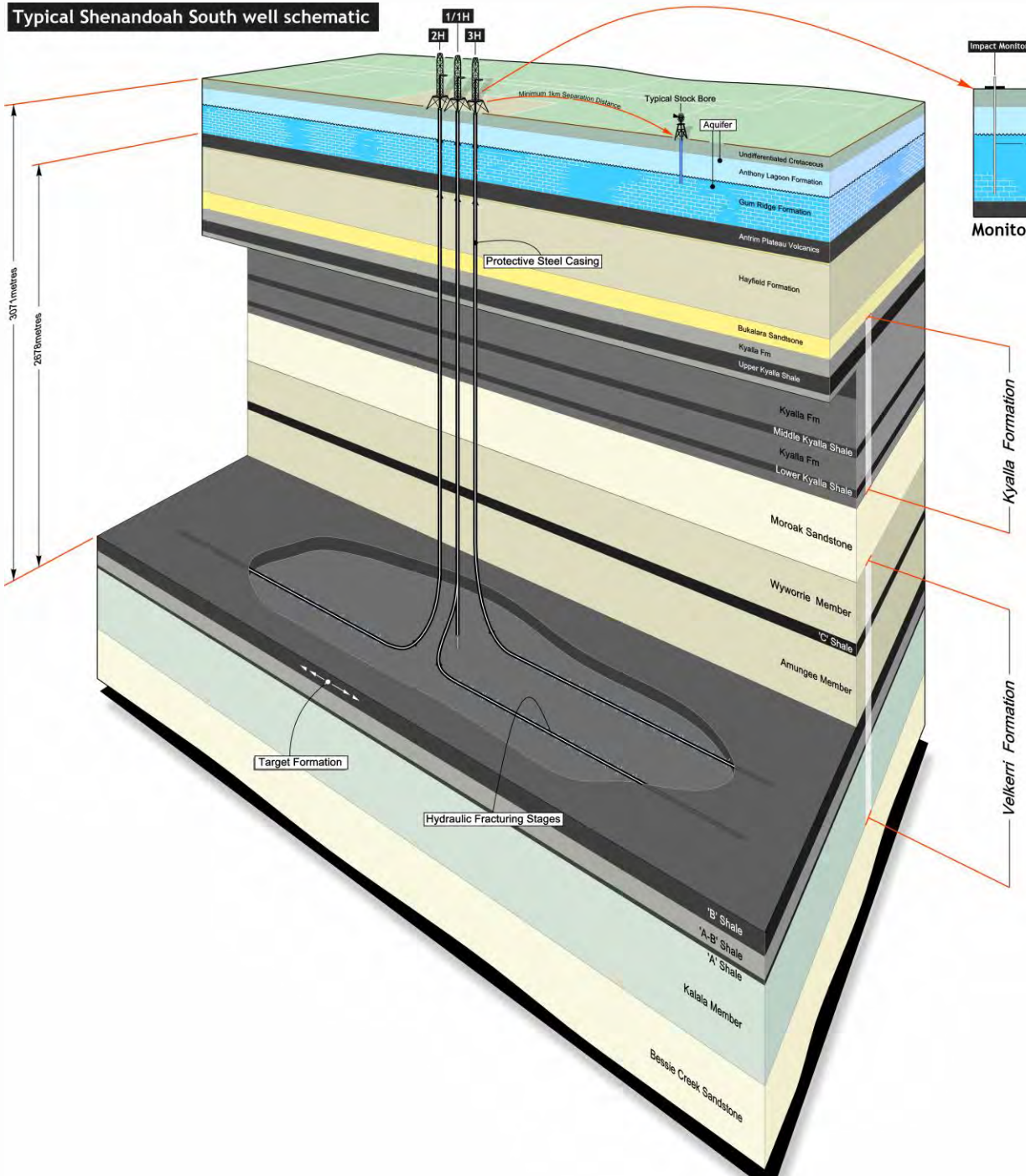


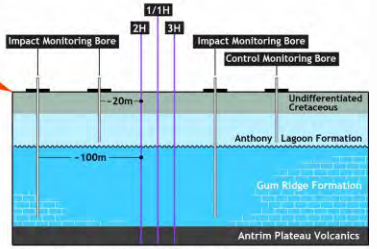






Typical Shenandoah South well schematic

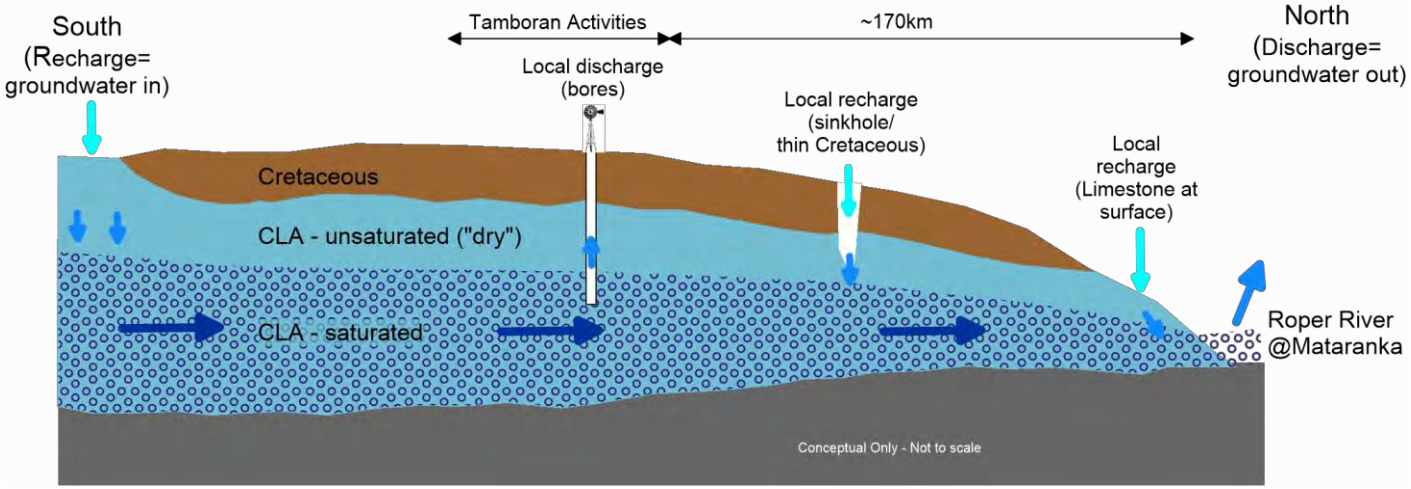


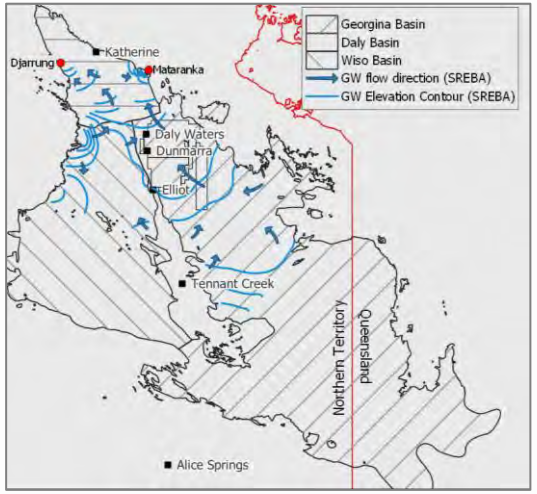


Monitoring Bore Detail



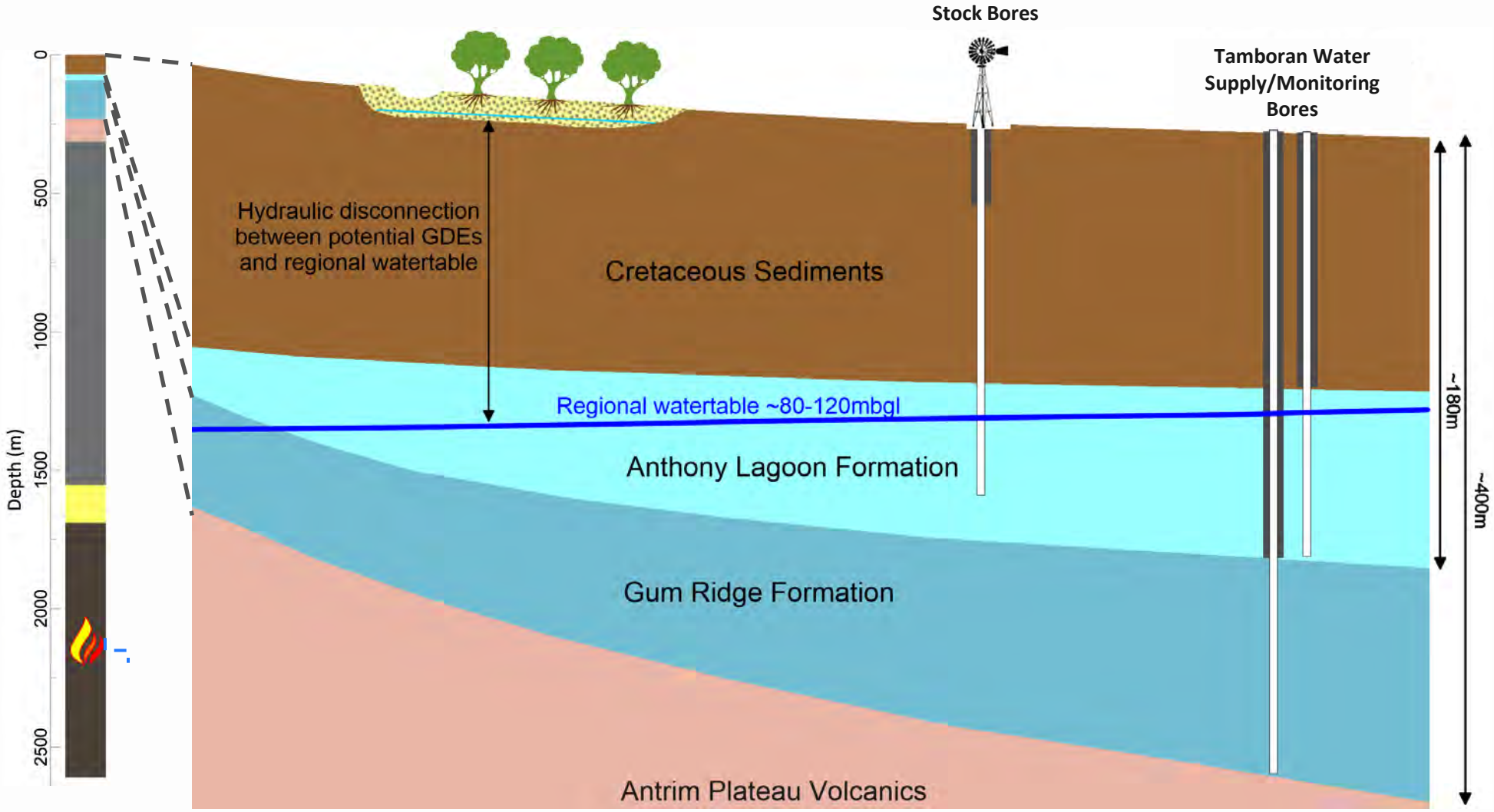
Groundwater in the CLA



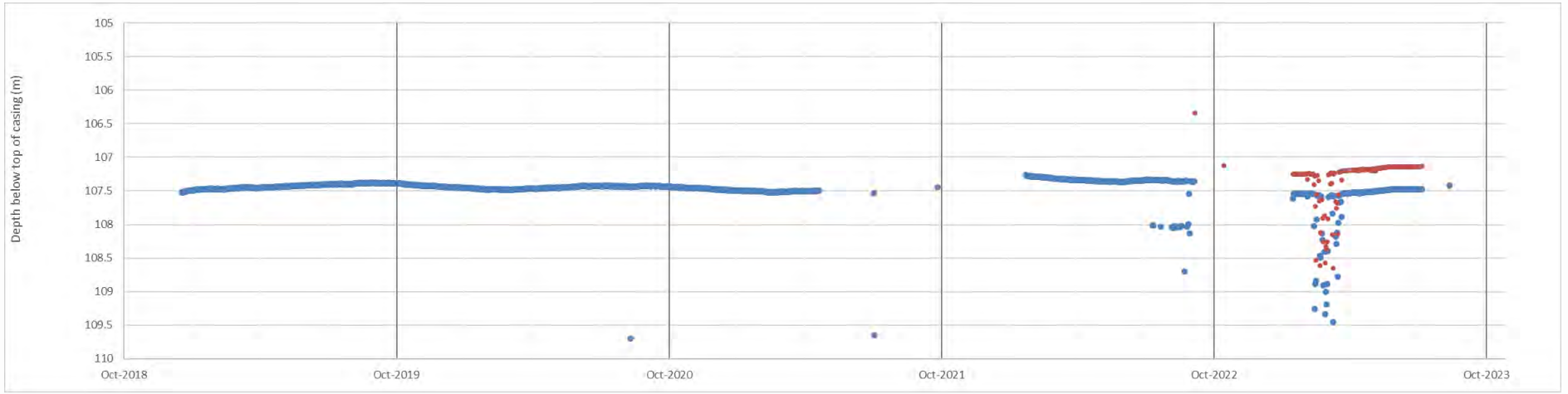


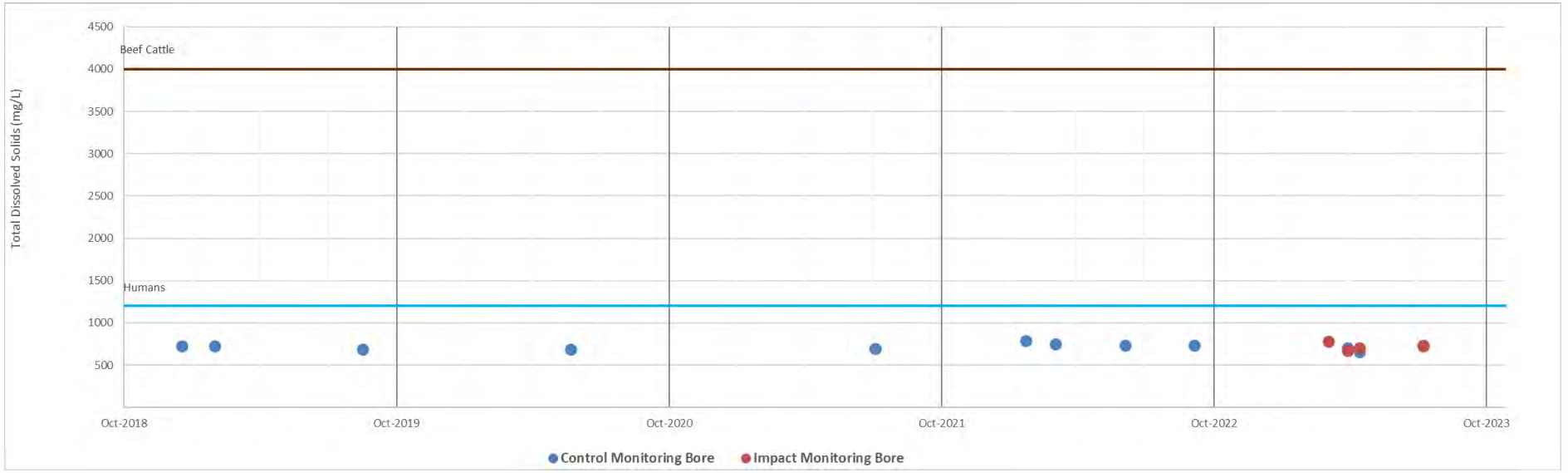
- 1,810,000 – 3,690,000 GL volume of groundwater stored within CLA
- Total usage of ~42 GL/year, Elliott usage ~0.18 GL/year
- Groundwater moves ~0.1 m/year
- Studies indicate that discharge at the Roper River (and Mataranka springs) is sourced from relatively close to the river. Groundwater originating from the CLA within the Beetaloo Sub-basin is likely to be only a very minor portion of the total discharge

Groundwater and surface water

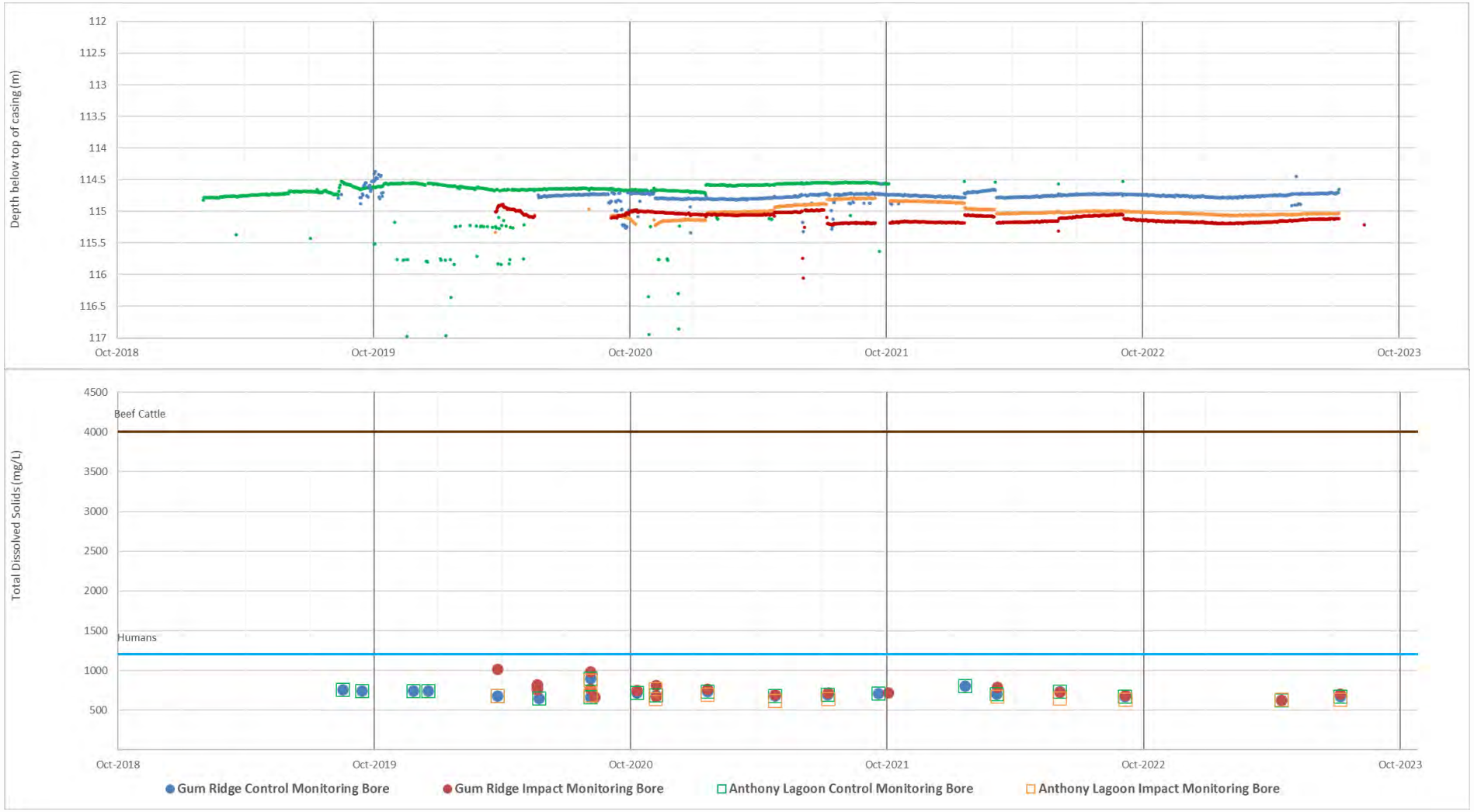


Wellsite Monitoring – Amungee NW

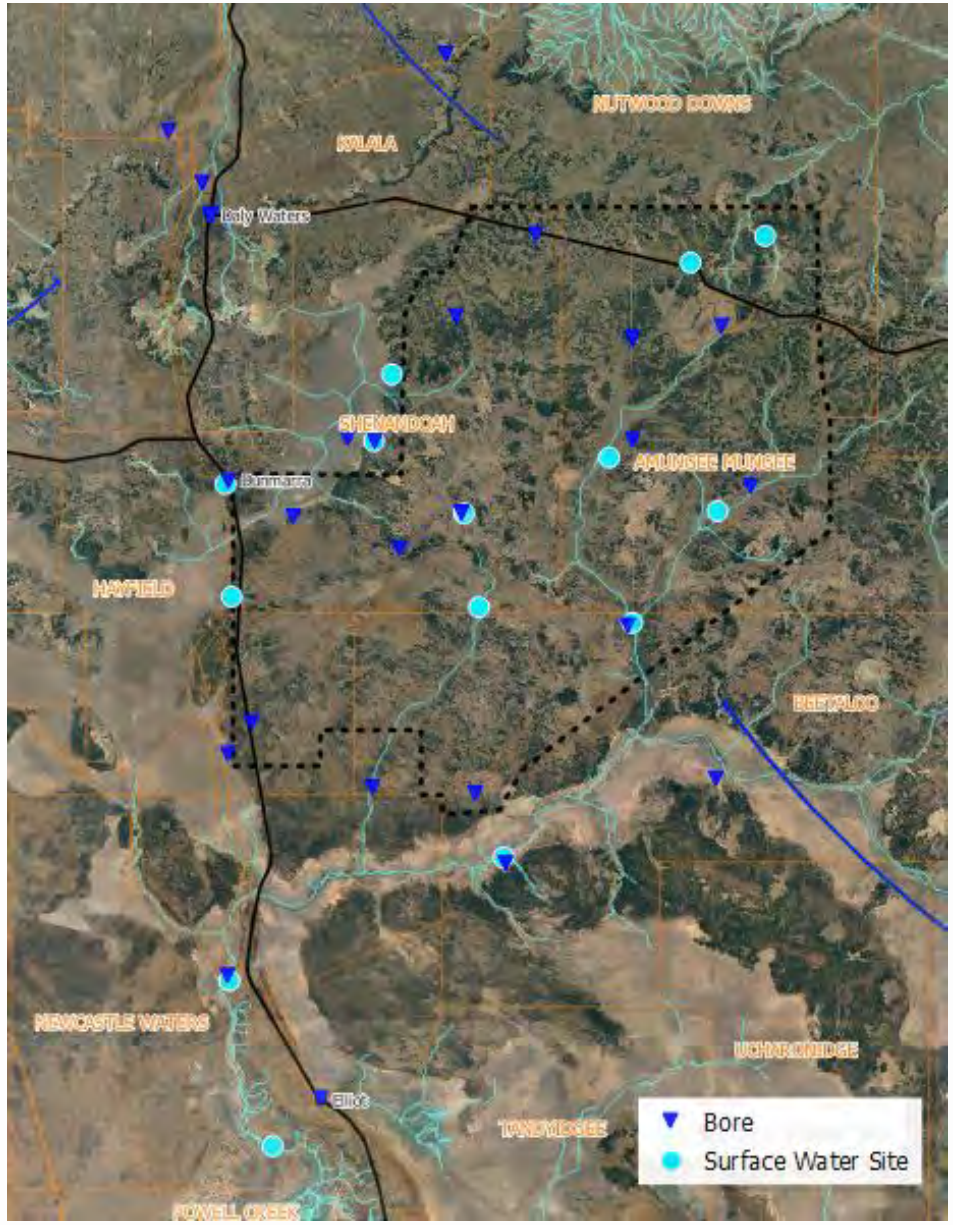




Wellsite Monitoring – Kyalla117



Regional Monitoring Program









QUESTIONS?

Appendix J.1.2 02 231030 & 201027 Tamboran Work Program Presentation Material

From: Emily Beresford-Cane
To: [redacted]
Cc: [redacted]
Subject: Re: Tamboran work program presentation material
Date: Monday, 30 October 2023 8:25:27 PM
Attachments: image001.png

Hi [redacted]

Again, thank you for this helpful feedback.

Matt has been able to make many of these amendments, and I look forward to discussing the presentation with you at some point tomorrow, before the Work Program Meeting.

Kind regards

Emily

[redacted]

[redacted]



[redacted]

Northern Land Council

[redacted]
Email: [redacted] | Website: www.nlc.org.au

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Appendix J.1.2 03 231103 Tamboran EP 76 98 117 NLC Work Program 2024

From: Matt Kernke
To: [redacted]
Cc: Emily Beresford-Cane; Tamboran Contact; Linda Pugh; Lisa Baruch
Subject: Tamboran EP 76, 98 and 117 2024 Work Program report
Date: Friday, 3 November 2023 10:09:00 PM
Attachments: Tamboran EP 76 98 117 NLC Work Program 2024.pdf
image001.png

Hi [redacted]

As foreshadowed, please find attached a copy of the 2024 Work program and clearance request report.

We are having a couple of technical issues obtaining the shape files which delayed this report. I will have them available next week and will send these through once we have them in hand.

Can I recommend we establish a meeting to start planning for next years clearances?

Please let me know if you require any further information.

Kind regards
Matt

Matt Kernke
Environment and Approvals Manager
tamboran
RESOURCES

M: [redacted]

2024 Work Program and Clearance Request

EP 98, 117, 76 – Beetaloo Joint Venture (Tamboran / Falcon)

Version:	0
Submitted:	Matt Kernke
Presented by:	Tamboran
Review Date:	03 November 2023

2024 Work Program and Sacred Site Clearance Request

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2024 Work Program and Sacred Site Clearance Request

1 OVERVIEW

In November 2022, Tamboran (B1) Pty Ltd (ABN 39 662 327 237) ("Tamboran (B1)") executed a transaction to purchase Origin B2 Pty Ltd (ABN 42 105 431 525) ("Origin B2"; A subsidiary of Origin Energy;) in its entirety. The transaction resulted in Tamboran (B1) acquiring Origin B2's 77.5% interest in Exploration Permits (EP) 76, 98 and 117 ("the Permits") under the Beetaloo Joint Venture ("the Beetaloo JV") with Falcon Oil & Gas Australia Pty Ltd ("Falcon"). Tamboran (B1) is a jointly owned subsidiary (in equal proportions) of Tamboran (West) Pty Limited (ACN 661 967 077) ("Tamboran West") and Daly Waters Energy, LP ("Daly Waters"). Tamboran West is ultimately owned by Tamboran Resources Limited and Daly Waters is ultimately owned by Sheffield Holdings, LP.

Northern Territory Government permit commitments across the Permits require Tamboran B2 to complete ongoing exploration and appraisal ("E&A") activities. Since 2015, the Beetaloo JV has drilled nine (9) wells in the Beetaloo Sub-basin ("Beetaloo"). These include wells on Kalala S (Kalala S-1), Beetaloo W (Beetaloo W-1), Amungee NW (Amungee NW-1, Amungee NW-1H, Amungee NW 2H and Amungee NW 3H), Kyalla 117 N2 (Kyalla 117 N2-1H and Shenandoah S-1H) and Velkerri 76 S2 (Velkerri 76 S2-1). The Shenandoah S-1H and Amungee NW 3H wells were drilled over the 2023 period.

Results collected from the Beetaloo E&A program highlighted the presence of various shales targets which are potentially suitable for a future onshore gas development. Tamboran B2 has identified two main areas where larger scale pilot projects may be completed in the coming years, pending approvals and E&A success, and referred to as the Amungee Delineation Area and the Shenandoah South Pilot Area. These areas are the focus of the forward E&A campaign and subsequent sacred site clearance requests.

Tamboran B2 respectfully requests the Northern Land Council's ("NLC") assistance to facilitate a *Sacred Site Clearance Survey* to comply with the obligations of the Exploration Agreement(s) and to support an application for Aboriginal Areas Protection Authority ("AAPA") Certificate for activity as described below.

This application is designed to provide coverage for Tamboran B2's proposed activities within these areas over the next 1-5 years, with all or a subset of the proposed activities likely to occur. Annual work program updates will continue to communicate any refinement of Tamboran B2's E&A strategy.

2 Exploration and appraisal program strategy - the bigger picture

Tamboran B2's development strategy is focused on bringing gas to the domestic market as soon as practicable. Well testing during the E&A phase is a crucial step in assessing the commercial viability of the Beetaloo shale resources. Hydrocarbons produced during this phase are typically flared, which is a significant source of Greenhouse Gasses (GHG). Tamboran B2 is seeking to beneficially use produced hydrocarbons, rather than dispose of them via an onsite flare. This will achieve multiple objectives including:

- Minimising GHG generation;
- Increasing domestic gas supply at a time of domestic and international scarcity;
- De-risking future shale developments through longer term gas production information; and,
- Providing near-term benefits to Native Title Holders ("NTH"), local stakeholders and the people of the Northern Territory through increased gas supply, as well as greater potential for local employment opportunities and compensation/royalty payments.

Tamboran B2 is focusing its E&A efforts around the Shenandoah South Pilot Area (around the existing Kyalla 117 N2 location) and the Amungee Delineation Area (around the existing Amungee NW location). An overview of the proposed focused areas is provided in Figure 2.

During Calendar Year (CY) 2023, Tamboran B2 completed the drilling of exploration and appraisal wells, Shenandoah S-1H and Amungee NW 3H which targeted the Mid Velkerri B shale. The Shenandoah S-1H well successfully intersected 90 metres of high quality Mid Velkerri B Shale in EP117, the thickest section to date within the Beetaloo depocentre. [redacted]

2024 Work Program and Sacred Site Clearance Request

The E&A work program for CY 2024 will be determined based upon the results of the Shenandoah S-1H well. In a success case, the anticipated work program includes 2 new E&A wells at the existing Kyalla 117 N2 pad and 2 new E&A wells on a new location ("Shenandoah S2 pad") to be constructed within 4km of Kyalla 117 N2 location (see Figure 1). The new Shenandoah S2 pad will be constructed in Q1 2024, with additional 2-4 well pads constructed progressively over the CY 2024-26 period.

[redacted]

[redacted]

[redacted]

3 Proposed 2024 work program

In addition to ongoing maintenance of existing assets, Tamboran B2's proposed CY 2024 work program includes activities in three potential focuses areas. These activities are subject to environmental, land access and sacred site clearance approvals and may change through ongoing consultation with the NLC and NTHs. Tamboran B2 is prioritising activities within the nominated areas as summarised below:

1. **Shenandoah South Pilot Area (subject land 2)**

- Ongoing well testing of the Shenandoah S-1H well;
- Expansion of the existing Kyalla 117 N2 location;
- Construction of a new step out location ("Shenandoah S2"), including a new Gravel pit (SSGP3);
- Drilling, HFS and EPT of 2 new E&A wells on the existing Kyalla 117 N2 location and 2 new E&A wells on the new step out location Shenandoah S2;
- [redacted]
- Maintenance of existing sites and associated infrastructure; and,
- Environmental and heritage surveys required for future production environmental approvals.

2. **Amungee Delineation Area** (**subject land 5**)

- HFS and EPT of Amungee NW 3H (nominally a 180-day well test);
- Contingent: Civil construction of the Amungee NW3 step out location, including lease pad, camp pad and access tracks;
- Contingent: Drilling, HFS and EPT of up to 2 additional wells on either the existing Amungee NW, new Amungee NW3 location or a combination of both;
- Maintenance of existing sites and associated infrastructure;
- Environmental and heritage surveys required for future production environmental approvals.

3. **Regional groundwater and surface water monitoring program**

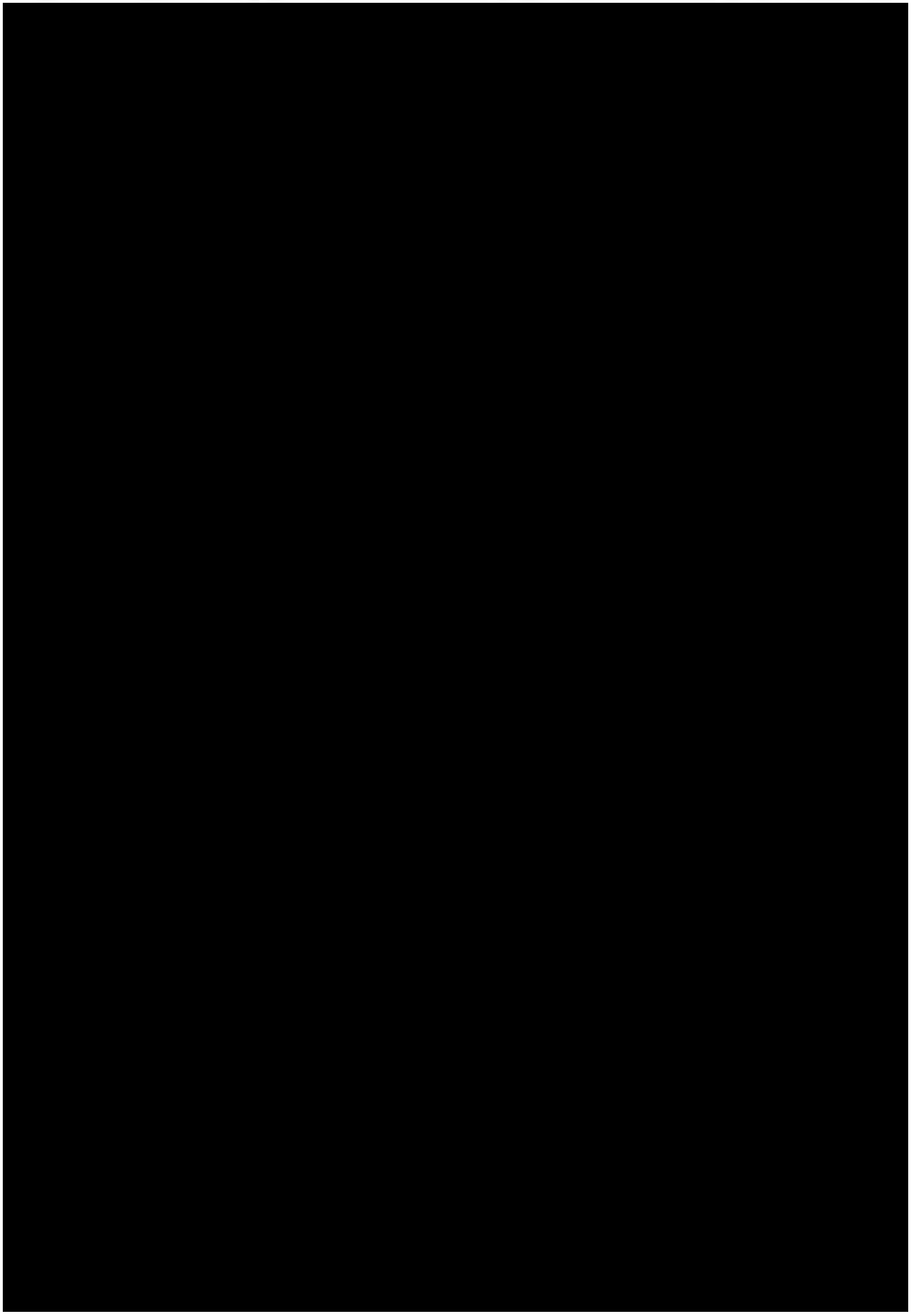
Tamboran B2 is proposing to continue the regional groundwater and surface water monitoring program, which has been collecting data from landholder bores across the Beetaloo since 2014 and expand its scope to include surface water monitoring based on feedback from the NLC and NTHs. These sites are provided in Figure 2.

The inclusion of surface water monitoring into the regional program is designed to collect data for the following purposes:

1. Demonstrate ongoing exploration and future production activities are not impacting on ground and surface water resources within the Beetaloo;
2. Demonstrate the waterholes of the Beetaloo are not likely to be impacted from water extraction from the underlying Cambrian Limestone aquifers of the region; and,
3. Collect ongoing baseline data used for future environmental impact assessments.

The CY 2024 work program for EP 76, 98 and 117 is summarised in Figure 1, with the regional surface water sites provided in Figure 2. Table 1 includes a summary covering the existing and proposed new locations required to support the proposed work program.

2024 Work Program and Sacred Site Clearance Request



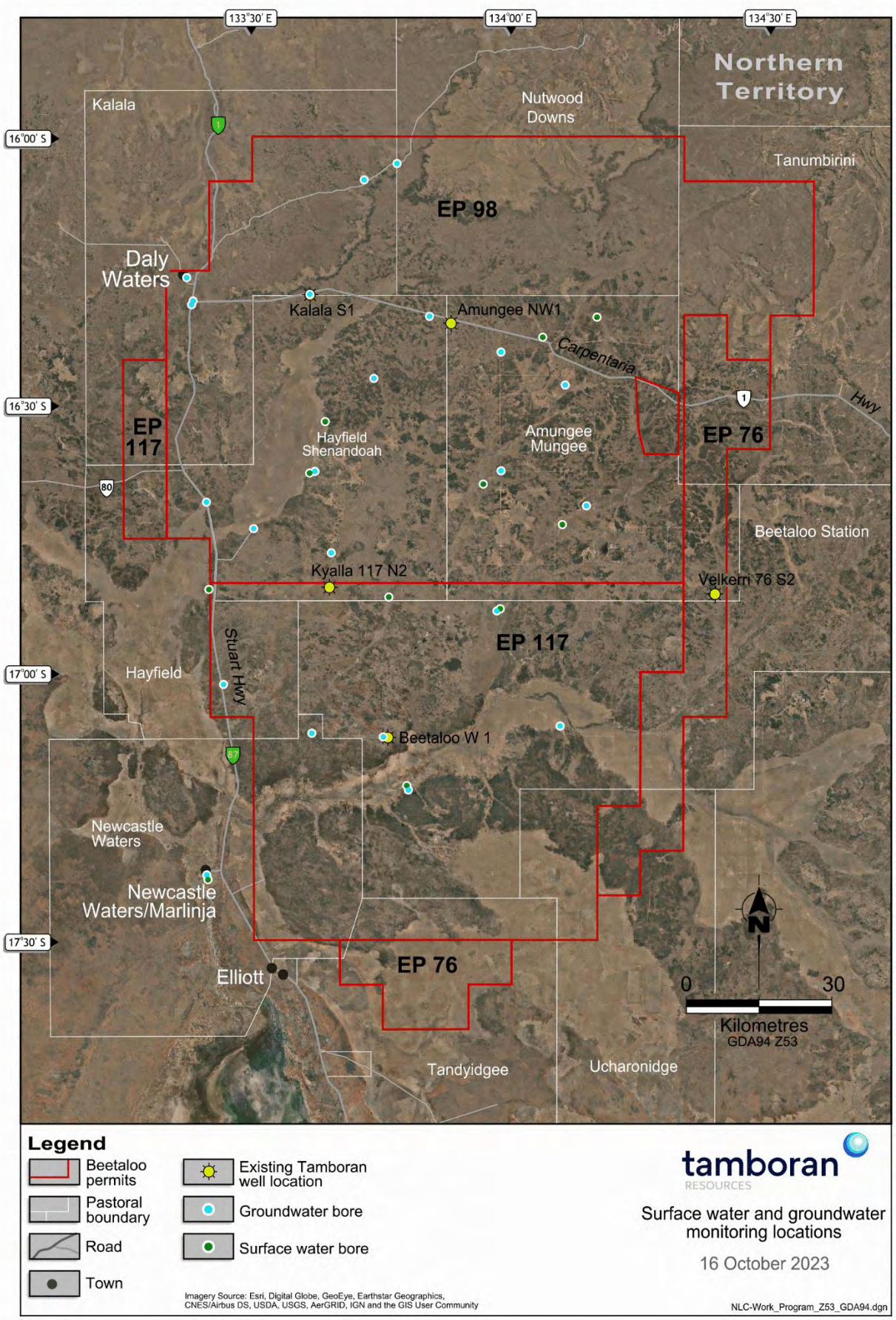


Figure 2 Overview of the proposed regional groundwater and surface water monitoring sites

2024 Work Program and Sacred Site Clearance Request

Table 1 EP 76, 98 and 117 CY 2024 Work Program Summary (including contingent scope)

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
New Works				
EP 117	Kyalla 117 N2	Existing	Shenandoah (NT Por 7026)	• Ongoing access track, gravel pit and lease pad maintenance and monitoring. • Civil construction works to maintain and expand the existing well pad to accommodate multiwell drilling and centralised wastewater treatment / storage- ~ 10 hectares. • Drilling, HFS and EPT of up to 2 new exploration and appraisal (E&A) wells in CY 2024 and an additional 2 wells in 2025 and beyond. • Ongoing EPT of the Shenandoah S-1H well- up to 300-day well test. • Ongoing maintenance and data collection from the existing Kyalla 117 N2-1H exploration well. • Operation of a temporary camp. • Groundwater extraction and monitoring. • Long-term wastewater storage and treatment.
EP 98	Shenandoah S2	New proposed location	Shenandoah (NT Por 7026)	• Construction of new E&A location consisting of access track, camp pad, lease pad, laydowns, firebreak to ~25 hectares • Construction and operation of groundwater extraction bores- potentially up to 8 bores. • Construction of a ~5 hectare laydown yard. • Drilling, HFS and EPT of up to 2 additional E&A wells in CY2024, and up to 4 E&A wells in 2025 and beyond. • Construction of a new ~5 hectare Gravel pit (SSGP 3).
EP 98	Amungee NW	Existing	Amungee station (NT Por 1079)	• Ongoing access track, camp pad and lease pad use, maintenance and monitoring. • HFS and EPT (~180 days) of the Amungee NW 3H well. • Well testing of the Amungee NW 1H and Amungee NW 2H wells. • Drilling, HFS and EPT of up to 2 additional E&A wells.

2024 Work Program and Sacred Site Clearance Request

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				• *Contingent*: approximately 40km of 2D seismic.
EP 98	Amungee NW3	New- contingent	Shenandoah East (NT Por 7027)	• Contingent activity. • Construction of new E&A location consisting of access track, camp pad, lease pad, laydowns, firebreak to ~25 hectares. • Construction and operation of groundwater extraction bores- potentially up to 8 bores. • Construction of a 2.5 hectare laydown yard. • Drilling, HFS and EPT of up to 2 additional E&A wells in 2024. • Construction of a new ~5 hectare Gravel pit adjacent to site.
EP 76, 98 117 and off tenure	Various sites across the Beetaloo- with a focus on the ILUA and regionally important water locations- such as Lake Woods	Landholder bores and surface water bodies	Kalala, Beetaloo, Hayfield/ Shenandoah, Newcastle Waters, Amungee Mungee	• Collection of groundwater and surface water monitoring results from landholder bores and surface water bodies (includes collection of water and sediment samples). • Program to be undertaken using local indigenous contractor, third party expert and cultural managers for relevant area. • ~12 surface water sites across the Beetaloo. • Monitored every 6 months. • Data to be provided to NLC and NTHs.
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
Existing sites- routine activities / care and maintenance				
EP 76	Velkerri 76 S2	Existing	Amungee station (NT Por 1079)	• Ongoing access track, gravel pit, camp pad and lease pad maintenance and monitoring. • Ongoing Velkerri 76 S2-1 well maintenance.
EP 98	Amungee NW2	Existing	Amungee station (NT Por 1079)	• Periodic inspection and ad hoc maintenance of existing access track, water bore, and lease pad. • Potential site rehabilitation.
EP 98	Kalala S	Existing	Kalala Station (NT Por 697)	• Periodic inspection and ad hoc maintenance of existing access track, camp pad, and lease pad.

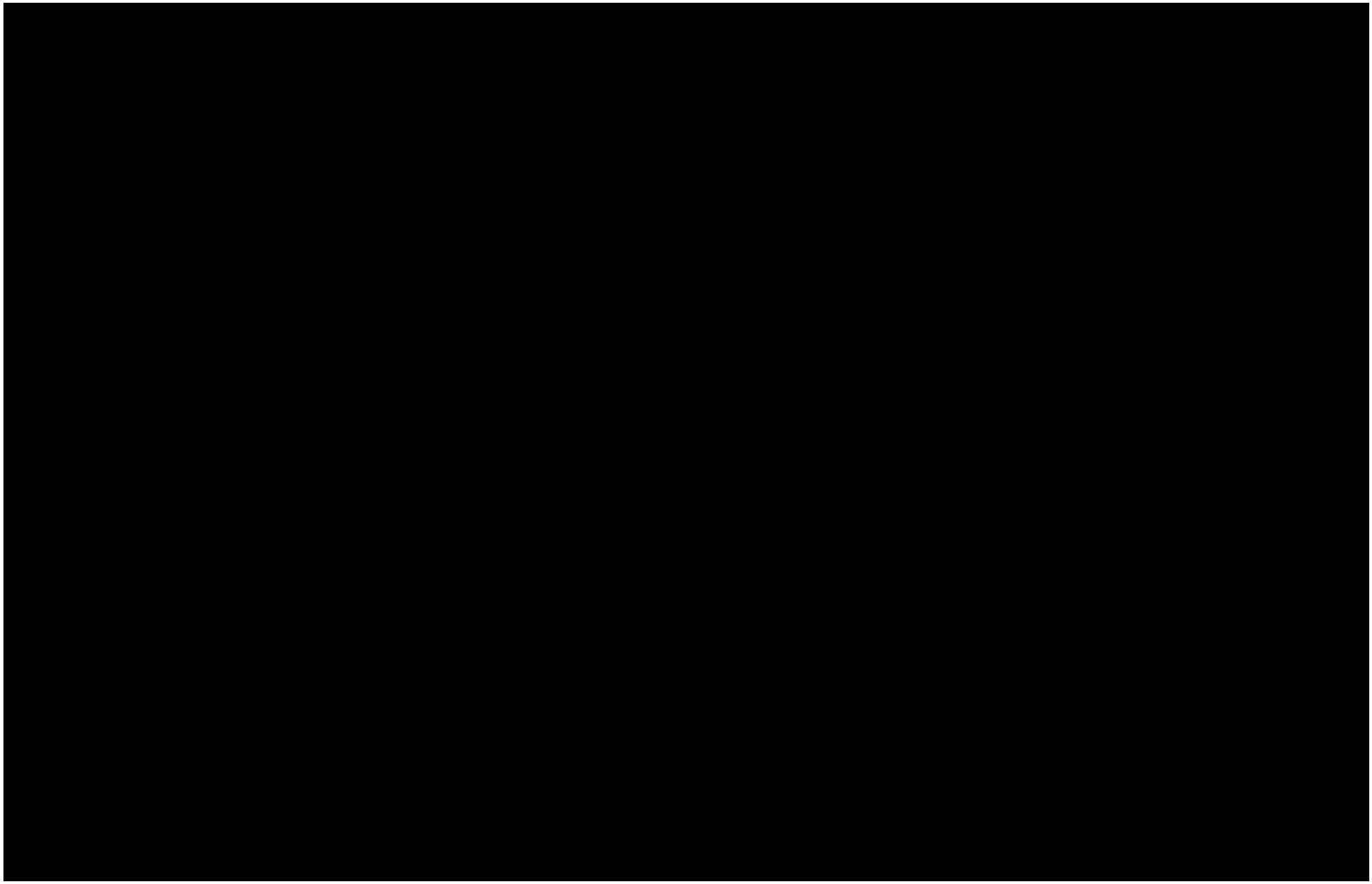
Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				• Ongoing Kalala S-1 well maintenance. • Groundwater monitoring and extraction. • Potential well abandonment. • Potential site rehabilitation.
EP 117	Beetaloo W	Existing	Beetaloo Station (NT Por (702) Access track: Hayfield (NT Por 1077) Access Track: Jingaloo (NT Por 5416)	• Periodic inspection and ad hoc maintenance of existing access track, gravel pits, camp pad and lease pad. • Ongoing Beetaloo W-1 well maintenance. • Diagnostic fracture injection test and monitoring. • Groundwater monitoring and extraction. • Potential well abandonment. • Potential site rehabilitation.

4 CY 2023/2024 NLC Requests-

To support the proposed E&A strategy and work program, Tamboran B2 seeks NLC support for a range of NTH engagement as summarised in Table 2. This can be summarised as the following items:

- On country meetings covering CY 2024 work program (March)
- Consultation covering beneficial use of appraisal gas (where beneficial use in this instance will be transported and sale of gas through a newly constructed pipeline and the Amadeus Gas Pipeline (AGP)).
- Assistance in execution of the regional groundwater and surface water monitoring program, including selection of sites and access constraints.
- Cultural Manager participation in activities where Tamboran is conducting ground disturbing activities for the first time or entering an area within the permits for the first time and/or seismic surveys.

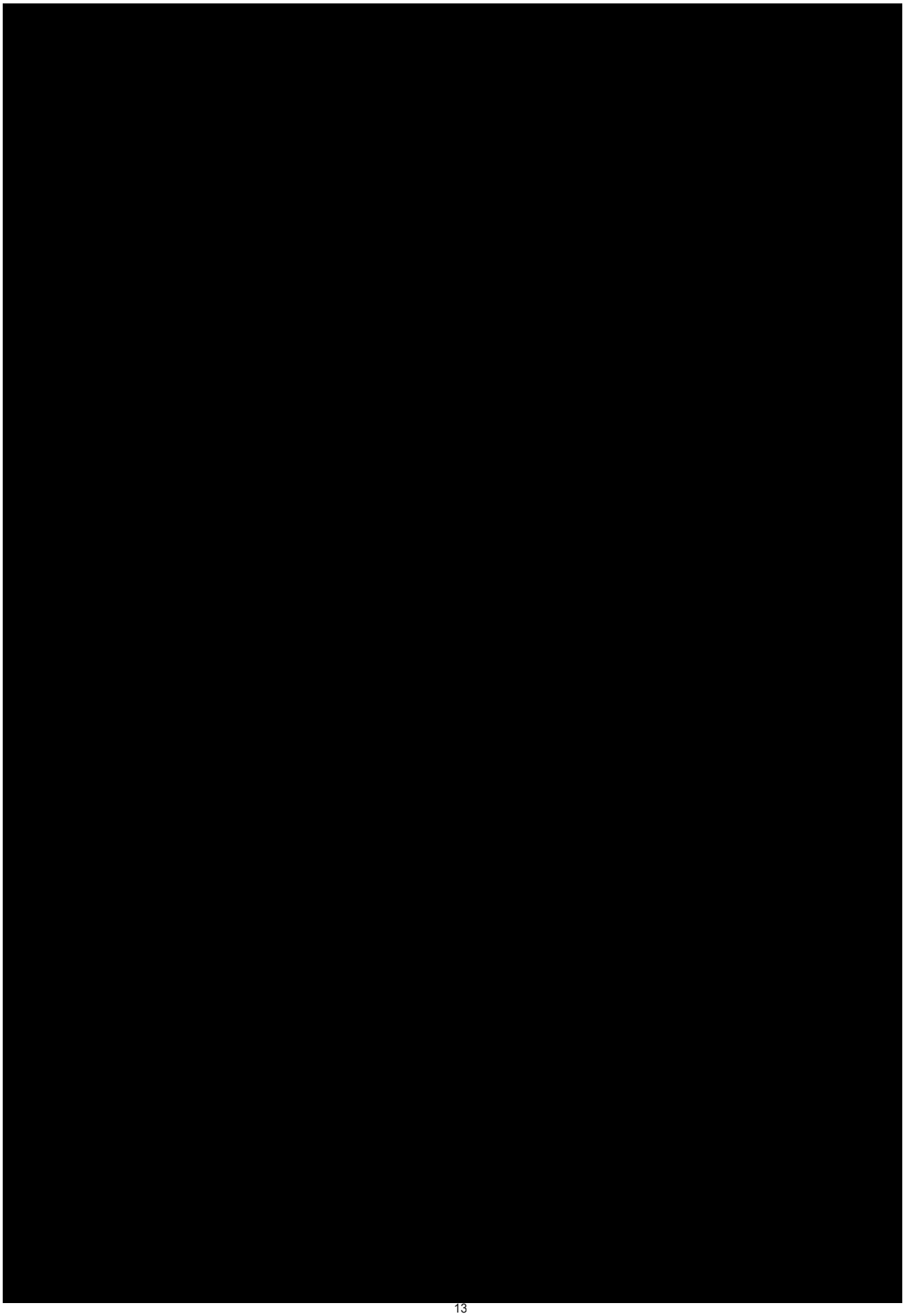
2024 Work Program and Sacred Site Clearance Request



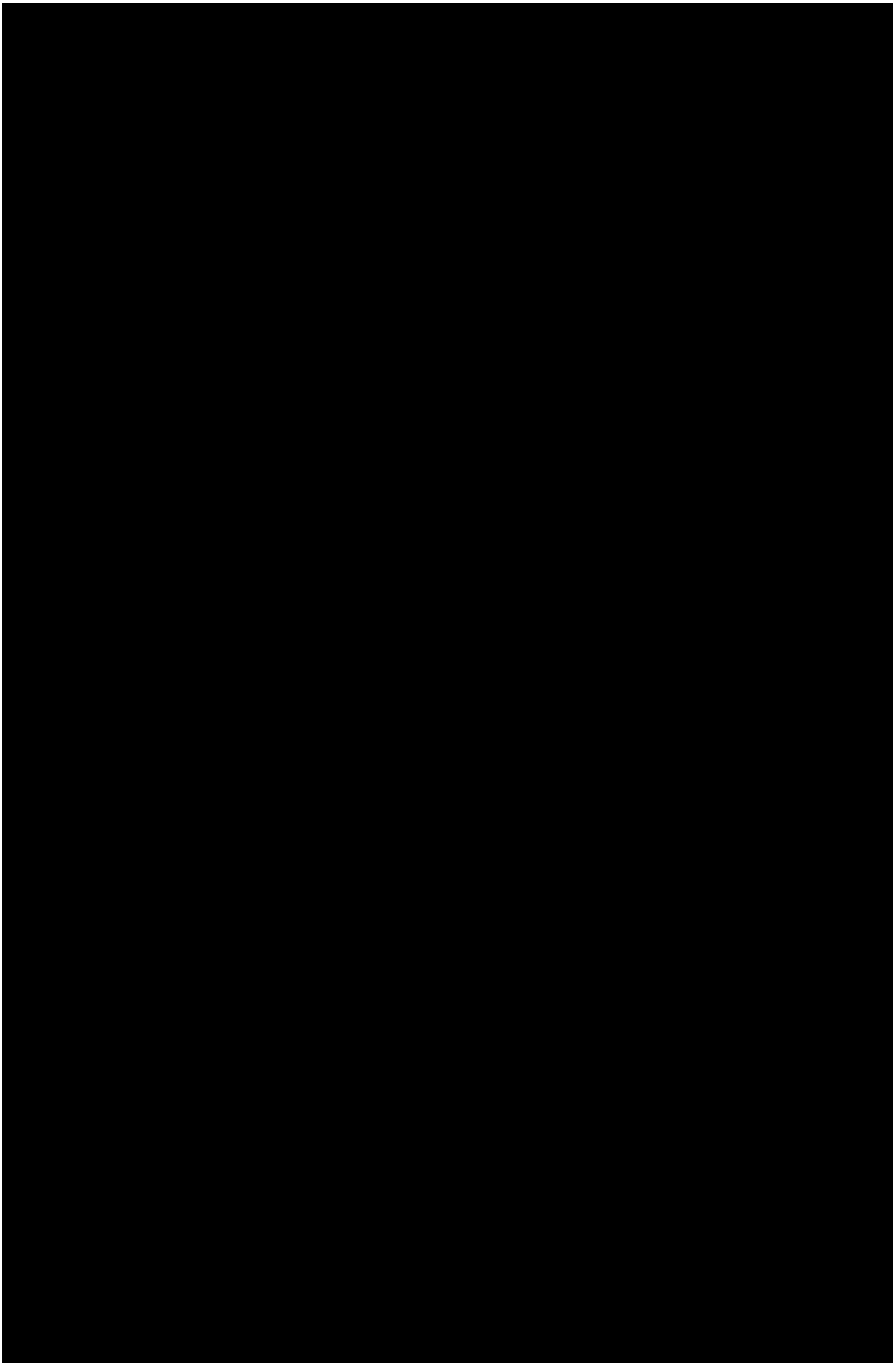
2024 Work Program and Sacred Site Clearance Request



2024 Work Program and Sacred Site Clearance Request



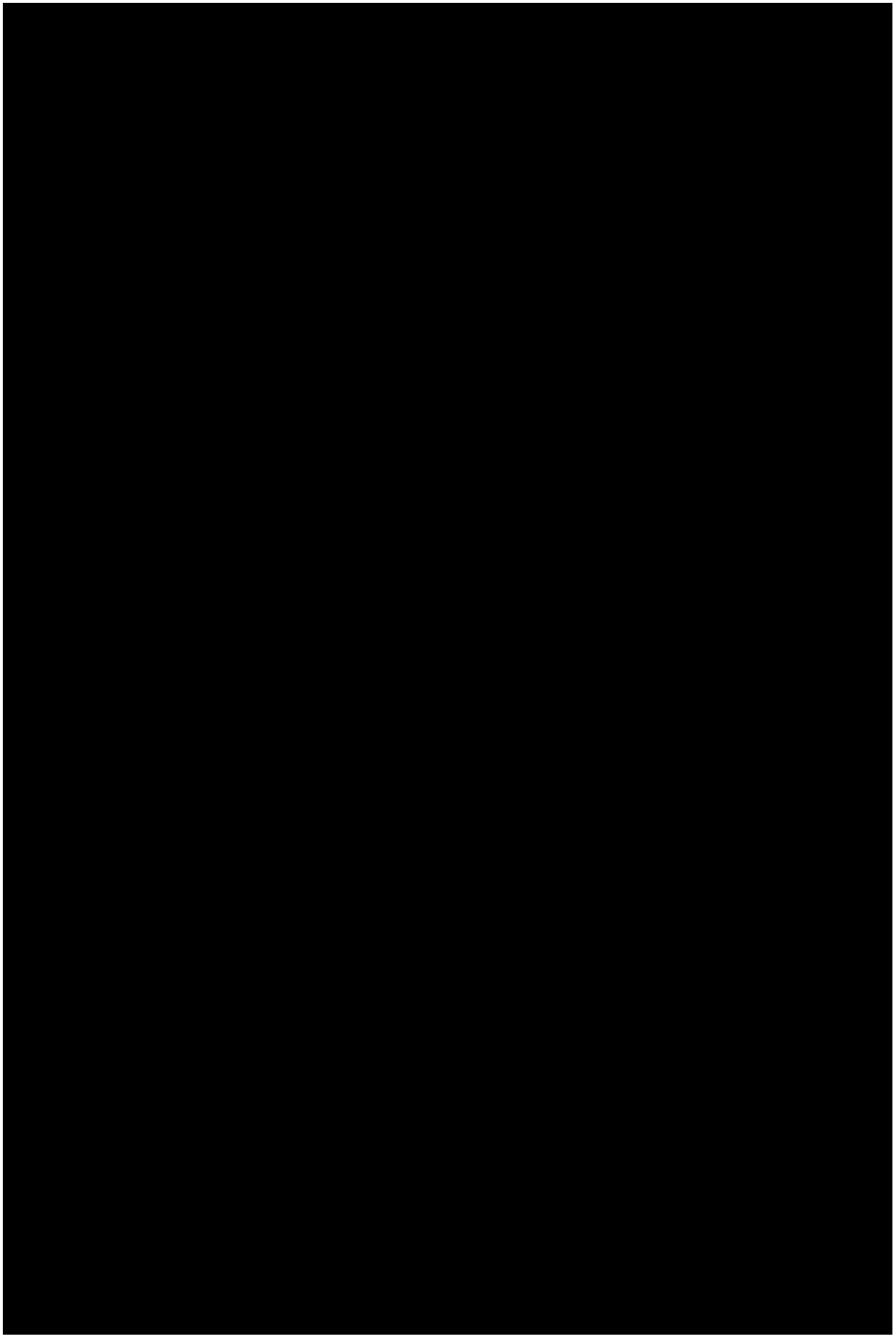
2024 Work Program and Sacred Site Clearance Request



2024 Work Program and Sacred Site Clearance Request



2024 Work Program and Sacred Site Clearance Request



2. Appraisal gas within "Subject Land 5"

The proposed 2024 sacred site clearance request within Subject Land 5 is designed to allow the future gathering, processing, transportation and beneficial use of appraisal gas to reduce greenhouse gas generation during appraisal activities (noting that approval to avoid flaring through beneficial use of gas will require separate agreement and consent from Native Title Holders). The "Subject Land 5" area was previously cleared as a during the 2021 clearances. Additional E&A activities proposed under this request are anticipated to be completed over the period from CY 2024 to CY 2026 and include:

- Beneficial use of appraisal gas, including for onsite electricity generation and sale of natural gas, CNG and LPG
- Construction and operation of low-pressure gathering pipelines to connect up well pads to transport raw water, flowback, produced water and hydrocarbons to temporary gas processing facilities
- Construction and operation of appraisal gas processing infrastructure, such as dehydration, compression, metering etc. this could be located on a well lease pad or a standalone location most likely in close proximity to the Macarthur River Mine Pipeline (MRMP)
- Electricity generation onsite, including from diesel, gas fired generators or renewable energy sources (such as solar panels or wind turbines)
- Onsite processing (and storage as required) of compressed natural gas (CNG) [redacted]
- Construction of a high-pressure sales gas pipeline within a 20-50m corridor connecting temporary gas processing infrastructure with the existing MRMP. Activity includes land clearing, trenching, pipe laying, hydrotesting, backfilling and reinstatement. The anticipated length of the pipeline is nominally between 1km to 10km in length.

An overview of "Subject Land 5" is provided in Figure 3, with digital GIS data included in this submission.

[redacted]

2024 Work Program and Sacred Site Clearance Request



APPENDIX A Detailed description of regulated activity

The following table provides details of the proposed exploration activities proposed **within the requested clearance areas**. These descriptions are indicative and general in nature, minor departures from such descriptions are likely to occur and such departures are covered as much as practicably possible by the content of this activity description.

Table 3 Description of proposed regulated activity details within the clearance areas

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site selection and scouting The first step of the process when undertaking exploration activities is site selection. Proposed E&A sites are chosen based upon their assessed chances of exploration success and are ranked as either a priority site (highly prospective) or a contingent site (if a priority site is unavailable due to a constraint). The selection of a site from a subsurface point of view, is often based upon existing exploration information (or lack of), such as seismic data, inferred resource depth (within the oil generating window for example) and previous drilling results. It also includes an assessment of geohazards, such as known major faults or structural features. Once a location has been proposed (including for other infrastructure such as pipelines, access tracks, gravel pits etc.), each site is assessed for suitability using a multi-criteria analysis. This analysis covers several disciplines, including cultural, environmental, pastoralist, regulatory and constructability requirements. Once proposed sites have been identified, each site is assessed using a desktop screening process covering the following: • Cultural constraints: sites are chosen to avoid known sacred sites and other restricted areas identified through previous NLC field clearance reports, AAPA certificates or heritage mapping. • Environmental constraints: proximity to sensitive ecological features such as water courses, flood heights, high conservation areas, threatened species and habitats and sensitive soil units • Leaseholder constraints: proximity to existing pastoral infrastructure and activities, such as cattle yards, fence lines, access tracks, water supply networks, water bores, homesteads and laneways. At this stage, leaseholders are engaged to ensure early input into the location of potential exploration sites. Activities also considers timing constraints such as mustering. • Regulatory constraints: proximity to water bores, well pad spacing, landscape amenity and proximity to roads and communities. The number of sites are re-ranked and potentially eliminated based upon their constraints assessment. A revised list of sites will then undergo field “scouting”, to further assess their suitability. Scouting involves assessment by several different specialists with a “scouting party”. Scouting activities include: • NLC field clearance: Tamboran B2 submits its proposed work program to NLC annually and then initiates field clearance surveys. Traditional owners are then engaged by the NLC and inspect all sites/areas to determine the potential for sacred sites or other areas of cultural significance in the vicinity of the activity. A final report is submitted to AAPA by NLC to generate AAPA certificates which outline the activity constraints and no -go areas. • Environmental: areas are inspected by ecologists to ground truth for areas of potential high conservation, evidence of threatened flora and fauna, overland flow paths, drainage lines, soil erosion susceptibility, areas of high habitat value (such as large hollow bearing trees) buffer zones (from high conservation value areas) and future rehabilitation constraints. The infrastructure (including access tracks,	N/A	2-6	During activity planning.	<4 weeks	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
lease pads and associated infrastructure) is orientated to minimise clearing (such as picking open woodland rather than dense Bullwaddy or Lancewood communities) and impacts on overland flow. A land condition assessment is completed for the proposed sites. • Archaeological scouting: detailed scouting is completed by a qualified archaeologist to identify any artefacts (such as spear tips, axes, stone workings etc.), scar trees or potential heritage features at the proposed sites. This is undertaken in addition to the NLC Traditional Owner clearances. • Constructability assessment: Constructability constraints are identified including geotechnical assessments, cut/fill requirements, soil types, rig operational requirements (orientation) and access construction constraints (such as access track design, water course crossings etc.). This often includes preliminary pegging of the proposed location Once the location of infrastructure has been proposed and finalised, the final location is pegged and surveyed. The engineering designs are updated and issued for construction.					
Access track construction Access tracks will be constructed to connect the proposed infrastructure to existing roads. Tracks will generally be constructed to at least NT Standard Drawings (CS3003) for Typical Cross Section for Rural Environment – Pastoral Access Road 2. Where possible access tracks will align with the existing seismic lines or other clearances/disturbances to minimise vegetation clearing. Access tracks will typically be less than 14m wide, with sections up to 20m wide where truck turn outs, erosion and sediment control and cut out drains are required. Gravel will be used to form up access tracks in places to enable all weather access. Where access tracks intersect with main roads (such as the Stuart Highway), intersections will be upgraded to accommodate turning truck traffic in accordance with the Department of Infrastructure, Planning and Logistic (DIPL) design requirements Access tracks are anticipated to be the first piece of infrastructure constructed to enable preliminary activities, such as the construction of groundwater monitoring bores.	<50ha (dependent on access track length)	<12 people	First activity required to enable civil construction and drilling.	Access tracks are likely to be continually maintained and surfaced throughout the life of the activity	 



Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
[redacted]					
Groundwater (monitoring and extraction) bore installation Installation of control and impact groundwater monitoring bores may be constructed on each of the lease pad within the underlying aquifers. These bores are required under the Code of Practice to establish baseline groundwater level and quality data prior to completing hydraulic fracture stimulation activities. Monitoring bores are required to be drilled and tested at least 6 months prior to drilling (except for exceptional circumstances) and stimulation activities and are often the first activity undertaken on a site (other than access tracks). Monitoring will continue throughout the life of the activity. The bores will also be used for groundwater extraction to support exploration activities. The construction of the groundwater monitoring bores will typically utilise a water bore drilling rig to construct the bores, similar to the rigs used to drill pastoral water bores. All groundwater monitoring bores will be constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia. Bores may drilled into the Anthony Lagoon formation (if present and saturated), Gum Ridge formation and other viable water bearing formations if encountered.. Waste cuttings, drilling fluids, muds and formation fluids will be collected in a small earthen sump and managed in alignment with the practices outlined in the. Minimum Construction Requirements for Water Bores in Australia. The fluid (which is anticipated to be fresh) will be discharged to grade and the area surrounding the lease. The formation cuttings and drill muds will be mixed with soil onsite and incorporated into the lease pad surface.	N/A located on proposed lease pad	<12 people	The drilling of water bores is generally one of the first activities undertaken to provide water for construction and drilling activities. Additional monitoring bores are also likely to be drilled prior to stimulation	<4 weeks	
Lease pad construction Each proposed lease pad will be constructed to accommodate exploration well drilling, stimulation, testing and ongoing wastewater storage and treatment; typically such pads will be less than 12 hectares. Each lease pad will be located within the proposed clearance area, with the final location based upon seismic information combined with cultural, environmental, pastoralist and regulatory constraints., . Once a suitable site has been selected the lease pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control measure and wastewater containment bund. The lease pad will then be levelled, compacted and surface with gravel to accommodate exploration activities. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). A sediment retention pond will be installed to manage surface water within the lease. Water captured onsite will be tested and released into the adjacent area. A drilling sump, flare pit, well cellars, sediment ponds, bunds and other necessary earthworks will be constructed onsite. The drilling sump will be lined with an impermeable liner to contain all drilling fluid, drilling muds, cuttings, cement returns and waste sand. The drilling sump will generally be able to contain up to approximately 3000m^3 of material	7.5-12ha	<24 people	Prior to exploration drilling	2-8 weeks	

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>(approximately 75m long x 25m wide x 4.5m deep). The drilling sump/broader site will be fenced to prevent livestock access.

The well cellars will be constructed on the proposed lease to accommodate the wellhead equipment and blow-out preventer (BOP). The cellars are typically concrete- or steel-lined and prefabricated off-site. The cellars are typically transported to the site in one (1) piece and lowered into an excavated pit. A shallow conductor casing is installed within the cellar to approximately 20m using an auger. The shallow conductor casing is designed to prevent the upper sections of the exploration well from caving in when drilling through the unconsolidated sediments. The cellar itself will be fenced at all times to exclude fauna ingress. Cellars will be typically separated from each other by 10m-20m..</td>
<td></td><td></td><td></td><td></td>
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</tr>
<tr>
<td>Gathering and main pipeline Construction

Each lease pad may be connected via ether a surface or buried gathering pipeline. The gathering pipeline will be constructed to transport both gas and water to/and from pads. Gathering pipelines will be constructed in a cleared right of way of approximately 25m wide.

If the beneficial use of gas is approved, to allow the avoidance of the majority of flaring, appraisal gas would likely be sold into the domestic gas market via a high-pressure main pipeline constructed to connect processing facilities to the existing Amadeus Gas Pipeline or McArthur River Mine Pipeline (MMRP). Pipeline corridors will be typically up to 50m, with the exact route and length dependent on final site selection.

Construction for the gathering and main pipelines generally include the following activities:

Pipeline Construction
<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Location</td><td>An initial route selection study will be conducted for the pipeline in order to optimise the pipeline route to connect to the Amadeus pipeline. Further fine-tuning and route refinement will continue throughout the planning phase of the project to ensure the route does not interfere with any sacred sites, cultural heritage or environmentally sensitive features.</td></tr>
<tr><td>Pipe</td><td>The gas transmission pipeline will be a buried, high pressure steel pipeline. It will be designed and constructed in accordance with the requirements of AS 2885 Pipelines – Gas and Liquid Petroleum. Where pipelines are to be buried, the pipeline will be deep enough so current land use activities can continue after the pipe has been installed. The minimum depth of cover over the buried pipeline will be 750mm. For road crossings the depth of cover will be increased to ensure protection of the pipeline and the asset or feature being crossed by the pipeline. For surface pipeline, pipelines will be designed to withstand grass fires and secured to the surface.</td></tr>
<tr><td>Early Works</td><td>In order to support the approvals and detailed design activities a number of activities take place prior to the main construction phases. Generally known as ‘early works’ , these activities include a range of field-based activities. These activities inform the Approvals and Design teams about field conditions and are often iterative, as additional identified information results in changes to aspects of the project scope requiring revisiting and rework of the project scope. These activities include but are not limited to general investigations, surveys for the pipeline, sacred sites, cultural heritage, environmental and soil & geotechnical.</td></tr>
<tr><td>Survey</td><td>The limits of the right of way (ROW) working width shall be marked with stakes at visible intervals.
A survey crew will work ahead of the initial clearance of vegetation from the ROW. This survey crew will utilise the project benchmarks to check</td></tr>
</table>
</td>
<td>25m to 50m wide</td><td>~15-50</td><td>Main Pipeline construction expected to start dry season 2024</td><td>3-6 months</td>
<td>  </td>
</tr>
</table>

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	and re-establish all agreed intersection points (IPs), mark the right of way boundaries and place offset/recovery pegs.					
Clear and Grade	To allow construction activities to commence, the pipeline alignment needs to be cleared of vegetation, rocks, trees, etc to provide mainline construction vehicles access. Clearing and grading shall be minimised to the extent necessary for the safe construction of the pipeline and shall in any event not exceed the maximum permissible width of the ROW except where additional working areas are defined and agreed. Light vegetation removed during clearing shall be stockpiled outside of the stripped ROW working area and will be respread during restoration unless the property owner requests that the vegetation be left as stockpiles.					
Pipe Transport and Stringing	Stockpiled pipe will be delivered to the ROW along the identified access tracks using prime movers and trailers. The specific logistics of the pipe haulage will be developed during the planning phase. The pipe trucks will only utilise specific access tracks which will be constructed (or upgraded) to allow them to pass. Pipe will be strung (placed on the ROW) directly from trailers onto saw dust filled bags or equivalent using a Vacuum lift pipe handler mounted on a hydraulic excavator, end hooks or slings depending on the pipe length and size, terrain. Strung pipe shall be supported clear of the ground and in a manner that will not damage the pipe or coating.					
Trenching (where applicable)	Where a buried gathering line is proposed, a trench is formed to accommodate the welded pipe strings and achieve the required depth of cover in accordance with the pipeline design. The trench shall be excavated along the surveyed and pegged centreline, in accordance with the minimum cover specified. Trenching operations are carried out utilising a combination of bucket wheel trenchers, rocksaws & 30T excavators. Accordingly, excavation plant, equipment and techniques will be selected to accommodate the anticipated conditions and required production rates. In areas of hard rock, controlled blasting using explosives may be required to break the rock to permit removal by excavator.					
Welding	Line pipe ends will be welded together (butt welded) to form pipe strings up to a typical length of 1km. The mainline welding crew is the engine room for the project's welding and sets the pace for mainline construction. The very agile and mobile poor boy crew carries out all difficult mainline welding sections and provides start joints for the mainline crew. Additional welding resources carry out all tie-ins and special crossings.					
Pipe laying	The coated pipe shall be placed/ lowered-in using a series of side booms so the pipeline has adequate and properly distributed slack, the pipe is not unduly stressed, and the pipe coating is not damaged. The prepared surface/ trench will be free of material that could damage the pipe, the pipe shall be laid directly on the trench bottom/ on top of the prepared surface (for above ground pipes). For buried, pipelines, the excavated material shall be used directly for bedding and padding. Where excavated material does not meet the specification, padding machines (screening machines) or similar will be used to produce bedding and padding. The trench will be back filled using the remaining trench spoil (excavated material) following the padding operation. The trench is compacted by wheel and/or track rolling with the backfilling equipment. Areas requiring higher compaction, such as road crossings, will be undertaken with an excavator mounted vibrating plate or other suitable manually operated or driven compaction equipment.					
High Point vents/ low point drains	High point vents may be installed on the pipeline to manage the accumulation of gas collected in gathering lines. High point vents typically consists of a cement pipe ring, with a vent that is placed over the pipeline to allow gas to be released. It is anticipated that these will					

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	be placed every 1-2kms, depending on the local topography. High point drains will be designed to automatically release small volumes of built-up gas, in order to prevent a gas lock in the water pipeline. High point vents will not be designed to be operated continuously and short duration of water transfers means most vents will be inactive (in comparison to CSG fields). Low point drains are designed to release water condensation from pipelines. These will be located every 1-2 km and consists of a drain within a cement pipe ring. These will be manually tested and released to the ground where the quality is confirmed to be uncontaminated.					
Reinstatement	The pipeline ROW will be reinstated which includes replacement of previously stripped topsoil and rootstock, installation of contour banks, reinstatement of fencing & install new gates and revegetation as necessary. High point vents, valve pits and low points drains will be constructed along the length of the pipeline to manage gas/ water build up and provide isolation points. Restoration of the ROW shall be completed in accordance with any easement agreements, Environmental Impact Statement, Construction Environmental Management Plan and regulatory requirements.					
Pipeline testing	The pipeline will be hydrostatic pressure tested to prove the strength and leak tightness of the installed pipeline. The hydrostatic testing will be conducted by a certified mechanical testing laboratory and all test reports are to be certified. Water sued for hydrotesting will be sourced under Tamboran's water extraction licence. Water will be released safely to the adjacent area where it is confirmed to not be contaminated.					
Commissioning	The commissioning phase of the works can be broken into two components, pre-commissioning and commissioning. Pre-commissioning is the exercise of manually proving each component of the pipeline/facility system prior to the introduction of gas. Example testing includes: • Verification that all parts are installed as detailed on engineering drawings, including position, orientation, part numbers, etc • Hydrostatic testing (confirming the system is leak tight), cleaning (blow through with air and cleanliness checks), drying and blow-through of piping • Bolt torquing of flanged connections • Functional testing of all manual valves through full extent of travel • Functional testing of all actuators and control valves through full extent of travel • Earthing compliance checks • Instrument calibration and installation checks • Insulation, continuity and point to point testing of all circuits installed by the Contractor Following the pre-commissioning phase, the asset becomes ready for the introduction of gas.					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Camp pad construction and camp operation A camp pad will be constructed adjacent to each proposed lease pad to accommodate a temporary 70-100 man camp (typically less than 70 man) to support civil construction and exploration (drilling, stimulation, testing and decommissioning) activities. Smaller, mobile camps may also be utilised across the clearance area during operations where required (for example to support seismic activities). The camp pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the camp pad. The camp pad will then be levelled, compacted and surface with gravel. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). Camps will be constructed with kitchens, offices, ablution blocks, accommodation blocks, storage containers, gymnasium, refrigeration, water treatment plan, sewage treatment plant, waste management areas, water storages, power generation, diesel storage tanks and car parking. All waste will be covered/stored in a manner that prevents feral animal access. An approved wastewater (sewage) treatment plant will be utilised to treat all sewage, with treated effluence irrigated in a fenced area adjacent to the camp (no clearing required). Treated effluence handling and irrigation will occur in accordance with the NT Department of Health requirements.	1.2-2.5ha	Typically <100 people (including housed staff)	For duration of activity	For duration of activity	
Helipad pad construction and operation A 1ha helipad may be constructed to accommodate wet season operations adjacent to each lease pad. Where prolonged access to the site is restricted, personnel and material will be helicoptered to and from site. The helicopter pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of helipad. The helipad will then be levelled, compacted, surface with gravel and then fenced. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains).	1ha	N/A	For duration of activity	For duration of activity	
Laydown/storage yard construction and operation Laydown/ storage yard may be constructed along access tracks to store materials, wastes, wastewater, equipment and other material as required. The laydown yard will be fenced to prevent access. These are typically 2.5- 5ha in size, with allowance up to 25 hectares for multiple laydowns. Laydowns may also be utilised for temporary offices/workshops/field camps or warehouse infrastructure support E&A and construction activities. The laydown/ storage yard will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of helipad. The yard will then be levelled, compacted, surface with gravel and then fenced. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains).	25ha	N/A	During exploration activities (as required)	For duration of activity	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Gravel pit construction and operation. Up to 15 hectares of gravel pits (multiple pits, anticipated to be ~5) may be constructed to support the construction of infrastructure onsite. The exact location of pits within the clearance area will be determined based on operational requirements (i.e. pits are constructed as close as needed to infrastructure) and through further testing. Up to a total of 50,000m3 of gravel may be nominally taken from pits specified in the clearance request. The likely figure actually extracted is anticipated to be materially less than this. Each gravel pit area will be progressively cleared of vegetation in 1-2 hectare stages (to minimise the required disturbance). Each pit stage will be stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control measure and to prevent overland flow access to the site. Subsoils will also be stripped, segregated from topsoil and stockpile around the edges of the gravel pit. Gravel will be periodically extracted from the pit, with the pit designed to drain internally. The Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, diversion drains and bank stabilisation using fallen debris). Once gravel activities are finished, the pit will be reshaped, with subsoils re-instated. Topsoils will be spread and fallen vegetation returned to aid site stability. The area will be temporarily fenced (where required) to allow vegetation regrowth. Seed maybe added to the site to support natural regeneration if required. The pits may be converted to pastoral watering points where appropriate and approved by pastoralists. An access track will be constructed to each pit, with the length of access track to be determined based on location of the pit The access track will typically be less than 14m wide, with sections up to 20m wide where truck turn outs, erosion and sediment control and cut out drains are required.	Gravel pit <15ha	<6 people	For duration of activity	For duration of activity	
Exploration well drilling Multiple petroleum exploration wells are proposed to be drilled at each site (typically 6-8 but potentially more where multiple formations are targeted). Wells may be drilled in stages (i.e. 1 or 2 at a time) or progressively (i.e. 8 wells drilled over a single campaign). Each well will be drilled into an underlying prospective petroleum reservoir (such as the Velkerri shale, Kyalla shale or other formation) to a typical depth of 1500m-4000m. Each well will be deviated into the horizontal position, with a lateral drilled up to 5000m (please note the depth and lateral length may change based on operational requirements and technological advances). Each petroleum well is designed and constructed in accordance with the Code of Practice for Onshore Petroleum Activities within the Northern Territory (Code of Practice) to maintain well integrity and protect aquifers and the environment. A Well operations management plan (WOMP) is required to be submitted to the regulator and approved prior to the drilling of any wells. The WOMP outlines the well design and drilling practices that will be deployed to ensure compliance with the Code of Practice and protect underlying aquifers and the environment. Each well is anticipated to be constructed with multiple casing and cement strings as per NT drilling regulations. Once the well design is approved by the Northern Territory government (NTG), a rig package will be mobilised to site, which consists of a drilling rig (comprising rig matting, a rig floor, mast or derrick, rig engine, blow out preventor, catwalk, safety flare etc.), pipe racks, casing strings, drilling rods, rig fluid system (mud tanks, shakers, mud treatment system and pipework) storage trailers, bunded chemical storage areas, workshop portable onsite offices, crib huts, mini-rig camp and sewage treatment system and irrigation area),	N/A located on proposed lease pad	<60 people	Post civil construction	Typically 45 - 90 days per well	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
freshwater storage tanks, diesel power generation, cement trucks, bulk fuel storage, water transfer pumps, fork lifts, lighting towers, crane etc. The rig will be constructed over the pre-installed conductor casing and cellar. Once functional, drilling will proceed down below the first encountered aquifer, where the first casing section of the well will be installed (either in the Anthony Lagoon Formation if present and saturated or the Gum Ridge formation (anticipated to be present). A BOP will then be installed, to ensure any influxes of gas, water or pressure are able to be safely managed during drilling of the remaining sections of the well. The drilling rig will continue to drill the various other casing and cement sections. The integrity of each of these casing strings is tested through a combination of leak off tests, formation integrity tests. casing pressure tests, cement return tracking and cement bond logs. Upon completion of drilling, a barrier integrity verification report is submitted to the regulator summarising the integrity of the well. This report is publicly available. Once each well is finished drilling, the well head is installed and the rig is either “walked” to the next adjacent location with the process repeated or mobilised to a new location. A low toxicity water-based drilling mud is to be used as the base fluid for drilling, which primarily contain salts and polymers. Drilling mud is required to maintain well control, provide formation stability, lubricate and control the temperature of the drill bit and lift cuttings to the surface. The fluid system consists of water with a sodium or potassium-based salt (to prevent formation swelling) and a viscosifying agent such as bentonite. Other low toxicity chemicals such as barite, citric acid, sodium bicarbonate and loss circulation material (fibres such as coconut coir or nut hulls etc.) may also be used. The chemicals used for drilling are consistent with those used for water bore drilling. Waste drilling muds, fluids, cuttings and mineral waste (such as cement returns, sand etc.) brought to surface will be stored in the lined drilling sump. Drilling fluids will be evaporated and then removed from the sump and disposed of offsite. Solid waste within the drilling sump will be allowed to dry out and then either removed from site or disposed of onsite in accordance with the Code of Practice. Where onsite disposal is proposed, a risk assessment will be completed demonstrating that the activity can occur with no residual environmental harm. Onsite disposal can include encapsulation or mix bury cover, depending on the site specific details and final composition of the drilling waste material. Subsurface diagnostic tools will be run on the well during and after drilling to understand the nature of the target reservoir. Some sections of the formation may be cored or have sidewall samples collected, which will add further analysis of the reservoir properties. To assist with determining the suitability and capacity of these formations for potential gas extraction activities, diagnostic fracture injection test (DFIT) may be conducted across a number of shale intervals to evaluate the geo-mechanical and reservoir properties of the targeted formation. Prior to a DFIT, a cement bond log and casing pressure test is completed to ensure the integrity of the cement and steel casing. A DFIT involves the injecting of small volumes of a water (approximately 30 barrels (5,000L) per DFIT) at low pumping rates to create a small fracture in the target interval. The well is shut-in, and the pressure allowed to fall-off naturally. Monitoring the fall-off pressure over time allows information to be derived about the reservoir. The fluid does not contain proppant so that the fracture closes naturally when the fluid leaks off into formation. The analysis of pressure, during injection and after shut-in, provide powerful tools for understanding and subsequently informing the design for a future hydraulic fracturing process (not in this scope). Any returned fluid will be stored within double lined tanks and disposed of offsite at a licenced facility. All waste drilling fluids, muds, cuttings, DFIT return fluid and cement returns will be managed in the existing lined drilling sump on-site (or equivalent tanks or fit-for-purpose containers). Once drilling has been completed, this material will be sampled and tested as per the code					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
of practice and a risk assessment completed to determine whether onsite encapsulation or mix-bury-cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with native soil and encapsulated within an impermeable liner. A cap of clean material will be placed over the liner to enable vegetation growth.					
Hydraulic Fracture Stimulation Upon completion of drilling activities, hydraulic fracturing stimulation (HFS) plant and equipment (commonly referred to as a "frac spread") will be mobilised to site to commence HFS (or stimulation) activities on each of the drilled wells. A frac spread typically consists of: • Data Van – on-site office to execute stimulation activities • Water Storage – tanks will be constructed on-site, capable of managing both make-up water (for frac fluids) and flowback water. Tanks will be double lined with leak detection capable of monitoring any leaks between the primary and secondary liner • Proppant Trailer – a large sand storage and delivery trailer that holds the proppant • Hydration Unit – used to add stimulation additives and viscosifying fluids • Blender Unit – used to mix proppant and fluid additives, prior to its injection into the well • High Pressure Pumps – pumps to inject the hydraulic fracturing fluid mixtures from the Blender Unit down the well, via the surface lines and hydraulic fracturing wellhead or coiled tubing unit • Coiled Tubing Unit – a large length of coiled steel pipe that can be temporarily installed in the well to perform various downhole operations • Wireline unit – plug and perforation deployment • Ancillary support equipment and buildings – offices, workshop, cranes, chemical storage area, equipment storage, power generation and all other activities required to support stimulation activities. Stimulation involves the injection of a slurry, primarily consisting of water (raw water or a mixture of raw water and recycled flowback wastewater) and sand (proppant), plus a small percentage of chemicals at high pressure into the target section of the horizontal wellbore. Typically, >90% of the total volume of stimulation fluids is a combination of water (fresh and recycled wastewater) and sand (~6-8%), with the remainder as fluid-conditioning additives (~2-4-%). Prior to the commencement of stimulation activities, the integrity of the well is tested with a cement bond log and pressure casing tests and an integrity report generated, which is submitted to and assessed by the regulator prior to the commencement of stimulation activities. The stimulation fluid is generated through mixing freshwater, recycled flowback, chemicals and sand in blenders. Stimulation fluid is then pressurised by the high-pressure pumping units and directed downhole via a manifold to the discrete target intervals along the horizontal wellbore (referred to as 'stages'). Each stage will be isolated and perforated using a plug and perforation gun assembly deployed via a wireline unit. As the pressure is sustained, the fractures propagate radially from the well, through the target rock. Once optimal fracture propagation has been achieved, the proppant (sand) is pumped down the well and into the open fractures. This process is repeated for each stage. The final number of stages pumped in each well is dependent on the useable length of the horizontal wellbore and in-situ geological conditions. Once all stages are complete, the well is suspended awaiting completion and well testing activities. Wellbore pressures are monitored during each stimulation, to ensure the operations have not compromised the integrity of the production casing or the cement barriers. A Maximum Allowable Operating Pressure (MAOP) is an important engineering parameter used to define the operating envelope (i.e. the safe maximum pressure that should not be	N/A located on proposed lease pad	<50 people	Post E&A well drilling	2- 8 weeks per well depending on stimulation size	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
exceeded). The maximum allowable pumping pressure (MAPP) is set below the MAOP to allow for uncertainty and provide an additional safety margin so the MAOP is not exceeded.					
Exploration well completion Once each well has been stimulated, a completion rig will be mobilised to site to "complete" the well. This involves installing downhole equipment such as packers, plugs, production tubing, artificial lift etc. required to enable the production testing.	N/A located on proposed lease pad	<12 people	Post stimulation	1-2 weeks	
Well testing Once the well has been completed, the well will be brought online and tested. To enable the testing, a well test package will be installed at the site consisting of: • Separators (to separate gas, condensate and water) • Flares (either a vertical or horizontal), • Flare pit (if a horizontal flare is utilised • surface pipework, manifolds, and tanks • communication and generator shacks • workshops/ storerooms • bulk diesel tanks • wastewater storage tanks (converted freshwater storage tanks used for stimulation makeup water) • Water transfer equipment • Wastewater evaporation and treatment units The E&A well will be underbalanced (or "unloaded") to initiate production, either through its own energy or through artificial lift (such as through a Nitrogen lift or pump). The fluid and gas will be sent through a separator, with all hydrocarbon metered and flared. Flowback water will be discharged from the separator into designated wastewater storage tanks. Well testing will typically be undertaken form a period of depending on the objective of the well. Multiple well testing operations may be required to test the behaviour of the formation to determine whether extended shut ins can affect well productivity. Gas will be either flared, sold (piped or compressed/liquified and trucked) or beneficially used onsite to reduce greenhouse gas emissions where possible.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	Typically 30 days to 24 months.	

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>
Appraisal gas sale

To minimise flaring during the production testing phase of the wells Tamboran will be developing facilities and a pipeline to enable this gas to be captured rather than flared. This is anticipated to reduce appraisal emissions by approximately 90%.

Options are currently being assessed with a priority on speed of installation to limit flaring and economic affordability.

The initial solution is likely to be a Compressed Natural Gas (CNG) or mini Liquified Natural Gas (LNG) facility to enable gas treatment, compression and truck loading of the CNG or LNG so the gas can be delivered to and injected into either the AGP or the McArthur River Mine Pipeline and to any customers seeking truck deliveries of CNG/LNG as a fuel or diesel alternative. This approach is commonly used around the world for initial production gas or virtual pipeline supply, however it is limited in the amount of gas it can capture. Local generation and power consumption for a data centre on site is another possibility for this initial gas but again will be limited in capacity.

In parallel, initial treatment and compression facilities will be developed to compress the gas into a new pipeline connection to the AGP. This will enable all the extended production gas to be captured and flaring stopped.

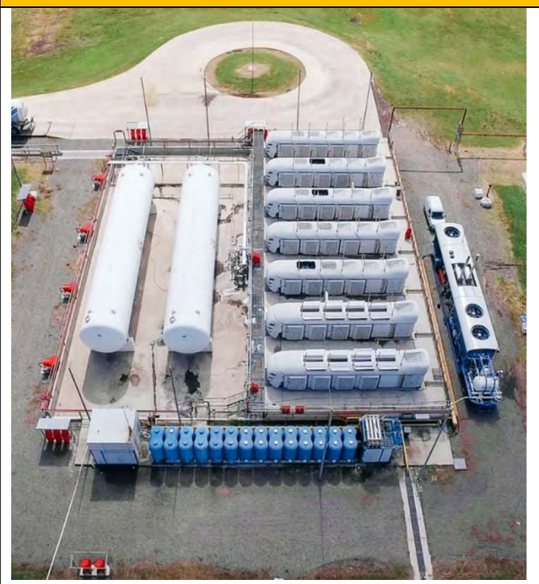
Appraisal gas facility construction
<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Mobilisation</td><td>Establishment of access track into site and site offices and amenities, laydown areas, erosion and sediment controls installation as per the requirements of the approval management plans, site communications links and construction set out survey.</td></tr>
<tr><td>Earthworks and Civil Works</td><td>Preparation of top soils and sub-fill for establishment of foundation – including excavation and removal of unsuitable fill materials from site, import of required sub-grade fill materials, grading and levelling of the facility pad and final capping and import of road base materials to design specification. Works may also include ongoing upgrading of existing access tracks.</td></tr>
<tr><td>Underground Services</td><td>Trenching of facility pad as required to install buried services and piping, backfill and compaction of trenches, including installation of crossing reinforcement for protection of buried services in trafficable areas.</td></tr>
<tr><td>Piling</td><td>Installation of steel pile foundations by driving into the prepared facility pad and/or pre-drilling as required and welding of pile caps onto piles in preparation for skids to be landed.</td></tr>
<tr><td>Structural Mechanical and Piping</td><td>Installation of pre-assembled skidded pipe rack modules onto foundations requiring lifting onto pile caps and welding in place, bolting flanges to connect interfacing skids and equipment packages, installation of site run utilities piping, lifting and welding in place of skidded equipment packages.</td></tr>
<tr><td>Electrical and Instrumentation</td><td>Installation of cables and cable supports, ladders and trays, termination of cables into relevant panels (control and low voltage), installation of tubing and glanding of instruments, mounting instruments onto piping or instrument stands.</td></tr>
<tr><td>Plant Commissioning</td><td>This stage involves the testing and commissioning of all equipment on the site, in preparation for operations.</td></tr>
</table>
A range of temporary facilities will be required during construction. These may include work areas for equipment and pipe, storage and lay down areas, and a site office.
</td>
<td>9 Ha</td>
<td>< 10 people operating and <50 people during construction</td>
<td>Upon completion of well testing- potential 2024.</td>
<td>Until Production Licence</td>
<td>

Figure 4 Example facility – the Buquebus LNG Facility in Buenos Aires Argentina


Figure 5 A truck mounted compression facility
</td>
</tr>
</table>

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
The location of the temporary facilities will be primarily based on logistical requirements. This will include ensuring facilities are located at a suitable distance from watercourses, are not endangered by threat of flood, do not require clearing of sensitive vegetation and are managed in such a way as to ensure no long-term land contamination issues. Typical manning during operations is <10 people. During construction, ~50 people may be required. These are indicative numbers with the final manning levels will be finalised during the activity planning.					
Wastewater tank storage Flowback and drilling wastewater will be stored one each location or piped to a centralised location for storage via gathering lines. Wastewater will be recycled within the drilling or stimulation process to reduce raw groundwater volumes. Wastewater not earmarked for recycling will be treated on site via evaporation within open tanks (or other treatment technologies such as enhanced evaporation units, brine crystallisation etc.) and removed from site upon completion of activities. Double lined wastewater tanks will be utilised to store wastewater, with the volume and number of tanks installed dependent on the anticipated flowback return volume. Wastewater storage tanks have continuous level monitoring, with leak detection sensors located within the interstitial space between the primary and secondary liners. It is anticipated that between 10ML to 30ML of tanks storage may be installed onsite, with a combination of enclosed tanks and open treatment tanks. In accordance with the Code of Practice, sufficient enclosed tank capacity must be onsite to store all wastewater. Flowback can only be stored within open tanks where undergoing treatment (such as evaporation). Open evaporation tanks must have a 1:1000 annual re-occurrence Interval (ARI) wet or dry season freeboard (i.e. available tank space to accommodate rainfall), which is typically 1.3M or 0.3M respectively. The lease pad or a specifically constructed wastewater storage areas will be bunded to contain 110% of the volume of the largest tank stored onsite. Wastewater storage tanks may be deployed for extended periods of time (potentially several years) to allow ongoing evaporation or treatment. Wastewater from other sites across the basin may also be used to stored onsite, to assist in wastewater treatment/ management. The treatment of wastewater may also be undertaken within Tamboran infrastructure footprint (such as lease pads or laydown yard) to reduce the amount of offsite wastewater trucking.	N/A located on proposed lease pad	<4 persons	During wastewater storage activities.	3-36 months	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Flaring During well testing and where gas cannot be beneficially used or sold (such as during facility downtime etc.) , produced hydrocarbons (gas and liquids) will be flared onsite, with a vertical flare used to manage gas and a horizontal flare used to manage condensate where it is anticipated to be encountered. The vertical flare will be an American Petroleum Industry (API) 537 and a US EPA AP 42 compliant unit, with a 98% combustion efficiency. The vertical flare will have a constant pilot flame, with an autoignition system that provides electrical impulses to a spark plug continuously. If the flare was to go out, the spark would ignite the flare within 1.3 seconds. A horizontal flare may be utilised to combust condensate if produced during well testing. A horizontal flare will been equipped with 3 independent nozzles, located in a 20mx 10m clay lined pit. Flares will be located at least 45m from the surrounding vegetation, with flaring not undertaken during total fire ban periods.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	During production testing.	
Condensate management (Storage and trucking) Where condensate (liquids rich gas that “condenses” when brought to the surface) is generated, it is separated and stored within double lined condensate tanks. Condensate may either then be trucked offsite for beneficial use or combusted in the horizontal flare.	N/A	1-2 trucks per day	During exploration activities	During production testing.	
Drilling waste management All waste drilling fluids, muds, cuttings, DFIT return fluid and cement returns will be managed in a lined drilling sump on-site. Once drilling has been completed, this material will be sampled as per the Code of Practice and a detailed risk assessment completed to determine whether onsite encapsulation or mix bury cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with clean fill and encapsulated onsite within an impermeable liner. It will then be buried with capping material to enable vegetation re-establishment. To reduce the number of sites where material is mix-buried covered, multiple wells from other locations may be disposed of at a selected location.	N/A- within proposed lease pad	< 6 people	Upon completion of drilling activities	7 days	

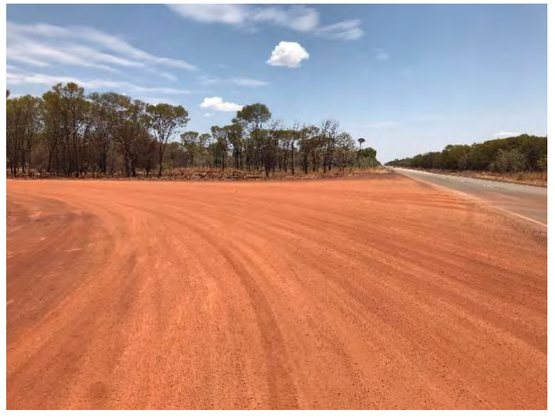
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wet season operations Exploration activities (including drilling, stimulation and well testing operations) may occur over the wet season. Where wet season operations are undertaken the following risk controls will be implemented: • All chemicals, fuels, equipment, tanks and materials required for ongoing operations will be stored on-site prior to the onset of wet season significant rains (notionally December or as predicted) • All equipment required to respond to emergency situations will be on-site; this includes earth moving equipment, vacuum trucks, wireline rigs, cementing equipment etc. and equipment and material to deal with well control issues, spills and other emergency events. • All chemicals storage areas will be bunded, with covers used (where safe and appropriate) to prevent rain ingress and bund overflows • Enclosed tanks will be utilised as the primary measure to store flowback wastewater with enough enclosed tank capacity to store all flowback wastewater on-site • Enclosed flowback wastewater storage volume will be sufficient to manage all flowback wastewater stored onsite • Open working evaporation tanks and mud sumps will have enough freeboard to manage an entire 1:1000 ARI wet season event (not just one (1) rainfall event but an entire season's rainfall total) • Helicopters will be used to transport people and supplies into and out of the site when access is restricted • No transportation of wastewater or chemicals will be undertaken during the wet season unless the access to the site is safe. • Wastewater storage area is bunded, which will prevent all off-site release of chemicals and stormwater. • During flowback wastewater storage, stormwater will be retained on-site via the sediment retention pond prior to release. • Overland flow will be diverted around lease pads as far as reasonably practicable.	N/A	N/A	October – May	7 months of the year	
Microseismic survey and Induced Seismic Monitoring Microseismic Surveys are undertaken to monitor 'listen to' the Hydraulic Fracture Stimulation Operations on each of the sites. Seismic Receivers called geophones are individual weatherproof units that contain a sensitive seismic recording device, memory storage, a long-life battery and GPS locator. The Geophones are deployed 5-25 metres apart along lines or in a grid over an area of 30-40km2 around each of the well during stimulation activities. Geophone deployment locations are located on foot by GPS locator. A handheld battery drill is used to create a 4cm diameter hole with an auger bit, a small quantity of water may be used to stabilise the soil. The Geophone is inserted into the hole so that the top of the receiver is flush with the surface of the ground (see picture) The Geophones deployed prior to the commencement of stimulation and retrieved after the stimulation has concluded. Deployment and retrieval of the Geophones is undertaken in small teams of 2 or 3 people, with the number of deployment teams depending on survey size. The teams are supported by a light 4WD vehicle or an All-Terrain Vehicle to carry equipment, gear, water, communication (radio/satellite phone), first aid kits and safety gear.	Minimal	3-9 personnel.	Deployment of Geophones before stimulation. Retrieval of Geophones after stimulation.	1 month (one week deployment, two weeks Stimulation, one week collection)	

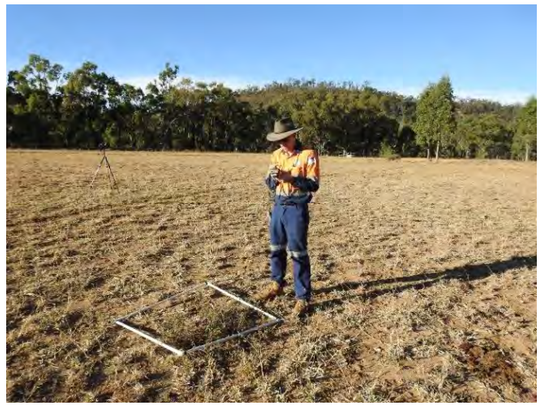
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Induced Seismic Monitoring will be undertaken at the same time as the Microseismic monitoring. A temporary seismic receiver is installed ~1km from the well site, with a small amount of other equipment such as solar panels and data transfer equipment. The equipment can be fenced off with temporary fencing if there are cattle in the area. The data from the seismic receiver is sent wirelessly back to the well site to enable live monitoring of seismic events during Hydraulic Fracture Stimulation. The Induced Seismic Monitoring equipment is installed prior to Hydraulic Fracture Stimulation, and remains installed, collecting data for up to 2 months after the conclusion of Hydraulic Fracture Stimulation. Minimal clearing or heavy machinery is required for either activity, and the activities are considered to have a minimal impact, like that of scouting activities.					
Site monitoring and inspections consisting of the following: • **Groundwater monitoring:** Groundwater monitoring bores are required to be installed on the lease pad before the commencement of hydraulic fracture stimulation activities. Groundwater monitoring is undertaken at the site commencing 6 months before stimulation and then quarterly for 3 years after. Groundwater monitoring involves purging a monitoring bore of water, measuring field parameters (level, electrical conductivity) and collecting laboratory samples and • **Site and exploration well monitoring-** an operator or contractor will access the site to perform checks on the exploration well and stability of the site. Checks include pressure readings and visual checks of valve integrity. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed fortnightly. • **Weed inspections-** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify weeds. In some cases, a helicopter may be utilised. Contractors may perform spot sprays with a NTG recommended weed treatment. Surveys are completed pre and post wet season. • **Erosion and sediment control inspections-** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify erosion or stability issues. Inspection will be used to schedule maintenance to repair any defects identified. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed pre and post wet season. • **Gas leak detection surveys-** Access to the site by 2- 3 contractors or Tamboran personnel in light vehicles to perform mandatory gas testing using handheld gas meters. Surveys are completed every 6 months. • **Build up pressure monitoring-** Post stimulation and well testing, the exploration well may be shut in with pressure monitoring equipment installed to monitor build up pressure. This requires the installation of a solar panel and telemetry equipment, with monthly equipment inspections (typically)	N/A	<2-6 people	Fortnightly/ 6 monthly (depending on activity)	1 day per inspection	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
					
Site maintenance (lease pad, camp pad, access tracks and gravel pit) Each site will be periodically maintained, which includes grading, erosion and sediment control repair, vegetation management, firebreak management, weed management, fence repair and all other ancillary activities required to maintain a site and associated with infrastructure. This includes maintenance of the access tracks. The work will be undertaken by civil maintenance contractors and Tamboran personnel.	N/A	<10 people	6 monthly- pre and post wet season maintenance	<7 days per activity depending on the nature of the activity.	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well head maintenance Maintenance is completed annually on each well. Maintenance primarily includes valve checking, testing, greasing and (in some cases) replacement, as well as any other activities required to maintain the integrity of the well.	N/A located on proposed lease pad	<20 people depending on activity	Annually	< 7 days per activity- depending on nature of maintenance.	
Well intervention- data acquisition and testing Subsurface activities may be undertaken periodically on each of the well to perform maintenance or collect additional information on the properties of the well or the reservoir. These type of well interventions typically include performing cement bond logs, casing pressure tests, running reservoir evaluation or production logging tools, cement and casing remediation activity (if required during the life of the well), setting downhole mechanical plugs and gauges, casing perforation, subsurface barrier maintenance/ installation and production tubing installation/repair or replacement. This generally involves the use of a variety of equipment dependent on the activity being completed. This typically may involve any of the following equipment: completion rig, coil tubing, wireline unit, data van, cement or pump truck, crane, trucks, power generation, support trucks and other support vehicles.	N/A located on proposed lease pad	<20 people depending on activity	Ad hoc requests- typically 2 interventions within the next 5 years	<10 days per activity	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Petroleum well plugging and decommissioning. Once a petroleum well is no longer required, each well will be decommissioned. Decommissioning involves the permanent removal of the well through the placement of cement plugs to isolate the target reservoir from overlying aquifers in accordance with the Code of Practice: Onshore Petroleum Activities within the Northern Territory (Code of Practice). Once plugs are installed, they are pressure tested to confirm the underlying formations have been adequately sealed off. The well head is then removed. A permanent marker is added to indicate the location of the plugged and abandoned well.	N/A located on proposed lease pad	<12	End of well life	<10 days	
Chemical and fuel storage- All chemicals and fuels (diesel) required to support exploration activities will be stored in accordance with the relevant regulatory requirements, including the use of secondary containment (bunding) onsite. The Code of Practice has implemented a range of additional controls, including requirements for routine inspections, emergency response procedures and spill management. Anticipated chemical and fuel volumes vary dependent on activity, but may involve the storage of the following types of chemicals and volumes: • Stimulation and drilling chemicals (friction reducers, surfactants, crosslinkers, breakers, buffers, acids, bases, biocides, scale inhibitors, corrosion inhibitors, clay stabilisers, loss of circulation material, drilling muds, salts etc.) Volumes are typically less than 20KL per chemical, with some chemicals stored at higher (such as pH control) or lower (such as biocides and corrosion inhibitors) volumes depending on their purpose and planned use. • Diesel – typically 100KL stored but may be 500KL if wet season activities are proposed. • Other chemicals and hydrocarbons- such as oils and greases, lubricants, hydraulic fluid, cleaning chemicals, domestic chemicals etc. used to support operations.	0.5ha (on existing lease pad or laydown yard)	N/A	During exploration activities	During exploration activities.	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Waste management: Any waste generated during exploration activities will be stored onsite in accordance with the NT *Waste Management and Pollution Control Act 1998* and Code of Practice and transported offsite to a licenced waste management facility. All wastes (other than drilling mineral waste) will be stored within skips or equivalent and removed from site at the end of each activity.	N/A	1 -2 trucks per day during operations	During explorations activities	During explorations activities	
Groundwater extraction: Groundwater extractions from the purpose built groundwater monitoring onsite or another approved extraction bore (which may include trucking water from adjacent properties) will be completed periodically to support exploration activities. All groundwater take will likely be from the Gum Ridge Formation and will be licenced under Tamboran's existing Water Extraction Licence (WEL) GRF 10285. A new WEL may be submitted to increase the water take and/or covering take an alternative formation where present. It is anticipated that groundwater extraction volumes to support this program will be in the order of 250-600ML per year (conservatively) , primarily used for civil construction, drilling and to stimulate the E&A wells. Once drilling and stimulation has ceased, minimal ongoing water extraction from the site will be required. Where possible, recycled flowback will be utilised within stimulation to reduce raw water usage.	N/A	N/A	Ongoing to support exploration activities.	During exploration activities	
Traffic management Access to the site will be via a combination of existing and new access tracks, located approximately 15-20km South of Dunmarra on the Stuart Highway. Minor traffic disruptions may occur during the construction of the access track intersection with the Stuart highway. During this period, a traffic management plan will be implemented, with traffic control utilised in accordance with DIPL requirements. Peak traffic volumes are anticipated to be associated with the drilling rig mobilisation and demobilisation. Traffic volumes may reach up to 44 vehicles per day spread over a 4 week period. During operations (drilling, stimulation or well testing), vehicle movements to the site are anticipated to be less than 10 movements per day. This period is likely to extend typically 60 days per exploration well, 45 days per stimulation and during the duration of a well test/appraisal gas sale (30-365+ days). Once the well is suspended or decommissioned, vehicle movements will reduce down to 1 vehicle per fortnight or 1 vehicle per 6 months respectively.	N/A	N/A	During operations	During operations	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site rehabilitation Within 6 months of the E&A wells being plugged and decommissioned, a site will be rehabilitated. This involves: a) the removal of all surface facilities (well heads, fencing, water bores, tanks etc.) b) deep ripping of compacted surfaces c) recontouring landforms d) respreading of topsoil from the topsoil stockpiles, e) re-seeding (if required;) and f) ongoing monitoring and maintenance of the rehabilitation.	N/A		Within 6 months of the plugging and abandonment of all E&A wells	<14 days, with ongoing monitoring and maintenance	 

Appendix B Summary of Environmental outcomes, impacts, risk and controls

An overview of the potential environmental outcomes, potential impacts and risks associated with the proposed exploration activities within this clearance request are summarised in Table 3. This information will also be provided in the EMP covering the proposed regulated activity, which will be submitted to the Department of Environment, Parks and Water Security (DEPWS) for formal assessment and approval.

An environmental outcome means an outcome that will be achieved if the environmental impacts and environmental risks of a regulated activity are reduced to a level that is as ALARP, and acceptable.

Environmental impacts are defined as any adverse change, or potential adverse change, to the environment resulting wholly or partly from a regulated activity.

Environmental risks are defined as the chance of something happening that will have an environmental impact, measured in terms of environmental consequences and the likelihood of those consequences happening.

Both the consequence and likelihood of a potential impact can be reduced through the adoption of controls, which must be applied to reduce a risk down to an ALARP and acceptable level.

Table 4 Environmental outcomes, impacts, risk and controls

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
Groundwater use and quality	• To manage exploration activities to prevent unsustainable depletion of groundwater resources • Preserve groundwater quality to protect environmental and pastoral use	• No adverse changes to groundwater quantity is anticipated to be associated with exploration activities. • Impacts to aquifers levels anticipated to be negligible, with rapid recharge observed from other Gum Ridge Formation bores utilised within the Basin. • No material changes to groundwater quality anticipated form exploration activities. • No impact to Groundwater Dependent Ecosystem's (GDE) or stygofauna from exploration activities (extraction and well construction) • Reduction in pastoral productivity through reduced groundwater volumes	• Low risk of groundwater contamination from drilling fluids during construction of the conductor/ surface casing in the Cambrian Limestone Aquifers due to the selection of low toxicity drilling fluids • Low risk of cross flow of deep formations (such as the target shales) to shallow aquifers through inappropriate well barrier design and construction due to the presence of the Code of Practice controls and verification processes. • Low risk of crossflow through fracture growth into aquifer from stimulation activities allowing the migration of fluid and gas due to the controls within the Code of Practice and underlying separation distance between the target formation and Cambrian Limestone aquifers. • Low risk of stimulation activity inducing seismic activity that enables cross formational flow between shallow aquifers due to seismic stability of region and lack major faults or fracture zones. • Low risk of stimulated zones intersecting offset wells (including the adjacent horizontal wells) or intersecting an existing geohazard due to seismic control, pressure monitoring during stimulation and lack of older petroleum wells in close proximity. • Low risk of crossflow/well integrity caused by the deviation of an E&A well into the adjacent well during drilling due to downhole GPS tracking tools and proximity alarms • Low risk of leakage of either flowback, produced water, or hydrocarbons (liquid and gaseous) from suspended or abandoned wells to groundwater due to well design and integrity management. • Low risk of leaks from gathering lines, with gathering lines constructed as per Australian Standard, leak detection in place to identify pipeline failures and routine inspections completed. • Low risk of surface contamination from storage and disposal of drilling fluids, additives, muds and cuttings on-site due to low toxicity of drilling muds and disposal risk assessment process. • Low risk of groundwater contamination from surface spills from storage, handling and transportation of flowback water due to the storage and spill management requirements outlined int eh Code of Practice. • Low risk of groundwater contamination from the storage, handling and transportation of chemicals, fuels and wastes due to the mandatory code of practice controls (such as mandated use of secondary containment) • Low risk of groundwater contamination from overtopping of drilling sumps and flowback tanks (including during wet season) due to level alarms and use of enclosed tanks. • Low risk of groundwater contamination from a failure of flowback storage tank due to the design standards of the tank (cyclone rated steel tank structures) and routine integrity inspections	• All petroleum wells are to be designed, constructed, operated and decommissioned in accordance with the mandatory controls within the Code of Practice. The Code of Practice outlines specific controls measures designed to protect underlying groundwater resources including: o Exploration wells designed with multiple cement and steel casing barriers to protect aquifers o Drilling fluids and muds must have a low residual toxicity o Groundwater monitoring must be completed before and after stimulation to detect contamination o Well integrity confirmation to prove barrier performance aquifer isolation (casing pressure tests, formation leak off tests, cement bond logs etc.). o Separation between stimulated shale resources and aquifers must be sufficient to ensure the risk of fracture growth is ALARP o Pressure monitoring completed to ensure maximum allowable operating pressure is not exceeded during stimulation. o Ongoing well integrity monitoring and maintenance throughout the life of each well to ensure aquifers are protected o All wells are to be decommissioned in accordance with the Code of Practice, with cement plugs utilised to separate aquifer units. • All surface storages of wastewater and chemicals to have secondary containment to prevent spills to the ground • An emergency response plan must be implemented outlining how spills and emergencies will be responded to. • Drilling fluids and wastes to be stored within a lined sump • Gathering lines and pipelines constructed as per Australian standard, leak detection in place to identify pipeline failures and routine inspections completed. • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Groundwater monitoring from monitoring bores installed at the site must be completed prior to and after stimulation to detect any contamination. • All water take covered by an existing Water Extraction Licence (WEL) GRF 10285 • New extraction bores must model potential impact on adjacent pastoral bores prior to being added to WEL. • All water take to be metered and reported quarterly to the regulator • No pastoralists groundwater bores within 1 km of each proposed site • Flowback to be preferentially used in stimulation fluid to reduce raw water usage.

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
			• Low risk from over extraction of groundwater for civils, drilling and stimulation activities due to limited nature of take (one off), yield of the Cambrian Limestone Aquifers and available allocation volumes (as assessed in the WEL).	
Soils	• Avoid, minimise and control soil erosion and discharge of sediment or soil into waterways or established drainage systems • Minimise disturbance of soil, vegetation and drainage during site activities • Prevent the contamination of soil to maintain the viability of soil resources • Minimise residual impacts to pastoralist usage of exploration areas	• Clearing of vegetation to support exploration activities. • Soil compaction from access tracks, leases and seismic lines. • Increased sedimentation transportation from disturbed areas • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Medium risk of soil erosion from cleared areas (access tracks, lease pads, camp pads, gravel pits and laydown areas) occurring on disturbed sites due to high intensity wet seasons. Risk is a low consequence (minor impact), possible (<50% chance of occurring) event. • Low risk Reduction in land production through poor erosion and sediment control practices • Low risk of spills/leaks from the on-site storing and handling of fuels. Condensate, hydrocarbons, drilling additives, stimulation additives, flowback fluid, solid wastes, storage and transportation of wastes causing soil contamination. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of chemical and waste transportation accident causing soil contamination due to licenced chemical/ waste provider use, spill response and emergency response requirements. • Low risk of contamination from on-site disposal of drill muds and cuttings with site specific assessment completed to ensure disposal is environmentally acceptable. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of wastewater evaporation mist transported offsite during wastewater treatment due to wind speed/direction cut offs and routine site inspections during operations. • Low risk of greywater and sewerage disposal from camp wastewater treatment plants due to the irrigation area being appropriately sized, fenced and quality aligning with the NT Department of Health requirements. • Low risk of reduction in land production through poor infrastructure placement as infrastructure is preferentially located in existing disturbed area, with no sensitive soil types present in the immediate vicinity. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements • Low risk of pipeline subsidence creating erosion	• Site selected to avoid sensitive soil units and slopes which may increase erosion hazard. • All land clearing (including during the establishment of seismic lines) to align with the requirements of the code of Practice and NT Land Clearing Guidelines (2019) • Erosion and sediment control practices to be utilised at all disturbed sites to minimise erosion. • Sites (including gravel pits) maintained to minimise sediment releases, with erosion and sediment control plan in place • Pre and post wet season monitoring completed on all disturbed areas (including seismic lines) to identify and repair erosion • Construction within the wet season to be avoided to reduce the erosion risk. • Vegetation clearing watercourses to be avoided as far as reasonably practicable (i.e. only when a new access is required to be constructed) • During seismic surveys, vegetation clearing within open woodlands to be minimal • All chemicals and fuels to be stored with secondary containment as per code of Practice. • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Stormwater to be retained onsite during wastewater storage and tested prior to release • All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • Disposal of drilling muds, cuttings and mineral waste to be undertaken in accordance with Code of Practice, with onsite disposal only permitted where the potential harm to the environment can be demonstrated as ALARP and acceptable. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist input. • Pipeline monitoring and repair work to minimise/ respond to pipeline subsidence

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
Emissions (dust, greenhouse and combustion emissions)	• Avoid environmental nuisance at sensitive receptors • Minimise impacts to pastoralists and surrounding ecological communities from dust • Minimise greenhouse gas emissions	• Dust on vegetation in the immediate vicinity of activities reduces plant palatability • Impacts of dust nuisance to birds and fauna in the immediate vicinity of activities, specifically access tracks and seismic lines • Emissions from the combustion of diesel. • Generation of Greenhouse gasses	• Low risk of dust impacts generated during Civil activities, drilling operations, well testing due to use of dust suppression and routine maintenance of access tracks and infrastructure • Low risk of reduction in regional air quality resulting from emissions from the combustion of diesel due to the temporal nature of the activities and selection of efficient equipment. • Low risk of reduction in regional air quality from gas and condensate flaring due to the combustion efficiency of the flare and operating procedures. • Low risk of air emissions from chemical releases during drilling and stimulation activities impacting livestock, fauna and people due to chemical handling procedures limiting emissions during mixing. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring, grinding) or personnel. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of uncontrolled release of gas impacting a receptor during drilling, stimulation, barrier failure, operator error or vehicle collision due to the well design, blow out prevention, well integrity and lack of sensitive receptors preventing impacts. • Low risk of leak of gas from wells due to the well design, routine leak detection and repair and separation distance from receptors, • Low risk of air emissions created by gas fired compression • Low risk of greenhouse gas emission impacts from appraisal gas sale/ well testing (climate change)	• Site located away from sensitive receptors, such as homesteads • Dust suppression to be used on access tracks, lease pads and gravel pits to minimise dust emissions where practicable • Outside of high intensity activities (such a s civil construction, drilling and stimulation) Dust levels consistent with standard pastoral activities (such as mustering/truck load outs) on the property • Venting of raw gas is tightly controlled under the Code of Practice, with no material volume of gas to be vented • A reduced emission completion (flare) to be utilised to combust all hydrocarbons • Flares to be compliant with USEPA design standards, including 98% flare efficiency • Stimulation chemical mixing procedures deployed (such as enclosed hoppers) that minimises dust emissions • Firebreaks to be maintained around well and camp pads to minimise bushfire risk • Flaring exclusion zones to be maintained around flare • No flaring during total fire bans • Slashing, grinding and other higher risk fire activities to be undertaken with appropriate controls to mitigate he risk of bushfire (such as buffer zones, use of fir trailers, fire breaks etc.) • During seismic surveys, no vegetation is to be mulched and bushfire management protocols implemented. • Vehicles to be equipped with fire extinguishers • 6 monthly gas leak detection on all exploration wells and equipment, with annual inspections on pipelines • Low NOx and Low CO gas fired compression/ power generation utilised to minimise air emissions. • Appraisal gas will be beneficially used through sale of CNG/LNG/ piped natural gas to reduce flaring and minimise flaring to reduce scope 1 and 2 emissions.
Surface Water	• Avoid and minimise the potential contamination caused by the discharge of sediment or contaminated storm water to waterways or established drainage systems. • Contain any potential contaminants for treatment or disposal.	• Increased sedimentation transportation from disturbed areas (access tracks, lease pads, seismic lines etc.)	• Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of gathering pipeline failure and release of flowback • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of a transportation accident releasing chemical or wastewater (drilling fluid and flowback) due to the use of licenced wastewater/ chemical transportation providers, spill management and emergency response requirements. • Low risk of spills to surface water from chemicals and fuel storage and handling activities due to use of secondary containment and separation distance to watercourses. • Low risk of stormwater releases from activities	• No take of surface water permitted or proposed • Lease pad located away from watercourses- typically 1km or greater • Seismic activities to: o avoid vegetation clearing as much as practicable o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o Avoid seismic lines in water courses (unless co-located with an access track) • Site maintained to minimise sediment releases, with erosion and sediment control plan in place • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All wastewater tanks engineered to withstand failure, cyclone rated construction • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
			contaminating surface water due to stormwater segregation and testing procedures. • Low risk of infrastructure (including pipeline) changing surface hydrology and flow due to infrastructure design and avoidance of overland flow locations. • Low risk of changes to terrestrial ground surface levels associated with seismic activity due to the stability of the basin and geomechanical properties of the target and overlying formations. • Low risk of gathering line failure releasing flowback fluid to the environment	applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • All gathering lines to be welded as per Australian Standards, hydrotested during construction to verify integrity prior to being brought into service • Gathering lines to utilise flowmeters/ pressure monitoring to identify leaks (such as flow/ pressure drops) • Gathering lines to be inspected 6 monthly to identify subsidence/ potential integrity issues. All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • No offsite releases of drilling or stimulation wastewater proposed or permitted • Stormwater retained onsite during wastewater storage, with testing completed prior to offsite release • Site selected to avoid major structural features, such as faults • Basin is seismically stable, with low seismic activity reported.
Flora and Fauna	• Minimise disturbance to flora and fauna • No disturbance to high conservation areas • Avoid the introduction of weeds • Avoid the spread of existing weeds • Minimise the loss of pastoral productivity	• Clearing of vegetation communities (such as Open Corymbia/eucalypt woodland, Bullwaddy and/ or Lancewood) to support exploration activities (lease pad extension and seismic lines). • Loss of fauna and flora habitat • Loss of livestock grazing area • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Low risk of impacts to sensitive vegetation communities from seismic activities, with high ecological areas avoided • Low risk of threatened fauna mortality during clearing, with all sites to be inspected prior to clearing to avoid fauna. • Low risk of vehicle and machinery noise and lighting on well pads and access tracks causing material impacts to threatened fauna or livestock. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Medium risk of introduction and spread of weeds in the area due to equipment washdowns, inspection and certification requirements. Monitoring and routine treatment completed on identified outbreaks. Impact from weed introductions/spread is considered moderate, with likelihood Unlikely. • Medium risk of bushfire from accidental ignition by site activities (civil works, seismic activities, drilling, flaring, grinding) or personnel on fauna, flora and land productivity. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of flora, fauna and livestock being trapped and drowning in storage tanks, sumps and pits due to the design of storages and fencing. • Low risk of contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities due to chemical storage and handling practices. Fences are utilised to restrict livestock access. • Low risk of vehicle collisions with fauna – fauna mortality	• Seismic activities to: o avoid clearing of mature trees and protected flora o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o No seismic lined in riparian o Implement fire management controls, include rapid response • No mulching of vegetation to occur which reduces risk to fire • Vegetation to be walked down and inspected for fauna prior to clearing. Where fauna are identified, work shall stop in the immediate vicinity until they leave the area. • Site to be fully fenced during operations • Open pits to be fully fenced to prevent livestock access • Sumps to have fauna ladders or liner material (such as coletanche) with sufficient friction to allow fauna to escape. • Gravel pits to be left open to act as watering point for livestock when not in use • Vehicle speed limit restricted to 60km/hr • Dust suppression used to limit dust impacts to vegetation • Limited night-time activities proposed. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist • All equipment and loads to be inspected and certified weed free prior to entry • 6 monthly weed inspections to be completed with all identified weeds treated.

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
			results in a localised impact to listed threatened species, due to avoidance of night-time driving, speed limit restrictions and number of vehicle movements. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements Reduction in land production through bushfire • Low risk of impacts to flora and fauna through the encouragement of feral animals and other pest species leading to competition with native species. This includes the introduction of cane toads.	• Weeds sprayed periodically to restrict weed numbers.
Environmental Nuisance and Amenity- including dust, noise, light, odour and vibration	• Minimise impacts to pastoralist operations	• Construction of exploration infrastructure onsite changes land use from pastoral to industrial. • Light and noise nuisance to fauna and livestock in immediate vicinity of activity • Increased traffic to proposed exploration area • Noise, light, odour and dust emissions in the immediate vicinity of the lease pad. • A visible hue visible from operations at night during flaring or from activity lighting. • Noise impacts from helicopter movements • Noise and vibration impacts during seismic activities.	• Low of changes in property amenity through the construction and operation of exploration infrastructure due to location of activities and separation distance from receptors • Low risk of increased vehicle accident or traffic impacts through associated with no material traffic volumes anticipated and limited peak traffic periods. • Low risk of adverse impacts to fauna from traffic are not anticipated, with impact levels consistent with standard road traffic levels. • Low risk of helicopter movements causing impacts to receptors based on location of site away from homesteads • Low risk of noise, dust, light and vibration impacts associated with temporary appraisal gas facility	• Sites located away from homesteads and local communities • Flaring to be minimised to avoid light generation • Site is located away from pastoralist main access points • Maximum peak traffic during mobilisation and demobilisation is likely to be typically less than<44 vehicle movements per day for 2 weeks. • Speed limit restricted on the access tracks to <60km/hr • Dust suppression to be utilised to minimise dust emissions • Where helicopter movements are planned, the pastoralist to be engaged prior to ensure helicopter do not interfere with pastoral activities. • Seismic surveys to avoid sensitive receptors, such as homesteads, local communities, sacred sites etc. • Compression/ power generation/ CNG/ LNG facilities to be designed to minimise aesthetic impacts and located away from homesteads and local communities. • Lighting of infrastructure designed to minimise aesthetic impacts during the evening •

Appendix J.1.2 04 231106 FW: Tamboran EP 76, 98 and 117 2024 Work Program report

From:	Matt Kernke
To:	[redacted]
Cc:	Tamboran Contact; Emily Beresford-Cane; Linda Pugh; Gibson Porkime
Subject:	FW: Tamboran EP 76, 98 and 117 2024 Work Program report
Date:	Monday, 6 November 2023 2:11:57 PM
Attachments:	Tamboran EP 76 98 117 NLC Work Program 2024.pdf image001.png Shenandoah-S2-GDA2020_Z53.zip Kyalla-117-N2-GDA2020_Z53.zip Amungee-NW-Location-GDA2020-Z53.zip Amungee-NW3-GDA2020-Z53.zip Subject-Land-2-GDA2020-Z53.zip

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Hi [redacted],

As foreshadowed, please find attached the shape files for the draft 2024 work program report.

Kind regards
Matt

From: Matt Kernke
Sent: Friday, November 3, 2023 10:39 PM
To: [redacted]
Cc: Emily Beresford-Cane [redacted]; Tamboran Contact [redacted]; Linda Pugh [redacted]; Lisa Baruch [redacted]
Subject: Tamboran EP 76, 98 and 117 2024 Work Program report

Hi [redacted]

As foreshadowed, please find attached a copy of the 2024 Work program and clearance request report.

We are having a couple of technical issues obtaining the shape files which delayed this report. I will have them available next week and will send these through once we have them in hand.

Can I recommend we establish a meeting to start planning for next years clearances?

Please let me know if you require any further information.

Kind regards
Matt

Matt Kernke
Environment and Approvals Manager
tamboran
RESOURCES

M: [redacted]

2024 Work Program and Clearance Request

EP 98, 117, 76 – Beetaloo Joint Venture (Tamboran / Falcon)

Version:	0
Submitted:	Matt Kernke
Presented by:	Tamboran
Review Date:	03 November 2023

2024 Work Program and Sacred Site Clearance Request

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2024 Work Program and Sacred Site Clearance Request

1 OVERVIEW

In November 2022, Tamboran (B1) Pty Ltd (ABN 39 662 327 237) ("Tamboran (B1)") executed a transaction to purchase Origin B2 Pty Ltd (ABN 42 105 431 525) ("Origin B2"; A subsidiary of Origin Energy;) in its entirety. The transaction resulted in Tamboran (B1) acquiring Origin B2's 77.5% interest in Exploration Permits (EP) 76, 98 and 117 ("the Permits") under the Beetaloo Joint Venture ("the Beetaloo JV") with Falcon Oil & Gas Australia Pty Ltd ("Falcon"). Tamboran (B1) is a jointly owned subsidiary (in equal proportions) of Tamboran (West) Pty Limited (ACN 661 967 077) ("Tamboran West") and Daly Waters Energy, LP ("Daly Waters"). Tamboran West is ultimately owned by Tamboran Resources Limited and Daly Waters is ultimately owned by Sheffield Holdings, LP.

Northern Territory Government permit commitments across the Permits require Tamboran B2 to complete ongoing exploration and appraisal ("E&A") activities. Since 2015, the Beetaloo JV has drilled nine (9) wells in the Beetaloo Sub-basin ("Beetaloo"). These include wells on Kalala S (Kalala S-1), Beetaloo W (Beetaloo W-1), Amungee NW (Amungee NW-1, Amungee NW-1H, Amungee NW 2H and Amungee NW 3H), Kyalla 117 N2 (Kyalla 117 N2-1H and Shenandoah S-1H) and Velkerri 76 S2 (Velkerri 76 S2-1). The Shenandoah S-1H and Amungee NW 3H wells were drilled over the 2023 period.

Results collected from the Beetaloo E&A program highlighted the presence of various shales targets which are potentially suitable for a future onshore gas development. Tamboran B2 has identified two main areas where larger scale pilot projects may be completed in the coming years, pending approvals and E&A success, and referred to as the Amungee Delineation Area and the Shenandoah South Pilot Area. These areas are the focus of the forward E&A campaign and subsequent sacred site clearance requests.

Tamboran B2 respectfully requests the Northern Land Council's ("NLC") assistance to facilitate a *Sacred Site Clearance Survey* to comply with the obligations of the Exploration Agreement(s) and to support an application for Aboriginal Areas Protection Authority ("AAPA") Certificate for activity as described below.

This application is designed to provide coverage for Tamboran B2's proposed activities within these areas over the next 1-5 years, with all or a subset of the proposed activities likely to occur. Annual work program updates will continue to communicate any refinement of Tamboran B2's E&A strategy.

2 Exploration and appraisal program strategy - the bigger picture

Tamboran B2's development strategy is focused on bringing gas to the domestic market as soon as practicable. Well testing during the E&A phase is a crucial step in assessing the commercial viability of the Beetaloo shale resources. Hydrocarbons produced during this phase are typically flared, which is a significant source of Greenhouse Gasses (GHG). Tamboran B2 is seeking to beneficially use produced hydrocarbons, rather than dispose of them via an onsite flare. This will achieve multiple objectives including:

- Minimising GHG generation;
- Increasing domestic gas supply at a time of domestic and international scarcity;
- De-risking future shale developments through longer term gas production information; and,
- Providing near-term benefits to Native Title Holders ("NTH"), local stakeholders and the people of the Northern Territory through increased gas supply, as well as greater potential for local employment opportunities and compensation/royalty payments.

Tamboran B2 is focusing its E&A efforts around the Shenandoah South Pilot Area (around the existing Kyalla 117 N2 location) and the Amungee Delineation Area (around the existing Amungee NW location). An overview of the proposed focused areas is provided in Figure 2.

During Calendar Year (CY) 2023, Tamboran B2 completed the drilling of exploration and appraisal wells, Shenandoah S-1H and Amungee NW 3H which targeted the Mid Velkerri B shale. The Shenandoah S-1H well successfully intersected 90 metres of high quality Mid Velkerri B Shale in EP117, the thickest section to date within the Beetaloo depocentre. [redacted]

2024 Work Program and Sacred Site Clearance Request

The E&A work program for CY 2024 will be determined based upon the results of the Shenandoah S-1H well. In a success case, the anticipated work program includes 2 new E&A wells at the existing Kyalla 117 N2 pad and 2 new E&A wells on a new location ("Shenandoah S2 pad") to be constructed within 4km of Kyalla 117 N2 location (see Figure 1). The new Shenandoah S2 pad will be constructed in Q1 2024, with additional 2-4 well pads constructed progressively over the CY 2024-26 period.

[redacted]

[redacted]

[redacted]

3 Proposed 2024 work program

In addition to ongoing maintenance of existing assets, Tamboran B2's proposed CY 2024 work program includes activities in three potential focuses areas. These activities are subject to environmental, land access and sacred site clearance approvals and may change through ongoing consultation with the NLC and NTHs. Tamboran B2 is prioritising activities within the nominated areas as summarised below:

1. **Shenandoah South Pilot Area (subject land 2)**

- Ongoing well testing of the Shenandoah S-1H well;
- Expansion of the existing Kyalla 117 N2 location;
- Construction of a new step out location ("Shenandoah S2"), including a new Gravel pit (SSGP3);
- Drilling, HFS and EPT of 2 new E&A wells on the existing Kyalla 117 N2 location and 2 new E&A wells on the new step out location Shenandoah S2;
- [redacted]
- Maintenance of existing sites and associated infrastructure; and,
- Environmental and heritage surveys required for future production environmental approvals.

2. **Amungee Delineation Area** (**subject land 5**)

- HFS and EPT of Amungee NW 3H (nominally a 180-day well test);
- Contingent: Civil construction of the Amungee NW3 step out location, including lease pad, camp pad and access tracks;
- Contingent: Drilling, HFS and EPT of up to 2 additional wells on either the existing Amungee NW, new Amungee NW3 location or a combination of both;
- Maintenance of existing sites and associated infrastructure;
- Environmental and heritage surveys required for future production environmental approvals.

3. **Regional groundwater and surface water monitoring program**

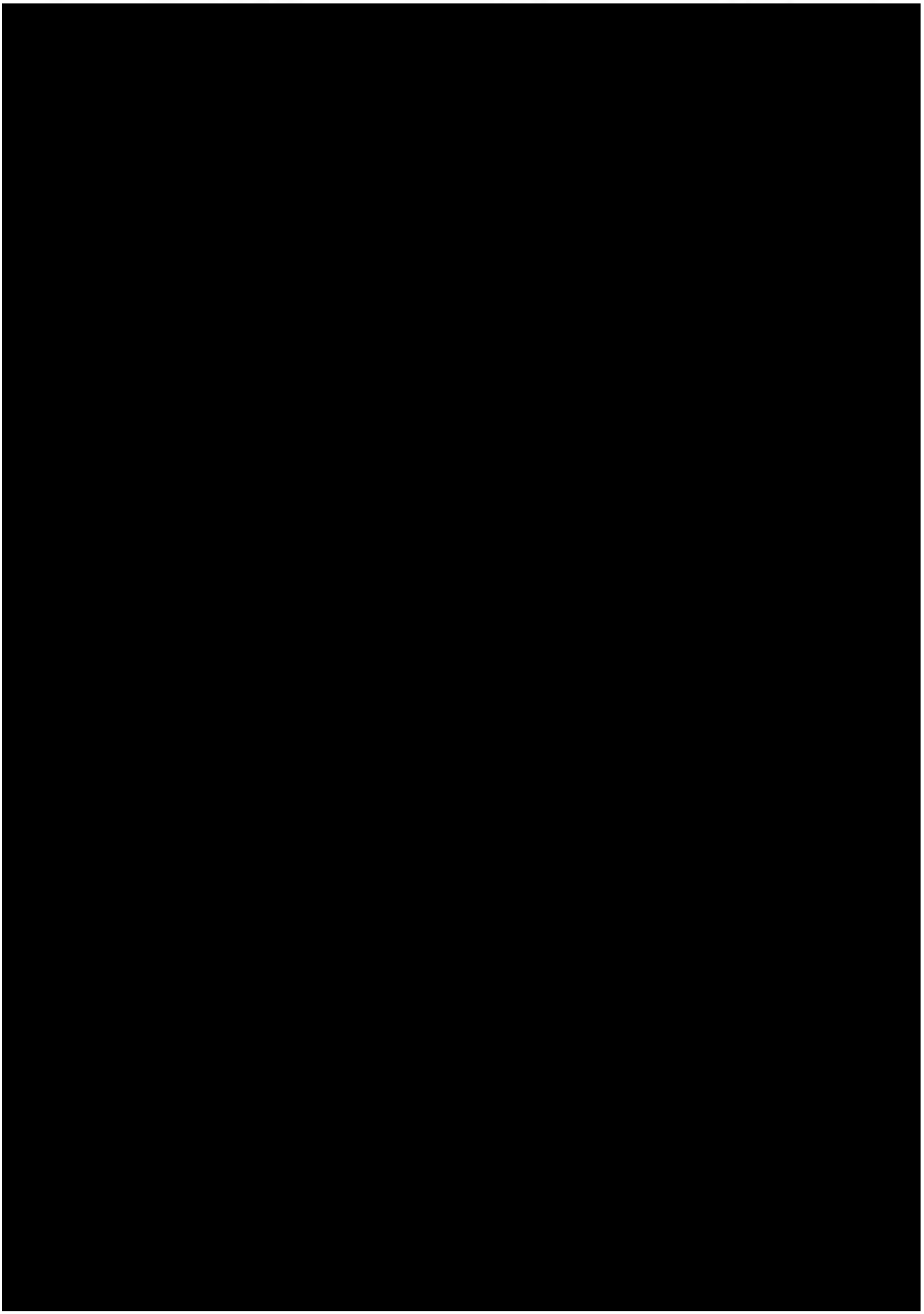
Tamboran B2 is proposing to continue the regional groundwater and surface water monitoring program, which has been collecting data from landholder bores across the Beetaloo since 2014 and expand its scope to include surface water monitoring based on feedback from the NLC and NTHs. These sites are provided in Figure 2.

The inclusion of surface water monitoring into the regional program is designed to collect data for the following purposes:

1. Demonstrate ongoing exploration and future production activities are not impacting on ground and surface water resources within the Beetaloo;
2. Demonstrate the waterholes of the Beetaloo are not likely to be impacted from water extraction from the underlying Cambrian Limestone aquifers of the region; and,
3. Collect ongoing baseline data used for future environmental impact assessments.

The CY 2024 work program for EP 76, 98 and 117 is summarised in Figure 1, with the regional surface water sites provided in Figure 2. Table 1 includes a summary covering the existing and proposed new locations required to support the proposed work program.

2024 Work Program and Sacred Site Clearance Request



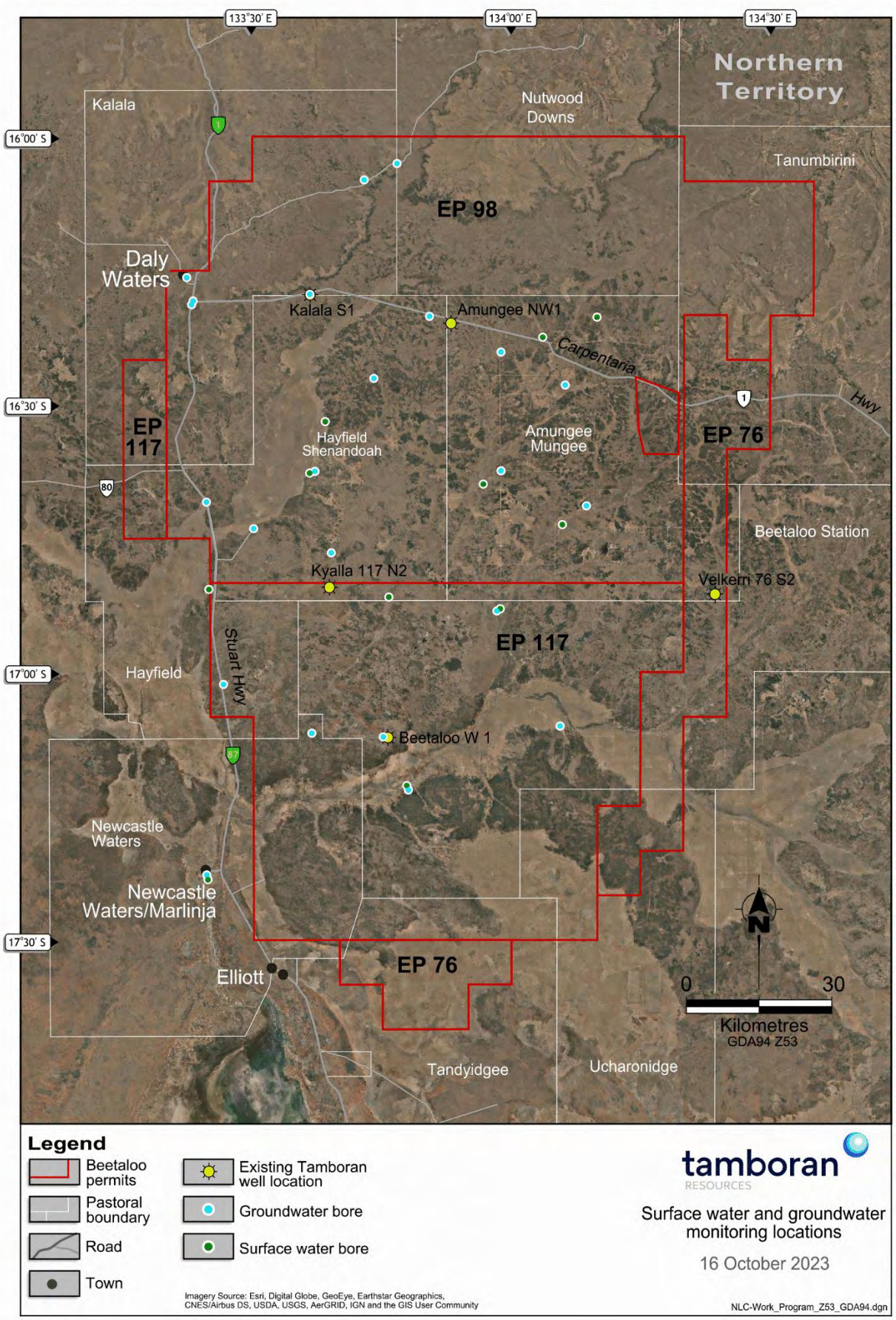


Figure 2 Overview of the proposed regional groundwater and surface water monitoring sites

2024 Work Program and Sacred Site Clearance Request

Table 1 EP 76, 98 and 117 CY 2024 Work Program Summary (including contingent scope)

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
New Works				
EP 117	Kyalla 117 N2	Existing	Shenandoah (NT Por 7026)	• Ongoing access track, gravel pit and lease pad maintenance and monitoring. • Civil construction works to maintain and expand the existing well pad to accommodate multiwell drilling and centralised wastewater treatment / storage- ~ 10 hectares. • Drilling, HFS and EPT of up to 2 new exploration and appraisal (E&A) wells in CY 2024 and an additional 2 wells in 2025 and beyond. • Ongoing EPT of the Shenandoah S-1H well- up to 300-day well test. • Ongoing maintenance and data collection from the existing Kyalla 117 N2-1H exploration well. • Operation of a temporary camp. • Groundwater extraction and monitoring. • Long-term wastewater storage and treatment.
EP 98	Shenandoah S2	New proposed location	Shenandoah (NT Por 7026)	• Construction of new E&A location consisting of access track, camp pad, lease pad, laydowns, firebreak to ~25 hectares • Construction and operation of groundwater extraction bores- potentially up to 8 bores. • Construction of a ~5 hectare laydown yard. • Drilling, HFS and EPT of up to 2 additional E&A wells in CY2024, and up to 4 E&A wells in 2025 and beyond. • Construction of a new ~5 hectare Gravel pit (SSGP 3).
EP 98	Amungee NW	Existing	Amungee station (NT Por 1079)	• Ongoing access track, camp pad and lease pad use, maintenance and monitoring. • HFS and EPT (~180 days) of the Amungee NW 3H well. • Well testing of the Amungee NW 1H and Amungee NW 2H wells. • Drilling, HFS and EPT of up to 2 additional E&A wells.

2024 Work Program and Sacred Site Clearance Request

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				• *Contingent*: approximately 40km of 2D seismic.
EP 98	Amungee NW3	New- contingent	Shenandoah East (NT Por 7027)	• Contingent activity. • Construction of new E&A location consisting of access track, camp pad, lease pad, laydowns, firebreak to ~25 hectares. • Construction and operation of groundwater extraction bores- potentially up to 8 bores. • Construction of a 2.5 hectare laydown yard. • Drilling, HFS and EPT of up to 2 additional E&A wells in 2024. • Construction of a new ~5 hectare Gravel pit adjacent to site.
EP 76, 98 117 and off tenure	Various sites across the Beetaloo- with a focus on the ILUA and regionally important water locations- such as Lake Woods	Landholder bores and surface water bodies	Kalala, Beetaloo, Hayfield/ Shenandoah, Newcastle Waters, Amungee Mungee	• Collection of groundwater and surface water monitoring results from landholder bores and surface water bodies (includes collection of water and sediment samples). • Program to be undertaken using local indigenous contractor, third party expert and cultural managers for relevant area. • ~12 surface water sites across the Beetaloo. • Monitored every 6 months. • Data to be provided to NLC and NTHs.
[redacted]				
Existing sites- routine activities / care and maintenance				
EP 76	Velkerri 76 S2	Existing	Amungee station (NT Por 1079)	• Ongoing access track, gravel pit, camp pad and lease pad maintenance and monitoring. • Ongoing Velkerri 76 S2-1 well maintenance.
EP 98	Amungee NW2	Existing	Amungee station (NT Por 1079)	• Periodic inspection and ad hoc maintenance of existing access track, water bore, and lease pad. • Potential site rehabilitation.
EP 98	Kalala S	Existing	Kalala Station (NT Por 697)	• Periodic inspection and ad hoc maintenance of existing access track, camp pad, and lease pad.

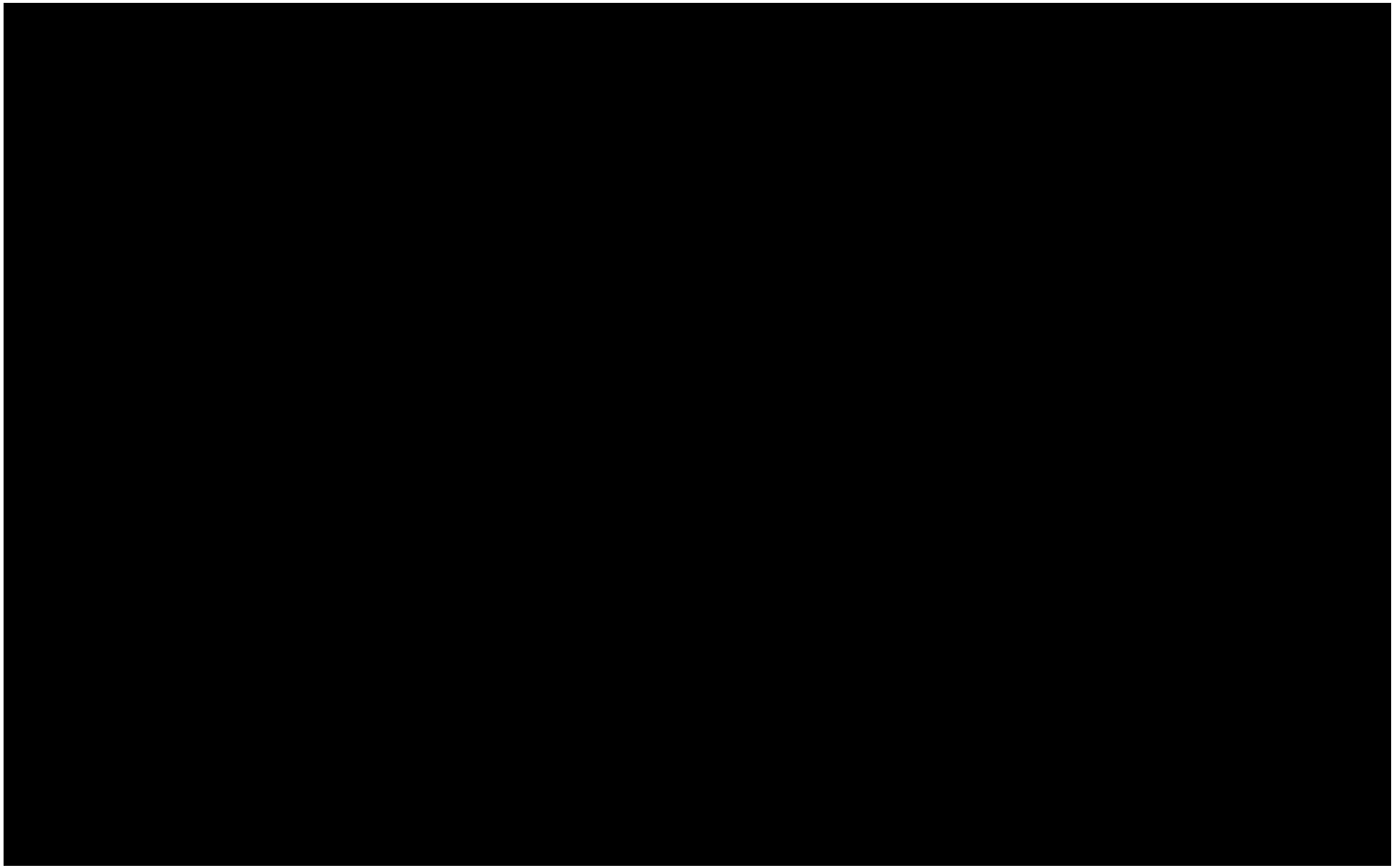
Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				• Ongoing Kalala S-1 well maintenance. • Groundwater monitoring and extraction. • Potential well abandonment. • Potential site rehabilitation.
EP 117	Beetaloo W	Existing	Beetaloo Station (NT Por (702) Access track: Hayfield (NT Por 1077) Access Track: Jingaloo (NT Por 5416)	• Periodic inspection and ad hoc maintenance of existing access track, gravel pits, camp pad and lease pad. • Ongoing Beetaloo W-1 well maintenance. • Diagnostic fracture injection test and monitoring. • Groundwater monitoring and extraction. • Potential well abandonment. • Potential site rehabilitation.

4 CY 2023/2024 NLC Requests-

To support the proposed E&A strategy and work program, Tamboran B2 seeks NLC support for a range of NTH engagement as summarised in Table 2. This can be summarised as the following items:

- On country meetings covering CY 2024 work program (March)
- Consultation covering beneficial use of appraisal gas (where beneficial use in this instance will be transported and sale of gas through a newly constructed pipeline and the Amadeus Gas Pipeline (AGP)).
- Assistance in execution of the regional groundwater and surface water monitoring program, including selection of sites and access constraints.
- Cultural Manager participation in activities where Tamboran is conducting ground disturbing activities for the first time or entering an area within the permits for the first time and/or seismic surveys.

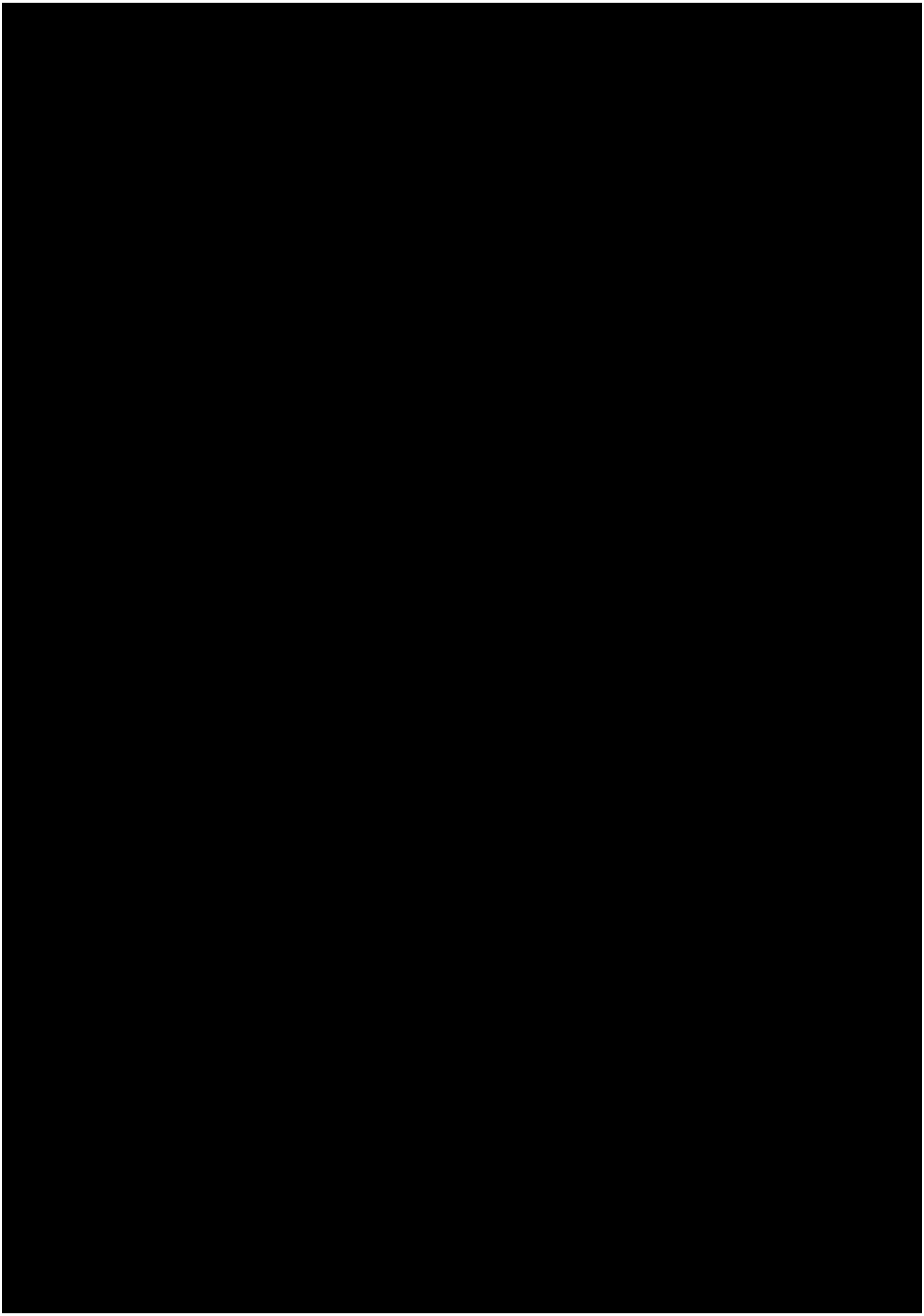
2024 Work Program and Sacred Site Clearance Request



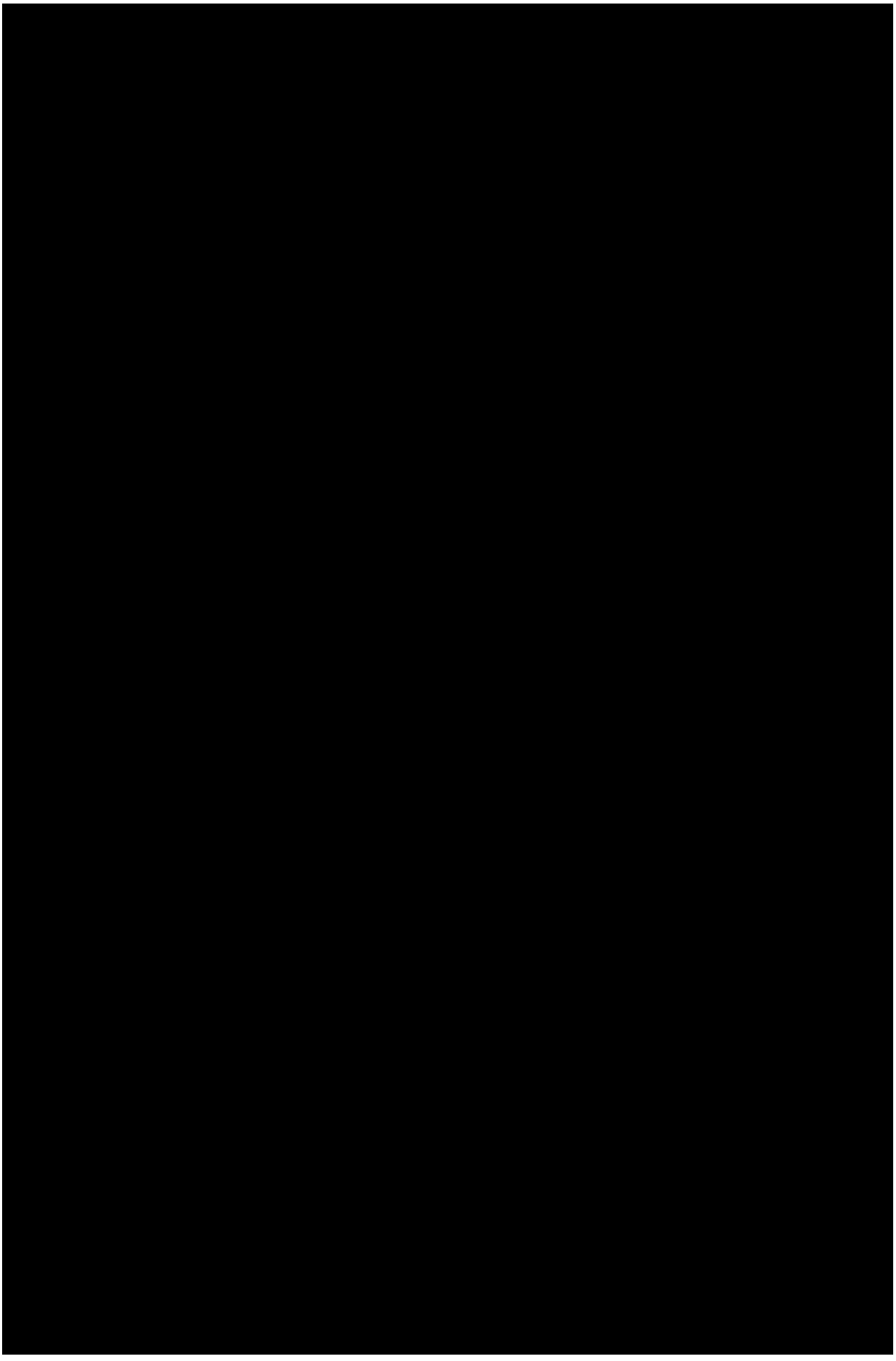
2024 Work Program and Sacred Site Clearance Request



2024 Work Program and Sacred Site Clearance Request



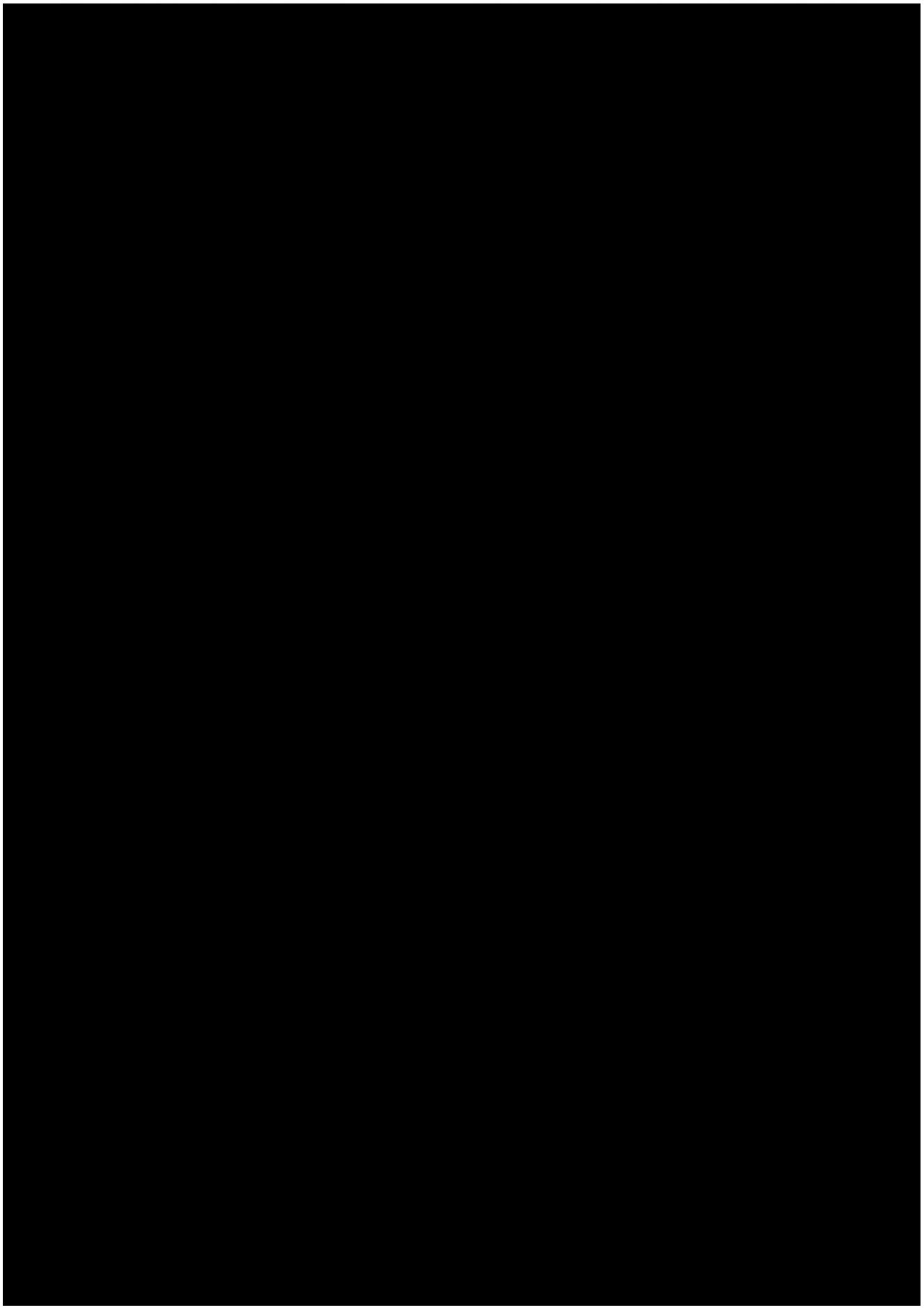
2024 Work Program and Sacred Site Clearance Request



2024 Work Program and Sacred Site Clearance Request



2024 Work Program and Sacred Site Clearance Request



2. Appraisal gas within "Subject Land 5"

The proposed 2024 sacred site clearance request within Subject Land 5 is designed to allow the future gathering, processing, transportation and beneficial use of appraisal gas to reduce greenhouse gas generation during appraisal activities (noting that approval to avoid flaring through beneficial use of gas will require separate agreement and consent from Native Title Holders). The "Subject Land 5" area was previously cleared as a during the 2021 clearances. Additional E&A activities proposed under this request are anticipated to be completed over the period from CY 2024 to CY 2026 and include:

- Beneficial use of appraisal gas, including for onsite electricity generation and sale of natural gas, CNG and LPG
- Construction and operation of low-pressure gathering pipelines to connect up well pads to transport raw water, flowback, produced water and hydrocarbons to temporary gas processing facilities
- Construction and operation of appraisal gas processing infrastructure, such as dehydration, compression, metering etc. this could be located on a well lease pad or a standalone location most likely in close proximity to the Macarthur River Mine Pipeline (MRMP)
- Electricity generation onsite, including from diesel, gas fired generators or renewable energy sources (such as solar panels or wind turbines)
- Onsite processing (and storage as required) of compressed natural gas (CNG) [redacted].
- [redacted]

An overview of "Subject Land 5" is provided in Figure 3, with digital GIS data included in this submission.

[redacted]

2024 Work Program and Sacred Site Clearance Request



APPENDIX A Detailed description of regulated activity

The following table provides details of the proposed exploration activities proposed **within the requested clearance areas**. These descriptions are indicative and general in nature, minor departures from such descriptions are likely to occur and such departures are covered as much as practicably possible by the content of this activity description.

Table 3 Description of proposed regulated activity details within the clearance areas

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site selection and scouting The first step of the process when undertaking exploration activities is site selection. Proposed E&A sites are chosen based upon their assessed chances of exploration success and are ranked as either a priority site (highly prospective) or a contingent site (if a priority site is unavailable due to a constraint). The selection of a site from a subsurface point of view, is often based upon existing exploration information (or lack of), such as seismic data, inferred resource depth (within the oil generating window for example) and previous drilling results. It also includes an assessment of geohazards, such as known major faults or structural features. Once a location has been proposed (including for other infrastructure such as pipelines, access tracks, gravel pits etc.), each site is assessed for suitability using a multi-criteria analysis. This analysis covers several disciplines, including cultural, environmental, pastoralist, regulatory and constructability requirements. Once proposed sites have been identified, each site is assessed using a desktop screening process covering the following: • Cultural constraints: sites are chosen to avoid known sacred sites and other restricted areas identified through previous NLC field clearance reports, AAPA certificates or heritage mapping. • Environmental constraints: proximity to sensitive ecological features such as water courses, flood heights, high conservation areas, threatened species and habitats and sensitive soil units • Leaseholder constraints: proximity to existing pastoral infrastructure and activities, such as cattle yards, fence lines, access tracks, water supply networks, water bores, homesteads and laneways. At this stage, leaseholders are engaged to ensure early input into the location of potential exploration sites. Activities also considers timing constraints such as mustering. • Regulatory constraints: proximity to water bores, well pad spacing, landscape amenity and proximity to roads and communities. The number of sites are re-ranked and potentially eliminated based upon their constraints assessment. A revised list of sites will then undergo field “scouting”, to further assess their suitability. Scouting involves assessment by several different specialists with a “scouting party”. Scouting activities include: • NLC field clearance: Tamboran B2 submits its proposed work program to NLC annually and then initiates field clearance surveys. Traditional owners are then engaged by the NLC and inspect all sites/areas to determine the potential for sacred sites or other areas of cultural significance in the vicinity of the activity. A final report is submitted to AAPA by NLC to generate AAPA certificates which outline the activity constraints and no -go areas. • Environmental: areas are inspected by ecologists to ground truth for areas of potential high conservation, evidence of threatened flora and fauna, overland flow paths, drainage lines, soil erosion susceptibility, areas of high habitat value (such as large hollow bearing trees) buffer zones (from high conservation value areas) and future rehabilitation constraints. The infrastructure (including access tracks,	N/A	2-6	During activity planning.	<4 weeks	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
lease pads and associated infrastructure) is orientated to minimise clearing (such as picking open woodland rather than dense Bullwaddy or Lancewood communities) and impacts on overland flow. A land condition assessment is completed for the proposed sites. • Archaeological scouting: detailed scouting is completed by a qualified archaeologist to identify any artefacts (such as spear tips, axes, stone workings etc.), scar trees or potential heritage features at the proposed sites. This is undertaken in addition to the NLC Traditional Owner clearances. • Constructability assessment: Constructability constraints are identified including geotechnical assessments, cut/fill requirements, soil types, rig operational requirements (orientation) and access construction constraints (such as access track design, water course crossings etc.). This often includes preliminary pegging of the proposed location Once the location of infrastructure has been proposed and finalised, the final location is pegged and surveyed. The engineering designs are updated and issued for construction.					
Access track construction Access tracks will be constructed to connect the proposed infrastructure to existing roads. Tracks will generally be constructed to at least NT Standard Drawings (CS3003) for Typical Cross Section for Rural Environment – Pastoral Access Road 2. Where possible access tracks will align with the existing seismic lines or other clearances/disturbances to minimise vegetation clearing. Access tracks will typically be less than 14m wide, with sections up to 20m wide where truck turn outs, erosion and sediment control and cut out drains are required. Gravel will be used to form up access tracks in places to enable all weather access. Where access tracks intersect with main roads (such as the Stuart Highway), intersections will be upgraded to accommodate turning truck traffic in accordance with the Department of Infrastructure, Planning and Logistic (DIPL) design requirements Access tracks are anticipated to be the first piece of infrastructure constructed to enable preliminary activities, such as the construction of groundwater monitoring bores.	<50ha (dependent on access track length)	<12 people	First activity required to enable civil construction and drilling.	Access tracks are likely to be continually maintained and surfaced throughout the life of the activity	 

2024 Work Program and Sacred Site Clearance Request

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
[redacted]					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
[redacted]					
Groundwater (monitoring and extraction) bore installation Installation of control and impact groundwater monitoring bores may be constructed on each of the lease pad within the underlying aquifers. These bores are required under the Code of Practice to establish baseline groundwater level and quality data prior to completing hydraulic fracture stimulation activities. Monitoring bores are required to be drilled and tested at least 6 months prior to drilling (except for exceptional circumstances) and stimulation activities and are often the first activity undertaken on a site (other than access tracks). Monitoring will continue throughout the life of the activity. The bores will also be used for groundwater extraction to support exploration activities. The construction of the groundwater monitoring bores will typically utilise a water bore drilling rig to construct the bores, similar to the rigs used to drill pastoral water bores. All groundwater monitoring bores will be constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia. Bores may drilled into the Anthony Lagoon formation (if present and saturated), Gum Ridge formation and other viable water bearing formations if encountered.. Waste cuttings, drilling fluids, muds and formation fluids will be collected in a small earthen sump and managed in alignment with the practices outlined in the. Minimum Construction Requirements for Water Bores in Australia. The fluid (which is anticipated to be fresh) will be discharged to grade and the area surrounding the lease. The formation cuttings and drill muds will be mixed with soil onsite and incorporated into the lease pad surface.	N/A located on proposed lease pad	<12 people	The drilling of water bores is generally one of the first activities undertaken to provide water for construction and drilling activities. Additional monitoring bores are also likely to be drilled prior to stimulation	<4 weeks	
Lease pad construction Each proposed lease pad will be constructed to accommodate exploration well drilling, stimulation, testing and ongoing wastewater storage and treatment; typically such pads will be less than 12 hectares. Each lease pad will be located within the proposed clearance area, with the final location based upon seismic information combined with cultural, environmental, pastoralist and regulatory constraints., . Once a suitable site has been selected the lease pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control measure and wastewater containment bund. The lease pad will then be levelled, compacted and surface with gravel to accommodate exploration activities. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). A sediment retention pond will be installed to manage surface water within the lease. Water captured onsite will be tested and released into the adjacent area. A drilling sump, flare pit, well cellars, sediment ponds, bunds and other necessary earthworks will be constructed onsite. The drilling sump will be lined with an impermeable liner to contain all drilling fluid, drilling muds, cuttings, cement returns and waste sand. The drilling sump will generally be able to contain up to approximately 3000m^3 of material	7.5-12ha	<24 people	Prior to exploration drilling	2-8 weeks	

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>(approximately 75m long x 25m wide x 4.5m deep). The drilling sump/broader site will be fenced to prevent livestock access.

The well cellars will be constructed on the proposed lease to accommodate the wellhead equipment and blow-out preventer (BOP). The cellars are typically concrete- or steel-lined and prefabricated off-site. The cellars are typically transported to the site in one (1) piece and lowered into an excavated pit. A shallow conductor casing is installed within the cellar to approximately 20m using an auger. The shallow conductor casing is designed to prevent the upper sections of the exploration well from caving in when drilling through the unconsolidated sediments. The cellar itself will be fenced at all times to exclude fauna ingress. Cellars will be typically separated from each other by 10m-20m..</td>
<td></td><td></td><td></td><td></td>
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</tr>
<tr>
<td>Gathering and main pipeline Construction

Each lease pad may be connected via ether a surface or buried gathering pipeline. The gathering pipeline will be constructed to transport both gas and water to/and from pads. Gathering pipelines will be constructed in a cleared right of way of approximately 25m wide.

If the beneficial use of gas is approved, to allow the avoidance of the majority of flaring, appraisal gas would likely be sold into the domestic gas market via a high-pressure main pipeline constructed to connect processing facilities to the existing Amadeus Gas Pipeline or McArthur River Mine Pipeline (MMRP). Pipeline corridors will be typically up to 50m, with the exact route and length dependent on final site selection.

Construction for the gathering and main pipelines generally include the following activities:

Pipeline Construction
<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Location</td><td>An initial route selection study will be conducted for the pipeline in order to optimise the pipeline route to connect to the Amadeus pipeline. Further fine-tuning and route refinement will continue throughout the planning phase of the project to ensure the route does not interfere with any sacred sites, cultural heritage or environmentally sensitive features.</td></tr>
<tr><td>Pipe</td><td>The gas transmission pipeline will be a buried, high pressure steel pipeline. It will be designed and constructed in accordance with the requirements of AS 2885 Pipelines – Gas and Liquid Petroleum. Where pipelines are to be buried, the pipeline will be deep enough so current land use activities can continue after the pipe has been installed. The minimum depth of cover over the buried pipeline will be 750mm. For road crossings the depth of cover will be increased to ensure protection of the pipeline and the asset or feature being crossed by the pipeline. For surface pipeline, pipelines will be designed to withstand grass fires and secured to the surface.</td></tr>
<tr><td>Early Works</td><td>In order to support the approvals and detailed design activities a number of activities take place prior to the main construction phases. Generally known as ‘early works’ , these activities include a range of field-based activities. These activities inform the Approvals and Design teams about field conditions and are often iterative, as additional identified information results in changes to aspects of the project scope requiring revisiting and rework of the project scope. These activities include but are not limited to general investigations, surveys for the pipeline, sacred sites, cultural heritage, environmental and soil & geotechnical.</td></tr>
<tr><td>Survey</td><td>The limits of the right of way (ROW) working width shall be marked with stakes at visible intervals.
A survey crew will work ahead of the initial clearance of vegetation from the ROW. This survey crew will utilise the project benchmarks to check</td></tr>
</table>
</td>
<td>25m to 50m wide</td><td>~15-50</td><td>Main Pipeline construction expected to start dry season 2024</td><td>3-6 months</td>
<td>  </td>
</tr>
</table>

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	and re-establish all agreed intersection points (IPs), mark the right of way boundaries and place offset/recovery pegs.					
Clear and Grade	To allow construction activities to commence, the pipeline alignment needs to be cleared of vegetation, rocks, trees, etc to provide mainline construction vehicles access. Clearing and grading shall be minimised to the extent necessary for the safe construction of the pipeline and shall in any event not exceed the maximum permissible width of the ROW except where additional working areas are defined and agreed. Light vegetation removed during clearing shall be stockpiled outside of the stripped ROW working area and will be respread during restoration unless the property owner requests that the vegetation be left as stockpiles.					
Pipe Transport and Stringing	Stockpiled pipe will be delivered to the ROW along the identified access tracks using prime movers and trailers. The specific logistics of the pipe haulage will be developed during the planning phase. The pipe trucks will only utilise specific access tracks which will be constructed (or upgraded) to allow them to pass. Pipe will be strung (placed on the ROW) directly from trailers onto saw dust filled bags or equivalent using a Vacuum lift pipe handler mounted on a hydraulic excavator, end hooks or slings depending on the pipe length and size, terrain. Strung pipe shall be supported clear of the ground and in a manner that will not damage the pipe or coating.					
Trenching (where applicable)	Where a buried gathering line is proposed, a trench is formed to accommodate the welded pipe strings and achieve the required depth of cover in accordance with the pipeline design. The trench shall be excavated along the surveyed and pegged centreline, in accordance with the minimum cover specified. Trenching operations are carried out utilising a combination of bucket wheel trenchers, rocksaws & 30T excavators. Accordingly, excavation plant, equipment and techniques will be selected to accommodate the anticipated conditions and required production rates. In areas of hard rock, controlled blasting using explosives may be required to break the rock to permit removal by excavator.					
Welding	Line pipe ends will be welded together (butt welded) to form pipe strings up to a typical length of 1km. The mainline welding crew is the engine room for the project's welding and sets the pace for mainline construction. The very agile and mobile poor boy crew carries out all difficult mainline welding sections and provides start joints for the mainline crew. Additional welding resources carry out all tie-ins and special crossings.					
Pipe laying	The coated pipe shall be placed/ lowered-in using a series of side booms so the pipeline has adequate and properly distributed slack, the pipe is not unduly stressed, and the pipe coating is not damaged. The prepared surface/ trench will be free of material that could damage the pipe, the pipe shall be laid directly on the trench bottom/ on top of the prepared surface (for above ground pipes). For buried, pipelines, the excavated material shall be used directly for bedding and padding. Where excavated material does not meet the specification, padding machines (screening machines) or similar will be used to produce bedding and padding. The trench will be back filled using the remaining trench spoil (excavated material) following the padding operation. The trench is compacted by wheel and/or track rolling with the backfilling equipment. Areas requiring higher compaction, such as road crossings, will be undertaken with an excavator mounted vibrating plate or other suitable manually operated or driven compaction equipment.					
High Point vents/ low point drains	High point vents may be installed on the pipeline to manage the accumulation of gas collected in gathering lines. High point vents typically consists of a cement pipe ring, with a vent that is placed over the pipeline to allow gas to be released. It is anticipated that these will					

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	be placed every 1-2kms, depending on the local topography. High point drains will be designed to automatically release small volumes of built-up gas, in order to prevent a gas lock in the water pipeline. High point vents will not be designed to be operated continuously and short duration of water transfers means most vents will be inactive (in comparison to CSG fields). Low point drains are designed to release water condensation from pipelines. These will be located every 1-2 km and consists of a drain within a cement pipe ring. These will be manually tested and released to the ground where the quality is confirmed to be uncontaminated.					
Reinstatement	The pipeline ROW will be reinstated which includes replacement of previously stripped topsoil and rootstock, installation of contour banks, reinstatement of fencing & install new gates and revegetation as necessary. High point vents, valve pits and low points drains will be constructed along the length of the pipeline to manage gas/ water build up and provide isolation points. Restoration of the ROW shall be completed in accordance with any easement agreements, Environmental Impact Statement, Construction Environmental Management Plan and regulatory requirements.					
Pipeline testing	The pipeline will be hydrostatic pressure tested to prove the strength and leak tightness of the installed pipeline. The hydrostatic testing will be conducted by a certified mechanical testing laboratory and all test reports are to be certified. Water sued for hydrotesting will be sourced under Tamboran's water extraction licence. Water will be released safely to the adjacent area where it is confirmed to not be contaminated.					
Commissioning	The commissioning phase of the works can be broken into two components, pre-commissioning and commissioning. Pre-commissioning is the exercise of manually proving each component of the pipeline/facility system prior to the introduction of gas. Example testing includes: • Verification that all parts are installed as detailed on engineering drawings, including position, orientation, part numbers, etc • Hydrostatic testing (confirming the system is leak tight), cleaning (blow through with air and cleanliness checks), drying and blow-through of piping • Bolt torquing of flanged connections • Functional testing of all manual valves through full extent of travel • Functional testing of all actuators and control valves through full extent of travel • Earthing compliance checks • Instrument calibration and installation checks • Insulation, continuity and point to point testing of all circuits installed by the Contractor Following the pre-commissioning phase, the asset becomes ready for the introduction of gas.					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Camp pad construction and camp operation A camp pad will be constructed adjacent to each proposed lease pad to accommodate a temporary 70-100 man camp (typically less than 70 man) to support civil construction and exploration (drilling, stimulation, testing and decommissioning) activities. Smaller, mobile camps may also be utilised across the clearance area during operations where required (for example to support seismic activities). The camp pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the camp pad. The camp pad will then be levelled, compacted and surface with gravel. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). Camps will be constructed with kitchens, offices, ablution blocks, accommodation blocks, storage containers, gymnasium, refrigeration, water treatment plan, sewage treatment plant, waste management areas, water storages, power generation, diesel storage tanks and car parking. All waste will be covered/stored in a manner that prevents feral animal access. An approved wastewater (sewage) treatment plant will be utilised to treat all sewage, with treated effluence irrigated in a fenced area adjacent to the camp (no clearing required). Treated effluence handling and irrigation will occur in accordance with the NT Department of Health requirements.	1.2-2.5ha	Typically <100 people (including housed staff)	For duration of activity	For duration of activity	
Helipad pad construction and operation A 1ha helipad may be constructed to accommodate wet season operations adjacent to each lease pad. Where prolonged access to the site is restricted, personnel and material will be helicoptered to and from site. The helicopter pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of helipad. The helipad will then be levelled, compacted, surface with gravel and then fenced. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains).	1ha	N/A	For duration of activity	For duration of activity	
Laydown/storage yard construction and operation Laydown/ storage yard may be constructed along access tracks to store materials, wastes, wastewater, equipment and other material as required. The laydown yard will be fenced to prevent access. These are typically 2.5- 5ha in size, with allowance up to 25 hectares for multiple laydowns. Laydowns may also be utilised for temporary offices/workshops/field camps or warehouse infrastructure support E&A and construction activities. The laydown/ storage yard will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of helipad. The yard will then be levelled, compacted, surface with gravel and then fenced. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains).	25ha	N/A	During exploration activities (as required)	For duration of activity	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Gravel pit construction and operation. Up to 15 hectares of gravel pits (multiple pits, anticipated to be ~5) may be constructed to support the construction of infrastructure onsite. The exact location of pits within the clearance area will be determined based on operational requirements (i.e. pits are constructed as close as needed to infrastructure) and through further testing. Up to a total of 50,000m3 of gravel may be nominally taken from pits specified in the clearance request. The likely figure actually extracted is anticipated to be materially less than this. Each gravel pit area will be progressively cleared of vegetation in 1-2 hectare stages (to minimise the required disturbance). Each pit stage will be stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control measure and to prevent overland flow access to the site. Subsoils will also be stripped, segregated from topsoil and stockpile around the edges of the gravel pit. Gravel will be periodically extracted from the pit, with the pit designed to drain internally. The Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, diversion drains and bank stabilisation using fallen debris). Once gravel activities are finished, the pit will be reshaped, with subsoils re-instated. Topsoils will be spread and fallen vegetation returned to aid site stability. The area will be temporarily fenced (where required) to allow vegetation regrowth. Seed maybe added to the site to support natural regeneration if required. The pits may be converted to pastoral watering points where appropriate and approved by pastoralists. An access track will be constructed to each pit, with the length of access track to be determined based on location of the pit The access track will typically be less than 14m wide, with sections up to 20m wide where truck turn outs, erosion and sediment control and cut out drains are required.	Gravel pit <15ha	<6 people	For duration of activity	For duration of activity	
Exploration well drilling Multiple petroleum exploration wells are proposed to be drilled at each site (typically 6-8 but potentially more where multiple formations are targeted). Wells may be drilled in stages (i.e. 1 or 2 at a time) or progressively (i.e. 8 wells drilled over a single campaign). Each well will be drilled into an underlying prospective petroleum reservoir (such as the Velkerri shale, Kyalla shale or other formation) to a typical depth of 1500m-4000m. Each well will be deviated into the horizontal position, with a lateral drilled up to 5000m (please note the depth and lateral length may change based on operational requirements and technological advances). Each petroleum well is designed and constructed in accordance with the Code of Practice for Onshore Petroleum Activities within the Northern Territory (Code of Practice) to maintain well integrity and protect aquifers and the environment. A Well operations management plan (WOMP) is required to be submitted to the regulator and approved prior to the drilling of any wells. The WOMP outlines the well design and drilling practices that will be deployed to ensure compliance with the Code of Practice and protect underlying aquifers and the environment. Each well is anticipated to be constructed with multiple casing and cement strings as per NT drilling regulations. Once the well design is approved by the Northern Territory government (NTG), a rig package will be mobilised to site, which consists of a drilling rig (comprising rig matting, a rig floor, mast or derrick, rig engine, blow out preventor, catwalk, safety flare etc.), pipe racks, casing strings, drilling rods, rig fluid system (mud tanks, shakers, mud treatment system and pipework) storage trailers, bunded chemical storage areas, workshop portable onsite offices, crib huts, mini-rig camp and sewage treatment system and irrigation area),	N/A located on proposed lease pad	<60 people	Post civil construction	Typically 45 - 90 days per well	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
freshwater storage tanks, diesel power generation, cement trucks, bulk fuel storage, water transfer pumps, fork lifts, lighting towers, crane etc. The rig will be constructed over the pre-installed conductor casing and cellar. Once functional, drilling will proceed down below the first encountered aquifer, where the first casing section of the well will be installed (either in the Anthony Lagoon Formation if present and saturated or the Gum Ridge formation (anticipated to be present). A BOP will then be installed, to ensure any influxes of gas, water or pressure are able to be safely managed during drilling of the remaining sections of the well. The drilling rig will continue to drill the various other casing and cement sections. The integrity of each of these casing strings is tested through a combination of leak off tests, formation integrity tests. casing pressure tests, cement return tracking and cement bond logs. Upon completion of drilling, a barrier integrity verification report is submitted to the regulator summarising the integrity of the well. This report is publicly available. Once each well is finished drilling, the well head is installed and the rig is either “walked” to the next adjacent location with the process repeated or mobilised to a new location. A low toxicity water-based drilling mud is to be used as the base fluid for drilling, which primarily contain salts and polymers. Drilling mud is required to maintain well control, provide formation stability, lubricate and control the temperature of the drill bit and lift cuttings to the surface. The fluid system consists of water with a sodium or potassium-based salt (to prevent formation swelling) and a viscosifying agent such as bentonite. Other low toxicity chemicals such as barite, citric acid, sodium bicarbonate and loss circulation material (fibres such as coconut coir or nut hulls etc.) may also be used. The chemicals used for drilling are consistent with those used for water bore drilling. Waste drilling muds, fluids, cuttings and mineral waste (such as cement returns, sand etc.) brought to surface will be stored in the lined drilling sump. Drilling fluids will be evaporated and then removed from the sump and disposed of offsite. Solid waste within the drilling sump will be allowed to dry out and then either removed from site or disposed of onsite in accordance with the Code of Practice. Where onsite disposal is proposed, a risk assessment will be completed demonstrating that the activity can occur with no residual environmental harm. Onsite disposal can include encapsulation or mix bury cover, depending on the site specific details and final composition of the drilling waste material. Subsurface diagnostic tools will be run on the well during and after drilling to understand the nature of the target reservoir. Some sections of the formation may be cored or have sidewall samples collected, which will add further analysis of the reservoir properties. To assist with determining the suitability and capacity of these formations for potential gas extraction activities, diagnostic fracture injection test (DFIT) may be conducted across a number of shale intervals to evaluate the geo-mechanical and reservoir properties of the targeted formation. Prior to a DFIT, a cement bond log and casing pressure test is completed to ensure the integrity of the cement and steel casing. A DFIT involves the injecting of small volumes of a water (approximately 30 barrels (5,000L) per DFIT) at low pumping rates to create a small fracture in the target interval. The well is shut-in, and the pressure allowed to fall-off naturally. Monitoring the fall-off pressure over time allows information to be derived about the reservoir. The fluid does not contain proppant so that the fracture closes naturally when the fluid leaks off into formation. The analysis of pressure, during injection and after shut-in, provide powerful tools for understanding and subsequently informing the design for a future hydraulic fracturing process (not in this scope). Any returned fluid will be stored within double lined tanks and disposed of offsite at a licenced facility. All waste drilling fluids, muds, cuttings, DFIT return fluid and cement returns will be managed in the existing lined drilling sump on-site (or equivalent tanks or fit-for-purpose containers). Once drilling has been completed, this material will be sampled and tested as per the code					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
of practice and a risk assessment completed to determine whether onsite encapsulation or mix-bury-cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with native soil and encapsulated within an impermeable liner. A cap of clean material will be placed over the liner to enable vegetation growth.					
Hydraulic Fracture Stimulation Upon completion of drilling activities, hydraulic fracturing stimulation (HFS) plant and equipment (commonly referred to as a "frac spread") will be mobilised to site to commence HFS (or stimulation) activities on each of the drilled wells. A frac spread typically consists of: • Data Van – on-site office to execute stimulation activities • Water Storage – tanks will be constructed on-site, capable of managing both make-up water (for frac fluids) and flowback water. Tanks will be double lined with leak detection capable of monitoring any leaks between the primary and secondary liner • Proppant Trailer – a large sand storage and delivery trailer that holds the proppant • Hydration Unit – used to add stimulation additives and viscosifying fluids • Blender Unit – used to mix proppant and fluid additives, prior to its injection into the well • High Pressure Pumps – pumps to inject the hydraulic fracturing fluid mixtures from the Blender Unit down the well, via the surface lines and hydraulic fracturing wellhead or coiled tubing unit • Coiled Tubing Unit – a large length of coiled steel pipe that can be temporarily installed in the well to perform various downhole operations • Wireline unit – plug and perforation deployment • Ancillary support equipment and buildings – offices, workshop, cranes, chemical storage area, equipment storage, power generation and all other activities required to support stimulation activities. Stimulation involves the injection of a slurry, primarily consisting of water (raw water or a mixture of raw water and recycled flowback wastewater) and sand (proppant), plus a small percentage of chemicals at high pressure into the target section of the horizontal wellbore. Typically, >90% of the total volume of stimulation fluids is a combination of water (fresh and recycled wastewater) and sand (~6-8%), with the remainder as fluid-conditioning additives (~2-4-%). Prior to the commencement of stimulation activities, the integrity of the well is tested with a cement bond log and pressure casing tests and an integrity report generated, which is submitted to and assessed by the regulator prior to the commencement of stimulation activities. The stimulation fluid is generated through mixing freshwater, recycled flowback, chemicals and sand in blenders. Stimulation fluid is then pressurised by the high-pressure pumping units and directed downhole via a manifold to the discrete target intervals along the horizontal wellbore (referred to as 'stages'). Each stage will be isolated and perforated using a plug and perforation gun assembly deployed via a wireline unit. As the pressure is sustained, the fractures propagate radially from the well, through the target rock. Once optimal fracture propagation has been achieved, the proppant (sand) is pumped down the well and into the open fractures. This process is repeated for each stage. The final number of stages pumped in each well is dependent on the useable length of the horizontal wellbore and in-situ geological conditions. Once all stages are complete, the well is suspended awaiting completion and well testing activities. Wellbore pressures are monitored during each stimulation, to ensure the operations have not compromised the integrity of the production casing or the cement barriers. A Maximum Allowable Operating Pressure (MAOP) is an important engineering parameter used to define the operating envelope (i.e. the safe maximum pressure that should not be	N/A located on proposed lease pad	<50 people	Post E&A well drilling	2- 8 weeks per well depending on stimulation size	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
exceeded). The maximum allowable pumping pressure (MAPP) is set below the MAOP to allow for uncertainty and provide an additional safety margin so the MAOP is not exceeded.					
Exploration well completion Once each well has been stimulated, a completion rig will be mobilised to site to "complete" the well. This involves installing downhole equipment such as packers, plugs, production tubing, artificial lift etc. required to enable the production testing.	N/A located on proposed lease pad	<12 people	Post stimulation	1-2 weeks	
Well testing Once the well has been completed, the well will be brought online and tested. To enable the testing, a well test package will be installed at the site consisting of: • Separators (to separate gas, condensate and water) • Flares (either a vertical or horizontal), • Flare pit (if a horizontal flare is utilised • surface pipework, manifolds, and tanks • communication and generator shacks • workshops/ storerooms • bulk diesel tanks • wastewater storage tanks (converted freshwater storage tanks used for stimulation makeup water) • Water transfer equipment • Wastewater evaporation and treatment units The E&A well will be underbalanced (or "unloaded") to initiate production, either through its own energy or through artificial lift (such as through a Nitrogen lift or pump). The fluid and gas will be sent through a separator, with all hydrocarbon metered and flared. Flowback water will be discharged from the separator into designated wastewater storage tanks. Well testing will typically be undertaken form a period of depending on the objective of the well. Multiple well testing operations may be required to test the behaviour of the formation to determine whether extended shut ins can affect well productivity. Gas will be either flared, sold (piped or compressed/liquified and trucked) or beneficially used onsite to reduce greenhouse gas emissions where possible.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	Typically 30 days to 24 months.	

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>
Appraisal gas sale

To minimise flaring during the production testing phase of the wells Tamboran will be developing facilities and a pipeline to enable this gas to be captured rather than flared. This is anticipated to reduce appraisal emissions by approximately 90%.

Options are currently being assessed with a priority on speed of installation to limit flaring and economic affordability.

The initial solution is likely to be a Compressed Natural Gas (CNG) or mini Liquified Natural Gas (LNG) facility to enable gas treatment, compression and truck loading of the CNG or LNG so the gas can be delivered to and injected into either the AGP or the McArthur River Mine Pipeline and to any customers seeking truck deliveries of CNG/LNG as a fuel or diesel alternative. This approach is commonly used around the world for initial production gas or virtual pipeline supply, however it is limited in the amount of gas it can capture. Local generation and power consumption for a data centre on site is another possibility for this initial gas but again will be limited in capacity.

In parallel, initial treatment and compression facilities will be developed to compress the gas into a new pipeline connection to the AGP. This will enable all the extended production gas to be captured and flaring stopped.

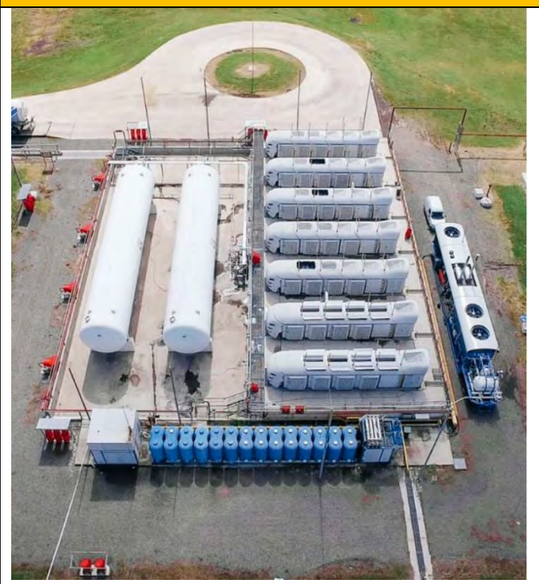
Appraisal gas facility construction
<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Mobilisation</td><td>Establishment of access track into site and site offices and amenities, laydown areas, erosion and sediment controls installation as per the requirements of the approval management plans, site communications links and construction set out survey.</td></tr>
<tr><td>Earthworks and Civil Works</td><td>Preparation of top soils and sub-fill for establishment of foundation – including excavation and removal of unsuitable fill materials from site, import of required sub-grade fill materials, grading and levelling of the facility pad and final capping and import of road base materials to design specification. Works may also include ongoing upgrading of existing access tracks.</td></tr>
<tr><td>Underground Services</td><td>Trenching of facility pad as required to install buried services and piping, backfill and compaction of trenches, including installation of crossing reinforcement for protection of buried services in trafficable areas.</td></tr>
<tr><td>Piling</td><td>Installation of steel pile foundations by driving into the prepared facility pad and/or pre-drilling as required and welding of pile caps onto piles in preparation for skids to be landed.</td></tr>
<tr><td>Structural Mechanical and Piping</td><td>Installation of pre-assembled skidded pipe rack modules onto foundations requiring lifting onto pile caps and welding in place, bolting flanges to connect interfacing skids and equipment packages, installation of site run utilities piping, lifting and welding in place of skidded equipment packages.</td></tr>
<tr><td>Electrical and Instrumentation</td><td>Installation of cables and cable supports, ladders and trays, termination of cables into relevant panels (control and low voltage), installation of tubing and glanding of instruments, mounting instruments onto piping or instrument stands.</td></tr>
<tr><td>Plant Commissioning</td><td>This stage involves the testing and commissioning of all equipment on the site, in preparation for operations.</td></tr>
</table>
A range of temporary facilities will be required during construction. These may include work areas for equipment and pipe, storage and lay down areas, and a site office.
</td>
<td>9 Ha</td>
<td>< 10 people operating and <50 people during construction</td>
<td>Upon completion of well testing- potential 2024.</td>
<td>Until Production Licence</td>
<td>

Figure 4 Example facility – the Buquebus LNG Facility in Buenos Aires Argentina


Figure 5 A truck mounted compression facility
</td>
</tr>
</table>

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
The location of the temporary facilities will be primarily based on logistical requirements. This will include ensuring facilities are located at a suitable distance from watercourses, are not endangered by threat of flood, do not require clearing of sensitive vegetation and are managed in such a way as to ensure no long-term land contamination issues. Typical manning during operations is <10 people. During construction, ~50 people may be required. These are indicative numbers with the final manning levels will be finalised during the activity planning.					
Wastewater tank storage Flowback and drilling wastewater will be stored one each location or piped to a centralised location for storage via gathering lines. Wastewater will be recycled within the drilling or stimulation process to reduce raw groundwater volumes. Wastewater not earmarked for recycling will be treated on site via evaporation within open tanks (or other treatment technologies such as enhanced evaporation units, brine crystallisation etc.) and removed from site upon completion of activities. Double lined wastewater tanks will be utilised to store wastewater, with the volume and number of tanks installed dependent on the anticipated flowback return volume. Wastewater storage tanks have continuous level monitoring, with leak detection sensors located within the interstitial space between the primary and secondary liners. It is anticipated that between 10ML to 30ML of tanks storage may be installed onsite, with a combination of enclosed tanks and open treatment tanks. In accordance with the Code of Practice, sufficient enclosed tank capacity must be onsite to store all wastewater. Flowback can only be stored within open tanks where undergoing treatment (such as evaporation). Open evaporation tanks must have a 1:1000 annual re-occurrence Interval (ARI) wet or dry season freeboard (i.e. available tank space to accommodate rainfall), which is typically 1.3M or 0.3M respectively. The lease pad or a specifically constructed wastewater storage areas will be bunded to contain 110% of the volume of the largest tank stored onsite. Wastewater storage tanks may be deployed for extended periods of time (potentially several years) to allow ongoing evaporation or treatment. Wastewater from other sites across the basin may also be used to stored onsite, to assist in wastewater treatment/ management. The treatment of wastewater may also be undertaken within Tamboran infrastructure footprint (such as lease pads or laydown yard) to reduce the amount of offsite wastewater trucking.	N/A located on proposed lease pad	<4 persons	During wastewater storage activities.	3-36 months	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Flaring During well testing and where gas cannot be beneficially used or sold (such as during facility downtime etc.) , produced hydrocarbons (gas and liquids) will be flared onsite, with a vertical flare used to manage gas and a horizontal flare used to manage condensate where it is anticipated to be encountered. The vertical flare will be an American Petroleum Industry (API) 537 and a US EPA AP 42 compliant unit, with a 98% combustion efficiency. The vertical flare will have a constant pilot flame, with an autoignition system that provides electrical impulses to a spark plug continuously. If the flare was to go out, the spark would ignite the flare within 1.3 seconds. A horizontal flare may be utilised to combust condensate if produced during well testing. A horizontal flare will been equipped with 3 independent nozzles, located in a 20mx 10m clay lined pit. Flares will be located at least 45m from the surrounding vegetation, with flaring not undertaken during total fire ban periods.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	During production testing.	
Condensate management (Storage and trucking) Where condensate (liquids rich gas that “condenses” when brought to the surface) is generated, it is separated and stored within double lined condensate tanks. Condensate may either then be trucked offsite for beneficial use or combusted in the horizontal flare.	N/A	1-2 trucks per day	During exploration activities	During production testing.	
Drilling waste management All waste drilling fluids, muds, cuttings, DFIT return fluid and cement returns will be managed in a lined drilling sump on-site. Once drilling has been completed, this material will be sampled as per the Code of Practice and a detailed risk assessment completed to determine whether onsite encapsulation or mix bury cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with clean fill and encapsulated onsite within an impermeable liner. It will then be buried with capping material to enable vegetation re-establishment. To reduce the number of sites where material is mix-buried covered, multiple wells from other locations may be disposed of at a selected location.	N/A- within proposed lease pad	< 6 people	Upon completion of drilling activities	7 days	

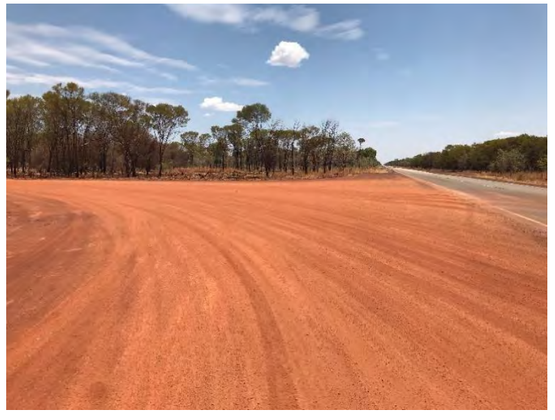
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wet season operations Exploration activities (including drilling, stimulation and well testing operations) may occur over the wet season. Where wet season operations are undertaken the following risk controls will be implemented: • All chemicals, fuels, equipment, tanks and materials required for ongoing operations will be stored on-site prior to the onset of wet season significant rains (notionally December or as predicted) • All equipment required to respond to emergency situations will be on-site; this includes earth moving equipment, vacuum trucks, wireline rigs, cementing equipment etc. and equipment and material to deal with well control issues, spills and other emergency events. • All chemicals storage areas will be bunded, with covers used (where safe and appropriate) to prevent rain ingress and bund overflows • Enclosed tanks will be utilised as the primary measure to store flowback wastewater with enough enclosed tank capacity to store all flowback wastewater on-site • Enclosed flowback wastewater storage volume will be sufficient to manage all flowback wastewater stored onsite • Open working evaporation tanks and mud sumps will have enough freeboard to manage an entire 1:1000 ARI wet season event (not just one (1) rainfall event but an entire season's rainfall total) • Helicopters will be used to transport people and supplies into and out of the site when access is restricted • No transportation of wastewater or chemicals will be undertaken during the wet season unless the access to the site is safe. • Wastewater storage area is bunded, which will prevent all off-site release of chemicals and stormwater. • During flowback wastewater storage, stormwater will be retained on-site via the sediment retention pond prior to release. • Overland flow will be diverted around lease pads as far as reasonably practicable.	N/A	N/A	October – May	7 months of the year	
Microseismic survey and Induced Seismic Monitoring Microseismic Surveys are undertaken to monitor 'listen to' the Hydraulic Fracture Stimulation Operations on each of the sites. Seismic Receivers called geophones are individual weatherproof units that contain a sensitive seismic recording device, memory storage, a long-life battery and GPS locator. The Geophones are deployed 5-25 metres apart along lines or in a grid over an area of 30-40km2 around each of the well during stimulation activities. Geophone deployment locations are located on foot by GPS locator. A handheld battery drill is used to create a 4cm diameter hole with an auger bit, a small quantity of water may be used to stabilise the soil. The Geophone is inserted into the hole so that the top of the receiver is flush with the surface of the ground (see picture) The Geophones deployed prior to the commencement of stimulation and retrieved after the stimulation has concluded. Deployment and retrieval of the Geophones is undertaken in small teams of 2 or 3 people, with the number of deployment teams depending on survey size. The teams are supported by a light 4WD vehicle or an All-Terrain Vehicle to carry equipment, gear, water, communication (radio/satellite phone), first aid kits and safety gear.	Minimal	3-9 personnel.	Deployment of Geophones before stimulation. Retrieval of Geophones after stimulation.	1 month (one week deployment, two weeks Stimulation, one week collection)	

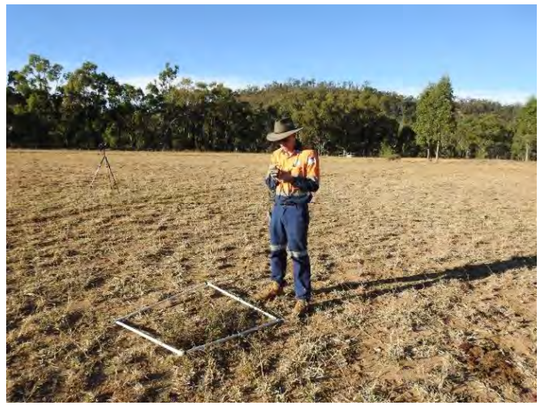
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Induced Seismic Monitoring will be undertaken at the same time as the Microseismic monitoring. A temporary seismic receiver is installed ~1km from the well site, with a small amount of other equipment such as solar panels and data transfer equipment. The equipment can be fenced off with temporary fencing if there are cattle in the area. The data from the seismic receiver is sent wirelessly back to the well site to enable live monitoring of seismic events during Hydraulic Fracture Stimulation. The Induced Seismic Monitoring equipment is installed prior to Hydraulic Fracture Stimulation, and remains installed, collecting data for up to 2 months after the conclusion of Hydraulic Fracture Stimulation. Minimal clearing or heavy machinery is required for either activity, and the activities are considered to have a minimal impact, like that of scouting activities.					
Site monitoring and inspections consisting of the following: • **Groundwater monitoring:** Groundwater monitoring bores are required to be installed on the lease pad before the commencement of hydraulic fracture stimulation activities. Groundwater monitoring is undertaken at the site commencing 6 months before stimulation and then quarterly for 3 years after. Groundwater monitoring involves purging a monitoring bore of water, measuring field parameters (level, electrical conductivity) and collecting laboratory samples and • **Site and exploration well monitoring-** an operator or contractor will access the site to perform checks on the exploration well and stability of the site. Checks include pressure readings and visual checks of valve integrity. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed fortnightly. • **Weed inspections-** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify weeds. In some cases, a helicopter may be utilised. Contractors may perform spot sprays with a NTG recommended weed treatment. Surveys are completed pre and post wet season. • **Erosion and sediment control inspections-** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify erosion or stability issues. Inspection will be used to schedule maintenance to repair any defects identified. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed pre and post wet season. • **Gas leak detection surveys-** Access to the site by 2- 3 contractors or Tamboran personnel in light vehicles to perform mandatory gas testing using handheld gas meters. Surveys are completed every 6 months. • **Build up pressure monitoring-** Post stimulation and well testing, the exploration well may be shut in with pressure monitoring equipment installed to monitor build up pressure. This requires the installation of a solar panel and telemetry equipment, with monthly equipment inspections (typically)	N/A	<2-6 people	Fortnightly/ 6 monthly (depending on activity)	1 day per inspection	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
					
Site maintenance (lease pad, camp pad, access tracks and gravel pit) Each site will be periodically maintained, which includes grading, erosion and sediment control repair, vegetation management, firebreak management, weed management, fence repair and all other ancillary activities required to maintain a site and associated with infrastructure. This includes maintenance of the access tracks. The work will be undertaken by civil maintenance contractors and Tamboran personnel.	N/A	<10 people	6 monthly- pre and post wet season maintenance	<7 days per activity depending on the nature of the activity.	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well head maintenance Maintenance is completed annually on each well. Maintenance primarily includes valve checking, testing, greasing and (in some cases) replacement, as well as any other activities required to maintain the integrity of the well.	N/A located on proposed lease pad	<20 people depending on activity	Annually	< 7 days per activity- depending on nature of maintenance.	
Well intervention- data acquisition and testing Subsurface activities may be undertaken periodically on each of the well to perform maintenance or collect additional information on the properties of the well or the reservoir. These type of well interventions typically include performing cement bond logs, casing pressure tests, running reservoir evaluation or production logging tools, cement and casing remediation activity (if required during the life of the well), setting downhole mechanical plugs and gauges, casing perforation, subsurface barrier maintenance/ installation and production tubing installation/repair or replacement. This generally involves the use of a variety of equipment dependent on the activity being completed. This typically may involve any of the following equipment: completion rig, coil tubing, wireline unit, data van, cement or pump truck, crane, trucks, power generation, support trucks and other support vehicles.	N/A located on proposed lease pad	<20 people depending on activity	Ad hoc requests- typically 2 interventions within the next 5 years	<10 days per activity	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Petroleum well plugging and decommissioning. Once a petroleum well is no longer required, each well will be decommissioned. Decommissioning involves the permanent removal of the well through the placement of cement plugs to isolate the target reservoir from overlying aquifers in accordance with the Code of Practice: Onshore Petroleum Activities within the Northern Territory (Code of Practice). Once plugs are installed, they are pressure tested to confirm the underlying formations have been adequately sealed off. The well head is then removed. A permanent marker is added to indicate the location of the plugged and abandoned well.	N/A located on proposed lease pad	<12	End of well life	<10 days	
Chemical and fuel storage- All chemicals and fuels (diesel) required to support exploration activities will be stored in accordance with the relevant regulatory requirements, including the use of secondary containment (bunding) onsite. The Code of Practice has implemented a range of additional controls, including requirements for routine inspections, emergency response procedures and spill management. Anticipated chemical and fuel volumes vary dependent on activity, but may involve the storage of the following types of chemicals and volumes: • Stimulation and drilling chemicals (friction reducers, surfactants, crosslinkers, breakers, buffers, acids, bases, biocides, scale inhibitors, corrosion inhibitors, clay stabilisers, loss of circulation material, drilling muds, salts etc.) Volumes are typically less than 20KL per chemical, with some chemicals stored at higher (such as pH control) or lower (such as biocides and corrosion inhibitors) volumes depending on their purpose and planned use. • Diesel – typically 100KL stored but may be 500KL if wet season activities are proposed. • Other chemicals and hydrocarbons- such as oils and greases, lubricants, hydraulic fluid, cleaning chemicals, domestic chemicals etc. used to support operations.	0.5ha (on existing lease pad or laydown yard)	N/A	During exploration activities	During exploration activities.	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Waste management: Any waste generated during exploration activities will be stored onsite in accordance with the NT *Waste Management and Pollution Control Act 1998* and Code of Practice and transported offsite to a licenced waste management facility. All wastes (other than drilling mineral waste) will be stored within skips or equivalent and removed from site at the end of each activity.	N/A	1 -2 trucks per day during operations	During explorations activities	During explorations activities	
Groundwater extraction: Groundwater extractions from the purpose built groundwater monitoring onsite or another approved extraction bore (which may include trucking water from adjacent properties) will be completed periodically to support exploration activities. All groundwater take will likely be from the Gum Ridge Formation and will be licenced under Tamboran's existing Water Extraction Licence (WEL) GRF 10285. A new WEL may be submitted to increase the water take and/or covering take an alternative formation where present. It is anticipated that groundwater extraction volumes to support this program will be in the order of 250-600ML per year (conservatively) , primarily used for civil construction, drilling and to stimulate the E&A wells. Once drilling and stimulation has ceased, minimal ongoing water extraction from the site will be required. Where possible, recycled flowback will be utilised within stimulation to reduce raw water usage.	N/A	N/A	Ongoing to support exploration activities.	During exploration activities	
Traffic management Access to the site will be via a combination of existing and new access tracks, located approximately 15-20km South of Dunmarra on the Stuart Highway. Minor traffic disruptions may occur during the construction of the access track intersection with the Stuart highway. During this period, a traffic management plan will be implemented, with traffic control utilised in accordance with DIPL requirements. Peak traffic volumes are anticipated to be associated with the drilling rig mobilisation and demobilisation. Traffic volumes may reach up to 44 vehicles per day spread over a 4 week period. During operations (drilling, stimulation or well testing), vehicle movements to the site are anticipated to be less than 10 movements per day. This period is likely to extend typically 60 days per exploration well, 45 days per stimulation and during the duration of a well test/appraisal gas sale (30-365+ days). Once the well is suspended or decommissioned, vehicle movements will reduce down to 1 vehicle per fortnight or 1 vehicle per 6 months respectively.	N/A	N/A	During operations	During operations	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site rehabilitation Within 6 months of the E&A wells being plugged and decommissioned, a site will be rehabilitated. This involves: a) the removal of all surface facilities (well heads, fencing, water bores, tanks etc.) b) deep ripping of compacted surfaces c) recontouring landforms d) respreading of topsoil from the topsoil stockpiles, e) re-seeding (if required;) and f) ongoing monitoring and maintenance of the rehabilitation.	N/A		Within 6 months of the plugging and abandonment of all E&A wells	<14 days, with ongoing monitoring and maintenance	 

Appendix B Summary of Environmental outcomes, impacts, risk and controls

An overview of the potential environmental outcomes, potential impacts and risks associated with the proposed exploration activities within this clearance request are summarised in Table 3. This information will also be provided in the EMP covering the proposed regulated activity, which will be submitted to the Department of Environment, Parks and Water Security (DEPWS) for formal assessment and approval.

An environmental outcome means an outcome that will be achieved if the environmental impacts and environmental risks of a regulated activity are reduced to a level that is as ALARP, and acceptable.

Environmental impacts are defined as any adverse change, or potential adverse change, to the environment resulting wholly or partly from a regulated activity.

Environmental risks are defined as the chance of something happening that will have an environmental impact, measured in terms of environmental consequences and the likelihood of those consequences happening.

Both the consequence and likelihood of a potential impact can be reduced through the adoption of controls, which must be applied to reduce a risk down to an ALARP and acceptable level.

Table 4 Environmental outcomes, impacts, risk and controls

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
Groundwater use and quality	• To manage exploration activities to prevent unsustainable depletion of groundwater resources • Preserve groundwater quality to protect environmental and pastoral use	• No adverse changes to groundwater quantity is anticipated to be associated with exploration activities. • Impacts to aquifers levels anticipated to be negligible, with rapid recharge observed from other Gum Ridge Formation bores utilised within the Basin. • No material changes to groundwater quality anticipated form exploration activities. • No impact to Groundwater Dependent Ecosystem's (GDE) or stygofauna from exploration activities (extraction and well construction) • Reduction in pastoral productivity through reduced groundwater volumes	• Low risk of groundwater contamination from drilling fluids during construction of the conductor/ surface casing in the Cambrian Limestone Aquifers due to the selection of low toxicity drilling fluids • Low risk of cross flow of deep formations (such as the target shales) to shallow aquifers through inappropriate well barrier design and construction due to the presence of the Code of Practice controls and verification processes. • Low risk of crossflow through fracture growth into aquifer from stimulation activities allowing the migration of fluid and gas due to the controls within the Code of Practice and underlying separation distance between the target formation and Cambrian Limestone aquifers. • Low risk of stimulation activity inducing seismic activity that enables cross formational flow between shallow aquifers due to seismic stability of region and lack major faults or fracture zones. • Low risk of stimulated zones intersecting offset wells (including the adjacent horizontal wells) or intersecting an existing geohazard due to seismic control, pressure monitoring during stimulation and lack of older petroleum wells in close proximity. • Low risk of crossflow/well integrity caused by the deviation of an E&A well into the adjacent well during drilling due to downhole GPS tracking tools and proximity alarms • Low risk of leakage of either flowback, produced water, or hydrocarbons (liquid and gaseous) from suspended or abandoned wells to groundwater due to well design and integrity management. • Low risk of leaks from gathering lines, with gathering lines constructed as per Australian Standard, leak detection in place to identify pipeline failures and routine inspections completed. • Low risk of surface contamination from storage and disposal of drilling fluids, additives, muds and cuttings on-site due to low toxicity of drilling muds and disposal risk assessment process. • Low risk of groundwater contamination from surface spills from storage, handling and transportation of flowback water due to the storage and spill management requirements outlined int eh Code of Practice. • Low risk of groundwater contamination from the storage, handling and transportation of chemicals, fuels and wastes due to the mandatory code of practice controls (such as mandated use of secondary containment) • Low risk of groundwater contamination from overtopping of drilling sumps and flowback tanks (including during wet season) due to level alarms and use of enclosed tanks. • Low risk of groundwater contamination from a failure of flowback storage tank due to the design standards of the tank (cyclone rated steel tank structures) and routine integrity inspections	• All petroleum wells are to be designed, constructed, operated and decommissioned in accordance with the mandatory controls within the Code of Practice. The Code of Practice outlines specific controls measures designed to protect underlying groundwater resources including: o Exploration wells designed with multiple cement and steel casing barriers to protect aquifers o Drilling fluids and muds must have a low residual toxicity o Groundwater monitoring must be completed before and after stimulation to detect contamination o Well integrity confirmation to prove barrier performance aquifer isolation (casing pressure tests, formation leak off tests, cement bond logs etc.). o Separation between stimulated shale resources and aquifers must be sufficient to ensure the risk of fracture growth is ALARP o Pressure monitoring completed to ensure maximum allowable operating pressure is not exceeded during stimulation. o Ongoing well integrity monitoring and maintenance throughout the life of each well to ensure aquifers are protected o All wells are to be decommissioned in accordance with the Code of Practice, with cement plugs utilised to separate aquifer units. • All surface storages of wastewater and chemicals to have secondary containment to prevent spills to the ground • An emergency response plan must be implemented outlining how spills and emergencies will be responded to. • Drilling fluids and wastes to be stored within a lined sump • Gathering lines and pipelines constructed as per Australian standard, leak detection in place to identify pipeline failures and routine inspections completed. • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Groundwater monitoring from monitoring bores installed at the site must be completed prior to and after stimulation to detect any contamination. • All water take covered by an existing Water Extraction Licence (WEL) GRF 10285 • New extraction bores must model potential impact on adjacent pastoral bores prior to being added to WEL. • All water take to be metered and reported quarterly to the regulator • No pastoralists groundwater bores within 1 km of each proposed site • Flowback to be preferentially used in stimulation fluid to reduce raw water usage.

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
			• Low risk from over extraction of groundwater for civils, drilling and stimulation activities due to limited nature of take (one off), yield of the Cambrian Limestone Aquifers and available allocation volumes (as assessed in the WEL).	
Soils	• Avoid, minimise and control soil erosion and discharge of sediment or soil into waterways or established drainage systems • Minimise disturbance of soil, vegetation and drainage during site activities • Prevent the contamination of soil to maintain the viability of soil resources • Minimise residual impacts to pastoralist usage of exploration areas	• Clearing of vegetation to support exploration activities. • Soil compaction from access tracks, leases and seismic lines. • Increased sedimentation transportation from disturbed areas • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Medium risk of soil erosion from cleared areas (access tracks, lease pads, camp pads, gravel pits and laydown areas) occurring on disturbed sites due to high intensity wet seasons. Risk is a low consequence (minor impact), possible (<50% chance of occurring) event. • Low risk Reduction in land production through poor erosion and sediment control practices • Low risk of spills/leaks from the on-site storing and handling of fuels. Condensate, hydrocarbons, drilling additives, stimulation additives, flowback fluid, solid wastes, storage and transportation of wastes causing soil contamination. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of chemical and waste transportation accident causing soil contamination due to licenced chemical/ waste provider use, spill response and emergency response requirements. • Low risk of contamination from on-site disposal of drill muds and cuttings with site specific assessment completed to ensure disposal is environmentally acceptable. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of wastewater evaporation mist transported offsite during wastewater treatment due to wind speed/direction cut offs and routine site inspections during operations. • Low risk of greywater and sewerage disposal from camp wastewater treatment plants due to the irrigation area being appropriately sized, fenced and quality aligning with the NT Department of Health requirements. • Low risk of reduction in land production through poor infrastructure placement as infrastructure is preferentially located in existing disturbed area, with no sensitive soil types present in the immediate vicinity. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements • Low risk of pipeline subsidence creating erosion	• Site selected to avoid sensitive soil units and slopes which may increase erosion hazard. • All land clearing (including during the establishment of seismic lines) to align with the requirements of the code of Practice and NT Land Clearing Guidelines (2019) • Erosion and sediment control practices to be utilised at all disturbed sites to minimise erosion. • Sites (including gravel pits) maintained to minimise sediment releases, with erosion and sediment control plan in place • Pre and post wet season monitoring completed on all disturbed areas (including seismic lines) to identify and repair erosion • Construction within the wet season to be avoided to reduce the erosion risk. • Vegetation clearing watercourses to be avoided as far as reasonably practicable (i.e. only when a new access is required to be constructed) • During seismic surveys, vegetation clearing within open woodlands to be minimal • All chemicals and fuels to be stored with secondary containment as per code of Practice. • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Stormwater to be retained onsite during wastewater storage and tested prior to release • All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • Disposal of drilling muds, cuttings and mineral waste to be undertaken in accordance with Code of Practice, with onsite disposal only permitted where the potential harm to the environment can be demonstrated as ALARP and acceptable. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist input. • Pipeline monitoring and repair work to minimise/ respond to pipeline subsidence

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
Emissions (dust, greenhouse and combustion emissions)	• Avoid environmental nuisance at sensitive receptors • Minimise impacts to pastoralists and surrounding ecological communities from dust • Minimise greenhouse gas emissions	• Dust on vegetation in the immediate vicinity of activities reduces plant palatability • Impacts of dust nuisance to birds and fauna in the immediate vicinity of activities, specifically access tracks and seismic lines • Emissions from the combustion of diesel. • Generation of Greenhouse gasses	• Low risk of dust impacts generated during Civil activities, drilling operations, well testing due to use of dust suppression and routine maintenance of access tracks and infrastructure • Low risk of reduction in regional air quality resulting from emissions from the combustion of diesel due to the temporal nature of the activities and selection of efficient equipment. • Low risk of reduction in regional air quality from gas and condensate flaring due to the combustion efficiency of the flare and operating procedures. • Low risk of air emissions from chemical releases during drilling and stimulation activities impacting livestock, fauna and people due to chemical handling procedures limiting emissions during mixing. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring, grinding) or personnel. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of uncontrolled release of gas impacting a receptor during drilling, stimulation, barrier failure, operator error or vehicle collision due to the well design, blow out prevention, well integrity and lack of sensitive receptors preventing impacts. • Low risk of leak of gas from wells due to the well design, routine leak detection and repair and separation distance from receptors, • Low risk of air emissions created by gas fired compression • Low risk of greenhouse gas emission impacts from appraisal gas sale/ well testing (climate change)	• Site located away from sensitive receptors, such as homesteads • Dust suppression to be used on access tracks, lease pads and gravel pits to minimise dust emissions where practicable • Outside of high intensity activities (such a s civil construction, drilling and stimulation) Dust levels consistent with standard pastoral activities (such as mustering/truck load outs) on the property • Venting of raw gas is tightly controlled under the Code of Practice, with no material volume of gas to be vented • A reduced emission completion (flare) to be utilised to combust all hydrocarbons • Flares to be compliant with USEPA design standards, including 98% flare efficiency • Stimulation chemical mixing procedures deployed (such as enclosed hoppers) that minimises dust emissions • Firebreaks to be maintained around well and camp pads to minimise bushfire risk • Flaring exclusion zones to be maintained around flare • No flaring during total fire bans • Slashing, grinding and other higher risk fire activities to be undertaken with appropriate controls to mitigate he risk of bushfire (such as buffer zones, use of fir trailers, fire breaks etc.) • During seismic surveys, no vegetation is to be mulched and bushfire management protocols implemented. • Vehicles to be equipped with fire extinguishers • 6 monthly gas leak detection on all exploration wells and equipment, with annual inspections on pipelines • Low NOx and Low CO gas fired compression/ power generation utilised to minimise air emissions. • Appraisal gas will be beneficially used through sale of CNG/LNG/ piped natural gas to reduce flaring and minimise flaring to reduce scope 1 and 2 emissions.
Surface Water	• Avoid and minimise the potential contamination caused by the discharge of sediment or contaminated storm water to waterways or established drainage systems. • Contain any potential contaminants for treatment or disposal.	• Increased sedimentation transportation from disturbed areas (access tracks, lease pads, seismic lines etc.)	• Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of gathering pipeline failure and release of flowback • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of a transportation accident releasing chemical or wastewater (drilling fluid and flowback) due to the use of licenced wastewater/ chemical transportation providers, spill management and emergency response requirements. • Low risk of spills to surface water from chemicals and fuel storage and handling activities due to use of secondary containment and separation distance to watercourses. • Low risk of stormwater releases from activities	• No take of surface water permitted or proposed • Lease pad located away from watercourses- typically 1km or greater • Seismic activities to: o avoid vegetation clearing as much as practicable o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o Avoid seismic lines in water courses (unless co-located with an access track) • Site maintained to minimise sediment releases, with erosion and sediment control plan in place • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All wastewater tanks engineered to withstand failure, cyclone rated construction • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
			contaminating surface water due to stormwater segregation and testing procedures. • Low risk of infrastructure (including pipeline) changing surface hydrology and flow due to infrastructure design and avoidance of overland flow locations. • Low risk of changes to terrestrial ground surface levels associated with seismic activity due to the stability of the basin and geomechanical properties of the target and overlying formations. • Low risk of gathering line failure releasing flowback fluid to the environment	applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • All gathering lines to be welded as per Australian Standards, hydrotested during construction to verify integrity prior to being brought into service • Gathering lines to utilise flowmeters/ pressure monitoring to identify leaks (such as flow/ pressure drops) • Gathering lines to be inspected 6 monthly to identify subsidence/ potential integrity issues. All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • No offsite releases of drilling or stimulation wastewater proposed or permitted • Stormwater retained onsite during wastewater storage, with testing completed prior to offsite release • Site selected to avoid major structural features, such as faults • Basin is seismically stable, with low seismic activity reported.
Flora and Fauna	• Minimise disturbance to flora and fauna • No disturbance to high conservation areas • Avoid the introduction of weeds • Avoid the spread of existing weeds • Minimise the loss of pastoral productivity	• Clearing of vegetation communities (such as Open Corymbia/eucalypt woodland, Bullwaddy and/ or Lancewood) to support exploration activities (lease pad extension and seismic lines). • Loss of fauna and flora habitat • Loss of livestock grazing area • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Low risk of impacts to sensitive vegetation communities from seismic activities, with high ecological areas avoided • Low risk of threatened fauna mortality during clearing, with all sites to be inspected prior to clearing to avoid fauna. • Low risk of vehicle and machinery noise and lighting on well pads and access tracks causing material impacts to threatened fauna or livestock. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Medium risk of introduction and spread of weeds in the area due to equipment washdowns, inspection and certification requirements. Monitoring and routine treatment completed on identified outbreaks. Impact from weed introductions/spread is considered moderate, with likelihood Unlikely. • Medium risk of bushfire from accidental ignition by site activities (civil works, seismic activities, drilling, flaring, grinding) or personnel on fauna, flora and land productivity. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of flora, fauna and livestock being trapped and drowning in storage tanks, sumps and pits due to the design of storages and fencing. • Low risk of contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities due to chemical storage and handling practices. Fences are utilised to restrict livestock access. • Low risk of vehicle collisions with fauna – fauna mortality	• Seismic activities to: o avoid clearing of mature trees and protected flora o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o No seismic lined in riparian o Implement fire management controls, include rapid response • No mulching of vegetation to occur which reduces risk to fire • Vegetation to be walked down and inspected for fauna prior to clearing. Where fauna are identified, work shall stop in the immediate vicinity until they leave the area. • Site to be fully fenced during operations • Open pits to be fully fenced to prevent livestock access • Sumps to have fauna ladders or liner material (such as coletanche) with sufficient friction to allow fauna to escape. • Gravel pits to be left open to act as watering point for livestock when not in use • Vehicle speed limit restricted to 60km/hr • Dust suppression used to limit dust impacts to vegetation • Limited night-time activities proposed. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist • All equipment and loads to be inspected and certified weed free prior to entry • 6 monthly weed inspections to be completed with all identified weeds treated.

Aspect	Environmental Outcomes	Environmental Impacts	Potential risk	Controls
			results in a localised impact to listed threatened species, due to avoidance of night-time driving, speed limit restrictions and number of vehicle movements. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements Reduction in land production through bushfire • Low risk of impacts to flora and fauna through the encouragement of feral animals and other pest species leading to competition with native species. This includes the introduction of cane toads.	• Weeds sprayed periodically to restrict weed numbers.
Environmental Nuisance and Amenity- including dust, noise, light, odour and vibration	• Minimise impacts to pastoralist operations	• Construction of exploration infrastructure onsite changes land use from pastoral to industrial. • Light and noise nuisance to fauna and livestock in immediate vicinity of activity • Increased traffic to proposed exploration area • Noise, light, odour and dust emissions in the immediate vicinity of the lease pad. • A visible hue visible from operations at night during flaring or from activity lighting. • Noise impacts from helicopter movements • Noise and vibration impacts during seismic activities.	• Low of changes in property amenity through the construction and operation of exploration infrastructure due to location of activities and separation distance from receptors • Low risk of increased vehicle accident or traffic impacts through associated with no material traffic volumes anticipated and limited peak traffic periods. • Low risk of adverse impacts to fauna from traffic are not anticipated, with impact levels consistent with standard road traffic levels. • Low risk of helicopter movements causing impacts to receptors based on location of site away from homesteads • Low risk of noise, dust, light and vibration impacts associated with temporary appraisal gas facility	• Sites located away from homesteads and local communities • Flaring to be minimised to avoid light generation • Site is located away from pastoralist main access points • Maximum peak traffic during mobilisation and demobilisation is likely to be typically less than<44 vehicle movements per day for 2 weeks. • Speed limit restricted on the access tracks to <60km/hr • Dust suppression to be utilised to minimise dust emissions • Where helicopter movements are planned, the pastoralist to be engaged prior to ensure helicopter do not interfere with pastoral activities. • Seismic surveys to avoid sensitive receptors, such as homesteads, local communities, sacred sites etc. • Compression/ power generation/ CNG/ LNG facilities to be designed to minimise aesthetic impacts and located away from homesteads and local communities. • Lighting of infrastructure designed to minimise aesthetic impacts during the evening •

Appendix J.1.2 05 240220 Updated Tamboran EP 76 98 117 NLC Work Program 2024 FEB

From:	Matt Kernke
To:	[redacted]
Cc:	Emily Beresford-Cane; Faron Thibodeaux; Tamboran Contact; Gibson Porkime; Robert Wear; Linda Pugh
Subject:	Tamboran 2024 revised work program
Date:	Tuesday, 20 February 2024 2:03:03 PM
Attachments:	Subject land 2 extension area clearance request.zip image001.png Tamboran EP 76 98 117 NLC Work Program 2024 FEB.pdf

Hi [redacted]

As foreshadowed, please find attached the updated 2024 work program and sacred site clearance request. I have also included the spatial file for the Subject land 2 extension.

In addition to the appraisal gas approval, the sacred site clearances will also cover the Stuart Plateau Compression Facility (SPCF) [redacted]. These programs are planned to commence in August/September this year, so we will need the sacred site clearances and AAPA certificate application to be a priority. It would be great to lock in dates for these clearances int eh next 2 weeks, so we can have people on the ground to support. We would hope for these to be completed in April/May to enable a certificate to be generated by mid August.

Similar to the previous clearance requests, we have provided a significant amount of information in application which is designed to satisfy our stakeholder engagement requirements under the Petroleum (Environment) Regulations. We welcome any comment/ queries on this information and it will be used to generate the EMP which will be submitted to the NLC in accordance with our Exploration agreements. At this stage, we are planning to commence developing 2 EMP's covering the Temporary Stuart Plateau Compression Facility (SPCF) [redacted]. These are planned to be submitted in May 2024.

Can I suggest a meeting in the next couple of weeks to sit down and go through the scope and discuss the forward plan?

Any questions, please let me know.
Talk soon.
Matt

Matt Kernke
Environment and Approvals Manager

tamboran
RESOURCES

M: [redacted]

2024 Work Program and Clearance Request

EP 98, 117, 76 – Beetaloo Joint Venture (Tamboran /Daly Waters Energy/ Falcon)

Version:	**1**
Submitted:	Matt Kernke
Presented by:	Tamboran
Review Date:	19/02/2024

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1 OVERVIEW

In November 2022, Tamboran (B1) Pty Ltd (ABN 39 662 327 237) ("Tamboran (B1)") executed a transaction to purchase Origin B2 Pty Ltd (ABN 42 105 431 525) ("Origin B2"; A subsidiary of Origin Energy;) in its entirety. The transaction resulted in Tamboran (B1) acquiring Origin B2's 77.5% interest in Exploration Permits (EP) 76, 98 and 117 ("the Permits") under the Beetaloo Joint Venture ("the Beetaloo JV") with Falcon Oil & Gas Australia Pty Ltd ("Falcon"). Tamboran (B1) is a jointly owned subsidiary (in equal proportions) of Tamboran (West) Pty Limited (ACN 661 967 077) ("Tamboran West") and Daly Waters Energy, LP ("Daly Waters"). Tamboran West is ultimately owned by Tamboran Resources Limited and Daly Waters is ultimately owned by Sheffield Holdings, LP.

Northern Territory Government permit commitments across the Permits require Tamboran B2 to complete ongoing exploration and appraisal ("E&A") activities. Since 2015, the Beetaloo JV has drilled nine (9) wells in the Beetaloo Sub-basin ("Beetaloo"). These include wells on Kalala S (Kalala S-1), Beetaloo W (Beetaloo W-1), Amungee NW (Amungee NW-1, Amungee NW-1H, Amungee NW 2H and Amungee NW 3H), Kyalla 117 N2 (Kyalla 117 N2-1H and Shenandoah S-1H) and Velkerri 76 S2 (Velkerri 76 S2-1). The Shenandoah S-1H and Amungee NW 3H wells were drilled over the 2023 period.

Results collected from the Beetaloo E&A program highlighted the presence of various shales targets which are potentially suitable for a future onshore gas development. Tamboran B2 has identified two main areas where larger scale pilot projects may be completed in the coming years, pending approvals and E&A success, and referred to as the Amungee Delineation Area and the Shenandoah South Pilot Area. These areas are the focus of the forward E&A campaign and subsequent sacred site clearance requests.

Tamboran B2 respectfully requests the Northern Land Council's ("NLC") assistance to:

- Undertake annual on country meetings to discuss the proposed 2024 work program scope
- facilitate a *Sacred Site Clearance Survey* to comply with the obligations of the Exploration Agreement(s) and to support an application for Aboriginal Areas Protection Authority ("AAPA") Certificate for activity as described below.

This application is designed to provide coverage for Tamboran B2's proposed activities within these areas over the next 1-5 years, with all or a subset of the proposed activities likely to occur. Information within these applications is utilised to satisfy stakeholder engagement requirements defined in section 7 of the Petroleum (Environment) Regulations .Annual work program updates will continue to communicate any refinement of Tamboran B2's E&A strategy.

2 Exploration and appraisal program strategy - the bigger picture

Tamboran B2's development strategy is focused on bringing gas to the domestic market as soon as practicable. Well testing during the E&A phase is a crucial step in assessing the commercial viability of the Beetaloo shale resources. Hydrocarbons produced during this phase are typically flared, which is a significant source of Greenhouse Gasses (GHG). Tamboran B2 is seeking to beneficially use produced hydrocarbons, rather than dispose of them via an onsite flare. This will achieve multiple objectives including:

- Minimising GHG generation;
- Increasing domestic gas supply at a time of domestic and international scarcity;
- De-risking future shale developments through longer term gas production information; and,
- Providing near-term benefits to Native Title Holders ("NTH"), local stakeholders and the people of the Northern Territory through increased gas supply, as well as greater potential for local employment opportunities and compensation/royalty payments.

Tamboran B2 is focusing its E&A efforts around the Shenandoah South Pilot Area (around the existing Kyalla 117 N2 location) and the Amungee Delineation Area (around the existing Amungee NW location). An overview of the proposed focused areas is provided in Figure 2.

During Calendar Year (CY) 2023, Tamboran B2 completed the drilling of exploration and appraisal wells, Shenandoah S-1H and Amungee NW 3H which targeted the Mid Velkerri B shale. The Shenandoah S-1H well successfully intersected 90 metres of high quality Mid Velkerri B Shale in EP117, the thickest section to date within the Beetaloo depocentre. [redacted]

[redacted]

The E&A work program for CY 2024 will primarily be focused around the Kyalla 117 N2 site for which the Shenandoah S-1H well was drilled. The focus area of 2024 is referred to as "Subject and 2" by the NLC.

It is anticipated that the work program in 2024 will include the construction of the new Shenandoah S2 pad and drilling, stimulation and testing of up to 4 new E&A wells (see Figure 1). The new Shenandoah S2 pad will be constructed in [redacted] As the number of wells drilled and tested increases, it is anticipated that gas appraisal volumes could be sufficient to warrant the construction of temporary compression (~~***Stuart Sturt***~~ ***Sturt Plateau Compression Facility or SPCF***) and pipeline(~~***Stuart***~~ ***Sturt Plateau Pipeline or SPP***) infrastructure to allow the export of gas into the Amadeus Gas Pipeline (AGP). [redacted] Larger volumes of up to an additional 40-50 TJ/day could commence on operation in late 2025/early 2026. Civil works and concrete footings for the larger SPCF is likely to commence in late 2024 to enable the bulk of the construction work to commence in 2025.

[redacted]

[redacted]

[redacted]

3 Proposed 2024 work program update

The CY 2024 work program for EP 76, 98 and 117 is summarised in Table 1, with the location provided in Figure 1 to Figure 3. Further information on the nature of the activity types reposed to be completed are provided in Appendix A. Appendix A provided information on proposed regulated activities to inform sacred site clearances. The description of the activity is also relevant to the description of activities to be completed in the 2024 work program; with some departures to account for duration i.e. the 2024 work program is a subset of the works proposed over a 5-year period.

Photographs of typical activity phases is provided in Figure 4 to Figure 10.

Table 1 EP 76, 98 and 117 CY 2024 Work Program Summary (including contingent scope)

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
New Works				
EP 98	Shenandoah S2	New proposed location	Shenandoah (NT Por 7026)	**Shenandoah S2**: Construction of a new exploration well pad Shenandoah S2 located ~3.5km north of the existing Kyalla 117 N2 location on NT Portion 7026. This construction of this new site includes: o Operation of the existing access track connecting the Stuart highway to the proposed location. Includes operation of the existing gravel pits (Gravel Pit A and Gravel Pit 3). o Construction a new lease pad (up to 12 ha) and fence line and firebreak (~4.0 ha). o Construction of a new 2 km access track approximately 14m wide connecting the proposed site to the existing access track. o Construction of a 5 ha laydown yard to accommodate material storage required for longer horizontals and wet season operations. o Construction and operation of a new 80 man camp, including accommodation, ablutions block, kitchen, gym, wastewater treatment and irrigation, storages, power generation, diesel storage, potable water storage. o Upgrade and use of the existing pastoralist access track from the Kyalla 117 N2 site to the turn off to Shenandoah S2. o Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad constructed before the main lease pad construction. o Construction of multiple (4) well cellars to accommodate E&A wells o Construction and operation of up to 6 new enclosed wastewater tanks and 2 new evaporation wastewater tanks (noting exact number to be base don operational requirements and compliance with the Code) , including the transfer of flowback and waste fluids between the adjacent Kyalla 117 N2 site for ongoing treatment (evaporation) and storage. o Construction of above ground pipes to facilitate the transfer of groundwater water/ wastewater between sites (i.e. form Kyalla 117 N2 to Shenandoah S2)

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				o Construction of seismicity instrumentation to monitor induced seismicity (regulatory requirement) o A schematic of the proposed Shenandoah S2 location is provided Figure 4 **Drilling, stimulation and appraisal of up to 4 new wells on Shenandoah S2 (Shenandoah S2- 1H and Shenandoah S2-2H)** including o Drilling, stimulation, completion, testing and maintenance of up to 2 new E&A well targeting the Velkerri shale in 2024; with an additional 4 E&A wells to be drilled on the pad in 2025. o E&A wells are anticipated to be ~3300m deep and extend for 3000m (noting we would like to potentially commence discussions to increase the lateral length to 5000m in the future) o Extraction and use of groundwater, with an anticipated water usage of below 80ML per well (72ML for hydraulic fracturing, the rest for drilling and operations) and an additional 20ML utilised for civil construction of the pad o Construction of bulk chemical, fuel and sand storage areas required to execute campaign. This is anticipated to be ~3 times larger than previous campaigns. All chemicals and fuels will be bunded and managed in accordance with occupational health and safety requirements, Dangerous goods and Australian standards. o Flaring of produced hydrocarbons, beneficial use of gas for power generation and potential appraisal gas sale where practicable. o Ongoing management of flowback and drilling wastes, including management of wastes from other sites within EP 76, 117 and 98. o All ancillary work required to support the above (power generation, workshops, material storage, waste storage, water pumping, etc.)
EP98	Shenandoah S2	New appraisal gas facility	Shenandoah (NT Por 7026)	o Sale of appraisal gas o Construction of appraisal gas sale locations, including civil construction, facility

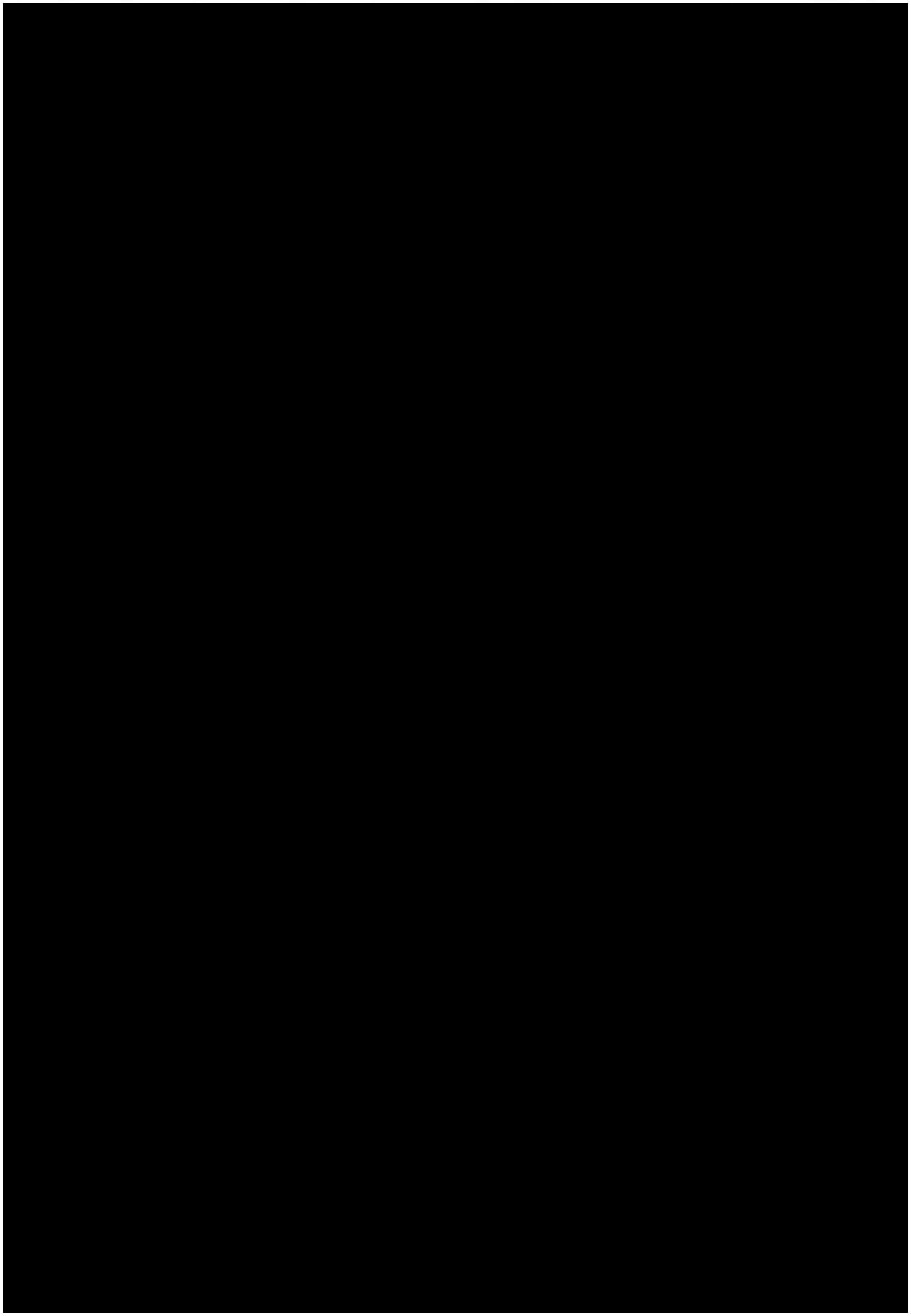
Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				construction, operation and maintenance. ▪ [redacted] the temporary Sturt Plateau Compression Facility (**SPCF**) ▪ [redacted] ▪ [redacted] o Construction of SPCF to enable larger appraisal gas sale into the Amadeus gas Pipeline over a 24- 36month period from bigger wells (i.e. each well may generate between 10-25TJ/day). This facility will take up to 50TJ/day of gas from appraisal wells drilled in subject land 2 to enable the longer-term collection of appraisal data to underpin future investment decisions and reduce greenhouse gas emissions. o SPCF likely to commence early civils and footings work in late 2024, with the facility built and commissioned in 2025/26. o The facility will be connected to the Amadeus Gas Pipeline via the Sturt Plateau Pipeline, which is being built by APA (outside of the scope of this engagement as APA will be proceeding with this approval). [redacted] ▪ [redacted] ▪ [redacted] ▪ [redacted] ▪ [redacted] ▪ [redacted]

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				[redacted] **Sturt Plateau Compression Facility (SPCF)** o Located at Shenandoah S2 on the re-purposed laydown yard to reduce extra clearing o Civil construction and footings/pilings will be installed in late 2024 to enable 2025 dry season construction o Skid mounted compressors (3-6), pipework, dehydration, power generation and ancillary equipment(work sheds, offices, ablutions, paydowns, water tanks etc.) will be installed and commissioned during the 2025 dry season o Appraisal gas will be sent to a new Sturt Plateau Pipeline (SPP) constructed by APA (out of the scope of this engagement)- APA will be obtaining all approvals for this pipeline including NTH consent. o Frist gas is anticipated to be late 2025/ Q1 2026.
EP 117	Kyalla 117 N2	Existing location	Shenandoah (NT Por 7026)	o Ongoing EPT of the Shenandoah S-1H well- up to 180-day well test (flaring). o Ongoing access track, gravel pit and lease pad maintenance and monitoring. o Flaring of produced hydrocarbons, beneficial use of gas for power generation and potential appraisal gas sale where practicable . o Ongoing management of flowback and drilling wastes, including management of wastes from other sites within EP 76, 117 and 98. o Ongoing maintenance and data collection from the existing Kyalla 117 N2-1H exploration well. o Operation of a temporary camp. o Groundwater extraction and monitoring.

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				o All ancillary work required to support the above (power generation, work shops, material storage, waste storage, water pumping, etc.)
[redacted]				
EP 117 and 98	Shenandoah North A (within Subject Land 1)	New Exploration Location	Shenandoah (NT Por 7026)	o Continent civil construction of a new exploration site "Shenandoah North A", including lease pad (~3ha) , access track and camp pad- includes upgrade of existing pastoral track connecting Kyalla 117 N2 to site. o Drilling of up to 4 water bores o Drilling of a vertical/ horizontal exploration well- noting no hydraulic fracturing contemplated during the 2024 period. o Suspension or abandonment of the exploration well. o Onsite mix, bury cover of drilling waste/ trucking to another site (Kyalla 117 N2/ Shenandoah S2) for management or offsite (such as a licenced landfill
EP 76, 98 117	Beetaloo Basin wide-	Surface water sites	Kalala, Beetaloo, Hayfield/ Shenandoah, Newcastle Waters, Amungee Mungee	Tamboran proposes to expand the regional monitoring program to include surface water sites. It is proposed 15 sites will be included in the routine round to demonstrate ongoing exploration and future production activities are not impacting/ not likely to impact on ground and surface water resources within the Beetaloo; The activity will be undertaken using a local indigenous contractor with the support of additional hydrogeologists and cultural managers engaged through the NLC (proposed). The program will visit each site every 6 months (pre and post wet season) for 1-2 hours and involve the following: o Collection of field chemistry using a calibrated water quality meter. o Collection of photographs GPS coordinates and observations at each site o The collection of surface water samples at each site in bottles for analysis by a

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
				laboratory o The collection of sediment samples at each site for analysis by a laboratory
Existing sites- routine activities / care and maintenance				
EP 98	Amungee NW	Existing	Amungee station (NT Por 1079)	o Ongoing access track, camp pad and lease pad use, maintenance and monitoring. o Ongoing wastewater (flowback and drilling fluids) storage and evaporation o Ongoing well maintenance
EP 76	Velkerri 76 S2	Existing	Amungee station (NT Por 1079)	o Ongoing access track, gravel pit, camp pad and lease pad maintenance and monitoring. o Ongoing Velkerri 76 S2-1 well maintenance.
EP 98	Amungee NW2	Existing	Amungee station (NT Por 1079)	o Periodic inspection and ad hoc maintenance of existing access track, water bore, and lease pad. o Potential site rehabilitation.
EP 98	Kalala S	Existing	Kalala Station (NT Por 697)	o Periodic inspection and ad hoc maintenance of existing access track, camp pad, and lease pad. o Ongoing Kalala S-1 well maintenance. o Groundwater monitoring and extraction. o Potential well abandonment. o Potential site rehabilitation.
EP 117	Beetaloo W	Existing	Beetaloo Station (NT Por (702) Access track: Hayfield (NT Por 1077)	o Periodic inspection and ad hoc maintenance of existing access track, gravel pits, camp pad and lease pad. o Ongoing Beetaloo W-1 well maintenance. o Diagnostic fracture injection test and monitoring. o Groundwater monitoring and extraction. o Potential well abandonment.

Exploration Permit	Location	Location type	Pastoral Stations/ NT Portions	2024 work program overview
			Access Track: Jingaloo (NT Por 5416)	o Potential site rehabilitation.





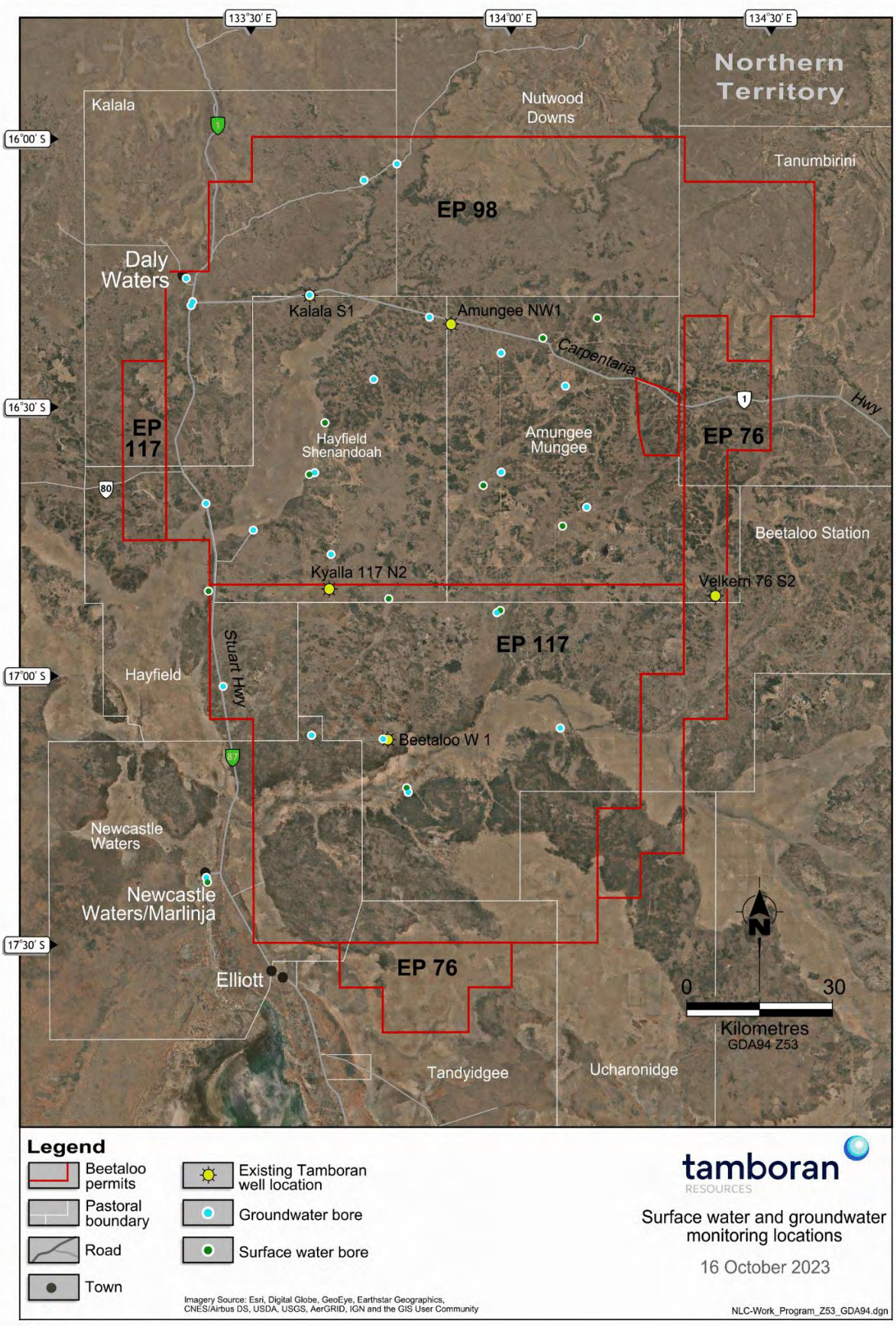


Figure 3 Overview of the proposed regional groundwater and surface water monitoring sites

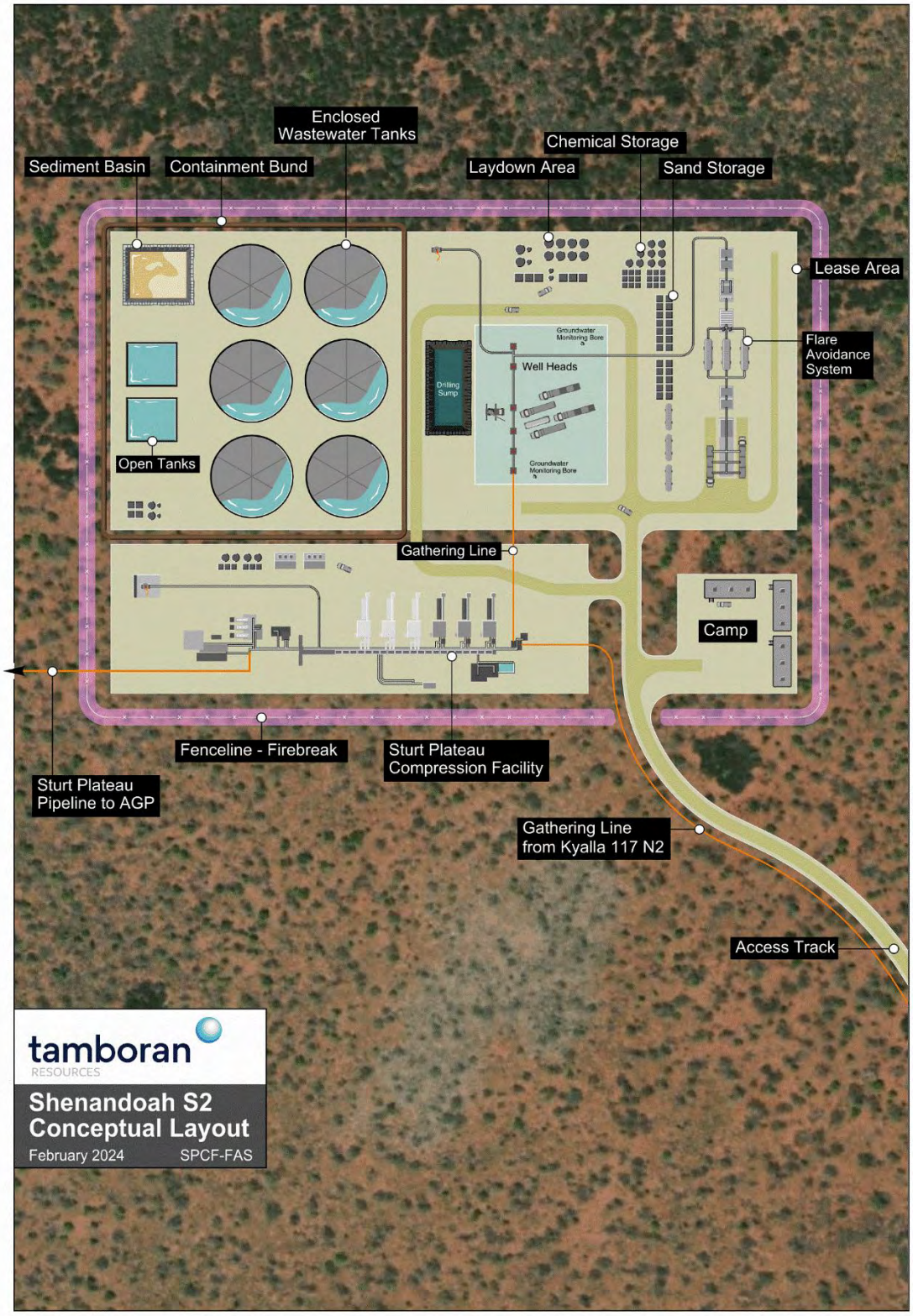


Figure 4 Conceptualisation of the New Shenandoah S2 location with full appraisal gas sale (SPCF and FAS)



Figure 5 Overview of an exploration site within the Beetaloo undergoing lease and camp pad construction, with water bore drilling underway



Figure 6 Typical well site layout during drilling; this is the existing Kyalla 117 N2 site. Noting the proposed scope has multiple wells to be drilled.

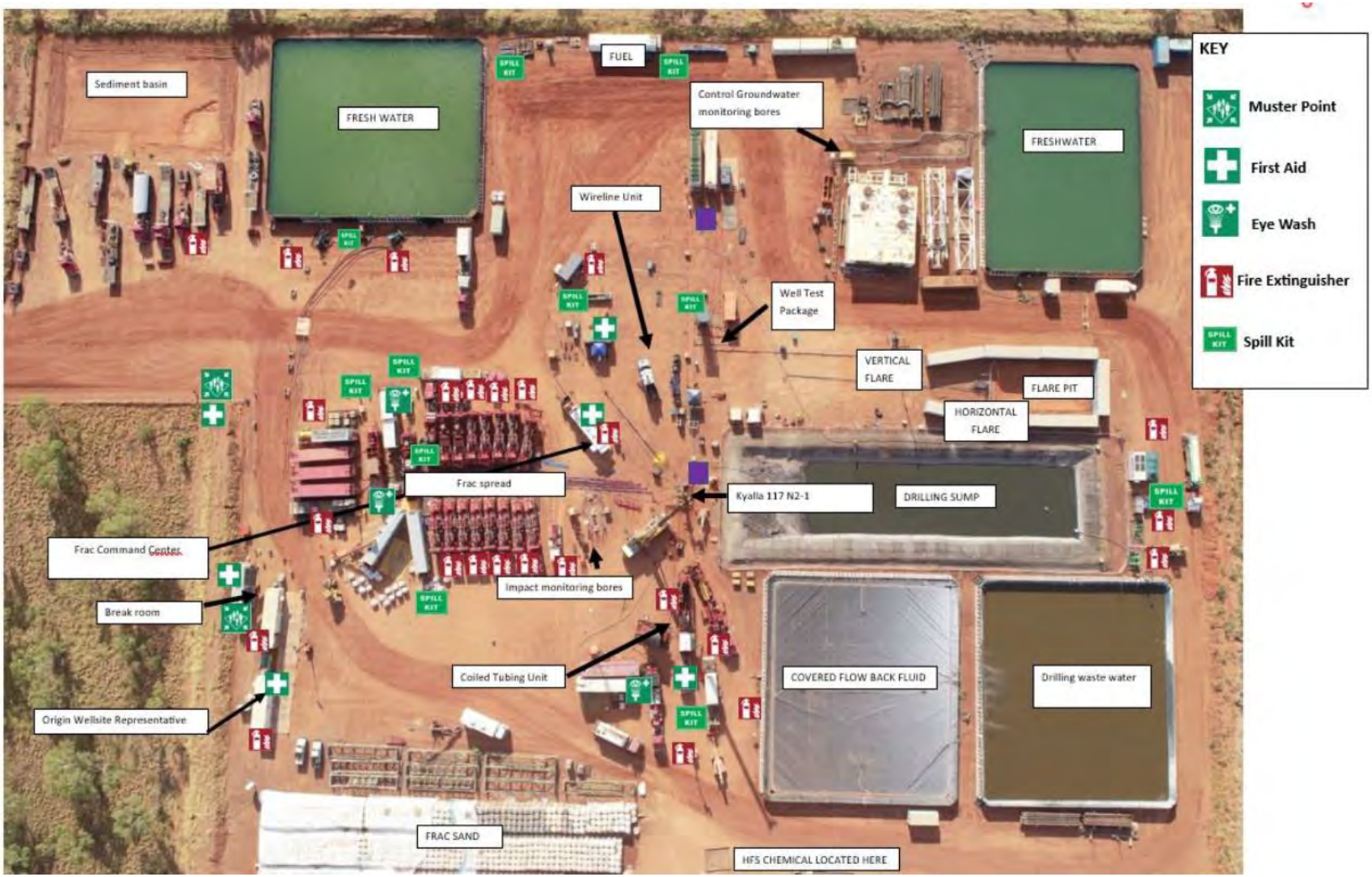


Figure 7 An example of a hydraulic fracture stimulation spread at the Kyalla 117 N2 site- noting the proposed future hydraulic fractures will be larger



Figure 8 Example of a well test underway at the existing Amungee NW location – noting flaring will be minimal if gas is sold instead of flare



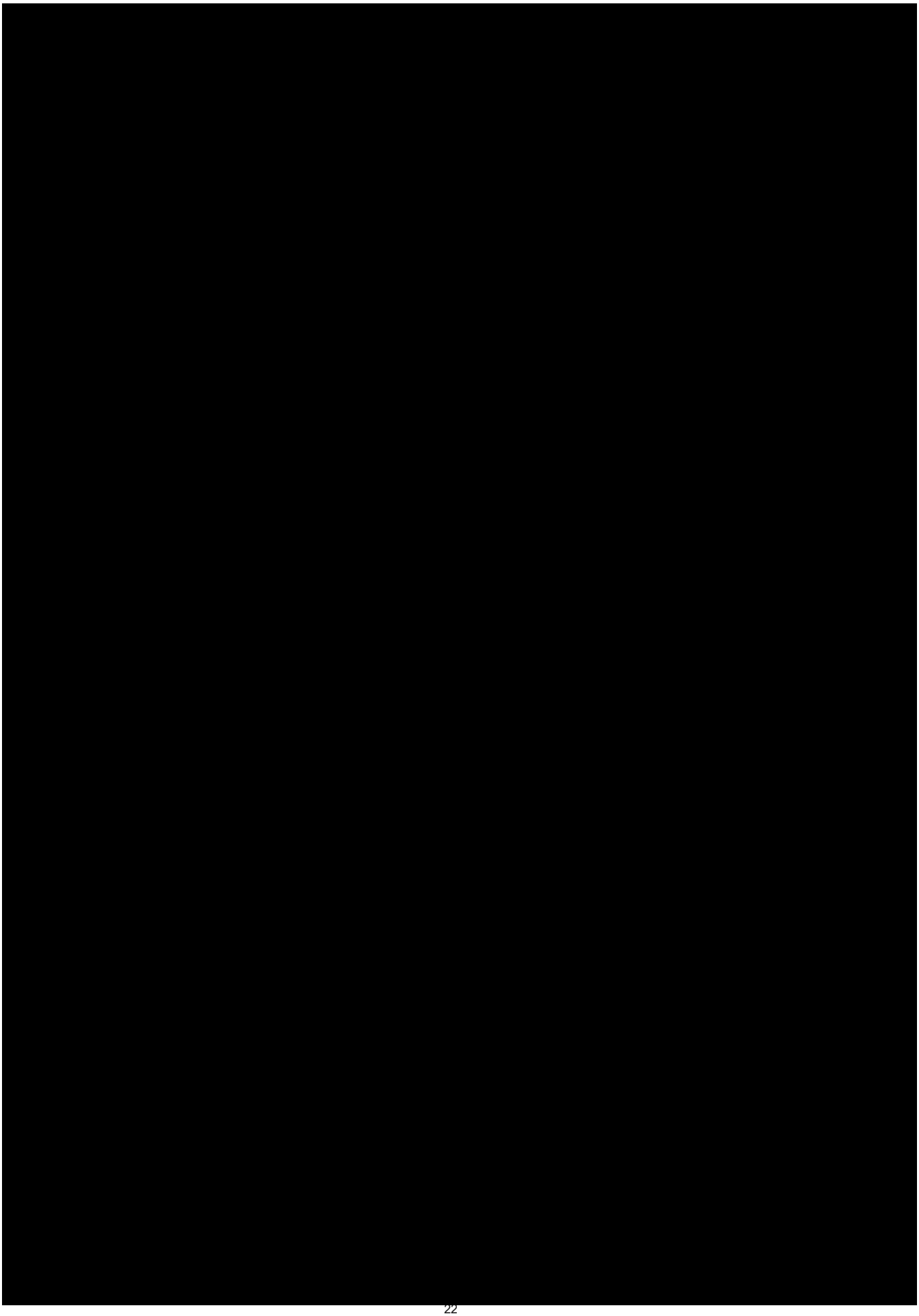


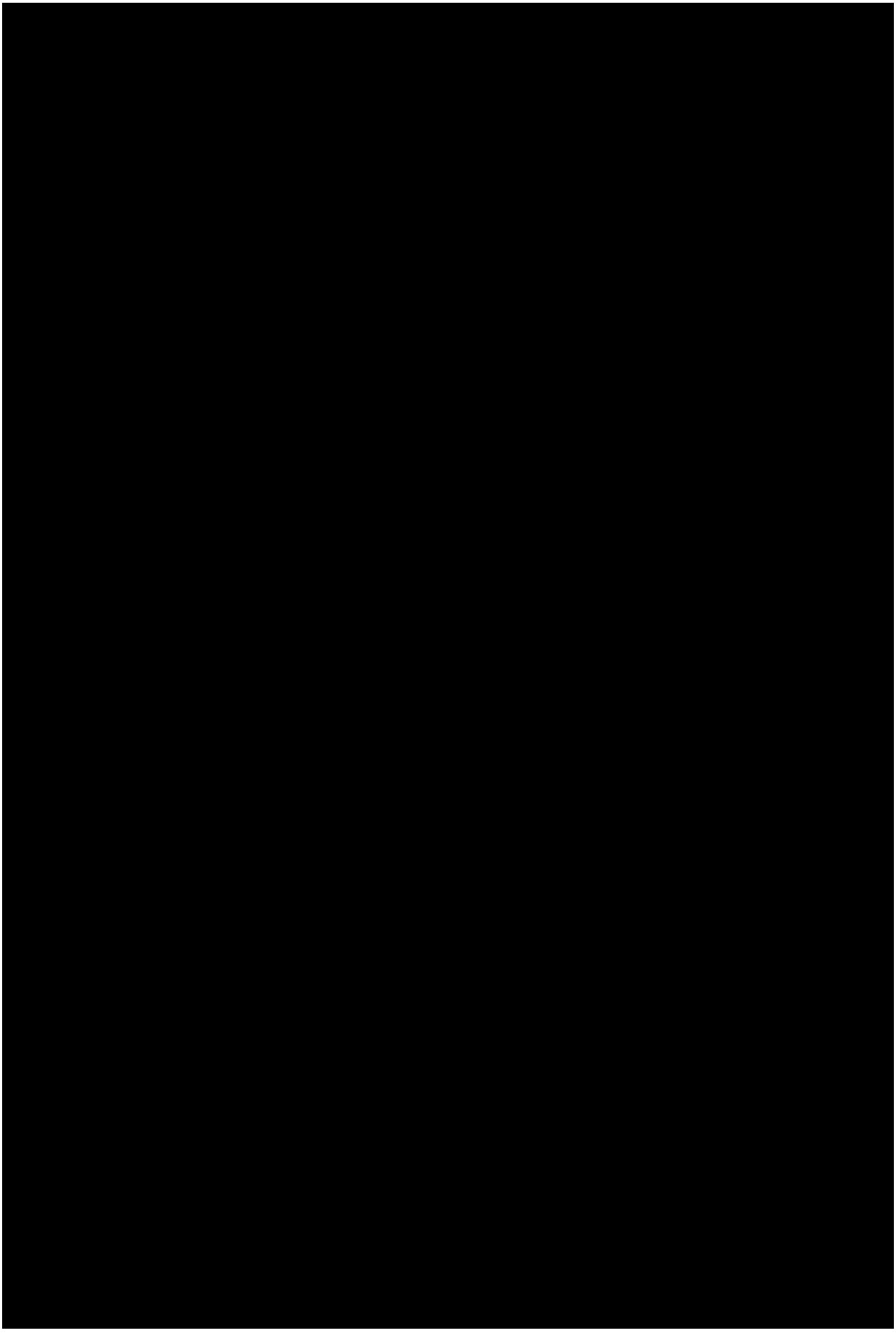


Figure 9 Example of a temporary gas processing facility used to compress and sell gas into the domestic gas market

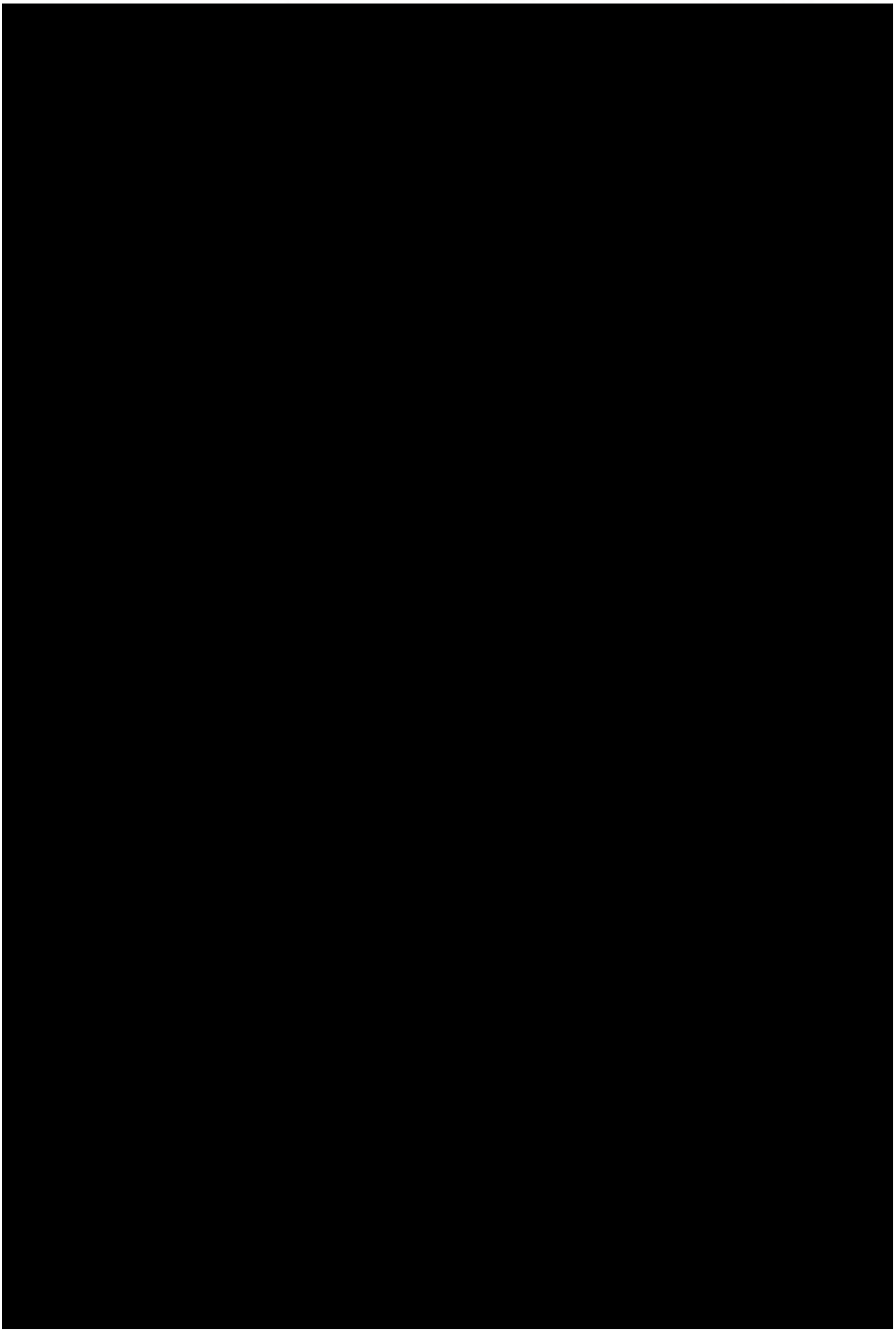


Figure 10 Analogue site for the Sturt Plateau Compression Facility (similar Senex Roma North Facility)









5 2024 NLC Requests

To support the proposed E&A strategy and work program, Tamboran B2 seeks NLC support for a range of NTH engagement as per the following:

- On country meetings covering CY 2024 work program (**March**).
- Sacred site clearance requests covering the Shenandoah South Pilot Area (extension of subject land 2) including appraisal gas sale **(April)**
- Consultation covering beneficial use of appraisal gas- including construction of the Sturt Plateau Compression Facility **(ASAP)**
- Assistance in execution of the regional groundwater and surface water monitoring program, including selection of sites and access constraints **(April/ May)**



APPENDIX A Detailed description of regulated activity

The following table provides details of the proposed exploration activities proposed **within the requested clearance areas**. These descriptions are indicative and general in nature, minor departures from such descriptions are likely to occur and such departures are covered as much as practicably possible by the content of this activity description.

Table 2 Description of proposed regulated activity details within the clearance areas

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site selection and scouting The first step of the process when undertaking exploration activities is site selection. Proposed E&A sites are chosen based upon their assessed chances of exploration success and are ranked as either a priority site (highly prospective) or a contingent site (if a priority site is unavailable due to a constraint). The selection of a site from a subsurface point of view, is often based upon existing exploration information (or lack of), such as seismic data, inferred resource depth (within the oil generating window for example) and previous drilling results. It also includes an assessment of geohazards, such as known major faults or structural features. Once a location has been proposed (including for other infrastructure such as pipelines, access tracks, gravel pits etc.), each site is assessed for suitability using a multi-criteria analysis. This analysis covers several disciplines, including cultural, environmental, pastoralist, regulatory and constructability requirements. Once proposed sites have been identified, each site is assessed using a desktop screening process covering the following: • Cultural constraints: sites are chosen to avoid known sacred sites and other restricted areas identified through previous NLC field clearance reports, AAPA certificates or heritage mapping. • Environmental constraints: proximity to sensitive ecological features such as water courses, flood heights, high conservation areas, threatened species and habitats and sensitive soil units • Leaseholder constraints: proximity to existing pastoral infrastructure and activities, such as cattle yards, fence lines, access tracks, water supply networks, water bores, homesteads and laneways. At this stage, leaseholders are engaged to ensure early input into the location of potential exploration sites. Activities also considers timing constraints such as mustering. • Regulatory constraints: proximity to water bores, well pad spacing, landscape amenity and proximity to roads and communities. The number of sites are re-ranked and potentially eliminated based upon their constraints assessment. A revised list of sites will then undergo field “scouting”, to further assess their suitability. Scouting involves assessment by several different specialists with a “scouting party”. Scouting activities include: • NLC field clearance: Tamboran B2 submits its proposed work program to NLC annually and then initiates field clearance surveys. Traditional owners are then engaged by the NLC and inspect all sites/areas to determine the potential for sacred sites or other areas of cultural significance in the vicinity of the activity. A final report is submitted to AAPA by NLC to generate AAPA certificates which outline the activity constraints and no -go areas. • Environmental: areas are inspected by ecologists to ground truth for areas of potential high conservation, evidence of threatened flora and fauna, overland flow paths, drainage lines, soil erosion susceptibility, areas of high habitat value (such as large hollow bearing trees) buffer zones (from high conservation value areas) and future rehabilitation constraints. The infrastructure (including access tracks, lease pads and associated infrastructure) is orientated to minimise clearing (such	N/A	2-6	During activity planning.	<4 weeks	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
as picking open woodland rather than dense Bullwaddy or Lancewood communities) and impacts on overland flow. A land condition assessment is completed for the proposed sites. • Archaeological scouting: detailed scouting is completed by a qualified archaeologist to identify any artefacts (such as spear tips, axes, stone workings etc.), scar trees or potential heritage features at the proposed sites. This is undertaken in addition to the NLC Traditional Owner clearances. • Constructability assessment: Constructability constraints are identified including geotechnical assessments, cut/fill requirements, soil types, rig operational requirements (orientation) and access construction constraints (such as access track design, water course crossings etc.). This often includes preliminary pegging of the proposed location Once the location of infrastructure has been proposed and finalised, the final location is pegged and surveyed. The engineering designs are updated and issued for construction.					
Access track construction Access tracks will be constructed to connect the proposed infrastructure to existing roads. Tracks will generally be constructed to at least NT Standard Drawings (CS3003) for Typical Cross Section for Rural Environment – Pastoral Access Road 2. Where possible access tracks will align with the existing seismic lines or other clearances/disturbances to minimise vegetation clearing. Access tracks will typically be less than 14m wide, with sections up to 20m wide where truck turn outs, erosion and sediment control and cut out drains are required. Access tracks will have various levels depending on landform and soil types. Each road will be constructed with an appropriate fall to prevent water pooling on the road surface. Drainage channels and cut outs are constructed to manage stormwater and discharge away from the road surface. Culverts, drains and bed level watercourse crossing are used to ensure overland flow is not impeded. Construction of erosion and sediment controls will be constructed in accordance with a Certified Practitioner in Erosion and Sediment Control (CPESC) accredited erosion and sediment control plan. Gravel will be used to form up access tracks in places to enable all weather access. Where access tracks intersect with main roads (such as the Stuart Highway), intersections will be upgraded to accommodate turning truck traffic in accordance with the Department of Infrastructure, Planning and Logistic (DIPL) design requirements. Access tracks are anticipated to be the first piece of infrastructure constructed to enable preliminary activities, such as the construction of groundwater monitoring bores.	<50ha (dependent on access track length)	<12 people	First activity required to enable civil construction and drilling.	Access tracks are likely to be continually maintained and surfaced throughout the life of the activity	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
[redacted]					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
[redacted]					
Groundwater (monitoring and extraction) bore installation Installation of control and impact groundwater monitoring bores may be constructed on each of the lease pad within the underlying aquifers. These bores are required under the Code of Practice to establish baseline groundwater level and quality data prior to completing hydraulic fracture stimulation activities. Monitoring bores are required to be drilled and tested at least 6 months prior to drilling (except for exceptional circumstances) and stimulation activities and are often the first activity undertaken on a site (other than access tracks). Monitoring will continue throughout the life of the activity. The bores will also be used for groundwater extraction to support exploration activities. The construction of the groundwater monitoring bores will typically utilise a water bore drilling rig to construct the bores, similar to the rigs used to drill pastoral water bores. All groundwater monitoring bores will be constructed in accordance with the Minimum Construction Requirements for Water Bores in Australia. Bores may drill into the Anthony Lagoon formation (if present and saturated), Gum Ridge formation and other viable water bearing formations if encountered. Waste cuttings, drilling fluids, muds and formation fluids will be collected in a small earthen sump and managed in alignment with the practices outlined in the. Minimum Construction Requirements for Water Bores in Australia. The fluid (which is anticipated to be fresh) will be discharged to grade and the area surrounding the lease. The formation cuttings and drill muds will be mixed with soil onsite and incorporated into the lease pad surface.	N/A located on proposed lease pad	<12 people	The drilling of water bores is generally one of the first activities undertaken to provide water for construction and drilling activities. Additional monitoring bores are also likely to be drilled prior to stimulation	<4 weeks	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Lease pad construction Each proposed lease pad will be constructed to accommodate exploration well drilling, stimulation, testing and ongoing wastewater storage and treatment; ~~typically such pads will be less than 12 hectares~~on average, lease pads are less than 12 hectares (ha). Each lease pad will be located within the proposed clearance area, with the final location based upon seismic information combined with cultural, environmental, pastoralist and regulatory constraints. Once a suitable site has been selected the lease pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control measure and wastewater containment bund (around the wastewater storage areas). The lease pad will then be levelled, compacted and surface with gravel to accommodate exploration activities. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). A sediment retention pond will be installed to manage surface water within the lease. Water captured onsite will be tested and released into the adjacent area. The criteria for release is based on field parameters: EC 1300 µs/cm and pH 6 – 9. A drilling sump, flare pit, well cellars, sediment ponds, bunds and other necessary earthworks will be constructed onsite. The drilling sump will be lined with an impermeable liner to contain all drilling fluid, drilling muds, cuttings, cement returns and waste sand. The drilling sump will generally be able to contain up to approximately 5000m^3 of material and required freeboard volumes (approximately 100m long x 25m wide x 4.5m deep). The drilling sump/broader site will be fenced to prevent livestock access. The well cellars will be constructed on the proposed lease to accommodate the wellhead equipment and blow-out preventer (BOP). The cellars are typically concrete- or steel-lined and prefabricated off-site. The cellars are typically transported to the site in one (1) piece and lowered into an excavated pit. A shallow conductor casing is installed within the cellar to approximately 20m using an auger. The shallow conductor casing is designed to prevent the upper sections of the exploration well from caving in when drilling through the unconsolidated sediments. The cellar itself will be fenced at all times to exclude fauna ingress. Cellars will be typically separated from each other by 10m-20m.	7.5-~~12ha~~15ha	<24 people	Prior to exploration drilling	2-8 weeks	 

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>
Gathering pipeline construction

Each lease pad may be connected via ether a surface or buried gathering pipeline. The gathering pipeline will be constructed to transport both gas and water to/and from pads. Gathering pipelines will be constructed in a cleared right of way of approximately 15-25m wide.

If the beneficial use of gas is approved, to allow the avoidance of the majority of flaring, appraisal gas would likely be sold into the domestic gas market via a high-pressure main pipeline constructed to connect processing facilities to the existing Amadeus Gas Pipeline. The construction f this pipeline is outside the scope of this engagement.

Construction for the gathering pipelines generally include the following activities:

Pipeline Construction

<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Location</td><td>An initial route selection study will be conducted for the pipeline in order to optimise the pipeline route to connect each well pad. Typically these will be located along existing access tracks.</td></tr>
<tr><td>Pipe</td><td>The gas gathering lines will be designed and constructed in accordance with the requirements of AS 2885 Pipelines – Gas and Liquid Petroleum and Code of Practice for upstream PE gathering lines in the CSG industry.. Where pipelines are to be buried, the pipeline will be deep enough so current land use activities can continue after the pipe has been installed. The minimum depth of cover over the buried pipeline will be 750mm. For road crossings the depth of cover will be increased to ensure protection of the pipeline and the asset or feature being crossed by the pipeline. For surface pipeline, pipelines will be designed to withstand grass fires and secured to the surface as per the code of practice for upstream PE Gathering line sin The CSG industry.</td></tr>
<tr><td>Survey</td><td>The limits of the right of way (ROW) working width shall be marked with stakes at visible intervals.
A survey crew will work ahead of the initial clearance of vegetation from the ROW. This survey crew will utilise the project benchmarks to check and re-establish all agreed intersection points (IPs), mark the right of way boundaries and place offset/recovery pegs.</td></tr>
<tr><td>Clear and Grade</td><td>To allow construction activities to commence, the pipeline alignment needs to be cleared of vegetation, rocks, trees, etc to provide mainline construction vehicles access. Clearing and grading shall be minimised to the extent necessary for the safe construction of the pipeline and shall in any event not exceed the maximum permissible width of the ROW except where additional working areas are defined and agreed. Light vegetation removed during clearing shall be stockpiled outside of the stripped ROW working area and will be respread during restoration unless the property owner requests that the vegetation be left as stockpiles.</td></tr>
<tr><td>Pipe Transport and Stringing</td><td>Stockpiled pipe will be delivered to the ROW along the identified access tracks using prime movers and trailers. The specific logistics of the pipe haulage will be developed during the planning phase. The pipe trucks will only utilise specific access tracks which will be constructed (or upgraded) to allow them to pass. Pipe will be strung (placed on the ROW) directly from trailers onto saw dust filled bags or equivalent using a Vacuum lift pipe handler mounted on a hydraulic excavator, end hooks or slings depending on the pipe length and size, terrain.
Strung pipe shall be supported clear of the ground and in a manner that will not damage the pipe or coating.</td></tr>
<tr><td>Trenching (where applicable)</td><td>Where a buried gathering line is proposed, a trench is formed to accommodate the welded pipe strings and achieve the required depth of cover in accordance with the pipeline design. The trench shall be</td></tr>
</table>
</td>
<td>25m to 50m wide</td>
<td>~15-50</td>
<td>Main Pipeline construction expected to start dry season 2024</td>
<td>3-6 months</td>
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Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	excavated along the surveyed and pegged centreline, in accordance with the minimum cover specified. Trenching operations are carried out utilising a combination of bucket wheel trenchers, rocksaws & 30T excavators. Accordingly, excavation plant, equipment and techniques will be selected to accommodate the anticipated conditions and required production rates. In areas of hard rock, controlled blasting using explosives may be required to break the rock to permit removal by excavator.					 High point vent
Welding	Line pipe ends will be welded together (butt welded) to form pipe strings up to a typical length of 1km. The mainline welding crew is the engine room for the project's welding and sets the pace for mainline construction. The very agile and mobile poor boy crew carries out all difficult mainline welding sections and provides start joints for the mainline crew. Additional welding resources carry out all tie-ins and special crossings.					
Pipe laying	The coated pipe shall be placed/ lowered-in using a series of side booms so the pipeline has adequate and properly distributed slack, the pipe is not unduly stressed, and the pipe coating is not damaged. The prepared surface/ trench will be free of material that could damage the pipe, the pipe shall be laid directly on the trench bottom/ on top of the prepared surface (for above ground pipes). For buried, pipelines, the excavated material shall be used directly for bedding and padding. Where excavated material does not meet the specification, padding machines (screening machines) or similar will be used to produce bedding and padding. The trench will be back filled using the remaining trench spoil (excavated material) following the padding operation. The trench is compacted by wheel and/or track rolling with the backfilling equipment. Areas requiring higher compaction, such as road crossings, will be undertaken with an excavator mounted vibrating plate or other suitable manually operated or driven compaction equipment.					 Low point drain and high point vent
High Point vents/ low point drains and valve pits	High point vents, valve pits and low points drains will be constructed along the length of the pipeline to manage gas/ water build up and provide isolation points. High point vents may be installed on the pipeline to manage the accumulation of gas collected in gathering lines. High point vents typically consists of a cement pipe ring, with a vent that is placed over the pipeline to allow gas to be released intermittently. It is anticipated that these will be placed every 1-2kms, depending on the local topography. High point drains will be designed to automatically release small volumes of built-up gas (1-2 litres at a time), in order to prevent a gas lock in the water pipeline. High point vents will not be designed to be operated continuously and short duration of water transfers means most vents will be inactive (in comparison to CSG fields). Low point drains are designed to capture water that condenses within the gas line to prevent water locks. They are typically location 1-2 kms-depending on the topography. Low point drains typically consist of a cement pipe ring and a riser valve. A separate small water tank may also be utilised to assist in collecting and testing the water. Water vapour in the gas pipeline condenses as it begins to cool and reduce in pressure. This results in a low Electrical conductivity water that is tested prior to release. Releases are typically 10's of litres and rarely 100's of litres that occur typically monthly (if at all). The water will be tested for Electrical Conductivity (EC) and pH prior to release to the surface adjacent the pipeline. This ensures any separator "carryover" (i.e flowback that enters the gathering line due to a malfunction) is detected and prevented from being released to the ground. EC is the indicator of carryover, with a limit of 1300 µs/cm applied based on the long-term irrigation levels for					 Picture of a gathering line post construction.

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	moderately sensitive crops. Any water that exceeds this level will be trucked to a wastewater tank.					
Reinstatement	The pipeline ROW will be reinstated which includes replacement of previously stripped topsoil and rootstock, installation of contour banks, reinstatement of fencing & install new gates and revegetation as necessary. Restoration of the ROW shall be completed in accordance with any easement agreements, Environmental Impact Statement, Construction Environmental Management Plan and regulatory requirements.					
Pipeline testing	The pipeline will be hydrostatic pressure tested to prove the strength and leak tightness of the installed pipeline. The hydrostatic testing will be conducted by a certified mechanical testing laboratory and all test reports are to be certified. Approximately 0.5ML of water will be used for hydrotesting will be sourced under Tamboran's water extraction licence. Water will be released safely to the adjacent area where it meets the required release limit: EC 1300 µs/cm (based on the long-term irrigation levels for moderately sensitive crops) and pH of 6-9.5. Any water that exceeds this level will be either treated so it complies with the required limit or trucked to a wastewater tank.					
Commissioning	The commissioning phase of the works can be broken into two components, pre-commissioning and commissioning. Pre-commissioning is the exercise of manually proving each component of the pipeline/facility system prior to the introduction of gas. Example testing includes: • Verification that all parts are installed as detailed on engineering drawings, including position, orientation, part numbers, etc • Hydrostatic testing (confirming the system is leak tight), cleaning (blow through with air and cleanliness checks), drying and blow-through of piping • Bolt torquing of flanged connections • Functional testing of all manual valves through full extent of travel • Functional testing of all actuators and control valves through full extent of travel • Earthing compliance checks • Instrument calibration and installation checks • Insulation, continuity and point to point testing of all circuits installed by the Contractor Following the pre-commissioning phase, the asset becomes ready for the introduction of gas.					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Camp pad construction and camp operation A camp pad will be constructed adjacent to each proposed lease pad to accommodate a temporary 70-100 man camp (typically 80 man) to support civil construction and exploration (drilling, stimulation, testing and decommissioning) activities. Smaller, mobile camps may also be utilised across the clearance area during operations where required (for example to support seismic activities). The camp pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the camp pad. The camp pad will then be levelled, compacted and surface with gravel. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). Camps will be constructed with kitchens, offices, ablution blocks, accommodation blocks, storage containers, gymnasium, refrigeration, water treatment plan, sewage treatment plant, waste management areas, water storages, power generation, diesel storage tanks and car parking. All waste will be covered/stored in a manner that prevents feral animal access. An approved wastewater (sewage) treatment plant will be utilised to treat all sewage, with treated effluence irrigated in a fenced area adjacent to the camp (no clearing required). Treated effluence handling and irrigation will occur in accordance with the NT Department of Health requirements.	1.2-2.5ha	Typically <100 people (including housed staff)	For duration of activity	For duration of activity	
Helipad pad construction and operation A 1ha helipad may be constructed to accommodate wet season operations adjacent to each lease pad. Where prolonged access to the site is restricted, personnel and material will be helicoptered to and from site. The helicopter pad will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of helipad. The helipad will then be levelled, compacted, surface with gravel and then fenced. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains).	1ha	N/A	For duration of activity	For duration of activity	
Laydown/storage yard construction and operation Laydown/ storage yard may be constructed along access tracks to store materials, wastes, wastewater, equipment and other material as required. The laydown yard will be fenced to prevent access. These are typically 2.5- 5ha in size, with allowance up to 25 hectares for multiple laydowns. Laydowns may also be utilised for temporary offices/workshops/field camps or warehouse infrastructure support E&A and construction activities. The laydown/ storage yard will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of helipad. The yard will then be levelled, compacted, surface with gravel and then fenced. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains).	25ha	N/A	During exploration activities (as required)	For duration of activity	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Gravel pit construction and operation. Up to 15 hectares of gravel pits (multiple pits, anticipated to be ~5) may be constructed to support the construction of infrastructure onsite. The exact location of pits within the clearance area will be determined based on operational requirements (i.e. pits are constructed as close as needed to infrastructure) and through further testing. Up to a total of 50,000m^3 of gravel may be nominally taken from pits specified in the clearance request. The quantity of gravel extracted from a pit varies, depending on quality and quantity of material found in each pit. Pits generally don't exceed a depth of ~3 m. Estimated volume of gravel for the regulated activities in the EMP is approximately 10,000 m^3 to 20,000 m^3 per site – i.e. materially less than the nominal 50,000m^3 allowance. Each gravel pit area will be progressively cleared of vegetation in 1-2 hectare stages (to minimise the required disturbance). Each pit stage will be stripped of topsoil down to approximately 100mm (depending on the depth of topsoil onsite). Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control measure and to prevent overland flow access to the site. Subsoils will also be stripped, segregated from topsoil and stockpile around the edges of the gravel pit. Gravel will be periodically extracted from the pit, with the pit designed to drain internally. The Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, diversion drains and bank stabilisation using fallen debris). Once gravel activities are finished, the pit will be reshaped, with subsoils re-instated. Topsoils will be spread and fallen vegetation returned to aid site stability. The area will be temporarily fenced (where required) to allow vegetation regrowth. Seed maybe added to the site to support natural regeneration if required. The pits may be converted to pastoral watering points where appropriate and approved by pastoralists. An access track will be constructed to each pit, with the length of access track to be determined based on location of the pit The access track will typically be less than 14m wide, with sections up to 20m wide where truck turn outs, erosion and sediment control and cut out drains are required.	Gravel pit <15ha	<6 people	For duration of activity	For duration of activity	
Exploration well drilling Multiple petroleum exploration wells are proposed to be drilled at each site (typically 6-8 but potentially more where multiple formations are targeted). Wells may be drilled progressively (i.e. 1 or 2 at a time) or over a single campaign. Each well will be drilled into an underlying prospective petroleum reservoir (such as the Velkerri shale, Kyalla shale or other formation) to a typical depth of 1500m-4000m. Each well will be deviated into the horizontal position, with a lateral drilled up to 5000m. Longer lateral lengths result in greater levels of production per unit of impact. The required land, water and energy required to construct longer wells is less per unit of energy produced- and is therefore more efficient better for the environment. Each petroleum well is designed and constructed in accordance with the Code of Practice for Onshore Petroleum Activities within the Northern Territory (Code of Practice) to maintain well integrity and protect aquifers and the environment. A Well operations management plan (WOMP) is required to be submitted to the regulator and approved prior to the drilling of any wells. The WOMP outlines the well design and drilling practices that will be deployed to ensure compliance with the Code of Practice and protect underlying aquifers and the environment. Each well is anticipated to be constructed with multiple casing and cement strings as per NT drilling regulations. Once the well design is approved by the Northern Territory government (NTG), a rig package will be mobilised to site, which consists of a drilling rig (comprising rig matting, a rig floor, mast or derrick, rig engine, blow out preventor, catwalk, safety flare etc.), pipe racks, casing strings, drilling rods, rig fluid system (mud tanks, shakers, mud treatment	N/A located on proposed lease pad	<60 people	Post civil construction	Typically 45 - 90 days per well	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
system and pipework) storage trailers, bunded chemical storage areas, workshop portable onsite offices, crib huts, mini-rig camp and sewage treatment system and irrigation area), freshwater storage tanks, diesel power generation, cement trucks, bulk fuel storage, water transfer pumps, fork lifts, lighting towers, crane etc. The rig will be constructed over the pre-installed conductor casing and cellar. Once functional, drilling will proceed down below the first encountered aquifer, where the first casing section of the well will be installed (either in the Anthony Lagoon Formation if present and saturated or the Gum Ridge formation (anticipated to be present). A BOP will then be installed, to ensure any influxes of gas, water or pressure are able to be safely managed during drilling of the remaining sections of the well. The drilling rig will continue to drill the various other casing and cement sections. The integrity of each of these casing strings is tested through a combination of leak off tests, formation integrity tests. casing pressure tests, cement return tracking and cement bond logs. Upon completion of drilling, a barrier integrity verification report is submitted to the regulator summarising the integrity of the well. This report is publicly available. Once each well is finished drilling, the well head is installed and the rig is either “walked” to the next adjacent location with the process repeated or mobilised to a new location. A low toxicity water-based drilling mud is to be used as the base fluid for drilling, which primarily contain salts and polymers. Drilling mud is required to maintain well control, provide formation stability, lubricate and control the temperature of the drill bit and lift cuttings to the surface. The fluid system consists of water with a sodium or potassium-based salt (to prevent formation swelling) and a viscosifying agent such as bentonite. Other low toxicity chemicals such as barite, citric acid, sodium bicarbonate and loss circulation material (fibres such as coconut coir or nut hulls etc.) may also be used. The chemicals used for drilling are consistent with those used for water bore drilling. Waste drilling muds, fluids, cuttings and mineral waste (such as cement returns, sand etc.) brought to surface will be stored in the lined drilling sump. Drilling fluids will be evaporated and then removed from the sump and disposed of offsite. Solid waste within the drilling sump will be allowed to dry out and then either removed from site or disposed of onsite in accordance with the Code of Practice. Where onsite disposal is proposed, a risk assessment will be completed demonstrating that the activity can occur with no residual environmental harm. Onsite disposal can include encapsulation or mix bury cover, depending on the site specific details and final composition of the drilling waste material. Subsurface diagnostic tools will be run on the well during and after drilling to understand the nature of the target reservoir. Some sections of the formation may be cored or have sidewall samples collected, which will add further analysis of the reservoir properties. To assist with determining the suitability and capacity of these formations for potential gas extraction activities, diagnostic fracture injection test (DFIT) may be conducted across a number of shale intervals to evaluate the geo-mechanical and reservoir properties of the targeted formation. Prior to a DFIT, a cement bond log and casing pressure test is completed to ensure the integrity of the cement and steel casing. A DFIT involves the injecting of small volumes of a water (approximately 30 barrels (5,000L) per DFIT) at low pumping rates to create a small fracture in the target interval. The well is shut-in, and the pressure allowed to fall-off naturally. Monitoring the fall-off pressure over time allows information to be derived about the reservoir. The fluid does not contain proppant so that the fracture closes naturally when the fluid leaks off into formation. The analysis of pressure, during injection and after shut-in, provide powerful tools for understanding and subsequently informing the design for a future hydraulic fracturing process (not in this scope). Any returned fluid will be stored within double lined tanks and disposed of offsite at a licenced facility.					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
All waste drilling fluids, muds, cuttings, DFIT return fluid and cement returns will be managed in the existing lined drilling sump on-site (or equivalent tanks or fit-for-purpose containers). Once drilling has been completed, this material will be sampled and tested as per the code of practice and a risk assessment completed to determine whether onsite encapsulation or mix-bury-cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with native soil and encapsulated within an impermeable liner. A cap of clean material will be placed over the liner to enable vegetation growth.					
Hydraulic Fracture Stimulation Upon completion of drilling activities, hydraulic fracturing stimulation (HFS) plant and equipment (commonly referred to as a "frac spread") will be mobilised to site to commence HFS (or stimulation) activities on each of the drilled wells. A frac spread typically consists of: • Data Van – on-site office to execute stimulation activities • Water Storage – tanks will be constructed on-site, capable of managing both make-up water (for frac fluids) and flowback water. Tanks will be double lined with leak detection capable of monitoring any leaks between the primary and secondary liner • Proppant Trailer – a large sand storage and delivery trailer that holds the proppant • Hydration Unit – used to add stimulation additives and viscosifying fluids • Blender Unit – used to mix proppant and fluid additives, prior to its injection into the well • High Pressure Pumps – pumps to inject the hydraulic fracturing fluid mixtures from the Blender Unit down the well, via the surface lines and hydraulic fracturing wellhead or coiled tubing unit • Coiled Tubing Unit – a large length of coiled steel pipe that can be temporarily installed in the well to perform various downhole operations • Wireline unit – plug and perforation deployment • Ancillary support equipment and buildings – offices, workshop, cranes, chemical storage area, equipment storage, power generation and all other activities required to support stimulation activities. Stimulation involves the injection of a slurry, primarily consisting of water (raw water or a mixture of raw water and recycled flowback wastewater) and sand (proppant), plus a small percentage of chemicals at high pressure into the target section of the horizontal wellbore. Typically, >90% of the total volume of stimulation fluids is a combination of water (fresh and recycled wastewater) and sand (~6-8%), with the remainder as fluid-conditioning additives (~2-4-%). Prior to the commencement of stimulation activities, the integrity of the well is tested with a cement bond log and pressure casing tests and an integrity report generated, which is submitted to and assessed by the regulator prior to the commencement of stimulation activities. The stimulation fluid is generated through mixing freshwater, recycled flowback, chemicals and sand in blenders. Stimulation fluid is then pressurised by the high-pressure pumping units and directed downhole via a manifold to the discrete target intervals along the horizontal wellbore (referred to as 'stages'). Each stage will be isolated and perforated using a plug and perforation gun assembly deployed via a wireline unit. As the pressure is sustained, the fractures propagate radially from the well, through the target rock. Once optimal fracture propagation has been achieved, the proppant (sand) is pumped down the well and into the open fractures. This process is repeated for each stage. The final number of stages pumped in each well is dependent on the useable length of the horizontal wellbore and in-situ geological conditions. Once all stages are complete, the well is suspended awaiting completion and well testing activities.	N/A located on proposed lease pad	<50 people	Post E&A well drilling	2- 8 weeks per well depending on stimulation size	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wellbore pressures are monitored during each stimulation, to ensure the operations have not compromised the integrity of the production casing or the cement barriers. A Maximum Allowable Operating Pressure (MAOP) is an important engineering parameter used to define the operating envelope (i.e. the safe maximum pressure that should not be exceeded). The maximum allowable pumping pressure (MAPP) is set below the MAOP to allow for uncertainty and provide an additional safety margin so the MAOP is not exceeded.					
Exploration well completion Once each well has been stimulated, a completion rig will be mobilised to site to "complete" the well. This involves installing downhole equipment such as packers, plugs, production tubing, artificial lift etc. required to enable the production testing.	N/A located on proposed lease pad	<12 people	Post stimulation	1-2 weeks	
Well testing Once the well has been completed, the well will be brought online and tested. To enable the testing, a well test package will be installed at the site consisting of: • Separators (to separate gas, condensate and water) • Flares (either a vertical or horizontal), • Flare pit (if a horizontal flare is utilised • surface pipework, manifolds, and tanks • communication and generator shacks • workshops/ storerooms • bulk diesel tanks • wastewater storage tanks (converted freshwater storage tanks used for stimulation makeup water) • Water transfer equipment • Wastewater evaporation and treatment units The E&A well will be underbalanced (or "unloaded") to initiate production, either through its own energy or through artificial lift (such as through a Nitrogen lift or pump). The fluid and gas will be sent through a separator, with all hydrocarbon metered and flared. Flowback water will be discharged from the separator into designated wastewater storage tanks. Well testing will typically be undertaken from a period of depending on the objective of the well. Multiple well testing operations may be required to test the behaviour of the formation to determine whether extended shut ins can affect well productivity. Gas will be either flared, sold (piped or compressed/liquified and trucked) or beneficially used onsite to reduce greenhouse gas emissions where possible.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	Typically 30 days to 24 months.	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
[redacted]					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Appraisal gas sale- Temporary Sturt Plateau Compression Facility (SPCF) A 50 TJ/day temporary gas compression facility will be constructed to compress (pressurise) the gas to a level that can then be transported into the AGP. It is anticipated that gas to this facility will be sourced from surrounding appraisal wells which will be progressively drilled and tested to collected long term data on the viability of the shale resource. Operation of the facility is anticipated to occur for 24-36 months- with the extension of life beyond this time requiring approval under the ILUA, Petroleum Act, EP Act and EPBC Act. It is anticipated that Tamboran will construct 3 skid mounted compressor station with gas dehydration. Allowances for an additional 3 compressors to manage lower inlet pressures if they are encountered has also been included. Gas collected from each well will be piped into the SPCF. The gas enters an inlet separator, where any water is removed and sent to wastewater storage tanks via pipework. The gas then enters the compressor, which pressurises the gas to approximately 11MPa . Small volumes of gas are directed to the compressor as fuel and to onsite power generators used to power electrical systems. Solar and battery systems may also be constructed to assist in supplying electricity to the facility. Once compressed, the gas is then sent to a Triethylene glycol (TEG) reboiler unit where TEG is added to the gas stream to remove (dehydrate) any excess moisture. Moisture binds to the TEG and the impregnated TEG is then captured and entrained water “boiled off” to regenerate the TEG. It is then re-used in a closed system with periodic top ups. The gas is then sent through a gas chromatograph and meter to monitor quality and quantity, prior to being discharged to the sales gas line for sale. A flare will be located onsite to manage plant shutdowns/ trips/ maintenance. The flare will be a smokeless flare, with the tip package containing an automatic ignition system to ensure continuous operation. The gas compression facility will also contain ancillary support infrastructure, such as instrument air packages, demountable offices, toilets, small kitchen/ tea room and night shift accommodation, potable water storage tanks, fire water tanks, small material laydowns, waste management, bunded chemical management, storage sheds, work shop and other minor buildings will also be constructed to support the GCF. Stormwater collected in the facility will be diverted away from the compressor stations. Water collected in the compressor units will be directed into an oily water separator with clean water released to soaking trenches or irrigated. Key controls include: • Noise abatement on the compression facility- including exhaust silencers, and low noise fans • Low NOx compressors utilised • Gas venting will be minimised through TEG stripping gas optimisation, selection of low emission compressor seals and ongoing maintenance programs • Leak and flame detection sensors within gas plant to detect leaks/ fires. • Lightning protection to be utilised. **Construction:** The construction of the SPCF is anticipated to commence in late 2024 with the completion of bulk civil works and the installation of footings and pilings for the temporary	~5 ha .	50 during construction, ~4 during operations.	Early works August/ September 2024. Major works 2025.	18 months	   Examples of small gas compression facilities that are indicative of what it likely to be constructed at Shenandoah S2 (same facility looking from different angles). This gas compression facility is Senex’s Roma North facility.

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
GPF. Undertaking this work in 2024 will ensure the GCF can be constructed in the 2025 dry season for first gas in late 2025/ early 2026. The construction of the SPCF will involve the clearing of vegetation from the site, grubbing to remove tree roots, topsoil stripping, removal of large rocks and then levelling, compacting and sheeting the proposed CPF area with gravel. Felled vegetation will be pushed to the outer batters to increase soil stability. Site offices and amenities, laydown areas, erosion and sediment controls will be installed to support this program, with crews staying at the existing camps either on Shenandoah S2 or Kyalla 117 N2. The construction work force is anticipated to be approximately 50 personnel. Pipework and underground services will be installed in trenches, backfilled and compacted. Additional crossing reinforcement for protection of buried services in trafficable areas will be installed as appropriate. Steel pile foundations will be driven into the prepared facility pad a and welding of pile caps onto piles in preparation for equipment skids 9compressors, TEG units, instrument air etc.) skids to be landed. It is likely that the installation of foundations will occur in late 2024 to enable construction of the main plant during the 2025 dry season. The pre-assembled skidded pipe rack modules will be installed onto the foundations requiring lifting onto pile caps with cranes and welding in place, bolting flanges to connect interfacing skids and equipment packages, installation of site run utilities piping, lifting and welding in place of skidded equipment packages. Cables and cable supports, ladders and trays, termination of cables into relevant panels (control and low voltage), installation of tubing and glanding of instruments, mounting instruments onto piping or instrument stands will then occur. Once all piping, instrumentation, compressors, power generation, flares, etc. are installed, the site will be commissioned ready to commence production. It is anticipated that the majority of construction work will be undertaken in the 2025 dry season. **Operation:** The SPCF will typically be manned 24 hours a day by 2-4 personnel; 2 operators and 2 maintenance personnel. These personnel will be based at the facility, with basic accommodation and kitchen facilities provided at the site. Additional contractors and staff will be brought on as required for ongoing maintenance. The facility may be shutdown partially or fully for major maintenance. **Decommissioning** During the decommissioning, all lines will be fully purged of hydrocarbons and fluids. The skid mounted equipment will be dissembled and removed from the site. These facilities may be re-used within the basin, sold or scrapped. All footings and underground piping will be removed, with any contaminated soils removed to a licence facility. Testing will be completed in alignment with the National Environment Protection Measures to verify the site is safe and is brought back to levels consistent with pre-disturbance. This includes supporting pastoral and NTH use. The site will then be ripped to reduce compaction, topsoil applied, recontoured and seeded with a native seed mix if required (i.e. seed stocks in topsoil are insufficient or vegetation re-establishment). Fencing on the site is likely to remain until the site has sufficiently re-established. Once the site has become re-established and the rehabilitation criteria achieved (typically after 2-3 years), then any fencing will be removed and an application to relinquish the site and associated bank guarantee to the NTG will be made. If accepted, the site will then by fully handed over.					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wastewater tank storage Flowback and drilling wastewater will be stored one each location or piped to a centralised location for storage via gathering lines. Wastewater will be recycled within the drilling or stimulation process to reduce raw groundwater volumes. Wastewater not earmarked for recycling will be treated on site via evaporation within open tanks (or other treatment technologies such as enhanced evaporation units, brine crystallisation etc.) and removed from site upon completion of activities. Double lined wastewater tanks will be utilised to store wastewater, with the volume and number of tanks installed dependent on the anticipated flowback return volume. A combination of round (Riptide) and square (Flexiponds) will be constructed and used to manage wastewater on site. Wastewater storage tanks have continuous level monitoring, with leak detection sensors located within the interstitial space between the primary and secondary liners. It is anticipated that between 10ML to 30ML of tanks storage may be installed onsite, with a combination of enclosed tanks and open treatment tanks. In accordance with the Code of Practice, sufficient enclosed tank capacity must be onsite to store all wastewater. Flowback can only be stored within open tanks where undergoing treatment (such as evaporation). Open evaporation tanks must have a 1:1000 annual re-occurrence Interval (ARI) wet or dry season freeboard (i.e. available tank space to accommodate rainfall), which is typically 1.3M or 0.3M respectively. The lease pad or a specifically constructed wastewater storage areas will be bunded to contain 110% of the volume of the largest tank stored onsite. Wastewater storage tanks may be deployed for extended periods of time (potentially several years) to allow ongoing evaporation or treatment. Wastewater from other sites across the basin may also be used to stored onsite, to assist in wastewater treatment/ management. The treatment of wastewater may also be undertaken within Tamboran infrastructure footprint (such as lease pads or laydown yard) to reduce the amount of offsite wastewater trucking.	N/A located on proposed lease pad	<4 persons	During wastewater storage activities.	3-36 months	 Flexipond  Circular tank

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Flaring During well testing and where gas cannot be beneficially used or sold (such as during facility downtime etc.) , produced hydrocarbons (gas and liquids) will be flared onsite, with a vertical flare used to manage gas and a horizontal flare used to manage condensate where it is anticipated to be encountered. The vertical flare will be an American Petroleum Industry (API) 537 and a US EPA AP 42 compliant unit, with a 98% combustion efficiency. The vertical flare will have a constant pilot flame, with an autoignition system that provides electrical impulses to a spark plug continuously. If the flare was to go out, the spark would ignite the flare within 1.3 seconds. A horizontal flare may be utilised to combust condensate if produced during well testing. A horizontal flare will be equipped with 3 independent nozzles, located in a 20mx 10m clay lined pit. Flares will be located at least 45m from the surrounding vegetation, with flaring not undertaken during total fire ban periods.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	During production testing.	
Condensate management (storage and trucking) Where condensate (liquids rich gas that “condenses” when brought to the surface) is generated, it is separated and stored within double lined condensate tanks. Condensate may either then be trucked offsite for beneficial use or combusted in the horizontal flare. Condensate is not anticipated to be produced form the Velkerri shales, but may be generated form the Kyalla shales (not currently a focus of exploration).	N/A	1-2 trucks per day	During exploration activities	During production testing.	
Drilling waste management All waste drilling fluids, muds, cuttings, DFIT return fluid and cement returns will be managed in a lined drilling sump on-site. Once drilling has been completed, this material will be sampled as per the Code of Practice and a detailed risk assessment completed to determine whether onsite encapsulation or mix bury cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with clean fill and encapsulated onsite within an impermeable liner. It will then be buried with capping material to enable vegetation re-establishment. To reduce the number of sites where material is mix-buried covered, multiple wells from other locations may be disposed of at a selected location. Where the quality or site is unsuitable for in situ disposal, material will be trucked off to a third party licenced waste disposal site. A schematic of the mix bury cover process is provided in appendix C.	N/A- within proposed lease pad	< 6 people	Upon completion of drilling activities	7 days	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wet season operations Exploration activities (including drilling, stimulation and well testing operations) may occur over the wet season. Where wet season operations are undertaken the following risk controls will be implemented: • All chemicals, fuels, equipment, tanks and materials required for ongoing operations will be stored on-site prior to the onset of wet season significant rains (notionally December or as predicted). • All equipment required to respond to emergency situations will be on-site or regionally available to respond to emergency situations. Where specialised equipment is required, then additional information will be brought into basin. • All chemicals storage areas will be bunded, with covers used (where safe and appropriate) to prevent rain ingress and bund overflows. • Enclosed tanks will be utilised as the primary measure to store flowback wastewater with enough enclosed tank capacity to store all flowback wastewater on-site. • Enclosed flowback wastewater storage volume will be sufficient to manage all flowback wastewater stored onsite. • Open working evaporation tanks and mud sumps will have enough freeboard to manage an entire 1:1000 ARI wet season event (not just one (1) rainfall event but an entire season's rainfall total). • Helicopters will be used to transport people and supplies into and out of the site when access is restricted. • No transportation of flowback wastewater or chemicals will be undertaken during the wet season, unless a risk assessment is undertaken that demonstrates the risk is ALARP and acceptable, and the access to the site is safe. Transportation will not occur on track where the surface is not safe to allow transportation. Wastewater and chemical transportation will not be undertaken through flooded waterways. The transportation of wastewater/ chemicals during rainfall events will be avoided. Driving on unsealed roads and access tracks will be avoided 24 hours following a >20mm rainfall event. • Flowback wastewater storage area is bunded, which will prevent all off-site release of chemicals and stormwater. • During flowback wastewater storage, stormwater will be retained on-site via the sediment retention pond prior to release. • Overland flow will be diverted around lease pads as far as reasonably practicable.	N/A	N/A	October – May	7 months of the year	
Microseismic survey and Induced Seismic Monitoring Microseismic Surveys are undertaken to monitor 'listen to' the Hydraulic Fracture Stimulation Operations on each of the sites. Seismic Receivers called geophones are individual weatherproof units that contain a sensitive seismic recording device, memory storage, a long-life battery and GPS locator. The Geophones are deployed 5-25 metres apart along lines or in a grid over an area of 30-40km2 around each of the well during stimulation activities. Geophone deployment locations are located on foot by GPS locator. A handheld battery drill is used to create a 4cm diameter hole with an auger bit, a small quantity of water may be used to stabilise the soil. The Geophone is inserted into the hole so that the top of the receiver is flush with the surface of the ground (see picture) The Geophones deployed prior to the commencement of stimulation and retrieved after the stimulation has concluded. Deployment and retrieval of the Geophones is undertaken in small teams of 2 or 3 people, with the number of deployment teams depending on survey size. The teams are supported	Minimal	3-9 personnel.	Deployment of Geophones before stimulation. Retrieval of Geophones after stimulation.	1 month (one week deployment, two weeks Stimulation, one week collection)	

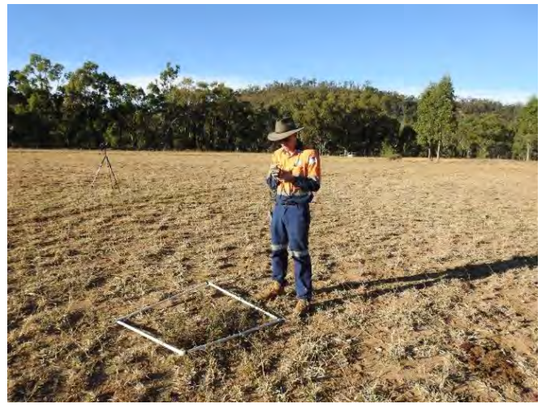
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
by a light 4WD vehicle or an All-Terrain Vehicle to carry equipment, gear, water, communication (radio/satellite phone), first aid kits and safety gear. Induced Seismic Monitoring will be undertaken at the same time as the Microseismic monitoring. A temporary seismic receiver is installed ~1km from the well site, with a small amount of other equipment such as solar panels and data transfer equipment. The equipment can be fenced off with temporary fencing if there are cattle in the area. The data from the seismic receiver is sent wirelessly back to the well site to enable live monitoring of seismic events during Hydraulic Fracture Stimulation. The Induced Seismic Monitoring equipment is installed prior to Hydraulic Fracture Stimulation, and remains installed, collecting data for up to 2 months after the conclusion of Hydraulic Fracture Stimulation. Minimal clearing or heavy machinery is required for either activity, and the activities are considered to have a minimal impact, like that of scouting activities.					
Site monitoring and inspections consisting of the following: • **Groundwater monitoring:** Groundwater monitoring bores are required to be installed on the lease pad before the commencement of hydraulic fracture stimulation activities. Groundwater monitoring is undertaken at the site commencing 6 months before stimulation and then quarterly for 3 years after. Groundwater monitoring involves purging a monitoring bore of water, measuring field parameters (level, electrical conductivity) and collecting laboratory samples and • **Site and exploration well monitoring-** an operator or contractor will access the site to perform checks on the exploration well and stability of the site. Checks include pressure readings and visual checks of valve integrity. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed fortnightly. • **Weed inspections-** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify weeds. In some cases, a helicopter may be utilised. Contractors may perform spot sprays with a NTG recommended weed treatment. Surveys are completed pre and post wet season. • **Erosion and sediment control inspections-** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify erosion or stability issues. Inspection will be used to schedule maintenance to repair any defects identified. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed pre and post wet season. • **Gas leak detection surveys-** Access to the site by 2- 3 contractors or Tamboran personnel in light vehicles to perform mandatory gas testing using handheld gas meters. Surveys are completed every 6 months. • **Build up pressure monitoring-** Post stimulation and well testing, the exploration well may be shut in with pressure monitoring equipment installed to monitor build up pressure. This requires the installation of a solar panel and telemetry equipment, with monthly equipment inspections (typically)	N/A	<2-6 people	Fortnightly/ 6 monthly (depending on activity)	1 day per inspection	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
					
Site maintenance (lease pad, camp pad, access tracks and gravel pit) Each site will be periodically maintained, which includes grading, erosion and sediment control repair, vegetation management, firebreak management, weed management, fence repair and all other ancillary activities required to maintain a site and associated with infrastructure. This includes maintenance of the access tracks. The work will be undertaken by civil maintenance contractors and Tamboran personnel.	N/A	<10 people	6 monthly- pre and post wet season maintenance	<7 days per activity depending on the nature of the activity.	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well head maintenance Maintenance is completed annually on each well. Maintenance primarily includes valve checking, testing, greasing and (in some cases) replacement, as well as any other activities required to maintain the integrity of the well.	N/A located on proposed lease pad	<20 people depending on activity	Annually	< 7 days per activity- depending on nature of maintenance.	
Well intervention- data acquisition and testing Subsurface activities may be undertaken periodically on each of the well to perform maintenance or collect additional information on the properties of the well or the reservoir. These type of well interventions typically include performing cement bond logs, casing pressure tests, running reservoir evaluation or production logging tools, cement and casing remediation activity (if required during the life of the well), setting downhole mechanical plugs and gauges, casing perforation, subsurface barrier maintenance/ installation and production tubing installation/repair or replacement. This generally involves the use of a variety of equipment dependent on the activity being completed. This typically may involve any of the following equipment: completion rig, coil tubing, wireline unit, data van, cement or pump truck, crane, trucks, power generation, support trucks and other support vehicles.	N/A located on proposed lease pad	<20 people depending on activity	Ad hoc requests- typically 2 interventions within the next 5 years	<10 days per activity	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Petroleum well plugging and decommissioning Once a petroleum well is no longer required, each well will be decommissioned. Decommissioning involves the permanent removal of the well through the placement of cement plugs to isolate the target reservoir from overlying aquifers in accordance with the Code of Practice. Once plugs are installed, they are pressure tested to confirm the underlying formations have been adequately sealed off. The well head is then removed. A permanent marker is added to indicate the location of the plugged and abandoned well.	N/A located on proposed lease pad	<12	End of well life	<10 days	
Chemical and fuel storage- All chemicals and fuels (diesel) required to support exploration activities will be stored in accordance with the relevant regulatory requirements, including the use of secondary containment (bunding) onsite. The Code of Practice has implemented a range of additional controls, including requirements for routine inspections, emergency response procedures and spill management. Anticipated chemical and fuel volumes vary dependent on activity, but may involve the storage of the following types of chemicals and volumes: • Stimulation and drilling chemicals (friction reducers, surfactants, crosslinkers, breakers, buffers, acids, bases, biocides, scale inhibitors, corrosion inhibitors, clay stabilisers, loss of circulation material, drilling muds, salts etc.) Volumes are typically less than 20KL per chemical, with some chemicals stored at higher (such as pH control) or lower (such as biocides and corrosion inhibitors) volumes depending on their purpose and planned use. • Diesel – typically 100KL stored but may be 500KL if wet season activities are proposed. • Other chemicals and hydrocarbons- such as oils and greases, lubricants, hydraulic fluid, cleaning chemicals, domestic chemicals etc. used to support operations.	0.5ha (on existing lease pad or laydown yard)	N/A	During exploration activities	During exploration activities.	 

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Waste management: Any waste generated during exploration activities will be stored onsite in accordance with the NT *Waste Management and Pollution Control Act 1998* and Code of Practice and transported offsite to a licenced waste management facility. All wastes (other than drilling mineral waste) will be stored within skips or equivalent and removed from site at the end of each activity.	N/A	1 -2 trucks per day during operations	During explorations activities	During explorations activities	
Groundwater extraction: Groundwater extractions from the purpose built groundwater monitoring onsite or another approved extraction bore (which may include trucking water from adjacent properties) will be completed periodically to support exploration activities. All groundwater take will likely be from the Gum Ridge Formation and will be licenced under Tamboran's existing Water Extraction Licence (WEL) GRF 10285. A new WEL may be submitted to increase the water take and/or covering take an alternative formation where present. It is anticipated that groundwater extraction volumes to support this program will be in the order of 250-600ML per year (conservatively) , primarily used for civil construction, drilling and to stimulate the E&A wells. Once drilling and stimulation has ceased, minimal ongoing water extraction from the site will be required. Where possible, recycled flowback will be utilised within stimulation to reduce raw water usage.	N/A	N/A	Ongoing to support exploration activities.	During exploration activities	
Traffic management Access to the site will be via a combination of existing and new access tracks, located approximately 15-20km South of Dunmarra on the Stuart Highway. Minor traffic disruptions may occur during the construction of the access track intersection with the Stuart highway. During this period, a traffic management plan will be implemented, with traffic control utilised in accordance with DIPL requirements. Peak traffic volumes are anticipated to be associated with the drilling rig mobilisation and demobilisation. Traffic volumes may reach up to 44 vehicles per day spread over a 4 week period. During operations (drilling, stimulation or well testing), vehicle movements to the site are anticipated to be less than 10 movements per day. This period is likely to extend typically 60 days per exploration well, 45 days per stimulation and during the duration of a well test/appraisal gas sale (30-365+ days).	N/A	N/A	During operations	During operations	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
The bulk of transport movements for the construction of the SPCF and FAS will be during the movement of the skid mounted compression units and supporting equipment. This will typically peak over a 2-3 week period and involve up to 12 movements of heavy vehicles. During the sale of trucked CNG, up to 4 B-triples movements per day between the Shenandoah south site to a reinjection point on the AGP. Transportation will be undertaken 24 hours a day, with the injection point likely to be into the AGP near the Buchanan Highway. All movements will be via the site access tracks onto the Stuart Highway. Once the well is suspended or decommissioned, vehicle movements will reduce to 1 vehicle per fortnight or 1 vehicle per 6 months respectively.					
Site rehabilitation Within 6 months of the E&A wells being plugged and decommissioned, a site will be rehabilitated. This involves: a) the removal of all surface facilities (well heads, fencing, water bores, tanks etc.) b) deep ripping of compacted surfaces c) recontouring landforms d) respreading of topsoil from the topsoil stockpiles, e) re-seeding (if required;) and f) ongoing monitoring and maintenance of the rehabilitation.	N/A		Within 6 months of the plugging and abandonment of all E&A wells	<14 days, with ongoing monitoring and maintenance	 

Appendix B Summary of Environmental outcomes, impacts, risk and controls

An overview of the potential environmental outcomes, potential impacts and risks associated with the proposed exploration activities within this clearance request are summarised in Table 3. This information will also be provided in the EMP covering the proposed regulated activity, which will be submitted to the Department of Environment, Parks and Water Security (DEPWS) for formal assessment and approval.

An environmental outcome means an outcome that will be achieved if the environmental impacts and environmental risks of a regulated activity are reduced to a level that is as ALARP, and acceptable.

Environmental impacts are defined as any adverse change, or potential adverse change, to the environment resulting wholly or partly from a regulated activity.

Environmental risks are defined as the chance of something happening that will have an environmental impact, measured in terms of environmental consequences and the likelihood of those consequences happening.

Both the consequence and likelihood of a potential impact can be reduced through the adoption of controls, which must be applied to reduce a risk down to an ALARP and acceptable level.

Table 3 Environmental outcomes, impacts, risk and controls

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
Groundwater use and quality	• To manage exploration activities to prevent unsustainable depletion of groundwater resources • Preserve groundwater quality to protect environmental and pastoral use	• No adverse changes to groundwater quantity is anticipated to be associated with exploration activities. • Impacts to aquifers levels anticipated to be negligible, with rapid recharge observed from other Gum Ridge Formation bores utilised within the Basin. • No material changes to groundwater quality anticipated from exploration activities. • No impact to Groundwater Dependent Ecosystem's (GDE) , stygofauna or Sacred sites from exploration activities (extraction and well construction) • No Rreduction in pastoral productivity through reduced groundwater volumes	• Low risk of groundwater contamination from drilling fluids during construction of the conductor/ surface casing in the Cambrian Limestone Aquifers due to the selection of low toxicity drilling fluids • Low risk of cross flow of deep formations (such as the target shales) to shallow aquifers through inappropriate well barrier design and construction due to the presence of the Code of Practice controls and verification processes. • Low risk of crossflow through fracture growth into aquifer from stimulation activities allowing the migration of fluid and gas due to the controls within the Code of Practice and underlying separation distance between the target formation and Cambrian Limestone aquifers. • Low risk of stimulation activity inducing seismic activity that enables cross formational flow between shallow aquifers due to seismic stability of region and lack major faults or fracture zones. • Low risk of stimulated zones intersecting offset wells (including the adjacent horizontal wells) or intersecting an existing geohazard due to seismic control, pressure monitoring during stimulation and lack of older petroleum wells in close proximity. • Low risk of crossflow/well integrity caused by the deviation of an E&A well into the adjacent well during drilling due to downhole GPS tracking tools and proximity alarms • Low risk of leakage of either flowback, produced water, or hydrocarbons (liquid and gaseous) from suspended or abandoned wells to groundwater due to well design and integrity management. • Low risk of leaks from gathering lines, with gathering lines constructed as per Australian Standard, leak detection in place to identify pipeline failures and routine inspections completed. • Low risk of surface contamination from storage and disposal of drilling fluids, additives, muds and cuttings on-site due to low toxicity of drilling muds and disposal risk assessment process. • Low risk of groundwater contamination from surface spills from storage, handling and transportation of flowback water due to the storage and spill management requirements outlined int eh Code of Practice. • Low risk of groundwater contamination from the storage, handling and transportation of chemicals, fuels and wastes due to the mandatory code of practice controls (such as mandated use of secondary containment) • Low risk of groundwater contamination from overtopping of drilling sumps and flowback tanks (including during wet season) due to level alarms and use of enclosed tanks.	• All petroleum wells are to be designed, constructed, operated and decommissioned in accordance with the mandatory controls within the Code of Practice. The Code of Practice outlines specific controls measures designed to protect underlying groundwater resources including: o Exploration wells designed with multiple cement and steel casing barriers to protect aquifers o Well cement and casing is designed to address the underlying formation characteristics in terms of corrosion risk, heat, temperature and pressure risks from each formation. o Drilling fluids and muds must have a low residual toxicity o Groundwater monitoring must be completed before and after stimulation to detect contamination o Well integrity confirmation to prove barrier performance aquifer isolation (casing pressure tests, formation leak off tests, cement bond logs etc.). o Separation between stimulated shale resources and aquifers must be sufficient to ensure the risk of fracture growth is ALARP o Pressure monitoring completed to ensure maximum allowable operating pressure is not exceeded during stimulation. o Ongoing well integrity monitoring and maintenance throughout the life of each well to ensure aquifers are protected o Maintenance completed on wells to ensure well barriers are working appropriately. o All wells are to be decommissioned in accordance with the Code of Practice, with cement plugs utilised to separate aquifer units. • All surface storages of wastewater and chemicals to have secondary containment to prevent spills to the ground • An emergency response plan must be implemented outlining how spills and emergencies will be responded to. • Drilling fluids and wastes to be stored within a lined sump • Gathering lines and pipelines constructed as per Australian standard, leak detection in place to identify pipeline failures and routine inspections completed. • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks are to be operated with a 1:1000 Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All flowback wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Groundwater monitoring from monitoring bores installed at the site must be completed prior to and after stimulation to detect any contamination. • All water take covered by an existing Water Extraction Licence (WEL) GRF 10285 • New extraction bores must model potential impact on adjacent pastoral bores prior to being added to WEL. • All water take to be metered and reported quarterly to the regulator

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of groundwater contamination from a failure of flowback storage tank due to the design standards of the tank (cyclone rated steel tank structures) and routine integrity inspections • Low risk from over extraction of groundwater for civils, drilling and stimulation activities due to limited nature of take (one off), yield of the Cambrian Limestone Aquifers and available allocation volumes (as assessed in the WEL).	• No pastoralists groundwater bores within 1 km of each proposed site • No water related sacred sites within 10kms of the site- noting the CLA and surface water bodies are not connected. • Flowback to be preferentially used in stimulation fluid to reduce raw water usage.
Soils	• Avoid, minimise and control soil erosion and discharge of sediment or soil into waterways or established drainage systems • Minimise disturbance of soil, vegetation and drainage during site activities • Prevent the contamination of soil to maintain the viability of soil resources • Minimise residual impacts to pastoralist usage of exploration areas	• Clearing of vegetation to support exploration activities. • Soil compaction from access tracks, leases, appraisal gas infrastructure and seismic lines. • Increased sedimentation transportation from disturbed areas • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Medium risk of soil erosion from cleared areas (access tracks, lease pads, camp pads, gravel pits and laydown areas) occurring on disturbed sites due to high intensity wet seasons. Risk is a low consequence (minor impact), possible (<50% chance of occurring) event. • Low risk reduction in land production (including pastoral and NTH use) through poor erosion and sediment control practices • Low risk of spills/leaks from the on-site storing and handling of fuels. Condensate, hydrocarbons, drilling additives, stimulation additives, flowback fluid, solid wastes, storage and transportation of wastes causing soil contamination. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of chemical and waste transportation accident causing soil contamination due to licenced chemical/ waste provider use, spill response and emergency response requirements. • Low risk of contamination from on-site disposal of drill muds and cuttings with site specific assessment completed to ensure disposal is environmentally acceptable. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of wastewater evaporation mist transported offsite during wastewater treatment due to wind speed/direction cut offs and routine site inspections during operations. • Low risk of greywater and sewerage disposal from camp wastewater treatment plants due to the irrigation area being appropriately sized, fenced and quality aligning with the NT Department of Health requirements. • Low risk of reduction in land production through poor infrastructure placement as infrastructure is preferentially located in existing disturbed area, with no sensitive soil types present in the immediate vicinity. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements • Low risk of pipeline subsidence creating erosion	• Site selected to avoid sensitive soil units and slopes which may increase erosion hazard. • All land clearing (including during the establishment of seismic lines) to align with the requirements of the code of Practice and NT Land Clearing Guidelines (2019) • Erosion and sediment control practices to be utilised at all disturbed sites to minimise erosion. • Sites (including gravel pits) maintained to minimise sediment releases, with erosion and sediment control plan in place • Pre and post wet season monitoring completed on all disturbed areas (including seismic lines) to identify and repair erosion • Construction within the wet season to be avoided to reduce the erosion risk. • Vegetation clearing watercourses to be avoided as far as reasonably practicable (i.e. only when a new access is required to be constructed) • During seismic surveys, vegetation clearing within open woodlands to be minimal • All chemicals and fuels to be stored with secondary containment as per code of Practice. • All chemicals to be risk assessed to ensure they do not represent an unacceptable risk to people, the environment and community, with all spills cleaned up as soon as practicable. • During flowback wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed flowback wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All flowback wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Stormwater to be retained onsite during wastewater storage and tested prior to release • Stormwater falling within the SPGCF compressor area shall be treated to remove oil, prior to release to soaker trenches. • All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • Disposal of drilling muds, cuttings and mineral waste to be undertaken in

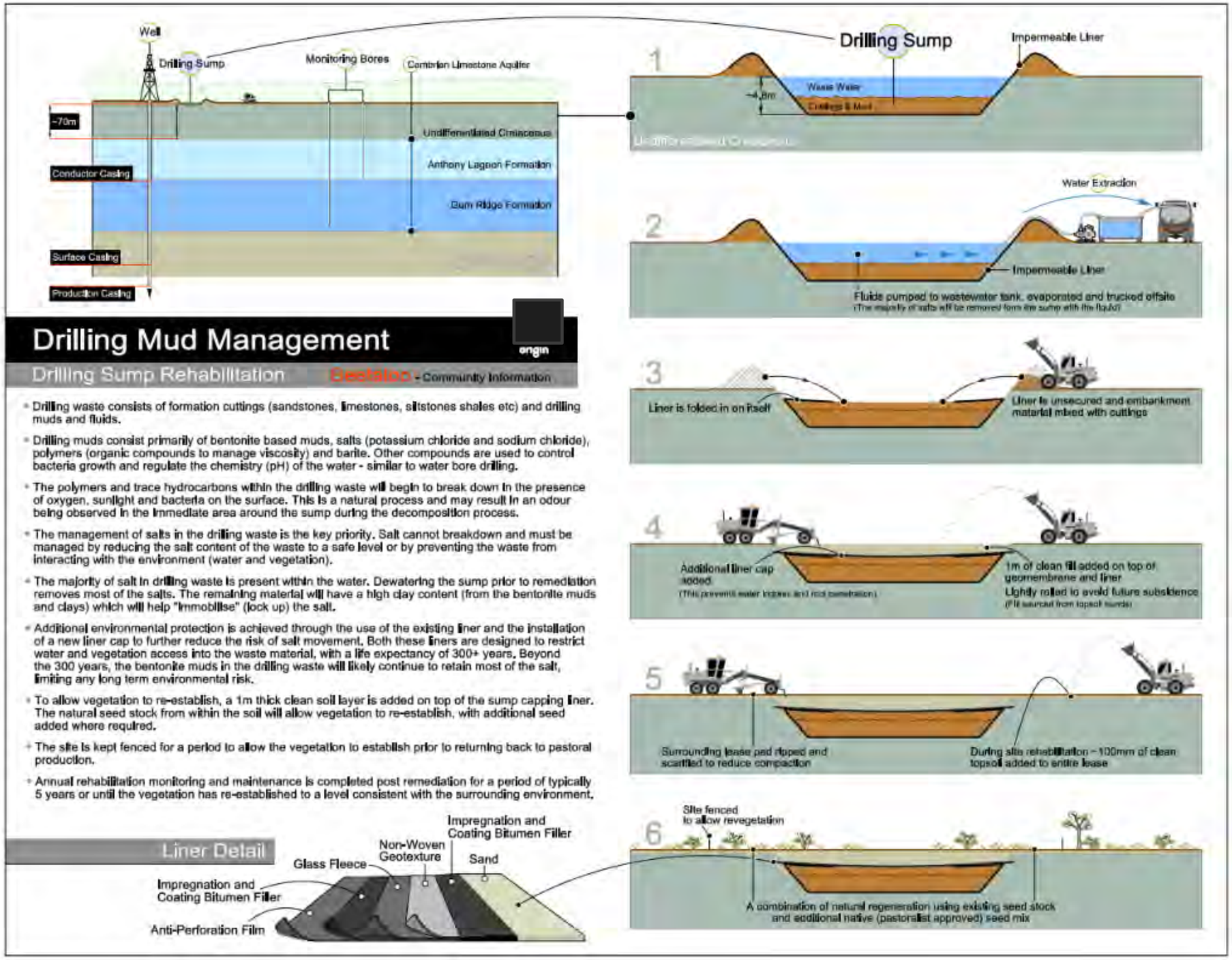
Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
				accordance with Code of Practice, with onsite disposal only permitted where the potential harm to the environment can be demonstrated as ALARP and acceptable. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist input. • Pipeline monitoring and repair work to minimise/ respond to pipeline subsidence
Emissions (dust, greenhouse and combustion emissions)	• Avoid environmental nuisance at sensitive receptors • Minimise impacts to pastoralists and surrounding ecological communities from dust • Minimise greenhouse gas emissions	• Dust on vegetation in the immediate vicinity of activities reduces plant palatability • Impacts of dust nuisance to birds and fauna in the immediate vicinity of activities, specifically access tracks and seismic lines • Emissions from the combustion of diesel. • Emissions from gas fired power/ compressor generation. • Fugitive emissions and VOC's • Generation of Greenhouse gasses	• Low risk of dust impacts generated during Civil activities, drilling operations, well testing due to use of dust suppression and routine maintenance of access tracks and infrastructure • Low risk of reduction in regional air quality resulting from emissions from the combustion of diesel due to the limit nature of the activities, selection of low pollution equipment (such as low NOx engines) and lack of regional pollutant sources. • Low risk of reduction in regional air quality from gas and condensate flaring due to the combustion efficiency of the flare and operating procedures. Emissions from these facilities will be modelled to ensure compliance with NEPM guidelines. • Low risk of air emissions from chemical releases during drilling and stimulation activities impacting livestock, fauna and people due to chemical handling procedures limiting emissions during mixing. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring, grinding) or personnel. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of uncontrolled release of gas impacting a receptor during drilling, stimulation, barrier failure, operator error or vehicle collision due to the well design, blow out prevention, well integrity and lack of sensitive receptors preventing impacts. • Low risk of leak of gas from wells and compressors due to the well design, routine leak detection and repair and separation distance from receptors, • Low risk of gas compression facility explosion/ gas release due to use of pressure safety valves, leak detection, flame detection and hazard zone management. • Low risk of air emissions created by gas fired compression with low NOX compressors to be utilised. • Low risk of greenhouse gas emission impacts from appraisal gas sale/ well testing through avoidance of venting and prioritisation of appraisal gas sale over flaring.	• Site located away from sensitive receptors, such as homesteads • Dust suppression to be used on access tracks, lease pads and gravel pits to minimise dust emissions where practicable • Outside of high intensity activities (such a s civil construction, drilling and stimulation) Dust levels consistent with standard pastoral activities (such as mustering/truck load outs) on the property • Venting of raw gas is tightly controlled under the Code of Practice, with no material volume of gas to be vented • A reduced emission completion (flare) to be utilised to combust all hydrocarbons • Flares to be compliant with USEPA design standards, including 98% flare efficiency • Stimulation chemical mixing procedures deployed (such as enclosed hoppers) that minimises dust emissions • Firebreaks to be maintained around well and camp pads to minimise bushfire risk • Flaring exclusion zones to be maintained around flare • No flaring during total fire bans • Slashing, grinding and other higher risk fire activities to be undertaken with appropriate controls to mitigate he risk of bushfire (such as buffer zones, use of fir trailers, fire breaks etc.) • During seismic surveys, no vegetation is to be mulched and bushfire management protocols implemented. • Vehicles to be equipped with fire extinguishers • 6 monthly gas leak detection on all exploration wells, equipment and compressors, with annual inspections on pipelines • Low NOx and Low CO gas fired compression/ power generation utilised to minimise air emissions. • Gas plant to have leak/ flame/ lightning detection to reduce potential of gas plant fires/ explosions. • Gas is lean, with very low levels of higher order hydrocarbons, BTEX, Radon or other harmful contaminants- noting gas will not be vented. • Modelling completed to ensure NPM air quality objectives are being met. • Appraisal gas will be beneficially used through sale of [redacted] piped natural gas to reduce flaring and minimise flaring to reduce scope 1 and 2 emissions.
Surface Water	• Avoid and minimise the potential contamination caused by the discharge of sediment or	• Increased sedimentation transportation from disturbed areas (access tracks, lease pads, seismic lines etc.)	• Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management	• No take of surface water permitted or proposed • Lease pad located away from watercourses- typically 1km or greater • Seismic activities to:

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
	contaminated storm water to waterways or established drainage systems. • Contain any potential contaminants for treatment or disposal.		requirements. • Low risk of gathering pipeline failure and release of flowback • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of a transportation accident releasing chemical or wastewater (drilling fluid and flowback) due to the use of licenced wastewater/ chemical transportation providers, spill management and emergency response requirements. • Low risk of spills to surface water from chemicals and fuel storage and handling activities due to use of secondary containment and separation distance to watercourses. • Low risk of stormwater releases from activities contaminating surface water due to stormwater segregation and testing procedures. • Low risk of infrastructure (including pipeline) changing surface hydrology and flow due to infrastructure design and avoidance of overland flow locations. • Low risk of changes to terrestrial ground surface levels associated with seismic activity due to the stability of the basin and geomechanical properties of the target and overlying formations. • Low risk of gathering line failure releasing flowback fluid to the environment	o avoid vegetation clearing as much as practicable o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o Avoid seismic lines in water courses (unless co-located with an access track) • Site maintained to minimise sediment releases, with erosion and sediment control plan in place • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All wastewater tanks engineered to withstand failure, cyclone rated construction • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • All gathering lines to be welded as per Australian Standards, hydrotested during construction to verify integrity prior to being brought into service • Gathering lines to utilise flowmeters/ pressure monitoring to identify leaks (such as flow/ pressure drops) • Gathering lines to be inspected 6 monthly to identify subsidence/ potential integrity issues. All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • No offsite releases of drilling or stimulation wastewater proposed or permitted • Stormwater retained onsite during wastewater storage, with testing completed prior to offsite release • Stormwater within process areas of the SPCF [redacted] to be passed through oily water separator prior to being released. • Site selected to avoid major structural features, such as faults • Basin is seismically stable, with low seismic activity reported.
Flora and Fauna	• Minimise disturbance to flora and fauna • No disturbance to high conservation areas • Avoid the introduction of weeds • Avoid the spread of existing weeds • Minimise the loss of pastoral/ NTH traditional productivity	• Clearing of vegetation communities (such as Open Corymbia/eucalypt woodland, Bullwaddy and/ or Lancewood) to support exploration activities (lease pad extension and seismic lines). • Loss of fauna and flora habitat • Loss of livestock grazing area • Loss of productivity of disturbed areas until final rehabilitation has been achieved • Impact on livestock and fauna from transport accidents	• Low risk of impacts to sensitive vegetation communities from seismic activities, with high ecological areas avoided • Low risk of threatened fauna mortality during clearing, with all sites to be inspected prior to clearing to avoid fauna. • Low risk of vehicle , machinery noise, plant noise, and lighting on well pads, access tracks and gas plant causing material impacts to threatened fauna or livestock. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency	• Seismic activities to: o avoid clearing of mature trees and protected flora o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o No seismic lined in riparian o Implement fire management controls, include rapid response • No mulching of vegetation to occur which reduces risk to fire • Vegetation to be walked down and inspected for fauna prior to clearing. Where fauna are identified, work shall stop in the immediate vicinity until they leave the area.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			response requirements and spill management requirements. • Medium risk of introduction and spread of weeds in the area due to equipment washdowns, inspection and certification requirements. Monitoring and routine treatment completed on identified outbreaks. Impact from weed introductions/spread is considered moderate, with likelihood Unlikely. • Medium risk of bushfire from accidental ignition by site activities (civil works, seismic activities, drilling, flaring, grinding) or personnel on fauna, flora and land productivity. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of flora, fauna and livestock being trapped and drowning in storage tanks, sumps and pits due to the design of storages and fencing. • Low risk of contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities due to chemical storage and handling practices and lack of contaminants within gas stream. Fences are utilised to restrict livestock access. • Low risk of vehicle collisions with fauna – fauna mortality results in a localised impact to listed threatened species, due to speed limit restrictions and number of vehicle movements. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements Reduction in land production through bushfire. • Low risk of impacts to flora and fauna through the encouragement of feral animals and other pest species leading to competition with native species. This includes the introduction of cane toads.	• Site to be fully fenced during operations • Open pits to be fully fenced to prevent livestock access • Sumps to have fauna ladders or liner material (such as coletanche) with sufficient friction to allow fauna to escape. • Gravel pits to be left open to act as watering point for livestock when not in use. High risk pits to be fenced to prevent livestock where appropriate (i.e. when cattle death is expected or observed) • Vehicle speed limit restricted to 60km/hr • Dust suppression used to limit dust impacts to vegetation • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist • All equipment and loads to be inspected and certified weed free prior to entry • 6 monthly weed inspections to be completed with all identified weeds treated. • Weeds sprayed periodically to restrict weed numbers.
Environmental Nuisance and Amenity- including dust, noise, light, odour and vibration	• Minimise impacts to pastoralist operations • Minimise impacts to NTH traditional use of the surrounding area	• Construction of exploration infrastructure onsite changes land use from pastoral/ natural to industrial. • Light and noise nuisance to fauna and livestock in immediate vicinity of activity • Increased traffic to proposed exploration area • Noise, light, odour and dust emissions in the immediate vicinity of the lease pad. • A visible hue visible from operations at night during flaring or from activity lighting. • Noise impacts from helicopter movements • Noise and vibration impacts during seismic activities.	• Low of changes in property amenity through the construction and operation of exploration infrastructure due to location of activities and separation distance from receptors • Low risk of increased vehicle accident or traffic impacts through associated with low traffic volumes anticipated and limited peak traffic periods. • Low risk of adverse impacts to fauna from traffic are not anticipated, with impact levels consistent with standard road traffic levels. • Low risk of helicopter movements causing impacts to receptors based on location of site away from homesteads • Low risk of noise, dust, light and vibration impacts associated with temporary appraisal gas facility • Low risks of pollutants extending beyond the boundary of the activity (water, air and soil) impacting on NTH foraging/use due to	• Sites located away from homesteads and local communities • Flaring to be minimised to avoid light generation • Site is located away from pastoralist main access points • Maximum peak traffic during mobilisation and demobilisation is likely to be typically less than<44 vehicle movements per day for 2 weeks. • Speed limit restricted on the access tracks to <60km/hr • Dust suppression to be utilised to minimise dust emissions • Where helicopter movements are planned, the pastoralist to be engaged prior to ensure helicopter do not interfere with pastoral activities. • Seismic surveys to avoid sensitive receptors, such as homesteads, local communities, sacred sites etc. • Compression/ power generation[redacted] facilities to be designed to minimise aesthetic impacts and noise, being located away from homesteads and local communities. • Lighting of infrastructure designed to minimise aesthetic impacts

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			environmental controls utilised.	during the evening • Air emissions reduced through selection of low NOx/ CO compressors and modelling to ensure air emission impacts are minimised.

Appendix C- Drilling Waste Mix Bury Cover schematic



Appendix J.1.2 06 240223 & 27 Ongoing matters

From: Emily Beresford-Cane
To: [redacted]
Subject: Re: Ongoing matters
Date: Tuesday, 27 February 2024 8:11:10 PM
Attachments: image001.png
240223 Letter NLC to Tamboran - Ongoing matters.pdf

Hi [redacted]

Thank you for the correspondence.

I just wanted to double check the dates for Work Program meeting being Tues 19th March and the JNWG meeting for Wed 20th March.

These are the dates I wrote down during our meeting in Darwin. The attached letter references different days (being 19th as Wed and 20th as Thurs).

We are planning on being in Elliott on the 19th and 20th March.

Can you please confirm?

Thanks

Emily

> On 23 Feb 2024, at 5:07 pm, [redacted] wrote:
>
> Good afternoon Emily
>
> Please find attached our letter to you dated 23 February 2024.
>
> Regards
>
> [redacted]
> **Senior Lawyer (Resources & Energy)**
> Northern Land Council
>
> NORTHERN LAND COUNCIL
> Our Land, Our Sea, Our Life
>
> [redacted]
> Email: RossRo@nlc.org.au | Website: www.nlc.org.au
>
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NORTHERN
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Our Land, Our Sea, Our Life

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[redacted]

