

19 August 2025

Ms Sally Strohmayer  
Acting Executive Director  
Environmental Regulation  
Department of Lands, Planning and Environment  
PO Box 3675  
Darwin NT 0801  
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Dear Ms Strohmayer

**Re: Annual Interpretative Groundwater Quality Report - Beetaloo Sub-Basin Multi-well Drilling, Stimulation and Well Testing Program Environment Management Plan ORI10-3 (the EMP)**

Ministerial condition 5(iii) of approval for the above EMP requires “... *an interpretative report of groundwater quality based on the groundwater monitoring required to be conducted at the well site(s) in accordance with Table 6 of the Code. The interpretative report must be provided annually within 3 months of the anniversary of the approval date of the EMP and include:*

- *identification of any change to groundwater quality or level attributable to conduct of the regulated activity at the well site(s) and discussion of the significance and cause of any such observed change*
- *interpretation of any statistical outliers observed from baseline measured values for each of the analytes*
- *discussion of any trends observed*
- *a summary of the results including descriptive statistics*
- *description of the layout of the groundwater monitoring bores and wells, indicative groundwater flow directions and levels in accordance with the Preliminary Guideline Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-basin.”*

The Code refers to the *Code of Practice: Onshore petroleum activities in the Northern Territory* (DENR, 2019). It is referred to as the “Code” throughout this report.

This letter constitutes the annual interpretative groundwater quality report for the Amungee NW well site for the 2025 reporting period (20 May 2024 – 19 May 2025). This interpretive groundwater quality report has been produced by Mr Peter Evans, Senior Hydrogeologist on behalf of Tamboran B2 Pty Ltd (Tamboran).

**Site layout and groundwater flow direction**

Figure 1 presents the layout of the Amungee NW wellsite, showing the locations of the Amungee NW-1H, Amungee NW-2H and Amungee NW-3H appraisal wells and the control monitoring bore (CMB – RN040864) and the impact monitoring bore (IMB – RN040318).

The CMB is 100 m to the south-southeast of Amungee NW-2H and the IMB is 20 m northwest of the same well. The CMB and IMB and up hydraulic gradient and down hydraulic gradient of the wells based on the regional groundwater flow direction (refer Figure 1). The CMB and IMB fully penetrate the Gum Ridge Formation aquifer. The Anthony Lagoon Formation aquifer is not present at the Amungee NW well site.

The indicative groundwater flow direction, based on the SREBA (DEPWS, 2022) and monitoring results collected on site, is from the southwest to the northeast in the vicinity of the Amungee NW well site.

Amungee NW-1 and NW-1H were drilled 2015 and 2016, respectively. Amungee NW-1H was hydraulically fractured in 2016 and underwent production testing in 2021.

The Amungee NW-2H well was drilled in November/December 2022 and was hydraulically fractured between 19 February 2023 and 20 March 2023 with production testing from 25 April to 17 July 2023.

Amungee NW-3H was drilled between 25 September and 16 October 2023. It has not been hydraulically fractured.

There have been no further regulated sub-surface activities at the Amungee NW well site during this reporting period.



Figure 1 Site layout and indicative groundwater flow direction

## Water level trends

Water level monitoring in the CMB and IMB commenced in 2018 and in 2022 respectively using InSitu® LevelTroll automatic water level sensors installed in the bores.

Figure 2 presents daily averaged timeseries water level data for the CMB (blue line) and IMB (orange line) for their full monitoring periods. Figure 3 presents high resolution data (including 4-minute monitoring) for the two years from 1 January 2023. The periods of activities at the well site are also shown on Figure 3. All data have been corrected for offsets due to logger replacements and for barometric pressure fluctuations. These data show:

- High frequency (four-minute) water level measurements commenced on 18 January 2023 and continued through to 10 February 2024.
- The CMB was used to supply water for regulated activities in July/August 2022, for civil works associated with the preparation of the wellsite for the drilling of Amungee NW-2H.
- Both bores were used to supply water for regulated activities for the period 17 February to 24 March 2023, associated with the hydraulic fracturing of Amungee NW-2H.
- There is a period from 16 September to 16 October 2023 when there is no logger data available for CMB BET-MB019. This partially corresponds to the period of drilling of Amungee NW-3H.
- While pumping, the water level in the bores draws down by up to approximately 2 to 3 m, with effectively instantaneous recovery thereafter.
- There has been limited groundwater extraction from the bores since late October 2024.
- The long-term groundwater levels have essentially been stable across the duration of the monitoring period, with a 2 cm difference in water levels between the start and end of available water level data for the CMB.
- A rising trend in groundwater level in both bores is observed following the 2023/2024 wet season, during which a significantly larger volume of rain fell compared with the five preceding wet seasons. This is consistent with observed water level changes elsewhere across the region.
- There is a strong temporal correlation in small-scale water level fluctuations between the two bores indicating a strong hydraulic connection within the aquifer.
- The differences in groundwater depths measured in the bores is most likely to relate to the relative difference in the height of the reference point from which the measurement is made and to the groundwater gradient along the aquifer flow path.
- There has been no significant change to the water level in the Gum Ridge Formation due to the regulated activities.

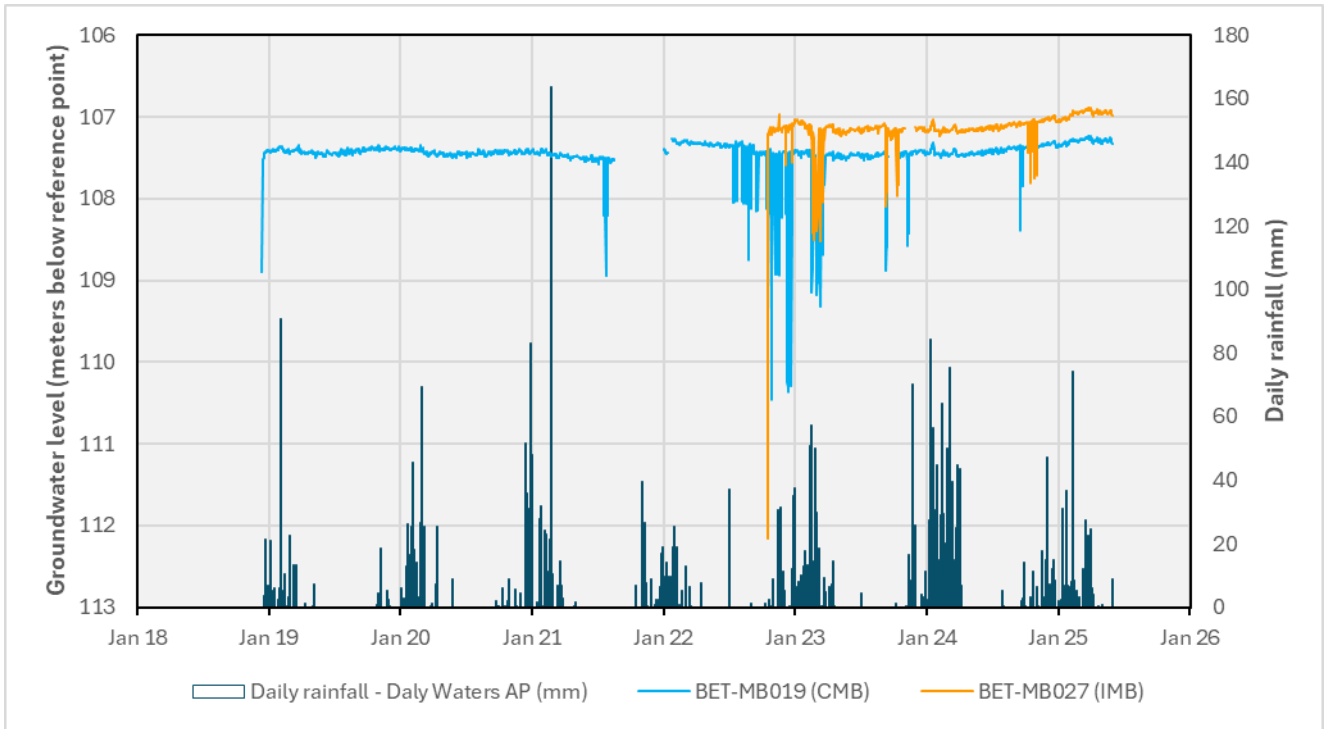


Figure 2 CMB and IMB daily average water levels

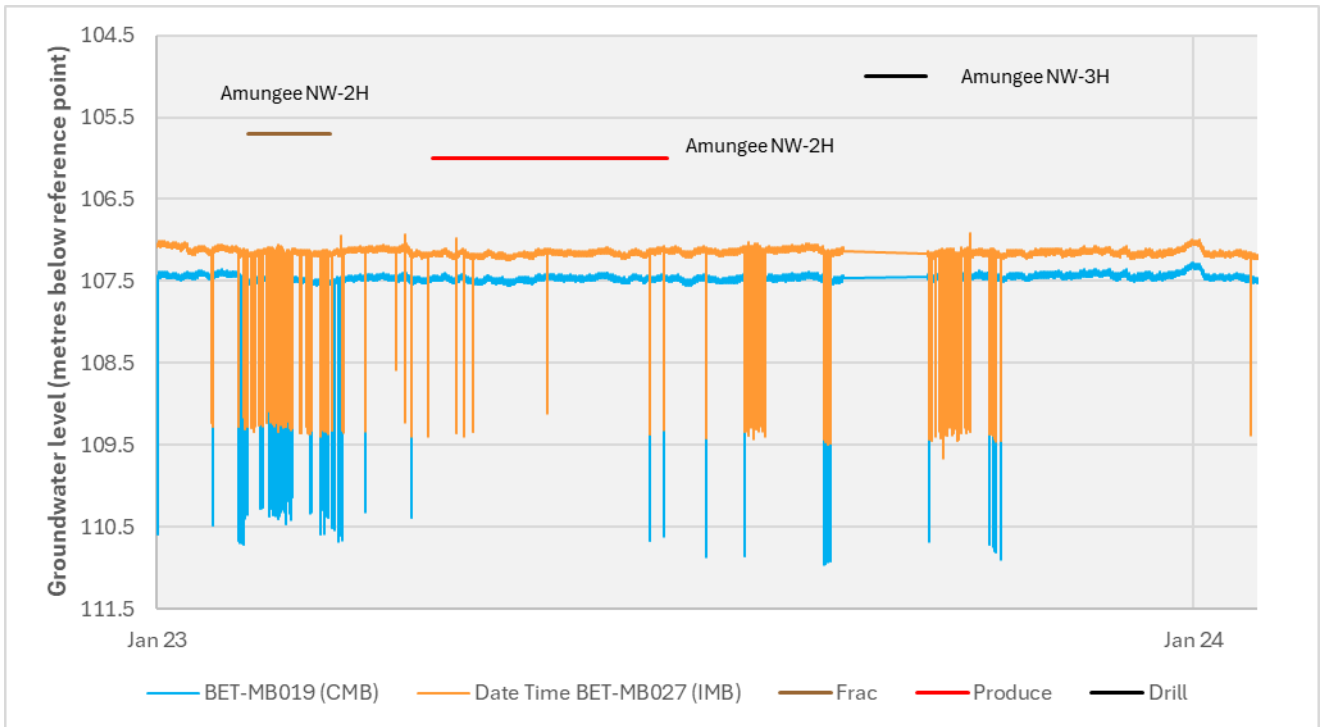


Figure 3 High temporal resolution data over 2023 period of activities

## Water quality trends

Groundwater from the CMB and IMB has been sampled for the suite of analytes listed in Table 6 of Section B.4.17 of the Code. Water quality monitoring of the CMB commenced on 17 December 2018, greater than four years prior to the hydraulic fracturing of Amungee NW-2H. Water quality monitoring of the IMB commenced on 5 December 2022, prior to the hydraulic stimulation of Amungee NW-2H. Sampling has not been conducted consistently since October 2023, due to ongoing issues with pumping equipment power supplies.

Summary statistics of the analytical results are provided in Table 1 and Table 2 for the CMB and IMB respectively. Where an analyte concentration was reported as less than the effective quantification limit (EQL), it was assumed to be equal to 0.5 times the EQL for the calculation of the statistic.

To identify whether there has been any change in water quality due to the regulated activities, a statistical assessment was made using a Student T-Test to test whether there was a significant difference in the results between the CMB (upgradient) and the IMB (downgradient). An F-Test was used to determine whether the homoscedastic (statistically similar variance) or heteroscedastic (statistically different variance) formula for the T-Test was used. Where a concentration was reported as less than the limit of reporting, the limit of reporting was assumed as the sample concentration. The statistical significance was assessed to a 95% confidence. The results of the analysis are provided in Table 3.

The analytes where the P-value was less than 0.05 (95% confidence that there is a significant different between the CMB and IMB data) are listed below with timeseries graphs for these analytes provided in Attachment A. Discussion of the data trends are as follows:

- Electrical Conductivity (Lab)** – The electrical conductivity of the CMB has shown some variability over the period of monitoring from a minimum of 1,080  $\mu\text{S}/\text{cm}$  to 1,120  $\mu\text{S}/\text{cm}$  in the most recent sample, reaching a maximum reported concentration of 1,220  $\mu\text{S}/\text{cm}$  in September 2024. Subsequent to this, values in the CMB have largely declined, probably regional recharge associated with the large 2023/2024 wet season. Results from the IMB generally reported electrical conductivity greater than the average concentration from the CMB (1,157  $\mu\text{S}/\text{cm}$ ). The electrical conductivity in the IMB has exhibited some variability over time, albeit showing some correlation in temporal behaviour. The most recent results (1,140  $\mu\text{S}/\text{cm}$  in July 2025) are still reporting above than the most recent CMB result (September 2024).
- Chloride** – Similarly to electrical conductivity (to which it is related), the chloride concentration in the IMB is generally greater than the CMB concentration. The key exception is the after the drilling of Amungee NW-2H when the chloride concentration in the IMB decreased to be almost identical to that of the CMB. This may be indicative of the loss of drilling fluid, made up with water supplied from the CMB, into the formation in the vicinity of the IMB. Subsequent samples from the IMB exhibited a relatively rapid increase in chloride content to broadly stabilise between 100 mg/L and 140 mg/L, compared with roughly 100 mg/L in the CMB. Notwithstanding a gradual increase in the chloride content in the early time data of the CMB, there are no clear trends in the chloride concentrations in the CMB and IMB.
- Sulfate as  $\text{SO}_4$**  – Sulfate concentrations in the CMB have gradually declined over time, but have generally been reported at concentrations between 100 mg/L and 140 mg/L. In the IMB, the first reported sulfate concentration was 127 mg/L, but it then declined to 111 mg/L in the two subsequent samples. The sample from February 2024 was low (79 mg/L) compared to preceding results,

however the succeeding sample results have fluctuated between 90 and 126 mg/L. The last four samples have shown close correlation with the CMB values.

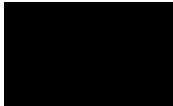
- **Sodium** – The sodium concentration in the CMB has been relatively stable throughout the monitoring period, with an average concentration of 66.4 mg/L and a maximum concentration of 72 mg/L. The first sodium concentration from the IMB was 72 mg/L with concentrations from samples thereafter oscillating between 62 mg/L and 75 mg/L until July 2023. Sodium concentrations in the IMB have been generally slightly higher than in the CMB. There are no clear long-term trends in the sodium concentrations.
- **Potassium** – The potassium concentration in the CMB has been relatively stable throughout the monitoring period, with an average concentration of 10.2 mg/L and a maximum concentration of 12 mg/L. The first potassium concentration from the IMB was 42 mg/L with concentrations from samples thereafter oscillating between ~15 mg/L and 26-43 mg/L, although with time the temporal variability has dampened. Potassium values in the IMB remain generally higher than in the CMB however the temporal pattern of values in the IMB suggest some relationship to drilling activities.
- **Barium** – The dissolved boron concentration reported from the CMB has broadly declined since August 2019 from 0.105 mg/L to a most recent value of 0.042 mg/L. The temporal pattern of barium values in the IMB shows much greater variability from values close to those in the CMB. The initial value in the IMB was 0.196 mg/L in December 2022 and this has broadly declined with time towards the levels seen in the CMB with the most recent IMB value being 0.088 mg/L.
- **Iron** – The dissolved iron concentrations from the CMB are generally low in the range of 0.21 to 2.63 mg/L. There appears to be no obvious long-term trend in iron in the CMB data. The iron values in the IMB have a range of 0.05 mg/L to 4.06 mg/L (disregarding an anomalous and likely spurious value of 13.4 mg/L report on 1 April 2023) and are generally higher than those in the CMB. Since October 2024, the IMB iron values have started to increase to a most recent value of 4.06 mg/L. The reason for this trend is not readily apparent; however, this has occurred post the major 2024/2024 wet season event which, as previously noted herein, has been associated with lower electrical conductivity values likely attributable to lateral through flow of recharged water.
- **Manganese** – The dissolved manganese concentrations from the CMB are generally low in the range of 0.031 to 0.152 mg/L. There appears to be no strong long-term trend in manganese in the CMB data although it may be declining very slightly with time. The manganese values in the IMB have a range of 0.024 mg/L to 0.694 mg/L (although the maximum number was obtained in the earliest sample and may reflect the influence of construction of the IMB). The IMB manganese values are generally higher than those in the CMB however with time they appear to be declining towards the values in the CMB.
- **Methane** – Dissolved methane concentrations have consistently been reported at less than the EQL (<EQL) of 0.01 mg/L in the CMB. Samples from the IMB have reported oscillating dissolved methane concentrations, from <EQL to a maximum reported concentration of 0.023 mg/L. There is no apparent correlation to site-based activities.

There are few statistically significant differences in groundwater chemistry between the CMB and the IMB. The analytes which show statistically significant differences in their concentrations, as discussed above, may be due to natural variability within the aquifer; however, there appears to be some correlation in the concentration trends which indicate subtle changes to the groundwater quality in the immediate vicinity of the wells potentially relating to the loss of drilling fluid while drilling through the highly permeable Gum Ridge Formation. Lost circulation is commonly noted on Statements of Bore for registered groundwater bores drilled in the vicinity of the Amungee NW well site. The changes in chemistry are likely to be localised. The concentrations, where potentially affected by lost fluid, can generally be seen to return to background concentrations. There has been no significant change to the water quality in the Gum Ridge Formation at the Amungee NW well site due to the regulated activities.

Tamboran will continue to monitor the groundwater at the Amungee NW well site in accordance with Ministerial conditions of ORI10-3 Beetaloo Multi-well EMP.

If you require any further information, please do not hesitate to email me.

Kind regards



Linda Pugh

**Senior Environmental Approvals Advisor**

**E:** [Redacted]

**M:** [Redacted]

## References

DENR (2018) Preliminary Guideline: Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-basin. Department of Environment and Natural Resources, November 2018.

DENR (2019) Code of Practice: Onshore Petroleum Activities in the Northern Territory. May 2019.  
[https://nt.gov.au/ media/docs/business-and-industry/energy/petroleum/petroleum-activities/petroleum-operations-forms-and-guidelines/2019-code-of-practice-onshore-petroleum-activity-nt.pdf](https://nt.gov.au/media/docs/business-and-industry/energy/petroleum/petroleum-activities/petroleum-operations-forms-and-guidelines/2019-code-of-practice-onshore-petroleum-activity-nt.pdf)

DEPWS (2022) Regional Report: Strategic Regional Environmental and Baseline Assessment for the Beetaloo Sub-basin. DEPWS Technical Report 41/2022. Department of Environment, Parks and Water Security, Northern Territory Government. Berrimah, Northern Territory.

Table 1 Amungee NW1 Gum Ridge Formation CMB (BET-MB019/RN040894) Statistical Summary

Analyte	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	pH_Units	0.01	20	6.55	7.10	6.70	6.58	6.70	6.85
Electrical Conductivity (Field)	µS/cm	1	18	1,131	1,536	1,409.0	1,222.0	1,454.0	1,501.6
pH (Lab)	pH_Units	0.01	19	7.04	7.83	7.30	7.09	7.29	7.63
Electrical Conductivity (Lab)	µS/cm	1	19	1,080	1,220	1,157.0	1,120.0	1,150.0	1,202.0
Total Dissolved Solids	mg/L	10	20	658	842.00	742.00	687.80	731.50	831.50
Suspended Solids	mg/L	5	20	2	11.00	3.80	4.00	6.00	10.50
Alkalinity (Bicarbonate as CaCO <sub>3</sub> )	mg/L	1	20	328	456.00	402.00	384.40	405.00	421.20
Alkalinity (Carbonate as CaCO <sub>3</sub> )	mg/L	1	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO <sub>3</sub> )	mg/L	1	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	1	20	328	456.00	402.00	384.40	405.00	421.20
Chloride	mg/L	1	20	73	112.00	98.00	82.60	99.50	106.20
Sulphate as SO <sub>4</sub>	mg/L	1	18	99	139.00	126.00	113.10	130.00	137.30
Sodium	mg/L	1	20	57	72	66.00	62.00	66.50	71.00
Potassium	mg/L	1	20	9	12	10.00	9.00	10.00	12.00
Calcium	mg/L	1	20	93	132	115.00	104.70	116.00	125.10
Magnesium	mg/L	1	20	39	50	46.00	43.00	47.00	49.10
Fluoride	mg/L	0.1	20	0.3	0.60	0.47	0.40	0.50	0.51
Nitrate (as N)	mg/L	0.01	20	0.010	0.160	0.024	0.010	0.020	0.036
Nitrite (as N)	mg/L	0.01	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	Bq/L	0.05	16	0.21	0.43	0.34	0.25	0.34	0.42
Gross beta activity (excluding activity of K-40)	Bq/L	0.1	16	0.10	0.28	0.15	0.11	0.17	0.22
Methane	mg/L	0.01	19	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Ethane	µg/L	10	19	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	mg/L	0.01	19	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	mg/L	0.001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Barium	mg/L	0.001	20	0.040	0.105	0.061	0.042	0.056	0.080
Boron	mg/L	0.05	20	0.11	0.24	0.15	0.13	0.15	0.18
Cadmium	mg/L	0.0001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	mg/L	0.001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	mg/L	0.001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Iron	mg/L	0.05	20	0.21	2.63	1.10	0.33	1.05	1.84
Lead	mg/L	0.001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Lithium	mg/L	0.001	19	0.041	0.060	0.051	0.044	0.051	0.058
Manganese	mg/L	0.001	20	0.031	0.15	0.08	0.04	0.07	0.11
Mercury	mg/L	0.0001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	mg/L	0.01	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Silicon as Si	mg/L	0.05	18	11.40	14.90	13.64	12.88	13.75	14.53
Silver	mg/L	0.001	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	mg/L	0.001	20	0.544	0.70	0.63	0.58	0.64	0.69
Zinc	mg/L	0.005	20	<LOR	0.045	0.014	0.009	0.010	0.029
TRH C <sub>6</sub> -C <sub>10</sub> fraction (sum)	µg/L	20	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C <sub>10</sub> -C <sub>40</sub> fraction (sum)	µg/L	100	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Sum of BTEX	µg/L	1	20	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	µg/L	0.5	19	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 2 Amungee NW Gum Ridge Formation IMB (BET-MB027/RN043018) Statistical Summary

Analyte	Output Unit	EQL	Count	Min	Max	Average	P10	P50	P90
pH (Field)	pH_Units	0.01	13	6.59	7.62	6.90	6.63	6.78	7.48
Electrical Conductivity (Field)	µS/cm	1	12	1,172	1,611	1,438.0	1,255.8	1,474.5	1,574.5
pH (Lab)	pH_Units	0.01	12	7.07	7.87	7.30	7.12	7.31	7.57
Electrical Conductivity (Lab)	µS/cm	1	12	1,140	1,260	1,199.0	1,162.0	1,190.0	1,256.0
Total Dissolved Solids	mg/L	10	13	672	834.00	743.00	682.80	725.00	818.80
Suspended Solids	mg/L	5	13	2	12.00	4.40	4.00	7.00	10.80
Alkalinity (Bicarbonate as CaCO <sub>3</sub> )	mg/L	1	13	377	411.00	397.00	380.60	398.00	407.40
Alkalinity (Carbonate as CaCO <sub>3</sub> )	mg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Hydroxide as CaCO <sub>3</sub> )	mg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	1	13	377	411.00	397.00	380.60	398.00	407.40
Chloride	mg/L	1	13	100	151.00	123.0	101.2	124.0	140.0
Sulphate as SO <sub>4</sub>	mg/L	1	11	79	127	110	90.0	111.0	126.0
Sodium	mg/L	1	13	62	75	69.0	62.6	69.0	73.6
Potassium	mg/L	1	13	14	43	27.0	15.6	26.0	40.8
Calcium	mg/L	1	13	97	129	115.0	106.4	113.0	127.6
Magnesium	mg/L	1	13	42	51	47.0	43.4	48.0	49.8
Fluoride	mg/L	0.1	13	0.3	0.50	0.46	0.40	0.50	0.50
Nitrate (as N)	mg/L	0.01	13	0.01	0.05	0.02	0.01	0.02	0.04
Nitrite (as N)	mg/L	0.01	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Gross alpha activity	Bq/L	0.05	11	0.16	0.64	0.35	0.18	0.35	0.39
Gross beta activity (excluding activity of K-40)	Bq/L	0.1	11	<LOR	0.29	0.16	0.14	0.19	0.26
Methane	mg/L	0.01	12	<LOR	0.023	0.011	0.012	0.012	0.022
Ethane	µg/L	10	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Propane	mg/L	0.01	12	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Arsenic	mg/L	0.001	13	0.001	0.00	0.00	0.00	0.00	0.00
Barium	mg/L	0.001	13	0.049	0.20	0.09	0.06	0.08	0.14
Boron	mg/L	0.05	13	0.1	0.22	0.14	0.10	0.14	0.18
Cadmium	mg/L	0.0001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Chromium (III+VI)	mg/L	0.001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Copper	mg/L	0.0005 - 0.001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Iron	mg/L	0.05	13	<0.05	13.40	2.80	0.81	2.42	3.97
Lead	mg/L	0.001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Lithium	mg/L	0.001	12	0.039	0.06	0.05	0.04	0.05	0.06
Manganese	mg/L	0.001	13	0.024	0.69	0.18	0.08	0.14	0.29
Mercury	mg/L	0.0001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Selenium	mg/L	0.01	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Silicon as Si	mg/L	0.05	11	7.53	14.10	12.61	11.00	13.30	14.00
Silver	mg/L	0.001	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Strontium	mg/L	0.001	13	0.573	0.687	0.64	0.58	0.65	0.68
Zinc	mg/L	0.005	13	0.007	0.03	0.017	0.01	0.02	0.02
TRH C <sub>6</sub> -C <sub>10</sub> fraction (sum)	µg/L	20	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
TRH C <sub>10</sub> -C <sub>40</sub> fraction (sum)	µg/L	100	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Sum of BTEX	µg/L	1	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR
Total Reportable PAH	µg/L	0.5	13	<LOR	<LOR	<LOR	<LOR	<LOR	<LOR

Table 3 Amungee NW1 Statistical Assessment

Analyte	Output unit	EQL	Sample size		Average Concentration		Statistics	
			Gum Ridge Formation CMB (BET-MB019)	Gum Ridge Formation IMB (BET-MB027)	Gum Ridge Formation CMB (BET-MB019)	Gum Ridge Formation IMB (BET-MB027)	F-Test Statistic	T-Test - P-value
pH (Field)	pH units	0.1	18	12	1409.00	1438.00	7.58	0.059
Electrical Conductivity (Field)	µS/cm	1	18	12	1,409.00	1,438.00	1.51	0.285
pH (Lab)	pH units	0.01	19	12	7.30	7.30	1.08	0.497
Electrical Conductivity (Lab)	µS/cm	1	19	12	1,157.00	1,199.00	1.07	0.001
Total Dissolved Solids	mg/L	10	20	13	742.00	743.00	1.35	0.482
Suspended Solids	mg/L	5	20	13	3.80	4.40	1.26	0.396
Alkalinity (Bicarbonate as CaCO <sub>3</sub> )	mg/L	1	20	13	402.00	397.00	6.98	0.247
Alkalinity (Carbonate as CaCO <sub>3</sub> )	mg/L	1	20	13	<LOR	<LOR	-	-
Alkalinity (Hydroxide as CaCO <sub>3</sub> )	mg/L	1	20	13	<LOR	<LOR	-	-
Alkalinity (Total as CaCO <sub>3</sub> )	mg/L	1	20	13	402.00	397.00	6.98	0.247
Chloride	mg/L	1	20	13	98.00	123.00	2.16	0.000002
Sulphate as SO <sub>4</sub>	mg/L	1	18	11	126.00	110.00	1.73	0.0007
Sodium	mg/L	1	20	13	66.00	69.00	1.18	0.046
Potassium	mg/L	1	20	13	10.00	27.00	74.16	0.00001
Calcium	mg/L	1	20	13	115.00	115.00	1.13	0.486
Magnesium	mg/L	1	20	13	46.00	47.00	1.12	0.309
Fluoride	mg/L	0.1	20	13	0.47	0.46	1.27	0.369
Nitrate (as N)	mg/L	0.01	20	13	0.02	0.02	5.97	0.336
Nitrite (as N)	mg/L	0.01	20	13	<LOR	<LOR	-	-
Gross alpha activity	Bq/L	0.05	16	11	0.34	0.35	3.31	0.4308
Gross beta activity (excluding activity of K-40)	Bq/L	0.1	16	11	0.15	0.16	1.50	0.105
Methane	mg/L	0.01	19	12	<LOR	0.011	-	-
Ethane	µg/L	10	19	12	<LOR	<LOR	-	-
Propane	mg/L	0.01	19	12	<LOR	<LOR	-	-
Arsenic	mg/L	0.001	20	13	<LOR	0.0009	-	-
Barium	mg/L	0.001	20	13	0.06	0.09	4.54	0.014
Boron	mg/L	0.05	20	13	0.15	0.14	1.22	0.109
Cadmium	mg/L	0.0001	20	13	<LOR	<LOR	-	-
Chromium (III+VI)	mg/L	0.001	20	13	<LOR	<LOR	-	-
Copper	mg/L	0.001	20	13	<LOR	<LOR	-	-
Iron	mg/L	0.05	20	13	1.10	2.80	24.89	0.034
Lead	mg/L	0.001	20	13	<LOR	<LOR	-	-
Lithium	mg/L	0.001	19	12	0.05	0.05	1.12	0.192
Manganese	mg/L	0.001	20	13	0.08	0.18	28.26	0.027
Mercury	mg/L	0.0001	20	13	<LOR	<LOR	-	-
Selenium	mg/L	0.01	20	13	<LOR	<LOR	-	-
Silicon as Si	mg/L	0.05	18	11	13.64	12.61	4.66	0.055
Silver	mg/L	0.001	20	13	<LOR	<LOR	-	-
Strontium	mg/L	0.001	20	13	0.63	0.64	1.34	0.336
Zinc	mg/L	0.005	20	13	<LOR	0.017	2.40	0.26
TRH C <sub>6</sub> - C <sub>10</sub> fraction (Sum)	µg/L	20	20	13	<LOR	<LOR	-	-
TRH C <sub>10</sub> - C <sub>40</sub> fraction (Sum)	µg/L	100	19	13	<LOR	<LOR	-	-
Sum of BTEX	µg/L	1	20	13	<LOR	<LOR	-	-
Total Reportable PAH	µg/L	0.5	19	13	<LOR	<LOR	-	-

Attachment A - Timeseries chemistry charts

