

Groundwater Interpretative Report

Imperial Oil and Gas Pty Ltd

Environmental Management Plan

Imperial O&G 2021 Carpentaria 1 Work Program
EP187 (IMP3-4)

(15 February 2021 to 14 February 2022)

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Acronyms / Terms	Definition
Code	Code of Practice: Onshore Petroleum Activities in the Northern Territory
CBM	Control Monitoring Bore
DENR	Department of Environment and Natural Resources
DEPWS	Department of Environment, Parks and Water Security (NT)
EC	Electrical Conductivity
EMP	Environment Management Plan
EP	Exploration Permit
Guideline	Preliminary Guideline: Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-Basin
IMB	Impact Monitoring Bore
LOR	Limit of Reporting
TDS	Total Dissolved Solids

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1 Introduction

The Imperial O&G 2021 Environmental Management Plan (EMP) Carpentaria-1 Work Program EP187 (IMP3-4) was approved on the 15 February 2021.

Ministerial Condition 10 of the EMP Approval Notice, requires Imperial Oil & Gas (Imperial) to provide an interpretative report of groundwater quality based on the groundwater monitoring required to be conducted at the well site.

Ministerial Condition 10 of the EMP is as follows:

"...in support of clause B.4.17.2 of the code, the interest holder must provide to DEPWS, via Onshoregas.DEPWS@nt.gov.au, groundwater monitoring data and 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. Groundwater data must be provided within one month of collection and be provided quarterly, in a format to be determined by DEPWS.

The interpretative report must be provided annually within 3 months of the anniversary of the approval date of the EMP and include:

- I. demonstration that there is no change to groundwater quality or level attributable to conduct of the regulated activity at the well sites(s);*
- II. interpretation of any statistical outliers observed from baseline measured values for each of the analytes;*
- III. discussion of any trends observed; and*
- IV. a summary of the results inclusive of descriptive statistics"*

The following report demonstrates that the activities at Carpentaria-1 have not had any impact on groundwater quality.

2 Background

The regulated activities under this EMP included the hydraulic fracturing and extended production testing of the existing Carpentaria-1 vertical exploration well on EP187.

For this well site two water monitoring bores were installed as per the Department of Environment and Natural Resources (DENR) Preliminary Guideline: Groundwater Monitoring Bores for Exploration Petroleum Wells in the Beetaloo Sub-Basin (Guideline).

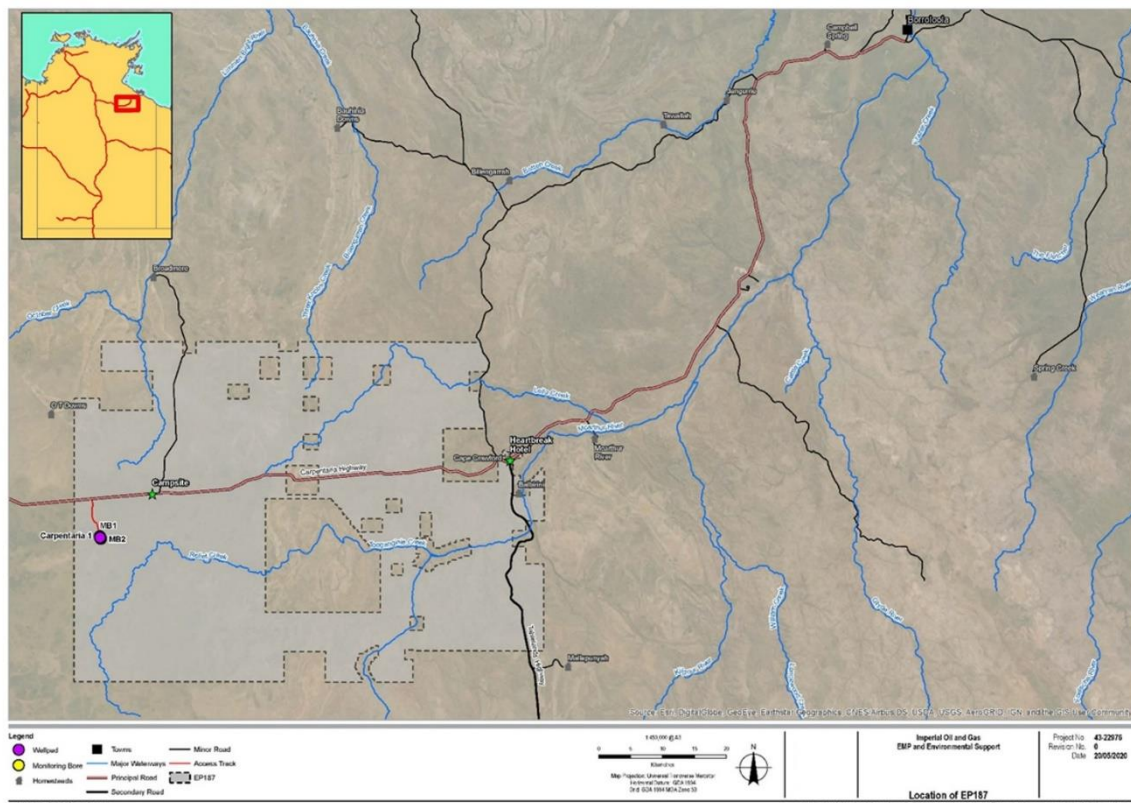


Figure 1: Location of the Carpentaria-1 wellsite in relation to EP187

3 Water Monitoring Bores

As per the Guideline a Control Monitoring Bore (CMB) is located approximately 100 metres up-gradient from the petroleum well, and an Impact Monitoring Bore (IMB) is located approximately 20 metres down-gradient from the well.

Details of the monitoring bores are presented in Table 1 below.

Table 1. Monitoring Bores Information

Well site	Carpentaria 1	
Aquifer	Gum Ridge	
Bore Number	RN041800	RN041678
Category	IMB	CMB
Total Depth (m)	96	96
Length of slotted liner (m)	24	22
ID of casing (mm)	158	158
Total Vol. of bore (L)	1882	1882
Production rate (L/s)	4	10
Time to produce one full volume (min)	7.8	3.1

4 Water Monitoring

Between February 2021 and April 2022, water samples were taken and analysed in accordance with the suite of analytes presented in Table 6: Minimum suite of analytes for groundwater monitoring from the Code of Practice: Onshore Petroleum Activities in the Northern Territory (Code):

- 16 samples were taken from both bores to provide site-specific baseline groundwater data between the dates of:
 - 18/04/2021 - 25/05/2022
- 7 samples were taken from the bores between the dates:
 - 16/06/21 – 06/04/2022

Hydraulic Fracturing was initiated on 04/06/2021 date and completed on 08/06/2021 date. During Hydraulic fracturing groundwater level and pressure monitoring was undertaken within the IMB. Data points were recorded every 4 minutes and are presented within this report.

Water quality monitoring data is presented in **Error! Reference source not found..**

5 Results

As per the Guideline (Section 7) the analytes that could highlight a change in groundwater quality from hydraulic fracturing include: Total Dissolved Solids (TDS), Chloride, and Electrical Conductivity (EC). Fluids utilized in the activity, and the produced formation fluids, typically have Chloride concentrations several orders of magnitude higher than background values found in shallow aquifer waters. Strontium, Barium, and Methane are also of interest as they are typically elevated in produced water from unconventional shale gas reservoirs. As such, the report will focus on these key indicators to determine if any impact has occurred due to the hydraulic stimulation.

To assess impact, statistical analysis was used to identify any change in values between the pre-activity monitoring and the post activity monitoring. The pre-activity monitoring has been taken to be the baseline expected properties of the aquifer. The statistical properties calculated to establish the baseline ranges were:

- Minimum
- Maximum
- Mean
- 20th Percentile
- 80th Percentile

The above statistical properties allow for identification of post activity trends and outliers.

5.1 Summary of Results

5.1.1 RN041678 – Control Monitoring Bore

Table 2: RN041678 Baseline Statistical Data

	Minimum	Maximum	Average	20th %ile	80th %ile	LOR[^]
TDS (mg/L)	646	846	727	672	786	10
Chloride* (mg/L)	74	102	86	79	93	1
EC (µS/cm)	1160	1210	1186	1174	1200	1
Strontium* (mg/L)	0.507	0.574	0.536	0.517	0.547	0.001
Barium* (mg/L)	0.119	0.160	0.139	0.128	0.149	0.001
Methane* (µg/L)	10	37	23	10	10	10

*Total measured concentrations, includes dissolved and undissolved.

[^]LOR = Limits of Reporting

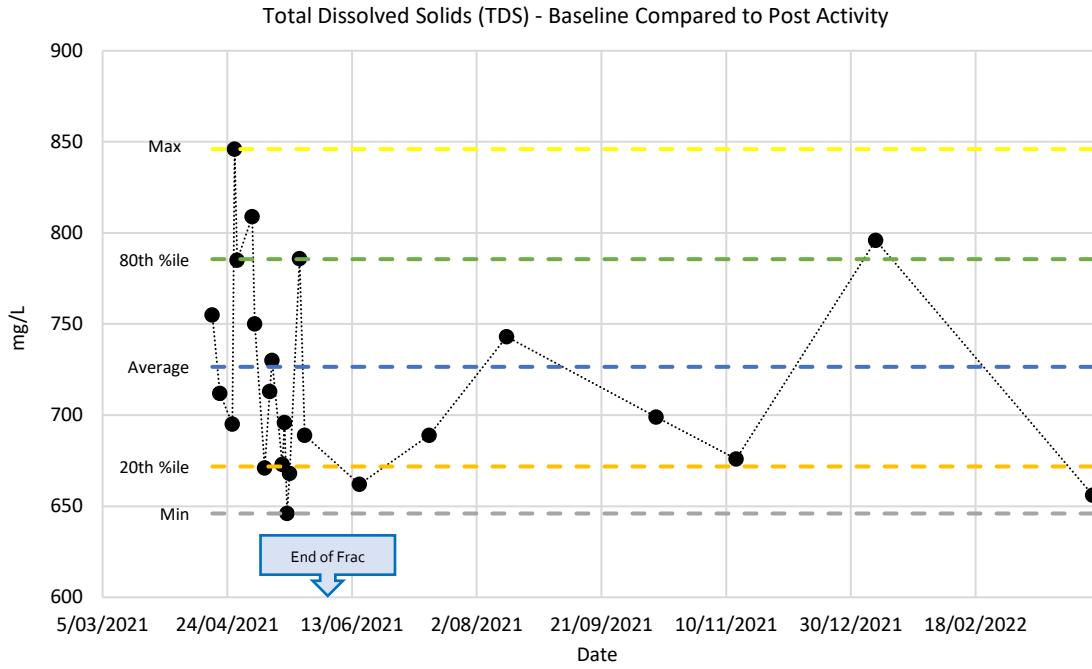


Figure 2: RNo41678 Total dissolved solids baseline data compared to post activity

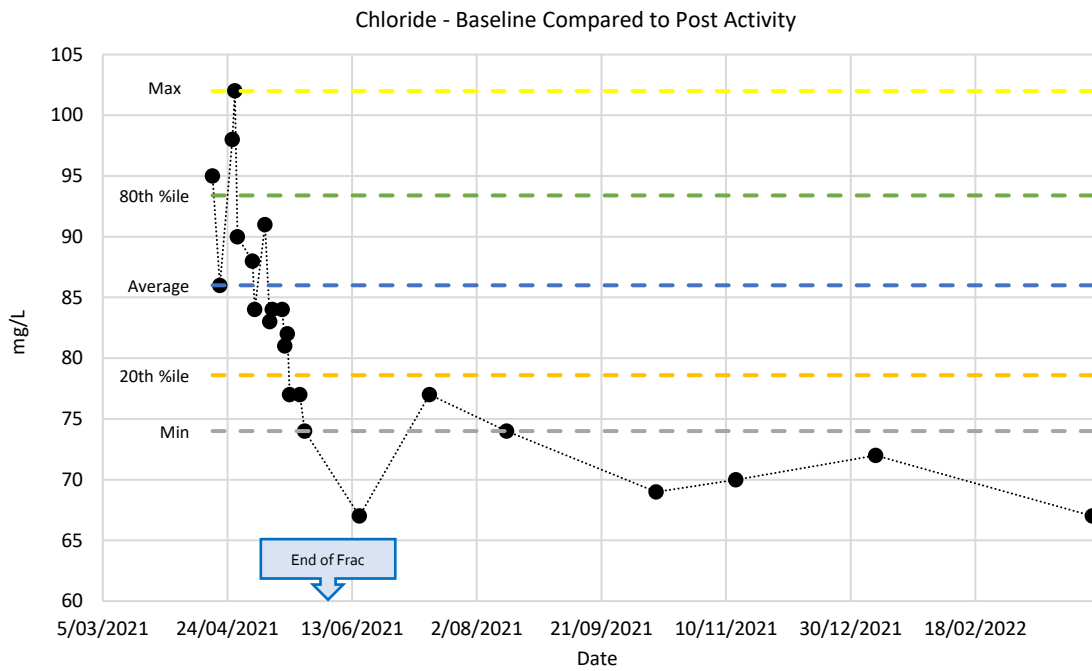


Figure 3: RNo41678 Chlorides baseline data compared to post activity

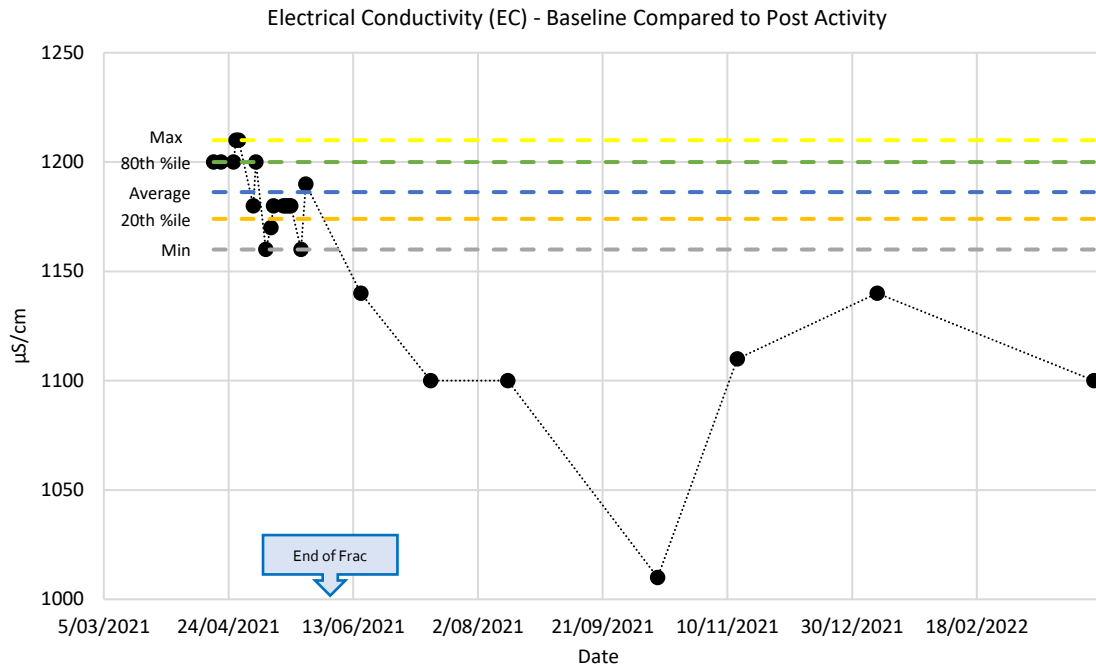


Figure 4: RNo41678 Electrical conductivity baseline data compared to post activity

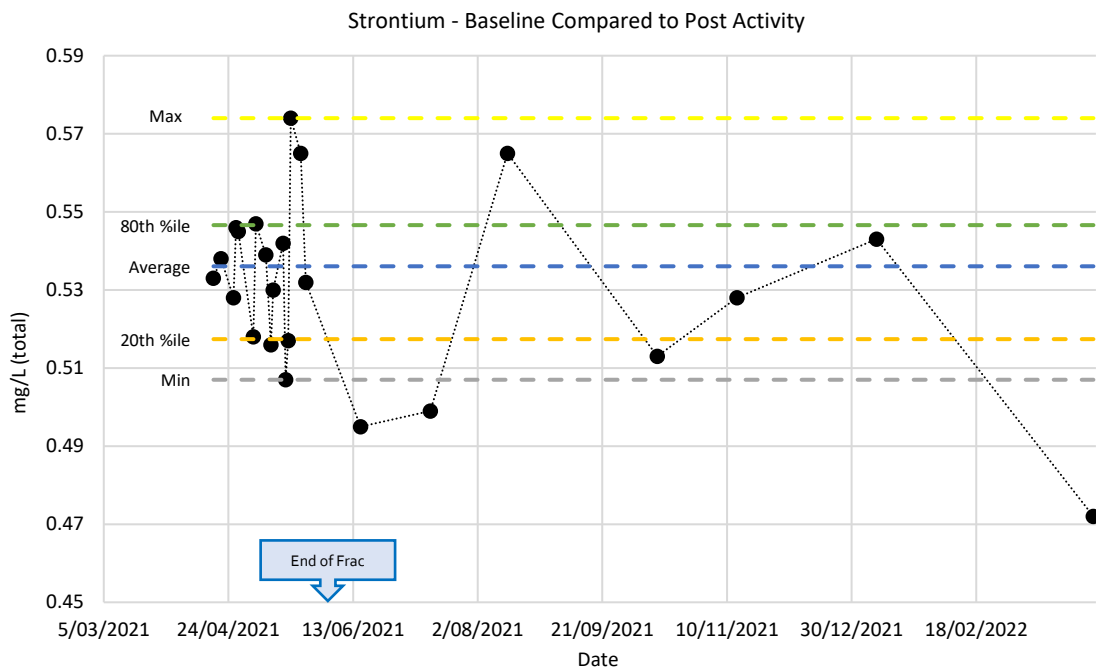


Figure 5: RNo41678 Strontium baseline data compared to post activity

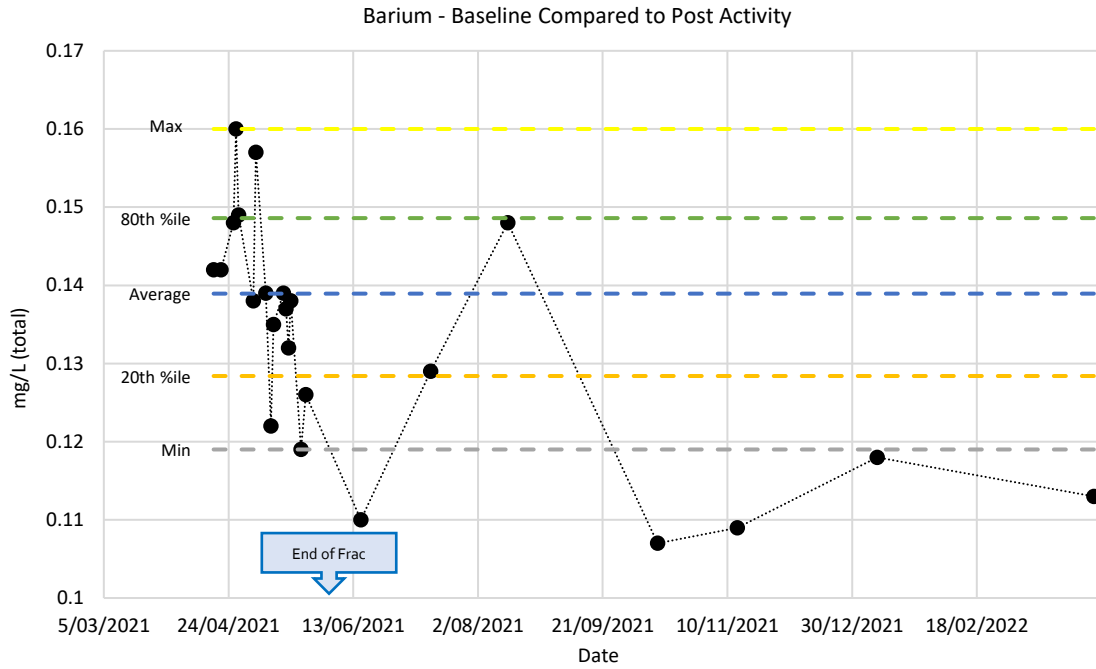


Figure 6: RNo41678 Barium baseline data compared to post activity

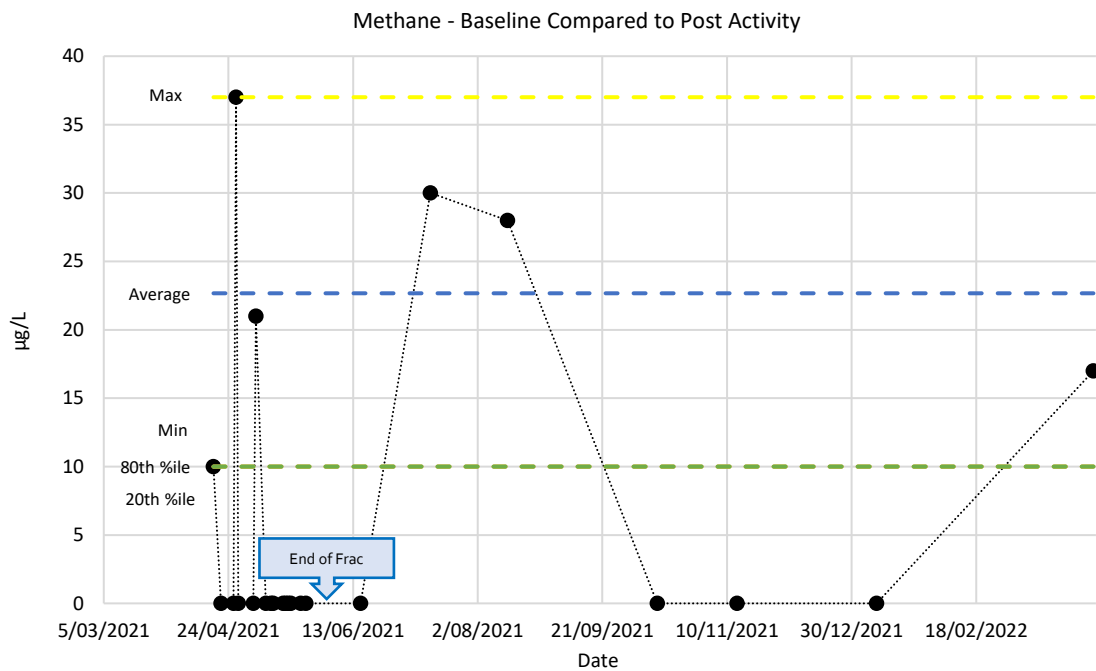


Figure 7: RNo41678 Methane baseline data compared to post activity

5.1.2 RN041800 – Impact Monitoring Bore

Table 3: RN041800 Baseline Statistical Data

	Minimum	Maximum	Average	20th %ile	80th %ile	LOR [^]
TDS (mg/L)	645	844	740	685	789	10
Chloride* (mg/L)	80	105	89	82	96	1
EC (µS/cm)	1170	1340	1209	1184	1220	1
Strontium* (mg/L)	0.487	0.609	0.544	0.520	0.563	0.001
Barium* (mg/L)	0.123	0.162	0.148	0.139	0.159	0.001
Methane* (µg/L)	10	38	21	10	27	10

*Total measured concentrations, includes dissolved and undissolved.

[^]LOR = Limits of Reporting

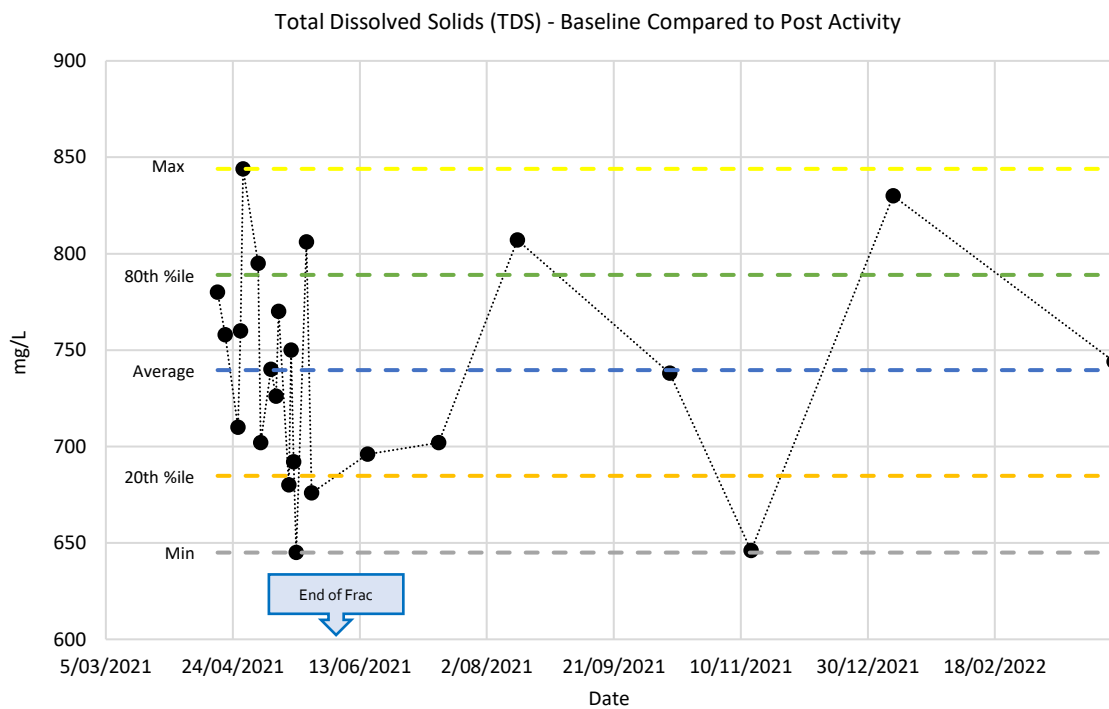


Figure 8: RN041800 Total dissolved solids baseline data compared to post activity

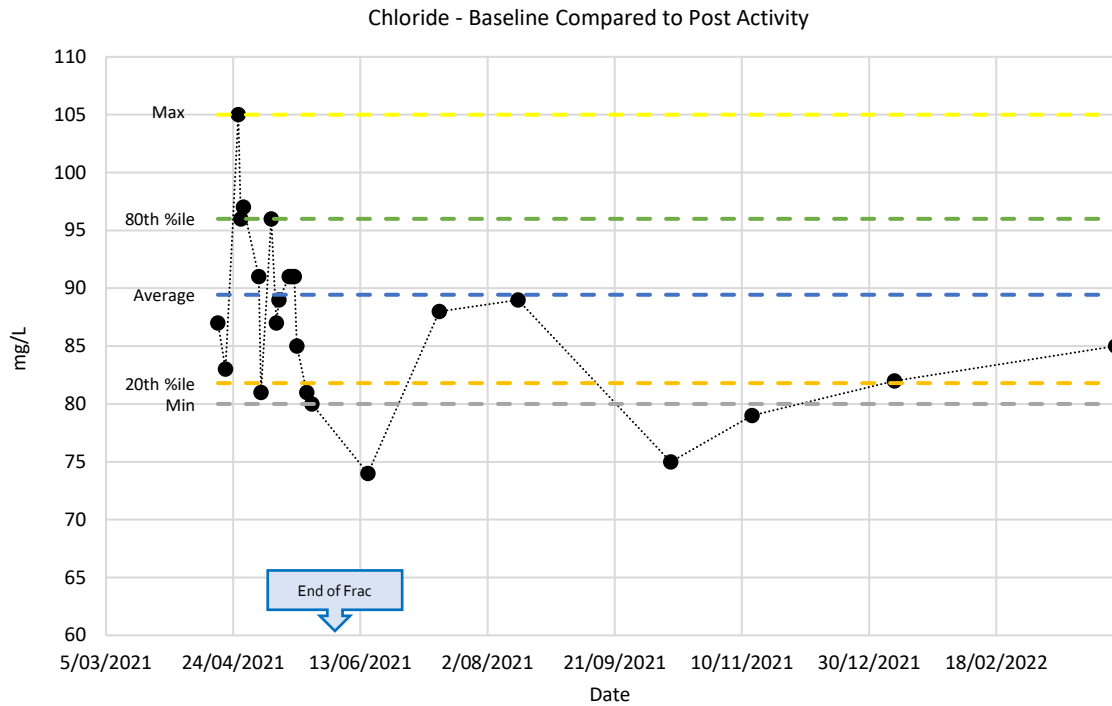


Figure 9: RNo41800 Chlorides baseline data compared to post activity

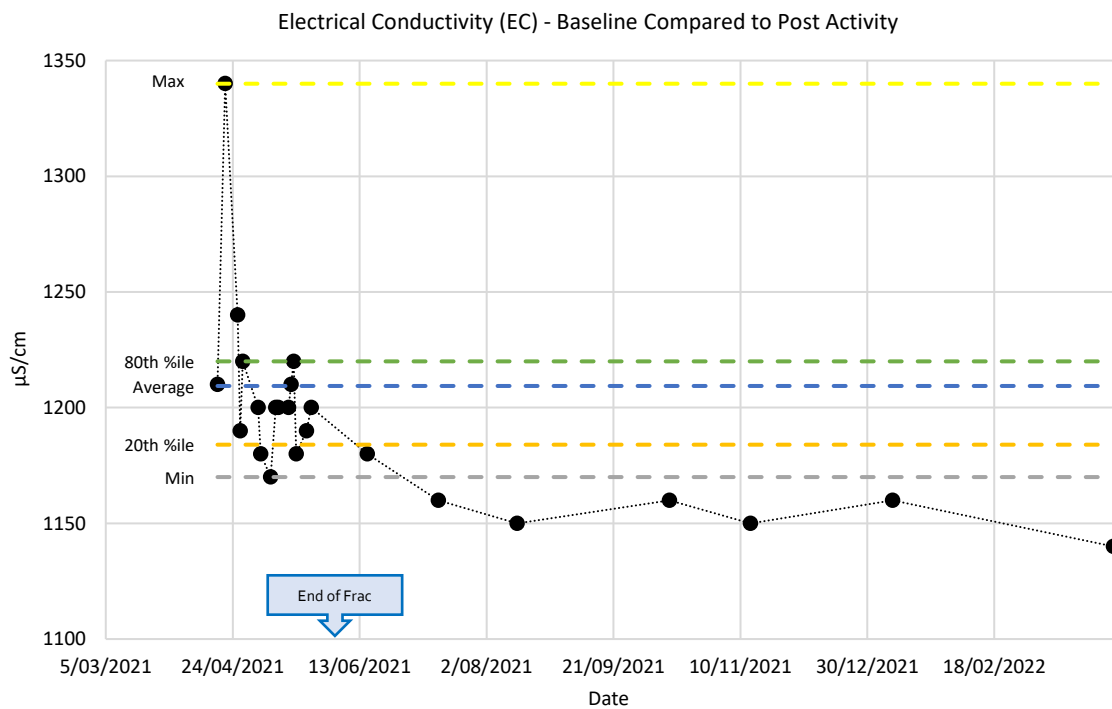


Figure 10: RNo41800 Electrical conductivity baseline data compared to post activity

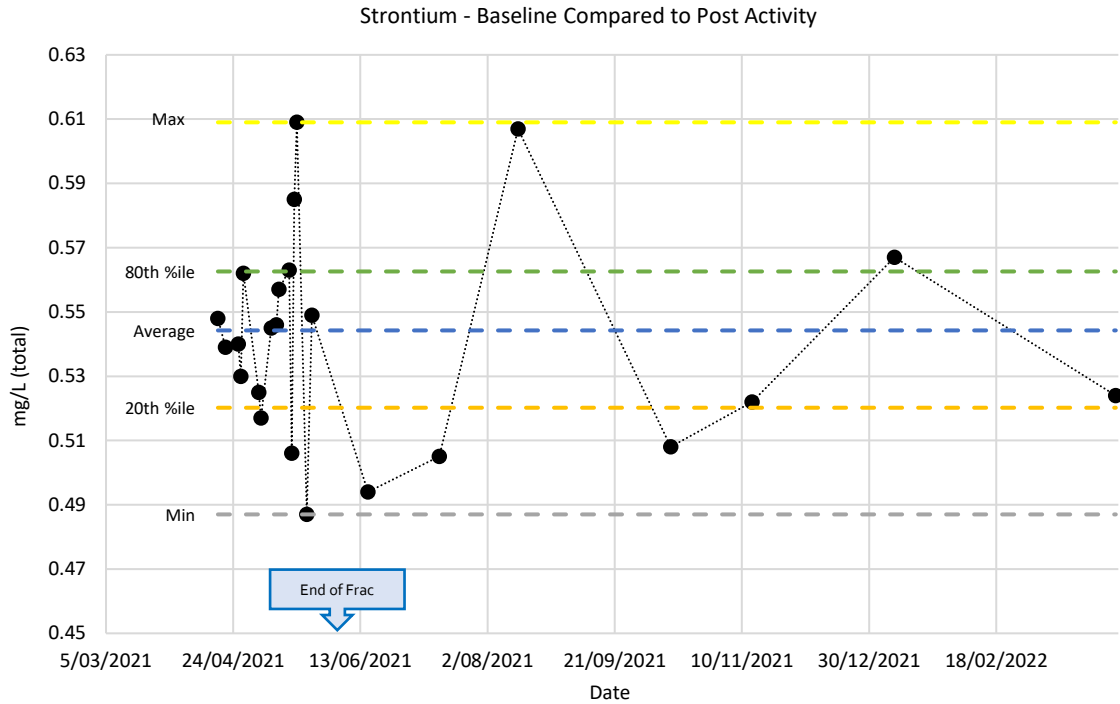


Figure 11: RNo41800 Strontium baseline data compared to post activity

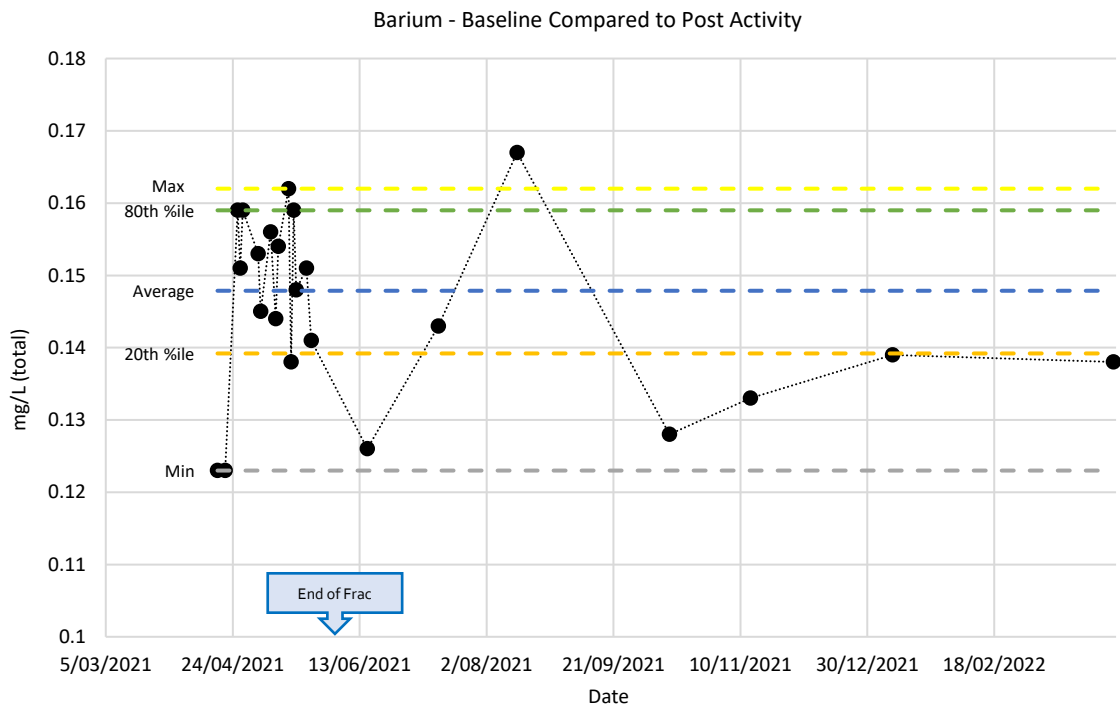


Figure 12: RNo41800 Barium baseline data compared to post activity

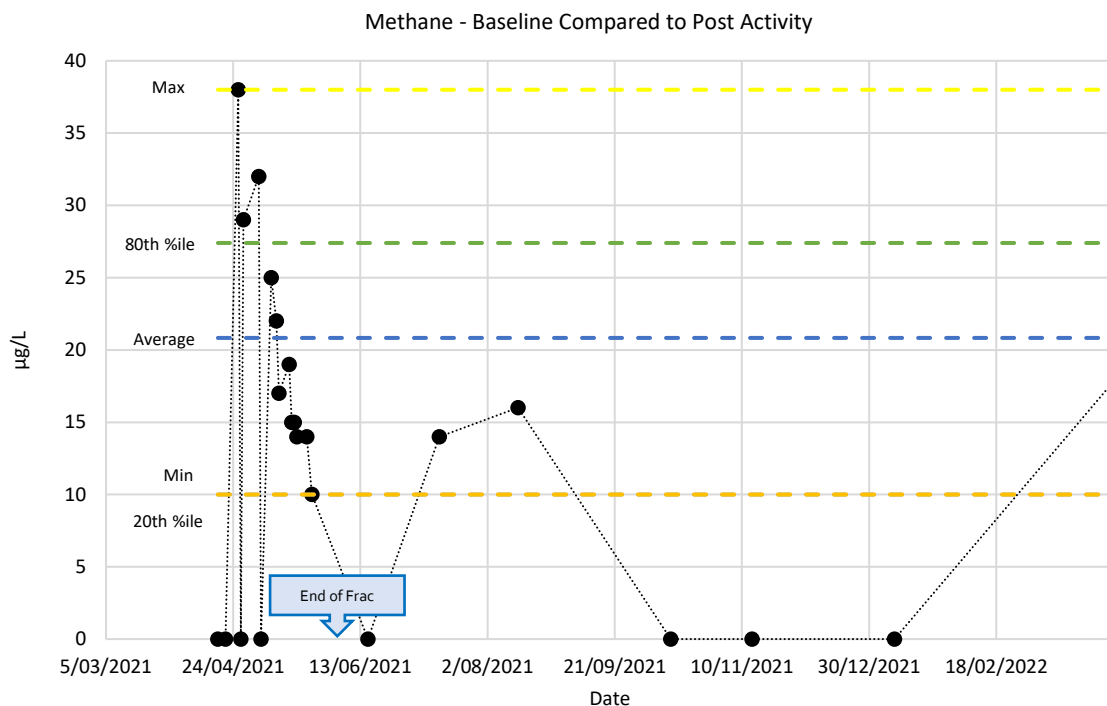


Figure 13: RNo41800 Methane baseline data compared to post activity

5.2 Trends

5.2.1 Total Dissolved Solids

The baseline period appears to have a downwards trend. However, this trend is not seen to continue during the post activity period. TDS measurements remained within the expected range of values post activity.

5.2.2 Chloride

During the baseline monitoring period the data exhibits a downward trend. During the post activity monitoring period the trend does not continue, and the data trend flattens. Post activity the data is below the expected value range.

5.2.3 Electrical Conductivity

During the baseline monitoring period the data exhibits a downward trend. During the post activity monitoring period the trend does not continue, and the data trend flattens. Post activity the data is below the expected value range. A statistical outlier was observed in the CMB on the 13th of October 2021 where the value was 150 µS/cm lower than the baseline minimum measured.

5.2.4 Strontium

The data trend is relatively flat during the baseline period. The data exhibits increase deviation from the average towards the end on the baseline period. Post activity the data trend is flat, and the values remain within the expected value ranges.

5.2.5 Barium

During the baseline monitoring period the data exhibits a downward trend. During the post activity monitoring period the trend does not continue, and the data trend flattens. Post activity the majority of the data is below the expected value range.

5.2.6 Methane

During the baseline monitoring period the data exhibits a downward trend. During the post activity monitoring period the trend does not continue, and the data trend flattens. Post activity the data is below the expected value range.

5.3 Groundwater Quality Discussion

The groundwater data collected indicates that there has been no impact to ground water quality as a result of the regulated activity. The quality of each indicator is discussed below.

5.3.1 Total Dissolved Solids

Groundwater impacted by fracture stimulation could exhibit an elevation of TDS above baseline measurements due to the salt concentrations used during stimulation. In this case TDS has not increased outside of the baseline statistical range and exhibits a relatively flat trend line post activity.

The trend of data along with the individual values measured in each bore track very closely. Both the IMB and CMB displayed the downward trend in the baseline period followed by a flattened trend post activity. The movement of values between sampling dates is synchronized between the IMB and CMB. For example, the sample taken on the 14th of July 2021 IMB and CMB returned values of 702 and 689 mg/L respectively and the following samples taken 14th of August 2021 showed increased values in both bores of 743 mg/L for the IMB and 807 mg/L for the CMB. The matched movement demonstrates that there was no alteration to the impact monitoring bore due to the activities.

5.3.2 Chloride

Groundwater impacted by fracture stimulation could exhibit an elevation of Chloride above baseline measurements due to the salt concentrations used during stimulation. In this case Chloride has not increased outside of the baseline statistical range. Post activity the values remained below the expected range based on the baseline data.

The trend of data along with the individual values measured in each bore track very closely. Both the IMB and CMB displayed the downward trend in the baseline period followed by a flattened trend post activity. The movement of values between sampling dates is synchronized between the IMB and CMB. For example, the sample taken on the 14th of July 2021 IMB and CMB returned values of 74 and 67 mg/L respectively and the following samples taken 14th of August 2021 showed increased values in both bores of 88 mg/L for the IMB and 77 mg/L for the CMB. The matched movement demonstrates that there was no alteration to the impact monitoring bore due to the activities.

5.3.3 Electrical Conductivity

Groundwater impacted by fracture stimulation could exhibit an elevation of EC above baseline measurements due to the salt concentrations used during stimulation. In this case EC has not increased outside of the baseline statistical range. Post activity the values remained below the expected range based on the baseline data.

The trend of data along with the individual values measured in each bore track very closely. Both the IMB and CMB displayed the downward trend in the baseline period followed by a flattened trend post activity. However, the movement of values between sampling does not align closely as per TDS and Chloride.

5.3.4 Strontium

Groundwater impacted by fracture stimulation could exhibit an elevation of Strontium above baseline measurements due to the concentrations found in produced shale reservoir fluids. In this case Strontium has not increased outside of the baseline statistical range and exhibits a relatively flat trend line post activity.

The trend of data along with the individual values measured in each bore track very closely. Both the IMB and CMB displayed the downward trend in the baseline period followed by a flattened trend post activity. The movement of values between sampling dates is synchronized between the IMB and CMB. For example, the sample taken on the 14th of July 2021 IMB and CMB returned values of 0.505 and 0.499 mg/L respectively and the following samples taken 14th of August 2021 showed increased values in both bores of 0.607 mg/L for the IMB and 0.565 mg/L for the CMB. The matched movement demonstrates that there was no alteration to the impact monitoring bore due to the activities.

5.3.5 Barium

Groundwater impacted by fracture stimulation could exhibit an elevation of Barium above baseline measurements due to the concentrations found in produced shale reservoir fluids. In this case Barium has not increased outside of the baseline statistical range. Post activity the values remained primarily below the expected range based on the baseline data.

The trend of data along with the individual values measured in each bore track very closely. Both the IMB and CMB displayed the downward trend in the baseline period followed by a flattened trend post activity. The movement of values between sampling dates is synchronized between the IMB and CMB. For example, the sample taken on the 16th of June 2021 IMB and CMB returned values of 0.126 and 0.110 mg/L respectively and the following samples taken 14th of July 2021 showed increased values in both bores of 0.143 mg/L for the IMB and 0.129 mg/L for the CMB. The matched movement demonstrates that there was no alteration to the impact monitoring bore due to the activities.

5.3.6 Methane

Groundwater impacted by fracture stimulation could exhibit an elevation of Methane above baseline measurements due to the concentrations found in produced shale reservoir fluids. In this case Methane has not increased outside of the baseline statistical range. Post activity the values remained primarily within the low range of the statistical spread of the baseline data.

The trend of data along with the individual values measured in each bore track very closely. Both the IMB and CMB displayed the downward trend in the baseline period followed by a flattened trend post activity. The movement of values between sampling dates is synchronized between the IMB and CMB. For example, the sample taken on the 16th of June 2021 IMB and CMB returned values of 0.126 and 0.110 mg/L respectively and the following samples taken 14th of July 2021 showed increased values in both bores of 0.143 mg/L for the IMB and 0.129 mg/L for the CMB. The matched movement demonstrates that there was no alteration to the impact monitoring bore due to the activities.

5.4 Outliers

Identification of outliers can be used to determine possible impact to groundwater quality. Where the activity has impacted the groundwater, it is expected that the concentrations of the key indicators would increase above the expected value range. None of the indicators monitored displayed an increase in values above baseline.

5.4.1 Total Dissolved Solids

No outliers were observed.

5.4.2 Chloride

Outliers were observed in both the IMB and CMB. Post activity, the IMB displayed three outliers below the baseline range while the CMB exhibited five below range. This demonstrates a drop in Chloride concentration after the frac activity. At this stage it is not known what caused the drop in concentration, however similar decreases were observed in potassium, sodium, magnesium, and calcium. This suggests that the change is likely due to seasonal variation since the primary ions present in drilling fluids are potassium and chloride.

5.4.3 Electrical Conductivity

Outliers were observed in both the IMB and CMB. Post activity, the IMB displayed six outliers below the baseline range while the CMB exhibited seven below range. This demonstrates a drop in EC after the frac activity. This is due to a drop in concentration of chloride, sodium, potassium, calcium and magnesium. At this stage it is not known what caused the drop in those ions, however the data suggests that the change is likely due to seasonal variation since the primary cation present in drilling fluids is potassium.

5.4.4 Strontium

No outliers were observed in samples taken from the IMB. Three outliers were observed in the data collected from the CMB with the outliers occurring below the baseline range. However, the trend of the samples over time was congruent across both bores. Contamination from a shale reservoir could lead to increased Strontium values, not a decrease. This suggests that the outliers in the CMB are likely due to formation heterogeneity.

5.4.5 Barium

No outliers were observed in samples taken from the IMB. Five outliers were observed in the data collected from the CMB with the outliers occurring below the baseline range. However, the trend of the samples over time was congruent across both bores. Contamination from a shale reservoir could lead to increased Barium values, not a decrease. This suggests that the outliers in the CMB are likely due to formation heterogeneity.

5.4.6 Methane

No outliers were observed in the data.

5.5 Groundwater Level and Pressure Monitoring

During Hydraulic fracturing groundwater level and pressure monitoring was undertaken within the IMB. Data points were recorded every 4 minutes and are graphed below for ease of viewing. The data for these has been provided as Appendix B.

Figure 14 graph includes every 4-minute data point record. This includes the time intervals when the logger was removed from the hole so that the data could be reviewed and downloaded. The orange line is the standing groundwater level in metres below ground level. The grey line is the temperature of the logger, and the blue horizontal lines are the dates when frac stages were pumped into Carpentaria-1.

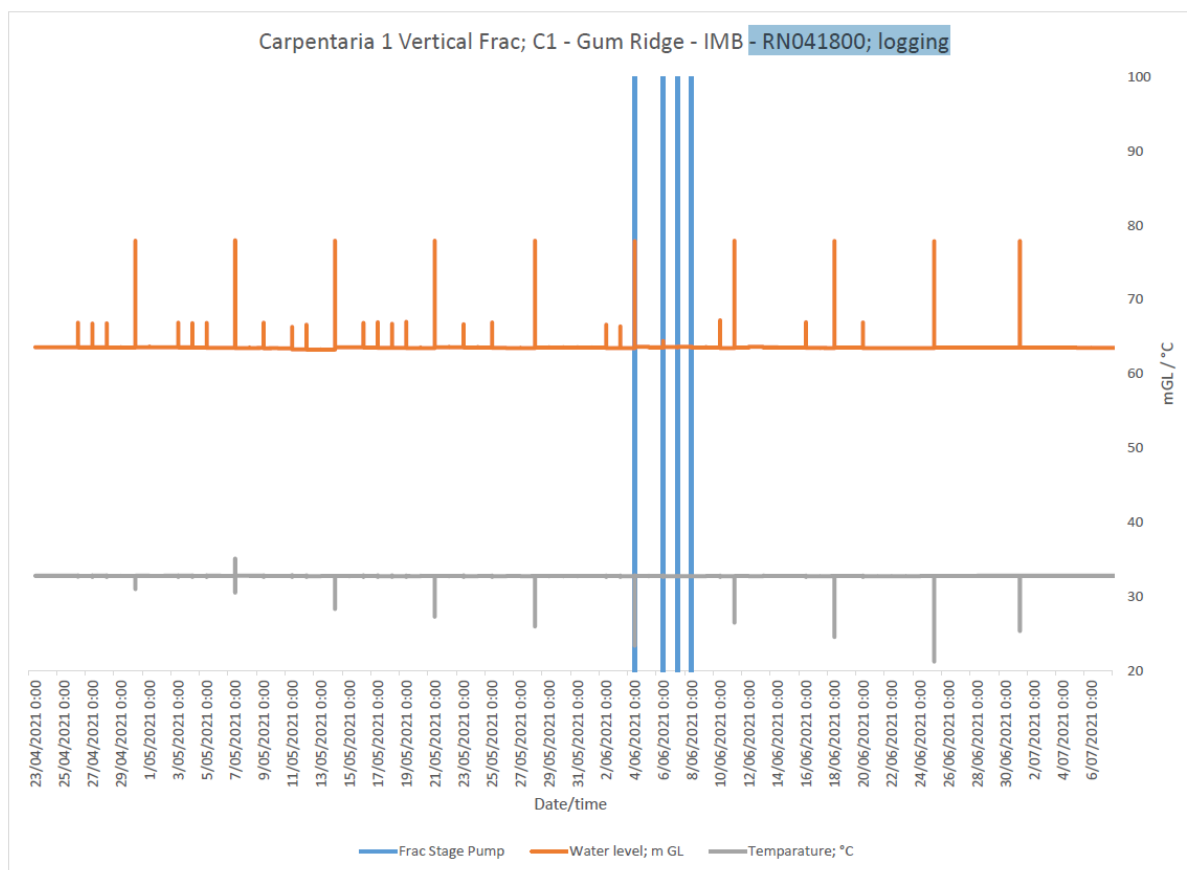


Figure 14: IMB GW and pressure monitoring all points

The graph in Figure 15 uses the same data from Figure 14 except removes the data points where the logger was removed from the hole for data collection and cleaning. In Figure 15, the same orange, grey and blue indicators have been used. The filtering out of these individual data points from the graph shows the stability in the groundwater level and temperature over time.

There are other anomalies found in the graphs which are present prior to and post stimulation activities. It was found that these are periods when the logging tool became fouled by sedimentation on the sensor giving it an abnormal reading or had a build-up of material that required cleaning. The fouling resulted in a variance from the trending readings.

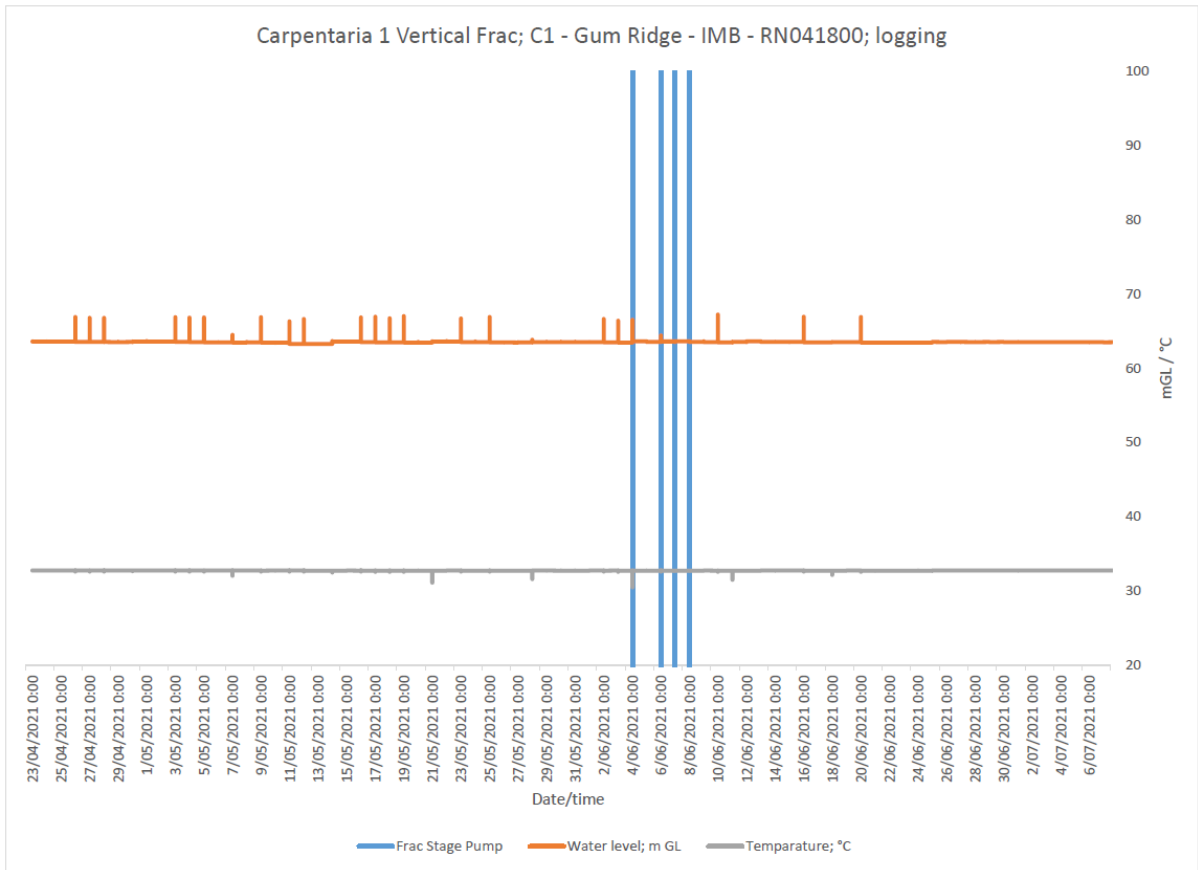


Figure 15: IMB GW and pressure monitoring excluding logger removal dates

The clean data presented demonstrates that there is minor variation in the groundwater level prior, during and post the hydraulic fracturing operations. Where there are gradual trends up or down these have been attributed to seasonal variations.

6 Appendix A

6.1 RN041800 - Groundwater Sampling Chemical Data

RN041800

CARPENTARIA 1

Category	CHEMICAL NAME	RESULT UNIT	Baseline Statistical Data							Baseline Data Recorded																		
			No. results	Min	Average	Max	20th %ile	80th %ile	LOR	18/04/2021	21/04/2021	26/04/2021	27/04/2021	28/04/2021	04/05/2021	05/05/2021	09/05/2021	11/05/2021	12/05/2021	16/05/2021	17/05/2021	18/05/2021	19/05/2021	23/05/2021	25/05/2021			
General anions, cations and metal	pH - Lab	pH Unit	16	7.03	7.31	7.68	7.16	7.46	0.01	7.28	7.03	7.39	7.41	7.13	7.22	7.68	7.5	7.21	7.25	7.24	7.35	7.41	7.03	7.23	7.55			
	Electrical Conductivity @ 25°C	µS/cm	16	1170	1209	1340	1184	1220	10	1210	1340	1240	1190	1220	1200	1180	1170	1200	1200	1200	1200	1210	1180	1190	1200			
	Total Dissolved Solids @ 180°C	mg/L	16	645	737	844	685	789	10	780	758	710	760	844	795	702	740	726	770	680	750	692	645	806	676			
	Suspended Solids (SS)	mg/L	16	2	7	19	3	14	1	19	18	8	2	<5	-----	<1	8	6	3	<1	<1	6	3	5	6			
	Gross beta	Bq/L	16	0.2	0.7	1.0	0.7	0.9	0.1	0.88	0.98	0.87	0.72	0.83	0.68	0.66	0.2	0.76	0.67	0.69	0.67	0.83	0.78	0.77	0.69			
	Hydroxide Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1			
	Carbonate Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1			
	Bicarbonate Alkalinity as CaCO3	mg/L	16	430	472	510	459	479	1	432	478	458	475	464	472	491	430	468	476	478	461	476	461	476	464			
	Total Alkalinity as CaCO3	mg/L	16	430	472	510	459	479	1	432	478	458	475	464	472	491	430	468	476	478	461	476	461	476	464			
	Sulfate as SO4 2-	mg/L	16	85	101	129	98	107	1	129	123	102	87	100	99	85	100	101	107	104	104	100	106	97	103			
	Chloride	mg/L	16	80	90	105	82	96	1	87	83	105	96	97	91	81	96	87	89	91	91	91	85	81	80			
	Calcium D	mg/L	16	117	134	149	123	144	1	137	134	131	148	133	147	149	128	135	119	117	134	139	140	130	119			
	Magnesium D	mg/L	16	46	52	56	48	55	1	53	53	53	52	56	54	50	51	53	47	46	53	55	55	52	46			
	Sodium D	mg/L	16	43	50	54	46	52	1	48	50	52	52	54	51	50	49	50	45	45	50	52	52	48	43			
	Potassium D	mg/L	16	14	19	23	16	21	1	20	20	22	20	22	19	23	19	16	16	18	20	20	20	14	14			
	Calcium T	mg/L	16	128	140	152	130	149	1	151	144	132	148	147	147	152	146	143	150	131	128	143	135	130	129			
	Magnesium T	mg/L	16	50	54	61	51	56	1	61	61	51	53	53	55	52	53	53	54	52	51	56	56	54	50			
	Sodium T	mg/L	16	46	50	54	48	52	1	52	54	51	52	51	51	51	52	50	50	49	48	53	52	48	46			
	Potassium T	mg/L	16	16	19	24	18	21	1	21	21	21	20	24	18	22	20	18	19	18	18	21	19	17	16			
	Arsenic D	mg/L	16	0.002	0.003	0.003	0.002	0.003	0.001	0.002	0.002	0.003	<0.001	0.003	0.003	<0.001	0.003	0.003	0.002	0.002	0.003	0.003	0.002	0.002	0.002			
	Barium D	mg/L	16	0.117	0.142	0.161	0.127	0.154	0.001	0.117	0.126	0.161	0.15	0.154	0.155	0.14	0.137	0.154	0.128	0.124	0.134	0.145	0.14	0.152	0.133			
	Cadmium D	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
	Chromium D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Copper D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Lead D	mg/L	16	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001			
	Lithium D	mg/L	16	0.036	0.040	0.046	0.037	0.045	0.001	0.046	0.042	0.036	0.041	0.044	0.041	0.037	0.039	0.041	0.036	0.037	0.046	0.041	0.046	0.043	0.037			
	Manganese D	mg/L	16	0.462	0.699	0.830	0.586	0.795	0.001	0.564	0.63	0.83	0.544	0.806	0.797	0.462	0.747	0.792	0.672	0.618	0.724	0.748	0.712	0.752	0.65			
	Selenium D	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
	Silver D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Strontium D	mg/L	16	0.489	0.539	0.611	0.498	0.565	0.001	0.543	0.493	0.564	0.536	0.575	0.542	0.545	0.494	0.551	0.505	0.489	0.559	0.548	0.611	0.566	0.508			
	Zinc D	mg/L	16	0.025	0.028	0.010	0.026	0.029	0.005	0.026	0.005	0.028	0.007	0.008	0.008	0.008	0.009	0.007	0.008	0.008	0.005	0.006	0.008	0.009	0.01			
	Boron D	mg/L	16	0.10	0.13	0.17	0.12	0.14	0.05	0.13	0.13	0.1	0.13	0.14	0.14	0.1	0.12	0.12	0.14	0.14	0.15	0.14	0.15	0.17	0.13			
	Iron D	mg/L	16	0.23	0.90	1.43	0.44	1.18	0.05	0.42	0.5	1.04	0.45	1.06	1.29	0.23	1.19	1.43	0.44	0.86	1.05	1.17	0.88	1.13	0.85			
	Arsenic T	mg/L	16	0.002	0.002	0.003	0.002	0.003	0.001	0.002	0.002	0.002	<0.001	0.003	0.003	<0.001	0.003	0.003	0.003	0.003	0.003	0.002	0.002	0.002	0.002			
	Barium T	mg/L	16	0.123	0.150	0.162	0.139	0.159	0.001	0.123	0.123	0.159	0.151	0.159	0.153	0.145	0.156	0.144	0.162	0.138	0.159	0.148	0.151	0.141	0.141			
	Cadmium T	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001			
	Chromium T	mg/L	16	<0.001	0.003	0.003	<0.001	<0.001	0.001	0.003	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Copper T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Lead T	mg/L	16	0.001	0.001	0.006	0.001	0.001	0.001	0.006	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Lithium T	mg/L	16	0.040	0.042	0.046	0.040	0.044	0.001	0.046	0.043	0.043	0.04	0.04	0.041	0.04	0.04	0.041	0.041	0.043	0.044	0.042	0.044	0.043	0.04			
	Manganese T	mg/L	16	0.460	0.714	0.830	0.590	0.807	0.001	0.581	0.604	0.83	0.548	0.809	0.803	0.46	0.778	0.759	0.779	0.708	0.817	0.704	0.684	0.691	0.691			
	Selenium T	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01			
	Silver T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001			
	Strontium T	mg/L	16	0.487	0.544	0.609	0.520	0.563	0.001	0.548	0.539	0.54	0.53	0.562	0.525	0.517	0.545	0.546	0.557	0.563	0.506	0.585	0.609	0.487	0.549			
	Zinc T	mg/L	16	0.006	0.009	0.013	0.007	0.011	0.005	0.009	0.008	0.01	0.007	0.009	0.008	0.008												

Diss. gas	Methane	Ethane	Propane	PAH Suite																					
				16	10	21	38	14	30	10	<10	<10	38	<10	29	32	<10	25	22	17	19	15	15	14	14
PAH Suite	Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Acenaphthylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Acenaphthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Fluorene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Phenanthrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Benzo(a)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Chrysene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Benzo(b)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Benzo(k)fluoranthene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Benzo(a)pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Indeno(1,2,3-cd)pyrene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Dibenz(a,h)anthracene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Benzo(g,h,i)perylene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Sum of polycyclic aromatic hydrocarbons	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Benzo(a)pyrene TEQ (zero)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	C6 - C9 Fraction	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20
	C10 - C14 Fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
C29 - C36 Fraction	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
C10 - C36 Fraction (sum)	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	<50	
C6 - C10 Fraction	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
C6 - C10 Fraction minus BTEX (F1)	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	<20	
>C10 - C16 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C16 - C34 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C34 - C40 Fraction	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C10 - C40 Fraction (sum)	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
>C10 - C16 Fraction minus Naphthalene (F2)	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	<100	
BTEXN, Alkylates, Surrogates	Benzene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	
	Toluene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
	Ethylbenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
	meta- & para-Xylene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
	ortho-Xylene	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	
	Total Xylenes	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
	Sum of BTEX	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Naphthalene	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
	Gross alpha	0.12	0.31	0.54	0.26	0.37	0.05	0.54	0.51	0.35	0.25	0.17	0.23	0.23	0.12	0.12	0.35	0.29	0.34	0.35	0.37	0.36	0.28	0.27	0.27
	Gross beta activity - 40K	0.1	0.2	0.4	0.2	0.3	0.1	0.33	0.42	0.26	0.17	0.23	0.23	0.12	<0.10	0.28	0.19	0.23	0.34	0.29	0.3	0.24	0.3	0.24	0.24
	Phenol-d6	20	25	29	23	27	1	19.5	29	25.8	27.4	24.4	24.7	22	27.6	25.2	26.8	25.6	24.4	23.5	26.2	24.6	29.4	24.6	29.4
	2-Chlorophenol-D4	38	54	66	45	60	1	39.9	38.3	46.5	46	52.9	62.1	57.2	44.3	52.7	48.7	54.7	57.9	66.4	55.3	65.4	56	56	56
	2,4,6-Tribromophenol	35	52	72	41	61	1	42.9	62.5	51.4	54.1	55.6	46.8	40.3	35.8	56.1	35	72	47.3	58	50.5	47.2	68.7	68.7	68.7
	2-Fluorobiphenyl	51	63	76	55	70	1	61.7	50.6	54.5	59.1	69.8	69	60.9	52.9	55	66	65.7	63.5	75.8	67.6	70.7	71	71	71
	Anthracene-d10	56	71	100	64	80	1	87.8	66	67.5	64.3	77.8	69.5	64.1	55.5	64.4	66.4	70.8	67.2	76	73.4	99.5	80.8	80.8	80.8
4-Terphenyl-d14	64	83	100	76	95	1	98.3	93.5	81.7	65.7	86.5	99.6	95.5	63.5	77.4	86.7	78.9	76.8	82.2	75	93.5	91.1	91.1	91.1	
1,2-Dichloroethane-D4	76	103	127	88	119	2	127	122	123	108	110	94.1	102	78.6	96.7	76.1	112	114	113	108	84.1	108	96.2	96.2	
Toluene-D8	93	109	122	100	117	2	103	122	116	108	108	93.4	96	115	106	105	109	109	117	117	122	97.9	106	106	
4-Bromofluorobenzene	92	107	124	98	114	2	105	115	119	108	106	92.4	94.3	112	102	101	113	108	109	124	95.5	106	106	106	

RN041800

CARPENTARIA 1

Category	CHEMICAL NAME	RESULT UNIT	Baseline Statistical Data							Post Activity							
			No. results	Min	Average	Max	20th %ile	80th %ile	LOR	16/06/2021	14/07/2021	14/08/2021	13/10/2021	14/11/2021	09/01/2022	06/04/2022	
General, anions, cations and metal	pH - Lab	pH Unit	16	7.03	7.31	7.68	7.16	7.46	0.01	7.29	6.91	7.07	7.16	7.75	7.6	7.04	
	Electrical Conductivity @ 25°C	µS/cm	16	1170	1209	1340	1184	1220	1	1180	1160	1150	1160	1150	1160	1140	
	Total Dissolved Solids @180°C	mg/L	16	645	737	844	685	789	10	696	702	807	738	646	830	744	
	Suspended Solids (SS)	mg/L	16	2	7	19	3	14	1	4	3	3	3	4	3	5	
	Gross beta	Bq/L	16	0.2	0.7	1.0	0.7	0.9	0.1	0.63	0.66	0.61	0.51	0.52	0.64	0.67	
	Hydroxide Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	Carbonate Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	
	Bicarbonate Alkalinity as CaCO3	mg/L	16	430	472	510	459	479	1	427	426	494	475	481	466	472	
	Total Alkalinity as CaCO3	mg/L	16	430	472	510	459	479	1	427	426	494	475	481	466	472	
	Sulfate as SO4 2-	mg/L	16	85	101	129	98	107	1	97	93	101	96	98	129	96	
	Chloride	mg/L	16	80	90	105	82	96	1	74	88	89	75	79	82	85	
	Calcium D	mg/L	16	117	134	149	123	144	1	131	127	132	135	139	127	128	
	Magnesium D	mg/L	16	46	52	56	48	55	1	49	53	50	48	54	50	47	
	Sodium D	mg/L	16	43	50	54	46	52	1	42	46	49	41	49	46	45	
	Potassium D	mg/L	16	14	19	23	13	21	1	15	14	16	13	14	14	17	
	Calcium T	mg/L	16	128	140	152	130	149	1	126	147	142	144	127	134	136	
	Magnesium T	mg/L	16	50	54	61	51	56	1	51	50	54	56	47	51	53	
	Sodium T	mg/L	16	46	50	54	48	52	1	46	48	52	50	44	46	50	
	Potassium T	mg/L	16	16	19	24	18	21	1	14	15	18	14	12	13	15	
	Arsenic D	mg/L	16	0.002	0.003	0.003	0.002	0.003	0.001	0.002	0.002	<0.001	0.001	0.001	0.001	0.001	
	Barium D	mg/L	16	0.117	0.142	0.161	0.127	0.154	0.001	0.125	0.139	0.156	0.122	0.134	0.125	0.132	
	Cadmium D	mg/L	16	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Chromium D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Copper D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lead D	mg/L	16	<0.001	<0.001	0.002	<0.001	0.0045	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lithium D	mg/L	16	0.036	0.040	0.046	0.037	0.045	0.001	0.04	0.018	0.042	0.033	0.038	0.04	0.038	
	Manganese D	mg/L	16	0.462	0.699	0.830	0.586	0.795	0.001	0.575	0.645	0.707	0.498	0.56	0.528	0.55	
	Selenium D	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	Silver D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium D	mg/L	16	0.489	0.539	0.611	0.498	0.565	0.001	0.504	0.51	0.58	0.512	0.517	0.503	0.505	
	Zinc D	mg/L	16	0.005	0.008	0.010	0.006	0.009	0.005	0.007	0.013	0.015	0.012	0.018	0.01	0.023	
	Boron D	mg/L	16	0.10	0.13	0.17	0.12	0.14	0.05	0.14	0.1	0.13	0.11	0.11	0.12	0.12	
	Iron D	mg/L	16	0.23	0.90	1.43	0.44	1.18	0.05	0.67	1.05	1.41	1.14	0.06	1.05	0.9	
	Arsenic T	mg/L	16	0.002	0.002	0.003	0.002	0.003	0.001	0.001	0.002	0.003	<0.001	<0.001	<0.001	0.001	
	Barium T	mg/L	16	0.123	0.150	0.162	0.139	0.159	0.001	0.126	0.143	0.167	0.128	0.133	0.139	0.138	
	Cadmium T	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Chromium T	mg/L	16	<0.001	0.003	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Copper T	mg/L	16	<0.001	<0.001	<0.001	<0.0001	<0.0001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lead T	mg/L	16	0.001	0.001	0.006	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lithium T	mg/L	16	0.040	0.042	0.046	0.040	0.044	0.001	0.039	0.034	0.043	0.056	0.037	0.042	0.038	
	Manganese T	mg/L	16	0.460	0.714	0.830	0.590	0.807	0.001	0.597	0.668	0.727	0.525	0.551	0.574	0.611	
	Selenium T	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	Silver T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium T	mg/L	16	0.487	0.544	0.609	0.520	0.563	0.001	0.494	0.505	0.607	0.508	0.522	0.567	0.534	
	Zinc T	mg/L	16	0.006	0.009	0.013	0.007	0.011	0.005	<0.005	0.013	0.016	0.013	0.018	0.015	0.027	
	Boron T	mg/L	16	0.10	0.13	0.16	0.11	0.14	0.05	0.11	0.1	0.13	0.15	0.12	0.13	0.13	
	Iron T	mg/L	16	0.28	1.21	2.98	0.98	1.50	0.05	0.8	1.28	1.87	1.42	1.5	1.32	2.02	
	Mercury D	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Mercury T	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Reactive Silica	mg/L	16	26.10	30.09	31.30	29.50	30.76	0.05	29.9	29.9	29.9	28.4	28.7	28.9		
Fluoride	mg/L	16	0.3	0.4	0.6	0.4	0.4	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4		
Nitrite as N	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Nitrate as N	mg/L	16	0.01	0.03	0.05	0.01	0.05	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01		
Nitrite + Nitrate as N	mg/L	16	0.01	0.03	0.05	0.01	0.05	0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.01	<0.01		
Total Anions	meq/L	16	13.40	14.06	14.60	13.84	14.26	0.01	12.6	12.9	14.5	13.6	13.9	14.3	13.8		
Total Cations	meq/L	16	12.00	13.56	14.50	12.60	14.30	0.01	12.8	13	13.2	12.8	13.9	12.8	12.6		
Ionic Balance	%	16	0.10	2.65	9.94	0.29	5.73	0.01	0.56	0.49	4.48	3.04	0.03	5.52	4.45		

Disc. pet. gases	µg/L	16	10	21	38	14	30	10	<10	14	16	<10	<10	<10	18
Methane	µg/L	16	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10
Ethane	µg/L	16	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10
Propane	µg/L	16	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b)fluoranthene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L	16	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	µg/L	16	<1	<1.0	<1	<1.0	<1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of polycyclic aromatic hydrocarbons	µg/L	16	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (zero)	µg/L	16	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C6 - C9 Fraction	µg/L	16	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	16	<50	<50	<50	<50	<50	50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	16	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	µg/L	16	<50	<50	<50	<50	<50	50	<50	<50	<50	<50	<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	16	<50	<50	<50	<50	<50	50	<50	<50	<50	<50	<50	<50	<50
C6 - C10 Fraction	µg/L	16	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20
C6 - C10 Fraction minus BTEX (F1)	µg/L	16	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20
>C10 - C16 Fraction	µg/L	16	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100
>C16 - C34 Fraction	µg/L	16	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction	µg/L	16	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	µg/L	16	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	16	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100
BTEXN - Alpha/Beta - Surrogates	µg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
Benzene	µg/L	16	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
Toluene	µg/L	16	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
Ethylbenzene	µg/L	16	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	µg/L	16	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
ortho-Xylene	µg/L	16	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
Total Xylenes	µg/L	16	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2
Sum of BTEX	µg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	µg/L	16	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Gross alpha	Bq/L	16	0.12	0.31	0.54	0.26	0.37	0.05	0.11	0.29	0.37	0.27	0.34	0.32	0.32
Gross beta activity - 40K	Bq/L	16	0.1	0.2	0.4	0.2	0.3	0.1	0.25	0.25	0.18	0.19	0.19	0.3	0.3
Phenol-d6	%	16	20	25	29	23	27	1	28.1	24.2	25.8	27.7	24.3	32.1	---
2-Chlorophenol-D4	%	16	38	54	66	45	60	1	53.4	59.2	59.7	50.9	64.8	62	---
2,4,6-Tribromophenol	%	16	35	52	72	41	61	1	58.3	54.4	67.8	51.3	66.6	79.8	---
2-Fluorobiphenyl	%	16	51	63	76	55	70	1	55	69.5	71.9	63.3	78.7	67.2	64.7
Anthracene-d10	%	16	56	71	100	64	80	1	71.8	78.6	93.7	73.2	94.2	92.4	91.8
4-Terphenyl-d14	%	16	64	83	100	76	95	1	73.6	98.7	96.7	83	95.5	97	81.4
1,2-Dichloroethane-D4	%	16	76	103	127	88	119	2	99.7	99.2	119	120	99.5	98.8	107
Toluene-D8	%	16	93	109	122	100	117	2	101	105	122	116	106	96.3	108
4-Bromofluorobenzene	%	16	92	107	124	98	114	2	97.9	112	120	106	96.5	98	115

6.2 RN041678 - Groundwater Sampling Chemical Data

RN041678

CARPENTARIA 1

Category	CHEMICAL NAME	RESULT UNIT	Baseline Statistical Data							Baseline																
			No. results	Min	Average	Max	20th %ile	80th %ile	LOR	18/04/2021	21/04/2021	26/04/2021	27/04/2021	28/04/2021	04/05/2021	05/05/2021	09/05/2021	11/05/2021	12/05/2021	16/05/2021	17/05/2021	18/05/2021	19/05/2021	23/05/2021	25/05/2021	
General, anions, cations and metal	pH - Lab	pH Unit	16	6.82	7.25	7.57	7.07	7.39	0.01	7.09	6.82	7.33	7.4	7.17	7.23	7.57	7.46	7.25	7.37	7.24	7.32	7.37	7.02	7.06	7.29	
	Electrical Conductivity @ 25°C	µS/cm	16	1160	1186	1210	1174	1200	1	1200	1200	1200	1210	1210	1180	1200	1160	1170	1180	1180	1180	1180	1180	1180	1190	1190
	Total Dissolved Solids @180°C	mg/L	16	646	727	846	672	786	10	755	712	846	846	846	785	809	750	671	713	730	673	686	646	668	786	689
	Suspended Solids (SS)	mg/L	16	2	4	6	3	6	1	2	3	4	2	6	3	4	4	6	3	<1	<1	<1	<1	<1	4	6
	Gross beta	Bq/L	16	0.2	0.7	0.9	0.7	0.8	0.1	0.67	0.76	0.69	0.87	0.79	0.73	0.76	0.24	0.37	0.7	0.68	0.68	0.68	0.68	0.73	0.75	0.79
	Hydroxide Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Carbonate Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
	Bicarbonate Alkalinity as CaCO3	mg/L	16	433	470	534	440	498	1	458	438	461	467	468	456	472	436	433	442	483	478	483	509	508	508	534
	Total Alkalinity as CaCO3	mg/L	16	433	470	534	440	498	1	458	438	461	467	468	456	472	436	433	442	483	478	483	509	508	508	534
	Sulfate as SO4 2-	mg/L	16	82	88	104	85	89	1	86	85	88	84	82	101	86	88	89	89	89	88	85	88	85	88	85
	Chloride	mg/L	16	74	86	102	79	93	1	95	86	98	102	90	88	84	91	83	84	84	81	82	77	77	77	74
	Calcium D	mg/L	16	120	133	148	127	139	1	136	120	133	148	135	141	142	129	134	127	132	133	132	136	127	127	126
	Magnesium D	mg/L	16	46	50	54	48	52	1	48	46	51	54	52	50	50	48	52	49	49	50	50	52	49	49	48
	Sodium D	mg/L	16	45	49	53	47	51	1	50	47	52	53	53	49	48	49	50	49	49	48	48	50	47	45	45
	Potassium D	mg/L	16	17	21	22	19	22	1	21	19	20	22	21	20	21	20	21	21	21	21	21	21	17	19	19
	Calcium T	mg/L	16	122	138	152	128	146	1	139	139	132	150	145	146	152	142	138	146	126	133	130	135	122	127	127
	Magnesium T	mg/L	16	48	51	57	49	54	1	53	54	49	57	50	53	56	50	49	50	49	51	50	54	48	48	48
	Sodium T	mg/L	16	43	50	55	47	54	1	54	55	50	54	51	51	53	50	47	48	48	48	48	52	43	45	45
	Potassium T	mg/L	16	18	21	23	20	22	1	23	22	20	22	23	21	21	22	20	21	20	22	21	22	18	20	20
	Arsenic D	mg/L	16	<0.001	<0.001	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Barium D	mg/L	16	0.120	0.134	0.157	0.124	0.146	0.001	0.147	0.12	0.149	0.157	0.145	0.134	0.142	0.124	0.135	0.131	0.124	0.12	0.124	0.131	0.134	0.127	0.127
	Cadmium D	mg/L	16	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Copper D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Lead D	mg/L	16	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Lithium D	mg/L	16	0.035	0.039	0.044	0.036	0.042	0.001	0.037	0.035	0.035	0.042	0.044	0.04	0.036	0.038	0.04	0.037	0.04	0.042	0.043	0.041	0.041	0.038	0.038
	Manganese D	mg/L	16	0.356	0.473	0.802	0.380	0.544	0.001	0.488	0.528	0.552	0.802	0.533	0.431	0.73	0.4	0.398	0.387	0.375	0.406	0.401	0.405	0.373	0.356	
	Selenium D	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	Silver D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium D	mg/L	16	0.417	0.531	0.571	0.508	0.556	0.001	0.528	0.417	0.553	0.545	0.559	0.502	0.517	0.498	0.543	0.551	0.544	0.534	0.544	0.571	0.558	0.54	
	Zinc D	mg/L	16	0.005	0.008	0.018	0.006	0.008	0.005	0.007	0.006	0.006	0.009	0.018	0.007	0.007	<0.005	0.007	0.008	0.005	0.006	0.007	0.005	0.007	0.005	0.007
	Boron D	mg/L	16	0.10	0.12	0.22	0.10	0.14	0.05	0.1	0.11	0.1	0.14	0.12	0.12	0.1	0.1	0.11	0.11	0.15	0.14	0.12	0.22	0.12	0.12	
	Iron D	mg/L	16	0.09	0.32	0.99	0.14	0.42	0.05	0.32	0.38	0.45	0.99	0.33	0.22	0.92	0.22	0.13	0.18	0.17	0.18	0.17	0.18	0.09	0.15	
	Arsenic T	mg/L	16	<0.001	<0.001	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
	Barium T	mg/L	16	0.119	0.139	0.160	0.128	0.149	0.001	0.142	0.142	0.148	0.16	0.149	0.138	0.157	0.139	0.122	0.135	0.139	0.137	0.132	0.138	0.119	0.126	
	Cadmium T	mg/L	16	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
	Chromium T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Copper T	mg/L	16	<0.001	<0.001	0.004	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lead T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lithium T	mg/L	16	0.036	0.040	0.044	0.038	0.042	0.001	0.036	0.036	0.041	0.044	0.038	0.04	0.042	0.038	0.04	0.038	0.042	0.043	0.041	0.041	0.038	0.038	
	Manganese T	mg/L	16	0.325	0.476	0.823	0.373	0.546	0.001	0.491	0.502	0.553	0.823	0.536	0.449	0.768	0.422	0.369	0.432	0.378	0.418	0.409	0.398	0.325	0.35	
	Selenium T	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	Silver T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium T	mg/L	16	0.507	0.536	0.574	0.517	0.547	0.001	0.533	0.538	0.528														

RN041678

CARPENTARIA 1

Category	CHEMICAL NAME	RESULT UNIT	Baseline Statistical Data					Post Activity									
			No. results	Min	Average	Max	20th %ile	80th %ile	LOR	16/06/2021	14/07/2021	14/08/2021	13/10/2021	14/11/2021	09/01/2022	06/04/2022	
General, anions, cations and metal	pH - Lab	pH Unit	16	6.82	7.25	7.57	7.07	7.39	0.01	7.32	7.12	7.06	7.08	7.61	7.76	7.07	
	Electrical Conductivity @ 25°C	µS/cm	16	1160	1186	1210	1174	1200	1	1140	1100	1100	1010	1110	1140	1100	
	Total Dissolved Solids @180°C	mg/L	16	646	727	846	672	786	10	662	689	743	699	676	796	656	
	Suspended Solids (SS)	mg/L	16	2	4	6	3	6	1	<1	2	3	1	1	1	1	
	Gross beta	Bq/L	16	0.2	0.7	0.9	0.7	0.8	0.1	0.53	0.59	0.51	0.55	0.51	<0.66	0.47	
	Hydroxide Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	
	Carbonate Alkalinity as CaCO3	mg/L	16	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	
	Bicarbonate Alkalinity as CaCO3	mg/L	16	433	470	534	440	498	1	431	438	514	434	483	482	481	
	Total Alkalinity as CaCO3	mg/L	16	433	470	534	440	498	1	431	438	514	434	483	482	481	
	Sulfate as SO4 2-	mg/L	16	82	88	104	85	89	1	78	73	79	80	85	82	80	
	Chloride	mg/L	16	74	86	102	79	93	1	67	77	74	69	70	72	67	
	Calcium D	mg/L	16	120	133	148	127	139	1	128	128	129	134	138	126	119	
	Magnesium D	mg/L	16	46	50	54	48	52	1	46	49	47	46	52	47	44	
	Sodium D	mg/L	16	45	49	53	47	51	1	40	43	44	40	46	42	39	
	Potassium D	mg/L	16	17	21	22	19	22	1	17	15	15	16	16	14	12	
	Calcium T	mg/L	16	122	138	152	128	146	1	128	146	131	140	130	133	120	
	Magnesium T	mg/L	16	48	51	57	49	54	1	50	48	48	48	46	48	44	
	Sodium T	mg/L	16	43	50	55	47	54	1	44	45	44	42	42	43	41	
	Potassium T	mg/L	16	18	21	23	20	22	1	16	17	16	17	14	14	12	
	Arsenic D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Barium D	mg/L	16	0.120	0.134	0.157	0.124	0.146	0.001	0.107	0.124	0.145	0.104	0.106	0.106	0.111	
	Cadmium D	mg/L	16	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Chromium D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Copper D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lead D	mg/L	16	<0.001	<0.001	0.002	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lithium D	mg/L	16	0.035	0.039	0.044	0.036	0.042	0.001	0.036	0.013	0.038	0.031	0.034	0.036	0.034	
	Manganese D	mg/L	16	0.356	0.473	0.802	0.380	0.544	0.001	0.222	0.323	0.359	0.21	0.233	0.242	0.252	
	Selenium D	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	Silver D	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium D	mg/L	16	0.417	0.531	0.571	0.508	0.556	0.001	0.496	0.484	0.554	0.499	0.508	0.491	0.471	
	Zinc D	mg/L	16	0.005	0.008	0.018	0.006	0.008	0.005	0.006	0.013	0.016	0.005	0.008	0.01	0.011	
	Boron D	mg/L	16	0.10	0.12	0.22	0.10	0.14	0.05	0.13	0.08	0.12	0.1	0.1	0.1	0.1	
	Iron D	mg/L	16	0.09	0.32	0.99	0.14	0.42	0.05	0.44	0.5	0.92	0.22	0.53	0.52	0.66	
	Barium T	mg/L	16	<0.001	<0.001	0.003	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium T	mg/L	16	0.119	0.139	0.160	0.128	0.149	0.001	0.11	0.129	0.148	0.107	0.109	0.118	0.113	
	Cadmium T	mg/L	16	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Chromium T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Copper T	mg/L	16	<0.001	<0.001	0.004	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lead T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Lithium T	mg/L	16	0.036	0.040	0.044	0.038	0.042	0.001	0.034	0.032	0.037	0.038	0.034	0.038	0.029	
	Manganese T	mg/L	16	0.325	0.476	0.823	0.373	0.546	0.001	0.226	0.326	0.351	0.214	0.237	0.261	0.254	
	Selenium T	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	
	Silver T	mg/L	16	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
	Strontium T	mg/L	16	0.507	0.536	0.574	0.517	0.547	0.001	0.495	0.499	0.565	0.513	0.528	0.543	0.472	
	Zinc T	mg/L	16	0.006	0.011	0.022	0.007	0.012	0.005	0.014	0.013	0.016	<0.005	0.006	0.009	0.012	
	Boron T	mg/L	16	0.09	0.12	0.15	0.10	0.14	0.05	0.08	0.1	0.11	0.1	0.1	0.11	0.09	
	Iron T	mg/L	16	0.09	0.37	1.16	0.17	0.49	0.05	0.64	0.79	1.1	0.19	0.58	0.62	0.86	
	Mercury D	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Mercury T	mg/L	16	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
	Reactive Silica	mg/L	16	29.30	30.49	32.00	29.74	31.40	0.05	30.8	30.5	30.7	31.4	28.5	29.4	29.5	
Fluoride	mg/L	16	0.3	0.4	0.4	0.3	0.4	0.1	0.4	0.3	0.3	0.4	0.4	0.4	0.4		
Nitrite as N	mg/L	16	<0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01		
Nitrate as N	mg/L	16	0.04	0.05	0.08	0.05	0.06	0.01	0.06	0.05	0.05	0.06	0.05	0.06	0.05		
Nitrite + Nitrate as N	mg/L	16	0.04	0.05	0.08	0.05	0.06	0.01	0.06	0.05	0.05	0.06	0.05	0.06	0.05		
Total Anions	meq/L	16	12.80	13.66	14.50	13.04	14.16	0.01	12.1	12.4	14	12.3	13.4	13.4	13.2		
Total Cations	meq/L	16	12.30	13.41	14.70	12.88	13.80	0.01	12.3	12.7	12.6	12.6	13.6	12.3	11.6		
Ionic Balance	%	16	0.05	1.80	6.85	0.48	3.00	0.01	0.91	0.92	5.26	1.36	0.67	4	6.48		

Disc. pet. gases	µg/L	16	10	23	37	<10	<10	10	<10	30	28	<10	<10	<10	17
Methane	µg/L	16	10	23	37	<10	<10	10	<10	30	28	<10	<10	<10	17
Ethane	µg/L	<10	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10
Propane	µg/L	<10	<10	<10	<10	<10	<10	10	<10	<10	<10	<10	<10	<10	<10
Naphthalene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthylene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Acenaphthene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluorene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Fluoranthene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Pyrene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)anthracene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Chrysene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(b+g)fluoranthene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(k)fluoranthene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(a)pyrene	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Indeno(1,2,3-cd)pyrene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Dibenz(a,h)anthracene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Benzo(g,h,i)perylene	µg/L	<1	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sum of polycyclic aromatic hydrocarbons	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ (zero)	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
C6 - C9 Fraction	µg/L	<20	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20
C10 - C14 Fraction	µg/L	<50	<50	<50	<50	<50	<50	50	<50	<50	<50	<50	<50	<50	<50
C15 - C28 Fraction	µg/L	150	150	150	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100
C29 - C36 Fraction	µg/L	140	140	140	<50	<50	50	<50	<50	<50	<50	<50	<50	<50	<50
C10 - C36 Fraction (sum)	µg/L	290	290	290	<50	<50	50	<50	<50	<50	<50	<50	<50	<50	<50
C6 - C10 Fraction	µg/L	<20	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20
C6 - C10 Fraction minus BTEX (F1)	µg/L	<20	<20	<20	<20	<20	<20	20	<20	<20	<20	<20	<20	<20	<20
>C10 - C16 Fraction	µg/L	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100
>C16 - C34 Fraction	µg/L	<100	<100	260	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100
>C34 - C40 Fraction	µg/L	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100
>C10 - C40 Fraction (sum)	µg/L	<100	<100	260	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100
>C10 - C16 Fraction minus Naphthalene (F2)	µg/L	<100	<100	<100	<100	<100	100	<100	<100	<100	<100	<100	<100	<100	<100
Benzene	µg/L	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Toluene	µg/L	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2
Ethylbenzene	µg/L	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2
meta- & para-Xylene	µg/L	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2
ortho-Xylene	µg/L	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2
Total Xylenes	µg/L	<2	<2	<2	<2	<2	2	<2	<2	<2	<2	<2	<2	<2	<2
Sum of BTEX	µg/L	<1	<1	<1	<1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1	<1	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Gross alpha	Bq/L	0.10	0.21	0.32	0.18	0.26	0.05	0.19	0.26	0.22	0.22	0.14	0.14	<0.33	0.19
Gross beta activity - 40K	Bq/L	0.1	0.2	0.3	0.1	0.2	0.1	<0.10	0.16	0.11	0.13	0.13	0.14	<0.66	0.13
Phenol-d6	%	18	25	30	22	28	1	25.8	23.4	17.6	27.3	20.7	31	---	---
2-Chlorophenol-D4	%	36	51	62	45	57	1	48.1	58.9	42.5	58.6	45.1	60.4	---	---
2,4,6-Tribromophenol	%	34	52	73	38	64	1	52.9	42.7	45	60.5	60.1	75.1	---	---
2-Fluorobiphenyl	%	51	62	80	54	73	1	51.2	77.8	53.4	79	58	64	66.6	66.6
Anthracene-d10	%	56	73	106	61	78	1	68.7	78.3	69.8	86.8	82.2	89.6	91.8	91.8
4-Terphenyl-d14	%	63	82	104	74	89	1	69.1	94.2	88.2	97.2	99.3	92.3	82.8	82.8
1,2-Dichloroethane-D4	%	74	105	131	88	118	2	98.6	101	116	117	101	104	107	107
Toluene-D6	%	93	109	119	100	118	2	100	109	119	116	107	101	106	106
4-Bromofluorobenzene	%	88	108	123	99	115	2	96.8	115	116	106	99.1	105	113	113

7 Appendix B

7.1 RN041800 - Impact Monitoring Bore Pressure and Groundwater Level monitoring data