Iluka Resources Limited
Mineral Sands By-Product Disposal

Planning Permit 15-105

Crown Allotments 91, 94, 95, 96
Parish of Telangatuk

Environmental Management Plan and Rehabilitation Performance Report – 2017

Iluka Ref: TRIM 2004796

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Document control

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1 Executive Summary

Iluka Resources Limited (Iluka) disposes of heavy mineral processing by-products generated by its mineral separation plant (MSP), located near Hamilton in the Southern Grampians Shire, to a mining void at its Douglas Mine. The void, known as Pit 23, is located at the Douglas Mine in the Kanagulk area and within the municipality of the Horsham Rural City.

This report is submitted in accordance with Section 12.2 of the endorsed Iluka Pit 23 Environmental Management Plan (EMP), and outlines the results of monitoring and management actions undertaken during the period 11th May 2017 to 31st December 2017. The abridged date of the 2017 reporting period covered herein reflects the date of commencement of Planning Permit 15-105, this being the date of the excision of Pit 23 from the Douglas Mining Licence (MIN5367).

Key commentary on environmental monitoring outcomes and performance against compliance objectives in the Pit EMP for the 2017 reporting period:

- No noise complaints were received;
- There were no exceedances of the PM_{10} dust limit;
- There were no exceedances of the air concentration limits for Radon and Thoron;
- There were no exceedances of applicable limits for radionuclides in groundwater;
- There were no exceedances of applicable limits for radionuclides in surface water;
- There were no surface water discharges from the Pit 23 disturbance area;
- An indication of potential groundwater seepage from Pit 23 and expression in surface waters was observed at McGlashin's Swamp (DUSW24) in Q3 2017, with pH and electrical conductivity above the natural background precautionary trigger levels for this location identified during the same period. While these observations are likely to be a product of natural variation when considered against groundwater seepage model predictions and monitoring data for other locations, an update of the hydrogeological model and impact assessment is required. This model update will seek to validate or adjust existing model predictions on seepage and quality impacts in order to understand the cause and potential impacts of these observations. This work is scheduled for 2018 and outcomes will be reported in the 2018 EMP and Rehabilitation Performance Report;
- Updated groundwater level contours and flow-paths show no material change from the hydrogeological model contours developed in 2015 by CDM Smith; and
- Reported non-compliances relate to missed monitoring of groundwater levels or monitoring for specific groundwater quality indicators.

Detailed assessment of compliance, key results and management actions are provided in Section 4 and 5 of the enclosed report.

2 Introduction

Iluka Resources Limited (Iluka) disposes of heavy mineral processing by-products generated by its mineral separation plant (MSP), located near Hamilton in the Southern Grampians Shire, to a mining void at its Douglas Mine. The void, known as Pit 23, is located at the Douglas Mine in the Kanagulk area within the municipality of the Horsham Rural City (Figure 1 and Figure 2).

2.1 Planning Permit 15-105

Under the Horsham Planning Scheme the subject land is in the Farming Zone and under the provisions of that zone a permit is required for use and development for Industry (Refuse Disposal). On 25th February 2017 Planning Permit 15-105, (the Permit) was issued by the Horsham Rural City Council as the Responsible Authority to allow:

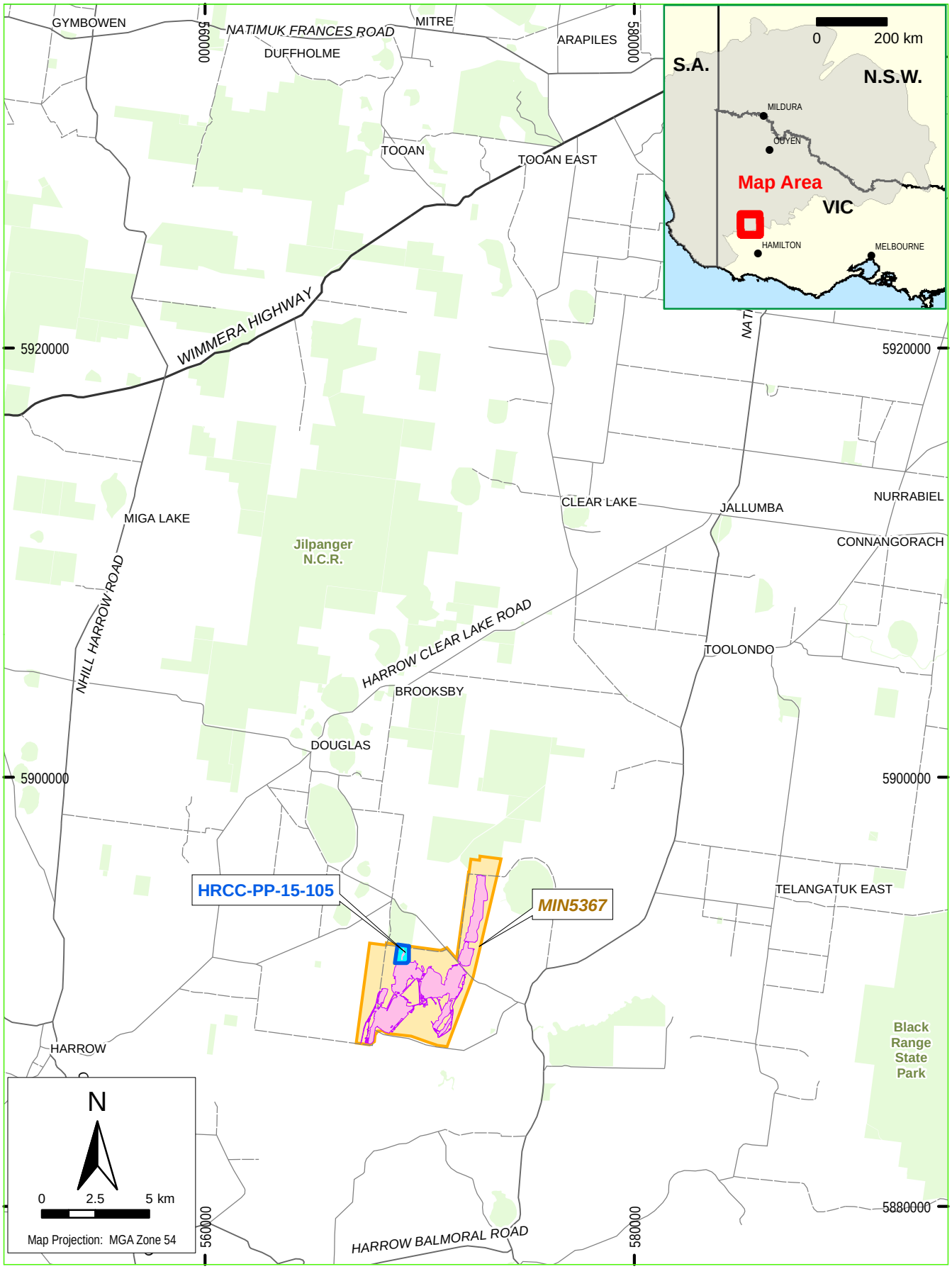
> *Use and development of the land for the disposal of waste by-products associated with or sourced through mineral sands processing undertaken at the Hamilton Mineral Separation Plant (MSP), including waste by-products and contaminated materials resulting from the processing and transport operations as follows:*
>
> - *By-products from the processing of heavy mineral concentrate at the Hamilton MSP;*
> - *used dust filter bags from the Hamilton MSP; and*
> - *Other chemically inert material contaminated with naturally occurring radioactive material.*
>
> *in accordance with the endorsed plans.*

2.2 Commencement of the Permit

Condition 1 of the Permit states:

> *This permit does not come into operation until:*
>
> *a. Iluka has applied to the Department of Economic Development, Jobs, Transport and Resources to vary the 2003 Work Plan to identify a new endues utilisation of Pit 23 and to vary the rehabilitation plan; and*
>
> *b. Iluka has applied to the Minister to surrender part of MIN 5367 (Pit 23); and*
>
> *c. The Department of Economic Development, Jobs, Transport and Resources has approved the Work Plan Variation; and*
>
> *d. The Minister has registered the partial surrender of MIN 5367.*
>
> *The permit comes into operation on the same day the Work Plan Variation is approved, and the partial surrender of MIN 5367 is registered.*

The Variation to the 2003 Douglas Mine Work Plan was approved on the 13th April 2017, and the partial surrender of MIN5367 was registered on 11th May 2017, being the date of commencement of the Permit.



Legend

- Douglas mine
- Pit 23
- HRCC-PP-15-105
- MIN5367 tenement

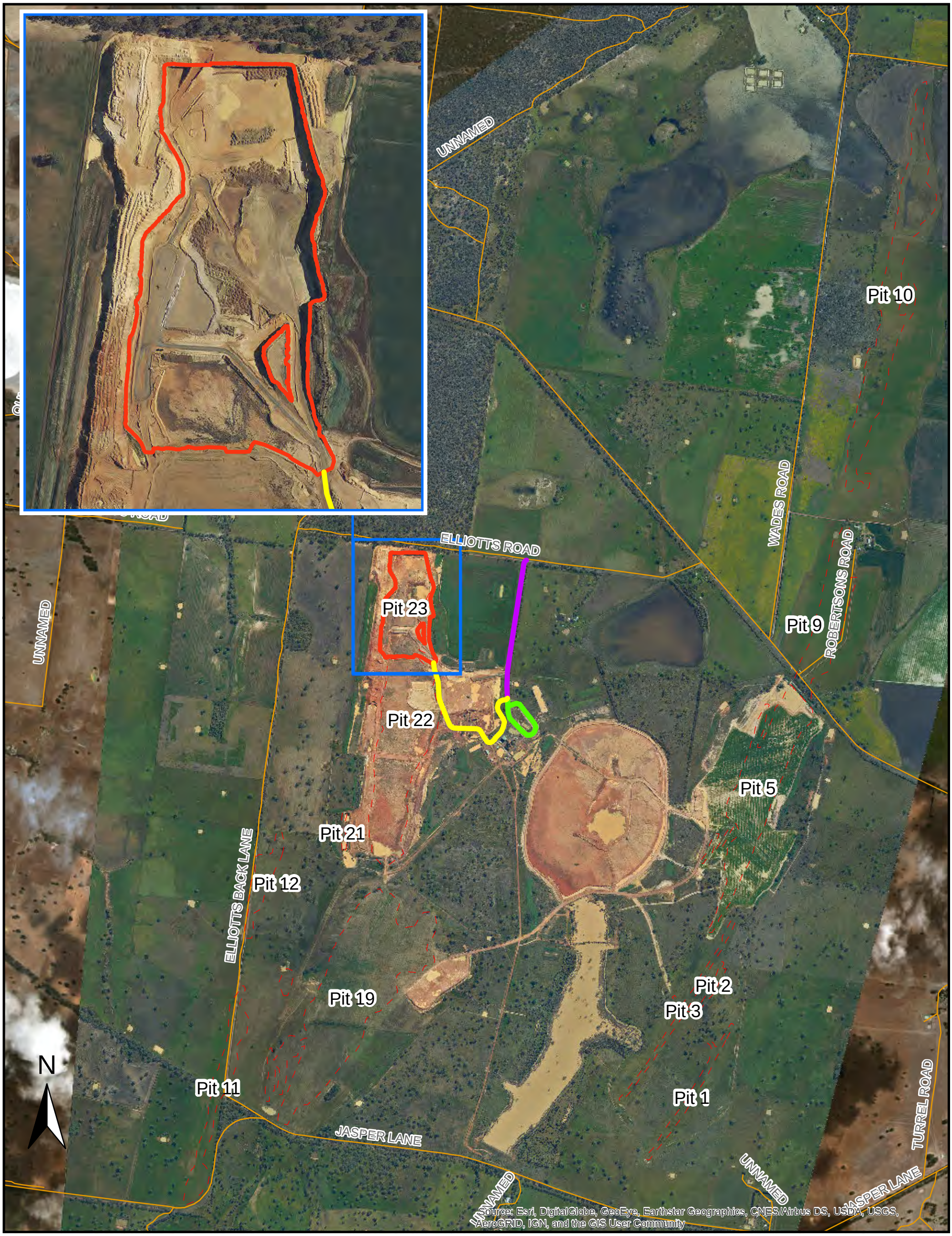
DOUGLAS

LOCATION PLAN

ILUKA

ORIG: N.Travers DRAWN: D.G.S. SCALE: 1:250,000 (A4) DATE: May 2018 DWG No: 247670 ver.00

FIGURE: 1



Legend

- Pit 23 haul road
- Mine Access Road
- Truck wash circuit
- Pit 23 crest
- Pit Crests
- Roads

0 250 500 1,000 1,500 2,000 Meters

LOCATION OF PIT 23

ILUKA

L:\Maps\2018\Unregistered\Douglas\mxd\Pit 23 Annual Report 2017 DRAWN: N. Travers DATE:26/06/2018

FIGURE: **2**

2.3 Endorsed Plans

Conditions 2, 3, 9, 14, 16 and 34 of the Permit relate to various management plans that once approved by the Responsible Authority will be endorsed to form part of the Permit, which includes:

- Incoming Waste Monitoring Plan (IWMP);
- Environmental Management Plan (EMP), incorporating;
    - Groundwater Monitoring and Management Plan (GWMMP);
    - Surface Water Monitoring and Management Plan (SWMMP);
    - Air Quality/Dust Control Plan (AQMP); and
- Rehabilitation and Vegetation Management Plan (R&VMP)

The plans were endorsed by Horsham Rural City Council on 17th July 2017.

2.4 Performance reporting

Section 12.2 of the endorsed EMP outlines the routine reporting requirements for the mineral sands by-product disposal operations which are:

> *A review of the performance will be completed and an EMP and Rehabilitation Performance report prepared annually, or less frequently as may be agreed with the Responsible Authority.*
>
> *Each EMP and Rehabilitation Performance Report will include, at least:*
>
> - *for the period from the previous EMP and Rehabilitation Performance Report:*
>   - *the total tonnage of materials disposed of;*
>   - *the average and maximum number of deliveries of materials disposed of per day; and*
>   - *the results of all measurements of:*
>   - *noise levels made in response to a complaint regarding noise;*
>   - *PM10 concentrations in air at sensitive receptors;*
>   - *environmental radiation monitoring results in accordance with the approved Radiation Management Plan, which will generally include:*
>   - *radon concentration in air;*
>   - *gross alpha activity concentration of airborne dust; and*
>   - *radionuclide concentrations in groundwater and surface water;*
>   - *discussion of any implications of the results of groundwater level monitoring on groundwater flow paths from Pit 23; and*
>   - *descriptions of any model review and recalibration completed and the results of subsequent model re-runs;*
> - *the maximum elevation of the upper surface of materials disposed of at the end of the reporting period;*
> - *a detailed discussion of all non-compliant events including progress toward resolution;*
> - *a summary of comments and complaints received and resulting actions;*
> - *plans for the next year; and*

- *discussion on other matters considered relevant by the Responsible Authority or Iluka.*

Deficiencies identified in an EMP and Rehabilitation Performance Report that can be addressed without amendment of this plan will be addressed as soon as practicable.

The EMP and Rehabilitation Performance Reports will be subject to review by an independent auditor as described in Section 13.2.

3 Delivery and Disposal of Materials into Pit 23

The tonnages of materials disposed into Pit 23 in accordance with the Incoming Waste Monitoring Plan (IWMP) are shown in Table 1 below.

Table 1: Production figures for the Iluka Murray Basin operations (May to December 2017)

Product	Product (tonnes)	Th (ppm)	U (ppm)
Dry circuit rejects	8,615	7,121	460
Wet circuit rejects	25,229	626	48
Baghouse dust filter bags	1.1	414*	23*
Total	**33,845.1**		

* Reference to 2011 analysis results

For the reporting period the average and maximum number of deliveries of materials for disposal per day was 3.6 and 10 respectively.

A radionuclide assessment of the 2017 baghouse filter bags has not been completed to-date but will be sent off in the foreseeable future for analysis, it is envisioned that results will be similar to those undertaken back in 2011 as shown in the above table.

4 Monitoring Results

4.1 Noise

In accordance with Section 10.1.4 of the endorsed EMP, noise level measurements will be undertaken in the unlikely event that complaints regarding noise levels are received.

No noise related complaints were received during the reporting period, and hence no noise levels measurements were undertaken.

4.2 PM10 concentrations in air

In accordance with Sections 9.6 and 10.1.4 of the endorsed EMP, the concentration of PM_{10} dust in air at the Lyon's, Rises and Chadwick's residences is measured using high volume ('hi-vol') air samplers on a one-in-six day monitoring cycle. The location of these hi-vol air samplers relative to Pit 23 are shown in Figure 4.

The PM_{10} results for the monitoring period are shown in Figure 3 below. There were no exceedances of the 0.06 mg/m^3 limit for PM_{10} limit during the reporting period.

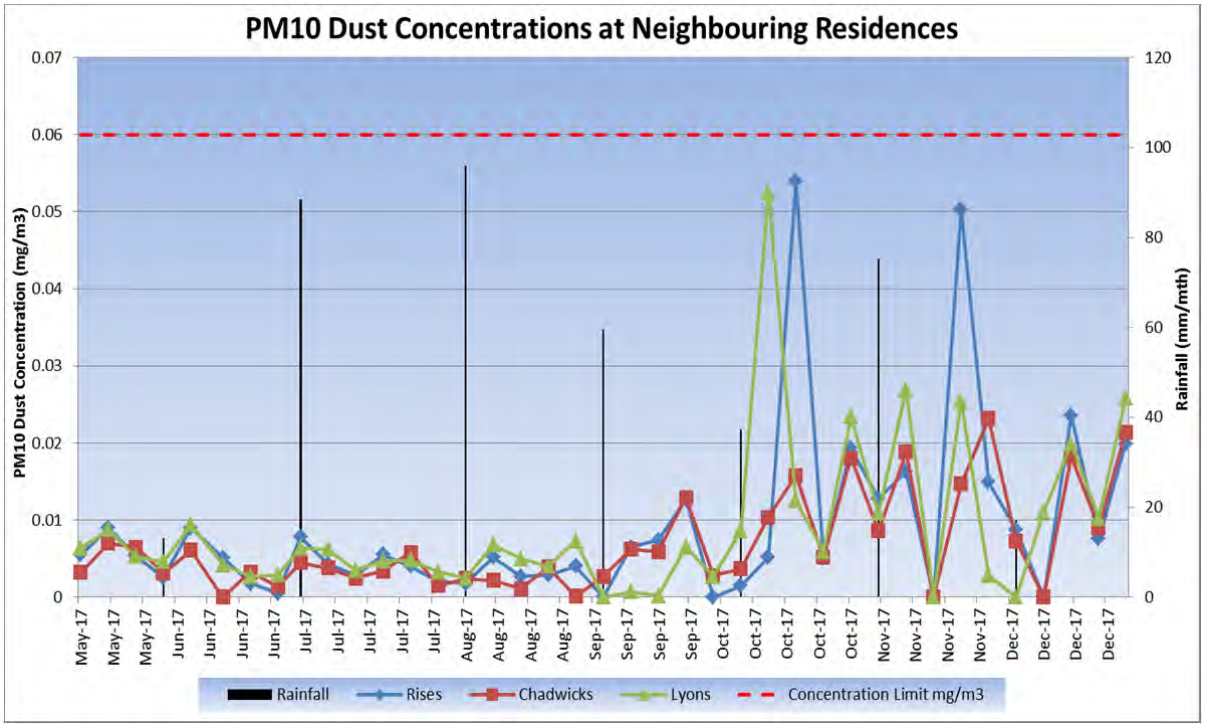


Figure 3: PM10 Dust concentrations at Neighbouring Residences

Pit 10
Chadwicks
Pit 23
Pit 9
Lyons
Pit 22
Pit 5
Pit 21
Pit 12
Pit 2
Pit 19
Pit 3
Pit 11
Pit 1
The Rises
N
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Legend

- PM10 monitoring
- Pit 23 crest
- Pit Crests

0 500 1,000 2,000 3,000 4,000 Meters

AIR QUALITY MONITORING LOCATIONS (PM10 - Hi Vols)

ILUKA

L:\Maps\2018\Unregistered\Douglas\mxd\Pit 23 Annual Report 2017

DRAWN: N. Travers

DATE:26/06/2018

FIGURE: 4

4.3 Environmental radiation monitoring

It is a requirement of Iluka Radiation Management Licence 300042022 that works relating to the minerals sands by-product disposal into Pit 23 are conducted in accordance with a Radiation Management Plan (RMP) and a Radioactive Waste Management Plan (RWMP), including the monitoring programs under those plans, to ensure that radiation doses are below the prescribed limit.

Radiation monitoring relevant to this Performance report includes:

- Radon concentration in air;
- Gross alpha activity concentration of airborne dust; and
- Radionuclide concentrations in groundwater and surface water.

These monitoring results are presented in the followings sections.

4.3.1 Radon concentrations in air

Monitoring of radon concentration in air at four locations within Pit 23 is undertaken using the Landauer “Radtrak” and “Radtrak2” radon and radon/thoron track etch detectors (Figure 5). The “Radtrak2” detectors supersede the “Radtrak” detectors which are no longer in supply.

Figure 5: Landauer "Radtrak" (left) and "Radtrak2" (right) track etch detectors

Radon and Thoron monitoring results for the reporting period are presented in Figure 6 and Figure **7**. Detailed data results for the measured Radon and Thoron monitoring results are provided in Section 7.1 – Appendix A.

Monitoring results indicate that Radon and Thoron concentrations in air during the reporting period were well under the threshold limits of 100 Bq/m^3 and 1,000 Bq/m^3, respectively.

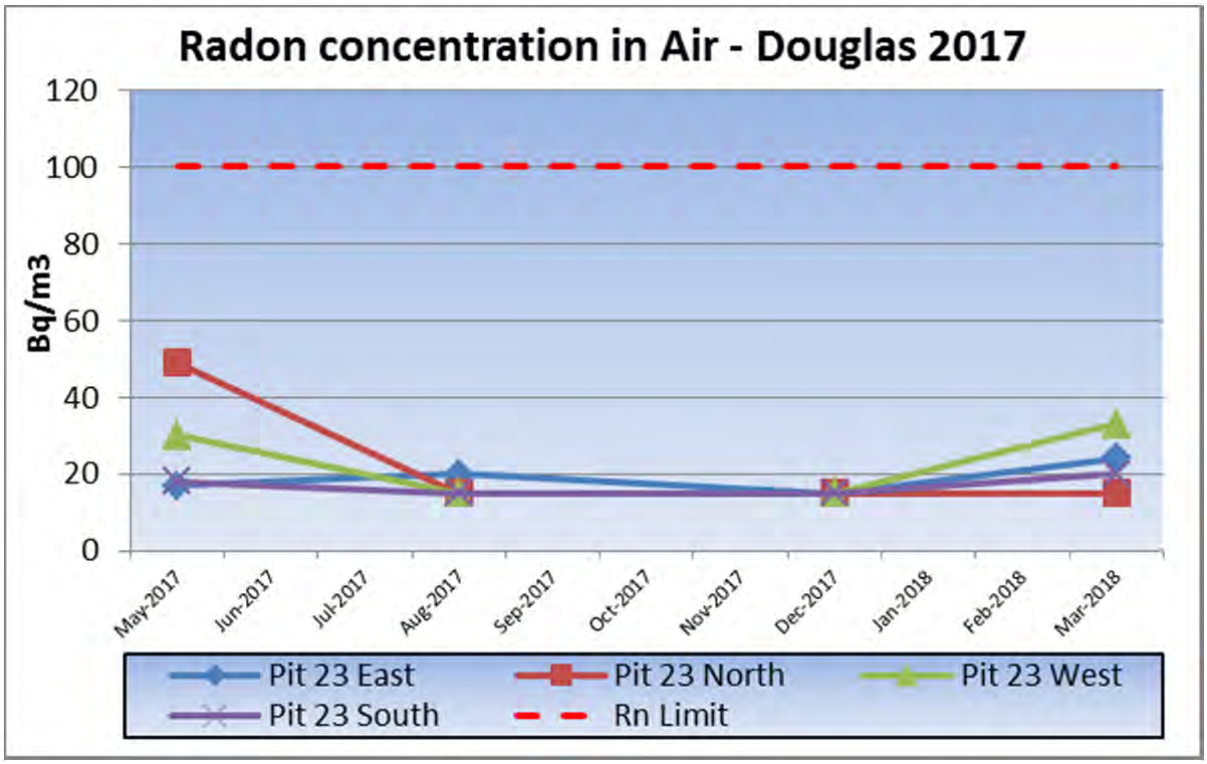


Figure 6: Radon concentration in air at Douglas 2017

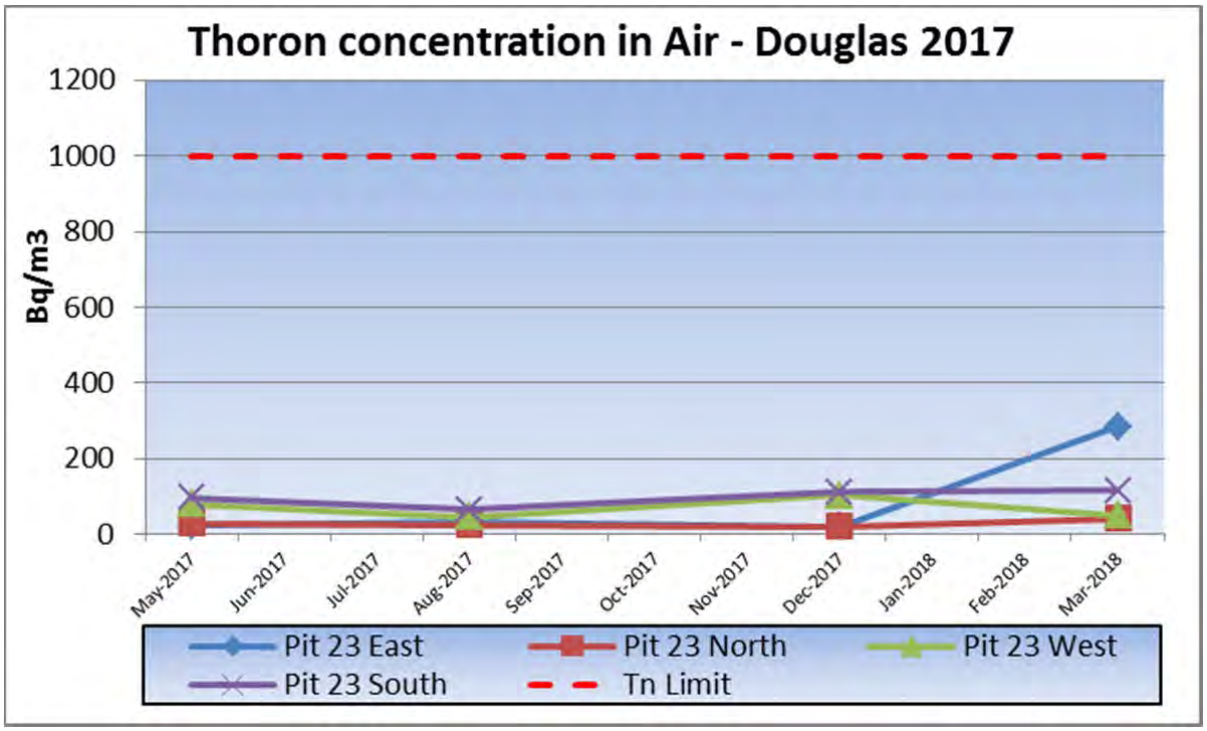


Figure 7: Thoron concentration in air at Douglas 2017

4.3.2 Gross alpha concentrations in airborne dust

As noted in Section 4.2, sampling for airborne particulates in PM_{10} dust is conducted using high volume air samplers, located at the in the vicinity of the Chadwick's, Lyons and Rises residences (see Figure 4).

For the purposes of monitoring gross alpha concentration in air, hi-vol samples are collected for a continuous 96 hour period every quarter, representing a total air sample volume of approximately 6,000 m^3. The filters are weighed to determine the total dust loading in mg/m^3 and then analysed for gross alpha activity, which is expressed as millibequerels/m^3 (mBq/m^3). The results for the monitoring period are shown in Table 2.

Table 2: Gross Alpha Radiation in PM10 dust

Location (Douglas)	Date	Sample No.	Run Time (Hrs)	Air Volume (m^3)	Activity Conc (mBq/m^3)
Chadwick's	1/07/2017	1244	95:45	6111	0.37
Lyons	14/06/2017	1225	95:08	6196	0.89
Rises	14/06/2017	1226	95:08	6107	0.87
Chadwick's	23/10/2017	B2	95:46	6037	0.15
Lyons	23/10/2017	B3	95:46	6020	0.20
Rises	23/10/2017	B4	95:45	6476	0.17
Chadwick's	16/12/2017	C4	95:45	5761	0.12
Lyons	16/12/2017	C5	95:46	5737	0.12
Rises	16/12/2017	C3	95:46	7090	0.12

4.3.3 Radionuclide concentrations in groundwater

Section 7.6.1 of the EMP prescribes the groundwater monitoring points and biannual frequency of monitoring; Section 7.6.7 of the EMP prescribes the laboratory analysis suite which includes target radionuclides (thorium, uranium, radium-226, radium-228 and uranium-238).

Radionuclide concentration results obtained in accordance with this schedule are presented in Table 3.

Iluka notes that several monitoring bores proposed for installation in the EMP will be installed as part of a drilling program in H1 2018. This drill program will include the drilling of a replacement bore for BW45, which is dry.

Table 3: Radionuclide concentrations in groundwater (May to December 2017)

Groundwater Bore ID	Date	Thorium (mg/L)	Uranium (mg/L)	U238 (Bq/L)	Ra226 (Bq/L)	Ra228 (Bq/L)
Precautionary trigger		*n/a*	*0.17*	*0.17*	*4.3*	*1.7*
Upper trigger		*n/a*	*0.2*	*0.2*	*5.0*	*2.0*
BW5	12/07/2017	<0.002	0.003	<0.025	<0.05	<0.08
BW28A	12/07/2017	<0.002	0.003	0.037	0.23	0.1
BW36	12/07/2017	<0.002	<0.001	<0.025	0.2	0.23
BW53 (“Puls”)	12/07/2017	0.0067	<0.001	<0.025	0.06	0.12
IWB2	12/07/2017	<0.002	<0.001	<0.025	<0.05	0.09
IWB6	12/07/2017	<0.002	<0.001	<0.025	0.07	<0.08
WRK300	26/07/2017	<0.002	<0.002	<0.025	<0.05	<0.08
WRK301	26/07/2017	<0.002	0.006	0.074	0.14	0.13
WRK302	26/07/2017	<0.002	<0.002	<0.025	0.25	1.12
WRK303	26/07/2017	<0.002	<0.002	<0.025	<0.05	<0.08
WRK304	26/07/2017	<0.002	<0.002	<0.025	<0.05	<0.08

NOTE: Where concentrations are reported as below the laboratory limit of reporting / limit of detection (as indicated by “<”) the numerical value is assumed as the actual concentration for purposes of reporting and graphical representation.

The monitoring results for radionuclides in groundwater obtained during the reporting period confirm nil exceedences of any precautionary trigger level or upper trigger level.

4.3.4 Radionuclide concentrations in surface water

Section 7.9.1 of the EMP prescribes the locations for surface water monitoring and the monitoring frequency, as summarised in Table 4. These locations are subject to sampling and laboratory analysis for radionuclides (thorium, uranium, radium-226, radium-228 and uranium-238).

Radionuclide monitoring results for the reporting period are presented in Figure 8, Figure 9 and Figure 10. The corresponding monitoring data for radionuclides in surface water is provided in Section 7.2 - Appendix B. Due to a misunderstanding by the sampling contractor no uranium-238 analysis was conducted on collected surface water samples during 2017.

Table 4: Monitoring program – radionuclide concentrations in surface water

Surface water monitoring locations	Frequency
SW14 – Costello’s Creek SW5b – White Lake SW24 – McGlashin’s Swamp SW20 – North-west drainage line SW 22 – Southern Drainage Line	• Quarterly; or • During or following an off-site discharge event (creek and drainage lines only)

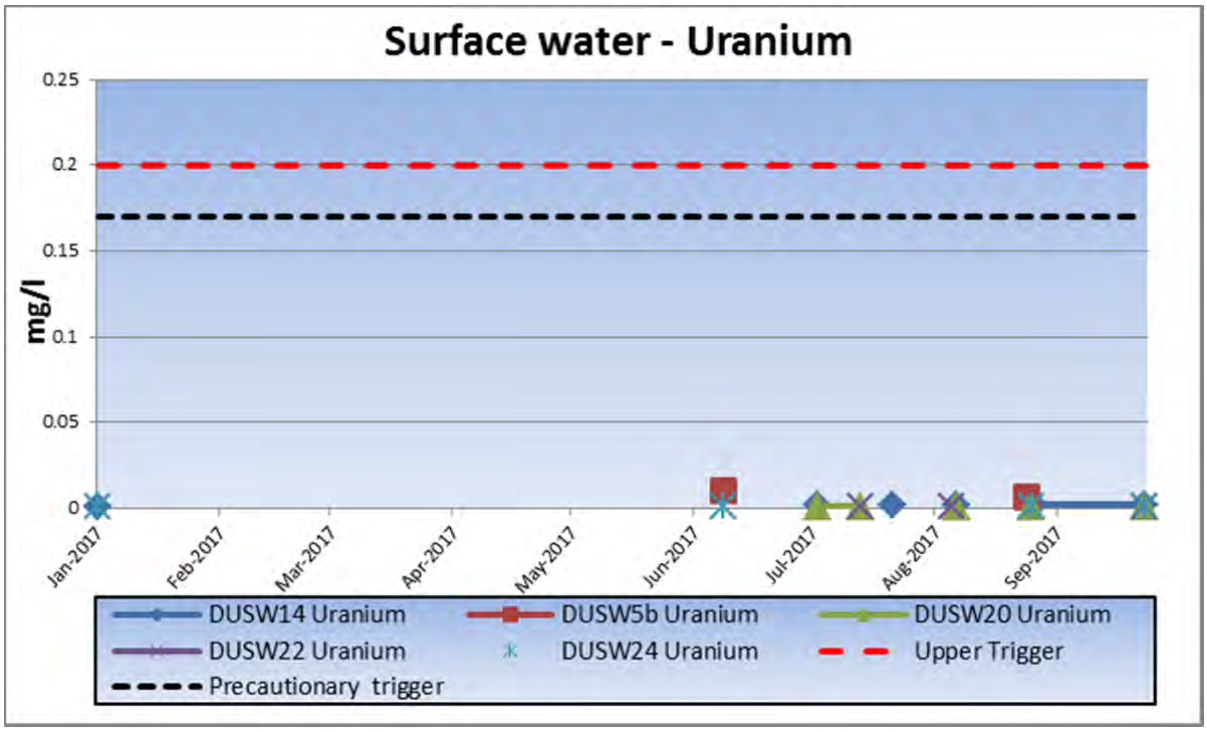


Figure 8: Uranium concentrations in Douglas Surface Water Sampling Locations

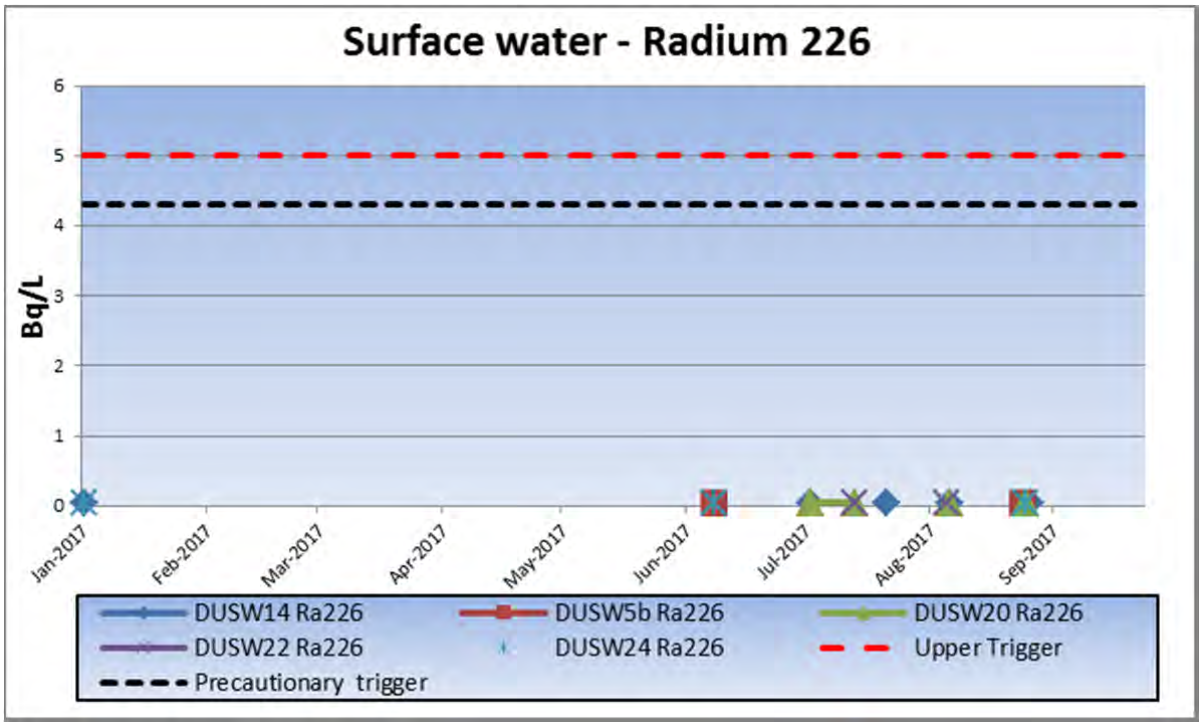


Figure 9: Radium 226 concentrations in Douglas Surface Water Sampling Locations

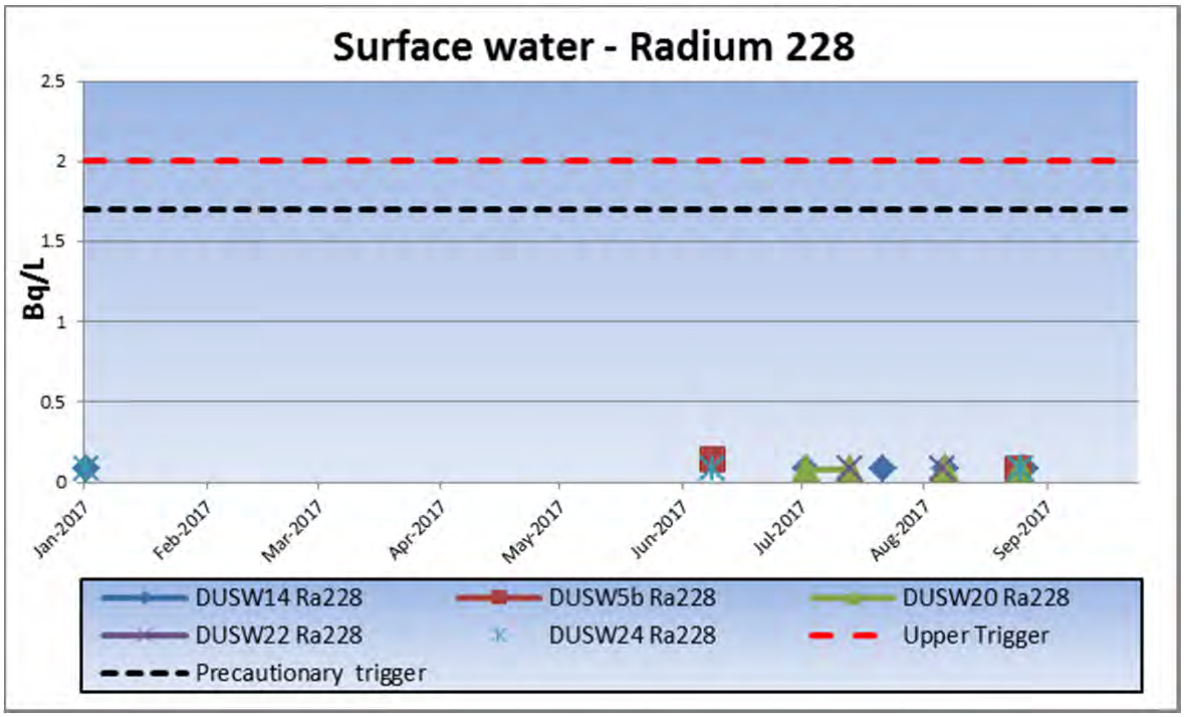


Figure 10: Radium 228 concentrations in Douglas Surface Water Sampling Locations

The monitoring results for radionuclides in surface water obtained during the reporting period confirm nil exceedances of any precautionary trigger level or upper trigger level. Further, no off-site discharges from the confines of Pit 23 or immediate area occurred.

4.4 Groundwater levels

In accordance with Section 7.9.1 of the EMP, groundwater levels are measured on a monthly basis at bores WRK300 – WRK304 inclusive, GW1 to GW7 inclusive, BW36 and BW45. The results of the groundwater level monitoring for the reporting period are shown in Figure 11.

No data is available for BW45 as this bore is dry and scheduled for replacement in 2018.

Monitoring of groundwater level was missed at BW36 for November and December 2017. However, levels were obtained in January 2018 which confirmed that standing water levels were in line with historical levels in bore BW36.

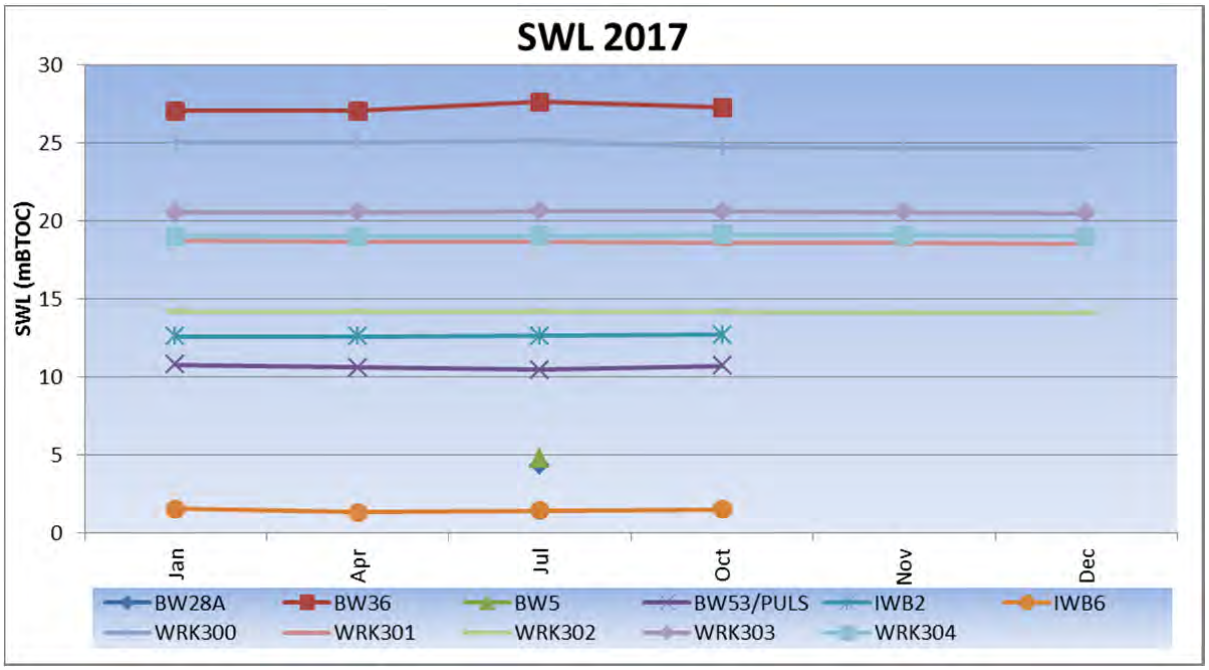


Figure 11: Douglas Groundwater Monitoring – Standing Water Levels, 2017

4.5 Groundwater quality

In accordance with Section 7.6.7 of the EMP, biannual groundwater samples obtained from the monitoring locations are subjected to in-field and laboratory analysis for a suite of target parameters.

The initial sampling round following issue of Planning Permit 15-105 and HRCC endorsement of the Pit 23 EMP was undertaken in July 2017, with the closest prior analysis completed 18 months earlier. Given this insufficient data, no comparative analysis of groundwater quality is possible within the 2017 reporting period and therefore will be undertaken in the following reporting period and presented in the 2018 report when sufficient data is available.

The results of the groundwater quality monitoring for the reporting period are shown in Section 6.3 Appendix C.

4.6 Surface water quality

4.6.1 Surface water potentially impacted by runoff from disturbed areas

In accordance with Section 8.7.1 of the EMP, surface water samples must be obtained from nominated surface water monitoring points if a discharge of run-off from the disturbed area of Pit 23 and surrounds occurs.

No discharges occurred during the reporting and consequently no follow-up monitoring was required.

4.6.2 Surface water potentially impacted by groundwater

In accordance with Section 8.7.2 of the EMP, surface water samples obtained from the monitoring locations each quarter are subjected to laboratory analysis for a suite of target parameters to identify the potential expression of Pit 23 groundwater seepage into surface waters.

Assessment of potential Pit 23 seepage and expression into surface waters is based on an analysis of chloride/sulphate and sodium/calcium ratios obtained from quarterly monitoring, with a reduction in either ratio by more than 10% applied as potential indicator of Pit 23 seepage and

expression at surface. The analysis of quarterly ionic ratio results for nominated surface water monitoring locations during the reporting period are given in Table 5.

Table 5: Surface water monitoring locations - ionic ratio balance results

Sample Point	Sample Date	Chloride (mg/L)	Sulfate (mg/L)	Chloride/Sulphate	Reduction in ratio	Confirmed repeated exceedence	Sodium (mg/L)	Calcium (mg/L)	Sodium/Calcium	Reduction in ratio	Confirmed repeated exceedence
DG_A_I_SW_DUSW5B	26/06/2017	100000	8300	12.05			53000	1700	31.176		
DG_A_I_SW_DUSW5B	11/09/2017	3200	390	8.21	32%		1800	130	13.846	56%	
DG_A_I_SW_DUSW5B	11/10/2017	44000	5200	8.46	-3%	No	23000	1400	16.429	-19%	No
DG_A_I_SW_DUSW5B	15/01/2018	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*
DG_A_I_SW_DUSW14	26/06/2017	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*
DG_A_I_SW_DUSW14	13/09/2017	190	34	5.59			130	13	10.000		
DG_A_I_SW_DUSW14	11/10/2017	1400	260	5.38	4%		850	49	17.347	-73%	
DG_A_I_SW_DUSW14	15/01/2018	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*
DG_A_I_SW_DUSW20	26/06/2017	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*
DG_A_I_SW_DUSW20	12/09/2017	360	61	5.90			230	27	8.519		
DG_A_I_SW_DUSW20	11/10/2017	1100	150	7.33	-24%		630	71	8.873	-4%	
DG_A_I_SW_DUSW20	15/01/2018	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*	*DRY*
DG_A_I_SW_DUSW22	26/06/2017	*DNS*	*DNS*	*DNS*	*DNS*	*DNS*	*DNS*	*DNS*	*DNS*	*DNS*	*DNS*
DG_A_I_SW_DUSW22	23/08/2017	190	35	5.43			110	14	7.857		
DG_A_I_SW_DUSW22	11/10/2017	1700	180	9.44	-74%		840	91	9.231	-17%	
DG_A_I_SW_DUSW22	15/01/2018	470	17	27.65	-193%		240	27	8.889	4%	
DG_A_I_SW_DUSW24	26/06/2017	530	8	66.25			430	87	4.943		
DG_A_I_SW_DUSW24	12/09/2017	500	38	13.16	80%		330	62	5.323	-8%	
DG_A_I_SW_DUSW24	11/10/2017	530	46	11.52	12%	Yes	360	69	5.217	2%	
DG_A_I_SW_DUSW24	15/01/2018	970	68	14.26	-24%		690	42	16.429	-215%	

DNS= Sample not taken

Per Table 5, monitoring data for DUSW24 (McGlashin's Swamp) indicated a reduction in the chloride/sulphate ratio by >10% between the June and September 2017 monitoring results.

Follow up sampling and analysis in October, as required under the EMP, showed that the chloride/sulphate ratio at DUSW24, although significantly reduced from 80% to 12%, was still greater than 10% ratio trigger.

Where consecutive results show a 10% reduction in the ionic balance at a nominated monitoring location, and may indicate potential seepage from Pit 23, the EMP requires that:

- *the timing of seepage from Pit 23 reaching the monitoring location will be compared with that predicted by the hydrogeological model and if there is variance of more than 10% the model will be recalibrated and the impact assessment re-examined.*
- *the full suite of analysis will be compared with trigger values, defined as follows:*
    - *Precautionary trigger value, set at 85% of the WoV SEPP objective or 85% of the background value, as defined below, whichever is the greater; and*
    - *Upper trigger value, set at the WoV SEPP objective or the background value, as defined below, whichever is the greater.*
- *If the average of the two results is greater than the precautionary trigger value, the following will occur:*
    - *Investigations to determine the cause of the indicated impact;*
    - *Increasing monitoring frequency in order to assess trends and understand processes occurring;*
    - *Possible analytical and/or numerical modelling to help determine the cause of impact.*

- *If the average of the two results is greater than the upper trigger value and exception report, as described in Section 12 of this document, will be prepared and submitted. The exception report will indicate a plan for remediation/prevention that may include any of all the following:*
    - *Further investigation of the cause, if not adequately understood;*
    - *Detailed impact assessment based on recalibrated models;*
    - *Development and implementation of strategies to prevent future unacceptable results or to mitigate any impacts, potentially including groundwater abstraction immediately adjacent and down-gradient of Pit 23; and*
    - *Reducing or ceasing the disposal of materials to Pit 23 until observations are stabilised and/or at acceptable levels if:*
        - *A change in the sodium/calcium or chloride/sulphate ratios is detected;*
        - *The change is found to due to seepage from Pit 23; and*
        - *The elevated result is assessed to be resulting in an unacceptable impact.*

Consistent with the above process, the following was identified:

- The hydrogeological model developed by CDM Smith (2015) predicted seepage from Pit 23 to reach McGlashin's Swamp (DUSW24) in the year 2160, or at least 143 years later than potentially indicated by the above chloride/sulphate results (less than 1 year).
- With respect to full-suite water quality analysis undertaken for sampling point DUSW24 (see Table 6) the following are noted:
    - For key indicators (pH, electrical conductivity, aluminium, total phosphorous and total nitrogen) sufficient data was available from monitoring conducted between January 2017 and January 2018 to determine background concentrations for these indicators, which are determined as the 75th percentile value based on the mean and standard deviation of the available data. For DUSW24, these 75th percentile (background) values are higher than the standard SEPP WoV objectives, and therefore apply as the upper trigger (background) values for the following step;
    - Comparison of the average of the two samples obtained within the reporting period (12/9/2017 and 11/10/2017) against the 75th percentile precautionary and upper trigger levels for DUSW24 indicated an exceedance of the *precautionary* trigger values for pH and electrical conductivity. Per the EMP, where this occurs:
        - investigation is required to determine the cause of the indicated impact;
        - the monitoring frequency shall be increased to assess trends and understand the processes occurring; and
        - consideration is given to analytical and/or numerical modelling to help determine cause of impact.

It is considered that the above observation at DUSW24 is the product of natural variation rather than the expression of any groundwater seepage from Pit 23 on the basis that:

- the difference between predicted seepage rates and expression at DUSW24, as compared to that potentially indicated in the ionic-balance data, is significant and unlikely based on hydraulic conductivity of the underlying lithology; and
- no indication of potential seepage was observed in other groundwater-seepage monitoring points, including the monitoring location closest to Pit 23 (DUSW20).

Notwithstanding the above, the requirement to update the hydrogeological model and impact assessment has been triggered based on the potential variance in predicted versus actual

seepage rates, and uncertainty in groundwater quality trends. This work will be undertaken in 2018 and outcomes reported in the 2018 EMP and Rehabilitation Performance Report.

Iluka notes that the monitoring frequency has already been increased to meet the required actions and obtain additional data required for this review.

Table 6: Surface water trigger levels – DUSW24 (McGlashin's Swamp)

DUSW24 (McGlashin Swamp)	Aluminium (mg/L)	Electrical Conductivity (uS/cm)	Total Nitrogen (mg/L)	pH	Total Phosphorous (mg/L)
19/01/2017	0.30	1500	1.20	8.57	1.66
26/06/2017	0.47	2530	5.00	8.91	1.80
12/09/2017	0.45	2120	2.80	8.61	0.92
11/10/2017	0.09	2290	3.00	9.61	0.69
15/01/2018	0.04	3710	4.60	10.40	0.35
Count	5	5	5	5	5
Max	0.47	3710	4.60	10.40	1.80
Min	0.04	1500	1.20	8.57	0.35
Average	0.27	2430	3.32	9.22	1.08
SD	0.20	811	1.53	0.78	0.63
WOV SEPP Objectives	0.08	1500	0.9	8.3	0.04
75%ile(background)	0.45	2530	4.60	9.61	1.66
Precautionary Trigger	**0.38**	**2151**	**3.91**	**8.17**	**1.41**
Upper Trigger	**0.45**	**2530**	**4.60**	**9.61**	**1.66**
2 Sample Average*	0.27	2205	2.9	9.11	0.805

*=The 2 sample average was calculated from data taken on the 26/9/17 and 11/10/17

Yellow shaded cells indicate values above the precautionary trigger

5 Management Actions

5.1 Monitoring bore audits

In accordance with Section 7.6.2 of the EMP, audits of the monitoring bore network are undertaken on monthly or bi-annually and outcomes reported annually within this EMP and Rehabilitation Performance Report.

Bore integrity (e.g. physical condition, blocked/dry or poor yield) is assessed as part of the groundwater monitoring program. Outcomes of monitoring bore audits performed during the reporting period are summarised in Table 7.

Table 7: Monitoring bore audit results, 2017

Well ID	Jul 2017	Aug 2017	Sep 2017	Oct 2017	Nov 2017	Dec 2017
WRK300	OK	NA	NA	OK	OK	OK
WRK301	OK	OK	OK	OK	OK	OK
WRK302	OK	OK	OK	OK	OK	OK
WRK303	OK	OK	OK	OK	OK	OK
WRK304	OK	OK	OK	OK	OK	OK
GW1	To be constructed – works scheduled in 2018					
GW2	To be constructed – works scheduled in 2018					
GW3	To be constructed – works scheduled in 2018					
GW4	To be constructed – works scheduled in 2018					
GW5	To be constructed – works scheduled in 2018					
GW6	To be constructed – works scheduled in 2018					
GW7	To be constructed – works scheduled in 2018					
GW8	To be constructed – works scheduled in 2018					
BW5	OK	NA	NA	NA	NA	NA
BW28A	OK	NA	NA	NA	NA	NA
BW36	OK	NA	NA	OK	OK	OK
BW45	To be re-drilled or replaced – works scheduled in 2018					
BW53	OK	NA	NA	OK	NA	NA
IWB2	OK	NA	NA	OK	NA	NA
IWB6	OK	NA	NA	OK	NA	NA

N/A = No sampling occurred therefore no audit completed

5.2 Groundwater flow paths from Pit 23

In accordance with Section 7.9.1 of the EMP, groundwater levels measured at bores WRK300 – WRK304 inclusive, GW1 to GW7 inclusive, GW9, BW36 and BW45 are used to construct groundwater contours in the area of Pit 23 and surrounds and infer groundwater flow paths from Pit 23, with these levels and flow paths compared with the groundwater levels and flow paths predicted by the hydrogeological model.

Interpreted groundwater level contours as at June 2018, compared against the original 2015 contours, are given in Figure 12 (EMM, 2018). From these updated contours it is demonstrated that:

- Groundwater contours and flow-paths are consistent between the 2018 and 2015 data; and
- Groundwater flow from Pit 23 is still to the north.

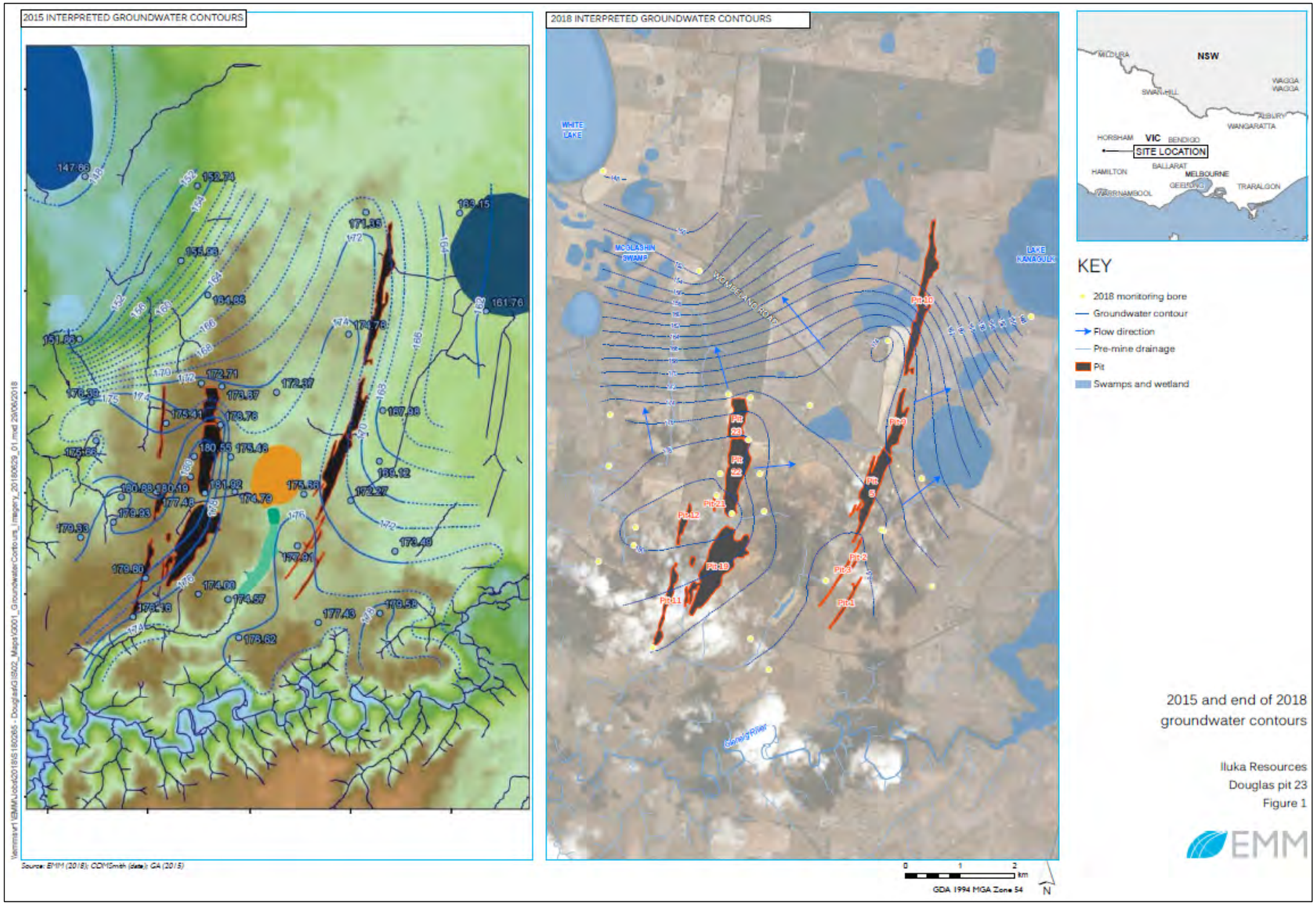


Figure 12: Douglas Groundwater contours and flow paths, as at June 2018

5.3 Groundwater model review and recalibration

Sections 7.10 and 8.7.2 of the endorsed EMP outlines the circumstances that will trigger a review and recalibration of the hydrogeological model. The requirement for review and recalibration was triggered during the reporting period as a result of surface water analysis indicating potential groundwater seepage via a reduction of the chloride/sulphate ratio greater than 10% at DUSW24 (McGlashin's Swamp) in quarter 3, 2017. A consultant has been engaged to review the data and groundwater model and re-examine the impact assessment.

5.4 Maximum surface level of disposed materials in Pit 23

In accordance with Section 7.9.1 of the EMP, the maximum elevation of the upper surface of materials disposed of at the end of the reporting period must be reported.

A survey undertaken on the 8th of December 2017 confirms that this level was 193mAHD[1].

5.5 Non-compliances

The following administrative non-compliances are declared:

- Sampling for Uranium-238 concentrations in surface water missed for surface water monitoring points DUSW5b, DUSW14, DUSW20, DUSW22 and DUSW24.
- Sampling for full suite analysis for concentrations in surface water missed for the surface water monitoring point DUSW22 for quarter 2, 2017.
- Sampling for Radium-226 and Radium-228 concentrations in surface water monitoring points DUSW5b, DUSW14, DUSW20, DUSW22 and DUSW24 was missed for quarter 4, 2017.
- Groundwater standing water level was missed at BW36 for November and December 2017; follow-up measurement in January 2018 confirms standing water levels are in line with historical levels.

These missed sampling events have been addressed with the Iluka contractor who is engaged to undertake groundwater and surface water monitoring.

5.6 Comments and complaints received

No complaints or comments were received during the reporting period.

5.7 Plans for next reporting period

The following activities are proposed for the 2018 reporting period:

- Installation of proposed groundwater monitoring bores (GW1, GW2, GW3, GW4, GW5, GW6, GW7, GW8, BW23A and BW45A).
- Increase monitoring frequency of surface water locations that have shown indication of potential seepage from Pit 23 and to assist with the recalibration of the groundwater model.
- Commission an update of the hydrogeological model and impact assessment to validate or adjust existing model predictions on Pit 23 seepage.

[1] mAHD = metres Australian Height Datum

5.8 Other matters

None identified.

6 References

EMM (2018) Memorandum to Iluka Resources Ltd – Douglas Pit 23 Compliance Reporting FY17/18: Groundwater contours and flow-paths, 29th June 2018.

CDM Smith (2014) Douglas Mine Site Hydrogeological Modelling. Completed on behalf of Iluka Resources, November 2014

CDM Smith (2015) Douglas Mine – Particle Tracking of Seepage Water. Completed on behalf of Iluka Resources, February 2015

7 Appendices

7.1 Appendix A: Monitoring Data – Radiation – Track Etch Detectors

Detector Number	Start date	End date	Location	Detector Type	Ave Rn Conc Bq/m^3	Ave Tn Conc Bq/m^3
191562-8 660102-5	22/02/2017	26/05/2017	Pit 23 east	Radon & thoron pair	17+/- 6	22 +/- 18
909679-3 660228-8	22/02/2017	26/05/2017	Pit 23 north	Radon & thoron pair	49 +/- 8	<30
140796-4 660531-5	22/02/2017	26/05/2017	Pit 23 west	Radon & thoron pair	30 +/- 8	80 +/- 28
170403-0 660201-5	22/02/2017	26/05/2017	Pit 23 south	Radon & thoron pair	18 +/- 6	96 +/- 24
198037-4 229836-6	26/05/2017	23/08/2017	Pit 23 east	Radon & thoron pair [#]	20	34
101953-8 177868-7	26/05/2017	23/08/2017	Pit 23 north	Radon & thoron pair [#]	15	24
115548-0 229901-4	26/05/2017	23/08/2017	Pit 23 west	Radon & thoron pair [#]	15	47
606645-0 229781-0	26/05/2017	23/08/2017	Pit 23 south	Radon & thoron pair [#]	15	64
6013087-6 466388-6	23/08/2017	13/12/2017	Pit 23 east	Radon & thoron pair [#]	15	21
117789-8 466372-0	23/08/2017	13/12/2017	Pit 23 north	Radon & thoron pair [#]	15	20
133730-2 660153-8	23/08/2017	13/12/2017	Pit 23 west	Radon & thoron pair [#]	15	102
401783-6 660202-3	23/08/2017	13/12/2017	Pit 23 south	Radon & thoron pair [#]	15	111
687417-6 660154-6	13/12/2017	8/03/2018	Pit 23 east	Radon & thoron pair [#]	24	285
400375-7 660198-3	13/12/2017	8/03/2018	Pit 23 north	Radon & thoron pair [#]	15	41
116814-5 660074-6	13/12/2017	8/03/2018	Pit 23 west	Radon & thoron pair [#]	33	50
780932-0 660568-7	13/12/2017	8/03/2018	Pit 23 south	Radon & thoron pair [#]	20	115

[#] Landauer “Radtrak2” track etch detector

7.2 Appendix B: Monitoring Data – Radiation – Surface Water

Surface Water Point ID		Date	Thorium (mg/L)	Uranium (mg/L)	Ra^{226} (Bq/L)	Ra^{228} (Bq/L)
White Lake	DUSW5b	26/06/2017	<0.02	<0.01	<0.05	0.14
McGlashin's Swamp	DUSW24	26/06/2017	<0.001	<0.001	<0.05	<0.08
Spring Creek	DUSW14	26/06/2017	DRY	DRY	DRY	DRY
Southern drainage line	DUSW22	26/06/2017	DNS	DNS	DNS	DNS
North-west drainage line	DUSW20	26/06/2017	DRY	DRY	DRY	DRY
Southern drainage line	DUSW22	23/08/2017	<0.002	<0.001	<0.05	<0.08
White Lake	DUSW5b	11/09/2017	0.0095	0.006	<0.05	<0.08
North-west drainage line	DUSW20	12/09/2017	<0.002	<0.001	<0.05	<0.08
McGlashin's Swamp	DUSW24	12/09/2017	<0.002	<0.001	<0.05	<0.08
Spring Creek	DUSW14	13/09/2017	<0.002	<0.001	<0.05	<0.08
Southern drainage line	DUSW22	11/10/2017	<0.002	<0.001	DNS	DNS
Spring Creek	DUSW14	11/10/2017	<0.002	<0.001	DNS	DNS
North-west drainage line	DUSW20	11/10/2017	<0.002	<0.001	DNS	DNS
McGlashin's Swamp	DUSW24	11/10/2017	<0.002	<0.001	DNS	DNS
White Lake	DUSW5b	11/10/2017	<0.002	0.02	DNS	DNS

DNS = did not sample

7.3 Appendix C: Monitoring Data – Groundwater Quality

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	410
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	36
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	470
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	34
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	34
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	14
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	220
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	360
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	100
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	30
Alkalinity (Bicarbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	34
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0
Alkalinity (Carbonate) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0
Alkalinity (Hydroxide) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	410
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	36
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	470
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	34
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	34

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	14
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	220
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	360
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	100
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	30
Alkalinity (Total) as CaCO3	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	34
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	1.1
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.15
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.22
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	2.4
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.11
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.19
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.25
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.44
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.2
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.13
Aluminium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.06
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	2.6
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.13
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.32
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.27
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.09
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.02
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.19
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.27
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.39
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.12
Ammonia Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.08
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	200
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	72
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	230
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	9.7
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	41
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	15
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	61
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	110
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	220
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	71
Anions (Total)	meq/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	69
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	1.1

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.005
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.008
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.028
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.003
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.006
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.003
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.004
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.003
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.003
Arsenic (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.009
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.19
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.021
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.024
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.025
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.004
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.021
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.033
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.022
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.022
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.027
Barium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.021
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.93
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.16
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	1.3
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.14
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.09
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.06
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.17
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.69
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	1.7
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.45
Boron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.55
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.0002

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.0002
Calcium	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	470
Calcium	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	74
Calcium	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	210
Calcium	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	10
Calcium	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	10
Calcium	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	5.8
Calcium	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	130
Calcium	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	240
Calcium	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	470
Calcium	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	93
Calcium	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	81
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	210
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	68
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	260
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	10
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	39
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	15
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	61
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	100
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	200
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	65
Cations (Total)	meq/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	65
Chloride	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	6300
Chloride	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	2200
Chloride	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	7000
Chloride	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	200
Chloride	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	1300
Chloride	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	360
Chloride	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	1800
Chloride	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	3100
Chloride	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	6700
Chloride	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	2100
Chloride	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	2000
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.005
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.01

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.002
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.004
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.007
Chromium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.033
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.042
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.005
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.001
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.003
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.002
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.004
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.003
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.037
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Cobalt (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.007
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.006
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.002
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.003
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.003
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_BW28A	13/07/2017	19830
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_BW36	12/07/2017	7270
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_BW5	13/07/2017	22600
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	1026
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_IWB2	12/07/2017	4420
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_IWB6	12/07/2017	1673
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_WRK300	26/07/2017	6300
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_WRK301	26/07/2017	11000
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_WRK302	25/07/2017	19820
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_WRK303	25/07/2017	7030
Electrical Conductivity	µS/cm	Douglas	DG_A_I_PZ_WRK304	25/07/2017	7050

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Fluoride	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.5
Fluoride	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.34
Fluoride	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.68
Fluoride	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.5
Fluoride	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.18
Fluoride	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.1
Fluoride	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.38
Fluoride	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.56
Fluoride	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	1
Fluoride	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	1
Fluoride	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.39
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	11
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.16
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.39
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	6
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.06
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.18
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.16
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.06
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.01
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.07
Iron (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.01
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.005
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.004
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
Magnesium	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	530
Magnesium	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	110
Magnesium	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	410
Magnesium	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	15
Magnesium	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	110
Magnesium	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	20
Magnesium	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	120

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Magnesium	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	240
Magnesium	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	420
Magnesium	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	100
Magnesium	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	91
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	4.5
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.009
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.087
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.017
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.012
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.01
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.17
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.16
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.02
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.005
Manganese (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.005
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.0004
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.0001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.002
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.002
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.012
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.002
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Molybdenum (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.009
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.007
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.006
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.004
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.001
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.032
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.011
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.022
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.002
Nickel (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.002
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.07
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	7.3
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.74
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	7
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	4.7
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	8.5
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	3.8
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.08
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.39
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	5.1
Nitrate Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	2.9
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.015
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.001
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.013
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.003
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.001
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.001
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.002
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Nitrite Nitrogen	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
pH	pH units	Douglas	DG_A_I_PZ_BW28A	13/07/2017	6.76
pH	pH units	Douglas	DG_A_I_PZ_BW36	12/07/2017	5.4
pH	pH units	Douglas	DG_A_I_PZ_BW5	13/07/2017	7.23
pH	pH units	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	6.64
pH	pH units	Douglas	DG_A_I_PZ_IWB2	12/07/2017	5.12
pH	pH units	Douglas	DG_A_I_PZ_IWB6	12/07/2017	5.23
pH	pH units	Douglas	DG_A_I_PZ_WRK300	26/07/2017	6.79
pH	pH units	Douglas	DG_A_I_PZ_WRK301	26/07/2017	7.19
pH	pH units	Douglas	DG_A_I_PZ_WRK302	25/07/2017	6.1
pH	pH units	Douglas	DG_A_I_PZ_WRK303	25/07/2017	5.92

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
pH	pH units	Douglas	DG_A_I_PZ_WRK304	25/07/2017	6.13
Potassium	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	41
Potassium	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	19
Potassium	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	73
Potassium	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	24
Potassium	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	4.8
Potassium	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	1.6
Potassium	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	14
Potassium	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	24
Potassium	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	26
Potassium	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	10
Potassium	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	16
Radium 226	Bq/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.23
Radium 226	Bq/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.2
Radium 226	Bq/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.05
Radium 226	Bq/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.06
Radium 226	Bq/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.05
Radium 226	Bq/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.07
Radium 226	Bq/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.05
Radium 226	Bq/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.14
Radium 226	Bq/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.25
Radium 226	Bq/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.05
Radium 226	Bq/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.05
Radium 228	Bq/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.1
Radium 228	Bq/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.23
Radium 228	Bq/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.08
Radium 228	Bq/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.12
Radium 228	Bq/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.09
Radium 228	Bq/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.08
Radium 228	Bq/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.08
Radium 228	Bq/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.13
Radium 228	Bq/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	1.12
Radium 228	Bq/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.08
Radium 228	Bq/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.08
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.002
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.003
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.011
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.001
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.002

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.003
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.006
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.012
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.023
Selenium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.013
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
Sodium	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	3300
Sodium	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	1300
Sodium	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	4200
Sodium	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	180
Sodium	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	670
Sodium	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	290
Sodium	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	1000
Sodium	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	1600
Sodium	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	3300
Sodium	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	1200
Sodium	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	1200
Sulphate	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	850
Sulphate	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	420
Sulphate	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	960
Sulphate	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	130
Sulphate	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	150
Sulphate	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	200
Sulphate	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	320
Sulphate	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	640
Sulphate	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	1400
Sulphate	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	570
Sulphate	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	500
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.002

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.0067
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.002
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	14000
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	4300
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	14000
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	690
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	2600
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	1200
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	3500
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	5800
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	13000
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	4100
Total Dissolved Solids	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	4100
Uranium	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.003
Uranium	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.006
Uranium	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.002
Uranium	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.002
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.003
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.003
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.006
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.001

Variable	Unit	Site	Sample Point (Bore ID)	Date	Result
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.001
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.037
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.025
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.025
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.025
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.025
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.025
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.025
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.074
Uranium 238	Bq/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.025
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_BW28A	13/07/2017	0.012
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_BW36	12/07/2017	0.087
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_BW5	13/07/2017	0.003
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_BW53/PULS	13/07/2017	0.028
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_IWB2	12/07/2017	0.018
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_IWB6	12/07/2017	0.005
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_WRK300	26/07/2017	0.038
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_WRK301	26/07/2017	0.012
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_WRK302	25/07/2017	0.012
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_WRK303	25/07/2017	0.007
Zinc (Total)	mg/L	Douglas	DG_A_I_PZ_WRK304	25/07/2017	0.006

7.4 Appendix D: Monitoring Data – Surface water Quality

Variable	Unit	Site	Sample Point ID	Date	Result
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.5
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	73
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	5.6
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.43
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	5.9
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.26
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	11
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.08
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.47
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.45
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.09
Aluminium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	17
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.02
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.042
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.003
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.002
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.004
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.003
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.004
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.002
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.015
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.01
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.009
Arsenic (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.03
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.12
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.085
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.029
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.074
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.04
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.073
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.035
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.081
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.052
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.043
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.044
Barium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.11
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.0002

Variable	Unit	Site	Sample Point ID	Date	Result
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.0002
Cadmium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.002
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	1700
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	130
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	13
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	49
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	27
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	71
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	14
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	91
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	87
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	62
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	69
Calcium	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	1400
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	100000
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	3200
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	190
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	1400
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	360
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	1100
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	190
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	1700
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	530
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	500
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	530
Chloride	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	44000
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.077
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.007
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.009
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.007

Variable	Unit	Site	Sample Point ID	Date	Result
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.002
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.001
Chromium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.02
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.047
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.002
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.002
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.002
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.003
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.002
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.001
Copper (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.01
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW05	26/06/2017	170000
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW05	11/09/2017	9420
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW14	13/09/2017	825
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	4860
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW20	12/09/2017	1404
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	4100
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW20	11/10/2017 13:00	3920
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW22	23/08/2017	817
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	5370
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW24	26/06/2017	2530
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW24	12/09/2017	2120
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	2290
Electrical Conductivity	µS/cm	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	103200
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.1
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.22
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.11
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.23
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.2
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.22
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.17
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.38
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.45
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.34

Variable	Unit	Site	Sample Point ID	Date	Result
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.37
Fluoride	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	1
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.3
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	55
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	3.5
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	2.2
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	5.2
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	1.2
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	5.8
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	1.5
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.26
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.42
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.14
Iron (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	13
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.04
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.002
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.002
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.001
Lead (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.01
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	4600
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	160
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	11
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	88
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	24
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	76
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	16
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	130
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	41
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	32
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	36
Magnesium	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	2200
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.21
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	1

Variable	Unit	Site	Sample Point ID	Date	Result
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.026
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.18
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.024
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.055
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.028
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.39
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.015
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.081
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.021
Manganese (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.56
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.0002
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.0001
Mercury (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.001
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.043
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.004
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.001
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.007
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.004
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.005
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.003
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.002
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.003
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.003
Nickel (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.02
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	5.4
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	4
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	1
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.84
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	2.4
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	2

Variable	Unit	Site	Sample Point ID	Date	Result
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	1.8
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.77
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	5
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	2.8
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	3
Nitrogen (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	5.5
pH	pH units	Douglas	DG_A_I_SW_DUSW05	26/06/2017	8.4
pH	pH units	Douglas	DG_A_I_SW_DUSW05	11/09/2017	6.72
pH	pH units	Douglas	DG_A_I_SW_DUSW14	13/09/2017	7.91
pH	pH units	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	7.73
pH	pH units	Douglas	DG_A_I_SW_DUSW20	12/09/2017	7.86
pH	pH units	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	7.7
pH	pH units	Douglas	DG_A_I_SW_DUSW20	11/10/2017 13:00	7.84
pH	pH units	Douglas	DG_A_I_SW_DUSW22	23/08/2017	7.5
pH	pH units	Douglas	DG_A_I_SW_DUSW22	23/08/2017 12:40	7.5
pH	pH units	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	7.75
pH	pH units	Douglas	DG_A_I_SW_DUSW24	26/06/2017	8.91
pH	pH units	Douglas	DG_A_I_SW_DUSW24	12/09/2017	8.61
pH	pH units	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	9.61
pH	pH units	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	7.82
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.08
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	1.1
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.049
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.035
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.078
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.04
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.081
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.015
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	1.8
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.92
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.69
Phosphorus (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.83
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	600
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	35
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	3
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	8.6
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	4.4
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	5.1
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	4.2
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	7.3

Variable	Unit	Site	Sample Point ID	Date	Result
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	29
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	21
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	18
Potassium	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	310
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017 11:00	0.05
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW05B	11/09/2017 12:40	0.05
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017 10:00	0.05
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017 12:50	0.05
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017 12:45	0.05
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017 11:30	0.05
Radium 226	Bq/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017 13:10	0.05
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017 11:00	0.14
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW05B	11/09/2017 12:40	0.08
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017 10:00	0.08
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017 12:50	0.08
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017 12:45	0.08
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017 11:30	0.08
Radium 228	Bq/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017 13:10	0.08
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.001
Silver (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.01
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	53000
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	1800
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	130
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	850
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	230
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	630
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	110
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	840
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	430
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	330

Variable	Unit	Site	Sample Point ID	Date	Result
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	360
Sodium	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	23000
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	8300
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	390
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	34
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	260
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	61
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	150
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	35
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	180
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	8
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	38
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	46
Sulphate	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	5200
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.02
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.0095
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.002
Thorium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.02
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	150000
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	5200
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	530
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	2800
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	850
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	2400
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	550
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	3300
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	1600
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	1200
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	1400
Total Dissolved Solids	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	73000
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	22
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	1000

Variable	Unit	Site	Sample Point ID	Date	Result
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	25
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	26
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	9
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	8
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	4
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	8
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	10
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	5
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	6
Total Suspended Solids	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	1200
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.006
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.001
Uranium (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.02
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	26/06/2017	0.01
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW05	11/09/2017	0.1
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	13/09/2017	0.012
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW14	11/10/2017 13:00	0.005
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	12/09/2017	0.023
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW20	11/10/2017 12:45	0.028
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	23/08/2017	0.01
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW22	11/10/2017 10:10	0.015
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	26/06/2017	0.001
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	12/09/2017	0.005
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW24	11/10/2017 13:45	0.002
Zinc (Total)	mg/L	Douglas	DG_A_I_SW_DUSW5B	11/10/2017 13:25	0.01

30th November 2018

Angela Murphy
Director Development Services
Horsham Rural City Council (HRCC)
Horsham, VIC 3402

Dear Angela,

RE: Pit 23 2017 Interim Performance Report – Groundwater Seepage Assessment

In accordance with the conditions of HRCC Planning 15-105 (Iluka Pit 23) and endorsed Iluka Management Plans, Iluka Resources Ltd (Iluka) submitted on 2nd July 2018 its inaugural annual performance reports for the 2017 reporting period.

In its *2017 Environmental Management Plan (EMP) and Rehabilitation Performance Report* Iluka reported on exceedances of precautionary trigger levels at McGlashin's Swamp used to monitor for potential groundwater seepage from Pit 23. Consistent with management responses specified in the Pit 23 EMP, Iluka commissioned a groundwater seepage impact assessment to determine cause, impacts and the need or otherwise for mitigation.

In subsequent correspondence to HRCC on 2nd October 2018 Iluka indicated its intent to submit an *Interim 2017 Performance Report* presenting findings of the seepage impact assessment. This letter and enclosed groundwater seepage impact assessment satisfies this commitment.

Iluka draws HRCC's attention to the following findings:

- no evidence of groundwater seepage or material transport from Pit 23 exists, with the cause of reported 'exceedances' associated with natural phenomena;
- that the findings of prior investigations of groundwater quality risk from Pit 23 by-product disposal (Jacobs, 2014) and groundwater hydrogeological modelling (CDM Smith 2014, 2015) remain valid; and
- that current groundwater trigger levels set within the Iluka Pit 23 EMP (Rev 4, July 2017) do not allow for natural variation and until these are amended further 'exceedances' can be expected, as was evident in more recent 2018 data.

Accordingly, it is Iluka's position that:

- no seepage from Pit 23 has occurred and no mitigation measures apply; and
- that interim trigger levels for groundwater seepage, as recommended in Section 6.3 of the seepage assessment, be adopted and applied to all data collected as of 1st January 2018. These adopted trigger levels will apply until trigger levels in the current endorsed Pit 23 EMP are revised.

Yours sincerely,

Nick Travers

Environment Superintendent
Iluka Resources Ltd – Murray Basin
0477 319 372 | nick.travers@iluka.com

Cc: *Adam Moar, HRCC*
Dean Menzel, Iluka

Attachments: *Pit 23 Groundwater – Assessment of Seepage Indicator Exceedances (EMM, 2018)*