1.1 Existing Surface Water Quality

The existing water quality monitoring locations are shown on **Figure 1** Water quality monitoring data collected for the Mine since 1999 is summarised in in the following sections and presented graphically in **Figure 2**, **Figure 3** and **Figure 4.** All the monitoring data is attached as **Appendix A**.

The Australian and New Zealand Environment and Conservation Council (ANZECC) and Agriculture and Resource Management Council of Australia and New Zealand (ARMCANZ) have prepared a guideline for water quality management for use throughout Australia and New Zealand based on the philosophy of ecologically sustainable development (ESD). The guideline is called the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC and ARMCANZ, 2000) and is often referred to as the 'ANZECC guideline'.

The NSW Department of Environment and Heritage issues a booklet titled Using the ANZECC Guidelines and Water Quality Objectives in NSW (DEC, 2006) to assist technical practitioners with applying the ANZECC guidelines in NSW (the NSW guideline).

The NSW guideline defines the 'environmental values' of receiving waters as those values or uses of water that the community believes are important for a healthy ecosystem. The environmental values of the receiving waters of the Hunter River are regarded as:

- Aquatic ecosystem;
- Irrigation water supply;
- Livestock water supply;
- Primary and secondary contact recreation; and
- Visual amenity.

The ANZECC guidelines specify three levels of protection, from stringent to flexible, corresponding to whether the condition of the particular ecosystem is:

- Of high conservation value;
- Slightly to moderately disturbed; or
- Highly disturbed.

The receiving waterways adjacent to the study area are regarded as moderately disturbed.

Rixs Creek Mine is located predominantly within the Singleton Water Source of the HUAWSP. About 6.5% of the Project area falls within the Glennies Water Source. The Report Card for these water sources, issued by the Department of Water and Energy, August 2009 states that for each water source there is:

- Low economic dependence of the local community on water extracted for irrigation relative to other water sources in the region.
- Low risk to instream value from extraction.
- Medium relative instream value within the catchment, although the Glennies Water Source values are generally rated higher than for Singleton.
- The Glennies instream values are more at risk from water extraction; being medium compared to low for Singleton.
- High hydrological stress on the water sources in summer.

The Rixs Creek and the Dead Mans Gully and the upper reaches of Station Creek are ephemeral.

The available long term water quality data Rixs Creek Mine, which include electrical conductivity, total dissolved solids, total suspended solids and pH, was compared to the trigger values extracted from the ANZECC water quality guidelines, shown in **Table 1**. A comparison of the recorded monitoring data at the Project Area with ANZECC trigger values has been undertaken in order to characterise the site water quality. Ecosystem protection trigger values used in the comparison are for Lowland Rivers with a level of protection of 90% of species, provided in Table 1. If ANZECC indicated a range of trigger values, the lowest value has been used for comparison.

Table 1: Fresh Water Quality Trigger Values (ANZECC, 2000)

Parameter	Unit	Trigger Value			
		Irrigation	Stock Water	Ecosystem *(Lowland River)*	Recreational
pH	pH	6.0 - 9.0	-	6.5 - 8.5[*g]	5.0 - 9.0
EC (25C)	1JS/cm	-	-	125 - 2200[*g]	-
DO (% Saturation)		-	-	85 -110[*g]	>80
Total Dissolved Solids (TDS)	mg/L	-	2500[*a]	-	1000
Turbidity	NTU	-	-	6 - 50[*g]	-
METALS AND METALLOIDS		-	-	-	-
Aluminium	mg/L	5[*f], 20[*g]	5[*h]	0.08, ID*[e]	0.2
Antimony		-	-	ID	-
Arsenic (AsV)	mg/L	0.1[*f], 2[*g]	0.5[*h]	0.042*[a, e]	0.05
Beryllium	mg/L	0.1[*f], 0.5[*g]	-	ID	-
Boron		0.5[*f], 2[*g]	5[*h]	0.68[*e]	-
Cadmium	mg/L	0.01[*f], 0.05[*g]	0.01[*h]	0.0004*[e]	0.01
Calcium (Ca)	mg/L	-	1000[*h]	-	-
Chloride as Cl	mg/L	350[*c]	-	-	400
Chromium	mg/L	0.1*f	1[*h]	0.006*[e]	0.05
Cobalt	mg/L	-	1[*h]	ID	-
Copper	mg/L	0.2[*f], 0.5[*g]	1[*a]	0.0018*[e]	1
Iron	mg/L	0.2[*f], 10[*g]	NST	ID[*e]	0.3
Lead	mg/L	2[*f], 5[*g]	0.1	0.0056*[e]	0.05
Magnesium (Mg)	mg/L		2,000*b	-	-
Manganese	mg/L	0.2[*f], 10[*g]	NST	2.5*[e]	0.1
Nickel	mg/L	0.2[*f], 2[*g]	1	0.013*[e]	0.1
Sodium {Na)	mg/L	230[*c]	-	-	300
Zinc (Zn)	mg/L	2[*f], 5[*g]	20	0.015[*e]	5
Mercury	mg/L	0.002[*f, *g]	0.002	0.0019[*e]	0.001
OTHER		-	-	-	-
Ammonia	mg/L	-	-	1.43[*e]	10
Naphthalene	mg/L	-	-	0.037[*e]	-
Nitrate-N	mg/L	-	400[*h]	3.4[*e]	10
Nitrite-N	mg/L	-	30[*h]	-	1
Sulphate as S04	mg/L	-	1000[*h]	-	400
Total nitrogen (Total N)	mg/L	5[*f], 25[*g]	-	0.5	-
Total phosphorus (Total P)	mg/L	0.05[*f], 0.8[*g]	-	0.02	-

Notes:

- No Trigger Value recommended

ID - insufficient data to recommend a trigger value

NST Not sufficiently Toxic

**a Dairy cattle*

**b Cattle (insufficient information on other livestock)*

**c Moderately Tolerant Crops*

**d Lowland River*

**e Moderately disturbed, adopted trigger based on 90% of species protected*

**f Long Term Trigger Value*

**g Short Term Trigger Value*

**h Low risk, adverse effects not expected.*

1.1.1 Clean Water Catchments and Dams

Three clean water dams, CWD1, CWD2 and CWD6 collect runoff from undisturbed land within the Rixs Creek Catchment. The monitoring locations are shown on **Figure 1**. The assessment of clean water quality is based on analyses of 564 monthly water samples taken from the three dams since 1999, a 17 year data set. The dams are a suitable analogue for the salinity of rainfall runoff, although EC in dams tends to increase during extended dry periods as evaporation removes water.

Table 2: Clean Water Runoff Quality (1999 - 2015)

Statistic	pH	TSS (mg/l)	TDS (mg/l)	EC (µS/cm)
Count	564	564	564	564
Average	7.5	28	182	210
5th %ile	6.6	2	82	120
Median	7.5	28	182	199
95th %ile	8.8	90	340	340
Min	6.0	1	36	54
Max	10.2	340	530	731

Review of **Table 2** indicates that the recorded surface water quality at CWD1, CWD2 and CWD6 is:

- Slightly alkaline, with a median pH value of approximately 7.5, and ranging from 6.6 to 8.8. The 95th percentile value is above the ecosystem protection trigger value.
- Fresh, with a median value for electrical conductivity of 199 µS/cm. The range of conductivity values is from 120 to 340 µS/cm.,

Review of **Table 6** indicates that the recorded surface water quality at CWD1, CWD2 and CWD6 is:

- Regularly above the ANZECC ecosystem trigger values for aluminium and copper; and occasionally exceeds the trigger value for zinc.
- Above the phosphorous ANZECC trigger value for ecosystem protection on almost all occasions, and regularly above the long term irrigation usage trigger.

The recorded EC values for clean water runoff are plotted on **Figure 2** and the data for pH are plotted on **Figure 3**.

The median value of all site clean water TSS records is 28 mg/l. Examination of **Figure 4** indicates almost all TSS values fall below 100mg/l. The low TSS values do not necessarily correlate with low turbidity as there appears to be a high proportion of colloidal material in the water on the Mine site. The high proportion of colloidal material also impacts the Total Dissolved Solids results such that the relationship between Total Dissolved Solids and EC often can depart markedly from the 0.6 – 0.7 ratio which is normally expected.

1.1.2 Disturbed Catchments (Sediment Dams)

The assessment of water quality of runoff from disturbed catchments across the site is based on analyses of a limited number of samples; 73 in all. The monitoring locations are shown on **Figure 1**. The trends values pH, TSS and EC are plotted on **Figure 2**, **Figure 3** and **Figure 4** for comparison purposes. The disturbed catchments produce water of similar EC and pH, but over the short term generally have higher levels of entrained sediment.

Table 3: Sediment Dam Water Quality (2002 - 2015)

Statistic	pH	TSS (mg/l)	TDS (mg/l)	EC (µS/cm)
Count	73	73	73	73
Average	7.4	175	492	402
5th %ile	6.5	6	120	98
Median	7.4	46	292	202
95th %ile	8.4	586	1,154	1,228
Min	5.7	4	50	77
Max	9.0	3,000	4,480	6,660

Review of **Table 3** indicates that the recorded surface water quality at site sediment dams is:

- Slightly alkaline, with a median pH value of approximately 7.4, and pH ranging from 6.5 to 8.4.
- Fresh, with electrical conductivities ranging from 98 to 1,228 µS/cm, and a median value of 202 µS/cm. The range of EC values is wider for sediment dams when compared to clean water dams, above, as the sediment dams are generally kept almost empty and results will reflect evaporative effects on smaller water bodies.

Review of **Table 6** indicates that the recorded surface water quality in sediment dams is:

- Regularly above the ANZECC ecosystem trigger values for aluminium and copper; and occasionally over the trigger value for manganese, nickel and zinc.
- Above the phosphorous ANZECC trigger value for ecosystem protection on almost all occasions, and regularly above the long term irrigation usage trigger.
- Above the nitrogen ANZECC trigger value for ecosystem protection occasionally.

The average of TSS is 175mg/l, but the median is 46, indicating some infrequent high values have been recorded. The bulk of TSS values fall between 6 mg/l and 586 mg/l. To be of suitable quality to be discharged off site, the TSS would need to be treated to achieve less than 50mg/l to meet Blue Book requirements; otherwise the water would need to be taken into the mine water management system.

Salinity and pH are suitable for direct discharge into the receiving waters (Hunter River) falling well within the normal ranges EC and pH seen in that stream.

1.1.3 Mine Water

The assessment of mine water quality is based on analyses of approximately 642 water samples taken monthly from mine water dams since 1999. The dams are: Dirty Water Dam 1 (DWD1), Dirty Water Dam 2 (DWD2), Dirty Water Dam 3 (DWD3), and Dirty Water Dam 4 (DWD4 - formerly Clean Water Dam 4). The monitoring locations are shown on **Figure 1**.

Review of **Table 4** indicates that the recorded surface water quality at site mine water management dams is:

- Strongly alkaline, with a median pH value of approximately 8.6, and ranging from 7.9 to 9.3. More than 50% of recorded pH values would be above the adopted trigger value for ecosystem protection.

- Tending to brackish, with the bulk of electrical conductivities ranging from 1,631 to 9,010 µS/cm, with a median value of 5,025 µS/cm. The majority of recorded EC values would be above the adopted trigger value for ecosystem protection.

Review of **Table 6** indicates that the recorded surface water quality in mine water dams is:

- Regularly above the ANZECC ecosystem trigger values for aluminium and copper; and occasionally over the trigger value for zinc.
- Regularly above the phosphorous ANZECC trigger value for ecosystem protection, and regularly above the long term irrigation usage trigger.
- Above the total nitrogen ANZECC trigger value for ecosystem protection regularly, but, in isolation from other analytes, nitrogen level is below the long term usage trigger for irrigation.
- Suitable only for irrigation of plants with foliage that is tolerant of high sodium and chloride levels in water. Sodium and chloride median values are above trigger levels for recreational usage.

Two distinct EC trends are observed at **Figure 2** Averages of mine water EC readings during an extended dry period from 2003 to 2007 are around 7,000µS/cm with occasional forays above 10,000µS/cm. During average rainfall periods since 2007, the EC value trends at around 4,500µS/cm. The absence of the dilution effect from fresh water runoff during drought periods contributes to a gradual increase of EC values in mine water at the Mine during extended periods of dry weather due to evaporation and leaching from mine spoil.

Table 4: Mine Water Quality (1999 - 2015)

Statistic	pH	TSS (mg/l)	TDS (mg/l)	EC (µS/cm)
Count	642	642	642	642
Average	8.6	17	3,271	5,236
5th %ile	7.9	1	902	1,631
Median	8.6	17	3,271	5,025
95th %ile	9.3	60	5,480	9,010
Min	6.6	1	430	620
Max	10.3	334	12,825	11,730

Recorded pH values for mine water over the period since 1999 are shown on **Figure 3**. The average mine water pH increased from around 8.1 to 8.8 between 1999 and 2006, and has remained more or less unchanged since with the return to average rainfall conditions.

Rixs Creek Mine does not have a licenced discharge point under the HRSTS, and must contain all mine water on the site, however the quality of the mine water would generally suitable for discharge under the HRSTS. The EC of the mine water is below 10,000µS/cm for 98% of the time. Some 97% of all recorded pH values are less than 9.5, and TSS is below 120mg/l for 98% of the time.

1.1.4 Rixs Creek and Other Streamlines

The assessment of Rixs Creek catchment water quality analysis is based on samples collected from six monitoring stations. The stations are located along Rixs Creek from the Main Northern Railway in the north to Maison Dieu Road to the south. The monitoring locations are shown on **Figure 1**. Three of the stations are located at the junction of a tributary draining an industrial estate, so that any influences on water quality from this subcatchment can be identified. The trends for recorded pH, TSS and EC are plotted on **Figure 2**, **Figure 3** and **Figure 4** for comparison purposes.

Insufficient data has been collected from the Dead Mans Gully stream line for meaningful comparisons. Data for the Dead Mans Gully dam near the New England Highway indicates similar medians and ranges for pH and TSS. The EC values for this dam indicate the water is noticeably fresher than in Rixs Creek; however the period of data collection spans wet years only.

Review of **Table 5** indicates that the recorded surface water quality in Rixs Creek is:

- Neutral to slightly alkaline, with median pH ranging from 7.1 to 7.8 across the stations. Four out of the six median values are slightly alkaline.
- Generally fresh, however 95th percentile EC values are brackish, reflecting the ephemeral nature of flows in this stream.
- TSS is generally less than 50mg/l. ANZECC Vol.1 Table 3.3.3 indicates the numerical range for turbidity trigger values (6 – 50) for ecosystem protection in a lowland river are similar to the acceptable TSS range. This relationship may not necessarily hold in catchments such as Rixs Creek where there are highly colloidal soils. In these catchments, water with a TSS value of 20mg/l is often highly turbid. Examination of **Figure 4** indicates TSS in the stream line is generally below 100mg/l.

Table 5: Rixs Creek Water Quality (1999 - 2015)

		Sampling Location					
Analyte	**Statistic**	**Railway Underpass**	**New England Highway**	**Industrial Estate Tributary**	**RXC Above Industrial Estate**	**Below Operation**	**Maison Dieu Bridge**
No Flow Periods	%	75	69	29	32	54	63
pH	Count	165	167	28	25	101	163
	Average	7.0	7.4	7.6	7.4	7.7	7.2
	5th %ile	6.0	6.7	6.9	6.9	7.0	6.5
	Median	**7.1**	**7.4**	**7.7**	**7.6**	**7.8**	**7.2**
	95th %ile	8.2	8.4	8.2	7.9	8.3	7.9
	Min	5.5	6.2	6.6	6.5	6.5	6.0
	Max	9.2	8.5	8.3	8.2	9.6	8.5
TSS (mg/l)	Count	165	167	27	25	100	163
	Average	155	61	65	80	56	132
	5th %ile	6	2	6	7	3	4
	Median	**60**	**24**	**42**	**40**	**23**	**30**
	95th %ile	505	255	192	146	187	429
	Min	2	1	5	5	1	1
	Max	1,880	730	256	596	492	4,110
TDS (mg/l)	Count	165	167	28	25	101	163
	Average	556	1,091	385	596	810	739
	5th %ile	92	263	176	227	212	201
	Median	**310**	**810**	**341**	**422**	**440**	**490**
	95th %ile	3,022	3,243	727	1,398	2,950	2,197
	Min	28	120	114	98	104	70
	Max	3,600	4,740	818	2,980	10,840	4,200
EC (µS/cm)	Count	165	167	28	25	101	163
	Average	746	1,738	489	837	1,248	1,172
	5th %ile	110	370	206	253	279	244
	Median	**280**	**1,300**	**365**	**529**	**610**	**782**
	95th %ile	4,876	4,911	1,231	2,220	4,550	3,648
	Min	75	150	154	187	7	160
	Max	6,130	7,100	1,600	4,370	16,450	6,450

Review of **Table 6** indicates that the recorded surface water quality in Rixs Creek is:

- Regularly above the ANZECC ecosystem trigger values for aluminium and copper; and occasionally over the trigger value for lead.
- Regularly above the phosphorous ANZECC trigger value for ecosystem protection, and regularly above the long term irrigation usage trigger.
- Rarely above the nitrogen ANZECC trigger value for ecosystem protection – once in 25 samples.

Rixs Creek and other local streams are not typical lowland rivers as described in ANZECC 2000, being ephemeral with a significant portion of the flow regime either dry or influenced by groundwater accession. Nevertheless the water quality and quantity remains suitable for stock water, probably the only practical environmental use. The variable water quality provides a wide range of habitats that change over time. Trigger levels for these streams have been adopted in recognition of the variability in flow and quality.

1.1.5 The Hunter River

Electrical conductivity in the Hunter River has been measured regularly since 1994 by the NSW Office of Water (NOW) at Long Point (Station 210134) about 4.0km downstream of the confluence of Rixs Creek. The installation of the station occurred shortly after the commencement of the trial HRSTS in 1993.

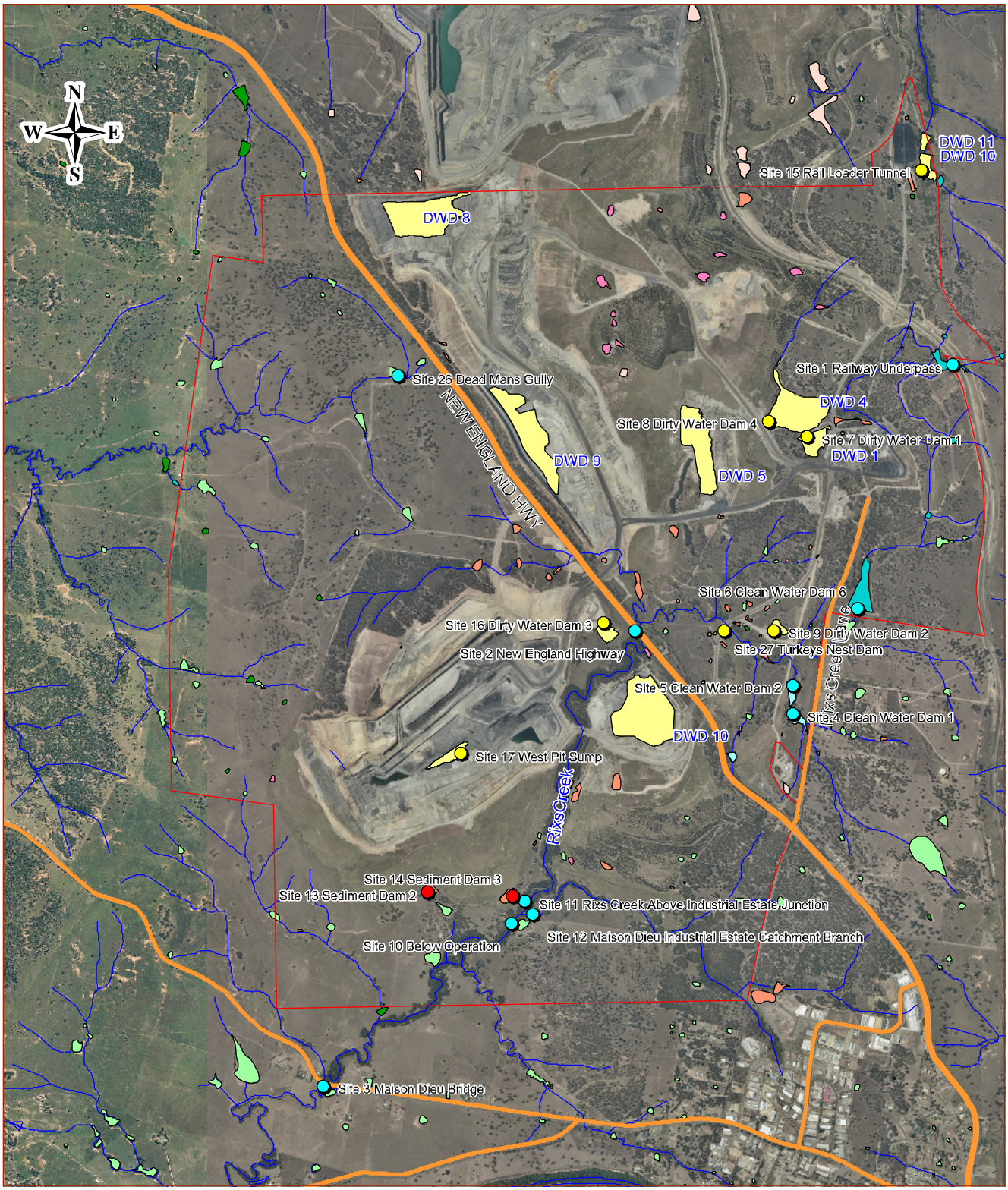
Water quality at Long Point is directly influenced by management of the regulated Hunter River upstream. Irrigation water is normally released into this reach of the Hunter River from Glennies Creek Dam and tends to keep EC low at Long Point. When Glennies Creek Dam is not releasing water, EC trends upwards towards 900µS/cm because the main influence then becomes the through-flow from Glenbawn Dam, which is located in the upper reaches of the Hunter River. By the time water from Glenbawn reaches the Long Point station, irrigation abstraction and natural accession of saline ground water has generally increased the salinity to around 800µS/cm.

Average daily EC at the Long Point gauging station is 627µS/cm, 93% of all results are less than 900µS/cm, and about 30% are less than 500µS/cm. The majority of data points fall within the range 300 – 900µS/cm.

Table 6: Summary of Monitoring results for Major Ions

Site	Analyte		Anions		Major Cations					Total Metals																		Nutrients		
			Total Alkalinity as CaCO3	Sulphate as SO4	Chloride	Calcium	Magnesium	Sodium	Potassium	Dissolved Iron	Aluminium	Antimony	Arsenic	Beryllium	Barium	Cadmium	Cobalt	Copper	Lead	Lithium	Manganese	Nickel	Rubidium	Selenium	Strontium	Zinc	Boron	Mercury	Fluoride	Ammonia + Nitrite + Nitrate as N	Total Phosphorus
Sediment Dam Catchments (sites 13, 14, 21, 22, 23, 26)	Count	18	18	18	18	18	18	18	18	18	0	18	2	18	0	12	17	13	18	18	17	18	3	18	15	1	0	18	18	18
	Average	68.3	41.3	7.1	7.1	8.7	51.8	7.8	0.6	9.8	<0.001	0.0	0.003	0.1	<0.0001	0.0	0.008	0.007	0.009	0.092	0.005	0.015	0.01	0.21	0.0315	0.060	<0.0001	0.4	0.26	0.27
	5th %ile	11.0	5.7	2.0	2.0	2.0	14.7	3.9	0.1	0.8	<0.001	0.0	0.002	0.0	<0.0001	0.001	0.002	0.001	0.002	0.031	0.002	0.002	0.01	0.05	0.0060	0.060	<0.0001	0.2	0.00	0.09
	Median	**77.5**	**14.0**	**6.0**	**6.0**	**7.0**	**37.5**	**8.0**	**0.7**	**4.0**	**<0.001**	**0.0**	**0.003**	**0.1**	**<0.0001**	**0.003**	**0.005**	**0.003**	**0.004**	**0.055**	**0.003**	**0.006**	**0.01**	**0.15**	**0.0120**	**0.060**	**<0.0001**	**0.5**	**0.20**	**0.18**
	95th %ile	126.6	239.7	19.0	19.0	28.9	193.6	11.3	1.3	34.6	<0.001	0.0	0.003	0.2	<0.0001	0.014	0.027	0.021	0.029	0.226	0.017	0.056	0.01	0.60	0.0957	0.060	<0.0001	0.8	0.88	0.79
	Min	11.0	4.0	2.0	2.0	2.0	13.0	3.0	0.1	0.4	0.0	0.0	0.0	0.0	0.0	0.001	0.001	0.001	0.002	0.024	0.001	0.002	0.01	0.04	0.0060	0.060	0.000	0.2	0.00	0.06
	Max	141.0	249.0	30.0	30.0	34.0	214.0	13.0	1.4	61.8	0.0	0.0	0.003	0.4	0.0	0.017	0.036	0.028	0.068	0.368	0.027	0.084	0.01	0.83	0.1370	0.060	0.0000	0.8	0.88	0.86
Rixs Creek (sites 1, 2, 3, 10, 11)	Count	25	25	25	25	25	25	25	25	25	0	23	0	25	2	23	25	23	25	25	25	25	0	25	25	4	4	25	25	25
	Average	54.08	57.44	11.68	11.68	15.04	87.4	4.6	0.698	5.877	<0.001	0.002	<0.001	0.0679	0.0002	0.002	0.007	0.003	0.011	0.077	0.004	0.009	<0.01	0.312	0.0226	0.053	8E-05	0.272	0.149	0.104
	5th %ile	23.2	8.4	2.4	2.4	2.8	15	4	0.146	1.71	<0.001	0.001	<0.001	0.0414	0.0001	0.001	0.003	0.001	0.004	0.021	0.002	0.003	<0.01	0.07	0.0092	0.05	2E-05	0.2	0	0.04
	Median	**54**	**46**	**8**	**8**	**9**	**73**	**4**	**0.64**	**4.13**	**<0.001**	**0.002**	**<0.001**	**0.062**	**0.0002**	**0.002**	**0.006**	**0.002**	**0.008**	**0.036**	**0.003**	**0.007**	**<0.01**	**0.247**	**0.017**	**0.05**	**0.0001**	**0.3**	**0.1**	**0.07**
	95th %ile	78.6	74	17	17	20.6	110	6	1.556	12.48	<0.001	0.003	<0.001	0.1054	0.0002	0.005	0.012	0.006	0.014	0.267	0.008	0.02	<0.01	0.423	0.0532	0.059	0.0001	0.4	0.41	0.252
	Min	6	3	1	1	2	10	3	0.12	0.78	0	0.001	0	0.033	0.0001	0.001	0.002	0.001	0.003	0.016	0.002	0.003	0	0.048	0.007	0.05	1E-05	0.1	0	0.03
	Max	115	366	92	92	136	642	9	2.95	16.3	0	0.004	0	0.159	0.0002	0.006	0.014	0.006	0.09	0.648	0.008	0.022	0	2.35	0.057	0.06	0.0001	0.4	0.57	0.43
Mine Water (sites 7, 8, 9, 15, 16)	Count	21	21	21	21	21	21	21	5	21	13	19	0	21	3	6	18	4	21	21	19	21	10	21	8	1	0	21	22	16
	Average	179.7	471.9	31.1	31.1	66.62	478.3	8.381	0.11	0.999	0.0028	0.0027	<0.001	0.0469	0.0001	0.002	0.004	0.002	0.044	0.019	0.003	0.007	0.02	2.504	0.0164	0.07	<0.0001	0.467	2.749	0.166
	5th %ile	70	238	16	16	21	190	3	0.054	0.12	0.001	0.0019	<0.001	0.028	0.0001	0.001	0.001	0.001	0.007	0.004	0.001	0.002	0.01	0.558	0.0057	0.07	<0.0001	0.3	0.007	0.01
	Median	**188**	**436**	**30**	**30**	**66**	**454**	**8**	**0.1**	**0.44**	**0.003**	**0.003**	**<0.001**	**0.04**	**0.0001**	**0.002**	**0.003**	**0.002**	**0.041**	**0.01**	**0.003**	**0.008**	**0.02**	**2.21**	**0.0095**	**0.07**	**<0.0001**	**0.5**	**1.355**	**0.05**
	95th %ile	274	751	48	48	105	784	13	0.192	5.5	0.0058	0.0042	<0.001	0.1	0.0002	0.003	0.008	0.004	0.084	0.06	0.004	0.011	0.03	5.57	0.0393	0.07	<0.0001	0.6	4.664	0.628
	Min	39	125	12	12	16	81	3	0.05	0.03	0.001	0.001	0	0.022	0.0001	0.001	0.001	0.001	0.006	0.004	0.001	0.002	0.01	0.442	0.005	0.07	0	0.3	0	0.01
	Max	279	820	50	50	112	831	14	0.21	5.89	0.007	0.006	0	0.106	0.0002	0.003	0.021	0.004	0.086	0.08	0.004	0.011	0.03	5.97	0.048	0.07	0	0.8	28.08	0.65
Clean Water Catchments (sites 4, 5, 6)	Count	12	12	12	12	12	12	12	12	12	0	9	0	12	1	9	12	10	12	12	11	12	0	12	12	0	1	12	12	12
	Average	35	12.42	3.583	3.583	3.917	19.33	4.083	0.654	3.28	<0.001	0.0022	<0.001	0.0473	0.0002	0.001	0.004	0.002	0.004	0.049	0.002	0.005	<0.01	0.068	0.032	<0.05	0.001	0.283	0.078	0.096
	5th %ile	19.3	2.55	2	2	2.55	15.1	3	0.299	0.994	<0.001	0.001	<0.001	0.0383	0.0002	0.001	0.002	0.001	0.002	0.021	0.002	0.002	<0.01	0.049	0.0086	<0.05	0.001	0.2	0	0.031
	Median	**34.5**	**10**	**4**	**4**	**3.5**	**18**	**4**	**0.6**	**3.025**	**<0.001**	**0.002**	**<0.001**	**0.047**	**0.0002**	**0.001**	**0.003**	**0.002**	**0.004**	**0.05**	**0.002**	**0.005**	**<0.01**	**0.065**	**0.0115**	**<0.05**	**0.001**	**0.2**	**0.055**	**0.09**
	95th %ile	50	32.25	5	5	5.45	25.7	5.45	1.099	6.145	<0.001	0.0036	<0.001	0.0583	0.0002	0.002	0.007	0.003	0.005	0.073	0.003	0.01	<0.01	0.099	0.123	<0.05	0.001	0.445	0.184	0.171
	Min	16	2	2	2	2	14	3	0.26	0.46	0	0.001	0	0.035	0.0002	0.001	0.001	0.001	0.002	0.017	0.002	0.001	0	0.046	0.008	0	0.001	0.2	0	0.02
	Max	50	46	5	5	6	29	6	1.17	7.85	0	0.004	0	0.061	0.0002	0.002	0.008	0.003	0.006	0.083	0.003	0.012	0	0.123	0.25	0	0.001	0.5	0.2	0.22

Notes:
Values shaded yellow indicate a departure outside the adopted ANZECC trigger values set out in ***Table*** *1*



Existing Water Sample Locations

- Clean
- Contained
- Sediment

2014 Site Dams by Purpose

- Clean
- Containment
- Diversion
- Erosion Control
- Other Operation
- Rural
- Sediment
- Sewage
- Soil Conservation

Roads

- Major Road
- Minor Road

Other

- Project Boundary
- Stream Line

JP Environmental

Surface Water Study for Rixs Creek
Continuation of Mining

Figure 1: Water Quality Monitoring Plan - Existing

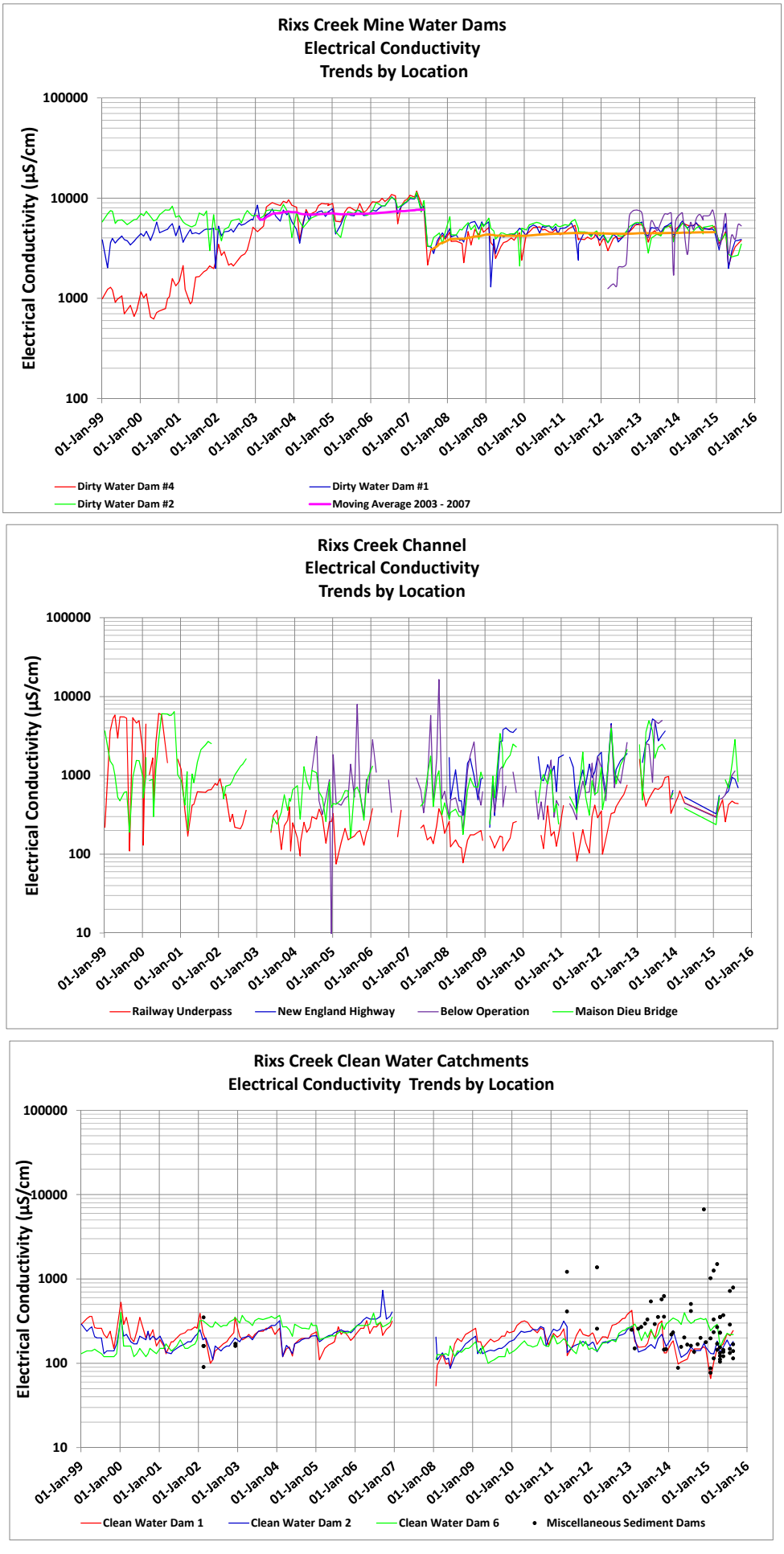


Figure 2: Graphs of Electrical Conductivity Data

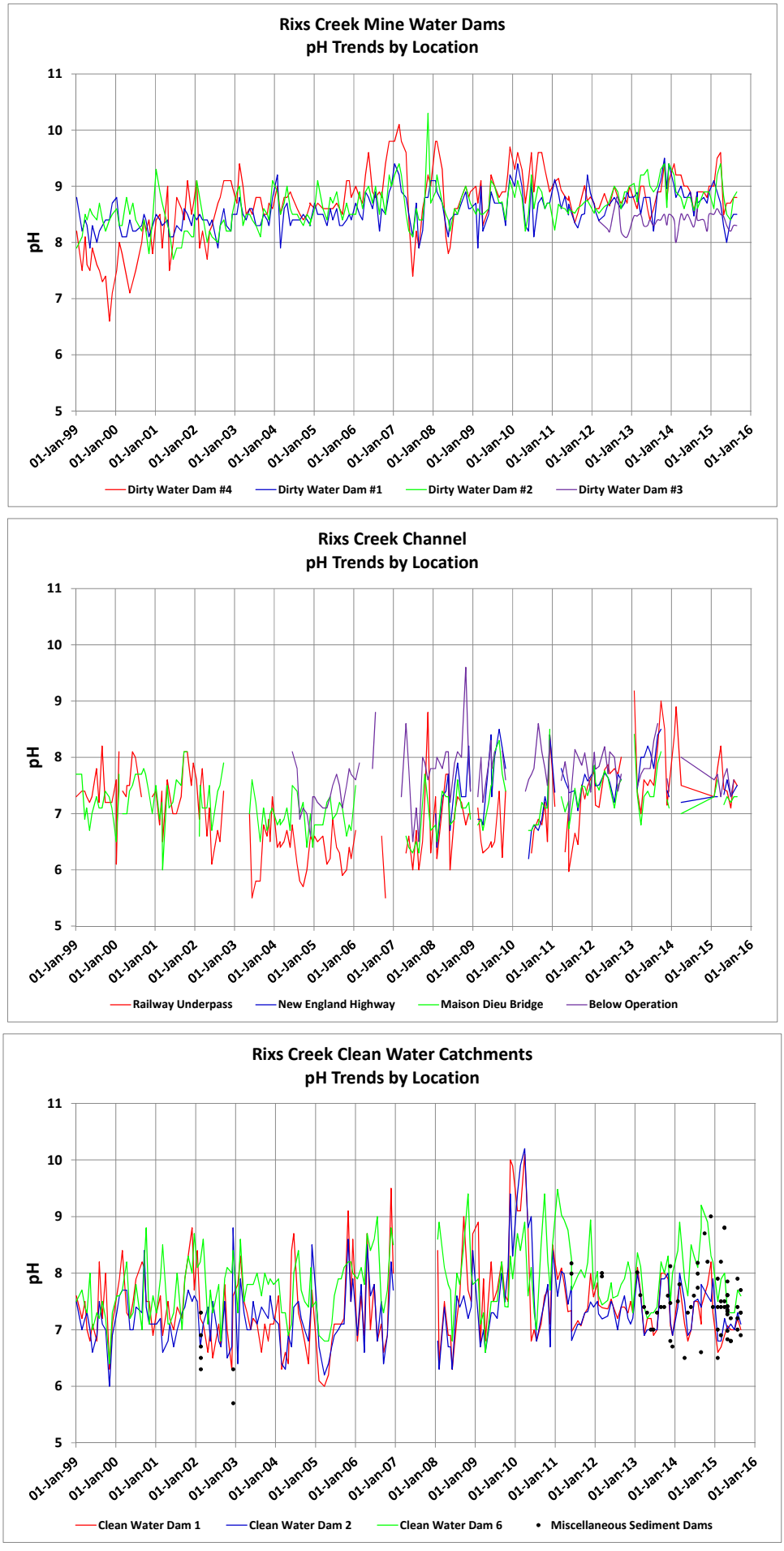
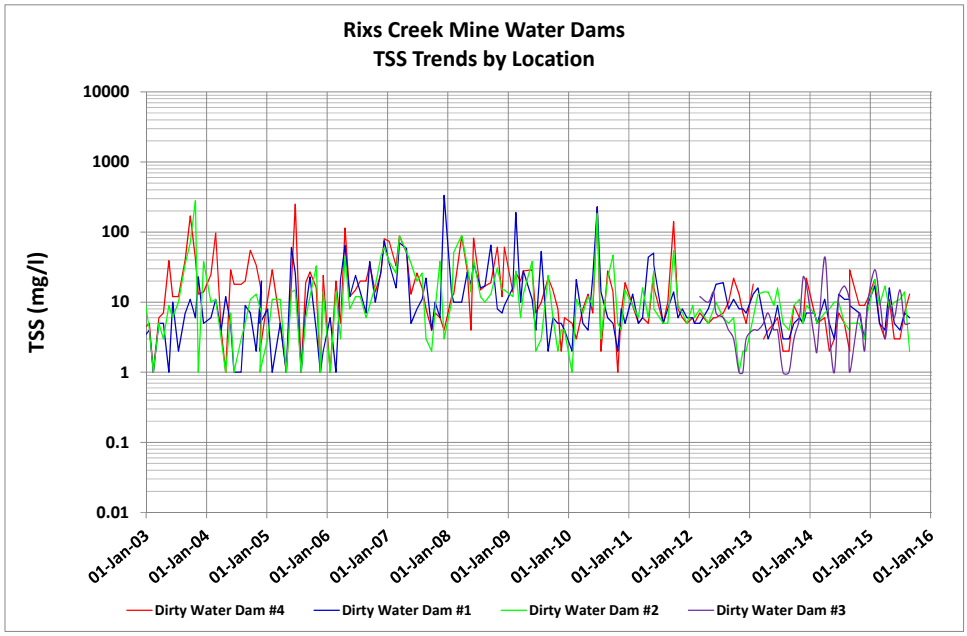
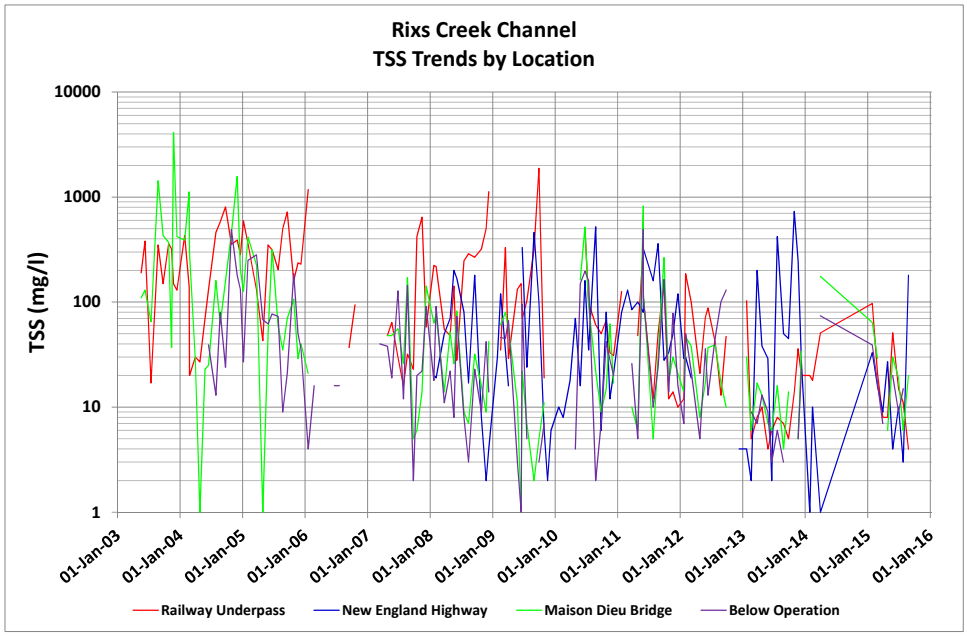


Figure 3: Graphs of pH Data





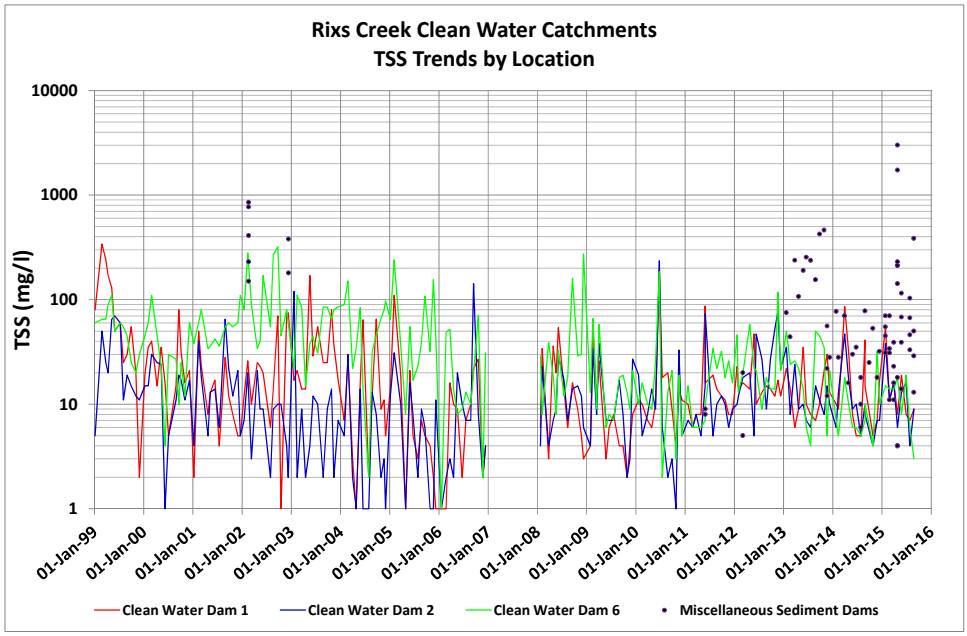


Figure 4: Graphs of Total Suspended Solids Data

2.0 Impact Assessment

2.1 Water Quality

Land disturbance associated with mining has the potential to adversely affect the quality of surface runoff in downstream receiving waters through increased sediment loads. In addition, runoff from active mining areas (including roads, coal stockpiles, etc.) may have increased concentrations of salts and other pollutants compared to natural runoff requires containment to prevent it from adversely affecting the quality of surface runoff in downstream catchments.

External Water Quality

Rixs Creek and the Unnamed Tributary north of Rixs Creek are the streams most likely to be impacted by land disturbance or saline runoff. Using Rixs Creek as an analogue for impacts the following observations are made:

- EC, pH and TSS are consistent at each monitoring location since 1999 with no noticeable trend over that period. Refer **Figure 2**, **Figure 3** and **Figure 4** in **Section1.1**.
- The observed median value of EC decreases moving downstream, the exception being the New England Highway Station.
- The observed median value of TSS generally decreases moving downstream. This is most likely a response to the increasing salinity of the water.
- pH in Rixs Creek appears to move towards neutral from slightly alkaline after periods of wet weather.

Based on monitoring results, during the period of mining in Pit 2 (South Pit) and Pit 3 (West Pit), mining has moved closer to and then away from the Rixs Creek channel with no apparent effect on stream water quality.

To date there are no observable impacts on external water quality due to the activity of the Mine, and provided existing management systems are maintained, and measures recommended in Section 7 are adopted there is a low risk of impacts on water quality in the surrounding catchment due to ongoing mining operations.

Sediment Management

Water monitoring results indicate that the runoff collected in the dams from mined and un-mined catchment can contain appreciable levels of sediment i.e. greater than 50mg/l. Observation of historical aerial photographs (2008, 2013, 2014 and 2015) of West Pit indicate that both mine sediment dams and offsite farm dams in the Dead Mans and Rixs Creek catchment are very turbid. This is indicative of the nature of the catchment soils rather than any specific activity occurring in the catchment, be it mine disturbance or agriculture.

Based on monitoring results from sediment dams, runoff from disturbed areas (pre-strip and rehabilitation areas) will require treatment to reduce the TSS levels if the water is to be released into downstream catchments without adverse impacts.

Metalloids

ANZECC 2000 sets a trigger level of 5 mg/l of dissolved aluminium for stock water, and the adopted trigger level for ecosystem protection is 0.08 mg/l. All water classes on the Rixs Creek site display elevated levels aluminium. Aluminium levels in runoff from clean and disturbed catchments; and in Rixs Creek, have median values in the range of 3 – 4 mg/l. The median value for aluminium in mine water is about 0.4 mg/l. These results are within the levels considered acceptable for stock watering but well over ecosystem protection trigger values. Notwithstanding the above, the trend of elevated aluminium levels is apparent in the monitoring results from before mining activity commenced in Deadman's Creek catchment. The three clean water catchments which are upstream of any mining activity display similar values for aluminium.

The elevated levels of aluminium detected by monitoring are not due to dissolved aluminium. *"In nature, aluminium exists in the trivalent oxidation state, i.e. Al3+. Its electric charge and the small ionic radius (0.51Å) give Al3+ a strong polarising effect on adjacent atoms; therefore the element is too reactive to be found free in nature. As a strongly hydrolysing element, Al is practically insoluble in the pH range of 6.5 to 8.5; the solubility is enhanced under acidic pH (pH < 6) or alkaline pH (pH > 8.5) conditions, and/or in the presence of complexing ligands."*[1] The highest levels of aluminium were detected in water between pH 6.8 and 7.4. Aluminium is highly toxic to plants, and the ongoing health of the vegetation indicates that the aluminium detected in the monitoring results is not biologically available.

The cause of the measured elevated aluminium levels, and to a lesser extent copper, manganese, nickel and zinc, is that the metal ions are adsorbed to colloidal (clay) particles which have passed through the standard filter used in the total dissolved solids test (TDS). Examination of the Rixs Creek monitoring results shows that the ratio of TDS to EC regularly departs from the "accepted norm" of about 0.65, indicating that additional material is present in the mass of the evaporated TDS sample, in this case, clay particles. TDS: EC ratios

[1] "Aluminium in drinking water: An overview." Water SA Vol. 25 No. 1 January 1999; P T Srinivasan, T Viraraghavan and K S Subramanian.

exceed 1 in about 60% of the non-standard sample results, and for several of the results the ratio is greater than 6.

There are no adverse impacts expected from the elevated metal levels detected by site water quality monitoring. The metals are adsorbed to clays and are not biologically available whilst water pH levels remain between 6 and 8.5.

3.0 Mitigation Management and Monitoring Measures

3.1 Water Quality

By implementing an effective system of mine water management, the Project will ensure no adverse impact on receiving waters. Key elements of the proposed water management system include:

- Diversion of runoff from undisturbed catchments away from disturbed areas, wherever possible, using surface drains.
- Treatment of runoff from overburden emplacements using sedimentation dams prior to discharge from the site; and
- Runoff from mining areas (including coal stockpiles) will be collected within mine water dams for recycling on site.

3.2 Surface Water Monitoring

Surface water monitoring will continue to be undertaken generally in accordance with the Rixs Creek Environmental Monitoring Plan (EMP), approved by DPE. The EMP specifies that all major dams, both mine water and clean, are monitored on a monthly basis for storage volume, pH, EC, TDS, and TSS. The major ions: sodium, magnesium, potassium, calcium, chloride, sulphate and bicarbonates are sampled annually. The results are reported in the site Annual Environment Management Report. The EMP includes a Trigger Action and Response Plan which documents responses, actions and reporting requirements to abnormal monitoring results or undesirable trends in water quality.

The EMP will be progressively extended to include the additional water storages and regional catchments impacted by the Project. The timing of the additional monitoring would generally correspond to the conceptual mine plan. The existing and proposed monitoring locations are shown in **Figure 5**. A description of the monitoring sites is given in **Table 7**.

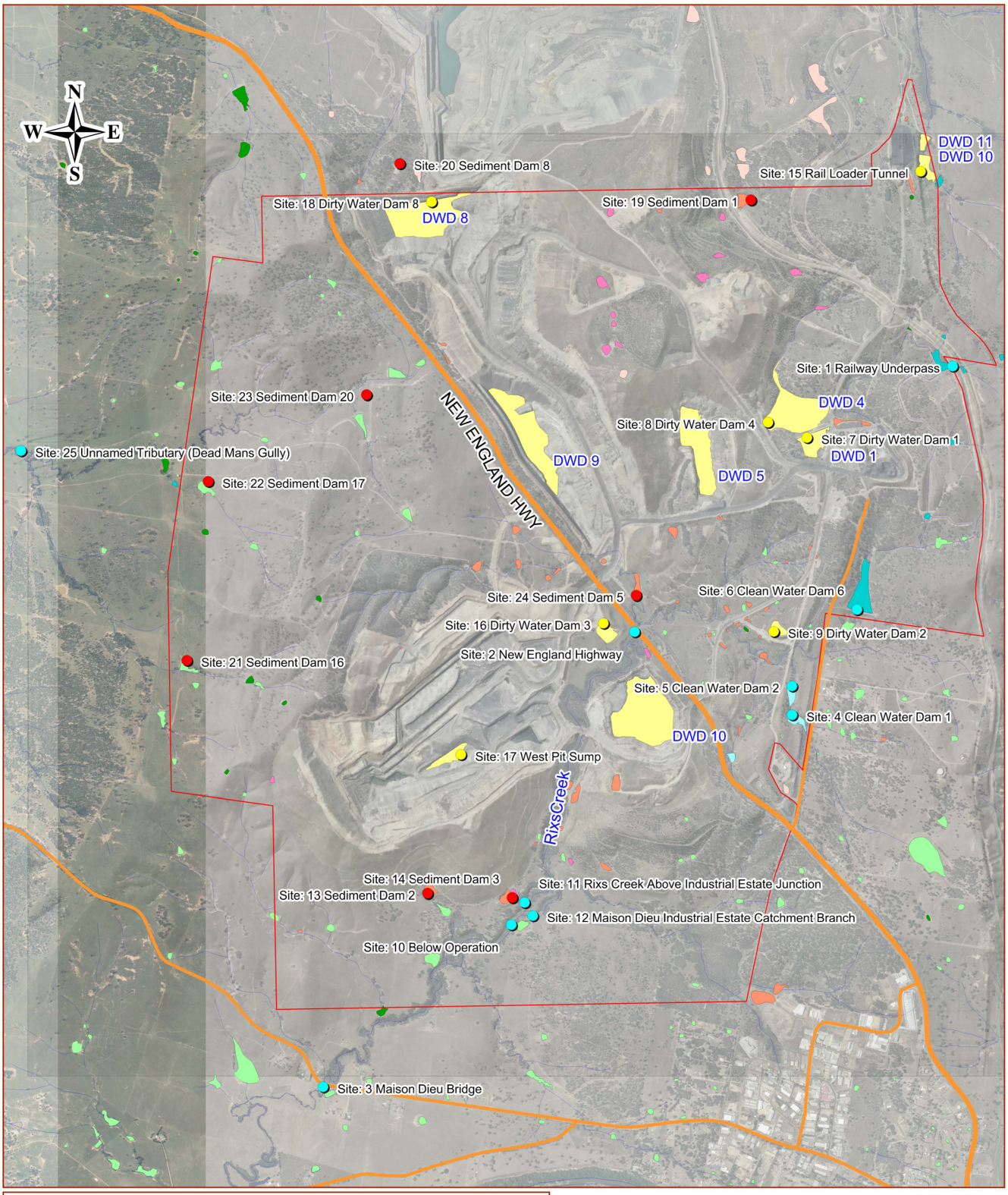
Table 7: Proposed Water Quality Monitoring Plan

Station ID	Type	Parameter	pH, EC, TSS, TDS[2]			Major Ions[3]
		Frequency	Special[4]	Quarterly	Monthly	Annual
1	Stream	Rail Underpass		1		1
2	Stream	New England Highway		1		1
3	Stream	Maison Dieu Bridge		1		1
4	Storage	Clean Water Dam 1 (CWD1)		1		
5	Storage	Clean Water Dam 2 (CWD2)		1		
6	Storage	Clean Water Dam 6 (CWD6)		1		
7	Storage	Dirty Water Dam 1			1	1
8	Storage	Dirty Water Dam 4 (CWD4-DWD4)	1		1	1
9	Storage	Dirty Water Dam 2		1		
10	Stream	Site 10 – Below Operation		1		1
11	Stream	Above Industrial Estate Junction	1			1
12	Stream	Maison Dieu Industrial Estate Catchment Branch	1			1
13	Storage	Sediment Dam 2 - Pit 3 West	1			
14	Storage	Sediment Dam 3 - Pit 3 East	1			
15	Storage	Rail Loader Dam	1			
16	Storage	Dirty Water Dam 3		1		
17	Storage	West Pit In-Pit Storage			1	1
18	Storage	North Pit Sump (DWD8)		1		1
19	Storage	Sediment Dam 1 - Pit 1 North East	1			
20	Storage	Sediment Dam 8 - Pit 1 North	1			
21	Storage	Sediment Dam 16 - Pit 3 West	1			
22	Storage	Sediment Dam 17 - Pit 3 West	1			
23	Storage	Sediment Dam 20 - Pit 3 North	1			
24	Storage	Sediment Dam 5 - Pit 1 South	1			
25	Stream	Dead Mans Gully Below Operations			1	1
26	Stream	Dead Mans Gully Highway Dam			1	

[2] EC – Electrical Conductivity; TSS – Total Suspended Solids; TDS – Total Dissolved Solids.

[3] Comprehensive analysis includes major ions AL, As, B, Ba, Be, Ca, CaCO3, Total Cl, Cd, Co, CO3, Cu, F, Fe (soluble), HCO3, Hg, K, Li, Mg, Mn, Na, NH3, Ni, NO2, NO3, OH, P, Pb, Rb, Sb, Se, Si, SO4 (or S), Sr, Zn

[4] Special sampling occurs at least annually; or when sufficient runoff is generated to either create appreciable flow in a stream or to cause a spillway to operate. Normal analytes: EC, TSS, Turbidity and TDS. At least one sample annually from at least one active sediment dam on Pit1 and Pit 3 should also be subjected to a comprehensive analysis – see Note 5 above.



Water Sample Locations

- Clean
- Contained (Saline)
- Sediment

2014 Site Dams by Purpose

- Clean
- Containment
- Diversion
- Erosion Control
- Other Operation
- Rural
- Sediment
- Sewage
- Soil Conservation

Roads

- Major Road
- Minor Road

Other

- Project Boundary
- Stream Line

JP Environmental

Surface Water Study for Rixs Creek

Continuation of Mining

Figure 5: Water Quality Monitoring Plan - Proposed

Appendix A: Water Quality Monitoring Data

Rixs Creek
Sediment Dams

Miscellaneous Sediment Dams					
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Location
19-Feb-02	6.3	150	120	160	Dead Mans Gully - Dam (Hwy)
19-Feb-02	6.50	230	60	90	SD 2: Pit 3 - West.
19-Feb-02	6.7	770	120	160	SD 3: Pit 3 - East
19-Feb-02	6.9	850	120	160	Sediment Dam - Hill
19-Feb-02	7.3	410	230	350	Sediment Dam 5 - Highway
12-Dec-02	5.7	180	310	160	Dead Mans Gully - Dam (Hwy)
12-Dec-02	6.3	380	500	170	Sediment Dam - Hill
01-Jun-11	7.99	8	298	411	SD 2: Pit 3 - West.
01-Jun-11	8.17	9	711	1210	SD 3: Pit 3 - East
06-Mar-12	8.0	20	266	256	SD 2: Pit 3 - West.
06-Mar-12	7.94	5	771	1370	SD 3: Pit 3 - East
23-Jan-13	8.01	75	373	249	Dead Mans Gully - Dam (Hwy)
20-Feb-13	7.61	44	292	150	Dead Mans Gully - Dam (Hwy)
26-Mar-13	7.4	238	302	256	Dead Mans Gully - Dam (Hwy)
23-Apr-13	7.3	107	255	269	Dead Mans Gully - Dam (Hwy)
28-May-13	7	190	302	295	Dead Mans Gully - Dam (Hwy)
19-Jun-13	7	254	374	330	Dead Mans Gully - Dam (Hwy)
22-Jul-13	7.3	237	605	540	Dead Mans Gully - Dam (Hwy)
27-Aug-13	7.4	155	571	291	Dead Mans Gully - Dam (Hwy)
26-Sep-13	7.4	424	358	353	Dead Mans Gully - Dam (Hwy)
30-Oct-13	7.6	463	465	571	Dead Mans Gully - Dam (Hwy)
21-Nov-13	6.8	22	272	145	Dead Mans Gully - Dam (Hwy)
21-Nov-13	8.12	12	305	356	SD 2: Pit 3 - West.
21-Nov-13	7.47	56	344	624	SD 3: Pit 3 - East
10-Dec-13	6.7	28	260	147	Dead Mans Gully - Dam (Hwy)
28-Jan-14	7.5	77	650	219	Dead Mans Gully - Dam (Hwy)
13-Feb-14	7.8	28	313	231	Dead Mans Gully - Dam (Hwy)
31-Mar-14	6.5	70	50	88	Dead Mans Gully - Dam (Hwy)
29-Apr-14	7.3	16	164	156	Dead Mans Gully - Dam (Hwy)
29-May-14	7.4	30	124	202	Dead Mans Gully - Dam (Hwy)
25-Jun-14	7.6	35	201	166	Dead Mans Gully - Dam (Hwy)
29-Jul-14	7.74	18	176	161	Dead Mans Gully - Dam (Hwy)
29-Jul-14	8.2	10	264	415	SD 2: Pit 3 - West.
29-Jul-14	8.0	6	236	503	SD 3: Pit 3 - East
29-Aug-14	6.6	78	192	136	Dead Mans Gully - Dam (Hwy)
30-Sep-14	8.7	25	177	168	Dead Mans Gully - Dam (Hwy)
27-Oct-14	8.2	53	187	200	Dead Mans Gully - Dam (Hwy)
27-Nov-14	9	18	4480	6660	Dead Mans Gully - Dam (Hwy)
15-Dec-14	7.4	32	221	177	Dead Mans Gully - Dam (Hwy)
28-Jan-15	6.5	55	146	77	Dead Mans Gully - Dam (Hwy)
28-Jan-15	7.9	70	652	1017	SD16
28-Jan-15	7.4	31	153	197	SD17
28-Jan-15	7.0	45	195	87	SD20
27-Feb-15	6.9	34	161	114	Dead Mans Gully - Dam (Hwy)
27-Feb-15	8.2	70	785	1254	SD16
27-Feb-15	7.5	31	176	233	SD17
27-Feb-15	7.4	11	231	330	SD20
31-Mar-15	7.5	23	226	144	Dead Mans Gully - Dam (Hwy)
31-Mar-15	8.8	39	920	1499	SD16
31-Mar-15	8.8	11	239	268	SD17
31-Mar-15	7.4	16	201	170	SD20
27-Apr-15	6.83	18	178	111	Dead Mans Gully - Dam (Hwy)
27-Apr-15	7.85	3000	2890	354	OOPD - Sed Dam (East)
27-Apr-15	7.27	1730	2300	122	OOPD - Sed Dam (West)
27-Apr-15	7.41	212	703	230	SD 2: Pit 3 - West.
27-Apr-15	7.61	4	220	352	SD 3: Pit 3 - East
27-Apr-15	7.3	4	187	154	SD16
27-Apr-15	7.0	230	1310	104	SD17
27-Apr-15	7.4	212	703	230	SD2
27-Apr-15	7.4	142	873	132	SD20
27-Apr-15	7.6	4	220	352	SD3
27-May-15	6.8	39	134	121	Dead Mans Gully - Dam (Hwy)
27-May-15	7.2	14	303	370	SD16
27-May-15	6.8	68	416	136	SD17
27-May-15	6.8	115	439	144	SD20
28-Jul-15	7	46	250	148	Dead Mans Gully - Dam (Hwy)
28-Jul-15	7.9	33	668	719	SD16
28-Jul-15	7.4	103	1050	132	SD17
28-Jul-15	7.2	67	359	287	SD20
27-Aug-15	6.9	50	203	114	Dead Mans Gully - Dam (Hwy)
27-Aug-15	7.7	13	586	788	SD16
27-Aug-15	7.3	29	911	139	SD17
27-Aug-15	7.3	385	882	168	SD20

Rixs Creek
Clean Water Dams

	Clean Water Dam 1				Clean Water Dam 2				Clean Water Dam 6			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
06-Jan-99	7.6	80	190	290	7.5	5	190	290	7.5	60	85	130
26-Feb-99	7.2	340	240	340	7	50	180	240	7.7	65	110	140
26-Mar-99	7.5	240	240	360	7.2	25	160	260	7.4	65	110	140
13-Apr-99	7	170	240	360	7.3	20	160	270	7.3	90	110	140
10-May-99	6.8	130	230	265	7	65	300	207	8	110	320	147
01-Jun-99	7.1	50	340	260	6.6	70	250	200	7	50	370	140
12-Jul-99	6.8	60	180	260	6.9	60	150	200	7.3	60	105	130
04-Aug-99	8.2	25	160	220	7.5	11	100	130	7.2	55	100	120
01-Sep-99	7.2	30	180	200	7.1	19	110	140	7.5	45	100	120
01-Oct-99	8	55	170	240	7	15	110	140	7.2	25	100	120
05-Nov-99	6.3	20	120	150	6	12	110	140	6.4	20	100	120
01-Dec-99	7.1	2	170	240	6.9	11	130	170	7.3	30	100	130
10-Jan-00	7.6	19	340	530	7.3	15	230	340	7.6	45	260	400
04-Feb-00	7.9	35	240	290	7.6	15	150	210	7.6	60	120	160
01-Mar-00	8.4	40	230	350	7.7	30	160	220	7.7	110	120	160
10-Apr-00	7.3	15	150	200	7.7	25	140	180	8.2	45	120	160
10-May-00	7.2	35	140	180	7	24	130	170	7.2	23	120	120
07-Jun-00	7.5	16	170	240	7	1	130	170	7.3	4	100	130
04-Jul-00	7.9	5	220	350	7.4	5	150	210	7.8	30	120	150
29-Aug-00	8.2	15	260	200	7.3	11	220	190	7	27	240	120
18-Sep-00	8.1	80	200	230	8.4	19	200	240	8.2	10	120	130
06-Oct-00	7.5	31	170	210	7.4	17	140	190	8.8	25	120	150
03-Nov-00	7.5	16	180	250	7.1	11	150	210	7.1	12	110	140
06-Dec-00	6.9	21	120	160	7.1	17	140	190	7.6	60	100	130
08-Jan-01	7.3	2	140	190	7.1	4	170	210	7.3	38	120	150
12-Feb-01	7.6	50	140	160	7.2	40	140	170	7.9	60	140	150
05-Mar-01	6.9	23	100	130	6.6	18	110	135	8.5	80	130	170
23-Apr-01	7.5	8	120	180	6.8	5	100	130	7.1	34	110	140
10-May-01	7.2	13	140	180	7.1	13	130	140	7.1	36	140	145
13-Jun-01	7	17	160	200	6.7	14	140	150	7.3	42	120	160
16-Jul-01	7.4	4	170	220	7	6	120	160	8	36	140	190
29-Aug-01	7.2	28	170	230	7.3	65	130	170	7	55	120	150
24-Sep-01	7.9	12	200	250	7.4	22	140	180	7.9	60	120	150
24-Oct-01	8.3	8	190	250	7.7	12	160	180	8.3	55	150	160
30-Nov-01	8.8	5	150	270	7.5	21	90	210	8	60	130	170
19-Dec-01	7.7	5	160	260	7.6	5	150	220	8.7	110	170	190
16-Jan-02	8.4	12	260	390	7.5	7	150	250	8.1	80	220	320
12-Feb-02	7.2	26	200	230	6.7	20	170	190	8.2	280	260	320

Rixs Creek
Clean Water Dams

	Clean Water Dam 1				Clean Water Dam 2				Clean Water Dam 6			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
11-Mar-02	7.1	10	160	190	7.1	3	110	200	8.6	90	250	300
23-Apr-02	6.6	25	90	100	7.4	21	110	140	7.1	34	230	270
15-May-02	7	23	70	110	6.8	9	60	110	7.7	40	340	270
06-Jun-02	6.5	20	180	140	7.5	9	160	160	7.3	170	340	310
31-Jul-02	7.1	6	160	160	6.8	2	95	140	7.8	55	360	270
20-Aug-02	6.7	14	280	170	6.7	9	230	150	6.8	270	440	280
23-Sep-02	7.8	70	150	180	7.5	10	85	160	7.9	320	250	280
16-Oct-02	7	1	210	200	6.5	10	95	160	8.1	45	390	310
27-Nov-02	6.3	70	250	230	6.7	4	100	190	8	80	390	330
09-Dec-02	7.6	75	240	350	8.8	2	120	200	8.4	60	430	350
21-Jan-03	7.8	17	210	210	6.4	120	140	180	7.3	22	420	300
14-Feb-03	8.3	21	170	190	7.9	2	120	200	8.6	110	360	370
19-Mar-03	7.5	14	300	200	7.3	9	120	205	7.5	85	370	320
16-Apr-03	7.3	14	260	220	7	2	170	210	7.8	15	450	310
19-May-03	7	170	250	200	7	4	130	190	7.8	38	440	280
11-Jun-03	7.2	29	160	220	7.5	12	130	210	7.8	44	530	320
16-Jul-03	7.1	55	270	240	7.1	10	180	240	8	31	440	340
26-Aug-03	6.6	25	270	240	7.4	2	250	250	7.6	85	340	330
25-Sep-03	7.1	25	340	260	7.3	9	230	250	8	85	460	340
27-Oct-03	6.8	80	320	260	7.2	14	340	270	7.8	65	470	350
13-Nov-03	7.1	37	270	270	7.6	2	190	280	7.9	80	470	360
15-Dec-03	7.1	17	240	220	7.2	7	280	280	7.8	85	490	340
29-Jan-04	7.6	7	200	260	7.1	5	180	320	7.9	90	420	370
26-Feb-04	6.3	27	168	120	6.4	30	132	120	7.3	151	292	270
31-Mar-04	6.6	3	66	148	6.3	2	104	163	7.3	22	290	271
27-Apr-04	6.4	1	42	156	6.9	1	78	150	6.9	34	272	250
27-May-04	8.4	16	184	122	6.7	14	242	130	7.1	84	342	209
16-Jun-04	8.7	64	136	170	7.4	1	138	170	8	14	289	290
29-Jul-04	7.3	2	70	190	7.5	1	120	180	8.4	2	230	270
23-Aug-04	7.1	12	36	197	7.2	13	60	191	7.7	32	286	260
23-Sep-04	6.8	65	148	199	7	8	180	197	7.5	46	412	260
28-Oct-04	6.4	9	54	197	6.8	2	118	199	7.4	66	316	255
20-Nov-04	7.3	11	200	220	7.4	3	140	210	8.1	80	400	300
30-Nov-04	7.7	5	192	223	8.5	1	140	211	7.4	97	280	280
06-Jan-05	6.8	14	190	236	7.6	12	180	213	7.5	65	365	280
02-Feb-05	6.1	110	140	110	6.7	31	140	180	6.9	240	200	190
23-Mar-05	6	19	88	150	6.2	10	88	200	6.8	37	250	200
29-Apr-05	6.2	1	120	165	6.4	1	40	213	6.8	8	150	207

Rixs Creek
Clean Water Dams

	Clean Water Dam 1				Clean Water Dam 2				Clean Water Dam 6			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
30-May-05	6.8	21	258	172	6.7	16	200	216	7.1	55	362	213
22-Jun-05	7.1	5	190	180	6.9	8	210	230	7.6	17	330	210
28-Jul-05	7.1	3	60	270	7	2	110	240	7.9	23	330	230
24-Aug-05	7.1	7	90	220	7.1	9	100	250	7.9	39	60	240
19-Sep-05	7.2	5	260	241	7.1	6	180	238	8.1	108	310	230
27-Oct-05	9.1	4	82	210	8.6	1	44	240	8.2	32	300	230
21-Nov-05	7.5	2	140	187	7.5	1	82	230	8.2	155	60	240
08-Dec-05	8.6	1	70	195	7.9	11	130	240	8	45	290	250
19-Jan-06	6.8	1	200	230	6.9	1	220	280	7.9	1	310	280
23-Feb-06	7.6	1	248	260	7.8	2	168	300	8.1	49	332	280
23-Mar-06	6.9	16	170	260	6.6	3	170	330	7.8	52	130	280
19-Apr-06	8.7	10	315	320	8.5	2	315	350	8.7	14	445	280
18-May-06	7	9	208	226	7.6	20	192	335	8.4	8	244	290
22-Jun-06	7.8	2	304	271	7.8	10	284	335	8.6	9	246	393
20-Jul-06	6.8	7	210	270	6.8	7	174	335	9	13	224	285
25-Aug-06	7.1	10	196	305	7.5	7	222	360	7.5	10	269	306
15-Sep-06	6.6	22	150	214	6.4	142	526	731	7.3	20	222	270
20-Oct-06	6.9	27	172	253	6.9	8	236	334	7.7	71	294	285
23-Nov-06	9.5	2	180	275	8.2	2	132	362	8.8	2	268	304
13-Dec-06	8	4	198	316	7.7	4	224	406	8.5	31	421	352
11-Jan-07												
22-Feb-07												
15-Mar-07												
27-Apr-07												
23-May-07												
28-Jun-07												
30-Jul-07												
23-Aug-07												
26-Sep-07												
17-Oct-07												
15-Nov-07												
10-Dec-07												
24-Jan-08	8.4	6	95	54	6.8	4	102	204	8.6	29	150	111
06-Feb-08	6.4	34	49	95	6.3	23	186	110	8.9	8	228	127
25-Mar-08	7.5	3	82	128	7.4	4	80	133	8.1	39	162	126
28-Apr-08	6.9	36	82	98	6.7	7	70	111	7.8	19	72	130
20-May-08	6.9	20	84	101	6.7	9	73	115	7.7	8	106	123
05-Jun-08	6.3	54	50	91	6.3	29	56	87	6.8	33	146	160

Rixs Creek
Clean Water Dams

	Clean Water Dam 1				Clean Water Dam 2				Clean Water Dam 6			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
17-Jul-08	7.2	14	140	170	7.6	17	120	120	8	12	120	120
13-Aug-08	7.6	6	145	196	7.4	7	127	131	7.8	18	210	140
18-Sep-08	9	16	136	181	7.6	14	82	144	8.5	160	160	135
27-Oct-08	7.7	9	280	220	7.2	15	170	170	9.4	29	280	150
24-Nov-08	7.5	5	170	230	7.4	12	150	180	8	30	200	150
09-Dec-08	8.7	3	162	237	8.4	6	116	188	7.8	273	266	155
29-Jan-09	8.9	4	150	260	7.2	4	140	210	7.9	13	220	180
16-Feb-09	6.7	55	74	180	6.7	34	110	130	7.1	66	150	140
17-Mar-09	7.9	11	120	180	7	8	90	150	7.3	9	130	130
03-Apr-09	6.8	26	160	150	6.6	38	140	130	6.6	58	160	160
26-May-09	8.2	3	110	180	7.3	7	110	140	7.5	6	180	100
17-Jun-09	7.5	6	54	193	7.3	7	82	143	7.5	8	124	105
20-Jul-09	7.7	8	140	180	7.2	7	122	140	7.5	7	192	110
31-Aug-09	8.2	4	130	190	8	17	110	150	8.2	18	210	120
28-Sep-09	7.62	4	134	210	7.49	8	104	150	7.41	19	209	120
29-Oct-09	7.5	2	170	210	8.1	2	150	160	7.4	13	230	120
18-Nov-09	10	4	140	240	9.4	3	110	170	8.3	9	220	150
08-Dec-09	9.9	8	150	230	8.3	27	280	180	7.9	21	220	130
22-Jan-10	9.1	11	190	240	9.4	19	120	190	8.7	10	220	140
17-Feb-10	9.1	10	230	280	9.9	5	210	210	8.4	16	360	150
29-Mar-10	10.1	7	244	310	10.2	8	74	240	8.9	10	160	170
29-Apr-10	8.8	6	208	318	8.8	14	112	233	7.6	9	124	184
28-May-10	6.8	10	170	306	9	9	132	237	8.1	25	138	164
24-Jun-10	7	191	176	271	7.5	235	100	240	7.3	185	98	161
16-Jul-10	6.8	18	122	257	6.8	6	100	253	7	2	179	156
26-Aug-10	7.1	20	174	230	7.2	2	152	247	8.5	13	92	163
27-Sep-10	7.6	9	162	262	7.5	3	144	273	9.4	21	148	206
26-Oct-10	7.7	4	161	249	7.8	1	164	262	8.2	3	153	166
17-Nov-10	7.1	14	138	196	6.7	33	149	159	7.7	19	152	160
09-Dec-10	8.5	11	74	165	8.4	5	161	198	8.5	5	156	158
24-Jan-11	7.89	10	150	226	7.59	7	172	254	9.48	15	135	216
28-Feb-11	8.09	6	153	204	8.03	6	191	242	9.03	6	127	170
25-Mar-11	7.82	8	139	214	7.99	8	159	253	8.94	6	117	176
29-Apr-11	7.32	8	191	256	7.45	5	213	316	8.76	6	159	195
31-May-11	7.34	87	158	151	7.77	15	152	272	8.25	7	149	180
01-Jun-11	6.97	16	148	123	6.81	73	147	134	7.7	10	126	170
28-Jul-11	7.16	19	128	167	7.1	5	121	159	7.96	34	184	140
25-Aug-11	7.07	14	170	213	7.09	10	125	165	8.06	22	193	130

Rixs Creek
Clean Water Dams

	Clean Water Dam 1				Clean Water Dam 2				Clean Water Dam 6			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
29-Sep-11	7.29	12	186	255	7.3	12	120	172	7.92	32	180	185
26-Oct-11	7.38	11	173	221	7.32	10	150	182	8.19	18	168	160
21-Nov-11	7.99	8	121	215	7.49	6	102	173	8.94	26	148	182
19-Dec-11	7.58	8	175	210	7.4	9	173	163	7.72	16	311	146
23-Jan-12	7.83	23	182	229	7.5	10	160	178	8.03	46	300	152
02-Feb-12	7.44	14	154	221	7.28	12	101	175	7.6	13	200	146
06-Mar-12	7.39	16	219	168	7.19	18	174	137	7.44	20	280	140
26-Apr-12	7.37	14	130	206	7.24	20	117	177	7.52	58	215	174
28-May-12	7.54	47	151	205	7.5	5	136	181	7.83	22	206	175
12-Jun-12	7.43	10	122	197	7.43	47	163	174	7.56	21	152	182
	7.2	13	228	282	7	27	168	190	7.6	9	230	189
25-Jul-12												
27-Aug-12	7.4	15	185	290	7.4	9	174	189	7.8	18	263	180
26-Sep-12	7.4	14	216	306	7.6	27	172	213	7.9	14	273	226
29-Oct-12	7.3	12	247	338	7.2	53	158	219	8.2	14	300	244
21-Nov-12	7.5	17	227	342	7.1	77	164	226	8	118	251	246
11-Dec-12	7.3	12	251	379	7.2	22	186	250	7.3	21	262	261
23-Jan-13	8.1	22	308	424	8	35	200	276	8.36	50	285	271
20-Feb-13	7.69	14	160	183	7.62	8	154	197	8.13	24	294	292
26-Mar-13	6.9	6	126	155	6.9	24	124	136	7.4	26	214	241
23-Apr-13	7.2	9	126	156	7	9	124	140	7.2	22	177	186
28-May-13	7.2	35	198	158	7	10	106	146	7.3	14	233	235
19-Jun-13	6.9	10	216	172	7	7	169	156	7.3	6	262	203
22-Jul-13	7	8	198	244	7	6	158	167	7.4	4	244	253
27-Aug-13	8	7	179	201	7.9	15	144	150	8.2	50	218	194
26-Sep-13	8	10	244	290	7.9	11	200	196	8	45	278	221
30-Oct-13	7.9	21	201	318	8	8	169	221	8.3	35	251	298
21-Nov-13	7.06	30	138	133	7.14	15	158	184	7.49	5	237	253
10-Dec-13	6.9	13	124	133	6.9	10	139	158	8	21	275	292
28-Jan-14	7.6	10	119	174	7.4	6	133	199	8.4	7	228	331
13-Feb-14	7.8	9	128	184	8	13	134	244	8.9	5	224	344
31-Mar-14	7.1	86	112	98	7.5	47	101	155	7.9	18	256	322
29-Apr-14	6.8	31	108	104	6.9	17	105	118	7.6	10	197	289
29-May-14	7	8	108	108	7	9	114	125	8.5	6	209	397
25-Jun-14	7.5	5	133	112	7.5	10	129	133	8.3	6	189	329
29-Jul-14	7.5	5	116	145	7.54	5	126	156	8.1	5	128	297

Rixs Creek
Clean Water Dams

	Clean Water Dam 1				Clean Water Dam 2				Clean Water Dam 6			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
29-Aug-14	7.1	41	156	130	7.4	10	134	141	8.8	7	189	314
29-Aug-14	7.4	15	146	148	7.8	8	141	141	9.2	10	207	323
27-Oct-14	7.8	5	139	148	7.6	4	143	142	8.9	4	229	341
27-Nov-14	8.2	7	136	157	7.5	7	143	173	8.3	32	195	329
15-Dec-14	7.3	17	122	148	7.9	7	125	155	8.2	10	201	340
28-Jan-15	6.6	54	93	66	6.8	38	96	131	7.5	15	134	244
27-Feb-15	6.7	11	124	104	6.8	11	132	129	7.9	14	198	271
31-Mar-15	6.9	16	140	149	7.2	16	143	183	8	14	218	290
27-Apr-15	7.07	8	150	158	7.01	6	154	133	7.32	18	171	154
27-May-15	7	19	185	170	7.1	13	156	156	7.3	8	119	190
30-Jun-15	7	8	191	225	7	16	148	189	7.3	19	190	226
28-Jul-15	7.2	7	249	212	7.3	4	247	160	7.7	6	235	218
27-Aug-15	7	9	269	244	7.1	9	178	181	7.6	3	247	219

Rixs Creek
Creek Water Monitoring Data

Date	Railway Underpass					New England Highway					Below Operation					Maison Dieu Bridge					Industrial Estate Tributary					RXC Above Industrial Estate Tributary				
	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
06-Jan-99	Nil	7.3	30	140	220	Nil	8.4	20	1950	3380						Nil	7.7	9	2210	3660										
26-Feb-99	Nil	7.4	480	2140	3630	Nil	7.4	19	2100	3790						Nil	7.7	10	880	1520										
26-Mar-99	Nil	7.4	25	3350	5300	Nil	7.3	50	1090	1810						Nil	6.9	30	810	1340										
13-Apr-99	Nil	7.3	6	3390	5830	Flow	7.4	70	820	1390						Flow	7.1	20	610	1010										
10-May-99	Nil	7.2	20	1690	2970	Flow	7	200	510	840						Flow	6.7	280	280	530										
01-Jun-99	Nil	7.3	8	3470	5530	Nil	7.1	170	600	1004						Nil	7	100	320	476										
12-Jul-99	Nil	7.8	4	3600	5520	Nil	7.8	80	760	1180						Nil	7.3	35	430	610										
04-Aug-99	Trickle	7.2	4	3060	5290	Nil	7.4	17	1480	2260						Nil	7.1	23	390	620										
01-Sep-99	Flow	8.2	70	90	110	Flow	7.4	180	120	150						Flow	7.1	270	140	190										
01-Oct-99	Nil	7.2	7	3310	5400	Nil	7.7	8	1530	2460						Nil	7.4	34	560	930										
05-Nov-99	Nil	7.2	12	2870	4620	Nil	7.9	2	2440	3950						Nil	7.3	8	870	1550										
01-Dec-99	Nil	7.2	9	3170	4940	Nil	7.9	4	2560	3880						Nil	7.1	6	960	1540										
10-Jan-00	Trickle	7.6	40	1060	1850	Trickle	6.7	30	640	1120						Trickle	6.5	30	580	910										
10-Jan-00	Flow	6.1	90	100	130	Flow	6.9	120	440	710						Flow	6.6	180	330	520										
04-Feb-00	Nil	8.1	20	2630	4470	Nil	7.7	35	640	1070						Nil	7.4	25	540	980										
04-Feb-00	Nil					Nil	7.9	16	730	1320						Nil	7.7	20	980	1680										
01-Mar-00	Nil					Nil										Nil														
01-Mar-00	Nil					Nil										Nil														
09-Mar-00	Flow	7.4	110	630	1020	Flow	7	330	970	1600						Flow	7	60	540	860										
10-Apr-00	Flow	7.3	10	1000	1660	Flow	7.3	24	650	960						Flow	7	40	630	890										
17-Apr-00	Flow	7.5	60	300	460	Flow	7.3	460	380	470						Flow	7	1080	200	300										
10-May-00	Trickle	7.5	30	1470	2570	Flow	7.6	100	1310	1830						Flow	7.4	90	730	1200										
07-Jun-00	Nil	8.1	2	3460	6130	Flow	8.2	6	3470	5850						Flow	7.5	4	1650	2900										
04-Jul-00	Nil	8	7	3490	5880	Flow	8.3	2	3750	6300						Flow	7.7	3	3600	6050										
29-Aug-00	Trickle	7.3	110	980	1450	Nil	8.2	6	3980	5000						Nil	7.7	1	3950	6000										
18-Sep-00	Nil					Nil	8.5	10	4160	6270						Nil	7.8	4	3750	5750										
06-Oct-00	Nil					Nil	8.5	8	4510	6360						Nil	7.7	8	3870	5810										
03-Nov-00	Nil					Nil	8.5	18	4740	7100						Nil	7.4	25	4200	6450										
06-Dec-00	Nil	7.3	60	980	1610	Nil	7.3	70	530	770						Flow	7	160	650	1020										
08-Jan-01	Nil	7.4	50	750	1190	Nil	7.6	16	1160	2120						Nil	7.5	1	470	860										
12-Feb-01	Flow	6.8	130	290	360	Flow	7	160	320	450						Flow	6.9	100	330	420										
05-Mar-01	Nil	7.4	100	180	210	Nil	7.6	35	620	900						Nil	7.2	18	800	1110										
12-Mar-01	Flow	6.5	320	130	170	Flow	6.2	520	150	200						Flow	6	120	150	200										
23-Apr-01	Nil	7.6	7	280	420	Nil	7.9	6	2830	4380						Nil	7.5	4	610	1040										
10-May-01	Trickle	7.4	29	310	430	Flow	7.6	80	1890	3210						Flow	7.1	150	590	810										
13-Jun-01	Nil	7	21	400	620	Nil	7.7	12	3050	4750						Nil	7.2	50	870	1480										
16-Jul-01	Nil	7	7	390	615	Nil	8.1	21	3360	5340						Nil	7.6	4	1220	2120										
29-Aug-01	Nil	7.3	14	450	610	Nil	7	80	1060	1700						Nil	7.5	8	1470	2440										
24-Sep-01	Nil	8.1	15	310	650	Nil	7.6	130	1180	1830						Nil	8.1	6	1550	2700										
24-Oct-01	Nil	8.1	12	440	660	Nil	7.9	85	1210	2150						Nil	8.1	9	1400	2530										
30-Nov-01	Nil	7.5	17	560	790	Nil	7.8	100	1520	2620						Nil														
19-Dec-01	Nil	7.9	18	460	750	Nil	7.7	80	1650	2460						Nil														
16-Jan-02	Nil	7.6	50	590	910	Nil	8	320	2120	3390						Nil														
12-Feb-02	Nil	6.9	250	450	610	Nil	7.4	160	490	710						Nil	6.6	120	530	720										
19-Feb-02	Flow	7.4	250	330	540	Flow	7.3	360	370	590						Flow	7.5	410	390	505										
11-Mar-02	Nil	7.8	160	440	580	Nil	7	28	530	720						Nil	7.1	55	530	730										
23-Apr-02	Nil	6.6	45	220	260	Nil	6.8	33	450	690						Nil	7.1	21	450	760										
15-May-02	Nil	7.1	80	160	320	Nil	7.1	50	480	720						Nil	7.5	6	470	860										
06-Jun-02	Trickle	6.1	150	300	220	Trickle	6.5	120	610	540						Trickle	6.7	75	560	1010										
31-Jul-02	Nil	6.7	85	170	210	Nil	7.2	29	580	1060						Nil	7.4	22	720	1310										
20-Aug-02	Nil	6.5	280	570	240	Nil	7.1	30	760	1120						Nil	7.5	8	890	1380										
23-Sep-02	Nil	7.4	460	230	360	Nil	7.8	19	740	1310						Nil	7.9	11	900	1620										
09-Oct-02	Nil					Nil										Nil														
27-Nov-02	Nil					Nil										Nil														
09-Dec-02	Nil					Nil										Nil														
12-Dec-02	Flow	6	5	120	180	Flow	6.7	160	340	380						Flow	7.6	170	350	400										
21-Jan-03	Nil					Nil										Nil														
14-Feb-03	Nil					Nil										Nil														
19-Mar-03	Nil	6	230	280	250	Nil	7.7	16	790	1220						Nil	7.2	140	300	500										
16-Apr-03	Nil					Nil										Nil														
19-May-03	Nil	7	190	330	190	Nil	7	4	1060	1280						Nil	7	110	200	200										
11-Jun-03	Nil	5.5	380	330	310	Nil	7.8	4	1040	1570						Nil	7.6	130	230	290										
16-Jul-03	Nil	5.8	17	320	360	Nil	8	2	1100	1580						Nil	7.2	65	290	240										
26-Aug-03	Trickle	5.8	350	130	115	Trickle	6.7	200	980	1480						Trickle	6.5	1430	330	340										
25-Sep-03	Nil	6.8	150	480	230	Nil	7	38	1130	1700						Nil	7.1	430	440	570										
27-Oct-03	Nil	6.6	360	360	270	Nil	7.1	29	870	1580						Trickle	6.7	370	160	360										

Rixs Creek

Creek Water Monitoring Data

Date	Railway Underpass					New England Highway				
	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
13-Nov-03	Nil	6.9	320	400	400	Nil	7.5	2	1060	1650
24-Nov-03	Flow	6.5	150	220	110	Flow	6.9	420	710	1300
15-Dec-03	Trickle	7.3	130	340	250	Trickle	7.2	50	710	1050
29-Jan-04	Trickle	6.4	430	300	160	Trickle	7.1	45	740	1270
24-Feb-04	Flow	6.5	140	40	95	Flow	7	730	260	410
26-Feb-04	Flow	6.4	20	272	140	Flow	6.9	247	258	360
31-Mar-04	Nil	6.5	30	236	254	Nil	7.2	26	832	1630
27-Apr-04	Nil	6.7	27	178	190	Nil	7.5	1	986	1250
27-May-04	Nil	6.4	70	378	218	Nil	7.3	10	1242	1578
16-Jun-04	Nil	6.8	132	202	300	Nil	7.9	1	1082	2000
29-Jul-04	Nil	6.1	460	290	280	Nil	7.4	33	1180	2000
23-Aug-04	Nil	5.8	580	310	373	Nil	7.3	16	1234	2140
23-Sep-04	Nil	5.7	804	374	297	Nil	7.5	9	1088	1898
28-Oct-04	Nil	6	355	280	138	Nil	7.1	27	950	1630
30-Nov-04	Nil	6.6	390	420	260	Nil	7.3	4	1660	2750
20-Dec-04	Nil	6.5	282	432	260	Nil	7.2	10	1450	2340
06-Jan-05	Nil	6.6	594	420	328	Nil	7.4	3	1480	2470
02-Feb-05	Flow	6.5	360	190	75	Flow	7.1	180	320	460
23-Mar-05	Flow	6.6	131	158	140	Flow	6.9	122	442	870
29-Apr-05	Nil	6.1	43	128	213	Nil	7.1	1	350	754
30-May-05	Nil	6.2	350	296	152	Nil	7.2	22	766	1218
22-Jun-05	Nil	6.9	315	260	160	Nil	7.4	8	700	1240
28-Jul-05	Nil	6.4	204	290	170	Nil	7	41	430	1000
24-Aug-05	Nil	6.3	500	340	190	Nil	7.4	24	610	1110
19-Sep-05	Nil	5.9	720	690	200	Nil	7.3	20	700	1120
27-Oct-05	Nil	6	160	400	130	Nil	6.8	116	560	1000
21-Nov-05	Nil	6.4	236	28	188	Nil	6.9	48	704	1270
08-Dec-05	Nil	6.2	230	230	210	Nil	6.8	2	960	1800
19-Jan-06	Nil	6.7	1180	440	380	Nil	7.3	45	1190	2080
23-Feb-06	Dry					Nil	7.6	24	874	1660
23-Mar-06	Dry					Dry				
19-Apr-06	Dry					Dry				
18-May-06	Dry					Dry				
22-Jun-06	Dry					Dry				
20-Jul-06	Dry					Dry				
25-Aug-06	Dry					Dry				
15-Sep-06	Trickle	6.6	37	236	167	Flow	6.7	14	180	238
20-Oct-06	Nil	5.5	94	324	361	Nil	6.8	18	1110	1866
23-Nov-06	Dry					Dry				
13-Dec-06	Dry					Dry				
11-Jan-07	Dry					Dry				
22-Feb-07	Dry					Dry				
15-Mar-07	Dry					Dry				
27-Apr-07	Nil	6.3	48	160	215	Nil	6.8	34	1106	1802
23-May-07	Nil	6.6	64	186	234	Nil	6.7	49	1042	1897
28-Jun-07	Flow	6	30	246	152	Flow	6.2	52	686	580
30-Jul-07	Nil	6.7	16	74	166	Nil	6.7	32	548	1004
23-Aug-07	Flow	6	32	186	136	Flow	6.5	109	310	511
26-Sep-07	Nil	6.5	23	184	232	Nil	6.8	8	624	1118
17-Oct-07	Nil	7.3	422	356	377	Nil	7.5	26	752	1213
15-Nov-07	Nil	8.8	642	188	304	Nil	7.8	21	680	1176
10-Dec-07	Nil	6.3	58	108	184	Flow	7	31	888	1598
24-Jan-08	Nil	7.3	224	30	262	Nil	7	10	1062	1679
06-Feb-08	Trickle	6.2	218	290	124	Flow	6.4	73	488	504
25-Mar-08	Nil	7.1	55	136	152	Nil	7.3	12	695	1178
28-Apr-08	Flow	7.7	48	108	125	Flow	7.4	25	286	476
20-May-08	Nil	7.7	142	32	120	Nil	7.7	10	372	478
05-Jun-08	Flow	6	28	48	78	Flow	6.7	47	226	312
17-Jul-08	Nil	7	247	80	150	Nil	7.5	8	960	1420
13-Aug-08	Nil	7.3	289	192	176	Nil	7.9	6	928	1647
18-Sep-08	Nil	7.2	268	154	176	Nil	7.3	26	640	979
27-Oct-08	Nil	6.8	320	320	190	Nil	7.3	18	810	490
24-Nov-08	Nil	7	500	510	200	Nil	8.2	110	530	900
09-Dec-08	Nil	7	1124	426	150	Nil	7.4	33	620	928
29-Jan-09	Dry					Dry				
16-Feb-09	Flow	7.1	35	160	170	Flow	6.9	46	200	220

Date	Below Operation					Maison Dieu Bridge				
	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
13-Nov-03						Nil	6.8	37	580	510
24-Nov-03						Flow	7	4110	330	470
15-Dec-03						Trickle	7.1	420	590	660
29-Jan-04						Flow	6.8	390	480	740
24-Feb-04						Flow	6.9	1120	70	280
26-Feb-04						Flow	6.8	296	238	310
31-Mar-04						Nil	6.9	28	646	1290
27-Apr-04						Nil	7.1	1	650	852
27-May-04						Nil	6.7	23	548	660
16-Jun-04		8.1	39	556	1170	Nil	7.5	25	556	1160
29-Jul-04		7.8	13	1720	3130	Nil	7.4	160	560	1080
23-Aug-04		6.9	80	236	476	Nil	7	62	434	620
23-Sep-04		7.1	24	180	320	Nil	7.2	159	476	520
28-Oct-04		7	490	402	520	Nil	6.4	454	338	260
30-Nov-04		6.6	180	710	880	Nil	7	1570	490	820
20-Dec-04		7.3	131	386	6.7	Nil	6.4	204	414	392
06-Jan-05	Nil	7.3	27	1100	1830	Nil	6.8	127	402	440
02-Feb-05	Flow	7.2	250	370	450	Flow	6.8	415	460	430
23-Mar-05	Flow	7.1	282	392	420	Flow	6.8	226	296	490
29-Apr-05	Nil	7.1	68	373	513	Nil	7.2	1	326	640
30-May-05	Nil	7.3	62	396	545	Nil	7.3	50	408	637
22-Jun-05	Nil	7.5	77	950	1390	Nil	6.9	315	260	160
28-Jul-05	Nil	7.7	73	330	530	Nil	7	59	320	650
24-Aug-05	Nil	7.5	9	4990	7990	Nil	7.2	35	420	710
19-Sep-05	Trickle	7.1	21	400	600	Nil	7.1	70	540	577
27-Oct-05	Trickle	7.5	186	194	300	Trickle	6.6	107	230	270
21-Nov-05	Nil	7.8	50	638	896	Trickle	6.8	29	448	775
08-Dec-05	Nil	7.7	36	410	600	Nil	6.7	40	540	970
19-Jan-06	Nil	7.6	4	1630	2840	Nil	7.5	21	710	1310
23-Feb-06	Nil	7.9	16	696	1100	Dry				
23-Mar-06	Dry					Dry				
19-Apr-06	Dry					Dry				
18-May-06	Dry					Dry				
22-Jun-06	Nil	7.8	16	618	873	Dry				
20-Jul-06	Trickle	8.8	16	236	340	Dry				
25-Aug-06	Dry					Dry				
15-Sep-06	Flow	7.7	112	366	448	Flow	6.8	152	676	1119
20-Oct-06	Dry					Dry				
23-Nov-06	Dry					Dry				
13-Dec-06	Dry					Dry				
11-Jan-07	Dry					Dry				
22-Feb-07	Dry					Dry				
15-Mar-07	Nil	7.3	40	600	929	Dry				
27-Apr-07	Nil	8.6	38	596	649	Nil	6.6	48	244	409
23-May-07	Nil	7.8	19	361	336	Nil	6.4	48	266	452
28-Jun-07	Flow	6.5	128	626	760	Flow	6.3	56	540	961
30-Jul-07	Nil	7.1	12	3540	5760	Nil	6.5	26	1064	1757
23-Aug-07	Flow	6.5	144	338	441	Flow	6.3	171	262	403
26-Sep-07	Nil	8	2	864	1668	Nil	7.2	5	488	951
17-Oct-07	Nil	7.9	20	10840	16450	Nil	7.7	6	698	1140
15-Nov-07	Nil	7.6	22	316	505	Nil	7.2	14	236	317
10-Dec-07	Flow	7.8	91	386	630	Flow	6.7	142	302	448
24-Jan-08	Trickle	7.8	18	204	293	Trickle	6.8	63	246	275
06-Feb-08	Flow	8	91	422	485	Flow	6.5	77	400	339
25-Mar-08	Trickle	7.8	11	398	519	Nil	7.4	14	226	373
28-Apr-08	Flow	8.1	22	302	346	Flow	7.3	52	224	302
20-May-08	Nil	8.1	8	286	343	Nil	7.3	26	200	302
05-Jun-08	Flow	7.2	73	104	189	Flow	6.8	82	128	178
17-Jul-08	Trickle	7.9	8	740	1150	Nil	6.9	9	410	650
13-Aug-08	Nil	8.1	3	998	1782	Nil	7.6	7	482	927
18-Sep-08	Nil	8	23	1297	2655	Nil	7.1	32	524	720
27-Oct-08	Nil	9.6	9	480	610	Nil	7.1	16	480	712
24-Nov-08	Trickle	7.9	42	340	420	Nil	7.2	9	690	1100
09-Dec-08	Nil	7.4	14	358	620	Nil	6.9	42	610	924
29-Jan-09	Dry					Dry				
16-Feb-09	Flow	7.3	46	180	250	Flow	6.8	61	210	240

Date	Industrial Estate Tributary					RXC Above Industrial Estate Tributary				
	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
13-Nov-03										
24-Nov-03										
15-Dec-03										
29-Jan-04										
24-Feb-04										
26-Feb-04										
31-Mar-04										
27-Apr-04										
27-May-04										
16-Jun-04										
29-Jul-04										
23-Aug-04										
23-Sep-04										
28-Oct-04										
30-Nov-04										
20-Dec-04										
06-Jan-05										
02-Feb-05										
23-Mar-05										
29-Apr-05										
30-May-05										
22-Jun-05										
28-Jul-05										
24-Aug-05										
19-Sep-05										
27-Oct-05										
21-Nov-05										
08-Dec-05										
19-Jan-06										
23-Feb-06										
23-Mar-06										
19-Apr-06										
18-May-06										
22-Jun-06										
20-Jul-06										
25-Aug-06										
15-Sep-06	Flow	7	80	260	243	Flow	7	80	260	243
20-Oct-06										
23-Nov-06										
13-Dec-06										
11-Jan-07										
22-Feb-07										
15-Mar-07										
27-Apr-07										
23-May-07										
28-Jun-07	Flow	7.3	42	280	379	Flow	6.9	147	706	420
30-Jul-07										
23-Aug-07	Flow	6.6	81	298	394	Flow	6.5	144	395	373
26-Sep-07										
17-Oct-07										
15-Nov-07										
10-Dec-07										
24-Jan-08										
06-Feb-08	Flow	7.3	127	326	233	Flow	7.1	74	422	529
25-Mar-08										
28-Apr-08	Flow	7.7	29	246	294	Flow	7.6	29	224	344
20-May-08										
05-Jun-08	Flow	6.9	78	158	198	Flow	6.9	64	98	187
17-Jul-08										
13-Aug-08										
18-Sep-08										
27-Oct-08										
24-Nov-08	Trickle									
09-Dec-08										
29-Jan-09										
16-Feb-09	Flow	7	56	210	220					

Rixs Creek

Creek Water Monitoring Data

Date	Railway Underpass					New England Highway					Below Operation					Maison Dieu Bridge					Industrial Estate Tributary					RXC Above Industrial Estate Tributary				
	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
17-Mar-09	Trickle	6.5	330	130	140	Flow	6.9	63	260	830	Flow	8	45	430	680	Flow	6.9	80	620	980										
03-Apr-09	Flow	6.3	29	220	120	Flow	6.8	36	270	310	Flow	7.2	67	330	340	Flow	6.7	57	430	520										
26-May-09	Nil	6.4	133	230	170	Nil	7.9	5	1820	2700	Flow	7.9	3	720	1200	Flow	7.2	11	2420	3400										
17-Jun-09	Nil	6.5	150	132	165	Nil	8.4	1	1450	2730	Nil	8.3	1	554	1296	Trickle	7.5	1	1000	2120										
23-Jun-09	Nil	6.4	70	210	110	Flow	7.3	68	2480	3800	Flow	7.8	95	220	400	Flow	7.5	22	670	1250										
20-Jul-09	Nil	6.5	103	344	130	Nil	8	4	2000	4000	Trickle	8.1	5	440	730	Nil	8.1	7	868	1540										
31-Aug-09	Nil	7.4	320	210	160	Nil	8.5	2	2100	3600	Dry					Nil	8.3	2	1100	1800										
28-Sep-09	Nil	6.22	1880	2390	250	Nil	8.17	3	2130	3500	Nil	8.11	3	607	1100	Nil	7.71	5	1470	2500										
29-Oct-09	Nil	7.4	19	250	260	Nil	7.8	4	2600	3900	Trickle	7.6	7	390	610	Nil	7.4	11	1500	2300										
18-Nov-09	Dry					Dry					Dry					Dry														
08-Dec-09	Dry					Dry					Dry					Dry														
22-Jan-10	Dry					Dry					Dry					Dry														
17-Feb-10	Dry					Dry					Nil	7.8	56	550	600	Nil	6.6	52	310	450										
29-Mar-10	Dry					Dry					Dry					Dry														
29-Apr-10	Dry					Dry					Nil	7.4	4	304	639	Dry														
28-May-10	Dry					Nil	6.2	71	1006	1724	Flow	7.6	150	212	279	Nil	6.7	163	294	449	Flow	7.3	115	114	244					
24-Jun-10	Trickle	6.3	506	156	173	Nil	6.7	259	512	885	Flow	7.7	197	328	462	Nil	6.7	518	476	853										
16-Jul-10	Flow	6.7	98	180	118	Flow	6.8	84	514	856	Flow	7.8	160	300	274	Flow	6.8	93	500	1024	Flow	7.4	114	230	274	Flow	7.2	92	548	1035
26-Aug-10	Trickle	6.9	61	268	410	Nil	6.7	14	798	1368	Flow	8.6	2	486	866	Flow	6.8	22	460	784										
27-Sep-10	Nil	6.8	50	194	171	Nil	6.9	9	518	1056	Nil	8.1	7	924	1569	Nil	7.2	9	618	1197										
26-Oct-10	Nil	7.2	67	331	193	Nil	7.3	4	724	1310	Flow	7.8	42	292	294	Flow	7.1	15	214	344	Flow	7.8	34	290	291					
17-Nov-10	Flow	6.5	33	114	126	Flow	7.1	24	418	623	Flow	7.5	28	386	479	Flow	7.1	62	208	434	Flow	7.5	28	342	351	Flow	7.4	40	410	550
09-Dec-10	Trickle	8.4	31	162	177	Trickle	8.4	5	944	1690	Trickle	8.3	20	306	418	Trickle	8.5	17	212	242										
24-Jan-11	Nil	7.13	126	322	413	Nil	7.38	34	1070	1820	Dry					Dry														
28-Feb-11	Dry					Dry					Dry					Dry														
25-Mar-11	Dry					Nil	7.8	12	1080	1700	Nil	7.59	26	352	437	Nil	7.3	10	360	535										
29-Apr-11	Nil	6.32	48	321	189	Nil	7.58	14	826	1270	Nil	7.92	5	330	362	Nil	7.03	6	378	434	Flow	7.44	220	256	154					
31-May-11	Flow	7.06	338	312	91	Flow	7.43	209	354	365	Flow	7.5	492	346	275	Flow	7.22	824	476	348	Flow	6.97	69	516	335	Flow	7.37	596	308	330
01-Jun-11	Flow	5.97	110	234	82	Flow	7.37	76	450	566	Flow	6.87	109	512	375	Flow	6.73	120	488	332						Flow	6.97	103	472	376
28-Jul-11	Flow	6.65	12	88	205	Flow	7.41	11	598	1170	Flow	8.14	10	420	847	Flow	7.45	5	974	1980	Flow	7.73	38	704	623					
25-Aug-11	Flow	6.45	50	262	140	Flow	7.05	11	478	757	Flow	8.02	24	486	603	Flow	7.11	30	444	540	Flow	7.57	256	540	259	Flow	7.6	20	398	545
29-Sep-11	Flow	7.51	155	214	104	Flow	7.47	297	970	1390	Flow	7.86	164	598	615	Flow	7.49	265	386	313	Flow	7.95	14	740	1370	Flow	7.69	107	658	949
26-Oct-11	Flow	7.26	12	252	304	Flow	7.7	18	562	942	Flow	8.08	14	794	1430	Flow	7.48	18	528	854	Flow	8.08	76	424	480	Flow	7.49	9	440	655
21-Nov-11	Flow	7.48	14	262	420	Flow	7.58	14	640	1110	Flow	7.76	78	480	562	Flow	7.32	30	338	577						Flow	7.57	106	486	691
19-Dec-11	Trickle	7.62	10	291	290	Trickle	7.66	28	1060	1750	Trickle	7.38	16	1100	1720	Trickle	7.51	21	496	612										
23-Jan-12	Nil	7.75	12	228	354	Nil	7.79	91	1240	1960	Trickle	8.09	7	736	1280	Trickle	7.86	14	736	1250										
02-Feb-12	Nil	7.15	186	255	100	Flow	7.49	90	790	1120	Flow	7.79	50	612	947	Flow	7.55	47	372	370	Flow	7.64	73	308	299	Flow	7.83	31	1070	1900
06-Mar-12	Nil	7.11	100	387	157	Flow	7.51	17	414	586	Flow	7.84	22	384	477	Flow	7.42	38	442	652	Flow	7.75	39	496	551	Flow	7.87	23	400	451
26-Apr-12	Nil	7.78	21	439	328	Flow	7.72	5	3180	4540	Flow	8.19	5	2950	4310	Flow	7.76	8	2710	3940	Flow	8.29	5	818	1600	Flow	8.15	8	2980	4370
28-May-12	Nil	7.87	72	364	339	Nil	7.64	16	524	809	Nil	7.71	36	526	697	Nil	7.63	17	750	1180										
12-Jun-12	Nil	7.71	88	372	402	Trickle	7.55	15	706	1190	Flow	8.1	13	484	989	Flow	7.48	37	490	782	Flow	7.92	7	502	972	Trickle	7.5	33	472	783
25-Jul-12	Nil	7.8	41	343	499	Trickle	7.2	36	920	1541	Flow	8	46	493	791	Flow	7.1	39	833	1363	Flow	7.9	49	494	790	Trickle	7.2	78	819	1356
27-Aug-12	Nil	7.7	13	381	577	Nil	7.7	48	995	1697	Nil	7.4	101	835	1462	Nil	7.5	17	940	1652										
26-Sep-12	Nil	8	47	462	753	Nil	7.6	77	1090	1889	Nil	7.7	130	1420	2610	Nil	7.6	10	1300	2120										
29-Oct-12	Dry					Dry					Dry					Dry														
21-Nov-12	Dry					Dry					Dry					Dry														
11-Dec-12	Dry					Dry					Dry					Dry														
23-Jan-13	Nil	9.18	103	984	1600	Nil - Dry					Nil - Dry					Nil	8.41	30	1440	2450	Nil					Nil				
20-Feb-13	Nil	7.39	5	500	702	Nil	7.44	6	892	1460	Nil	7.47	9	312	536	Nil	7.33	6	356	489	Nil					Nil				
26-Mar-13	Nil	7	8	258	406	Nil	8	13	1420	2570	Nil	7.7	7	1480	2520	Nil	6.8	17	2080	3540	Nil					Nil				
23-Apr-13	Nil	7.6	10	304	507	Nil	8	8	1670	2870	Nil	7.8	13	1500	2470	Nil	7.3	13	2900	4940	Nil					Nil				
28-May-13	Nil	7.5	4	397	609	Trickle	8.2	5	3450	5200	Trickle	7.8	9	503	819	Trickle	7.4	7	2060	3710	Trickle	7.7	13	465	778	Trickle	7.8	33	1480	2300
19-Jun-13	Nil	7.6	6	465	683	Nil	8.1	5	3270	4980	Nil	7.8	3	3240	4940	Trickle	7.3	6	919	1659	Dry					Dry				
22-Jul-13	Nil	7.5	8	431	663	Nil	7.8	6	1700	2750	Nil	8.3	6	2870	4550	Trickle	7.3	16	1380	2270	Dry					Dry				
27-Aug-13	Nil	8.2	7	431	735	Nil	8.4	20	1870	3240	Nil	8.6	3	3100	4970	Nil	7.9	4	1480	2490	Dry					Dry				
26-Sep-13	Nil	9	5	586	940	Nil	8.5	23	2130	3650	Nil - Dry					Nil	8.1	14	1240	2150	Dry					Dry				
30-Oct-13	Nil	8.5	14	628	970	Nil - Dry					Nil - Dry					Nil - Dry					Dry					Dry				
21-Nov-13	Nil	7.15	36	277	330	Trickle	7.41	5	387	519	Low flow	7.62	5	379	502	Low flow	7.25	5	375	522	Trickle	7.68	5	347	425	Low flow	7.63	5	364	523
10-Dec-13	Nil	7.5	20	462	381	Nil	7.3	18	449	644	Nil	7.4	23	461	509	Nil	7.1	34	408	591	Dry					Dry				
28-Jan-14	Nil	8.4	20	365	540	Dry					Dry					Dry					Dry					Dry				
13-Feb-14	Nil	8.9	18	354	637	Dry					Dry					Dry					Dry					Dry				
31-Mar-14	Nil	7.5	51	540	448	Trickle	7.2	66	388	533	Trickle	8	74	353	445	Trickle	7	176	337	383	Trickle	8.2	41	339	397	Trickle	7.7	111	412	476
28-Jan-15	Flow	7.3	97	203	299	Flow	7.3	34	213	325	Flow	7.6	39	259	293	Flow	7.3	64	197	238	Flow	7.5	42	289	267	Flow	7.6	23	551	758
27-Feb-15	Nil	7.8	21	255	384	Nil	7.3	91	426	556	Nil	7.7	17	327	494	Nil	7.6	29	351	533	Flow	7.8	11	404	615	Flow	7.63	7	296	498
31-Mar-15	Nil	8.2	8	350	492	Nil					Nil	7.3	7	348	518	Nil					Flow	7.66	<5	373	666	Flow	7.6	36	240	292
27-Apr-15	Flow	7.43	8	215	259	Flow	7.34	7	310	579	Flow	7.65	<5	342	567	Flow	7.16	6	482	876										

Rixs Creek
Creek Water Monitoring Data

	Railway Underpass					New England Highway					Below Operation				
Date	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
27-May-15	Nil	7.4	51	283	426	Nil	7.6	15	384	635	Flow	7.8	20	510	785
30-Jun-15	No	7.1	15	614	473	No	7.3	9	930	950	No	7.3	9	721	1010
28-Jul-15	No	7.6	11	653	445	No	7.4	7	665	896	No	7.6	15	639	1138
27-Aug-15	Trickle	7.5	4	378	439	Flow	7.5	11	513	698					

	Maison Dieu Bridge					Industrial Estate Tributary					RXC Above Industrial Estate Tributary				
Date	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	Flow	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
27-May-15	Trickle	7.3	30	411	691										
30-Jun-15	No	7.2	19	790	1392										
28-Jul-15	Trickle	7.3	6	1650	2850										
27-Aug-15	Flow	7.3	20	630	833										

Rixs Creek
Mine Water Monitoring Data

	Dirty Water Dam #1				Dirty Water Dam #2				Dirty Water Dam #3				Dirty Water Dam #4			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
06-Jan-99	8.8	1	2220	3830	7.9	1	3560	5800					8.2	10	600	990
26-Feb-99	8.2	33	1200	2020	8.1	4	4410	6960					7.5	50	700	1230
26-Mar-99	8.4	3	2240	3590	8.5	4	4750	7490					8.1	130	780	1290
13-Apr-99	8.3	7	2260	3960	8.4	2	4440	7400					7.6	45	610	1210
10-May-99	7.9	2	2410	3560	8.6	4	3820	5600					7.5	50	560	912
01-Jun-99	8.3	11	2470	3800	8.5	4	3950	5990					7.9	18	540	980
12-Jul-99	8	4	2590	4180	8.4	3	3660	6070					7.6	22	690	1060
04-Aug-99	8.2	1	2390	3850	8.7	3	3570	5790					7.5	29	490	700
01-Sep-99	8.3	5	2320	3750	8.4	2	3450	5440					7.3	35	470	770
01-Oct-99	8.4	1	2210	3410	8.2	1	3830	5730					7.4	40	590	850
05-Nov-99	8.4	6	2290	3710	8.4	1	3780	6100					6.6	60	430	660
01-Dec-99	8.7	11	2350	4010	8.5	5	3670	6170					7.1	80	470	760
10-Jan-00	8.8	3	2600	4430	8.6	4	4180	6980					7.5	35	690	1160
04-Feb-00	8.3	20	2540	4160	8.3	5	4170	6690					8	20	650	1010
01-Mar-00	8.1	4	3010	4660	8.3	4	4690	7400					7.8	5	740	1110
10-Apr-00	8.1	7	2270	3790	8.8	7	3970	6540					7.4	50	500	650
10-May-00	8.4	1	2790	4550	8.5	4	3600	5940					7.1	60	430	620
07-Jun-00	8.2	1	3420	5760	8.7	2	3640	6110					7.3	50	440	720
04-Jul-00	8.2	1	2660	4520	8.4	2	4090	6830					7.5	60	460	750
29-Aug-00	8.3	19	3080	4790	8.2	7	4830	7640					8	45	580	790
18-Sep-00	8.5	6	3140	4880	8.4	60	4950	7590					8.4	24	570	990
06-Oct-00	8.4	7	3590	5180	8.2	11	5260	7600					8.2	12	610	1040
03-Nov-00	8.1	2	3600	5560	7.8	13	5280	8320					8.4	3	980	1570
06-Dec-00	8.3	7	2640	4210	8.4	8	4170	6460					7.8	23	780	1330
08-Jan-01	8.5	1	3300	5280	9.3	4	4130	6670					8.4	1	830	1480
12-Feb-01	8.4	17	2200	3620	8.9	20	3630	5790					8.5	11	1250	2120
05-Mar-01	8.3	85	2720	4010	8.7	14	3660	5540					7.9	28	870	1220
23-Apr-01	8.4	7	3050	4880	8.3	18	3230	5220					9	110	530	880
10-May-01	8.1	25	2730	4410	8.2	13	3200	5180					7.5	31	600	930
13-Jun-01	8.1	5	2960	4510	7.7	4	3560	5410					8	38	960	1630
16-Jul-01	8.3	1	2900	4380	7.9	12	4520	7100					8.8	9	1000	1650
29-Aug-01	8.2	13	3050	4790	7.9	11	4310	6700					8.6	28	1170	1840
24-Sep-01	8.6	11	3030	4900	8.2	13	4670	7430					8.4	16	1140	1910
24-Oct-01	8.5	16	3030	4890	8.2	80	1680	2990					9.1	19	1200	2110
30-Nov-01	8.3	11	3220	5000	8.1	14	4270	6820					8.5	100	1150	1980
19-Dec-01	8.5	20	3030	1990	8.1	10	2940	4850					8.7	13	1480	2300
16-Jan-02	8.4	6	3430	5240	9.1	3	3010	4890					9.1	13	2020	3460
12-Feb-02	8.5	14	2600	4200	8.8	4	2240	3750					7.9	11	1670	2680
11-Mar-02	8.4	3	3100	4610	8.5	1	3380	4850					8.2	2	1860	2920
23-Apr-02	8.4	5	2910	4680	8	3	3200	5140					7.7	5	1230	2140
15-May-02	8.3	6	3030	4890	8.2	8	3660	5890					8.2	5	1100	2220
06-Jun-02	8.4	5	2920	4580	8.1	7	3850	6040					8.3	6	1260	2100
31-Jul-02	7.9	1	3460	5620	8	2	3740	6210					8.7	1	1370	2490
20-Aug-02	8.3	1	3540	5370	8.3	1	3650	5650					8.8	4	1630	2650
23-Sep-02	8.6	4	3500	5530	8.4	4	4370	6890					9.1	1	1580	2780

Rixs Creek
Mine Water Monitoring Data

	Dirty Water Dam #1				Dirty Water Dam #2				Dirty Water Dam #3				Dirty Water Dam #4			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
16-Oct-02	8.3	4	3670	5760	8.2	16	4750	7500					9.1	9	1800	3050
27-Nov-02	8.2	1	4250	6170	8.2	11	4530	6720					9.1	7	2750	4480
09-Dec-02	8.5	3	4030	6050	8.5	20	4450	6660					9	4	3260	5120
21-Jan-03	8.5	4	3830	8510	8.9	4	4310	6770					8.7	5	2850	4620
14-Feb-03	8.8	1	4070	6000	9	1	4110	6290					9.4	1	3050	4870
19-Mar-03	8.5	5	4010	6210	8.3	5	4180	6610					9	6	3280	5250
16-Apr-03	8.4	5	4530	6780	8.5	3	5050	7490					8.5	7	5620	8170
19-May-03	8.6	1	4650	7150	8.5	9	4990	7640					8.6	39	5740	8700
11-Jun-03	8.6	10	5090	7800	8.4	6	4850	7570					8.5	12	5990	9010
16-Jul-03	8.3	2	4540	6550	8.3	10	5070	7560					8.8	12	6020	8700
26-Aug-03	8.3	7	3880	5900	8.1	35	4890	7450					8.8	40	5460	8440
25-Sep-03	8.5	11	5095	7620	8.6	70	5830	8670					8.5	170	6195	9280
27-Oct-03	8.4	6	4670	6830	8.5	280	5090	7540					8.5	42	6350	9000
13-Nov-03	8.3	23	4800	7110	8.4	1	4740	7120					8.7	13	6400	9610
15-Dec-03	8.8	5	3760	5790	9.1	38	2360	4040					8.6	14	5630	8470
29-Jan-04	9.2	6	2930	4880	8.9	10	4620	7280					9	25	5140	8120
26-Feb-04	7.9	11	2164	3550	8.5	11	3696	5820					8.5	97	2318	3840
31-Mar-04	8.6	4	3610	5600	8.7	3	3120	5100					8.8	4	3770	5880
27-Apr-04	8.7	12	3848	7300	9	1	2862	5520					8.8	1	4320	7690
27-May-04	8.3	5	4072	6000	8.6	7	3910	6030					8.9	29	4496	6670
16-Jun-04	8.4	1	4562	6860	8.5	1	3898	6320					8.8	18	4566	7000
29-Jul-04	8.4	1	4750	7020	8.5	3	4270	6640					8.6	18	4940	7380
23-Aug-04	8.4	9	4734	7280	8.4	5	4146	6810					8.5	20	5428	8400
23-Sep-04	8.5	7	4846	7460	8.3	11	4280	7000					8.4	55	5764	8850
28-Oct-04	8.4	2	4236	6570	8.5	13	4680	7230					8.5	34	5704	8750
30-Nov-04	8.3	20	4970	7240	8.4	7	5390	7050					8.7	14	5950	8790
20-Nov-04	8.3	5	4728	7240	8.3	1	4440	7140					8.7	2	5660	8440
06-Jan-05	8.7	8	5420	7870	8.6	3	4700	7000					8.6	11	6080	8850
02-Feb-05	8.5	1	2560	4380	9.1	11	3510	4620					8.7	29	4620	5880
23-Mar-05	8.5	5	3560	5400	8.6	11	2406	4050					8.6	5	3696	5800
29-Apr-05	8.3	1	4306	6760	8.4	1	3730	6030					8.6	1	4782	7250
30-May-05	8.6	60	4632	7100	8.8	14	4764	7300					8.6	19	5380	8000
22-Jun-05	8.4	26	4960	6750	8.7	15	5070	7200					8.6	250	5100	8070
28-Jul-05	8.6	1	4680	6670	8.9	1	4970	7020					8.7	1	5160	7630
24-Aug-05	8.3	8	5150	7570	8.6	6	5050	7610					8.6	19	5470	7450
19-Sep-05	8.3	23	4990	7460	8.4	12	4880	7500					8.5	27	5800	8870
27-Oct-05	8.4	4	5150	6700	8.7	33	5250	7100					9.1	16	5040	7200
21-Nov-05	8.5	1	4640	6740	8.5	1	4614	6720					9.1	1	5164	7520
08-Dec-05	8.4	2	4930	6920	8.5	14	4840	6830					8.8	24	5330	7960
19-Jan-06	8.7	6	5220	7570	8.5	1	5370	7500					9	1	5910	9210
23-Feb-06	8.5	1	5180	7440	8.9	14	3054	9020					8.8	20	5918	9110
23-Mar-06	8.4	21	5290	7900	8.6	3	5670	8690					8.7	5	6010	9220
19-Apr-06	8.9	64	5120	8350	8.9	44	5370	8340					9.2	114	5460	9940
18-May-06	8.8	12	5030	8370	9	8	4805	8410					9.6	12	5280	9270
22-Jun-06	8.6	24	7390	9400	8.7	12	5610	9340					8.9	15	6110	9950

Rixs Creek
Mine Water Monitoring Data

	Dirty Water Dam #1				Dirty Water Dam #2				Dirty Water Dam #3				Dirty Water Dam #4			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
20-Jul-06	8.9	14	5220	10290	9	12	5180	10190					8.8	20	5720	10870
25-Aug-06	8.2	7	5940	9520	8.5	6	5925	9650					8.9	20	6120	10530
15-Sep-06	8.6	38	4035	7040	8.9	9	4535	8050					8.8	34	2980	5540
20-Oct-06	8.5	10	5175	8310	8.5	17	12825	8430					9.4	14	5208	8330
23-Nov-06	8.9	28	5055	8860	9.2	46	5150	9035					9.8	26	5290	9500
13-Dec-06	9	75	5115	9190	9	60	5010	9260					9.8	80	5080	9650
11-Jan-07	9.4	36	5350	9900	9.2	38	4500	10170					9.8	74	5620	10680
22-Feb-07	9.2	16	6100	9800	9.4	26	6300	9920					10.1	33	5900	10240
15-Mar-07	8.9	70	5360	10840	9.2	88	5400	11470					9.8	88	4760	11730
27-Apr-07	8.8	58	5135	7930	8.5	52	4575	7290					9.6	50	2224	8850
23-May-07	8.5	5	4280	8360	8.2	36	4925	9455					8.4	13	3894	7850
28-Jun-07	8.1	8	1734	3300	8.1	20	1808	3300					7.4	26	1020	2150
30-Jul-07	8.7	11	1735	3255	8.6	26	1850	3325					8.2	16	1470	3085
23-Aug-07	7.9	22	1612	2805	8.4	3	2325	4055					7.9	8	1420	3030
26-Sep-07	8.2	4	2065	3740	8.4	2	2495	4315					8.6	4	1930	3410
17-Oct-07	8.8	10	2250	4080	8.8	8	2545	4485					8.8	7	2435	3905
15-Nov-07	8.8	6	2270	4490	10.3	38	1745	3500					9.2	6	2215	4250
10-Dec-07	9.1	334	902	4050	8.7	3	1076	4525					9	4	798	3880
24-Jan-08	9.1	13	2315	4955	8.9	10	3238	6530					9.8	12	2240	4570
06-Feb-08	8.9	10	3815	4110	9.2	51	5480	4310					9.8	13	2925	3695
25-Mar-08	8.7	10	2510	4285	8.7	89	2576	4285					9.3	88	2055	3725
28-Apr-08	8.3	27	2070	3775	8.5	33	2838	4880					8.1	28	1915	3600
20-May-08	8.1	18	3318	3880	8.4	14	3768	4805					7.8	4	2318	3510
05-Jun-08	8.4	36	2180	3645	8.2	41	2695	5110					7.9	82	2080	2265
17-Jul-08	8.5	16	1980	5450	8.6	12	2980	5700					8.6	15	2310	4640
13-Aug-08	8.5	17	3010	5705	8.5	10	2938	4845					8.6	17	2552	3405
18-Sep-08	8.7	65	2810	5840	8.8	13	2565	5390					8.8	19	2395	4870
27-Oct-08	8.9	8	3100	4900	9	31	2400	3900					9	61	2700	4300
24-Nov-08	8.6	7	3200	5800	8.8	15	3040	5600					8.8	12	2700	5100
09-Dec-08	8.6	9	3115	5320	8.7	15	3190	5180					8.9	61	2660	4570
29-Jan-09	8.7	16	3700	5800	8.5	12	3900	6300					9	14	3200	5100
16-Feb-09	7.9	190	850	1300	8.6	28	2800	5000					8.7	26	2000	3600
17-Mar-09	9	10	2400	3900	8.5	6	2900	4700					9.1	20	1900	3300
03-Apr-09	8.2	28	1900	2800	8.5	13	2600	3900					8.3	28	1600	2500
26-May-09	8.5	11	3030	4300	8.6	38	2960	4500					8.6	29	2070	3300
17-Jun-09	8.9	4	2225	4090	9.1	2	6615	4470					9.2	7	1945	3590
20-Jul-09	8.7	53	2595	4300	9	3	2615	4300					9	10	2180	3700
31-Aug-09	8.7	2	2800	4400	8.7	24	2700	4400					8.8	22	2500	4000
28-Sep-09	8.69	6	2810	4300	8.72	6	2800	4400					8.9	15	2500	3800
29-Oct-09	8.3	5	3200	4700	8.4	2	3000	4700					8.9	8	2900	4300
18-Nov-09	8.8	5	3000	5000	8.8	4	3000	2100					9.2	2	2600	4500
08-Dec-09	9.2	4	3400	4800	9.1	4	3300	5000					9.7	6	3200	2400
22-Jan-10	9	2	3100	4200	8.8	1	4000	4800					9.3	5	2900	4400
17-Feb-10	9.4	21	2300	5100	9.1	11	3200	5400					9.6	3	2700	4600
29-Mar-10	9	5	3900	5400	8.8	7	3800	5600					9.3	8	3100	5100

Rixs Creek
Mine Water Monitoring Data

	Dirty Water Dam #1				Dirty Water Dam #2				Dirty Water Dam #3				Dirty Water Dam #4			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
29-Apr-10	8.3	4	3300	5200	8.2	12	3445	5720					8.7	13	3066	5110
28-May-10	8.2	23	2505	4470	8.5	9	3340	5625					9.1	7	3035	5165
24-Jun-10	9.1	227	2675	5230	9.2	185	2905	5400					9.6	230	2515	4820
16-Jul-10	8.1	14	2805	5125	8.6	3	2820	5285					8.9	2	2710	4870
26-Aug-10	8.7	6	3100	5315	9	22	3215	5270					9.6	28	2810	4595
27-Sep-10	8.8	5	3300	4770	8.9	47	3555	5100					9.6	14	2945	4550
26-Oct-10	8.6	2	3160	5180	8.6	5	3380	5530					9.3	1	2900	4870
17-Nov-10	8.7	8	2650	4400	8.7	4	3110	5250					9.1	7	2540	4460
09-Dec-10	8.7	5	3080	4990	8.7	15	3180	5200					8.9	19	2530	4310
24-Jan-11	9.12	13	3100	5030	8.22	9	3390	5440					9.08	9	2840	4600
28-Feb-11	8.87	5	3640	5310	8.68	6	3710	5330					9.14	5	3320	4950
25-Mar-11	8.6	6	3510	5640	8.62	16	3700	5820					8.93	6	3140	5130
29-Apr-11	8.82	44	2870	4700	8.6	6	3750	6120					8.82	5	3290	5360
31-May-11	8.49	50	1440	2400	8.51	28	3180	4980					8.75	26	2440	3830
01-Jun-11	8.68	34	2130	3470	8.59	8	2660	4620					8.82	16	2400	3920
28-Jul-11	8.35	5	2650	4590	8.52	5	2650	4600					8.35	5	2260	3850
25-Aug-11	8.26	8	2540	4440	8.61	5	2630	4540					8.52	10	2390	4090
29-Sep-11	8.49	14	2640	4290	8.66	54	2590	4120					8.8	141	2390	3890
26-Oct-11	8.51	6	2780	4490	8.72	9	2860	4520					9.01	8	2580	4050
21-Nov-11	9.2	8	2420	4140	8.75	7	2790	4710					8.74	6	2780	4560
19-Dec-11	8.88	6	2410	3800	8.65	5	2690	4210					8.81	5	2030	3360
23-Jan-12	8.67	6	2710	4290	8.52	9	2910	4550					8.7	6	2430	3930
02-Feb-12	8.56	5	2510	4030	8.61	6	2470	4160					8.6	5	2290	3880
06-Mar-12	8.39	5	2230	3580	8.52	8	2270	3610	8.4	12	745	1250	8.6	7	1810	2990
26-Apr-12	8.48	8	2740	4350	8.64	5	2900	4440	8.3	10	834	1390	8.87	5	2520	3940
28-May-12	8.68	14	2690	4100	8.68	8	2830	4500	8.2	14	900	1320	8.69	6	2720	4150
12-Jun-12	8.68	18	2270	3660	8.74	10	2670	4200	8.2	7	1240	2020	8.65	6	2490	3910
25-Jul-12	8.8	19	2550	4080	9	6	2470	4160	8.6	6	1270	2060	9	7	2500	4080
27-Aug-12	8.7	8	2890	4620	8.9	5	2890	4590	8.8	4	1420	2210	8.8	10	2730	4360
26-Sep-12	8.6	11	2970	4680	8.6	6	3290	5180	8.2	3	4380	6610	8.7	22	2930	4630
29-Oct-12	8.7	8	3490	5340	8.9	1	3470	5450	8.1	1	4960	7440	8.8	13	3370	5010
21-Nov-12	8.9	8	3560	5620	8.9	2	3390	5650	8.1	1	4990	7580	8.7	7	3360	5370
11-Dec-12	8.8	7	3600	5490	9	2	3680	5730	8.2	3	5130	7590	9	5	3500	5450
23-Jan-13	8.81	13	3600	5770	9.05	6	3570	5580	8.5	4	5130	7140	8.76	18	3470	5400
20-Feb-13	8.89	16	2210	4370	8.72	13	3060	4630	8.5	4	3080	4650	8.6	<5	3310	5040
26-Mar-13	8.5	6	2500	4210	9.2	14	1570	2830	8.5	5	2350	4060	9	3	2040	3640
23-Apr-13	8.8	3	2990	5100	9.2	14	2360	3990	8.3	7	3740	5920	9	4	2700	4450
28-May-13	8.8	5	3150	5000	9.3	9	2600	4220	8.3	4	3640	5230	8.6	5	3020	4730
19-Jun-13	8.8	9	3240	5090	9	16	2740	4410	8.4	4	3040	4750	8.4	6	2700	4330
22-Jul-13	8.2	3	3050	4540	8.9	5	2640	4190	8.3	1	3850	5700	8.6	2	2800	4260
27-Aug-13	8.9	3	3140	5180	9	4	3030	5000	8.4	1	4400	6910	8.9	2	3010	5090
26-Sep-13	9.1	5	3340	5350	9.3	9	3230	5190	8.4	3	4510	6910	8.9	9	3290	5270
30-Oct-13	9.5	6	3540	5690	9.4	11	3470	5400	8.5	6	4620	7050	9.4	6	3130	5100
21-Nov-13	8.96	5	2390	4340	8.62	5	2020	3670	8.3	23	906	1700	8.76	5	2240	3860
10-Dec-13	9.4	7	2740	4440	9.4	9	2740	4370	8.5	18	3800	5790	9.1	22	3120	4900

Rixs Creek
Mine Water Monitoring Data

	Dirty Water Dam #1				Dirty Water Dam #2				Dirty Water Dam #3				Dirty Water Dam #4			
Date	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)	pH	Total Suspended Solids (mg/l)	Total Dissolved Solids (mg/l)	Specific Conductance (µS/cm)
28-Jan-14	9	7	3440	5660	9.2	7	3150	5290	8.4	3	4440	7010	9.4	7	3270	5380
13-Feb-14	8.8	5	3510	5900	8.9	5	3460	5650	8.0	2	4480	7100	9.2	5	3490	5640
31-Mar-14	9	11	2990	5010	8.8	7	3160	5030	8.5	44	1560	2740	9.2	6	3060	5370
29-Apr-14	8.8	5	3310	5360	8.6	8	2650	4410	8.4	4	3650	5640	9	2	3180	5270
29-May-14	8.8	3	3310	5290	8.8	10	2820	4680	8.5	1	3000	4850	9	3	3190	5350
25-Jun-14	8.9	13	3440	5670	8.8	10	3010	5050	8.4	12	4080	6270	8.9	7	3350	5570
29-Jul-14	8.47	11	2670	4980	8.57	5	3190	5280	8.28	17	4670	6870	8.55	5	2860	5280
29-Aug-14	8.9	11	2910	4630	8.8	4	2780	4400	8.6	10	3950	6050	8.9	2	3210	4940
29-Aug-14	8.7	9	3370	5020	8.6	5	3390	5110	8.4	1	4470	6610	8.9	29	3140	4920
27-Oct-14	8.8	7	3170	4870	8.9	5	3230	5250	8.4	7	4230	6720	8.9	9	3270	4920
27-Nov-14	8.7	3	3360	4910	8.9	3	3500	5330	8.2	2	4860	7620	8.8	9	3400	5130
15-Dec-14	8.9	9	2750	4690	8.9	7	2930	4990	8.5	9	3990	6430	9	11	3130	5250
28-Jan-15	9.1	17	1720	3040	8.6	21	2190	3740	8.5	29	2030	3380	9	21	2310	3540
27-Feb-15	8.9	5	2830	4410	9.2	9	2390	3940	8.6	11	2720	4220	9.5	5	2440	3880
31-Mar-15	8.7	4	3380	5560	9.4	17	2640	4430	8.5	3	4380	7000	9.6	3	2780	4630
27-Apr-15	8.3	16	948	1990	8.83	8	1430	2780	8.47	9	1450	2800	8.49	11	1010	2090
27-May-15	8	5	1760	2930	8.5	10	1460	2590	8.3	6	2580	4270	8.7	3	1540	2670
30-Jun-15	8.4	4	2240	3760	8.4	11	1570	2650	8.2	15	2530	3890	8.7	3	1910	3260
28-Jul-15	8.5	7	2460	3790	8.8	14	1670	2700	8.3	5	3700	5450	8.8	7	2260	3510
27-Aug-15	8.5	6	2240	3870	8.9	2	1880	3480	8.3	5	3300	5290	8.8	13	2100	3790

Details	Date	pH	Electrical Conductivity - uS/cm	Total Dissolved Solids	Total Suspended Solids	Total Hardness as CaCO3	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Silicon	Sulphate as SO4	Chloride	Calcium	Magnesium	Sodium	Potassium	Dissolved Metals - Fe	Aluminium	Antimony	Arsenic	Beryllium	Barium	Cadmium	Cobalt	Copper	Lead	Lithium	Manganese	Nickel	Rubidium	Selenium	Strontium	Zinc	Boron	Mercury
		Basic Analytes				Alkalinity					Major Anions			Major Cations					Total Metals																	
Limit of Resolution		0.01	1	10	5	1	1	1	1	1	0.05	1	1	1	1	1	1	0.5	0.01	0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.001	0.005	0.05	0.0001
Unit		pH unit	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Site 1 Railway Underpass Rixs Creek Tributary	01-Jun-11	5.97	82	234	110	11	<1	<1	6	6	8.46	3	12	1	2	10	4	0.78	11	<0.001	0.001	<0.001	0.062	<0.0001	0.003	0.009	0.003	0.009	0.05	0.004	0.017	<0.01	0.048	0.038	<0.5	<0.0001
	06-Mar-12	7.11	157	387	100	40	<1	<1	57	57	17.4	7	12	6	6	19	4	1.66	12	<0.001	0.004	<0.001	0.099	<0.0001	0.006	0.014	0.004	0.009	0.297	0.008	0.017	<0.01	0.147	0.037	<0.05	<0.0001
	21-Nov-13	7.06	133	138	30	13	<1	<1	22	22	7.54	14	15	2	2	14	4	0.44	2.99	<0.001	0.002	<0.001	0.05	<0.0001	0.001	0.003	0.002	0.004	0.05	0.002	0.005	<0.01	0.061	0.012	<0.05	<0.0001
	27-Apr-15	7.43	259	215	8	58	<1	<1	48	48	23.7	38	23	10	8	31	3	0.25	3.7	<0.001	0.002	<0.001	0.033	<0.0001	0.001	0.004	0.001	0.004	0.149	0.002	0.006	<0.01	0.108	0.01	<0.05	<0.0001
Site 2 New England Highway Rixs Creek	01-Jun-11	6.58	566	450	76	56	<1	<1	37	37	3.2	61	101	6	10	85	5	0.52	5.37	<0.001	<0.001	<0.001	0.052	<0.0001	0.002	0.005	0.003	0.007	0.027	0.003	0.009	<0.01	0.223	0.017	<0.05	<0.0001
	06-Mar-12	7.51	586	414	17	87	<1	<1	79	79	7.46	61	103	10	15	92	4	1.09	1.83	<0.001	0.002	<0.001	0.056	<0.0001	<0.001	0.002	<0.001	0.006	0.035	0.002	0.003	<0.01	0.234	0.007	<0.05	<0.0001
	21-Nov-13	7.41	519	387	<5	50	<1	<1	54	54	14.5	70	77	5	9	77	5	0.64	4.68	<0.001	0.003	<0.001	0.049	<0.0001	0.002	0.007	0.003	0.009	0.039	0.004	0.007	<0.01	0.298	0.016	0.05	<0.0001
	27-Apr-15	7.34	579	310	7	76	<1	<1	60	60	27.8	60	92	9	13	73	4	0.12	3.79	<0.001	0.002	<0.001	0.063	<0.0001	0.001	0.005	0.001	0.008	0.03	0.003	0.006	<0.01	0.252	0.012	<0.05	<0.0001
Site 3 Maison Dieu Bridge Rixs Creek	01-Jun-11	6.73	332	488	120	37	<1	<1	29	29	3.45	37	56	5	6	48	4	1.05	11.9	<0.001	0.002	<0.001	0.087	<0.0001	0.004	0.01	0.006	0.011	0.049	0.007	0.02	<0.01	0.17	0.046	0.06	0.0001
	06-Mar-12	7.42	652	442	38	116	<1	<1	71	71	8.18	56	137	15	19	94	5	1.13	3.59	<0.001	0.002	<0.001	0.073	<0.0001	0.001	0.004	0.002	0.005	0.068	0.003	0.006	<0.01	0.364	0.015	<0.05	<0.0001
	21-Nov-13	7.25	522	375	<5	48	<1	<1	52	52	13.8	65	85	6	8	77	6	0.67	5.63	<0.001	0.003	<0.001	0.05	<0.0001	0.002	0.007	0.003	0.009	0.036	0.004	0.008	<0.01	0.265	0.021	0.05	<0.0001
	27-Apr-15	7.16	879	482	6	129	<1	<1	71	71	27.2	70	179	17	21	114	5	0.21	3.9	<0.001	0.002	<0.001	0.08	<0.0001	0.002	0.005	0.002	0.008	0.067	0.003	0.007	<0.01	0.438	0.018	<0.05	<0.0001
Site 10 Below Operation Rixs Creek	01-Jun-11	6.87	375	512	109	44	<1	<1	33	33	3.81	40	66	6	7	54	4	2.95	12.6	<0.001	0.002	<0.001	0.086	0.0001	0.004	0.01	0.006	0.011	0.05	0.006	0.019	<0.01	0.191	0.055	<0.05	0.0001
	06-Mar-12	7.84	477	384	22	78	<1	<1	69	69	8.03	44	85	10	13	70	4	1.04	5.86	<0.001	0.003	<0.001	0.07	<0.0001	0.001	0.006	0.002	0.007	0.033	0.004	0.009	<0.01	0.264	0.02	<0.05	<0.0001
	21-Nov-13	7.62	502	379	<5	45	<1	<1	54	54	14	66	77	5	8	74	5	0.66	4.13	<0.001	0.003	<0.001	0.043	<0.0001	0.001	0.006	0.002	0.008	0.03	0.003	0.006	<0.01	0.298	0.013	0.05	<0.0001
	27-Apr-15	7.65	567	342	<5	88	<1	<1	59	59	26.2	50	96	12	14	77	4	0.2	3.6	<0.001	0.001	<0.001	0.056	<0.0001	0.001	0.005	0.001	0.006	0.023	0.002	0.006	<0.01	0.264	0.014	<0.05	<0.0001
Site 10 Above Industrial Catchment Junction Rixs Creek	01-Jun-11	6.97	376	472	103	39	<1	<1	30	30	3.19	44	64	4	7	56	5	0.28	10	<0.001	0.001	<0.001	0.066	<0.0001	0.004	0.009	0.005	0.09	0.048	0.005	0.017	<0.01	0.198	0.046	<0.05	1E-05
	06-Mar-12	7.87	451	400	23	72	<1	<1	66	66	7.55	46	73	9	12	66	4	1.14	5.27	<0.001	0.002	<0.001	0.06	<0.0001	0.001	0.005	0.002	0.007	0.027	0.003	0.008	<0.01	0.228	0.02	<0.05	<0.0001
	21-Nov-13	7.63	523	364	<5	45	<1	<1	55	55	13.4	75	69	5	8	78	6	0.67	3.57	<0.001	0.002	<0.001	0.041	<0.0001	0.001	0.006	0.002	0.009	0.028	0.003	0.006	<0.01	0.327	0.013	<0.05	<0.0001
	27-Apr-15	7.63	498	296	7	72	<1	<1	54	54	26	53	77	9	12	62	5	0.14	3.66	<0.001	0.002	<0.001	0.053	<0.0001	0.001	0.012	0.002	0.009	0.02	0.003	0.006	<0.01	0.265	0.018	<0.05	<0.0001
Site 10 Industrial Catchment Tributary	01-Jun-11	6.97	335	516	69	45	<1	<1	28	28	4.52	24	63	8	6	47	4	0.21	16.3	<0.001	0.002	<0.001	0.107	0.0002	0.005	0.011	0.006	0.015	0.049	0.008	0.022	<0.01	0.137	0.057	<0.05	0.0001
	06-Mar-12	7.75	551	496	39	100	<1	<1	72	72	8.74	28	125	17	14	82	4	0.95	1.68	<0.001	0.001	<0.001	0.076	<0.0001	<0.001	0.004	0.001	0.003	0.03	0.003	0.003	<0.01	0.247	0.015	<0.05	<0.0001
	21-Nov-13	7.68	425	347	<5	40	<1	<1	54	54	14.3	25	84	6	6	54	4	0.3	5.62	<0.001	0.002	<0.001	0.057	<0.0001	0.002	0.006	0.002	0.006	0.025	0.004	0.008	<0.01	0.18	0.02	<0.05	<0.0001
	27-Apr-15	7.66	666	373	<5	100	<1	<1	77	77	26.1	33	136	17	14	89	4	0.18	3.47	<0.001	0.001	<0.001	0.069	<0.0001	0.001	0.005	0.001	0.006	0.016	0.003	0.006	<0.01	0.253	0.017	<0.05	<0.0001
Site 4 CWD 1	01-Jun-11	6.85	123	148	16	17	<1	<1	16	16	3.33	7	21	2	3	16	4	0.33	4.61	<0.001	<0.001	<0.001	0.047	<0.0001	0.002	0.004	0.002	0.004	0.046	0.002	0.008	<0.01	0.046	0.25	<0.05	0.001
	06-Mar-12	7.39	168	219	16	35	<1	<1	50	50	7.29	3	24	4	6	23	4	1.17	1.66	<0.001	0.002	<0.001	0.042	<0.0001	<0.001	0.003	0.001	0.003	0.024	0.002	0.003	<0.01	0.073	0.013	<0.05	<0.0001
	21-Nov-13	7.06	133	138	30	13	<1	<1	22	22	7.54	14	15	2	2	14	4	0.44	2.99	<0.001	0.002	<0.001	0.05	<0.0001	0.001	0.003	0.002	0.004	0.05	0.002	0.005	<0.01	0.061	0.012	<0.05	<0.0001
	27-Apr-15	7.07	158	150	8	22	<1	<1	43	43	18.3	4	19	4	3	18	4	0.6	2.55	<0.001	0.002	<0.001	0.046	<0.0001	0.001	0.003	0.001	0.003	0.058	0.002	0.004	<0.01	0.054	0.011	<0.05	<0.0001

Details	Date	Fluoride	Ammonia as N	Nitrate as N	^ Nitrate as N	Nitrite + Nitrate as N	Total Phosphorus	Total Anions	Total Cations	Ionic Balance
		Nutrients						Ionic Balance		
Limit of Resolution		0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%
Site 1 Railway Underpass Rixs Creek Tributary	01-Jun-11	0.1	0.06	<0.01	0.02	--	0.13	0.52	0.75	--
	06-Mar-12	0.2	<0.01	<0.01	<0.01	<0.01	0.43	1.62	1.72	--
	21-Nov-13	0.2	0.15	<0.01	<0.01	<0.01	0.22			
	27-Apr-15	0.2	0.04	<0.01	0.09	0.09	0.05	2.4	5.58	--
Site 2 New England Highway Rixs Creek	01-Jun-11	0.3	0.03	<0.01	0.08	--	0.26	4.86	4.95	0.86
	06-Mar-12	0.4	<0.01	<0.01	<0.01	<0.01	0.08	5.75	5.84	0.7
	21-Nov-13	0.4	0.02	<0.01	<0.01	<0.01	0.04			
	27-Apr-15	0.2	0.02	<0.01	0.55	0.55	0.07	5.04	4.8	2.53
Site 3 Maison Dieu Bridge Rixs Creek	01-Jun-11	0.2	0.02	<0.01	0.39	--	0.16	2.93	2.93	--
	06-Mar-12	0.3	0.06	<0.01	0.02	0.02	0.1	6.45	6.53	0.6
	21-Nov-13	0.3	0.03	<0.01	0.07	0.07	0.06			
	27-Apr-15	0.2	0.11	<0.01	0.3	0.3	0.06	7.92	7.66	1.7
Site 10 Below Operation Rixs Creek	01-Jun-11	0.2	0.02	<0.01	0.21	--	0.12	3.35	3.33	0.43
	06-Mar-12	0.3	<0.01	<0.01	<0.01	<0.01	0.11	4.69	4.72	0.23
	21-Nov-13	0.4	0.01	<0.01	0.01	0.01	0.06			
	27-Apr-15	0.2	0.01	<0.01	0.29	0.29	0.05	4.93	5.2	2.69
Site 10 Above Industrial Catchment Junction Rixs Creek	01-Jun-11	0.3	0.03	<0.01	0.17	--	0.03	3.32	3.34	0.26
	06-Mar-12	0.3	<0.01	<0.01	<0.01	<0.01	0.1	4.34	4.41	0.82
	21-Nov-13	0.4	0.01	<0.01	0.01	0.01	0.04			
	27-Apr-15	0.3	0.02	<0.01	0.33	0.33	0.07	4.35	4.26	1.1
Site 10 Industrial Catchment Tributary	01-Jun-11	0.2	0.03	<0.01	0.17	--	0.13	3.04	3.04	0.04
	06-Mar-12	0.3	<0.01	<0.01	<0.01	<0.01	0.11	5.55	5.67	1.08
	21-Nov-13	0.3	0.02	<0.01	0.01	0.01	0.04			
	27-Apr-15	0.3	0.03	<0.01	0.07	0.07	0.04	6.06	5.97	0.74
Site 4 CWD 1	01-Jun-11	0.2	0.05	<0.01	0.09	--	0.06	1.06	1.14	--
	06-Mar-12	0.4	<0.01	<0.01	<0.01	<0.01	0.12	1.74	1.8	--
	21-Nov-13	0.2	0.15	<0.01	<0.01	<0.01	0.22			
	27-Apr-15	0.4	0.14	<0.01	0.03	0.03	0.09	1.48	1.33	--

Details	Date	pH	Electrical Conductivity - uS/cm	Total Dissolved Solids	Total Suspended Solids	Total Hardness as CaCO3	Hydroxide Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Silicon	Sulphate as SO4	Chloride	Calcium	Magnesium	Sodium	Potassium	Dissolved Metals - Fe	Aluminium	Antimony	Arsenic	Beryllium	Barium	Cadmium	Cobalt	Copper	Lead	Lithium	Manganese	Nickel	Rubidium	Selenium	Strontium	Zinc	Boron	Mercury
		Basic Analytes				Alkalinity					Major Anions			Major Cations					Total Metals																		
Limit of Resolution		0.01	1	10	5	1	1	1	1	1	0.05	1	1	1	1	1	1	0.5	0.01	0.001	0.001	0.001	0.001	0.0001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.01	0.001	0.005	0.05	0.0001
Unit		pH unit	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Site 5 CWD2	01-Jun-11	6.81	134	147	73	17	<1	<1	23	23	2.71	6	22	2	3	18	4	0.34	4.75	<0.001	<0.001	>0.001	0.051	<0.0001	0.002	0.003	0.002	0.004	0.049	0.002	0.008	<0.01	0.053	0.017	<0.05	<0.0001
	06-Mar-12	7.19	137	174	18	30	<1	<1	34	34	7.85	2	21	4	5	18	4	1.04	0.46	<0.001	0.001	<0.001	0.035	<0.0001	<0.001	0.003	<0.001	0.002	0.063	0.002	0.001	<0.01	0.063	0.009	<0.05	<0.0001
	21-Nov-13	7.14	184	158	15	17	<1	<1	35	35	5.32	16	23	2	3	21	6	0.58	2.41	<0.001	0.002	<0.001	0.049	<0.0001	0.001	0.003	0.002	0.004	0.044	0.002	0.004	<0.01	0.08	0.009	<0.05	<0.0001
	27-Apr-15	7.01	133	154	6	22	<1	<1	32	32	16.8	3	17	4	3	16	5	0.78	3.06	<0.001	0.001	<0.001	0.047	<0.0001	0.001	0.008	0.002	0.004	0.065	0.002	0.005	<0.01	0.051	0.019	<0.05	<0.0001
Site 6 CWD 6	01-Jun-11	7.7	170	126	10	30	<1	<1	46	46	2.65	13	12	4	5	23	3	0.26	1.43	<0.001	<0.001	<0.001	0.041	<0.0001	<0.001	0.001	<0.001	0.002	0.017	<0.001	0.002	<0.01	0.075	0.008	<0.05	<0.0001
	06-Mar-12	7.44	140	280	20	33	<1	<1	50	50	10.2	14	14	5	5	18	4	0.97	7.85	<0.001	0.003	<0.001	0.056	<0.0001	0.002	0.006	0.003	0.006	0.05	0.003	0.012	<0.01	0.075	0.015	<0.05	<0.0001
	21-Nov-13	7.49	253	237	<5	33	<1	<1	37	37	12.3	46	23	5	5	29	4	0.74	3.97	<0.001	0.004	<0.001	0.061	0.0002	0.002	0.004	0.002	0.004	0.083	0.003	0.006	<0.01	0.123	0.011	<0.05	<0.0001
	27-Apr-15	7.32	154	171	18	29	<1	<1	32	32	26.4	21	14	5	4	18	3	0.6	3.62	<0.001	0.003	<0.001	0.042	<0.0001	0.001	0.004	0.001	0.004	0.036	0.002	0.006	<0.01	0.067	0.01	<0.05	<0.0001
Site 7 Dirty Water Dam 1	01-Jun-11	8.68	3470	2130	34	464	<1	10	196	207	1.33	585	622	44	86	616	10	<0.05	0.48	0.001	0.003	<0.001	0.045	<0.0001	0.002	0.003	<0.001	0.064	0.016	0.004	0.009	0.02	4.77	0.008	<0.05	<0.0001
	06-Mar-12	8.39	3580	2230	<5	535	<1	33	239	272	0.53	681	721	46	102	751	12	<0.05	0.03	0.003	0.003	<0.001	0.038	<0.0001	<0.001	<0.001	<0.001	0.072	0.004	0.002	0.01	0.02	3.95	<0.005	<0.05	<0.0001
	21-Nov-13	8.76	3860	2240	<5	479	<1	39	174	214	1.7	732	658	37	94	710	12	<0.05	0.12	0.004	0.006	<0.001	0.034	0.0001	<0.001	0.001	<0.001	0.072	0.007	0.003	0.01	0.02	4.07	<0.005	<0.05	<0.0001
	27-Apr-15	8.3	1990	948	16	296	<1	<1	150	150	6.3	328	335	31	53	323	7	<0.05	0.71	0.001	0.002	<0.001	0.04	<0.0001	0.001	0.003	<0.001	0.032	0.011	0.002	0.006	<0.01	2.21	0.005	<0.05	<0.0001
Site 9 Dirty Water Dam 2	01-Jun-11	8.59	4620	2660	8	586	<1	32	242	274	1.51	751	771	50	112	784	12	<0.05	0.48	0.003	0.002	<0.001	0.038	<0.0001	<0.001	0.003	<0.001	0.086	0.004	0.004	0.011	0.02	5.97	<0.005	<0.05	<0.0001
	06-Mar-12	8.52	3610	2270	8	540	<1	44	235	279	2.15	682	742	48	102	766	12	<0.05	0.28	0.003	0.003	<0.001	0.043	<0.0001	<0.001	0.001	<0.001	0.066	0.006	0.003	0.01	0.02	4	<0.005	<0.05	<0.0001
	21-Nov-13	8.96	4340	2390	<5	490	<1	59	137	196	1.84	820	752	28	102	831	14	<0.05	0.25	0.005	0.003	<0.001	0.03	0.0002	<0.001	0.004	<0.001	0.084	0.006	0.003	0.01	0.03	3.07	<0.005	<0.05	<0.0001
	27-Apr-15	8.83	2780	1430	8	343	<1	35	153	188	4.6	436	516	22	70	454	8	<0.05	0.33	0.001	0.002	<0.001	0.036	<0.0001	<0.001	0.002	<0.001	0.041	0.008	0.001	0.004	<0.01	1.56	<0.005	<0.05	<0.0001
Site 8 Dirty Water Dam 4 was Clean Water Dam 4	01-Jun-11	8.82	3920	2400	16	522	<1	33	222	255	0.96	671	683	36	105	707	12	<0.05	0.7	<0.001	0.002	<0.001	0.051	<0.0001	<0.001	0.003	<0.001	0.075	0.018	0.003	0.009	0.01	3.14	0.007	<0.05	<0.0001
	06-Mar-12	8.6	2990	1810	7	437	<1	34	207	242	1.8	507	614	38	83	612	10	0.07	0.36	0.002	0.002	<0.001	0.052	<0.0001	<0.001	<0.001	<0.001	0.048	0.01	0.001	0.007	<0.01	2.59	<0.005	<0.05	<0.0001
	21-Nov-13	8.62	3670	2020	<5	464	<1	28	194	222	2.09	681	631	29	95	672	13	<0.05	0.21	0.003	0.004	<0.001	0.033	0.0001	<0.001	0.003	<0.001	0.064	0.014	0.003	0.008	0.01	2.45	<0.005	<0.05	<0.0001
	27-Apr-15	8.49	2090	1010	11	277	<1	10	147	158	6.4	321	370	22	54	350	7	<0.05	0.62	0.001	0.002	<0.001	0.035	<0.0001	<0.001	0.002	<0.001	0.032	0.008	0.002	0.004	<0.01	1.55	<0.005	<0.05	<0.0001
Site 14 Sediment Dam Pit 3 EAST	01-Jun-11	7.96	308	176	15	39	<1	<1	81	81	1.42	9	34	4	7	42	9	0.09	1.33	<0.001	0.003	<0.001	0.059	<0.0001	<0.001	0.001	<0.001	0.002	0.024	0.001	0.003	<0.01	0.138	<0.005	<0.05	<0.0001
	01-Jun-11	7.94	1140	764	75	158	<1	<1	96	96	1.12	238	136	17	28	190	3	0.21	5.5	<0.001	0.003	<0.001	0.063	<0.0001	0.003	0.006	0.004	0.008	0.056	0.003	0.011	<0.01	0.558	0.048	<0.05	<0.0001
	06-Mar-12	8.14	381	271	10	63	<1	<1	81	81	4.9	26	53	7	11	52	10	0.66	1.31	<0.001	0.002	<0.001	0.045	<0.0001	<0.001	0.002	<0.001	0.002	0.034	0.002	0.003	<0.01	0.161	0.01	<0.05	<0.0001
	06-Mar-12	8.17	1210	711	9	215	<1	<1	141	141	0.78	249	160	30	34	214	4	0.12	0.44	<0.001	0.001	<0.001	0.028	<0.0001	<0.001	<0.001	<0.001	0.007	0.051	<0.001	0.002	<0.01	0.834	<0.005	<0.05	<0.0001
	21-Nov-13	8.25	491	297	<5	50	<1	<1	102	102	3.75	30	66	5	9	63	11	0.84	0.92	<0.001	0.004	<0.001	0.063	<0.0001	<0.001	0.002	<0.001	0.002	0.08	0.002	0.002	<0.01	0.213	<0.005	<0.05	<0.0001
	27-Apr-15	7.61	352	220	<5	54	<1	<1	85	85	11.5	15	47	7	9	49	10	0.16	1.69	<0.001	0.002	<0.001	0.049	<0.0001	<0.001	0.003	<0.001	0.002	0.051	0.002	0.004	<0.01	0.132	0.007	<0.05	<0.0001
Site 13 Sediment Dam Pit 3 WEST	01-Jun-11	7.99	411	298	8	61	<1	<1	124	124	2.61	9	40	8	10	50	11	0.44	3.45	<0.001	0.004	<0.001	0.086	<0.0001	0.001	0.002	0.002	0.003	0.064	0.002	0.005	<0.01	0.264	0.006	<0.05	<0.0001
	01-Jun-11	7.99	411	298	8	61	<1	<1	124	124	2.61	9	40	8	10	50	11	0.44	3.45	<0.001	0.004	<0.001	0.086	<0.0001	0.001	0.002	0.002	0.003	0.064	0.002	0.005	<0.01	0.264	0.006	<0.05	<0.0001
	06-Mar-12	8	256	266	20	44	<1	<1	74	74	6.12	4	32	6	7	33	10	0.85	2.63	<0.001	0.003	<0.001	0.035	<0.0001	<0.001	0.003	0.001	0.002	0.053	0.002	0.004	<0.01	0.121	0.006	<0.05	<0.0001
	21-Nov-13	8.12	356	305	12	44	<1	<1	100	100	12	18	38	6	7	43	13	0.34	4.31	<0.001	0.005	<0.001	0.048	<0.0001	0.002	0.005	0.002	0.003	0.095	0.004	0.006	<0.01	0.179	0.009	0.06	<0.0001
	27-Apr-15	7.41	230	703	212	36	<1	<1	62	62	114	27	26	6	5	29	10	1.23	27.7	<0.001	0.006	<0.001	0.15	<0.0001	0.009	0.018	0.014	0.02	0.158	0.013	0.037	<0.01	0.157	0.07	<0.05	<0.0001
Site 15 Rail Loader Tunnel	01-Jun-11	7.94	1140	764	75	158	<1	<1	96	96	1.12	238	136	17	28	190	3	0.21	5.5	<0.001	0.003	<0.001	0.063	<0.0001	0.003	0.006	0.004	0.008	0.056	0.003	0.011	<0.01	0.558	0.048	<0.05	<0.0001
	06-Mar-12	8.17	1210	711	9	215	<1	<1	141	141	0.78	249	160	30	34	214	4	0.12	0.44	<0.001	0.001	<0.001	0.028	<0.0001	<0.001	<0.001	<0.001	0.007	0.051	<0.001	0.002	<0.01	0.834	<0.005	<0.05	<0.0001
	21-Nov-13	7.94	1370	771	5	231	<1	<1	156	156	2.39	282	157	33	36	211	7	0.1	1.04	<0.001	0.003	<0.001	0.106	<0.0001	<0.001	0.002	<0.001	0.006	0.06	0.001	0.003	<0.01	1.07	0.011	0.07	<0.0001
	27-Apr-15	7.47	624	344	56	108	<1	<1	70	70	29.5	125	67	17	16	81	3	0.05	5.89	<0.001	0.003	<0.001	0.055	<0.0001	0.003	0.005	0.003	0.008	0.08	0.004	0.011	<0.01	0.442	0.023	<0.05	<0.0001

Details	Date	Fluoride	Ammonia as N	Nitrate as N	^ Nitrate as N	Nitrite + Nitrate as N	Total Phosphorus	Total Anions	Total Cations	Ionic Balance
		Nutrients						Ionic Balance		
Limit of Resolution		0.1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	meq/L	meq/L	%
	01-Jun-11	0.2	0.06	<0.01	0.08	--	0.02	1.21	1.23	--
Site 5	06-Mar-12	0.2	<0.01	<0.01	<0.01	<0.01	0.12	1.31	1.5	--
CWD2	21-Nov-13	0.2	0.02	<0.01	<0.01	<0.01	0.09			
	27-Apr-15	0.2	0.16	<0.01	0.04	0.04	0.09	1.18	1.27	--
	01-Jun-11	0.5	0.03	<0.01	<0.01	--	0.04	1.53	1.69	--
Site 6	06-Mar-12	0.3	<0.01	<0.01	<0.01	<0.01	0.13	1.69	1.55	--
CWD 6	21-Nov-13	0.4	0.01	<0.01	<0.01	<0.01	0.04			
	27-Apr-15	0.2	0.03	<0.01	0.05	0.05	0.13	1.47	1.44	--
	01-Jun-11	0.5	0.19	0.18	3.07	--	0.23	33.9	36.3	3.48
Site 7	06-Mar-12	0.6	0.07	0.08	4.54	4.62	0.58	40	43.7	4.41
Dirty Water Dam 1	21-Nov-13	0.4	0.62	0.08	2.72	2.8	0.01			
	27-Apr-15	0.3	0.27	0.1	1.39	1.49	0.06	19.3	20.1	2.16
	01-Jun-11	0.5	0.05	0.03	3.29	--	<0.01	42.9	46.1	3.64
Site 9	06-Mar-12	0.6	0.04	0.05	4.07	4.12	0.02	40.7	44.4	4.33
Dirty Water Dam 2	21-Nov-13	0.4	0.02	0.01	1.29	1.3	<0.01			
	27-Apr-15	0.4	0.07	0.02	0.45	0.47	<0.01	27.4	26.8	1.09
Site 8	01-Jun-11	0.5	0.11	0.06	1.22	--	0.01	38.3	41.5	3.94
Dirty Water Dam 4	06-Mar-12	0.5	0.14	0.08	1.2	1.28	0.65	32.7	35.6	4.21
was	21-Nov-13	0.4	0.14	0.04	0.96	1	0.02			
Clean Water Dam 4	27-Apr-15	0.3	<0.01	0.05	0.1	0.15	0.06	20.3	20.9	1.59
	01-Jun-11	0.6	0.2	<0.01	0.12	--	0.06	2.76	2.83	--
Site 14	01-Jun-11	0.5	0.09	<0.01	0.06	--	0.18	11.5	11.5	0.07
Sediment Dam Pit 3	06-Mar-12	0.4	<0.01	<0.01	<0.01	<0.01	0.1	3.65	3.77	1.56
EAST	06-Mar-12	0.6	<0.01	<0.01	<0.01	<0.01	0.62	12.5	13.7	4.52
	21-Nov-13	0.5	0.07	<0.01	<0.01	<0.01	0.09			
	27-Apr-15	0.5	0.18	<0.01	0.08	0.08	0.29	3.34	3.48	2.04
	01-Jun-11	0.8	0.83	<0.01	0.05	--	0.09	3.79	3.68	1.56
Site 13	01-Jun-11	0.8	0.83	<0.01	0.05	--	0.09	3.79	3.68	1.56
Sediment Dam Pit 3	06-Mar-12	0.5	<0.01	<0.01	<0.01	<0.01	0.42	2.46	2.57	--
WEST	21-Nov-13	0.7	0.03	<0.01	<0.01	<0.01	0.2			
	27-Apr-15	0.4	0.08	0.02	0.21	0.23	0.78	2.53	2.23	--
	01-Jun-11	0.5	0.09	<0.01	0.06	--	0.18	11.5	11.5	0.07
Site 15	06-Mar-12	0.6	<0.01	<0.01	<0.01	<0.01	0.62	12.5	13.7	4.52
Rail Loader Tunnel	21-Nov-13	0.5	0.07	<0.01	0.12	0.12	0.04			
	27-Apr-15	0.3	0.14	<0.01	0.11	0.11	0.07	5.89	5.76	1.1