

DE BEERS
GROUP OF COMPANIES

August 31, 2016

File: S115

Kierney Leach
Regulatory Officer
Mackenzie Valley Land and Water Board
PO Box 2130
Yellowknife, Northwest Territories
X1A 2P6

Dear: Ms. Leach:

**Re: Snap Lake Mine Monthly Water License Report: July 2016
Water License # MV2011L2-0004**

De Beers Canada Inc., (De Beers) Snap Lake Mine is pleased to provide the Mackenzie Valley Land and Water Board (MVLWB) the Monthly Surveillance Network Program (SNP) Report for July 2016.

Samples were collected from ten (10) stations at the during the reporting period (Figure 1).

This report satisfies the SNP requirements as dictated in Snap Lake Mines Water Licence MV2011L2-0004.

Should you have any questions, comments or require further clarification, please do not hesitate to contact me at the following address:

sean.whitaker@debeersgroup.com.

Sincerely,
DE BEERS CANADA INC.



Sean Whitaker
Regulatory Specialist- Environment and Permitting

Copied to: J. Steele
P. di Pizzo, Z. Liu

GNWT
SLEMA

FIGURE 1: ACTIVE SNP STATIONS JULY 2016



SNP SAMPLING STATUS JULY 2016

SNP STATION	DESCRIPTION	STATUS	SAMPLED	TABLE
02-01	Final mine water collection sump	Active	yes	2
02-02	North Pile drainage collection ditch	Active	yes	3
02-03	Core Facilities area collection ditch near Water Management Pond	Active	yes	4
02-04	Uncontrolled surface runoff at culvert by airstrip (3)	Active	no	-
02-05	Uncontrolled surface runoff at Bulk Sample Mine Rock Pad	Active	yes	5
02-06	Uncontrolled surface runoff at Quarry Site	Active	no	-
02-07	Uncontrolled surface runoff at Road to Bulk Emulsion Plant (6)	Active	no	-
02-08	Uncontrolled surface runoff at Winter Access Road	Active	no	-
02-09	Uncontrolled surface runoff at Emulsion Plant Area (6)	Active	no	-
02-10	Any other points where observable flow to Snap Lake or IL5 is observed	Active	no	-
02-11	Seepage well down gradient from Dam 1 near Snap Lake shoreline	Active	yes	6
02-12	Seepage well down gradient from Dam 1 at Water Management Pond	Active	no	-
02-13 B	Seepage well down gradient from Dam 2 at Water Management Pond	Active	no	-
02-14	Water Management Pond	Active	yes	7
02-15	Water Intake from Snap Lake	Active	yes	8
02-16	Sewage Discharge from Sewage Treatment Plant prior to mixing with Water Treatment Plant Effluent (2)	Active	yes	9
02-17 B	Final Combined Water Treatment Plant, Water Treatment Plant 6-Day Rolling Average and Daily Inline Chloride and Measured Total Dissolved Solids of Effluent	Active	yes	10-12
02-18	Whole Lake Total Dissolved Solids, Calcium, and Chloride (several sites within the main lake basin of Snap Lake)	AEMP	no	-
02-19	SNP Station Removed effective November 16 th 2007	Terminated	Terminated	-
02-20	Snap Lake on the edge of the mixing zone around the diffuser (4 stations located in a radius of 120 degrees at 200 meters from diffuser)	AEMP	yes	13-16
02-21	Outlet from Snap Lake flowing into the Lockhart System	AEMP	AEMP	-
02-22	Diffuser Construction	Active	In-active	-
02-23	Intake Construction - completed September 2005	In-active	In-active	-

WATER MANAGEMENT

SNP Station 02-11 (Table 6): Quarterly sample – sufficient water for metals analysis only.

SNP Station 02-16i STP2 (Table 9): The Sewage Treatment Plant (STP) operated for 31 days in the month of July.

SNP Station 02-17B (Table 10-12): The Water Treatment Plant (WTP) operated for 31 days during the month of July. All parameters tested met compliance, with the exception of zinc on July 11, 2016.

Water management practices are continually assessed in order to control water high in TDS at the source. The six day, four sample Rolling Averages, daily In-line Conductivity and Measured TDS are tabulated in Table 11 and 12.

SNP Station 02-20 (Table 13-16): De Beers conducted montly water sampling in July.

RAW WATER CONSUMPTION

The quantity of water extracted from Snap Lake for camp operations, site services, and construction is tabulated in Table 22. Please note that mine water results are subject to change pending completion of quality assurance checks.

GENERAL WASTE

Glass jars, tin cans, and most food related plastic containers are washed and shipped off site. Waste wood products and cardboard are burned in the authorized pit as per the Land Use Permit MV2010D0053. Waste Management Area staff ensures that waste is handled as per the approved operational procedures for waste handling.

REGULATORY

De Beers continues to abide by the Extended Care and Maintenance Plan and associated management plans during the reporting period. The GNWT Inspector continues to conduct inspections at the Snap Lake Mine with the last inspection being conducted on July 25, 2016.

ENVIRONMENTAL STUDIES/SURVEYS

Regulatory monitoring of Snap Lake included the following:

- Air Quality Monitoring;
- Monthly SNP monitoring;
- July AEMP Monitoring;
- Downstream Lakes MacKay Lake Fish Program;
- Fish Health Survey at Snap Lake, Reference Lake 13 and Northeast Lakes

OTHER SITE ACTIVITIES

- Site Water Quality monitoring;
- North Pile Thermistor and Piezometer monitoring;
- Meteorological data downloads;
- Dam and Water Management Pond monitoring;
- North Pile ditch and sump monitoring;
- Potable water monitoring; and
- Wildlife Surveillance Audits.

CONSTRUCTION ACTIVITIES

- West cell construction activities are on hold due to the mine being placed into care and maintenance.

GEO-TECHNICAL ACTIVITIES

The Water Management Pond (WMP) water elevation and North Pile sump monitoring are ongoing. Thermistor and piezometer monitoring is ongoing. No anomalies were identified.

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WATER MANAGEMENT ACTIVITIES

Water Balance	Table 22
Runoff Water Pumped to Water Management Pond	Table 23

PROCESSING PLANT ACTIVITIES

The mine is currently under care and maintenance conditions, and the process plant is not in operation at this time.

Quantity of Ore Processed	Table 24
Quantity of Slurry and Paste Deposited to the North Pile	Table 25
Quantity of Solids Deposited to the North Pile	Table 26
Quantity of Liquid Waste Discharged to the North Pile	Table 27
Quantity of Paste Deposited Underground	Table 28

FUEL STORAGE/ TANK FARM ACTIVITIES

Ongoing inspections of the tank farms and distribution systems continued in July.

SPILLS

No reportable spills occurred in July.

AIR STRIP

Regular monitoring and air strip maintenance was carried out in July.

CONTAINMENT DAMS

Weekly inspections of Dams # 1 and # 2 continued during the month of July. The placement of erosion protection layer in the East Cell commenced in July. North Pile inspection conducted weekly and report submitted to Geotechnical Engineers.

**ATTACHMENT:
SNP REPORT DATA TABLES AND FIGURES**

**TABLE 1. SNAP LAKE WATER LICENSE WTP DISCHARGE CRITERIA
 MV#2011L2-0004
 (Amended June 22, 2016)
 June 14, 2012 – June 13, 2020**

PARAMETER	AVERAGE MONTHLY LIMIT	MAXIMUM CONCENTRATION OF ANY GRAB SAMPLE	ANNUAL LOADING
Ammonia as N	10 mg/L	20 mg/L	208,000 kg/yr
Extractable Petroleum Hydrocarbons - F1 Fraction (C6-C10)	4.6 mg/L		
Extractable Petroleum Hydrocarbons - F2 Fraction (C11-C16)	2.1 mg/L		
Faecal Coliforms	10 CFU/100ml*	20 CFU/100ml*	
* CFU - (Colony-forming units)			
Fluoride	1.3 mg/L	2.0 mg/L	
Nitrate as N	12 mg/L	17 mg/L	250,000 kg/yr
Nitrite as N	0.35 mg/L	0.6 mg/L	
pH	6.0 - 9.0		
Total Aluminum	100 µg/L	200 µg/l	
Total Arsenic	3 µg/L	10 µg/L	
Total Chromium	10 µg/L	20 µg/L	
Total Copper	3 µg/L	6 µg/L	
Total Lead	5 µg/L	10 µg/L	
Total Nickel	50 µg/L	100 µg/L	
Total Zinc	10 µg/L	20 µg/L	
Total Phosphorus Discharge from All Sources			229 kg/yr
Total Dissolved Solids (TDS) (calculated)	960 mg/L	1253 mg/L	
Total Suspended Sediments	7 mg/L	14 mg/L	
RUNOFF DISCHARGE CRITERIA			
pH*	5.0 - 9.0		
* Except SNP 02-04, SNP 02-07, SNP 02-08, or SNP 02-09			

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**TABLE 2. FINAL MINEWATER COLLECTION SUMP
 (SNP Station 02-01)
 LICENCE # MV2011L2-0004
 Month - July 2016**

Surveillance Network Program Results for the Snap Lake Mine	UNITS	03-Jul-16		3-Jul-16 Duplicate		3-Jul-16 Triplicate		10-Jul-16		17-Jul-16		24-Jul-16		31-Jul-16	
Sample Control Number		2016-0548		2016-0549		2016-0550		2016-0562		2016-0594		2016-0657		2016-0671	
ROUTINE	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
pH	pH	8.00		8.02		8.08		8.24		7.94		7.80		7.94	
Specific Conductivity	µS/cm	1610		1610		1650		1590		1520		1510		1570	
Alkalinity	mg/L	84.2		83.4		94.3		94.4		105		85.4		89.7	
Hardness	mg/L	523		532		570		594		535		560		488	
Total Suspended Solids	mg/L	15.4		19.7		16.8		32.1		14.1		12.7		18.6	
Total Dissolved Solids(calc)	mg/L	803		805		769		880		771		880		778	
Turbidity	NTU	7.12		6.25		3.12		12.1		6.31		5.1		9.04	
NUTRIENTS	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
Ammonia-N	mg/L	0.04		0.042		0.033		0.0509		0.063		0.0545		0.0522	
Nitrate-N	mg/L	0.55		0.561		0.678		0.663		0.616		0.56		0.537	
Nitrite-N	mg/L	0.0215		0.0204		0.0036		0.0116		0.013		0.0113		0.0093	
Total Kjeldahl Nitrogen	mg/L	< 0.050		< 0.050		< 0.020				0.067					
Phosphorus	mg/L	0.0196	0.0024	0.0174	0.0108	0.018	0.0028			0.0224					
Ortho-phosphate	mg/L	< 0.0010		< 0.0010		0.0057				< 0.0010					
Organic Carbon	mg/L	1.4		2.1		1.61									
MAJOR IONS	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
Bicarbonate	mg/L	103.0		102.0		115		115		128		104		109	
Calcium	mg/L	184		188		198		210		188		196		171	
Carbonate	mg/L	< 5.0		< 5.0		< 0.50		< 5.0		< 5.0		< 5.0		< 5.0	
Chloride	mg/L	396		394		338		422		348		450		384	
Fluoride	mg/L	0.416		0.415		0.43		0.335		0.353		0.502		0.415	
Magnesium	mg/L	15.5		15.3		14.3		17.0		15.8		17.1		14.8	
Potassium	mg/L	4.67		4.6		4.5		4.85		4.79		4.69		4.40	
Reactive Silica	mg/L	7.05		6.9		6.8		8.90		8.27		7.88		7.93	
Sodium	mg/L	81.5		82.1		87.5		96.5		85.4		85.6		80.2	
Sulphate	mg/L	59.5		59		58.4		58.6		52.0		62.6		57.4	
ORGANICS	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
Benzene	mg/L	< 0.00050		< 0.00050		< 0.40									
Ethylbenzene	mg/L	< 0.00050		< 0.00050		< 0.40									
Toluene	mg/L	< 0.00050		< 0.00050		< 0.40									
Xylene	mg/L	< 0.00071		< 0.00071		< 0.40									
F1 (C6-C10)	mg/L	< 0.10		< 0.10		< 0.3									
F2 (> C10 C-16)	mg/L	< 0.10		< 0.10		< 0.15									
ULTRA LOW METALS	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
Aluminum	mg/L	289		266		< 2.0		539		2.14					
Antimony	mg/L	< 0.10		XM		< 0.10		0.20 XM		0.054		0.047			
Arsenic	mg/L	0.14		< 0.20		0.14		< 0.20		0.102		0.069			
Barium	mg/L	53.1		44.6		52.9		44.7		57.0		42.4			
Beryllium	mg/L	< 0.10		< 0.20		< 0.10		XM		0.035		< 0.010			
Bismuth	mg/L	< 0.050		XM		< 0.050		XM		< 0.0050		< 0.0050			
Boron	mg/L	153		137		142		128		120					
Cadmium	mg/L	< 0.0050		XM		< 0.0050		XM		< 0.0050		< 0.0050			
Cesium	mg/L	0.098		0.065		0.09		0.061		0.096		0.076			
Chromium	mg/L	3.11		< 0.20		2.92		< 0.20		6.49		< 0.10			
Cobalt	mg/L	0.52		< 0.20		0.49		< 0.20		0.677		0.123			
Copper	mg/L	0.73		< 0.40		0.83		< 0.40		0.724		0.206			
Iron	mg/L	1130		< 20		1030		< 20		1520		1.8			
Lead	mg/L	0.235		< 0.10		0.214		< 0.10		0.229		< 0.0050			
Lithium	mg/L	31.2		31.1		31.6		30.2		32.0		30.8			
Manganese	mg/L	62.5		50.2		60.0		48.7		64.0		48.6			
Mercury	mg/L	< 0.020		< 0.020		< 0.020		< 0.020		< 0.020		< 0.020			
Molybdenum	mg/L	3.79		3.5		3.49		3.41		3.62		3.67			
Nickel	mg/L	13.8		9.7		13.3		9.7		17.7		9.92			
Rubidium	mg/L	6.23		5.24		6.04		5.5		7.36		6.03			
Selenium	mg/L	< 0.050		XM		< 0.050		XM		< 0.040		< 0.040			
Silver	mg/L	0.013		< 0.020		0.124		< 0.020		0.0100		0.0060			
Strontium	mg/L	2590		2710		2570		2610		3390		3160			
Thallium	mg/L	< 0.010		XM		< 0.010		XM		0.0100		0.0090			
Tin	mg/L	< 0.10		< 0.20		< 0.10		XM		n/a		n/a			
Titanium	mg/L	23.2		XM		22.6		< 0.60		34.4		< 0.50			
Uranium	mg/L	1.24		1.21		1.18		1.15		1.25		1.31			
Vanadium	mg/L	0.8		< 1.0		0.8		< 1.0		0.88		< 0.20			
Zinc	mg/L	16.4		11.7		15.8		11.3		19.1		13.2		20.7	
Field Parameters	UNITS														
pH	pH	7.95		7.95		7.95		7.79		7.94		7.92		7.56	
Specific Conductivity	µS/cm	1609		1609		1609		1528		1468		1429		1603	
Water Temperature	°C	10.8		10.8		10.8		8.6		8.7		9.6		9.9	

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine. XM- Invalid result based on De Beers' internal review: Dissolved metals exceeded total metals by RPD value of 30%.

**TABLE 3. NORTH PILE DRAINAGE
 COLLECTION DITCH
 (SNP Station 02-02)**

LICENCE # MV2011L2-0004

Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine		UNITS	17-Jul-16	
Sample Control Number			2016-0589	
ROUTINE	UNITS		TOTAL	
pH	pH		7.47	
Specific Conductivity	µS/cm		2410	
Alkalinity	mg/L		112	
Hardness	mg/L		961	
Total Suspended Solids	mg/L		< 3.0	
Total Dissolved Solids (calc)	mg/L		1690	
Turbidity	NTU		0.41	
NUTRIENTS	UNITS	TOTAL	DISS	
Ammonia-N	mg/L	7.22		
Nitrate-N	mg/L	78.8		
Nitrite-N	mg/L	0.558		
Total Kjeldahl Nitrogen	mg/L	6.99		
Phosphorous	mg/L	0.0081	0.0062	
Ortho-phosphate	mg/L	< 0.0010		
Organic Carbon	mg/L	5.8		
MAJOR IONS	UNITS		TOTAL	
Bicarbonate	mg/L		136	
Calcium	mg/L		205	
Carbonate	mg/L		< 5.0	
Chloride	mg/L		287	
Fluoride	mg/L		0.32	
Magnesium	mg/L		109	
Potassium	mg/L		27.6	
Reactive Silica	mg/L		11.1	
Sodium	mg/L		126	
Sulphate	mg/L		396	
ORGANICS	UNITS		TOTAL	
Benzene	mg/L		< 0.00050	
Ethylbenzene	mg/L		< 0.00050	
Toluene	mg/L		< 0.00050	
Xylene	mg/L		< 0.00071	
F1 C6-C10 (mg/L)	mg/L		< 0.10	
F2 (> C10 C-16)	mg/L		< 0.10	
ULTRA LOW METALS	UNITS	TOTAL	DISS	
Aluminum	µg/L	15.4	7.7	
Antimony	µg/L	0.45	0.57	
Arsenic	µg/L	0.27	0.21	
Barium	µg/L	64.8	62.2	
Beryllium	µg/L	< 0.10	< 0.20	
Bismuth	µg/L	< 0.050	< 0.10	
Boron	µg/L	1300	1140	
Cadmium	µg/L	0.05	0.041	
Cesium	µg/L	0.171	0.154	
Chromium	µg/L	0.15	< 0.20	
Cobalt	µg/L	5.49	5.31	
Copper	µg/L	1.27	0.99	
Iron	µg/L	55	< 20	
Lead	µg/L	0.454	0.27	
Lithium	µg/L	15.5	14.4	
Manganese	µg/L	444	399	
Mercury	µg/L	< 0.020	< 0.020	
Molybdenum	µg/L	36.7	30.2	
Nickel	µg/L	70.5	68.4	
Rubidium	µg/L	35.2	36.3	
Selenium	µg/L	0.499	0.43	
Silver	µg/L	< 0.010	< 0.020	
Strontium	µg/L	2170	1890	
Thallium	µg/L	0.029	0.031	
Tin	µg/L	< 0.10	< 0.20	
Titanium	µg/L	0.38	< 0.60	
Uranium	µg/L	8.5	8.07	
Vanadium	µg/L	< 0.50	< 1.0	
Zinc	µg/L	3.3	2.6	
FIELD PARAMETERS	UNITS			
pH	pH		7.07	
Specific Conductivity	µS/cm		2300	
Water Temperature	°C		n/a	

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

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**TABLE 4. CORE FACILITIES AREA COLLECTION DITCH NEAR
 WATER MANAGEMENT POND
 (SNP Station 02-03.1)
 LICENCE # MV2011L2-0004
 Month - July 2016**

Surveillance Network		30-Jul-16	
Program Results for the Snap Lake Mine	UNITS		
Sample Control Number		2016-0669	
ROUTINE	UNITS	TOTAL	
pH	pH		7.89
Specific Conductivity	µS/cm		500
Alkalinity	mg/L		86.9
Hardness	mg/L		187
Total Suspended Solids	mg/L		19.4
Total Dissolved Solids (calc)	mg/L		309
Turbidity	NTU		12.7
NUTRIENTS	UNITS	TOTAL	DISS
Ammonia-N	mg/L	0.0620	
Nitrate-N	mg/L	5.31	
Nitrite-N	mg/L	0.0229	
Total Kjeldahl Nitrogen	mg/L	0.607	
Phosphorous	mg/L	0.0497	0.0129
Ortho-phosphate	mg/L	0.0046	
Organic Carbon	mg/L	5.8	
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L		106
Calcium	mg/L		45.2
Carbonate	mg/L		< 5.0
Chloride	mg/L		24.5
Fluoride	mg/L		0.764
Magnesium	mg/L		18.0
Potassium	mg/L		7.86
Reactive Silica	mg/L		11.0
Sodium	mg/L		18.9
Sulphate	mg/L		104
ORGANICS	UNITS	TOTAL	
Benzene	mg/L	< 0.00050	
Ethylbenzene	mg/L	< 0.00050	
Toluene	mg/L	< 0.00050	
Xylene	mg/L	< 0.00071	
F1 C6-C10 (mg/L)	mg/L	< 0.10	
F2 (> C10 C-16)	mg/L	< 0.10	
ULTRA LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	279	18.40
Antimony	µg/L	0.35	0.35
Arsenic	µg/L	0.53	0.36
Barium	µg/L	30.3	28.1
Beryllium	µg/L	< 0.10	< 0.10
Bismuth	µg/L	< 0.050	< 0.050
Boron	µg/L	215	201
Cadmium	µg/L	0.0178	0.0182
Cesium	µg/L	0.09	0.046
Chromium	µg/L	4.20	0.28
Cobalt	µg/L	1.98	0.7
Copper	µg/L	4.30	4.14
Iron	µg/L	647	56
Lead	µg/L	0.978	0.112
Lithium	µg/L	6.20	6.2
Manganese	µg/L	36.6	33.2
Mercury	µg/L	< 0.020	< 0.020
Molybdenum	µg/L	22.6	18.7
Nickel	µg/L	54.8	35.1
Rubidium	µg/L	10.3	9.41
Selenium	µg/L	0.139	0.13
Silver	µg/L	< 0.010	< 0.010
Strontium	µg/L	371	375
Thallium	µg/L	0.041	0.034
Tin	µg/L	< 0.10	< 0.10
Titanium	µg/L	11.6	0.51
Uranium	µg/L	3.91	3.79
Vanadium	µg/L	2.29	1.12
Zinc	µg/L	3.9	1.10
FIELD PARAMETERS	UNITS		
pH	pH		7.69
Specific Conductivity	µS/cm		475
Water Temperature	°C		10.1

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

**TABLE 5. UNCONTROLLED SURFACE RUNOFF
 AT BULK SAMPLE MINE ROCK PAD
 (SNP Station 02-05)
 LICENCE # MV2011L2-0004
 Month - July 2016**

Surveillance Network Program Results for the Snap Lake Mine	UNITS	29-Jul-16	
Sample Control Number		2016-0670	
ROUTINE	UNITS	TOTAL	
pH	pH	7.59	
Specific Conductivity	µS/cm	413	
Alkalinity	mg/L	35.0	
Hardness	mg/L	186	
Total Suspended Solids	mg/L	< 3.0	
Total Dissolved Solids (calc)	mg/L	256	
Turbidity	NTU	0.50	
NUTRIENTS	UNITS	TOTAL	DISS
Ammonia-N	mg/L	0.0387	
Nitrate-N	mg/L	0.853	
Nitrite-N	mg/L	0.0075	
Total Kjeldahl Nitrogen	mg/L	0.398	
Phosphorous	mg/L	0.0075	0.0040
Ortho-phosphate	mg/L	< 0.0010	
Organic Carbon	mg/L	4.7	
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L	42.7	
Calcium	mg/L	37.1	
Carbonate	mg/L	< 5.0	
Chloride	mg/L	15.8	
Fluoride	mg/L	0.155	
Magnesium	mg/L	22.7	
Potassium	mg/L	3.73	
Reactive Silica	mg/L	4.18	
Sodium	mg/L	5.41	
Sulphate	mg/L	141	
ORGANICS	UNITS	TOTAL	
Benzene	mg/L	< 0.00050	
Ethylbenzene	mg/L	< 0.00050	
Toluene	mg/L	< 0.00050	
Xylene	mg/L	< 0.00071	
F1 C6-C10 (mg/L)	mg/L	< 0.10	
F2 (> C10 C-16)	mg/L	< 0.10	
ULTRA LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	24.0	14.3
Antimony	µg/L	0.067	0.073
Arsenic	µg/L	0.136	0.124
Barium	µg/L	34.1	34.0
Beryllium	µg/L	< 0.010	< 0.010
Bismuth	µg/L	< 0.010	< 0.010
Boron	µg/L	29.4	28.7
Cadmium	µg/L	0.0595	0.0592
Cesium	µg/L	0.0234	0.0232
Chromium	µg/L	0.236	0.130
Cobalt	µg/L	4.24	4.10
Copper	µg/L	7.01	5.77
Iron	µg/L	80.2	32.2
Lead	µg/L	< 0.010	< 0.010
Lithium	µg/L	3.01	3.12
Manganese	µg/L	58.7	57.7
Mercury	µg/L	< 0.020	< 0.020
Molybdenum	µg/L	1.23	1.09
Nickel	µg/L	14.3	14.3
Rubidium	µg/L	6.0	5.8
Selenium	µg/L	0.118	0.097
Silver	µg/L	< 0.0050	< 0.0050
Strontium	µg/L	115	113
Thallium	µg/L	0.0090	0.0091
Tin	µg/L	< 0.050	< 0.050
Titanium	µg/L	0.51	< 0.10
Uranium	µg/L	0.113	0.103
Vanadium	µg/L	0.169	0.094
Zinc	µg/L	12.0	11.9
FIELD PARAMETERS	UNITS	TOTAL	
pH	pH	7.32	
Specific Conductivity	µS/cm	439	
Water Temperature	°C	13.4	

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

**TABLE 6. SEEPAGE WELL DOWN GRADIENT FROM DAM
 1 NEAR SNAP LAKE SHORELINE (SP06-06)**

(SNP Station 02-11)

LICENCE # MV2011L2-0004

Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	17-Jul-16	
Sample Control Number		2016-0596	
ROUTINE	UNITS	TOTAL	
pH	pH		
Specific Conductivity	µS/cm		
Alkalinity	mg/L		
Hardness	mg/L		
Total Suspended Solids	mg/L		
Total Dissolved Solids (calc)	mg/L		
Turbidity	NTC		
NUTRIENTS	UNITS	TOTAL	DISS
Ammonia-N	mg/L		
Nitrate-N	mg/L		
Nitrite-N	mg/L		
Total Kjeldahl Nitrogen	mg/L		
Phosphorous	mg/L		
Ortho-phosphate	mg/L		
Organic Carbon	mg/L		
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L		
Calcium	mg/L		
Carbonate	mg/L		
Chloride	mg/L		
Fluoride	mg/L		
Magnesium	mg/L		
Potassium	mg/L		
Reactive Silica	mg/L		
Sodium	mg/L		
Sulphate	mg/L		
ORGANICS	UNITS	TOTAL	
Benzene	mg/L		
Ethylbenzene	mg/L		
Toluene	mg/L		
Xylene	mg/L		
F1 C6-C10 (mg/L)	mg/L		
F2 (> C10 C-16)	mg/L		
ULTRA LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	121	73.7
Antimony	µg/L	7.68	6.41
Arsenic	µg/L	0.305	0.27
Barium	µg/L	1530	1420
Beryllium	µg/L	0.033	< 0.010
Bismuth	µg/L	< 0.010	< 0.010
Boron	µg/L	7.8	7.6
Cadmium	µg/L	1.34	0.0942
Cesium	µg/L	1.81	1.79
Chromium	µg/L	1.26	0.493
Cobalt	µg/L	1.47	1.03
Copper	µg/L	18.6	16.5
Iron	µg/L	556	24.1
Lead	µg/L	0.864	0.034
Lithium	µg/L	63.40	62.2
Manganese	µg/L	10.4	0.465
Mercury	µg/L	< 0.020	< 0.020
Molybdenum	µg/L	0.229	0.597
Nickel	µg/L	3.23	2.05
Rubidium	µg/L	57.2	57.1
Selenium	µg/L	< 0.040	< 0.040
Silver	µg/L	0.0125	< 0.0050
Strontium	µg/L	2320	2340
Thallium	µg/L	< 0.0050	< 0.0050
Tin	µg/L	0.892	0.631
Titanium	µg/L	3.28	< 0.10
Uranium	µg/L	0.038	0.012
Vanadium	µg/L	0.123	< 0.050
Zinc	µg/L	11.9	2.18
FIELD PARAMETERS	UNITS		
pH	pH	11.39	
Specific Conductivity	µS/cm	506	
Water Temperature	°C	n/a	

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

Snap Lake Mine
 Surveillance Network Program
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TABLE 7. WATER MANAGEMENT POND
(SNP Station 02-14)
LICENCE # MV2011L2-0004
Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	03-Jul-16		10-Jul-16		17-Jul-16		24-Jul-16		31-Jul-16	
Sample Control Number		2016-0551		2016-0563		2016-0595		2016-0658		2016-0672	
ROUTINE	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
pH	pH	7.87		8.28		8.02		8.06		7.93	
Specific Conductivity	µS/cm	1460		1520		1520		1450		1400	
Alkalinity	mg/L	68.9		88.2		93.1		90.4		76.7	
Hardness	mg/L	465		564		533		509		481	
Total Suspended Solids	mg/L	4.1		5.2		< 3.0		3.3		3.9	
Total Dissolved Solids (calc)	mg/L	772		851		799		824		744	
Turbidity	NTU	1.54		2.97		1.89		2.46		5.60	
NUTRIENTS	UNITS	TOTAL		DISS		TOTAL		DISS		TOTAL	
Ammonia-N	mg/L	1.90		0.0512		0.556		1.28		0.671	
Nitrate-N	mg/L	17.5		0.696		5.2		14.5		8.57	
Nitrite-N	mg/L	0.336		0.0120		0.086		0.252		0.157	
Total Kjeldahl Nitrogen	mg/L	2.44		0.081		0.657		1.110		0.873	
Phosphorous	mg/L	0.0159	0.0013	0.0317	0.0031	0.0109	< 0.0010	0.0123	< 0.0010	0.0173	0.0019
Ortho-phosphate	mg/L	< 0.0010		< 0.0010		< 0.0010		< 0.0010		< 0.0010	
Organic Carbon	mg/L	3.4		1.2		3		2.8		2.4	
MAJOR IONS	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
Bicarbonate	mg/L	84.1		108		114		110		93.6	
Calcium	mg/L	141		196		180		157		155	
Carbonate	mg/L	< 5.0		< 5.0		< 5.0		< 5.0		< 5.0	
Chloride	mg/L	286		405		349		313		300	
Fluoride	mg/L	0.462		0.311		0.253		0.49		0.450	
Magnesium	mg/L	27.4		18.1		20.3		28.4		22.7	
Potassium	mg/L	9.79		5.02		5.74		9.03		7.50	
Reactive Silica	mg/L	5.24		8.11		6.58		5.98		6.56	
Sodium	mg/L	71.7		101		85.9		83.9		77.9	
Sulphate	mg/L	110		59.0		70.7		106		87.8	
ORGANICS	UNITS	TOTAL		TOTAL		TOTAL		TOTAL		TOTAL	
Benzene	mg/L	< 0.00050		< 0.00050		< 0.00050		< 0.00050		< 0.00050	
Ethylbenzene	mg/L	< 0.00050		< 0.00050		< 0.00050		< 0.00050		< 0.00050	
Toluene	mg/L	< 0.00050		< 0.00050		< 0.00050		< 0.00050		< 0.00050	
Xylene	mg/L	< 0.00071		< 0.00071		< 0.00071		< 0.00071		< 0.00071	
F1 C6-C10 (mg/L)	mg/L	< 0.10		< 0.10		< 0.10		< 0.10		< 0.10	
F2 (> C10 C-16)	mg/L	< 0.10		< 0.10		< 0.10		< 0.10		< 0.10	
ULTRA LOW METALS	UNITS										
Aluminum	µg/L	60.1	7.0	120	7.5	47.0	3.0	59.1	3.1	156	5.1
Antimony	µg/L	0.17	0.16	< 0.10	< 0.10	< 0.10	XM	0.11	XM	< 0.20	< 0.10
Arsenic	µg/L	0.16	0.14	0.11	< 0.10	0.15	< 0.20	0.21	0.12	< 0.20	XM
Barium	µg/L	58.1	55.5	48.3	45.9	46.8	45.9	48.8	48.7	48.0	45.8
Beryllium	µg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	XM	< 0.10	< 0.10	< 0.20	< 0.10
Bismuth	µg/L	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	XM	< 0.050	< 0.050	< 0.10	< 0.050
Boron	µg/L	335	318	151	163	271	230	263	278	254	279
Cadmium	µg/L	0.0107	0.0074	< 0.0050	< 0.0050	0.0055	< 0.010	0.0079	0.0068	< 0.010	XM
Cesium	µg/L	0.126	0.117	0.073	0.062	0.085	0.073	0.094	0.095	0.098	0.083
Chromium	µg/L	0.83	< 0.10	1.41	< 0.10	0.63	< 0.20	1.04	< 0.10	2.25	< 0.10
Cobalt	µg/L	0.97	0.73	0.42	0.23	0.47	0.36	0.72	0.57	1.01	0.49
Copper	µg/L	1.19	0.89	0.81	0.77	1.16	XM	0.98	0.73	1.5	0.80
Iron	µg/L	193	< 10	432	17	249	< 20	238	< 10	407	< 10
Lead	µg/L	0.144	< 0.050	0.239	< 0.050	0.167	< 0.10	0.138	< 0.050	0.29	< 0.050
Lithium	µg/L	24.1	21.8	34.4	31.2	27.0	27.8	22.7	26.2	23.8	25.2
Manganese	µg/L	97.0	51.8	65.8	61.5	64.4	56.6	70.1	64.0	67.1	53.3
Mercury	µg/L	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Molybdenum	µg/L	12.6	11.6	4.00	3.73	6.51	5.45	9.52	8.53	9.63	8.04
Nickel	µg/L	19.6	16.6	13.2	11.2	14.7	12.6	17.3	16.3	23.3	16.4
Rubidium	µg/L	14.8	14.4	7.02	6.25	8.22	8.49	11.7	11.2	10.4	9.47
Selenium	µg/L	0.074	0.076	< 0.050	XM	< 0.050	XM	0.194	0.074	< 0.10	< 0.050
Silver	µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	XM	< 0.010	< 0.010	< 0.020	< 0.010
Strontium	µg/L	1920	1800	2690	2590	2560	2240	2040	1970	2010	1990
Thallium	µg/L	0.025	0.026	0.010	< 0.010	0.011	< 0.020	0.018	0.024	< 0.020	XM
Tin	µg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	XM	< 0.10	< 0.10	< 0.20	< 0.10
Titanium	µg/L	2.70	< 0.30	7.25	0.39	2.89	< 0.60	2.79	< 0.30	8.47	< 0.30
Uranium	µg/L	2.38	2.30	1.27	1.22	1.63	1.54	2.11	2.13	2.03	1.92
Vanadium	µg/L	< 0.50	< 0.50	< 0.50	< 0.50	< 0.50	XM	< 0.50	< 0.50	< 1.0	< 0.50
Zinc	µg/L	6.0	7.8	13.0	10.8	11.7	9.9	7.0	7.1	9.1	5.7
FIELD PARAMETERS	UNITS										
pH	pH	8.27		8.01		8.30		8.07		7.98	
Specific Conductivity	µS/cm	1377		1434		1491		1362		1398	
Water Temperature	°C	19.0		11.5		13.4		10.9		15.1	

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine. XM - Invalid result based on De Beers' internal review: Dissolved metals exceeded total metals by RPD value of 30%.

TABLE 8. WATER INTAKE FROM SNAP LAKE

(SNP Station 02-15)

LICENCE # MV2011L2-0004

Month -Jun 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	18-Jul-15	
Sample Control Number		2016-0590 & 0591	
ROUTINE	UNITS	TOTAL	
pH	pH	7.37	
Specific Conductivity	µS/cm	482	
Alkalinity	mg/L	29.7	
Hardness	mg/L	154	
Total Suspended Solids	mg/L	n/a	
Total Dissolved Solids (meas)	mg/L	357	
Total Dissolved Solids (calc)	mg/L	232	
Turbidity	NTU	n/a	
NUTRIENTS	UNITS	TOTAL	DISS
Ammonia-N	mg/L		n/a
Nitrate-N	mg/L	0.714	
Nitrite-N	mg/L	< 0.0020	
Total Kjeldahl Nitrogen	mg/L		n/a
Phosphorous	mg/L		n/a
Ortho-phosphate	mg/L		n/a
Organic Carbon	mg/L		n/a
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L	36.2	
Calcium	mg/L	51.4	
Carbonate	mg/L	< 5.0	
Chloride	mg/L	106	
Fluoride	mg/L	0.156	
Magnesium	mg/L	6.25	
Potassium	mg/L	2.43	
Reactive Silica	mg/L	0.558	
Sodium	mg/L	25.1	
Sulphate	mg/L	18.9	
MICROBIOLOGY	UNITS	TOTAL	
E. coli	MPN/100ml	<1.0	
Cryptosporidium	oocyst/100mL	n/a	
Giardia	cysts/10L	n/a	
Heterotrophic Plate Count	CFU/ml	n/a	
ULTRA LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L		n/a
Antimony	µg/L		n/a
Arsenic	µg/L		n/a
Barium	µg/L		n/a
Beryllium	µg/L		n/a
Bismuth	µg/L		n/a
Boron	µg/L		n/a
Cadmium	µg/L		n/a
Cesium	µg/L		n/a
Chromium	µg/L		n/a
Cobalt	µg/L		n/a
Copper	µg/L		n/a
Iron	µg/L		n/a
Lead	µg/L		n/a
Lithium	µg/L		n/a
Manganese	µg/L		n/a
Mercury	µg/L		n/a
Molybdenum	µg/L		n/a
Nickel	µg/L		n/a
Rubidium	µg/L		n/a
Selenium	µg/L		n/a
Silver	µg/L		n/a
Strontium	µg/L		n/a
Thallium	µg/L		n/a
Tin	µg/L		n/a
Titanium	µg/L		n/a
Uranium	µg/L		n/a
Vanadium	µg/L		n/a
Zinc	µg/L		n/a
FIELD PARAMETERS	UNITS		
pH	pH	6.77	
Specific Conductivity	µS/cm	741	
Water Temperature	°C	18.2	

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

**TABLE 9. SEWAGE DISCHARGED FROM SEWAGE TREATMENT PLANT PRIOR TO
 MIXING WITH WATER TREATMENT PLANT EFFLUENT
 (SNP Station 02-16i STP2)
 LICENCE #MV2011L2-0004
 Month - Jun 2016**

Surveillance Network Program Results for the Snap Lake Mine	UNITS	04-Jul-16	4-Jul-16 Duplicate	11-Jul-16	18-Jul-16	18-Jul-16 Duplicate	25-Jul-16
Sample Control Number		2016-0553	2016-0554	2016-0567	2016-0597	2016-0598	2016-0659
ROUTINE	UNITS						
Total Suspended Solids	mg/L	59	54	< 3	5	5	3
NUTRIENTS							
BOD (5-day)	mg/L	< 2	< 2	< 2	2	< 2	4
Ammonia-N	mg/L	0.018	0.016	0.031	0.036	0.028	0.044
Total Kjeldahl Nitrogen	mg/L	4.32	2.24	0.92	0.85	0.00	1.12
Phosphorous	mg/L	16.100	12.200	15.800	12.100	7.950	XM
Ortho-phosphate	mg/L	8.160	7.730	6.690	5.470	6.040	6.170
Organic Carbon	mg/L	32.0	30.0	7.4	7.7	5.400	6.040
						8.2	5.700
							5.550
							5.130
							14.4
MAJOR IONS							
Nitrate-N	mg/L	14.30	14.00	32.80	30.60	30.80	29.20
Nitrite-N	mg/L	< 0.01	< 0.01	0.41	0.22	0.23	0.08
MICROBIOLOGICAL	UNITS						
E. Coli	MPN/100ml	< 1.0	< 1.0	< 1.0	1	7.4	< 1.0
Faecal Coliforms	CFU/100ml	< 1.0	< 1.0	< 1.0	10	8	1
ORGANICS	UNITS						
Hexane Extractable Material	mg/L	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
FIELD PARAMETERS	UNITS						
pH	pH	7.87	n/a	6.57	6.66	n/a	6.91
Specific Conductivity	µS/cm	1596	n/a	875	851	n/a	957
Water Temperature	°C	25.2	n/a	23.0	21.5	n/a	18.1

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TABLE 10. WATER TREATMENT PLANT EFFLUENT
(SNP Station O2-17B)
LICENCE # MV2011L2-0004
Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	05-Jul-16	11-Jul-16	17-Jul-16	23-Jul-16	29-Jul-16	
Sample Control Number		2016-0559 & 0560	2016-0568 & 0569	2016-0592 & 0593	2016-0655 & 0656	2016-0662 & 0663	
ROUTINE	UNITS						
pH	pH	7.92	8.22	7.97	7.90	7.83	
Specific Conductivity	µS/cm	1350	1460	1300	1290	1270	
Alkalinity	mg/L	76.6	81.3	98.2	91.2	85.7	
Hardness	mg/L	487	528	453	480	403	
Total Suspended Solids	mg/L	< 3.0	5.3	< 3.0	< 3.0	< 3.0	
Total Dissolved Solids (meas)	mg/L	952	1050	932	915	799	
Total Dissolved Solids (calc)	mg/L	734	759	692	728	650	
Turbidity	NTU	0.76	1.44	0.85	0.87	0.70	
NUTRIENTS	UNITS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS
Biochemical Oxygen Demand	mg/L	n/a	< 2.0	n/a	n/a	n/a	n/a
Ammonia-N	mg/L	0.364	0.0450	0.118	0.0466	0.0758	0.0758
Nitrate-N	mg/L	4.23	0.641	1.57	0.736	1.18	1.18
Nitrite-N	mg/L	0.120	0.0096	0.031	0.0098	0.0199	0.0199
Total Kjeldahl Nitrogen	mg/L	0.504	4.24	0.20	< 0.050	0.155	0.155
Phosphorous	mg/L	0.0047	0.0016	0.0089	0.0035	0.0043	< 0.0010
Ortho-phosphate	mg/L	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010	< 0.0010
Organic Carbon	mg/L	< 1.0	< 1.0	2.9	< 1.0	1.3	1.3
MAJOR IONS	UNITS						
Bicarbonate	mg/L	93.5	99.2	120	111	105	105
Calcium	mg/L	164	185	156	166	137	137
Carbonate	mg/L	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Chloride	mg/L	321	371	316	344	311	311
Fluoride	mg/L	0.413	0.268	0.349	0.419	0.380	0.380
Magnesium	mg/L	18.8	16.1	15.3	16.0	14.8	14.8
Potassium	mg/L	6.08	4.46	5.13	5.08	4.68	4.68
Reactive Silica	mg/L	7.36	7.58	7.18	7.34	7.06	7.06
Sodium	mg/L	79.8	74.2	71.3	75.3	61.4	61.4
Sulphate	mg/L	69.5	56.4	52.7	53.9	54.7	54.7
ORGANICS	UNITS						
Oil & Grease	mg/L	n/a	< 1.0	n/a	n/a	n/a	n/a
Benzene	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Ethylbenzene	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Toluene	mg/L	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050	< 0.00050
Xylene	mg/L	< 0.00071	< 0.00071	< 0.00071	< 0.00071	< 0.00071	< 0.00071
F1 (C6-C10)	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
F2 (>C10-C16)	mg/L	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
MICROBIOLOGY	UNITS						
E. Coli	mpn/100ml	n/a	< 1.0	n/a	n/a	n/a	n/a
ULTRA / LOW METALS	UNITS	TOTAL	DISS	TOTAL	DISS	TOTAL	DISS
Aluminum	µg/L	36.6	35.1	5.65	12.1	27.4	8.85
Antimony	µg/L	0.049	0.050	0.044	0.076	0.112	0.022
Arsenic	µg/L	0.096	0.073	0.043	0.086	0.1	0.057
Barium	µg/L	43.6	44.7	47.9	41.7	41.0	39.6
Beryllium	µg/L	< 0.010	0.011	< 0.010	< 0.010	< 0.010	< 0.010
Bismuth	µg/L	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Boron	µg/L	153	123	122	120	115	119
Cadmium	µg/L	< 0.0050	0.0053	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Cesium	µg/L	0.0751	0.0664	0.0648	0.0584	0.0626	0.0571
Chromium	µg/L	0.547	0.325	< 0.060	0.202	0.413	0.137
Cobalt	µg/L	0.372	0.657	0.587	0.235	0.179	0.217
Copper	µg/L	0.38	0.84	0.45	0.7	0.28	0.28
Hexavalent Chromium	µg/L	n/a	n/a	n/a	n/a	n/a	n/a
Iron	µg/L	288	507	4.3	188	243	187
Lead	µg/L	0.067	0.149	< 0.010	0.026	0.046	0.041
Lithium	µg/L	25.5	24.8	24.2	24.6	25.0	24.5
Manganese	µg/L	59.2	82.8	79.1	51.0	39.5	46.3
Mercury	µg/L	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020	< 0.020
Molybdenum	µg/L	4.58	2.95	2.91	2.96	2.76	2.21
Nickel	µg/L	11.5	13.6	12.5	9.5	9.27	8.36
Rubidium	µg/L	7.4	5.1	5.1	5.8	5.1	5.2
Selenium	µg/L	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040	< 0.040
Silver	µg/L	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050	< 0.0050
Strontium	µg/L	2050	2380	2330	1970	2090	1910
Thallium	µg/L	0.0110	< 0.0050	0.0053	0.0067	0.0104	< 0.0050
Tin	µg/L	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050	< 0.050
Titanium	µg/L	4.33	7.16	< 0.10	3.92	3.11	2.11
Uranium	µg/L	1.29	1.11	1.05	1.17	1.08	1.05
Vanadium	µg/L	0.210	0.110	< 0.050	0.121	0.158	0.086
Zinc	µg/L	5.84	32.6	27.9	7.61	9.05	6.78
FIELD PARAMETERS	UNITS						
pH	pH	7.89	7.57	7.89	7.96	7.94	7.94
Specific Conductivity	µS/cm	1274	1372	1252	1295	1331	1331
Water Temperature	°C	9.8	8.1	9.2	8.2	7.8	7.8
Dissolved Oxygen	mg/L	9.17	7.99	7.6	7.80	8.10	8.10

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

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TABLE 11. WTP DISCHARGE 6-DAY ROLLING AVERAGE

Date	pH		TSS mg/L		TDS (calc) mg/L		Total Ammonia mg/L		Nitrite (NO2) mg/L		Nitrate (NO3) mg/L		Fluoride mg/L		Aluminum µg/L		Arsenic µg/L		Chromium µg/L		Copper µg/L		Nickel µg/L		Lead µg/L		Zinc µg/L	
	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE	02-17 B	AVE
5-Jul-16	7.92	7.98	3.0	3.8	734	734	0.364	0.362	0.120	0.093	4.23	4.58	0.413	0.374	36.6	36.0	0.096	0.096	0.547	0.47275	0.38	0.44	11.5	11.8	0.067	0.087	5.84	7.51
11-Jul-16	8.22	8.03	5.3	3.9	759	747	0.045	0.355	0.010	0.090	0.641	4.15	0.268	0.344	35.1	30.7	0.073	0.085	0.325	0.36675	0.84	0.50	13.6	12.7	0.149	0.075	32.6	12.61
17-Jul-16	7.97	8.05	3.0	3.6	692	728	0.118	0.248	0.031	0.072	1.57	3.30	0.349	0.342	12.1	27.5	0.086	0.085	0.202	0.39125	0.70	0.58	9.5	11.5	0.026	0.073	7.61	12.55
23-Jul-16	7.90	8.00	3.0	3.6	728	728	0.047	0.143	0.010	0.043	0.736	1.79	0.419	0.362	27.4	27.8	0.1	0.089	0.413	0.37175	0.28	0.55	9.3	10.8	0.046	0.072	9.05	12.60
29-Jul-16	7.83	7.98	3.0	3.6	650	707	0.0758	0.070	0.0199	0.017	1.18	1.03	0.380	0.345	8.85	24.9	0.057	0.086	0.137	0.31333	0.28	0.61	8.36	9.4	0.041	0.074	6.78	12.84

TABLE 12. WTP DISCHARGE DAILY INLINE CONDUCTIVITY

Month -Jun 2016

Date	Daily Average In-line Conductivity (μ S/cm)	TDS (Measured) (mg/L)	Chloride (mg/L)
1-Jul-16			
2-Jul-16			
3-Jul-16			
4-Jul-16			
5-Jul-16	1274	952	321
6-Jul-16			
7-Jul-16			
8-Jul-16			
9-Jul-16			
10-Jul-16			
11-Jul-16	1372	1050	371
12-Jul-16			
13-Jul-16			
14-Jul-16			
15-Jul-16			
16-Jul-16			
17-Jul-16	1252	932	316
18-Jul-16			
19-Jul-16			
20-Jul-16			
21-Jul-16			
22-Jul-16			
23-Jul-16	1295	915	344
24-Jul-16			
25-Jul-16			
26-Jul-16			
27-Jul-16			
28-Jul-16			
29-Jul-16	1331	799	311
30-Jul-16			
31-Jul-16			

The correlation between the on-site measurements of chloride and calculated total dissolved solids concentrations is $y = 0.567x - 70.619$ ($R^2 = 0.8685$).

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**TABLE 13: SNAP LAKE ON EDGE OF THE
 MIXING ZONE AROUND DIFFUSER
 (SNP Station 02-20d)
 LICENCE # MV2011L2-0004
 Month -July 2016**

Surveillance Network Program Results for the Snap Lake Mine	UNITS	03-Jul-16		03-Jul-16	
Sample Control Number		2016-5080		2016-5104	
ROUTINE	UNITS	TOTAL		TOTAL	
pH	pH	7.7 XH		7.6 XH	
Specific Conductivity	µS/cm	672		687	
Alkalinity	mg/L	40.5		41.7	
Hardness	mg/L	212		216	
Total Suspended Solids	mg/L	<3		<3	
Total Dissolved Solids (calc)	mg/L	335		344	
Total Dissolved Solids (meas)	mg/L	506		510	
Turbidity	NTU	0.3 WH		0.3 WH	
NUTRIENTS	UNITS	TOTAL	DISS	TOTAL	DISS
Biochemical Oxygen Demand	mg/L	<2 WH	N/A	<2 WH	N/A
Ammonia-N	mg/L	0.0367	N/A	0.0316	N/A
Nitrate-N	mg/L	1.14	N/A	1.21	N/A
Nitrite-N	mg/L	0.0087	N/A	0.0096	N/A
Total Kjeldahl Nitrogen	mg/L	0.28(c)	N/A	0.35(b)	N/A
Phosphorous	mg/L	<0.001	<0.001	<0.001	<0.001
Inorganic Phosphorous	mg/L	<0.001	<0.001	<0.001	<0.001
Organic Phosphorous	mg/L	<0.0014	<0.0014	<0.0014	<0.0014
Ortho-phosphate	mg/L	<0.001	N/A	<0.001	N/A
Organic Carbon	mg/L	2.6	N/A	2.9	N/A
MAJOR IONS	UNITS	TOTAL		TOTAL	
Bicarbonate	mg/L	49.4		50.9	
Calcium	mg/L	70.8		71.9	
Carbonate	mg/L	<5		<5	
Chloride	mg/L	158		162	
Fluoride	mg/L	0.219		0.229	
Magnesium	mg/L	8.66		8.84	
Potassium	mg/L	3.01		3.04	
Reactive Silica	mg/L	1.08		1.28	
Sodium	mg/L	33.6		34.6	
Sulphate	mg/L	29.9		31.0	
ORGANICS	UNITS	TOTAL	TOTAL	TOTAL	TOTAL
Oil & Grease	mg/L	<1		<1	
Benzene	mg/L	<0.0005		<0.0005	
Ethylbenzene	mg/L	<0.0005		<0.0005	
Toluene	mg/L	<0.0005		<0.0005	
Xylene	mg/L	<0.00071		<0.00071	
F1 (C6-C10)	mg/L	<0.1		<0.1	
F2 (>C10-C16)	mg/L	<0.1		<0.1	
MICROBIOLOGY	UNITS	TOTAL	TOTAL	TOTAL	TOTAL
E. Coli	mpn/100ml	<1 WH		<1 WH	
ULTRA LOW METALS	UNITS	TOTAL	DISS	TOTAL	DISS
Aluminum	µg/L	7.5	5.6	7.63	5.08
Antimony	µg/L	0.059	0.056	0.067	0.059
Arsenic	µg/L	0.09	0.088	0.084	0.079
Barium	µg/L	28.6	28.5	28.1	28.0
Beryllium	µg/L	<0.01	<0.01	<0.01	<0.01
Bismuth	µg/L	<0.01	<0.01	<0.01	<0.01
Boron	µg/L	76.6	75.9	73.7	76.7
Cadmium	µg/L	0.005	<0.005	0.0066	0.0055
Cesium	µg/L	0.0424	0.0427	0.0432	0.0444
Chromium	µg/L	<0.06	<0.06	0.064	<0.06
Cobalt	µg/L	0.039	0.028	0.038	0.038
Copper	µg/L	0.45	0.55	0.45	0.7(c) XQ
Iron	µg/L	17.5	<1	16.9	<1
Lead	µg/L	<0.01	<0.01	<0.01	<0.01
Lithium	µg/L	11.6	11.6	11.7	11.6
Manganese	µg/L	6.92	2.40	6.64	3(b)
Mercury	µg/L	<0.02	<0.02	<0.02	<0.02
Molybdenum	µg/L	1.75	1.69	1.73	1.68
Nickel	µg/L	2.41	2.35	2.43	2.71
Rubidium	µg/L	4.3	4.4	4.4	4.2
Selenium	µg/L	<0.04	<0.04	<0.04	<0.04
Silver	µg/L	<0.005	<0.005	<0.005	<0.005
Strontium	µg/L	983	984	958	951
Thallium	µg/L	<0.005	<0.005	<0.005	0.0052
Tin	µg/L	#N/A	#N/A	#N/A	#N/A
Titanium	µg/L	0.23	<0.1	0.2	<0.1
Uranium	µg/L	0.447	0.474	0.469	0.469
Vanadium	µg/L	<0.05	<0.05	<0.05	<0.05
Zinc	µg/L	0.83	0.8	<0.8	1.28
FIELD PARAMETERS	UNITS				
pH	pH	8.03		8.06	
Specific Conductivity	µS/cm	713		699	
Dissolved Oxygen	mg/L	11.32		11.56	
Water Temperature	°C	14.16		14.03	

Notes:
 Results are DRAFT and are subject to change pending completion of final quality assurance checks.
 Water samples were collected from the mid-depth of the water column; conductivity gradients were not observed.
 WH = warning, hold time was exceeded.
 XH = data invalidated because the hold time was exceeded by over 10 days and may have an effect on the results.
 XQ = data invalidated because the dissolved metal concentration was substantially higher (i.e. > 30%) than the total metal concentration in the sample.
 a) Total dissolved solids calculated using Methods 1030 E in Standard Methods for the Examination of Water and Wastewater, 22nd Edition (APHA 2012).
 b) Value was of questionable data quality and is under review. Repeat analysis of the sample was requested for confirmation.
 c) Value was of questionable data quality due to the variance in duplicate samples and is under review. Repeat analysis of the sample was requested for confirmation.
 Abbreviations in parameter names: HCO₃ = bicarbonate; CaCO₃ = calcium carbonate; CO₃ = carbonate; OH = hydroxide; SiO₂ = silicate; BOD = biochemical oxygen demand; N = nitrogen; P = phosphorus; BTEX = benzene, toluene, ethylbenzene, and xylene; E. coli = Escherichia coli; F1 (C₆-C₁₀) = hydrocarbon fraction 1 encompasses the range of equivalent carbon number from C₆ to C₁₀; F2 (C₁₀-C₁₆) = hydrocarbon fraction 2 encompasses the range of equivalent carbon number from C₁₀ to C₁₆; Flet = Flet Research Limited; Taggs = Taggs Environmental Laboratory.
 Other symbols and abbreviations: < = less than; > = greater than.
 Abbreviations for units: deg. C = degree Celsius; µS/cm = microsiemens per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity units; mg-P/L = milligrams of phosphorus per litre; mg-N/L = milligrams of nitrogen per litre; µg/L = micrograms per litre; % = percent; MPN/100 mL = most probable number per 100 millilitres.
 APHA (American Public Health Association). 2012. Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015. Washington, DC, USA.

TABLE 14. SNAP LAKE ON THE EDGE OF THE MIXING ZONE AROUND THE DIFFUSER (SNP Station 02-20e)
 LICENCE # MV2011L2-0004
 Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	03-Jul-16	
Sample Control Number		2016-5081	
ROUTINE	UNITS	TOTAL	DISS
pH	pH	7.6	XH
Specific Conductivity	µS/cm	694	
Alkalinity	mg/L	40.8	
Hardness	mg/L	208	
Total Suspended Solids	mg/L	<3	
Total Dissolved Solids (calc)	mg/L	343	
Total Dissolved Solids (meas)	mg/L	527	
Turbidity	NTU	<3	
NUTRIENTS	UNITS	TOTAL	DISS
Biochemical Oxygen Demand	mg/L	<2	WH
Ammonia-N	mg/L	0.0365	N/A
Nitrate-N	mg/L	1.37	N/A
Nitrite-N	mg/L	0.0095	N/A
Total Kjeldahl Nitrogen	mg/L	0.29	N/A
Phosphorous	mg/L	0.0013	0.0013
Inorganic Phosphorous	mg/L	<0.001	<0.001
Organic Phosphorous	mg/L	<0.0014	<0.0014
Ortho-phosphate	mg/L	<0.001	N/A
Organic Carbon	mg/L	2.7	N/A
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L	49.8	
Calcium	mg/L	68.4	
Carbonate	mg/L	<5	
Chloride	mg/L	164	
Fluoride	mg/L	0.223	
Magnesium	mg/L	8.99	
Potassium	mg/L	3.02	
Reactive Silica	mg/L	1.45	
Sodium	mg/L	34.4	
Sulphate	mg/L	31.3	
ORGANICS	UNITS	TOTAL	
Oil & Grease	mg/L	<1	
Benzene	mg/L	<0.0005	
Ethylbenzene	mg/L	<0.0005	
Toluene	mg/L	<0.0005	
Xylene	mg/L	<0.00071	
F1 (C6-C10)	mg/L	<0.1	
F2 (>C10-C16)	mg/L	<0.1	
MICROBIOLOGY	UNITS	TOTAL	
E. Coli	mpn/100ml	<1	WH
ULTRA / LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	7.2	5.41
Antimony	µg/L	0.115	0.084
Arsenic	µg/L	0.081	0.086
Barium	µg/L	27.7	27.4
Beryllium	µg/L	<0.01	<0.01
Bismuth	µg/L	<0.01	<0.01
Boron	µg/L	76.8	69.8
Cadmium	µg/L	<0.005	<0.005
Cesium	µg/L	0.0435	0.0444
Chromium	µg/L	<0.06	<0.06
Cobalt	µg/L	0.034	0.026
Copper	µg/L	0.49	0.54
Iron	µg/L	15.1	<1
Lead	µg/L	0.017	0.016
Lithium	µg/L	11.5	12.0
Manganese	µg/L	6.53	1.61
Mercury	µg/L	<0.02	<0.02
Molybdenum	µg/L	1.76	1.64
Nickel	µg/L	2.44	2.36
Rubidium	µg/L	4.2	4.4
Selenium	µg/L	<0.04	<0.04
Silver	µg/L	<0.005	<0.005
Strontium	µg/L	963	942
Thallium	µg/L	0.0053	<0.005
Tin	µg/L	#N/A	#N/A
Titanium	µg/L	0.15	<0.1
Uranium	µg/L	0.466	0.476
Vanadium	µg/L	<0.05	<0.05
Zinc	µg/L	0.8	0.85
FIELD PARAMETERS	UNITS		
pH	pH	7.95	
Specific Conductivity	µS/cm	697	
Dissolved Oxygen	mg/L	11.43	
Water Temperature	°C	12.27	

Notes:
 Results are DRAFT and are subject to change pending completion of final quality assurance checks.
 Water samples were collected from the mid-depth of the water column; conductivity gradients were not observed.
 WH = warning; hold time was exceeded.
 XH = data invalidated because the hold time was exceeded by over 10 days and may have an effect on the results.
 NO = data invalidated because the dissolved metal concentration was substantially higher (i.e. ≥ 30%) than the total metal concentration in the sample.
 a) Total dissolved solids calculated using Methods 1030 E in Standard Methods for the Examination of Water and Wastewater, 22nd Edition (APHA 2012).
 b) Value was of questionable data quality and is under review. Repeat analysis of the sample was requested for confirmation.
 c) Value was of questionable data quality due to the variance in duplicate samples and is under review. Repeat analysis of the sample was requested for confirmation.
 Abbreviations in parameter names: HCO₃ = bicarbonate; CaCO₃ = calcium carbonate; CO₃ = carbonate; CH = hydroxide; SO₄ = sulfate; BOD = biochemical oxygen demand; N = nitrogen; P = phosphorus; BTEX = benzene, toluene, ethylbenzene, and xylene; E. coli = Escherichia coli; F1 (C₆-C₁₀) = hydrocarbon fraction 1 encompasses the range of equivalent carbon number from C₆ to C₁₀; F2 (>C₁₀-C₁₆) = hydrocarbon fraction 2 encompasses the range of equivalent carbon number from >C₁₀ to C₁₆; FIAT = FIAT Research Limited; Targa = Targa Environmental Laboratory.
 Other symbols and abbreviations: < = less than; > = greater than.
 Abbreviations for units: deg. C = degree Celsius; µS/cm = microSiemens per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity units; mg-P/L = milligrams of phosphorus per litre; mg-N/L = milligrams of nitrogen per litre; µg/L = micrograms per litre; % = percent; MPN/100 mL = most probable number per 100 millilitres.
 APHA (American Public Health Association), 2012. Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015. Washington, DC, USA.

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TABLE 15. SNAP LAKE ON THE EDGE OF THE MIXING ZONE AROUND THE DIFFUSER (SNP Station 02-20f) LICENCE # MV2011L2-0004
Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine		UNITS	03-Jul-16	
Sample Control Number			2016-5082	
ROUTINE	UNITS		TOTAL	
pH	pH		7.7 XH	
Specific Conductivity	µS/cm		701	
Alkalinity	mg/L		42.1	
Hardness	mg/L		213	
Total Suspended Solids	mg/L		<3	
Total Dissolved Solids (calc)	mg/L		346	
Total Dissolved Solids (meas)	mg/L		519	
Turbidity	NTU		0.6 WH	
NUTRIENTS	UNITS		TOTAL	DISS
Biochemical Oxygen Demand	mg/L	<2 WH	N/A	
Ammonia-N	mg/L	0.0371	N/A	
Nitrate-N	mg/L	1.24	N/A	
Nitrite-N	mg/L	0.0105	N/A	
Total Kjeldahl Nitrogen	mg/L	0.234	N/A	
Phosphorous	mg/L	0.0032	0.0083(b)	
Inorganic Phosphorous	mg/L	<0.001	<0.001	
Organic Phosphorous	mg/L	0.0032	0.0083(b)	
Ortho-phosphate	mg/L	<0.001	N/A	
Organic Carbon	mg/L	2.7	N/A	
MAJOR IONS	UNITS		TOTAL	
Bicarbonate	mg/L		51.4	
Calcium	mg/L		70.6	
Carbonate	mg/L		<5	
Chloride	mg/L		165	
Fluoride	mg/L		0.218	
Magnesium	mg/L		8.8	
Potassium	mg/L		3.0	
Reactive Silica	mg/L		1.36	
Sodium	mg/L		34.5	
Sulphate	mg/L		31.1	
ORGANICS	UNITS		TOTAL	
Oil & Grease	mg/L		<1	
Benzene	mg/L		<0.0005	
Ethylbenzene	mg/L		<0.0005	
Toluene	mg/L		<0.0005	
Xylene	mg/L		<0.00071	
F1 (C6-C10)	mg/L		<0.1	
F2 (>C10-C16)	mg/L		<0.1	
MICROBIOLOGY	UNITS		TOTAL	
E. Coli	mpn/100ml		<1 WH	
ULTRA / LOW METALS	UNITS		TOTAL	DISS
Aluminum	µg/L		7.5	5.04
Antimony	µg/L		0.067	0.062
Arsenic	µg/L		0.084	0.074
Barium	µg/L		28.7	28.3
Beryllium	µg/L		<0.01	<0.01
Bismuth	µg/L		<0.01	<0.01
Boron	µg/L		76.2	77.7
Cadmium	µg/L		<0.005	<0.005
Cesium	µg/L		0.0435	0.0418
Chromium	µg/L		0.067	0.072
Cobalt	µg/L		0.041	0.049
Copper	µg/L		0.46	0.56
Iron	µg/L		18.7	<1
Lead	µg/L		<0.01	<0.01
Lithium	µg/L		11.7	11.7
Manganese	µg/L		6.63	2.47
Mercury	µg/L		<0.02	<0.02
Molybdenum	µg/L		1.7	1.8
Nickel	µg/L		2.4	2.38
Rubidium	µg/L		4.2	4.2
Selenium	µg/L		<0.04	<0.04
Silver	µg/L		<0.005	<0.005
Strontium	µg/L		970	986
Thallium	µg/L		<0.005	0.0054
Tin	µg/L		#N/A	#N/A
Titanium	µg/L		0.29	<0.1
Uranium	µg/L		0.463	0.464
Vanadium	µg/L		<0.05	0.056
Zinc	µg/L		0.86	0.86
FIELD PARAMETERS	UNITS			
pH	pH		8.05	
Specific Conductivity	µS/cm		705	
Dissolved Oxygen	mg/L		11.52	
Water Temperature	°C		13.81	

Notes:
 Results are DRAFT and are subject to change pending completion of final quality assurance checks.
 Water samples were collected from the mid-depth of the water column; conductivity gradients were not observed.
 WH = warning, hold time was exceeded.
 XH = data invalidated because the hold time was exceeded by over 10 days and may have an effect on the results.
 a) Total dissolved solids calculated using Methods 1000 E in Standard Methods for the Examination of Water and Wastewater, 22nd Edition (APHA 2012).
 b) Value was of questionable data quality and is under review. Repeat analysis of the sample was requested for confirmation.
 c) Value was of questionable data quality due to the variance in duplicate samples and is under review. Repeat analysis of the sample was requested for confirmation.
 Abbreviations in parameter names: HCO₃⁻ = bicarbonate; CaCO₃ = calcium carbonate; CO₃⁼ = carbonate; OH⁻ = hydroxide; SiO₂ = silicate; BOD = biochemical oxygen demand; N = nitrogen; P = phosphorus; BTEX = benzene, toluene, ethylbenzene, and xylene; E. coli = Escherichia coli; F1 (C₆-C₁₀) = hydrocarbon fraction 1 encompasses the range of equivalent carbon number from C₆ to C₁₀; F2 (>C₁₀-C₁₆) = hydrocarbon fraction 2 encompasses the range of equivalent carbon number from >C₁₀ to C₁₆; FI = FI = FI Research Limited; Tuga = Tuga Environmental Laboratory.
 Other symbols and abbreviations: < = less than; > = greater than.
 Abbreviations for units: deg. C = degree Celsius; µS/cm = microSiemens per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity units; mg-P/L = milligrams of phosphorus per litre; mg-N/L = milligrams of nitrogen per litre; µg/L = micrograms per litre; % = percent; MPN/100 mL = most probable number per 100 millilitres.
 APHA (American Public Health Association). 2012. Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015. Washington, DC: 1624.

**TABLE 16. SNAP LAKE ON THE EDGE OF THE MIXING ZONE
 AROUND THE DIFFUSER
 (SNP Station 02-20g)
 LICENCE # MV2011L2-0004**

Month - July 2015

Surveillance Network Program Results for the Snap Lake Mine	UNITS	03-Jul-16	
Sample Control Number		2016-5083	
ROUTINE	UNITS	TOTAL	
pH	pH	7.7 XH	
Specific Conductivity	µS/cm	693	
Alkalinity	mg/L	41.2	
Hardness	mg/L	217	
Total Suspended Solids	mg/L	<3	
Total Dissolved Solids (calc)	mg/L	345	
Total Dissolved Solids (meas)	mg/L	513	
Turbidity	NTU	0.4 WH	
NUTRIENTS	UNITS	TOTAL	DISS
Biochemical Oxygen Demand	mg/L	<2 WH	N/A
Ammonia-N	mg/L	0.0331	N/A
Nitrate-N	mg/L	1.24	N/A
Nitrite-N	mg/L	0.0104	N/A
Total Kjeldahl Nitrogen	mg/L	0.277	N/A
Phosphorous	mg/L	0.0013	<0.001
Inorganic Phosphorous	mg/L	<0.001	<0.001
Organic Phosphorous	mg/L		<0.0014
Ortho-phosphate	mg/L	<0.001	N/A
Organic Carbon	mg/L	2.9	N/A
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L	50.3	
Calcium	mg/L	72.0	
Carbonate	mg/L	<5	
Chloride	mg/L	163	
Fluoride	mg/L	0.226	
Magnesium	mg/L	8.92	
Potassium	mg/L	3.05	
Reactive Silica	mg/L	1.37	
Sodium	mg/L	34.4	
Sulphate	mg/L	31.1	
ORGANICS	UNITS	TOTAL	
Oil & Grease	mg/L	<1	
Benzene	mg/L	<0.0005	
Ethylbenzene	mg/L	<0.0005	
Toluene	mg/L	<0.0005	
Xylene	mg/L	<0.00071	
F1 (C6-C10)	mg/L	<0.1	
F2 (>C10-C16)	mg/L	<0.1	
MICROBIOLOGY	UNITS	TOTAL	
E. Coli	mpn/100ml	<1 WH	
ULTRA / LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	7.39	5.46
Antimony	µg/L	0.07	0.07
Arsenic	µg/L	0.079	0.093
Barium	µg/L	28.2	27.1
Beryllium	µg/L	<0.01	<0.01
Bismuth	µg/L	<0.01	<0.01
Boron	µg/L	75.5	74.9
Cadmium	µg/L	0.0066	0.087(b) X0
Cesium	µg/L	0.0424	0.0429
Chromium	µg/L	0.061	<0.06
Cobalt	µg/L	0.04	0.027
Copper	µg/L	0.48	0.61
Iron	µg/L	15.8	<1
Lead	µg/L	0.011	<0.01
Lithium	µg/L	11.4	11.1
Manganese	µg/L	6.53	2.42
Mercury	µg/L	<0.02	<0.02
Molybdenum	µg/L	1.8	1.7
Nickel	µg/L	2.37	2.37
Rubidium	µg/L	4.3	4.2
Selenium	µg/L	<0.04	<0.04
Silver	µg/L	<0.005	<0.005
Strontium	µg/L	965	941
Thallium	µg/L	0.0053	<0.005
Tin	µg/L	#N/A	#N/A
Titanium	µg/L	0.22	<0.1
Uranium	µg/L	0.472	0.454
Vanadium	µg/L	<0.05	<0.05
Zinc	µg/L	0.8	0.92
FIELD PARAMETERS	UNITS		
pH	pH	8.06	
Specific Conductivity	µS/cm	699	
Dissolved Oxygen	mg/L	11.56	
Water Temperature	°C	14.03	

Notes:
 Results are DRAFT and are subject to change pending completion of final quality assurance checks.
 Water samples were collected from the mid-depth of the water column; conductivity gradients were not observed.
 WH = warning, hold time was exceeded.
 XH = data invalidated because the hold time was exceeded by over 10 days and may have an effect on the results.
 X0 = data invalidated because the dissolved metal concentration was substantially higher (i.e., ≥ 50%) than the total metal concentration in the sample.
 a) Total dissolved solids calculated using Methods 1030 E in Standard Methods for the Examination of Water and Wastewater, 22nd Edition (APHA 2012).
 b) Value was of questionable data quality and is under review. Repeat analysis of the sample was requested for confirmation.
 c) Value was of questionable data quality due to the variance in duplicate samples and is under review. Repeat analysis of the sample was requested for confirmation.
 Abbreviations in parameter names: HCO₃ = bicarbonate; CaCO₃ = calcium carbonate; CO₃ = carbonate; OH = hydroxide; SiO₂ = silicate; BOD = biochemical oxygen demand; N = nitrogen; P = phosphorus; BTEX = benzene, toluene, ethylbenzene, and xylene; E. coli = *Escherichia coli*; F1 (C₆-C₁₀) = hydrocarbon fraction 1 encompasses the range of equivalent carbon number from C₆ to C₁₀; F2 (C₁₀-C₁₆) = hydrocarbon fraction 2 encompasses the range of equivalent carbon number from C₁₀ to C₁₆; Pst = Pst Research Limited; Taps = Taps Environmental Laboratory.
 Other symbols and abbreviations: < = less than; > = greater than.
 Abbreviations for units: deg. C = degree Celsius; µg/l = micrograms per centimetre; mg/L = milligrams per litre; NTU = nephelometric turbidity units; mg-P/L = milligrams of phosphorus per litre; mg-N/L = milligrams of nitrogen per litre; µg/l = micrograms per litre; % = percent; MPN/100 mL = most probable number per 100 millilitres.
 APHA (American Public Health Association). 2012. Standard Methods for the Examination of Water and Wastewater, 22nd Edition, with updates to 2015. Washington, DC, USA.

TABLE 17. TRAVEL BLANKS

LICENCE # MV2011L2-0004

Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	10-Jul-16	
Sample Control Number		2016-0565	
ROUTINE	UNITS	TOTAL	
pH	pH	6.43	
Specific Conductivity	µS/cm	< 2.0	
Alkalinity	mg/L	< 2.0	
Hardness	mg/L	< 1.0	
Total Suspended Solids	mg/L	< 3.0	
Total Dissolved Solids (calc)	mg/L	< 1.3	
Turbidity	NTU	0.12	
NUTRIENTS	UNITS	TOTAL	DISS
BOD (5-day)	mg/L	< 2.0	
Ammonia-N	mg/L	< 0.0050	
Nitrate-N	mg/L	< 0.0060	
Nitrite-N	mg/L	< 0.0020	
Total Kjeldahl Nitrogen	mg/L	< 0.050	
Phosphorous	mg/L	< 0.0010	< 0.0010
Ortho-phosphate	mg/L	< 0.0010	
Organic Carbon	mg/L	< 1.0	
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L	< 5.0	
Calcium	mg/L	< 0.020	
Carbonate	mg/L	< 5.0	
Chloride	mg/L	< 0.50	
Fluoride	mg/L	< 0.020	
Magnesium	mg/L	< 0.0050	
Potassium	mg/L	< 0.050	
Reactive Silica	mg/L	< 0.010	
Sodium	mg/L	< 0.050	
Sulphate	mg/L	< 0.050	
ORGANICS	UNITS	TOTAL	
Oil & Grease	mg/L	< 1.0	
Benzene	mg/L	< 0.00050	
Ethylbenzene	mg/L	< 0.00050	
Toluene	mg/L	< 0.00050	
Xylene	mg/L	< 0.00071	
F1-(C6-C10)	mg/L	< 0.10	
F2 (>C10-C16)	mg/L	< 0.10	
ULTRA LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	< 0.30	< 0.30
Antimony	µg/L	< 0.020	0.021
Arsenic	µg/L	< 0.020	< 0.020
Barium	µg/L	< 0.050	< 0.050
Beryllium	µg/L	< 0.010	< 0.010
Bismuth	µg/L	< 0.010	< 0.010
Boron	µg/L	3.2	3.4
Cadmium	µg/L	< 0.0050	< 0.0050
Cesium	µg/L	< 0.0050	< 0.0050
Chromium	µg/L	< 0.060	< 0.060
Cobalt	µg/L	< 0.010	< 0.010
Copper	µg/L	< 0.10	< 0.10
Iron	µg/L	< 1.0	< 1.0
Lead	µg/L	< 0.010	< 0.010
Lithium	µg/L	< 0.50	< 0.50
Manganese	µg/L	< 0.050	< 0.050
Mercury	µg/L	< 0.020	< 0.020
Molybdenum	µg/L	< 0.050	< 0.050
Nickel	µg/L	< 0.060	< 0.060
Rubidium	µg/L	< 1.0	< 1.0
Selenium	µg/L	< 0.040	< 0.040
Silver	µg/L	< 0.0050	< 0.0050
Strontium	µg/L	< 0.050	< 0.050
Thallium	µg/L	< 0.0050	< 0.0050
Tin	µg/L	< 0.050	< 0.050
Titanium	µg/L	< 0.10	< 0.10
Uranium	µg/L	< 0.010	< 0.010
Vanadium	µg/L	< 0.050	< 0.050
Zinc	µg/L	< 0.80	< 0.80

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

TABLE 18. FIELD BLANKS
LICENCE # MV2011L2-0004
Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	UNITS	10-Jul-16	
Sample Control Number		2016-0564	
ROUTINE	UNITS	TOTAL	
pH	pH	6.58	
Specific Conductivity	µS/cm	< 2.0	
Alkalinity	mg/L	< 2.0	
Hardness	mg/L	< 1.0	
Total Suspended Solids	mg/L	< 3.0	
Total Dissolved Solids (calc)	mg/L	< 1.3	
Turbidity	NTU	0.43	
NUTRIENTS	UNITS	TOTAL	DISS
BOD (5-day)	mg/L	< 2.0	
Ammonia-N	mg/L	< 0.0050	
Nitrate-N	mg/L	< 0.0060	
Nitrite-N	mg/L	< 0.0020	
Total Kjeldahl Nitrogen	mg/L	< 0.050	
Phosphorous	mg/L	< 0.0010	< 0.0010
Ortho-phosphate	mg/L	< 0.0010	
Organic Carbon	mg/L	< 1.0	
MAJOR IONS	UNITS	TOTAL	
Bicarbonate	mg/L	< 5.0	
Calcium	mg/L	< 0.020	
Carbonate	mg/L	< 5.0	
Chloride	mg/L	< 0.50	
Fluoride	mg/L	< 0.020	
Magnesium	mg/L	< 0.0050	
Potassium	mg/L	< 0.050	
Reactive Silica	mg/L	< 0.010	
Sodium	mg/L	< 0.050	
Sulphate	mg/L	< 0.050	
ORGANICS	UNITS	TOTAL	
Oil & Grease	mg/L	< 1.0	
Benzene	mg/L	< 0.00050	
Ethylbenzene	mg/L	< 0.00050	
Toluene	mg/L	< 0.00050	
Xylene	mg/L	< 0.00071	
F1-(C6-C10)	mg/L	< 0.10	
F2 (>C10-C16)	mg/L	< 0.10	
ULTRA LOW METALS	UNITS	TOTAL	DISS
Aluminum	µg/L	< 0.30	< 0.30
Antimony	µg/L	0.022	0.041
Arsenic	µg/L	< 0.020	< 0.020
Barium	µg/L	< 0.050	< 0.050
Beryllium	µg/L	< 0.010	< 0.010
Bismuth	µg/L	< 0.010	< 0.010
Boron	µg/L	2.5	2.1
Cadmium	µg/L	< 0.0050	< 0.0050
Cesium	µg/L	< 0.0050	< 0.0050
Chromium	µg/L	< 0.060	< 0.060
Cobalt	µg/L	< 0.010	< 0.010
Copper	µg/L	< 0.10	< 0.10
Iron	µg/L	< 1.0	< 1.0
Lead	µg/L	< 0.010	< 0.010
Lithium	µg/L	< 0.50	< 0.50
Manganese	µg/L	< 0.050	< 0.050
Mercury	µg/L	< 0.020	< 0.020
Molybdenum	µg/L	< 0.050	< 0.050
Nickel	µg/L	< 0.060	< 0.060
Rubidium	µg/L	< 1.0	< 1.0
Selenium	µg/L	< 0.040	< 0.040
Silver	µg/L	< 0.0050	< 0.0050
Strontium	µg/L	< 0.050	< 0.050
Thallium	µg/L	< 0.0050	< 0.0050
Tin	µg/L	< 0.050	< 0.050
Titanium	µg/L	< 0.10	< 0.10
Uranium	µg/L	< 0.010	< 0.010
Vanadium	µg/L	< 0.050	< 0.050
Zinc	µg/L	< 0.80	< 0.80

General Notes: Parameters in addition to those requested by the water license were analyzed. This data will be used in water quality modelling for the mine.

TABLE 19. FIELD BLANKS (SEWAGE)
LICENCE # MV2011L2-0004
Month - July 2016

Surveillance Network Program Results for the Snap Lake Mine	STATION	04-Jul-16		18-Jul-16	
Sample Control Number		2016-0555		2016-0599	
ROUTINE	UNITS	TOTAL		TOTAL	
Total Suspended Solids	mg/L	< 3		< 3	
NUTRIENTS		TOTAL	DISS	TOTAL	DISS
BOD (5-day)	mg/L	< 2		< 2	
Ammonia-N	mg/L	<0.005		0.006	
Total Kjeldahl Nitrogen	mg/L	<0.05		< 0.05	
Phosphorous	mg/L	<0.002	0.003	<0.002	<0.002
Ortho-phosphate	mg/L	0.007		<0.002	
Organic Carbon	mg/L	<0.5		< 0.5	
MAJOR IONS	UNITS	TOTAL		TOTAL	
Nitrate-N	mg/L	< 1.0		<0.01	
Nitrite-N	mg/L	< 1.0		<0.01	
ORGANICS	UNITS	TOTAL		TOTAL	
Hexane Extractable Material	mg/L	< 2.0		< 2.0	
MICROBIOLOGY	UNITS	TOTAL		TOTAL	
E. Coli	mpn/100ml	< 1.0		< 1.0	
Faecal Coliform	cfu/100ml	< 1.0		< 1.0	

**TABLE 20. TOTAL DISSOLVED SOLIDS
 CALCIUM AND CHLORIDE LOADING TO SNAP
 LAKE 2015**

MONTH	TDS	CALCIUM	CHLORIDE
	(tonnes)		
JAN	852	233	483
FEB	892	206	412
MAR	822	188	382
APR	1,007	230	468
MAY	1,087	186	397
JUN	1,057	235	467
JUL	1,091	248	510
AUG			
SEP			
OCT			
NOV			
DEC			
TOTAL	6,808	1,526	3,118

**TABLE 21. NUTRIENT LOADING TO SNAP
 LAKE 2015**

MONTH	PHOSPHORUS	AMMONIA	NITRATE
	(kg)		
JAN	8.64	294	2,647
FEB	13.19	231	1,623
MAR	5.95	264	1,798
APR	3.39	118	1,870
MAY	6.33	300	719
JUN	9.85	494	6,135
JUL	7.88	200	2,571
AUG			
SEP			
OCT			
NOV			
DEC			
TOTAL	55.23	1,901	17,363

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TABLE 22. WATER BALANCE

MONTH	FRESHWATER VOLUME PUMPED	SEWAGE VOLUME DISPOSED	RECYCLED WATER <small>Used in Process, Powerhouse, Utility Building</small>	RECYCLED WATER <small>*Dust control</small>	DIRTY MINEWATER TO WTP	CLEAR MINEWATER TO WTP	CLEAR MINEWATER TO WMP	WTP DISCHARGE TO SNAP LAKE	WMP TO WTP
	(m ³)								
JAN	4,583	1,277	19,946	0	1,099,861	214,117	108,500	1,500,329	248,887
FEB	3,283	1,234	10,964	0	1,084,127	184,947	101,500	1,384,595	240,459
MAR	3,095	915	12,369	0	1,167,197	224,711	108,500	1,496,615	229,190
APR	2,760	586	15,616	0	1,081,656	227,799	105,000	1,457,276	168,475
MAY	3,159	832	16,757	0	1,045,275	225,325	108,500	1,599,582	217,672
JUN	1,608	706	24,651	105	981,537	209,833	168,000	1,532,039	240,223
JUL	2,111	543	31,542	255	1,060,379	215,248	248,000	1,550,556	219,009
AUG									
SEP									
OCT									
NOV									
DEC									
TOTAL	20,599	6,093	131,845	360	7,520,032	1,501,980	948,000	10,520,992	1,563,915

TABLE 23: RUNOFF WATER PUMPED TO WATER MANAGEMENT POND

Month	North Pile Sumps	South Pit (to WTP)	Airport Deicing Sump	Ammonium Nitrate Sump	Fuel Berms	WTP to WMP (overflow return line)	Total
JAN	12,612	0	0	0	0	259,917	272,529
FEB	1,744	0	0	0	0	240,905	242,649
MAR	8,688	0	0	0	0	227,632	236,320
APR	7,157	0	0	0	0	159,588	166,745
MAY	137,337	0	0	0	0	88,978	226,315
JUN	80,911	0	0	0	0	146,812	227,723
JUL	28,127					170,347	198,474
AUG							
SEP							
OCT							
NOV							
DEC							
TOTAL	276,576	0	0	0	0	1,294,179	1,570,755

TABLE 24. QUANTITY OF ORE PROCESSED

MONTH	KIMBERLITE (tonnes)
JAN	0
FEB	0
MAR	0
APR	0
MAY	0
JUN	0
JUL	0
AUG	
SEP	
OCT	
NOV	
DEC	
TOTAL	0

TABLE 25. QUANTITY OF SLIMES AND PASTE DEPOSITED TO THE NORTH PILE

MONTH	PASTE (m ³)	SLIME (m ³)
JAN	0	0
FEB	0	0
MAR	0	0
APR	0	0
MAY	0	0
JUN	0	0
JUL	0	0
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

TABLE 26. QUANTITY OF SOLIDS DEPOSITED TO THE NORTH PILE

MONTH	SLIMES SOLIDS	GRITS
	(tonnes)	
JAN	0	0
FEB	0	0
MAR	0	0
APR	0	0
MAY	0	0
JUN	0	0
JUL	0	0
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

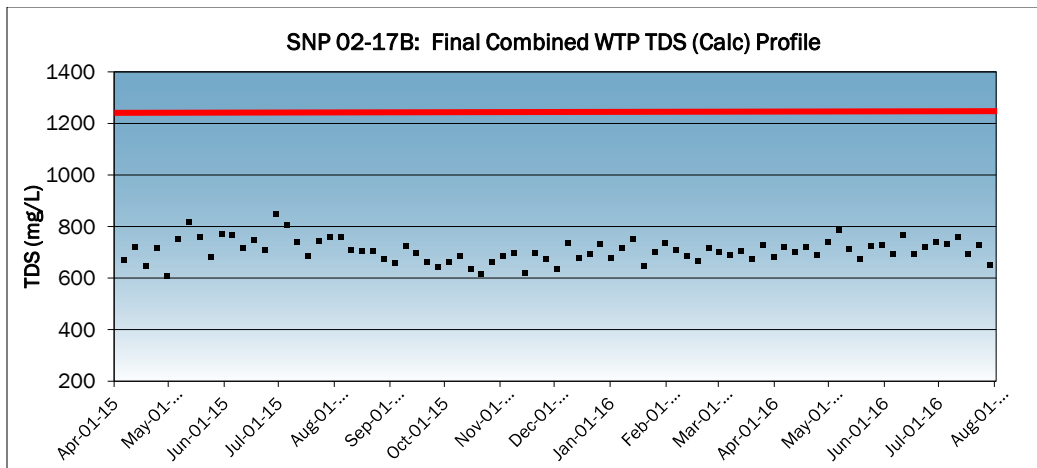
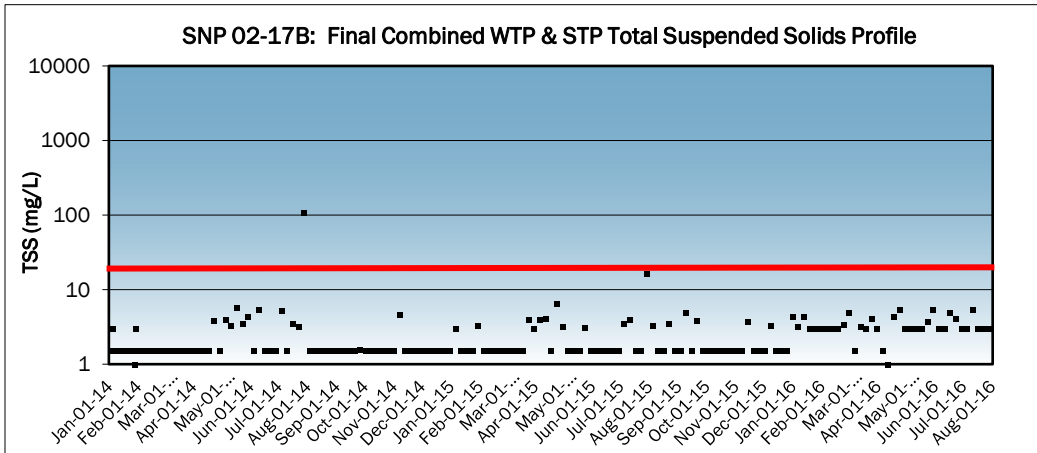
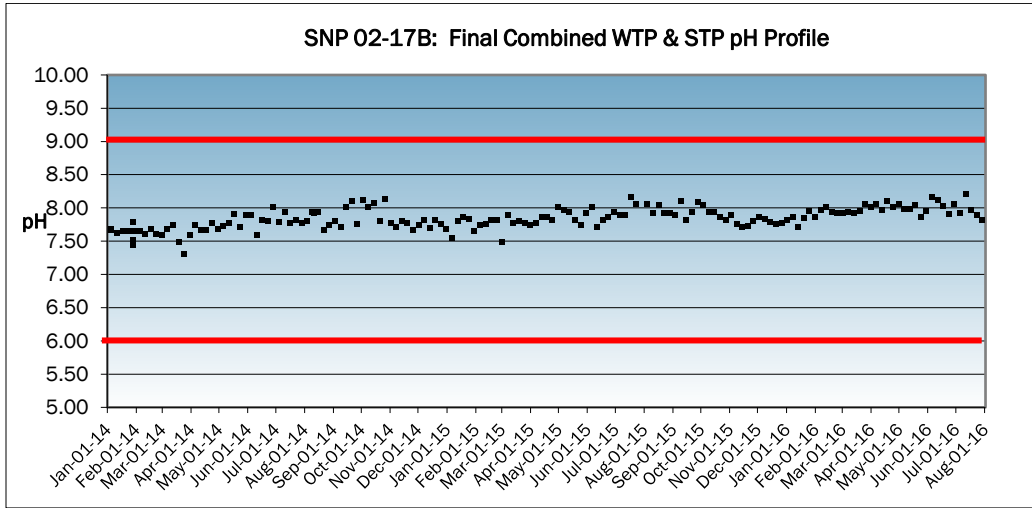
TABLE 27. QUANTITY OF LIQUID WASTE DISCHARGED TO THE NORTH PILE

MONTH	PASTE WATER (m ³)	SLIMES WATER (m ³)
JAN	0	0
FEB	0	0
MAR	0	0
APR	0	0
MAY	0	0
JUN	0	0
JUL	0	0
AUG		
SEP		
OCT		
NOV		
DEC		
TOTAL	0	0

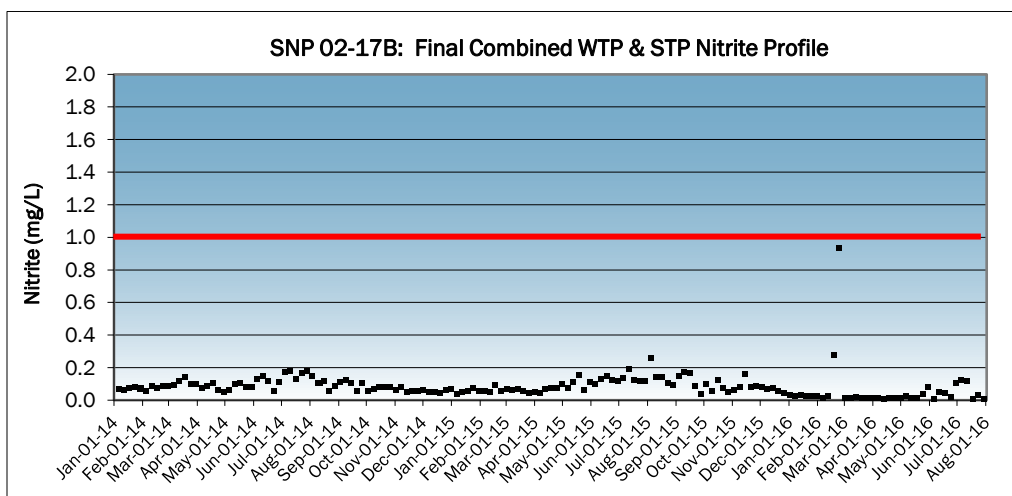
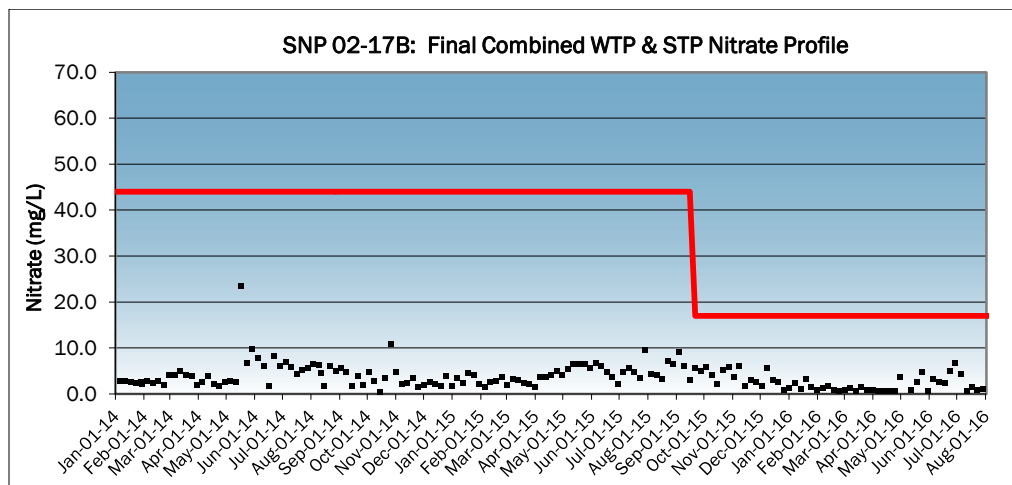
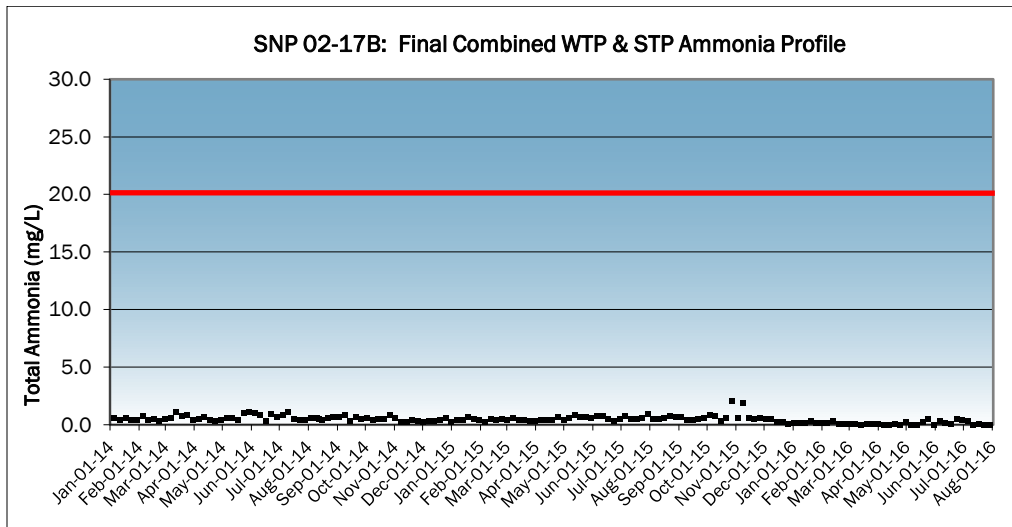
TABLE 28. QUANTITY PASTE DEPOSITED UNDERGROUND

MONTH	PASTE (m ³)
JAN	0
FEB	0
MAR	0
APR	0
MAY	0
JUN	0
JUL	0
AUG	
SEP	
OCT	
NOV	
DEC	
TOTAL	0

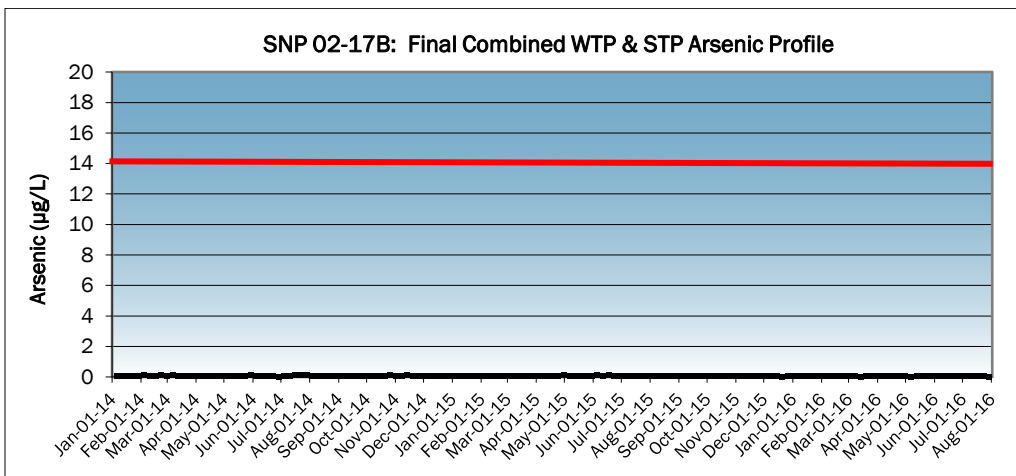
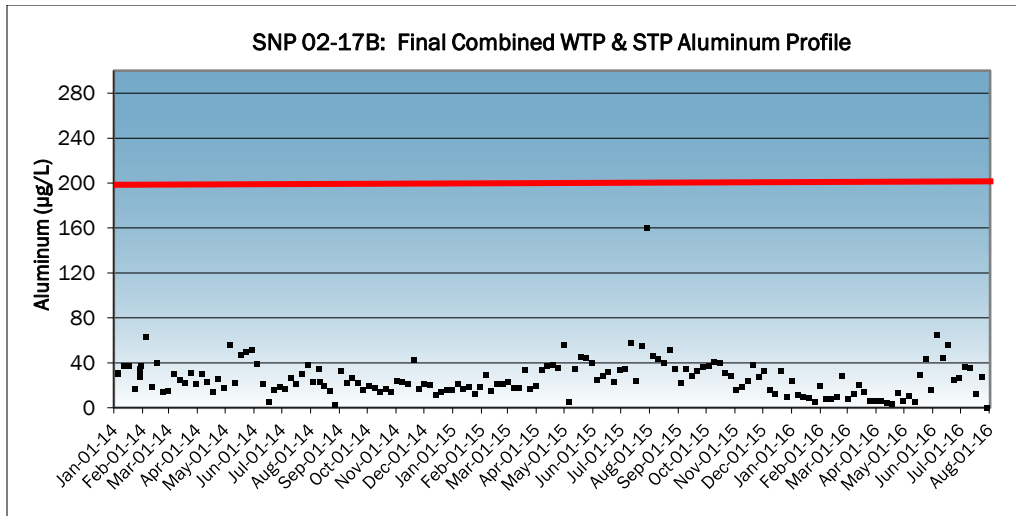
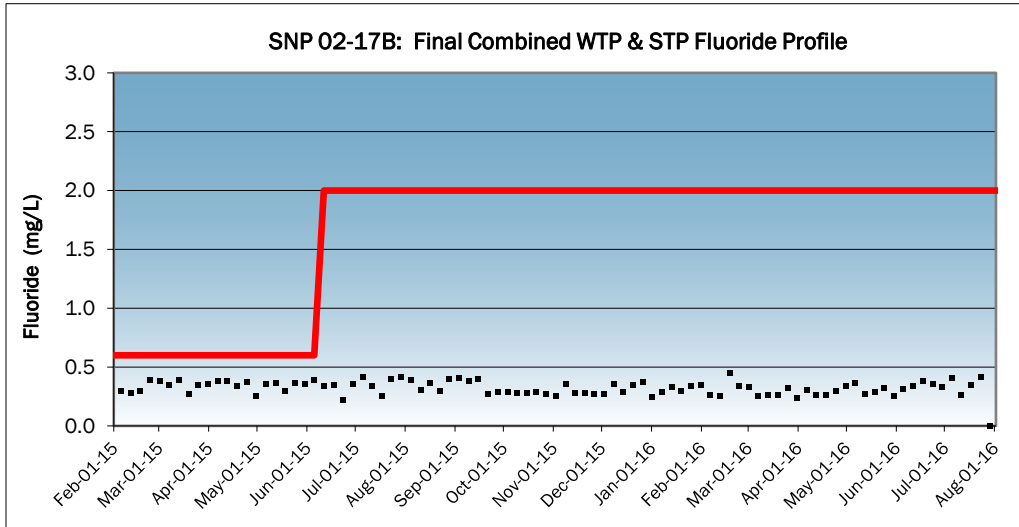
FIGURES 1-3



FIGURES 4-6



FIGURES 7-9



FIGURES 10-12

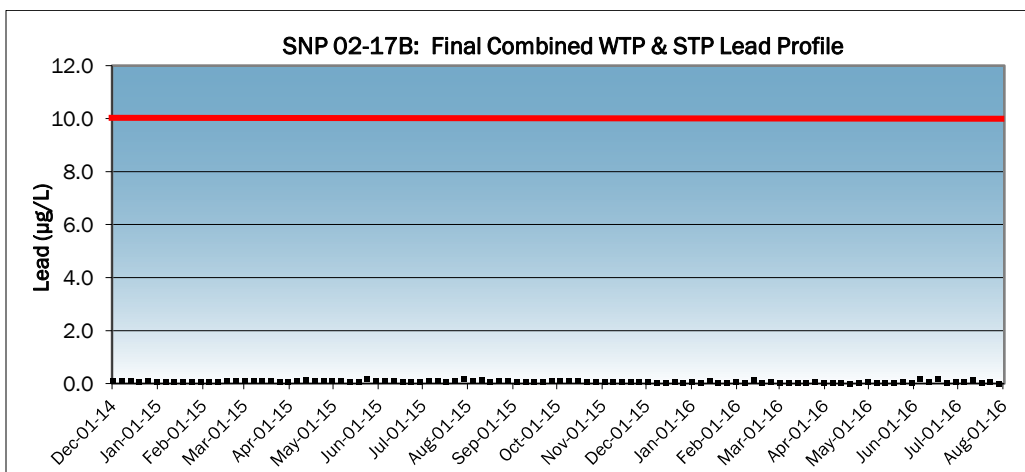
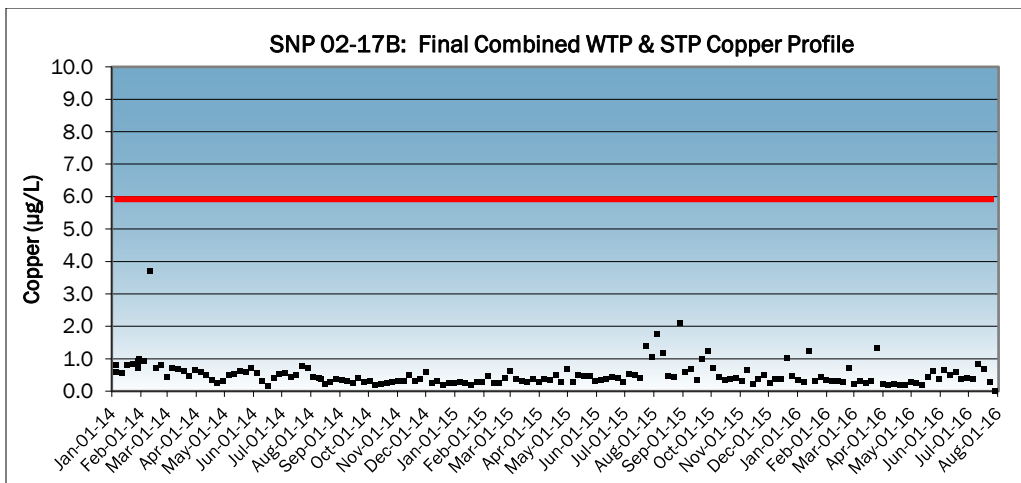
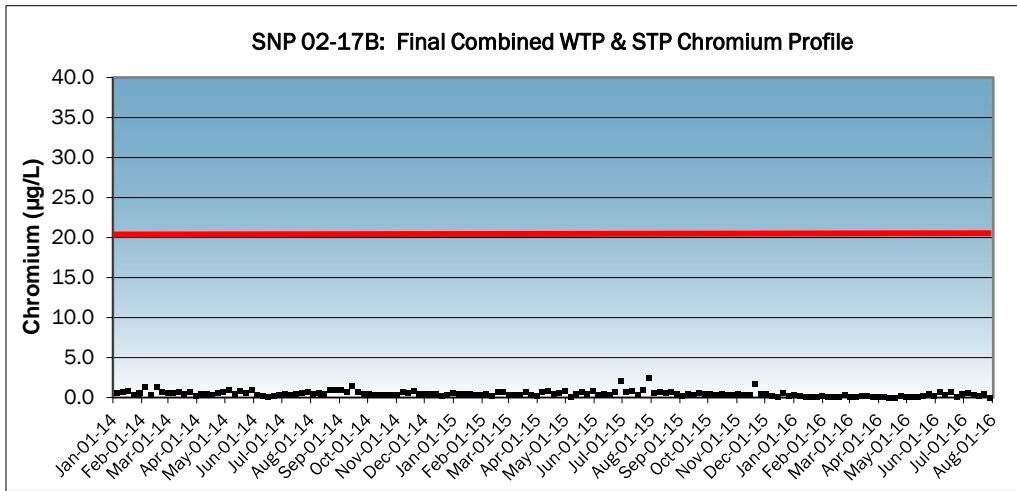


FIGURE 13-15

