
Tables

Table 1.1: List of Reporting Requirements

Authorization Reference	Reporting Requirement	Report Section
NIRB Project Certificate No.004 Condition 4	Take prompt and appropriate action to remedy any noncompliance with environmental laws and regulations and/or regulatory instruments, and shall report any non compliance as required by law immediately and report the same to NIRB annually.	11.2
NIRB Project Certificate No.004 Condition 8	Continue to undertake semi-annual groundwater samples and re-evaluate the groundwater quality after each sample collection; report the results of each re-evaluation to NIRB's Monitoring Officer, INAC and EC	8.1.9
NIRB Project Certificate No.004 Condition 15	Within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure; results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer	5.1
NIRB Project Certificate No.004 Condition 19	Report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness.	5.3.3
NIRB Project Certificate No.004 Condition 23	Ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB; results of analysis shall be provided to the NWB and NIRB's Monitoring Officer	8.1.13
NIRB Project Certificate No.004 Condition 29	Report to NIRB if and when [Cumberland] develops plans for an expansion of the Meadowbank Gold Mine, and in particular if those plans affect the selection of Second Portage Lake as the preferred alternative for tailings management	11.6
NIRB Project Certificate No.004 Condition 32e	Prior to opening of the road, and annually thereafter, advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is a private road with non-mine use of the road limited to approved, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.	11.3.2
NIRB Project Certificate No.004 Condition 32f	Place notices at least quarterly on the radio and television to explain to the community that the road is a private road with non-mine use of road limited to authorized, safe and controlled use by all-terrain-vehicles for the purpose of carrying out traditional Inuit activities.	11.3.2
NIRB Project Certificate No.004 Condition 32g	Record all authorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road, and collect and report this data to NIRB one (1) year after the road is opened and annually thereafter.	11.3.1
NIRB Project Certificate No.004 Condition 32h	Report all accidents or other safety incidents on the road, to the GN, KivIA [KIA], and the Hamlet immediately, and to NIRB annually.	11.3.2

NIRB Project Certificate No.004 Condition 33	Cumberland shall update the Access and Air Traffic Management Plan to: 1. include an All-weather Private Access Road Management Plan, including a right-of-way policy developed in consultation with the KivIA, GN, INAC and the Hamlet of Baker Lake, for the safe operation of the all-weather private access road; and 2. to facilitate monitoring of the environmental and socio-economic impacts of the private road and undertake adaptive management practices as required, including responding to any concerns regarding the locked gates.	11.3.1
NIRB Project Certificate No.004 Condition 36	Inuit observation and encounter reports for on-board vessels transporting goods and fuel through Chesterfield Inlet	11.4
NIRB Project Certificate No.004 Condition 39	Annually advertise and hold a community information meeting in Chesterfield Inlet to report on the Project and to hear from Chesterfield Inlet residents and respond to concerns; a consultation report shall be submitted to NIRB's Monitoring Officer within one month of the meeting.	11.5
NIRB Project Certificate No.004 Condition 40	Report to KIA and NIRB's Monitoring Officer annually on the Traditional Knowledge gathered including any operational changes that resulted from concerns shared at the workshop.	11.5
NIRB Project Certificate No.004 Condition 45	[Cumberland] shall carry, and require contracted shippers to carry adequate insurance to fully compensate losses arising from a spill or accident, including but not limited to the loss of resources arising from the spill or accident; any claims are to be reported to proper officials with a copy to NIRB's Monitoring Officer	11.7
NIRB Project Certificate No.004 Condition 49	Develop, implement and report on the fish-out programs for the dewatering of Second Portage Lake, Third Portage Lake and Vault Lake	8.1.16
NIRB Project Certificate No.004 Condition 51	Engage the HTOs in the development, implementation and reporting of creel surveys within waterbodies affected by the Project to the GN, DFO and local HTO	8.1.15

NIRB Project Certificate No.004 Condition 54	a. Updated terrestrial ecosystem baseline data; e. Details of a comprehensive hunter harvest survey to determine the effect on ungulate populations resulting from increased human access caused by the all-weather private access road, including establishing preconstruction baseline harvesting data, to be developed in consultation with local HTOs, the GN-DOE and the Nunavut Wildlife Management Board; f. Details of annual aerial surveys to be conducted to assess waterfowl densities in the regional study area during the construction phase and for at least the first three (3) years of operation, with the data analyzed and compared to baseline data to determine if significant effects are occurring and require mitigation. g. Details of an annual breeding bird plot surveys and transects along the all-weather road to be conducted during the construction phase and for at least the first three (3) years of operation.	8.4.2
NIRB Project Certificate No.004 Condition 55	Annual Wildlife Summary Monitoring Report	8.4.1
NIRB Project Certificate No.004 Condition 56	Information on caribou migration corridors shall be reported to the GN, KIA and NIRB's Monitoring Officer annually.	8.4.3
NIRB Project Certificate No.004 Condition 57	Participate in a caribou collaring program as directed by the GN-DOE.	8.4.4
NIRB Project Certificate No.004 Condition 58	In consultation with Elders and the HTOs and subject to safety requirements, design the lighting and use of lights at the mine site to minimize the disturbance of lights on sensitive wildlife and birds	11.5
NIRB Project Certificate No.004 Condition 59	In consultation with Elders and the HTOs, design and implement means of deterring caribou from the tailing ponds, such as temporary ribbon placement or Inukshuks, with such designs not to include the use of fencing	11.5
NIRB Project Certificate No.004 Condition 62	Develop and implement a noise abatement plan to protect wildlife from significant mine activity noise, including blasting, drilling, equipment, vehicles and aircraft; sound meters are to be set up immediately upon issuance of the Project Certificate for the purpose of obtaining baseline data, and monitoring during and after operations	8.2

NIRB Project Certificate No.004 Condition 63	GN and INAC shall form a Meadowbank Gold Mine Socio-Economic Monitoring Committee (“Meadowbank SEMC”) to monitor the socio-economic impacts of the Project and the effectiveness of the Project’s mitigation strategies; the monitoring shall supplement, not duplicate, the monitoring required pursuant to the IIBA negotiated for the Project, and on the request of Government or NPC, could assist in the coordination of data collection and tracking data trends in a comparable form to facilitate the analysis of cumulative effects; the terms of reference shall focus on the Project, include a plan for ongoing consultation with KivIA and affected local governments and a funding formula jointly submitted by GN, INAC and [Cumberland]; the terms of reference shall be submitted to NIRB for review and subsequent direction within six (6) months of the issuance of a Project Certificate; [Cumberland] is entitled to be included in the Meadowbank SEMC	11.8
NIRB Project Certificate No.004 Condition 64	[Cumberland] shall work with the GN and INAC to develop the terms of reference for a socio-economic monitoring program for the Meadowbank Project, including the carrying out of monitoring and research activities in a manner which will provide project specific data which will be useful in cumulative effects monitoring (upon request of Government or NPC) and consulting and cooperating with agencies undertaking such programs; [Cumberland] shall submit draft terms of reference for the socio-economic monitoring program to the Meadowbank SEMC for review and comment within six (6) months of the issuance of a Project Certificate, with a copy to NIRB’s Monitoring Officer	11.8
NIRB Project Certificate No.004 Condition 65	Cumberland shall include in its socio-economic monitoring program for the Meadowbank Project the collection and reporting of data of community of origin of hired Nunavummiut	11.9
NIRB Project Certificate No.004 Condition 67	Develop and implement a program to monitor contaminant levels in country foods in consultation with HC; a copy of the plan shall be submitted to NIRB’s Monitoring Officer	8.5
NIRB Project Certificate No.004 Condition 69	Carry out the Project to minimize the impacts on archeological sites, including conducting proper archeological surveys of the Project area (including the all-weather road and all quarry sites); [Cumberland] shall provide to the GN an updated baseline report for archeological sites in the Project area”	8.6
NIRB Project Certificate No.004 Condition 71	In consultation with EC, install and fund an atmospheric monitoring station to focus on particulates of concern generated at the mine site. The results of air-quality monitoring are to be reported annually to NIRB.	8.3
NIRB Project Certificate No.004 Condition 72	Conduct annual stack testing to demonstrate that the on-site incinerators are operating in compliance with these standards. The results of stack testing shall be contained in an annual monitoring report submitted to GN, EC and NIRB’s Monitoring Officer.	6.3
NIRB Project Certificate No.004 Commitment 74	Provide annual report of the quantity and type of waste generated at the mine site distinguishing landfilled, recycled and incinerated streams.	6.2

NIRB Project Certificate No.004 Condition 75	Provide a complete list of possible accidents and malfunctions for the Project; it must consider the all-weather road, shipping spills, cyanide and other hazardous material spills, and pitwall/dikes /dam failure, and include an assessment of the accident risk and mitigation developed in consultation with Elders and potentially affected communities	7
NIRB Project Certificate No.004 Condition 80	File annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, INAC, and/or the NWB.	9.2.1
NIRB Project Certificate No.004 Condition 82	Monitor the ingress/egress of ship cargo at Baker Lake and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer annually.	7
NIRB Project Certificate No.004 Condition 85	Develop a detailed blasting program to minimize the effects of blasting on fish and fish habitat, water quality, and wildlife and terrestrial VECs	8.1.11
NWB 2AM-MEA0815 Schedule B-1	Construction Details for dikes and dams.	3.1
NWB 2AM-MEA0815 Schedule B-2	Results of lake level monitoring conducted under the protocol developed as per Part D Item 11.	4.1
NWB 2AM-MEA0815 Schedule B-3	Summary of reporting results for the Water Balance Water Quality model and any calibrations as required in Part E Items 6 and 7.	4.2
NWB 2AM-MEA0815 Schedule B-4	The bathymetric survey(s) conducted prior to each year of shipping at the Baker Lake Marshalling Facility.	4.3
NWB 2AM-MEA0815 Schedule B-5	Geochemical monitoring results.	3.1
NWB 2AM-MEA0815 Schedule B-6	Volumes of waste rock used in construction and placed in the Rock Storage Facilities.	5.2
NWB 2AM-MEA0815 Schedule B-7	An update on the remaining capacity of the Tailings Storage Facility.	5.3.1
NWB 2AM-MEA0815 Schedule B-8	Summary of quantities and analysis of seepage and runoff monitoring from the landfills.	6.1
NWB 2AM-MEA0815 Schedule B-9	A summary report of solid waste disposal activities including monthly and annual quantities in cubic metres of waste generated and location of disposal.	6.2
NWB 2AM-MEA0815 Schedule B-10	Report of Incinerator test results including the materials burned and the efficiency of the Incinerator as they relate to water and the deposit of waste into water.	6.3
NWB 2AM-MEA0815 Schedule B-11	A list and description of all unauthorized discharges including volumes, spill report line identification number and summaries of follow-up action taken.	7
NWB 2AM-MEA0815 Schedule B-12	A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities.	11.1
NWB 2AM-MEA0815 Schedule B-13	The results and interpretation of the Monitoring Program in accordance with Part I and Schedule I.	8

NWB 2AM-MEA0815 Schedule B-14	The results of monitoring under the AEMP.	8.7
NWB 2AM-MEA0815 Schedule B-15	Results of monitoring pursuant to the Fault Testing and Monitoring Plan (August 2007).	5.3.2
NWB 2AM-MEA0815 Schedule B-16	A summary of any progressive closure and reclamation work undertaken including photographic records of site conditions before and after completion of operations, and an outline of any work anticipated for the next year, including any changes to implementation and scheduling.	9.1.1
NWB 2AM-MEA0815 Schedule B-17	A summary of on-going field trials to determine effective capping thickness for the Tailings Storage Facility and Waste Rock Storage Facilities for the purpose of long term environmental protection.	5.3.3
NWB 2AM-MEA0815 Schedule B-18	An updated estimate of the current restoration liability based on project development monitoring, results of restoration research and any changes or modifications to the Appurtenant Undertaking.	9.2.1
NWB 2AM-MEA0815 Schedule B-19	A summary of any studies requested by the Board that relate to Waste disposal, Water use or Reclamation, and a brief description of any future studies planned.	10.1
NWB 2AM-MEA0815 Schedule B-20	Where applicable, revisions as Addendums, with an indication of where changes have been made, for Plans, Reports, and Manuals.	10.2
NWB 2AM-MEA0815 Schedule B-21	An executive summary in English, Inuktitut and French of all plans, reports, or studies conducted under this Licence.	10.3
NWB 2AM-MEA0815 Schedule B-22	A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector.	11.2
NWB 2AM-MEA0815 Schedule B-23	A summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions.	11.5
NWB 2AM-MEA0815 Schedule B-24	Any other details on Water use or Waste Disposal requested by the Board by November 1st of the year being reported.	4.5/6.4
NWB 2AM-MEA0815 Part E Item 8	The Licensee shall, on an annual basis during Operations, compare the predicted water quantity and quality within the pits, to the measured water quantity and quality.	4.4
NWB 2AM-MEA0815 Part I Item 14	The Licensee shall submit to the Board as part of the Annual Report required under Part B Item 5, all reports and performance evaluations prepared by the Independent Geotechnical Expert Review Panel.	3.1.2
NWB 2AM-MEA0815 Part I Item 16	The Licensee shall submit the results and interpretation of the Seepage Monitoring program.	8.1.8
DFO HADD NU-08-0013 Western Channel Condition 6	Submit written report and photographic record summarizing monitoring results - physical monitoring of Western Channel Crossing.	8.1
DFO S-08/09-1040 NU	The result of monitoring under the AEMP	8.7

DFO S-08/09-1040 NU	Result of fisheries monitoring along AWPAP	8.1.17
DFO-08/09-1042 NU	Results of the fish out program	8.1.16
DFO HADD NU-03-0190 AWPAP Condition 5.2.4	Creel survey results.	8.1.15
DFO HADD NU-03-0190 AWPAP Condition 5.3 / 6	Submit written report summarizing 2008 monitoring results and photographic record of works and undertakings.	8.1.7
DFO HADD NU-03-0191 Mine Site Condition 6.1	Submit Written Report and Photographic Record summarizing monitoring program results.	8.1.10/8.1.11
INAC Land Lease 66A/8-71-2 Condition 19	The lessee shall submit to the Minister every two years after the commencement date of this lease, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.2
INAC Land Lease 66A/8-71-2 Condition 33	The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with the approved Abandonment and Restoration Plan, as well as any variations from the said Plan.	9.1.2
INAC Land Lease 66A/8-72-2 Condition 8	The lessee shall file a report, annually ...	3.2
	i. Quantity of material removed and location of removal, for the immediately preceding calendar year	
	ii. Such other data as are reasonably required by the Minister from time to time.	
INAC Land Lease 66A/8-72-2 Condition 25	The lessee shall file, annually, a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.	3.2
INAC Quarry Lease 66A/8-72-2 Condition 33	The lessee shall file annually a report for the preceding year, outlining ongoing restoration completed in conformity with C&R Plan, as well as any variations from the said Plan.	9.1.3
INAC Land Lease 66A/8-72-2 Condition 37	The lessee shall submit to the Minister every 2 years after the commencement date of this lease, a report describing cumulative variations from the C&R Plan with updated cost estimates.	9.2.2
KIA ROW KVRW06F04 Condition 14	Submit to KIA every two years on each anniversary of the commencement date, a report describing any variations from the Abandonment and Restoration Plan and updated cost estimates.	9.2.2
KIA ROW KVRW06F04 Condition 26	File annually a progress report for the preceding year, outlining any ongoing restoration completed, in conformity with the Abandonment and Restoration plan.	9.1.2
KIA ROW KVRW06F04 Schedule E - Condition 8	The lessee shall file annually a report for the preceding year, outlining the ongoing borrow area operations completed in conformity with the approved Borrow Management Plan, as well as any variations from the Plan.	3.2

Table 1.2: Summary of Sample Stations

NWB Station	Description	Phase	2012 Reporting Status
ST-DC-1 to TBD	Monitoring stations during DiKE Construction as defined in Part D Item 11	Construction	Not Applicable in 2012
ST-DD-1 to TBD	Monitoring stations during DiKE Dewatering as defined in Part D Item 11	Construction	Not Applicable in 2012
ST-1	Water Intake for camp and mill	Construction, early operation, late operation, closure	Section 8.1.14
ST-2	Reclaim Water Intake	Construction, early operation, late operation, closure	Section 8.1.14
ST-3	Water Intake for Emulsion Plant	Construction, early operation, late operation, closure	Section 8.1.14
ST-4	Water reclaimed from Tailings Storage Facility	Early operation, late operation, closure	same as ST-2
ST-5	Portage Area (east) diversion ditch	Early operation, late operation, closure	Section 8.1.2
ST-6	Portage Area (west) diversion ditch	Early operation, late operation, closure	Section 8.1.2
ST-7	Vault Area diversion ditch	Early operation, late operation, closure	Not Applicable in 2012
ST-9	Portage Attenuation Pond prior to discharge through Third Portage Lake Outfall Diffuser	Early operation	Section 8.1.4
ST-10	Vault Attenuation Pond prior to discharge through Wally Lake Outfall Diffuser	Late operation	Not Applicable in 2012
ST-11	Tailings Storage Facility	Post closure	Not Applicable in 2012
ST-12	Portage/ Goose Pit Lake	Post closure	Not Applicable in 2012
ST-13	Vault Pit Lake	Post closure	Not Applicable in 2012

NWB Station	Description	Phase	2012 Reporting Status
ST-14 (TEH-11)	Discharge to the land from Landfarm sump at mine site	Pre-development, Construction, early operation, late operation, closure	Section 8.1.5
ST-15	Vault non-contact diversion ditch	Early operation, late operation, closure	Not Applicable in 2012
ST-16	Portage Rock Storage Facility	Early operation, late operation, closure	Section 8.1.4
ST-17**	North Portage Pit Sump	Early operation	Section 8.1.3
	Portage Pit Lake	Late operation, closure	Not Applicable in 2012
ST-18	Portage Attenuation Pond	Early operation	Section 8.1.3
ST-19**	Third Portage Pit Sump	Early operations	Section 8.1.3
	Third Portage Pit Lake	Late operations	Not Applicable in 2012
ST-20	Goose Island Pit Sump	Early operations	Section 8.1.3
	Goose Island Pit Lake	Late operations, closure	Not Applicable in 2012
ST-21	Tailings Reclaim Pond	Early operation (south of central dike), late operation (north of central dike)	Section 8.1.4
ST-22	Tailings Storage Facility	Late operation, closure	Not Applicable in 2012
ST-23	Vault Pit Sump	Late operations	Not Applicable in 2012
ST-24***	Vault Rock Storage Facility	Late operation	Not Applicable in 2012
		Closure (east ditch)	Not Applicable in 2012
		ST-24-A	
		Closure (west ditch)	Not Applicable in 2012
		ST-24-B	
ST-25	Vault Attenuation Pond	Late operation	Not Applicable in 2012
ST-26	Vault Pit Lake	Closure	
ST-S-1 to TBD	Seeps (to be determined)	Construction, Early operations, late operations, closure	Section 8.1.8

NWB Station	Description	Phase	2012 Reporting Status
ST-GW-1 to TBD	Groundwater wells (to be determined)	Construction, Early operations, late operations, closure	Section 8.1.9 & Appendix G4
ST-AEMP-1 to TBD	Receiving AEMP	Construction, Early operations, late operations, closure	Section 8.1.10 & Appendix G2
ST-MMER-1 to TBD	Vault and Portage effluent outfall	Early and late operations	Section 8.1.12
ST-37 (MEA-1)	Water sample location at Baker Lake in close proximity to the construction facilities	Pre-development, construction, early operation, late operation, closure	Sections 8.1.6 & Appendix G2
ST-38 (MEA-2)	East Contact Water Pond located in the south-east corner of the lay-down area	Pre-development, construction, early operation, late operation, closure	Not Applicable in 2012 - Section 7.6
ST-39 (MEA-3)	West Contact Collection Pond located in the south-west corner of the lay-down area	Pre-development, construction, early operation, late operation, closure	Not Applicable in 2012 - Section 7.6
ST-40 (MEA-4)	Secondary containment sump at the Bulk Fuel Storage Facility	Pre-development, construction, early operation, late operation, closure	Section 8.1.6
ST-41 (MEA-5)	Water sample location at the ammonium nitrate storage area	Pre-development, construction, early operation, late operation, closure	Not Applicable in 2012 - Section 7.6
ST-42 (MEA-6)	Water sample location at the explosive storage area	Pre-development, construction, early operation, late operation, closure	Not Applicable in 2012 - Section 7.6

Table 3.1: 2012 Routine Geotechnical Monitoring Program

Instrumentation	Dewatering Frequency	Operations Frequency
Piezometers	Daily	Daily
Slope Inclinator Casings	Monthly	Monthly
Thermistors	Daily	Daily to Weekly
Surface Monuments and Surface Prisms ²	Monthly	Monthly
Seismographs	During blasting at the Portage Pit / Goose Pit adjacent to the dike	

Footnotes:

1. All the instrumentations are monitored by a qualified employee (technician or engineer)

The data is treated, verified and reported to the Engineering Superintendent.

2. The monitoring system for the surface monuments and surface prisms at Bay Goose Dike and East Dike will be modified and reajusted to provide more precise monitoring on a regular basis.

Table 4.1: 2012 Lake Level Monitoring

	Dewatering Intake (masl)	Discharge Intake (masl)	Discharge (masl)
	Second Portage Lake Impoundment Area	Bay Goose Impoundment Area	Third Portage Lake
Identification Code	SPL-IN	BG-IN	TPL-survey
3-Jan-12	101.73		133.58
9-Jan-12	101.93		133.59
16-Jan-12	102.04		133.60
23-Jan-12	102.23		133.54
30-Jan-12	102.41		133.53
9-Feb-12	102.55		road not open
14-Feb-12	102.69		133.51
20-Feb-12	102.61		133.51
27-Feb-12	102.83		133.35
6-Mar-12	102.86		133.53
20-Mar-12	103.19		
22-Mar-12			133.51
28-Mar-12	103.35		
3-Apr-12	103.33		133.50
9-Apr-12	103.55		133.51
16-Apr-12	103.76		133.47
23-Apr-12	103.97		133.47
30-Apr-12	104.10		133.53
8-May-12	104.29		133.44
10-May-12	104.38		
11-May-12	104.43		
12-May-12	104.43		
13-May-12	104.44		
14-May-12	104.50		
15-May-12	104.52		
16-May-12	104.48		
17-May-12	104.41		
18-May-12	104.33		
19-May-12	104.25		
20-May-12	104.20		
21-May-12	104.10		
22-May-12	103.98		
23-May-12	103.92		
24-May-12	103.86		
25-May-12	103.77		133.47
26-May-12	103.75	127.90	
27-May-12		127.88	
28-May-12	103.56	127.89	
29-May-12	103.57	127.87	
30-May-12	103.49	127.87	
31-May-12	103.50		
1-Jun-12	103.44		
2-Jun-12	103.45	127.84	
3-Jun-12	103.40	127.65	
4-Jun-12	103.32		
5-Jun-12	103.24		
6-Jun-12	103.21		

	Dewatering Intake (masl)	Discharge Intake (masl)	Discharge (masl)
	Second Portage Lake Impoundment Area	Bay Goose Impoundment Area	Third Portage Lake
Identification Code	SPL-IN	BG-IN	TPL-survey
7-Jun-12	103.18	126.94	133.61
8-Jun-12	103.05		
9-Jun-12	102.91		
10-Jun-12	102.84		
11-Jun-12	102.73		
12-Jun-12	102.58		
13-Jun-12	102.48		
14-Jun-12	102.38		133.64
15-Jun-12	102.28		
16-Jun-12	102.17		
17-Jun-12	102.08		
18-Jun-12	102.18		
19-Jun-12	102.08		
20-Jun-12	101.98		
21-Jun-12	101.90		
22-Jun-12	101.88		
23-Jun-12	101.71		
24-Jun-12	101.50		
25-Jun-12	101.41	126.15	133.73
26-Jun-12	101.22		
27-Jun-12	100.96		
28-Jun-12	100.81		
29-Jun-12	100.70		
30-Jun-12	100.45		
1-Jul-12	100.27		
2-Jul-12	100.01	125.06	133.72
4-Jul-12	99.62		
5-Jul-12	99.42		
6-Jul-12	99.20		
7-Jul-12	99.05		
8-Jul-12	98.88		
9-Jul-12	98.70	124.52	133.67
10-Jul-12	98.55		
11-Jul-12	98.40		
12-Jul-12	98.60		
13-Jul-12	98.53	125.13	133.68
14-Jul-12	98.60		
15-Jul-12	98.25		
16-Jul-12	97,00 (T) & 97,90		
17-Jul-12	98.12		
18-Jul-12	95,67 (T) & 98,22		
19-Jul-12	94,81 (T) & 98,10		

	Dewatering Intake (masl)	Discharge Intake (masl)	Discharge (masl)
	Second Portage Lake Impoundment Area	Bay Goose Impoundment Area	Third Portage Lake
Identification Code	SPL-IN	BG-IN	TPL-survey
20-Jul-12	94,99 (T) & 97,90		
21-Jul-12	98.26		
22-Jul-12	96,64 (T) & 98,06	125.16	133.72
23-Jul-12	96,85 (T) & 98,06		
24-Jul-12	97,13 & 98,00		
25-Jul-12	98.20		
26-Jul-12	98.25		
27-Jul-12	97.96		
28-Jul-12	98.00		
29-Jul-12	96,41 & 97,86		
30-Jul-12	94,74 & 97,58		
31-Jul-12	97.84		
1-Aug-12	97.88		
2-Aug-12	95,75 & 97,85		
3-Aug-12		124.88	133.68
4-Aug-12	95,78 & 97,78		
5-Aug-12	95,77 & 97,75		
6-Aug-12	95,77 & 97,79		
7-Aug-12	95,80 & 97,77		
8-Aug-12	95,80 & 97,88		
9-Aug-12	95,90 & 97,81		
10-Aug-12	95,90 & 97,78		
11-Aug-12	96,00 & 97,85		
12-Aug-12	97.96		
13-Aug-12	97.90		
14-Aug-12	97.97		
15-Aug-12	97.95	122.15	
16-Aug-12	98.12		
17-Aug-12	97.95		
18-Aug-12	98.06		133.70
19-Aug-12	97,80 & 97,83		
20-Aug-12	97.92		
21-Aug-12	98.02		
22-Aug-12	97,76 & 97,84		
23-Aug-12	98.02		
24-Aug-12	98.22		
25-Aug-12	98.34		
26-Aug-12	98.44		
27-Aug-12	98.38		
28-Aug-12	98.38	125.64	133.67
25-Sep-12		125.10	
25-Sep-12	98.32		133.56
5-Oct-12	99.29		
6-Oct-12	99.38		
7-Oct-12	99.54		
8-Oct-12	99.61		
13-Oct-12	99.94		133.58
20-Oct-12	100.18		133.56
5-Nov-12	100.06		133.53
6-Dec-12			133.52

Table 4.2: Predicted water quantity and quality compared to the measured water quantity and quality within the pits**Water Quantity Year 3**

Pits	Predicted (m ³)	Measured (m ³)	% Difference between predicted vs measured
Portage	931,800	1,026,000	-10
Bay Goose	1,235,100	499,000	60

Third Portage Open Pit Sumps Water Quality Year 3

Parameters	Units	Probable Scenario	Possible Poor end Scenario	Measured	% Difference between predicted vs measured	
					Probable	Possible Poor
pH		6.30	6.10	7.80	-24	-28
Alkalinity	mg CaCO ₃ /L	39	42	92	-136	-119
Ammonia	mg N/L	0.00057	0.0006	0.2113	-36,961	-35,108
Ammonia nitrogen	mg N/L	2.30	3.90	3.90	-69	0
Asenic	mg/L	0.0024	0.0570	0.0034	-42	94
Chloride	mg/L	630	630	19.63	97	97
Copper	mg/L	0.0014	0.0130	0.0050	-254	62
Fluoride	mg/L	0.19	0.23	0.62	-228	-171
Hardness	mg CaCO ₃ /L	300	310	100	67	68
Lead	mg/L	0.0016	0.0063	0.0022	-34	66
Nickel	mg/L	0.0029	0.0730	0.0063	-118	91
Nitrate	mgN/L	2.60	4.40	9.05	-248	-106
Sulphate	mgN/L	31	42	39.63	-28	6
Total dissolved solids	mg/L	960	990	239.89	75	76
Zinc	mg/L	0.0074	0.0680	0.0147	-98	78

Goose Island Open Pit Sumps Water Quality Year 3

Parameters	Units	Probable Scenario	Possible Poor end Scenario	Measured	% Difference between predicted vs measured	
					Probable	Possible Poor
pH		6.10	6.10	7.75	-27	-27
Alkalinity	mg CaCO ₃ /L	27	27	85	-216	-216
Ammonia	mg N/L	0.0006	0.0006	0.2483	-44,245	-44,245
Asenic	mg/L	0.0016	0.0016	0.0064	-298	-298
Chloride	mg/L	440	440	15.50	96	96
Copper	mg/L	0.0010	0.0010	0.0141	-1,381	-1,381
Fluoride	mg/L	0.13	0.13	0.43	-231	-231
Hardness	mg CaCO ₃ /L	210	210	130	38	38
Lead	mg/L	0.0011	0.0011	0.0085	-673	-673
Nickel	mg/L	0.0020	0.0020	0.0255	-1,173	-1,173
Nitrate	mgN/L	4.00	4.00	6.28	-57	-57
Sulphate	mgN/L	21	21	27.25	-30	-30
Total dissolved solids	mg/L	670	670	258.17	61	61
Zinc	mg/L	0.0051	0.0051	0.0275	-439	-439

Highlighted values represent exceedences of 20% between predicted vs measured values

Table 5.1: 2012 Rock Volumes

	Portage and Bay-Goose Pits (tonnes)										
	Ore	Waste Rock									
		Tailings Dams		Other Construction		Waste Dump		Overburden		Total	
		NPAG	PAG	NPAG	PAG	NPAG	PAG	NPAG	PAG	NPAG	PAG
Q1	944,854	0	0	714,461	125,705	1,271,694	4,507,457	48,512	0	2,034,667	4,633,162
Q2	849,228	92	124,021	1,029,459	494,801	1,048,064	3,789,092	1,178,983	0	3,256,599	4,407,914
Q3	990,619	29,329	831,610	2,234,768	801,216	139,967	3,003,164	1,208,477	0	3,612,542	4,635,990
Q4	428,428	1,865	3,177	1,227,943	167,469	955,114	5,184,420	264,030	0	2,448,952	5,355,066
TOTAL	3,213,129	31,287	958,808	5,206,631	1,589,191	3,414,840	16,484,133	2,700,002	0	11,352,760	19,032,132

	Vault Pit (tonnes)										
	Ore	Waste Rock									
		Tailings Dams		Other Construction		Waste Dump		Overburden		Total	
		NPAG	PAG	NPAG	PAG	NPAG	PAG	NPAG	PAG	NPAG	PAG
Q1	0	0	0	0	0	0	0	0	0	0	0
Q2	0	0	0	0	0	0	0	0	0	0	0
Q3	0	0	0	0	0	0	0	0	0	0	0
Q4	852	0	0	958,505	4,426	34,347	20,072	140,956	0	1,133,808	24,498
TOTAL	852	0	0	958,505	4,426	34,347	20,072	140,956	0	1,133,808	24,498

	Portage, Bay-Goose and Vault Pits (tonnes)										
	Ore	Waste Rock									
		Tailings Dams		Other Construction		Waste Dump		Overburden		Total	
		NPAG	PAG	NPAG	PAG	NPAG	PAG	NPAG	PAG	NPAG	PAG
TOTAL	3,213,981	31,287	958,808	6,165,136	1,593,617	3,449,187	16,504,205	2,840,958	0	12,486,568	19,056,630

Table 5.3: 2012 Tailings Volume

	Tailings Solid (tonnes)	Tailings Liquid (tonnes)	Density of Tailings (% solid)	Density of Slurry (tonnes / m³)	Tailings Placed in TSF (m³)
January	275186	278448	49.71%	1.51	182527
February	307134	310477	49.73%	1.51	203668
March	304740	307389	49.78%	1.51	201969
April	285702	290166	49.61%	1.51	189682
May	320542	323865	49.74%	1.51	212531
June	294829	297100	49.81%	1.51	195350
July	337110	339720	49.81%	1.51	223368
August	352831	355537	49.81%	1.51	233780
September	313014	315459	49.81%	1.51	207406
October	358860	362791	49.73%	1.51	237973
November	356646	360872	49.71%	1.51	236558
December	314317	319205	49.61%	1.51	208676
TOTAL					2,533,488

Table 6.1: 2012 Volume of Waste Transferred

Month	Volume of Waste Transferred to AEM Landfill (m³)	Volume of Waste Sent to Incinerator (m³)
January	1092	343
February	720	321
March	780	343
April	1380	332
May	768	343
June	1080	332
July	1092	343
August	1152	343
September	1812	332
October	1224	332
November	1704	310
December	1258	343
Total	14,062	4,015

Table 6.2: 2012 Hazardous Materials Shipped Off Site

Type of Waste	Type of Packaging and Amount of Items							
	Drum	Tote	Quatrex	10L canister	60 L steel drum	20 L plastic pail	20 L steel pail	Container (Bulk)
Acid lead batteries			19					
Contaminated soils	6							
Crushed neon	1							
Empty content contaminated	2429	341	1		681	2	71	
Empty plastic pails (SO)						3222		
Epoxy glue residues			6					
Glycol		15						
Liquid soap						14		
Oil filters	171		12					
Oily plastic cans			4					
Oily solids waste	81		384					
Oily water	147	15						2
Plastic pail lids (SO)			30					
Scraped metal								71
Scraped tire								6
Smoke detector			4					
Tar	49							
Urathane resin and catalyser				24				
Vegetal oil (cooking)	28							
Waste diesel	25	16						
Waste gasoline		1						
Waste glycol and oil mixed	1	26						
Waste grease					39			
Waste Methanol (windshield washer)		1						
Waste oil	97	458						
Waste oily sludge	10							1
Waste paint			10					
Waste pitch	48							
Waste spray cans (aerosols)	3		13					
TOTAL	3096	873	483	24	720	3238	71	80

Table 6.3: 2012 Incinerator Ash Monitoring

	Units	Guideline for Industrial Waste Discharge*	Mine Site Incinerator 14-Feb-12
Arsenic	mg/L	2.5	0.4215
Barium	mg/L	100	0.0486
Cadmium	mg/L	0.5	0.0032
Chromium	mg/L	0.5	<0.0006
Lead	mg/L	5	<0.0005
Mercury	mg/L	0.1	0.0068
Selenium	mg/L	1	0.02
Silver	mg/L	5	<0.0005
Zinc	mg/L	500	8.14

Footnotes:

* Government of Nunavut Environmental Guideline for Industrial Waste Discharges (D of SD, 2002)

Table 6.4: 2012 Waste Oil - Volume Incinerated or Consumed

Month	Total Volume of Waste Oil Incinerated or Consumed (m³)	Volume of Waste Oil Incinerated at the Incinerator (m³)	Volume of Waste Oil Consumed in the Furnace (m³)
January	0.110	0.110	0
February	0.255	0.255	0
March	0.348	0.348	0
April	0.535	0.535	0
May	0.440	0.440	0
June	0.055	0.055	0
July	0.000	0.000	0
August	0.300	0.300	0
September	0.200	0.200	0
October	0.800	0.800	0
November	0.000	0.000	0
December	0.100	0.100	0
Total	3.143	3.143	0

Table 6.5: 2012 Waste Oil Monitoring at Incinerator

	Units	Maximum Allowable Concentration *	11-Jan-12	28-Feb-12	21-Mar-12	10-Apr-12	8-May-12	11-Jun-12
Cadmium	mg/L	2	< 2	< 1	< 1	< 1	< 1	< 1
Chromium	mg/L	10	< 1	< 1	< 1	< 1	< 1	< 1
Lead	mg/L	100	< 5	< 5	< 5	< 5	< 5	< 5
PCB	mg/L	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorine	mg/L	1000	< 100	220	160	390	530	130
Flash point	°C	≥ 37.7	> 80	> 80	> 80	> 80	> 80	> 80

	Units	Maximum Allowable Concentration *	10-Jul-12	14-Aug-12	11-Sep-12	8-Oct-12	14-Nov-12	11-Dec-12
Cadmium	mg/L	2	< 1	< 1	< 1	< 1	< 2	< 1
Chromium	mg/L	10	< 1	< 1	< 1	< 1	< 1	< 1
Lead	mg/L	100	< 5	< 5	< 5	< 5	< 5	< 5
PCB	mg/L	2	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chlorine	mg/L	1000	580	200	580	110	290	2600
Flash point	°C	≥ 37.7	> 80	> 80	> 80	> 80	> 80	> 80

Footnotes:

* NWT Used Oil and Waste Fuel Management Regulations (NWT, 2003)

Highlighted values exceed the maximum allowable concentration

Table 7.1: 2012 Reported Spills

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-01-04	Gasoline	5 L	Old Warehouse	Leak from a tank	Contaminated soil taken to Hazmat area	No
2012-01-05	Glycol	25 L	Between Mill and Assay lab	Transportation of a genset	Contaminated snow taken to power plant pit. As snow is melting it is pumped in a Hazmat waste disposal container	No
2011-12-08	Windshield Washer fluid	80 L	Refueling Station	Leak from dispensing hose	Contaminated soil taken to Hazmat area	No
2012-02-01	Calcium chloride	200 L	In front of process plant	Fork of a zoom boom puncture a tote while performing Sea Can unloading	Contaminated snow taken in the mill at the grinding sump	No
2012-02-01	Hydraulic oil	15 L	North Pit Pattern #5169307	Hydraulic Hose broke on drill unit #9928	Contaminated soil taken to Hazmat area	No
2012-02-04	Mill Perse 813	20 L	Laydown area; inside a Sea Can	A damaged curved fork combine with poor lighting on unloading unit	Place Material inside a sealed drum and bring in to Hazmat	No
2012-02-06	Hydraulic oil	25 L	Outside Process Plant between Sea Can	Leaking hose	Contaminated snow taken in into Hazmat disposal in the mill	No
2012-02-17	Hydraulic oil	40 L	Storm water dike	Hole in a hydraulic hose	Absorbent pad were used and bring in to Hazmat Storage	No
2012-02-28	Anti-freeze	10 L	South Portage Pit Pattern #5074028	Accident between Loader IT-14 and pick-up 45 causing radiator failure	Spill kit was use to recover contaminant and used material was bring in to Hazmat Storage	No
2012-03-01	Oil	46 L	Fountain Tire	Failed component	Used rags to recover fluid and disposed of in hazmat waste drum in the shop	No
unreported	Anti-freeze	20 L	New transit laydown	Unknown	Scraped the contamination off the ground and took it to Hazmat	No
2012-03-02	Hydraulic oil	7 L	Between Assay lab and Mill	Hydraulic Hose hit and broke	Shoveled the contaminated snow into a drum and took it to Hazmat	No
2012-03-04	Copper Sulphate	2 kg	In front of process plant	Powder dropped on the ground while handling bag	Shovelled the copper into a pail and took it to the mill	No
2012-03-06	Oil	20 L	Fountain Tire	Failed component	Contained the spill, picked up the contaminated snow, and took it to Hazmat	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-03-09	Hydraulic oil	40 L	Next to the cold storage	A seal broke while doing maintenance	Contained the spill, picked up the contaminated snow, and took it to Hazmat	No
2012-03-26	Emulsifier oil	160 L	Emulsion Plant laydown	Sea can fell on ground while moving it	Scraped the contamination off the ground and placed it into drums, then took it to Hazmat	Yes
2012-03-26	Oil	5 L	Km 62 AWPAP	Mechanical problem on grader 1	Removed the contamination off the ground and took it to Quarry 22	No
2012-03-27	Anti-freeze	20 L	Old Genset	Leak on radiator	Cleaned inside the genset with absorbent, took contaminated soil to Hazmat	No
2012-03-27	Power steering oil	2 L	Pit supervisor parking	Leak on the line	Scraped the contamination off the ground and took it to Hazmat	No
2012-03-29	Anti-freeze	20 L	Intersection AWPAP and EMR	Anti-freeze hose going to heater broke	Scraped the contamination off the ground and took it to Quarry 22	No
2012-04-01	Diesel	25 L	Air strip hill parking	Leaking hose	Contaminated soil taken to Quarry 22	No
2012-04-01	Hydraulic oil	35 L	Air strip hill parking	Hydraulic Hose broke	Contaminated soil taken to Quarry 22	No
2012-04-03	Hydraulic oil	20 L	Quarry 19	Hydraulic Hose broke	Contaminated soil taken to Quarry 22	No
2012-04-05	Sulfur prills	500 kg	Outside mill door A	Human error	Recycle the good ones and bring the rest to tailing pond	No
2012-04-10	Diesel	40 L	Secondary crusher	Human error	Contaminated soil taken to Quarry 22	No
2012-04-17	Diesel	410 L	Old Genset	Split fuel line cause a fire and the spill spread because of the water from the sprinkler system	Contaminated soil taken to Quarry 22	Yes
2012-05-02	Fuel	150 L	Haul truck refueling station	Failed component	Contaminated soil taken to contaminated soil disposal	Yes
2012-05-03	Fuel	20 L	Haul truck refueling station	Unreported	Contaminated soil taken to Hazmat area	No
2012-05-05	Fuel	10 L	South pit view point	Human error	Contaminated soil taken to Hazmat area	No
2012-05-13	Coolant	40 L	FGL/Sana Garage	Improper working procedure	Contaminated soil taken to Hazmat area	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-05-14	Hydraulic oil	40 L	North pit	Human error	Contaminated soil taken to Hazmat area	No
2012-05-15	Oil	80 L	FGL/Sana Garage	Human error	Contaminated soil taken to Hazmat area	No
2012-05-16	Oil	25 L	Hazmat storage	Improper working procedure and storage	Contaminated soil taken to Hazmat area	No
2012-05-18	Sewage	24,750 L	Outside Sewage treatment plant	Failed component	Sewage was vacuumed and contaminated soil was removed and both disposed to the TSF	Yes
2012-05-18	Diesel	400 L	Behind mill, green tanks	Overflowed due to expansion of the fuel by the temperature	Contaminated soil taken to contaminated soil disposal	Yes
2012-05-20	Diesel	85 L	Refueling Station	Unreported	Contaminated soil taken to contaminated soil disposal	No
2012-05-24	Hydraulic oil	70 L	Bay goose pit	Hydraulic Hose broke	Contaminated soil taken to Hazmat area	No
2012-05-24	Coolant	20 L	Truck shop inuksuk side	Failed component	Contaminated soil taken to Hazmat area	No
2012-05-26	CIP pulp	500 L	Mill	The identification of the valves were reverse	Vacuum the liquid and contaminated soil taken to TSF	Yes
2012-05-26	Oil	4 L	Site service parking	Failed component	Contaminated soil taken to Hazmat area	No
2012-06-01	Hydraulic oil	340 L	Bay goose pit	Rocks fall off pit wall - hit truck	Cont. soil taken to temporary on site storage facility.	Yes
2012-07-14	Diesel	50 L	Exploration diesel tank	Human error	Contaminated soil taken to contaminated soil disposal	No
2012-07-14	Oil	500 L	Hazmat sorting out	Human error	Oil was pumped into drums, contaminated soil put in drums and stored at Hazmat area	Yes
2012-07-14	Hydraulic oil	60 L	Waste dump	Failed component fall on hydraulic hoses	Contaminated soil taken to Hazmat area	No
2012-07-14	Hydraulic oil	10 L	Truck shop parking inuksuk side	Failed component	Contaminated soil taken to Hazmat area	No
2012-07-18	Hydraulic oil	20 L	Central dyke	Failed component	Contaminated soil taken to Hazmat area	No
2012-07-17	Oil	600 L	Maintenance dome side	Human error	Pump free oil on the ground and bring contaminated soil to contaminated soil disposal area.	Yes
2012-07-20	Antifreeze	70 L	In front of SANA garage	Failed component	Contaminated soil taken to Hazmat area	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-07-29	Diesel	5 L	TCG storage area	Leak from a HAZMAT storage container	Contaminated soil taken to Hazmat area	No
2012-08-09	Diesel	200 L	Baker Lake Marshaling area	Failed component	Contain with Maritime barriers and used absorbent sheets. Contaminated material sent to Hazmat Storage	Yes
2012-09-01	Diesel	10 L	Refueling Station	Equipment failure	Contamination removed, remediated with new material	No
2012-09-11	Antifreeze	65 L	Bay Goose Pit	Equipment Failure	Contamination removed	No
2012-09-11	Hydraulic Oil	50 L	Nova Camp	Equipment Failure	Contamination removed, remediated with new material	No
2012-09-12	Tailing Slurry	5000 L	Mill	Rupture of a pipe division (Y)	Vacuum truck was used to reclaim the water from the mill, contention of the material with berm, all the material bring at the tailing pond	Yes
2012-09-19	Diesel	25 L	Pit C	Equipment Failure	Removed the contaminated material to the contaminated soil pad	No
2012-09-25	Diesel	50 L	Baker Lake Tank Farm	Human error	Removed contaminated material, remediated with new material	No
2012-09-30	Antifreeze	35 L	Maintenance	Equipment Failure	Remove contaminated material, remediated with new material	No
2012-10-01	STP intake	7.8 m ³	STP	When operator got to Sewage Treatment Pant red light alarm for high level in main tank was flashing outside building. He went to check tank outside. It was overflowing from the top. At that time both pumps were on and showing no flow. After verification, effluent pipe was obstructed, explaining why no water was being pumped from the main tank and overflow.	Spill was contained in the tank area. Contaminated soil will be removed and disposed of at our tailings storage facility (TSF – authorized by water license). Removal of material is made difficult by the presence of pipes, electrical cable and shack over affected area.	Yes
2012-10-02	Glycol	15 L	Between gym and genset	Valve stayed open	Absorbant was put on top and soil put in drum qty estimated at 20 liter pail	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-10-04	Glycol	40 L	Construction genset	The electric motor pillow blocks that drive the fan disintegrate. Broken parts were projected in the radiators and damage them1. The glycol contained in the radiators slowly drain itself out of the container. The spill happen on the 29th of September but we notice it only the 4th of October	Under genset, not visible will have to wait after removal of genset.	No
2012-10-06	Diesel	50 L	Tank farm	When hooking up the line to a 785 Haul truck #25, the wiggins fitting became partially stuck in the open position	980 loader was used to clean up the spill with gravel. Stock piled at truck parking for instructions for disposal.	No
2012-10-07	Hydraulic oil	10 L	Truck Shop parking Dome side	Broken hydrolic line	Leak has been contained and the container has been emptied. The haul truck has been moved and the contaminated soil has been picked up by Site Services on October 9, 2012	No
2012-10-08	Hydraulic oil	40-50 L	Drill Pattern 5095 -299 Pit A	The hydraulic hose had a leak, the leak wasn't notice first	Some fine material have been laid on to absorb, then the material has been collected and bring to the WTP contaminated soil pad	No
2012-10-11	Oil	15 L	Outside truck shop door 3	Bad procedure, no supervision while filling a tote with oil, the nozzle fall of the tote to the floor	Absorbed most of the oil with absorbant , scrap the contaminated soil and all the contaminated stuff in drums in the truck shop	No
2012-10-14	Transmission fluid	7 L	Service building parking lot	Broken transmission cooler	Absorbed most of the oil with absorbant , scrap the contaminated soil and all the contaminated stuff in drums in the truck shop	No
2012-10-17	Engine coolant	40 L	Sana garage pad	Busted radiator	Excavate the contaminant and put it in the yellow bin	No
2012-10-19	Hydraulic oil	80 L	Pit B	Ruptered Hydaulic Hose	Clean up spill and take to contaminated soil pad at WTP	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-10-20	Compressor oil	5 L	Pit pattern 5109-509	Busted compressor oil hose	Absorb with rags and pick up the contaminated soil and sent it at the incinerator	No
2012-10-21	Hydraulic oil	70 L	Goose Bay	Broken O-ring on relief valve	Clean up spill and take to contaminated soil pad at WTP	No
2012-10-23	Engine oil	20 L	Fuel Farm and Lower Ramp - Primary Crusher	Blown Engine	Clean up spill and take to contaminated soil pad at WTP	No
2012-10-25	Diesel	80 L	Wht. Mait Coverall	Loose pipe fitting	Excavate the contaminant and put it in the yellow bin	No
2012-10-25	Compressor oil	40 L	Pit A	Busted Cooler	Absorbent pads were placed over spill then excavated and sent to Yellow Bin	No
2012-10-27	Glycol	20 L	Genset #2	Seal failed and started fire - damaged to Rad in fire created spill.	Absorbents deployed to soak up Glycol then sent to Hazmat. Any contaminated soil will be cleaned up and sent to yellow bin. Engine is in repair to determine root cause.	No
2012-10-29	Hydraulic oil	20 L	Goose pit	Busted hose	Absorbent pads were placed over spill then excavated and sent to Yellow Bin	No
2012-11-01	Oil-Water	3 L	Vault road	Tire of a 50 tons vehicle (#1536) exploded. The interior of the tire contained water (resulting from condensation) and oil (from air compressor that inflated the tire) the mixture of these two liquids went out from the hole of the flat tire.	Soil was collected and disposed of at CSP.	No
2012-11-01	Calcium chloride	100 L	In front of door B	Broken valve	Tote and soil was brought inside	Yes

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-11-05	Coolant	30 L	End of truck shop	Found near of 2 pails containing coolant	We immediately sent a mechanic to install absorbent pads to contain the coolant on the ground, put the absorbent pads and coolant in 5 gallon pails where pick-up and dispose of in the bin in the shop.	No
2012-11-11	Slurry	2500 L	Mill door a-b	Power failure, overflow of the pump box	Blocked the seeping door, built berms, collect material and sent it to the tailing pond	Yes
2012-11-11	Stripping solution	500 L	Mill door c	Power failure, overflow of the barren solution box	blocked the seeping door, collect material and sent it back in the process	Yes
2012-11-14	Oil	20 L	Push back pit	broken fitting on BAC 07	Soil was collected and disposed of at CSP.	No
2012-11-17	Calcium chloride	1500 L	Mill door B	Punctured totes in a c-can	None, calcium chloride is used on the site for dust control.	No
2012-11-18	Lime powder	4 kg	Mill door A	Leaking lime bag during transportation	Shoveled it, put it in a pale and send it in the tailing pond	No
2012-11-21	Envirobend	80 L	Mill Overhead door "B"	A zoom boom transported a tote inside mill, smaller forklift trying to pick up tote inside the Mill puncturing the tote in process of lifting it up	Shoveled content and placed into a different tote and dispersed at Tailings pump	No
2012-11-22	Hydraulic oil	5 L	Goose pit	Busted hydrolic hose	Drill was shut down immediately spill pads were laid down on the deck of the drill. Spill was picked up and brought to incinerator.	No
2012-11-22	Engine oil	50 L	Pit B	Connecting rod in the engine of 992 loader #3 came apart and punched a hole in the oil pan	picked up absorbant pads and taken to CSP	No
2012-11-23	Transmission fluid	95 L	West road sana crusher/waste dump	Transmission line broke	Pick up and brought to CSP	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-11-25	Hydraulic oil	20 L	push back phase 2	Developped a leak in hydraulic hose and in the process of taking it off for repair a quantity of oil was spilled on the ground.	Covered the oil with absorbant pads. Mechanic picked up the pads after installing the new pipe.	No
2012-11-22	Compressor oil	20 L	Pattern 5081-273	Compressor oil hose	Drill was shut down immediately spill pads were laid down on the spill. The hose was repaired. Spill was picked up and brought to incinerator.	No
2012-11-27	Hydraulic oil	150 L	Pattern 5081-273 Pit B	The mounting brackets bolts broke causing the hydraulic line going to the swing motor to come free.	Absorbent pads were used to clean surface oil. Pads were brought to our Hazmat location and put in proper location.	Yes
2012-11-27	Coolant	20 L	Maintenance parking	2 haul trucks. HTR 04 & HTR 08. Radiator leak on both trucks	Already asked Jean Noel to clean these spills. Will be done today	No
2012-11-29	Hydraulic oil	30 L	Mid pit access	Driveshaft broke off causing hydraulic hose to be pulled off pump	Absorbant pads were used to pick up the hydraulic oil then disposed of at incinerator	No
2012-11-29	Hydraulic oil	10 L	Push back	Broken hydraulic hose grader 3	Absorbant pad were used to pickup oil then disposed of at incenerator	No
2012-12-02	Coolant	5 L	Camp genset #1	The engine had a hard shutdown. Coolant start boiling inside the rad Overflow on the floor and drop down on the ground through the container door	Spill clean and disposed in the Power plant bilge well	No
2012-12-03	Transmission fluid	40 L	West road/bay goose	Broken hose connecting retarder to the transmission	Absorbing towels were put on the transmission oil (on the groung). Towels were properly disposed of. Cantaminated soil was collected and disposed properly. (roll-off)	No
2012-12-15	Hydraulic oil	5 L	Push back pattern 5116402	Busted o-ring on hydraulic pump	Drill was shut down, spill pads were laid down on the spill.	No

Date of Spill	Hazardous Material	Quantity	Location	Cause of spill	Clean-up action taken	Reported to Spill Hot Line
2012-12-22	Emulsion, Diesel, Antifreeze	emulsion- 50 L, diesel-5 L, antifreeze- 5 L	AWPR Km 103	Dyno truck went off road and rolled over	Fuel leak stopped using Plug patties, emulsion scooped up with shovels into 45 gallon drums	No
2012-12-26	Hydraulic oil	10 L	Pit A	Snap ring on hydraulic pump broke	Placed absorbant pads below spill, brought contaminated absorbant pads to incinerator	No
2012-12-29	Engine oil	5-10 L	Camp genset #3	Oil line failed	Spill rags used to pick up leak onto the floor of genset and placed in a 20L pail	No

Table 8.1: 2012 GPS Coordinates of Meadowbank Mine Site Sampling Stations

Sample Location Description	Sample ID	GPS Coordinates Easting / Northing
<i>MMER and EEM</i>		
effluent water quality monitoring and toxicity testing	ST-9	14W 0637593 7215174
water quality monitoring in receiving environment - discharge area	TPN	14W 0636531 7214581
water quality monitoring in receiving environment - reference area	TPS	14W 0633840 7208079
<i>Sewage Treatment Plant</i>		
STP discharge to stormwater management pond	STP	14W 0638042 7214140
<i>Incinerator</i>		
ash sampling; waste oil sampling	Incinerator	14W 0638189 7213412
<i>Baker Lake Bulk Fuel Storage Facility</i>		
water quality monitoring of discharge from secondary containment area	ST-40	15W 0357598 7134539
<i>Meadowbank Bulk Fuel Storage Facilities</i>		
water quality monitoring of discharge from secondary containment area	MB-Fuel	14W 0638258 7213430
<i>Tailings Reclaim Pond</i>		
water quality monitoring	ST-21	14W 0637608 7215745
<i>North Portage Pit Sump</i>		
water quality monitoring from area of water accumulation	ST-17	14W 0638951 7214783
<i>South Portage Pit Sump</i>		
water quality monitoring from area of water accumulation	ST-19	14W 0638604 7214240
<i>Bay Goose Pit Sump</i>		
water quality monitoring from area of water accumulation	ST-20	14W 0638339 7212681

Sample Location Description	Sample ID	GPS Coordinates Easting / Northing
<i>East Dike Seepage</i>		
water quality monitoring of seepage from East Dike - North location	EDS-N	14W 0639280 7214166
water quality monitoring of seepage from East Dike - South location	EDS-S	14W 0639316 7213937
water quality monitoring of seepage from East Dike - North + South location	ST-S-1	14W 0639316 7213937
<i>Attenuation Pond</i>		
water quality monitoring	ST-18	14W 0638335 7214719
<i>Waste Rock Storage Facility</i>		
water quality monitoring of seepage from Waste Rock Storage Facility	ST-16	14W 0638617 7216164
<i>Saddle Dam 1 Seepage</i>		
water quality monitoring of seepage from Saddle Dam 1	ST-S-2	14W 0636977 7216000
<i>Landfarm</i>		
discharge to the land from landfarm sump	ST-14	14W 0637706 7215230
<i>Diversion Ditch Non-Contact Water</i>		
Portage Area (West) diversion ditch (North Cell Diversion Ditch)	ST-6	14W 0637743 7216332
Portage area (East) diversion ditch around WSF	ST-5	14W 0638698 7216571

Table 8.2: 2012 Water Transfers around the Mine Site

Water Pumped From Various Mine Site Locations				
	(m³)			
	North Pit (ST-17)	South Pit (ST-19)*	Stormwater Management Pond #1	Bay Goose (ST-20)
January	0	54,200	0	0
February	0	16,500	0	0
March	0	50,500	0	0
April	0	66,800	0	0
May	0	110,000	0	276,000
June	0	179,500	97,240	73,000
July	0	127,500	15,300	53,000
August	0	127,000	0	28,000
September	0	82,000	0	31,500
October	0	91,000	13,400	15,500
November	0	63,000	0	13,000
December	0	58,000	0	9,000
Total	0	1,026,000	125,940	499,000
Water Pumped TO Various Mine Site Locations				
	North Pit	South Pit	Stormwater Management Pond #1	Bay Goose
	pumped to Attenuation Pond	from January to August pumped to Stormwater Management Pond #1; from September to December pumped to Attenuation Pond	pumped to Tailings Pond	Pumped to attenuation pond or to Bay Goose pond (need to specify)

* including approximately 312,000 m³ of seepage from East dike (ST-S-1)

Table 8.3: 2012 Attenuation Pond Water Quality Monitoring (ST-18)

Lab Identification		ST-18	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18
Date	Units	09-Jan-12	14-Feb-12	06-Mar-12	03-Apr-12	10-Apr-12	16-Apr-12	23-Apr-12	30-Apr-12
*pH		7.51	7.32	7.50	7.41	7.50	7.35	7.37	7.33
*Turbidity	NTU	9.00	4.07	10.00	13.00	22.50	3.77	25.40	11.01
Alkalinity	mg CaCO ₃ /L	160	162	194	170	139	206	161	142
Ammonia	mg N/L	< 0.05	< 0.05	0.16	0.13	0.18	0.12	0.10	0.11
Arsenic	mg/L	< 0.0005	0.0014	< 0.0005	0.0041	0.0011	< 0.0005	0.0102	0.0108
Chloride	mg/L	91.4	44.3	38.4	41.8	33.4	46.2	53.4	53.1
Copper	mg/L	0.0049	0.0044	0.0107	0.0058	0.0052	0.0094	0.0049	0.0035
Dissolved Aluminum	mg/L	< 0.01	< 0.01	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Arsenic	mg/L	< 0.005	< 0.005	< 0.005	0.004	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Barium	mg/L	0.010	0.157	0.141	0.156	0.108	0.167	0.117	0.083
Dissolved Cadmium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Copper	mg/L	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Iron	mg/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.01	< 0.05
Dissolved Lead	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Manganese	mg/L	0.227	3.180	2.620	2.850	1.800	2.910	2.710	1.700
Dissolved Mercury	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Molybdenum	mg/L	< 0.005	0.033	0.032	0.033	0.024	0.032	0.028	0.021
Dissolved Nickel	mg/L	< 0.005	0.011	0.010	0.011	0.008	0.012	0.008	0.024
Dissolved Selenium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Silver	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Thallium	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Zinc	mg/L	< 0.005	0.011	0.016	< 0.005	0.008	0.007	0.005	0.019
Fluoride	mg/L	< 0.02	0.98	1.00	0.18	0.75	1.00	0.74	0.29
Hardness	mg CaCO ₃ /L	268	351	288	374	225	315	147	314
Lead	mg/L	0.0063	< 0.0003	< 0.0003	0.0017	0.0006	< 0.0003	0.0275	< 0.0003
Nickel	mg/L	0.0147	0.0114	0.0105	0.0110	0.0095	0.0152	0.0077	0.0240
Nitrate	mgN/L	0.82	8.20	10.60	8.40	6.50	9.60	4.40	3.60
Nitrite	mgN/L	0.02	0.21	0.32	0.36	0.29	0.44	0.24	0.18
Sulphate	mg/L	517	268	224	281	219	337	372	337
Total dissolved solids (TDS)	mg/L	897	708	637	712	566	728	796	742
Zinc	mg/L	0.008	0.014	0.040	0.007	0.014	0.012	0.013	0.021

Footnotes:

* Parameter measured in the field by environment department

Lab Identification	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18
Date	08-May-12	15-May-12	05-Jun-12	03-Jul-12	10-Jul-12	07-Aug-12	03-Sep-12
*pH	7.67	7.83	7.20	7.99		7.68	7.47
*Turbidity	56.80	37.70	59.60	15.50		8.59	1.71
Alkalinity	118	85	77	88	86	107	129
Ammonia	0.10	< 0.05	0.12	0.09	0.09	0.19	0.90
Arsenic	0.0081	< 0.0005	0.0054	0.0043	0.0080	0.0214	0.0059
Chloride	45.2	24.5	29.4	30.1	33.3	27.3	19.5
Copper	0.0065	0.0072	0.0056	0.00970	0.00190	0.00240	0.01000
Dissolved Aluminum	< 0.01	0.01	< 0.01	< 0.01	< 0.01	0.05	0.01
Dissolved Arsenic	< 0.005	< 0.005	< 0.005	< 0.005	0.008	0.011	0.005
Dissolved Barium	0.048	0.041	0.057	0.097	0.106	0.135	0.080
Dissolved Cadmium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Copper	< 0.005	< 0.005	< 0.005	0.010	< 0.005	< 0.005	0.010
Dissolved Iron	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Dissolved Lead	< 0.005	< 0.005	< 0.005	0.013	< 0.005	< 0.005	< 0.005
Dissolved Manganese	1.100	0.987	1.200	1.880	2.230	1.280	0.903
Dissolved Mercury	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Molybdenum	0.012	0.016	0.011	0.010	0.016	0.019	0.056
Dissolved Nickel	0.015	0.012	0.018	0.015	0.012	0.013	0.016
Dissolved Selenium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Silver	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Thallium	0.04	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Zinc	< 0.005	< 0.005	< 0.005	0.037	< 0.005	0.007	< 0.005
Fluoride	0.61	< 0.02	0.36	0.52	0.51	0.61	0.53
Hardness	259	254	240	143	42	233	214
Lead	< 0.0003	0.0053	0.0009	< 0.0003	< 0.0003	< 0.0003	0.0012
Nickel	0.0226	0.0173	0.0195	0.0149	0.0249	0.0137	0.0146
Nitrate	2.90	2.90	2.10	1.60	1.40	5.10	29.20
Nitrite	0.18	0.11	0.11	0.09	0.10	0.20	0.64
Sulphate	230	165	217	202	253	325	148
Total dissolved solids (TDS)	614	434	637	46	516	682	538
Zinc	0.008	0.027	< 0.001	0.060	< 0.001	0.012	0.001

Footnotes:

* Parameter measured in the field by environment department

	Attenuation Pond			Attenuation Pond					
	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18	ST-18
Date	24-Sep-12	02-Oct-12	15-Oct-12	18-Oct-12	22-Oct-12	29-Oct-12	05-Nov-12	09-Nov-12	12-Nov-12
*pH		7.58					7.46	7.15	
*Turbidity		33.30					10.78	18.14	
Alkalinity									
Ammonia		0.19					< 0.05		
Arsenic		0.0137					0.0136		
Chloride									
Copper		0.00590					0.00560		
Dissolved Aluminum									
Dissolved Arsenic									
Dissolved Barium									
Dissolved Cadmium									
Dissolved Copper									
Dissolved Iron									
Dissolved Lead									
Dissolved Manganese									
Dissolved Mercury									
Dissolved Molybdenum									
Dissolved Nickel									
Dissolved Selenium									
Dissolved Silver									
Dissolved Thallium									
Dissolved Zinc									
Fluoride									
Hardness									
Lead		0.0018					0.0073		
Nickel		0.0305					0.0436		
Nitrate	8.10		18.00	20.90	16.10	13.60	14.40		13.40
Nitrite									
Sulphate									
Total dissolved solids (TDS)							1202		
Zinc		0.006					< 0.001		

Footnotes:

* Parameter measured in the field by environment department

Table 8.4: 2012 South Portage Pit Sump Water Quality Monitoring (ST-19)

Date		2012-01-03	2012-02-13	2012-03-06	2012-06-13	2012-07-03
Lab Identification	Units	ST-19	ST-19 (SW-5)	ST-19 (SW-5)	ST-19	ST-19
*pH		7.79	7.77	7.96	7.87	8.12
*Turbidity	NTU	23.30	12.61	5.35	20.20	10.09
Alkalinity	mg CaCO ₃ /L	132	99	145	82	108
Ammonia	mg N/L	0.60	0.22	0.18	0.22	0.24
Ammonia Nitrogen	mg N/L	0.60	0.22	0.18	6.10	5.50
Arsenic	mg/L	0.0048	0.0179	< 0.0005	< 0.0005	0.0008
Chloride	mg/L	10.9	5.6	37.8	14.0	17.7
Copper	mg/L	0.0058	0.0079	< 0.0005	0.0018	0.0092
Dissolved Aluminum	mg/L	0.06	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Arsenic	mg/L	< 0.005	0.009	< 0.005	< 0.005	0.001
Dissolved Barium	mg/L	0.010	0.019	0.274	0.005	0.001
Dissolved Cadmium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Copper	mg/L	0.005	0.006	< 0.005	< 0.005	0.008
Dissolved Iron	mg/L	0.05	< 0.05	0.05	< 0.05	< 0.05
Dissolved Lead	mg/L	< 0.005	< 0.005	0.011	< 0.005	< 0.005
Dissolved Manganese	mg/L	0.020	0.060	0.109	0.006	0.046
Dissolved Mercury	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Molybdenum	mg/L	0.023	0.024	0.020	0.020	0.026
Dissolved Nickel	mg/L	0.005	< 0.005	0.005	0.008	0.010
Dissolved Selenium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Silver	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Thallium	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Zinc	mg/L	< 0.005	0.011	0.080	< 0.005	0.036
Fluoride	mg/L	0.98	0.99	0.98	0.32	0.35
Hardness	mg CaCO ₃ /L	78	95	135	142	78
Lead	mg/L	0.0020	0.0018	< 0.0003	< 0.0003	0.0119
Nickel	mg/L	0.0088	0.0042	0.0077	0.0142	0.0091
Nitrate	mgN/L	13.20	0.14	12.80	11.60	15.50
Nitrite	mgN/L	0.31	10.30	1.00	0.26	0.43
Sulphate	mg/L	15	20	16	108	32
Total dissolved solids	mg/L	247	217	386	248	303
Zinc	mg/L	0.011	0.016	0.090	< 0.001	0.004

Footnotes:

*Parameter measured in the field
by environment department

Date	2012-07-19	2012-08-21	2012-09-04	2012-09-24	2012-10-17
Lab Identification	South Central Portage Pit	ST-19	ST-19	South Pit	ST-19
*pH	8.27	7.48	7.90		7.06
*Turbidity	2.68	53.40	2.83		3.01
Alkalinity	111	56	55		40
Ammonia		0.07	0.11	<	0.05
Ammonia Nitrogen	17.80	1.80	2.80		0.08
Arsenic	0.0027	< 0.0005	0.0014		0.0015
Chloride	62.2	1.7	7.1		
Copper	0.0069	0.0013	0.0100		0.0012
Dissolved Aluminum	0.02	0.02	0.01		
Dissolved Arsenic	< 0.005	< 0.005	<0.005		
Dissolved Barium	0.179	0.016	0.016		
Dissolved Cadmium		< 0.005	<0.005		
Dissolved Copper	0.008	< 0.005	<0.005		
Dissolved Iron	0.06	< 0.05	<0.05		
Dissolved Lead	< 0.005	< 0.005	<0.005		
Dissolved Manganese	0.117	0.046	0.038		
Dissolved Mercury	< 0.0005	< 0.0005	<0.0005		
Dissolved Molybdenum	0.046	0.014	0.017		
Dissolved Nickel	< 0.005	< 0.005	0.005		
Dissolved Selenium	< 0.005	< 0.005	<0.005		
Dissolved Silver	0.040	< 0.005	<0.005		
Dissolved Thallium	< 0.01	< 0.00	<0.01		
Dissolved Zinc	0.006	< 0.005	<0.005		
Fluoride	0.69	0.32	0.35		
Hardness	130	85	57		
Lead	< 0.0003	< 0.0003	<0.0003	<	0.0003
Nickel	0.0062	< 0.0005	0.0048		0.0013
Nitrate	< 0.01	4.80	3.90	19.50	
Nitrite	< 0.01	0.10	0.07		
Sulphate	54	47	25		
Total dissolved solids	409	168	129		52
Zinc	0.006	< 0.001	0.002	<	0.001

Footnotes:

*Parameter measured in the field
by environment department

Table 8.5: 2012 Saddle Dam #1 Water Quality Monitoring (ST-S-2)

Date			12-Jun-12	3-Jul-12	7-Aug-12	4-Sep-12	1-Oct-12
Lab Identification	Units		S-SD1	S-SD1	S-SD1	S-SD1	ST-S-2
*pH			7.48	7.74	7.51	7.20	7.20
*Turbidity	NTU		67.60	2.58	7.89	3.97	6.79
Alkalinity	mg CaCO3/L		8	60	55	112	129
Aluminum	mg/L		0.781	1.740	0.320	0.175	0.073
Ammonia	mgN/L	<	0.05	0.08	0.24	0.07	NA
Arsenic	mg/L	<	0.0005	0.0182	0.0485	0.0292	0.2189
Barium	mg/L		0.0100	0.0427	0.0441	0.0451	0.0477
Cadmium	mg/L	<	0.00002	0.000	< 0.000	< 0.000	< 0.000
Chloride	mg/L		2.2	7.1	16.9	11.6	21.2
Chromium	mg/L		0.004	0.015	0.001	< 0.001	< 0.001
Copper	mg/L		0.0137	0.0123	0.0042	0.0060	0.0025
Fluoride	mg/L		0.03	0.30	0.43	0.40	0.38
Hardness	mg CaCO3/L		17	93	301	301	426
Iron	mg/L		1.50	4.60	0.26	0.42	0.13
Lead	mg/L	<	0.0003	0.014	< 0.0003	< 0.0003	< 0.0003
Manganese	mg/L		0.0544	0.255	0.291	0.580	0.564
Mercury	mg/L	<	0.00001	0.00024	0.00001	0.00001	0.00001
Molybdenum	mg/L	<	0.0005	0.0084	0.0332	0.0245	0.0962
Nickel	mg/L		0.0074	0.0204	0.0453	0.0462	0.0843
Nitrate	mg/L		0.72	1.50	34.60	17.70	24.00
Selenium	mg/L	<	0.0010	< 0.0010	0.0060	0.0003	0.0030
Silver	mg/L	<	0.0002	0.0004	< 0.0002	< 0.0002	< 0.0002
Sulfate	mg/L		9	54	114	153	184
Thallium	mg/L	<	0.005	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	mg/L	<	0.001	0.015	0.010	0.004	0.345

Footnotes:

* Parameters measured in field by environment department

Table 8.6: 2012 Bay Goose Pit Sump Water Quality Monitoring (ST-20)

Date	Units		5-Jun-12	3-Jul-12	7-Aug-12	18-Sep-12	1-Oct-12	14-Nov-12
*pH			7.15	7.58	7.71	7.80	7.55	8.68
*Turbidity	NTU		1.05	1327.00	32.70	33.80	73.10	12.03
Alkalinity	mg CaCO ₃ /L		37	52	63	121	95	144
Ammonia	mg N/L	<	0.05	< 0.05	< 0.05	0.82	0.29	0.23
Arsenic	mg/L		0.0064	0.0044	0.0112	0.0076	0.0064	0.0022
Chloride	mg/L		4.1	7.0	25.6	25.3		
Copper	mg/L		0.0027	0.0486	0.0052	0.0193	0.0076	0.0010
Dissolved Aluminum	mg/L	<	0.01	< 0.01	0.01	< 0.01		
Dissolved Arsenic	mg/L	<	0.005	< 0.005	0.008	0.005		
Dissolved Barium	mg/L		0.014	0.036	0.083	0.114		
Dissolved Cadmium	mg/L	<	0.005	< 0.005	< 0.005	< 0.005		
Dissolved Copper	mg/L	<	0.005	0.020	0.005	0.010		
Dissolved Iron	mg/L	<	0.05	< 0.05	< 0.05	< 0.05		
Dissolved Lead	mg/L	<	0.0050	< 0.0050	0.0050	< 0.0050		
Dissolved Manganese	mg/L		0.249	0.147	< 0.005	0.193		
Dissolved Mercury	mg/L	<	0.0005	< 0.0005	< 0.0005	< 0.0005		
Dissolved Molybdenum	mg/L	<	0.005	< 0.005	0.021	0.025		
Dissolved Nickel	mg/L	<	0.005	< 0.005	< 0.005	0.025		
Dissolved Selenium	mg/L	<	0.005	< 0.005	< 0.005	< 0.005		
Dissolved Silver	mg/L	<	0.005	< 0.005	< 0.005	< 0.005		
Dissolved Thallium	mg/L	<	0.01	< 0.01	< 0.01	< 0.01		
Dissolved Zinc	mg/L	<	0.005	0.038	< 0.005	< 0.005		
Fluoride	mg/L		0.23	0.24	0.60	0.65		
Hardness	mg CaCO ₃ /L		43	65	118	292		
Lead	mg/L		0.0018	0.0207	0.0140	0.0042	0.0100	< 0.0003
Nickel	mg/L		0.0025	0.0500	0.0067	0.0418	0.0343	0.0174
Nitrate	mgN/L		0.37	0.92	3.20	24.30		2.60
Nitrite	mgN/L		0.02	0.07	0.06	0.41		
Sulphate	mg/L		13	18	29	49		
Total dissolved solids (TDS)	mg/L		148	86	225	432	319	339
Zinc	mg/L	<	0.001	0.103	0.010	0.030	0.006	0.015

Footnotes:

*Parameter measured in the field by environment department

Table 8.7: 2012 Non Contact Water Diversion Ditch Water Quality Monitoring (ST-6)

Date		17-May-12	24-May-12	28-May-12	5-Jun-12	12-Jun-12	19-Jun-12
Lab Identification	Units	NCDD	NCDD	NCDD	NCDD	NCDD	ST-6
pH*			6.63		8.71		7.37
Turbidity*	NTU		11.78		7.05		2.15
Conductivity*	µs/cm		40		71		44
CN	mg/L		< 0.005				
TSS	mg/l	17	7	5	5	6	
Ra	Bq/l		0.004				
Al	mg/l		0.29				
As	mg/L		< 0.0005				
Cu	mg/L		0.0013				
Ni	mg/L		0.0019				
Pb	mg/L		< 0.0003				
SO ₄	mg/L		8				
Zn	mg/L		< 0.001				

Footnotes:

* Parameters measured in the field by environment department

Date	26-Jun-12	3-Jul-12	5-Jul-12	10-Jul-12	7-Aug-12	28-Aug-12	5-Sep-12	1-Oct-12
Lab Identification	NCDD	NCDD	NCDD	NCDD	NCDD	NCDD	NCDD	ST-6
pH*	7.76	7.45	7.07	7.48	7.70	7.87	7.09	7.53
Turbidity*	0.93	0.23	0.13	4.32	20.50	7.07	0.82	7.56
Conductivity*	44		44		71	95	103	119
CN	< 0.005		< 0.005	< 0.005	< 0.005		< 0.005	< 0.005
TSS	7	1	< 1	7	60	1	2	7
Ra	< 0.002		0.002	< 0.002	0.011		< 0.002	0.002
Al	0.06			< 0.01	0.98		0.08	0.32
As	< 0.0005		< 0.0005	0.0003	0.0012		< 0.0005	< 0.0005
Cu	0.0008		0.0021	< 0.0005	0.0071		< 0.0005	0.0010
Ni	0.0021		0.0018	0.0094	0.0044		0.0016	0.0064
Pb	0.0051		0.0005	< 0.0003	0.0363		< 0.0003	0.0024
SO ₄	3		2	< 1	5		8	10
Zn	0.002		0.007	< 0.001	0.030		0.004	< 0.001

Footnotes:

* Parameters measured in the field by environment department

Table 8.8: 2012 Tailings Reclaim Pond Water Quality Monitoring (ST-21)**Monthly Monitoring**

Date	Units	3-Jan-12	13-Feb-12	6-Mar-12	3-Apr-12	1-May-12	5-Jun-12
*pH		8.42	8.03	8.49	9.06	9.39	8.74
*Turbidity	NTU	0.88	2.53	6.49	2.51	2.21	14.74
Alkalinity	mg CaCO ₃ /L	126	125	147	157	145	75
Ammonia nitrogene (NH ₃)	mg N/L	1.60	0.44	1.80	2.90	2.60	0.73
Chloride	mg/L	449	559	639	672	853	634
Cyanide	mg/L	5.89	14.22	23.18	59.37	63.38	48.76
Dissolved Aluminum	mg/L	0.02	< 0.01	< 0.01	0.02	0.41	< 0.01
Dissolved Arsenic	mg/L	0.045	0.018	0.015	0.041	0.071	0.006
Dissolved Barium	mg/L	0.048	0.078	0.096	0.066	0.052	0.029
Dissolved Cadmium	mg/L	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Copper	mg/L	7.68	6.83	9.91	26.85	7.13	20.39
Dissolved Iron	mg/L	1.30	1.10	2.40	8.90	1.50	9.50
Dissolved Lead	mg/L	< 0.005	< 0.005	< 0.005	0.009	< 0.005	< 0.005
Dissolved Manganese	mg/L	0.023	0.034	0.032	< 0.005	0.032	< 0.005
Dissolved Mercury	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved Molybdenum	mg/L	0.290	0.308	0.332	0.001	0.310	0.232
Dissolved Nickel	mg/L	0.46	0.89	1.52	0.60	1.21	2.01
Dissolved Selenium	mg/L	< 0.005	< 0.005	0.006	0.014	0.021	0.013
Dissolved Silver	mg/L	0.006	0.008	< 0.005	< 0.005	0.005	< 0.005
Dissolved Thallium	mg/L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Zinc	mg/L	0.018	0.010	0.006	< 0.005	1.390	< 0.005
Fluoride	mg/L	0.50	0.49	0.54	0.30	2.50	< 0.02
Hardness	mg CaCO ₃ /L	914	1087	1057	1369	1008	1001
Nitrate	mgN/L	7.20	8.60	10.40	11.80	10.50	7.30
Nitrite	mgN/L	0.23	0.22	0.21	0.20	0.17	0.12
Sulphate	mg/L	1825	2173	2477	2384	2508	1555
Total dissolved solids (TDS)	mg/L	3012	3334	3620	3843	3374	4955

Footnotes:

*Parameter measured in the field by environment department

Date	3-Jul-12	2-Aug-12	4-Sep-12	1-Oct-12	5-Nov-02	10-Dec-12
*pH	8.94	8.47	8.04	7.89	8.09	8.14
*Turbidity	16.80	4.18	3.87	4.16	4.94	1.13
Alkalinity	98	102	117	114	129	134
Ammonia nitrogene (NH3)	1.00	40.30	48.00	38.20	38.70	69.30
Chloride	626	826	14	889	872	1267
Cyanide	39.26	24.34	14.87	1.44	3.26	16.45
Dissolved Aluminum	< 0.01	< 0.01	0.02	0.05	0.02	0.04
Dissolved Arsenic	0.011	0.012	0.009	0.008	0.011	0.012
Dissolved Barium	0.034	0.043	0.057	0.077	0.082	0.084
Dissolved Cadmium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Copper	19.58	5.94	0.55	1.86	1.71	12.96
Dissolved Iron	7.40	0.93	< 0.05	< 0.05	< 0.05	1.20
Dissolved Lead	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved Manganese	0.009	0.005	0.017	0.095	0.039	0.007
Dissolved Mercury	< 0.0005	0.0005	< 0.0005	< 0.0005	< 0.0005	0.0003
Dissolved Molybdenum	0.262	0.290	0.349	0.361	0.411	0.437
Dissolved Nickel	2.54	2.22	1.28	1.08	0.18	0.15
Dissolved Selenium	0.009	0.020	0.015	0.014	0.019	0.021
Dissolved Silver	0.068	< 0.005	< 0.005	< 0.005	< 0.005	0.015
Dissolved Thallium	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved Zinc	0.034	< 0.005	< 0.005	0.006	< 0.005	0.006
Fluoride	0.06	0.23	0.52	0.48	0.07	0.22
Hardness	574	771	1045	1313	1177	1497
Nitrate	8.60	9.10	10.00	10.00	11.90	14.10
Nitrite	0.10	0.12	0.15	0.12	0.07	0.19
Sulphate	1457	1551	1703	1910	2332	2644
Total dissolved solids (TDS)	2343	2590	3213	3206		

Footnotes:

*Parameter measured in the field by environment department

Annual Monitoring

Date	Units	19-Jun-12	26-Jun-12
Aluminum	mg/L	0.158	0.263
Antimony	mg/L	0.0007	< 0.0001
Arsenic	mg/L	0.0049	0.0119
Barium	mg/L	0.0305	0.0321
Beryllium	mg/L	< 0.0005	< 0.0005
Cadmium	mg/L	0.00055	0.00019
Chromium	mg/L	< 0.0006	0.0106
Cobalt	mg/L	0.0092	0.0213
Copper	mg/L	1.038	2.744
Iron	mg/L	0.83	0.70
Lead	mg/L	0.0006	< 0.0003
Lithium	mg/L	< 0.005	< 0.005
Manganese	mg/L	0.0194	0.0314
Molybdenum	mg/L	0.2209	0.2576
Nickel	mg/L	1.354	1.680
Selenium	mg/L	0.009	0.008
Strontium	mg/L	1.100	0.837
Thallium	mg/L	< 0.005	< 0.005
Tin	mg/L	< 0.001	< 0.001
Titanium	mg/L	0.34	0.43
Uranium	mg/L	0.01	0.01
Vanadium	mg/L	< 0.0005	< 0.0005
Zinc	mg/L	< 0.001	0.015

Footnotes:

* Parameter measured in the field by environment department

Table 8.9: 2012 Waste Rock Storage Facility Seepage Water Quality Monitoring (ST-16)

Date			12-Jun-12	26-Jun-12	3-Jul-12	12-Jul-12	18-Jul-12	24-Jul-12
Lab Identification	Units		S-RSF-1	S-RSF-1	S-RSF-1	S-RSF-1	S-RSF-1	S-RSF-1
*pH			6.98	7.21	7.46	7.39	7.39	7.04
*Turbidity	NTU		44.8	91.7	71.6	52.2	23.3	33.6
Alkalinity	mg CaCO ₃ /L		28	49	52	47	54	64
Aluminum	mg/L		0.322	1.170	0.595	0.816	0.641	0.444
Ammonia	mgN/L	<	0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Arsenic	mg/L		0.0023	0.0006	0.0045	0.0046	0.0040	0.0059
Barium	mg/L		0.0099	0.0177	0.0151	0.0181	0.0204	0.0194
Cadmium	mg/L	<	0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chloride	mg/L		1.9	0.9	1.4	2.2	2.5	2.1
Chromium	mg/L		0.0028	0.0194	0.0054	0.0129	0.0012	< 0.0006
Copper	mg/L		0.0013	0.0062	0.0059	0.0072	0.0035	0.0040
Fluoride	mg/L		0.04	0.02	0.09	< 0.20	0.10	0.12
Hardness	mg CaCO ₃ /L		24	35	24	53	78	51
Iron	mg/L		1.9	3.1	2.3	1.7	1.2	2.0
Lead	mg/L	<	0.0003	0.0043	0.0049	< 0.0002	< 0.0003	< 0.0003
Manganese	mg/L		1.396	0.963	0.582	0.771	0.819	0.903
Mercury	mg/L	<	0.00001	< 0.00001	0.00079	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L	<	0.0005	< 0.0005	< 0.0005	< 0.0008	0.0014	0.0012
Nickel	mg/L		0.0165	0.0352	0.2460	0.0229	0.0216	0.0257
Nitrate	mg/L		0.08	0.23	0.21	0.45	0.54	0.50
Selenium	mg/L	<	0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Silver	mg/L	<	0.0002	< 0.0002	0.0005	0.0251	0.0322	< 0.0002
Sulphate	mg/L		4	8	6	4	12	5
Thallium	mg/L	<	0.005	< 0.005	< 0.005	< 0.0050	< 0.005	< 0.005
Zinc	mg/L	<	0.001	0.024	0.003	< 0.001	0.002	< 0.001

Footnotes:

* Parameters measured in the field by environment department

Date	30-Jul-12	7-Aug-12	13-Aug-12	21-Aug-12	28-Aug-12	4-Sep-12	1-Oct-12
Lab Identification	S-RSF-1	S-RSF-1	S-RSF-1	S-RSF-1	S-RSF-1	S-RSF-1	ST-16
*pH	7.39	7.55	7.37	7.04	7.53	7.11	7.50
*Turbidity	25.1	21.8	27.2	16.7	15.6	14.5	4.7
Alkalinity	92	56	73	76	85	90	105
Aluminum	0.710	0.413	0.394	0.176	0.275	0.197	
Ammonia	< 0.05	< 0.05	< 0.05	< 0.05	<0.05	<0.05	< 0.05
Arsenic	0.0089	0.0060	0.0062	< 0.0005	0.0072	0.0052	0.0033
Barium	0.0216	0.0195	0.0219	0.0239	0.0212	0.0270	
Cadmium	0.00008	< 0.00002	< 0.00002	< 0.00002	0.00024	< 0.00002	
Chloride	1.8	2.3	2.5	8.7	2.6	3.0	
Chromium	0.0021	0.0029	0.0055	0.0018	0.0014	0.0017	
Copper	0.0052	0.0034	0.0031	0.0027	0.0098	0.0043	0.0029
Fluoride	0.10	0.13	0.12	0.14	0.14	0.17	
Hardness	79	64	70	76	82	77	
Iron	1.8	1.5	1.7	1.7	1.9	2.5	
Lead	0.0280	< 0.0003	< 0.0003	< 0.0003	0.0262	< 0.0003	0.0087
Manganese	0.838	0.826	0.828	1.126	1.181	1.301	
Mercury	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	
Molybdenum	0.0015	0.0016	0.0017	0.0019	0.0020	0.0018	
Nickel	0.0242	0.0208	0.0198	0.0073	0.0213	0.0216	0.0302
Nitrate	0.50	0.31	0.42	0.49	0.21	0.15	
Selenium	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Silver	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	
Sulphate	16	10	14	11	9	9	
Thallium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	
Zinc	< 0.004	0.002	0.001	< 0.001	0.048	0.008	

Footnotes:

* Parameters measured in the field by environment department

Table 8.10: 2012 Attenuation Pond Discharge (ST-9)

Analytical Certificate ID	Units	Limit Maximum	15-May-12 ST-9	22-May-12 ST-9	29-May-12 ST-9	5-Jun-12 ST-9
Alkalinity Total	mg CaCO ₃ /L		102	97	68	36
Alkalinity bicarbonate	mg/L		102	97	68	36
Alkalinity carbonate	mg/L		< 2	< 2	2	< 2
Ammonia	mg N/L		0.09	0.14	0.08	0.05
Ammonia-nitrogen	mg N/L	32	3.2	4.1	3.7	0.78
Calcium	mg/L		55.8	75.5	54.9	14.9
Chloride	mg/L	2000	24.9	35.7	34.9	5.9
Conductivity*	µS/cm		837	1083	772	182
Cyanide Total	mg/L	1.0	0.088	0.133	0.124	0.021
Dissolved organic carbon	mg/L		5.7	8.3	7.4	3.1
Fluoride	mg/L		< 0.02	< 0.02	0.17	0.16
Hardness	mg CaCO ₃ /L		252	316	244	60
Magnesium	mg/L		27.4	31.1	26.2	5.7
Nitrate	mg N/L	40	2.7	2.3	2.2	0.53
Nitrite	mg N/L		0.1	0.13	0.09	0.01
Ortho-phosphate	mg/L		0.01	< 0.01	< 0.01	< 0.01
Phosphorous total	mg/L	2.0	0.08	0.02	0.11	0.04
pH*	pH Unit	6.0 to 9.0	7.69	7.26	6.8	7.26
Potassium	mg/L		7.9	11.5	8.7	2.2
Reactive silica	mg/L		6.1	6.9	5.8	3.7
Sodium	mg/L		84.6	81.3	83.6	10.1
Sulphate	mg/L		170	270	264	39
TDS	mg/L		498	581	519	123
Kjeldahl Nitrogen	mg/L		8		9	2
TOC	mg/L			8.4	7	2.2
Total petroleum hydrocarbons	mg/L	6	< 0.1	< 0.1	< 0.1	< 0.1
TSS	mg/L	30	4	19	5	6
Turbidity*	NTU	15	2.98	4.57	3.24	1.76
Aluminum	mg/L	1.5	1.01	1.85	1.55	0.759
Silver	mg/L		< 0.0002	< 0.0002	< 0.0002	< 0.0002
Arsenic	mg/L	0.60	< 0.005	0.0036	< 0.0005	0.0046
Boron	mg/L		0.03	0.04	0.04	< 0.01
Barium	mg/L		0.042	0.0705	0.061	0.0173
Beryllium	mg/L		< 0.005	< 0.0005	< 0.0005	< 0.0005
Cadmium	mg/L	0.004	< 0.00002	0.00009	0.00003	< 0.00002
Copper	mg/L	0.2	0.0048	0.0038	0.003	0.0008
Chromium	mg/L		< 0.0006	0.0006	0.0006	< 0.0006
Iron	mg/L		0.18	0.4	0.17	0.09
Lithium	mg/L		< 0.005	0.005	< 0.005	< 0.005
Manganese	mg/L		1.072	1.803	1.281	5.7
Mercury	mg/L	0.0008	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	mg/L		0.0168	0.0227	0.0146	0.0038
Nickel	mg/L	0.4	0.0144	0.0281	0.0228	0.001
Lead	mg/L	0.20	< 0.0003	< 0.0003	< 0.0003	< 0.0003
Selenium	mg/L		< 0.001	< 0.001	< 0.001	< 0.001
Antimony	mg/L		0.0004	0.0003	0.0002	< 0.0001
Tin	mg/L		< 0.001	< 0.001	< 0.001	< 0.001
Strontium	mg/L		0.231	0.4	0.311	0.084
Titanium	mg/L		0.04	0.04	0.05	0.01
Thallium	mg/L		< 0.005	< 0.005	< 0.005	< 0.005
Uranium	mg/L		0.002	0.011	0.001	< 0.001
Vanadium	mg/L		< 0.0005	0.0005	< 0.0005	0.0014
Zinc	mg/L	0.8	0.003	0.01	< 0.005	< 0.001
Dissolved aluminum	mg/L	1.0	0.01	< 0.01	0.02	< 0.01
Dissolved silver	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved arsenic	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved boron	mg/L		< 0.0500	0.05	< 0.05	< 0.05
Dissolved barium	mg/L		0.0420	0.066	0.06	0.015
Dissolved beryllium	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved cadmium	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved copper	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved chromium	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved iron	mg/L		< 0.0500	< 0.05	< 0.05	< 0.05
Dissolved lithium	mg/L		< 0.0100	< 0.01	< 0.01	< 0.01
Dissolved manganese	mg/L		1.0100	1.72	1.27	0.293
Dissolved mercury	mg/L		< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved molybdenum	mg/L		0.0160	0.021	< 0.005	< 0.005
Dissolved nickel	mg/L		< 0.0050	0.025	0.023	< 0.005
Dissolved lead	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved selenium	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved antimony	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved tin	mg/L		< 0.0050	< 0.005	< 0.005	< 0.005
Dissolved strontium	mg/L		0.2500	0.4	0.31	0.07
Dissolved titanium	mg/L		0.0300	0.03	0.04	< 0.01
Dissolved thallium	mg/L		< 0.01	< 0.01	< 0.01	< 0.01
Dissolved uranium	mg/L		< 0.005	0.007	< 0.005	< 0.005
Dissolved vanadium	mg/L		< 0.005	< 0.005	< 0.005	< 0.005
Dissolved zinc	mg/L		< 0.005	0.007	< 0.005	< 0.005
Daphnia Magna			> 100			> 100
Rainbow trout			> 100			> 100

NA: Samples loss

*Taken on field par environment technician

Table 8.10: 2012 Attenuat

Analytical Certificate ID	12-Jun-12 ST-9	19-Jun-12 ST-9	26-Jun-12 ST-9	3-Jul-12 ST-9	10-Jul-12 ST-9	18-Jul-12 ST-9	26-Jul-12 ST-9	1-Aug-12 ST-9
Alkalinity Total	92	NA	53	81	76	109	80	106
Alkalinity bicarbonate	92	NA	53	81	76	109	80	106
Alkalinity carbonate	< 2	NA	< 2	< 2	< 2	< 2	< 2	< 2
Ammonia	0.09	NA	< 0.05	0.1	< 0.05	0.31	0.17	0.64
Ammonia-nitrogen	3.5	1	2.1	3.1	2.1	7.9	6.9	15.3
Calcium	50.2	10	28.6	38.8	55.4	82	57.4	48.2
Chloride	34.1	8.5	10.8	31	33.1	39.6	21.2	32.2
Conductivity*	866	229	432	859		1124	995	1052
Cyanide Total	0.145	NA	0.066	0.187	0.2	0.169	0.128	0.386
Dissolved organic carbon	7.5	NA	4.7	6.5	6	7.3	6.1	7.8
Fluoride	0.37	0.13	0.17	0.44	0.37	0.36	0.41	0.37
Hardness	201	38	116	151	230	396	291	193
Magnesium	18.4	NA	11	1.8	22.5	46.5	36.1	17.7
Nitrate	2.1	NA	0.9	1.7	1.4	12.9	14.9	27.1
Nitrite	0.09	NA	0.03	0.09	0.1	0.39	0.32	0.9
Ortho-phosphate	0.01	NA	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phosphorous total	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
pH*	7.27	6.63	7.2	7.5		7.9	7.81	7.63
Potassium	10.2	2.1	4.4	6.9	7.6	14.7	9.7	24.3
Reactive silica	5.1	NA	4.7	6.1	5.4	6.5	5.6	6.2
Sodium	72.9	10.3	28.7	47	55.4	93	46.5	44.8
Sulphate	238	58	94	204	268	291	232	41
TDS	519	NA	243	471	529	712	495	595
Kjeldahl Nitrogen	10	2	4	7	8	14	11	18
TOC	6.9	2.6	3.6	5.8	6.6	7.5	7.1	7.5
Total petroleum hydrocarbons	< 1	< 0.1	< 0.01	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TSS	2	NA	2	3	6	4	4	1
Turbidity*	1.01		3.73	0.75		1.32	1.44	2.05
Aluminum	0.37	0.326	0.631	0.506	0.757	1.06	1.33	0.429
Silver	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0624	0.001	0.0087
Arsenic	< 0.0005	< 0.0002	< 0.0005	0.003	0.005	0.0104	0.0075	0.0204
Boron	0.03	0.02	< 0.01	0.01	0.03	0.08	0.04	0.05
Barium	0.0638	0.0531	0.0742	0.0952	0.11	0.1359	0.0906	0.1609
Beryllium	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Cadmium	< 0.00002	0.00033	< 0.00002	0.00004	< 0.00002	< 0.00002	0.00068	0.00012
Copper	0.0019	0.0034	0.0013	0.0073	0.0025	0.0035	0.03	0.0013
Chromium	< 0.0006	< 0.0006	0.0053	< 0.0006	0.0074	< 0.0006	0.0007	0.017
Iron	0.07	0.38	0.21	0.09	0.06	0.13	0.06	0.15
Lithium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.005	< 0.0005	< 0.005
Manganese	1.469	0.539	11	1.8	2.204	1.92	1.212	1.183
Mercury	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.0145	0.0036	< 0.0005	0.0135	0.0142	0.026	0.0361	0.038
Nickel	0.0246	0.0068	0.0164	0.0154	0.0135	0.0201	0.0306	0.0271
Lead	0.0056	0.0069	0.0003	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0032
Selenium	0.002	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Antimony	0.0003	< 0.0001	< 0.0001	< 0.0001	0.0003	< 0.0001	0.0031	0.0006
Tin	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Strontium	0.329	0.118	0.176	0.447	0.398	0.514	0.404	0.447
Titanium	0.05	0.02	0.03	0.04	0.05	0.07	0.05	0.06
Thallium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Uranium	0.004	< 0.001	< 0.001	0.003	0.003	0.002	0.004	0.003
Vanadium	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Zinc	< 0.001	0.006	0.018	0.014	< 0.001	0.009	0.124	0.027
Dissolved aluminum	0.07	0.27	0.04	0.02	< 0.01	0.11	0.1	0.05
Dissolved silver	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved arsenic	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.011	< 0.005	0.019
Dissolved boron	< 0.05	< 0.05	0.09	< 0.05	< 0.05	0.08	< 0.05	0.05
Dissolved barium	0.063	0.042	0.055	0.098	0.111	0.131	0.087	0.141
Dissolved beryllium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved cadmium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved copper	< 0.005	< 0.005	< 0.005	0.0073	< 0.005	< 0.005	0.006	0.012
Dissolved chromium	< 0.005	< 0.005	< 0.005	0.013	0.008	< 0.005	< 0.005	< 0.005
Dissolved iron	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.06
Dissolved lithium	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved manganese	1.38	0.42	0.832	1.84	2.24	1.82	1.17	1.14
Dissolved mercury	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005
Dissolved molybdenum	0.013	< 0.005	0.006	0.009	0.015	0.025	0.036	0.041
Dissolved nickel	0.019	0.005	0.015	0.0154	0.01	0.019	0.013	0.028
Dissolved lead	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved selenium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved antimony	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved tin	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved strontium	0.31	0.08	0.16	0.32	0.35	0.53	0.42	0.44
Dissolved titanium	0.04	0.01	0.04	0.03	0.05	0.08	0.05	0.05
Dissolved thallium	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dissolved uranium	< 0.005	< 0.005	< 0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Dissolved vanadium	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.0005	< 0.005
Dissolved zinc	< 0.005	< 0.005	< 0.005	0.045	< 0.005	0.007	< 0.005	< 0.005
Daphnia Magna					> 100			
Rainbow trout					> 100			

NA: Samples loss

*Taken on field par environment techni

Table 8.10: 2012 Attenuat

Analytical Certificate ID	7-Aug-12 ST-9	13-Aug-12 ST-9	21-Aug-12 ST-9	28-Aug-12 ST-9	3-Sep-12 ST-9	9-Sep-12 ST-9	11-Sep-12 ST-9	18-Sep-12 ST-9
Alkalinity Total	107	61	51	113		118	94	98
Alkalinity bicarbonate	107	61	51	113		118	94	98
Alkalinity carbonate	< 2	< 2	< 2	< 2		< 2	< 2	< 2
Ammonia	0.12	0.08	0.06	1		0.64		
Ammonia-nitrogen	3.3	4.1	2.9	15.8		14.2	10.4	15.8
Calcium	76.1	56	35.3	50.5		48.4	42.1	57.2
Chloride	48.5	28.9	9.7	16.9		20	19.3	24
Conductivity*	999	746	996	812		789	658	718
Cyanide Total	0.106	0.154	0.463	0.143		0.292	0.156	0.138
Dissolved organic carbon	8.2	7.7	3.4	4.7		4.3	5.3	3.9
Fluoride	0.47	0.23	0.2	0.41		0.41		
Hardness	355	238	150	224		214	181	289
Magnesium	40.3	24	15.1	23.9		22.7	18.6	35.5
Nitrate	3.8	2.3	9.1	34.5		27.4	18.6	23.9
Nitrite	0.15	0.03	0.26	0.7		0.63	0.42	0.42
Ortho-phosphate	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Phosphorous total	< 0.01	< 0.01	0.03	< 0.01		< 0.01	0.01	0.01
pH*	7.61	6.96	6.94	7.53		7.38	7.26	7.25
Potassium	6.2	10.2	9.1	23		22.2	16.8	7.4
Reactive silica	7	4.5	2.9	6.9		6	4.5	7.5
Sodium	32.2	37.7	30.7	51.6		58	41.4	23.2
Sulphate	305	222	131	147		171	174	7
TDS	706	556	330	< 1		559	471	449
Kjeldahl Nitrogen	10	8	4	17		17	10	11
TOC	9.1	7.3	3.3	4.6		4.6	4.5	3.5
Total petroleum hydrocarbons	< 0.1	< 0.1	< 0.1	< 0.1		0.1	< 0.1	< 0.1
TSS	3	11	6	1		2	4	4
Turbidity*	0.8	1.26	0.89	0.1		0.09	0.5	2.2
Aluminum	0.893	0.691	0.766	0.579		0.572	0.625	0.885
Silver	< 0.0002	< 0.0002	< 0.0002	< 0.0002		< 0.0002		
Arsenic	0.018	0.0062	< 0.0005	0.0026		< 0.0005	0.0038	0.0023
Boron	0.05	0.04	0.04	0.06		< 0.01	0.06	0.08
Barium	0.1263	0.0499	0.0367	0.0838		0.0778	0.0568	0.104
Beryllium	< 0.0005	< 0.0005	< 0.0005	< 0.0005		< 0.0005	< 0.0005	< 0.0005
Cadmium	< 0.00002	< 0.00002	< 0.00002	0.00014		< 0.00002	0.00003	0.00007
Copper	0.0007	0.0703	0.00009	0.01		0.01	0.0058	0.007
Chromium	< 0.0006	< 0.0006	< 0.0006	< 0.0006		< 0.0006	0.003	0.002
Iron	0.05	0.11	0.09	0.09		0.02	0.09	0.17
Lithium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Manganese	1.334	1.139	1.003	0.8204		0.9094	0.8234	0.2147
Mercury	< 0.00001	< 0.00001	< 0.00001	< 0.00001		< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.0183	0.0206	0.0122	0.0453		0.0521	0.0351	0.0252
Nickel	0.014	0.0309	< 0.0005	0.0122		0.019	0.0243	0.0308
Lead	0.086	< 0.0003	< 0.0003	< 0.0003		< 0.0003	< 0.0003	0.0099
Selenium	< 0.001	< 0.001	0.001	0.0002		0.001	0.001	0.001
Antimony	0.0002	0.0004	0.0006	0.0006		< 0.0001	0.0005	0.0027
Tin	< 0.001	< 0.001	< 0.001	< 0.001		< 0.001	< 0.001	< 0.001
Strontium	0.507	0.386	0.276	0.35		0.318	0.326	0.301
Titanium	0.07	0.04	0.03	0.03		0.04	0.03	0.02
Thallium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Uranium	0.004	0.001	0.001	0.006		0.008	0.008	0.002
Vanadium	< 0.0005	< 0.0005	< 0.0005	< 0.005		< 0.005	< 0.0005	< 0.0005
Zinc	0.005	0.002	< 0.001	0.007		< 0.001	< 0.001	0.009
Dissolved aluminum	0.09	0.04	0.01	0.08		0.12	0.06	0.04
Dissolved silver	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005		
Dissolved arsenic	0.017	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved boron	< 0.05	< 0.05	0.04	0.07		< 0.05	< 0.05	0.11
Dissolved barium	0.1263	0.053	0.033	0.087		0.077	0.051	0.104
Dissolved beryllium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved cadmium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved copper	< 0.005	< 0.005	< 0.005	0.009		0.008	0.006	0.007
Dissolved chromium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	0.008
Dissolved iron	< 0.05	< 0.05	< 0.05	< 0.05		< 0.05	< 0.05	< 0.05
Dissolved lithium	< 0.05	< 0.05	< 0.01	< 0.01		< 0.01	< 0.01	< 0.01
Dissolved manganese	1.32	1.05	0.93	0.754		0.896	0.715	0.212
Dissolved mercury	< 0.0005	< 0.0005	< 0.0005	< 0.0005		< 0.0005	< 0.0005	< 0.0005
Dissolved molybdenum	0.018	0.02	0.011	0.045		0.054	0.033	0.023
Dissolved nickel	0.014	0.021	< 0.005	0.011		0.013	0.022	0.026
Dissolved lead	0.016	< 0.005	< 0.0003	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved selenium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved antimony	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved tin	< 0.005	< 0.005	< 0.001	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved strontium	0.57	0.38	0.29	0.35		0.32	0.28	0.301
Dissolved titanium	0.08	0.03	0.02	0.02		0.05	0.02	0.03
Dissolved thallium	< 0.01	< 0.01	0.01	< 0.01		< 0.01	< 0.01	< 0.005
Dissolved uranium	< 0.005	< 0.005	< 0.005	0.006		0.009	0.007	< 0.005
Dissolved vanadium	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	< 0.005
Dissolved zinc	< 0.005	< 0.005	< 0.005	< 0.005		< 0.005	< 0.005	0.009
Daphnia Magna	> 100				> 100			
Rainbow trout	> 100				> 100			

NA: Samples loss

*Taken on field par environment techni

Table 8.10: 2012 Attenuat

Analytical Certificate ID	26-Sep-12 ST-9	5-Nov-12 ST-9	12-Nov-12 ST-9
Alkalinity Total	86	113	115
Alkalinity bicarbonate	86	113	115
Alkalinity carbonate	< 2	< 2	< 2
Ammonia			
Ammonia-nitrogen	4.2	9.6	8.3
Calcium	54.6	59.5	57.4
Chloride	25	33.4	55.1
Conductivity*	815	911	1007
Cyanide Total	0.105	0.245	0.21
Dissolved organic carbon	6.6	6.1	6.6
Fluoride			
Hardness	260	279	231
Magnesium	30.1	31.9	21.3
Nitrate	5.9	13	12.7
Nitrite	0.2	0.47	0.35
Ortho-phosphate	< 0.01	< 0.01	< 0.01
Phosphorous total	0.03	0.01	< 0.01
pH*	7.71	6.77	6.91
Potassium	10.1	10	14
Reactive silica	4.7	8.3	7.9
Sodium	64.5	39.1	44.2
Sulphate	200	266	262
TDS	456	1104	617
Kjeldahl Nitrogen	7	12	12
TOC	5.7	6.1	6.9
Total petroleum hydrocarbons	< 0.1	0.1	0.1
TSS	4	6	4
Turbidity*	0.53	0.65	1.16
Aluminum	0.952	1.27	0.962
Silver			
Arsenic	0.0054	0.0078	0.0121
Boron	0.08	0.05	< 0.01
Barium	0.0453	0.081	0.049
Beryllium	< 0.005	< 0.0005	< 0.0005
Cadmium	< 0.00002	0.00004	< 0.00002
Copper	0.0018	0.0067	0.0058
Chromium	0.0012	< 0.0006	< 0.0006
Iron	0.1	0.1	0.02
Lithium	< 0.005	< 0.005	< 0.005
Manganese	1.28	1.176	1.075
Mercury	< 0.00001	< 0.00001	< 0.00001
Molybdenum	0.029	0.0246	0.0101
Nickel	0.0248	0.047	0.0426
Lead	0.0119	< 0.0003	0.0014
Selenium	0.001	0.001	< 0.001
Antimony	0.0004	0.0018	< 0.0001
Tin	< 0.001	< 0.001	< 0.001
Strontium	0.33	0.408	0.366
Titanium	0.05	0.05	0.61
Thallium	< 0.005	< 0.005	< 0.005
Uranium	0.005	0.006	0.002
Vanadium	< 0.0005	< 5	< 0.005
Zinc	< 0.001	< 0.001	0.008
Dissolved aluminum	0.91	< 0.01	0.04
Dissolved silver			
Dissolved arsenic	0.005	0.006	0.011
Dissolved boron	0.07	< 0.05	0.08
Dissolved barium	0.046	0.074	0.047
Dissolved beryllium	< 0.005	< 0.005	< 0.005
Dissolved cadmium	< 0.005	< 0.005	< 0.005
Dissolved copper	< 0.005	0.006	0.005
Dissolved chromium	< 0.005	< 0.005	< 0.005
Dissolved iron	0.05	< 0.05	< 0.05
Dissolved lithium	< 0.01	< 0.01	< 0.01
Dissolved manganese	1.17	1.23	1.05
Dissolved mercury	< 0.0005	< 0.0005	< 0.0001
Dissolved molybdenum	0.02	0.026	0.027
Dissolved nickel	0.026	0.043	0.043
Dissolved lead	< 0.05	< 0.005	< 0.005
Dissolved selenium	< 0.005	< 0.005	< 0.005
Dissolved antimony	< 0.005	< 0.005	< 0.005
Dissolved tin	< 0.001	< 0.005	< 0.005
Dissolved strontium	0.33	0.33	< 0.39
Dissolved titanium	0.06	0.06	0.07
Dissolved thallium	< 0.01	< 0.01	< 0.01
Dissolved uranium	0.005	0.005	< 0.005
Dissolved vanadium	< 0.005	< 0.005	< 0.005
Dissolved zinc	< 0.005	< 0.005	< 0.005
Daphnia Magna		> 100	
Rainbow trout		> 100	

NA: Samples loss

*Taken on field par environment techni

Table 8.11: 2012 Sewage Treatment Plant Water Quality Monitoring**Sample Location: STP-SEP**

Date	Units	3-Jan-12	9-Jan-12	16-Jan-12	23-Jan-12	30-Jan-12	6-Feb-12	13-Feb-12	20-Feb-12	27-Feb-12
Ammonia	mg N/L									
Ammonia-Nitrogen	mg N/L	5.1	5.5	1.5	4.2	5	13	4.2		2.9
Total Kjeldahl Nitrogen	mg N/L	9	9	5	7	8	20	7	5	5
BOD-5	mg/L	<1	2	4	6	3	48	6	6	3
COD	mg/L	64	71	70	112	60	147	27	49	56
Total Suspended Solids	mg/L	9	18	<1	14	<1	60	26	15	7
Nitrate (NO3)	mg N/L	25.9	23.8	26.4	26.8	26.6	11.1	23.6	23.6	23.3
Nitrite (NO2)	mg N/L	0.05	0.94	0.27	0.07	0.1	16.6	0.03	0.02	0.01
Total Phosphorus	mg/L	11	9.6	13.7	10.6	10.1	11.2	10.8	11.1	21.1
pH *	units	4.8	5.2	4.8	4.9	4.70	4.30	4.10	4.30	4.50
Fecal Coliform	UFC/100 mL	32	48.0	430	40	36	208	<100	<4	<4
Total Coliform	UFC/100 mL	100	<100	3,000	200	<1000	600	9,200	200	<1000

Sample Location: STP-SEP

Date	Units	5-Mar-12	12-Mar-12	19-Mar-12	26-Mar-12	2-Apr-12	9-Apr-12	16-Apr-12	23-Apr-12	30-Apr-12
Ammonia	mg N/L									
Ammonia-Nitrogen	mg N/L	2.8	7	3.5	2.9	6.6	9.1	8.6	8	9.5
Total Kjeldahl Nitrogen	mg N/L	7	11	8	7	12	14	13	12	17
BOD-5	mg/L	5	7	7	5	11	9	5	8	9
COD	mg/L	76	55	78	50	72	69	55	62	179
Total Suspended Solids	mg/L	41	17	25	32	28	35	31	14	24
Nitrate (NO3)	mg N/L	25	24.8	22.7	21.9	23.1	24.7	22.7	23.1	28.3
Nitrite (NO2)	mg N/L	0.04	0.02	0.02	0.02	0.0	0.0	0.01	0.01	0.02
Total Phosphorus	mg/L	10.4	10.6	11	11	8.2	11.7	11.5	10.4	10.5
pH *	units	4.80	4.10	4.40	4.70	5.10	4.50	4.10	4.70	4.7
Fecal Coliform	UFC/100 mL	108	28	116	92.0	<100 000	40	30	44	20
Total Coliform	UFC/100 mL	<1000	300	4 400	1 000	8,000,000	300	200	< 10 000	1 400

Sample Location: STP-SEP

Date	Units	7-May-12	14-May-12	22-May-12	28-May-12	4-Jun-12	13-Jun-12	20-Jun-12	25-Jun-12
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia-nitrogen (NH3-N)	mg N/L	6.4	7	5.5	6.1	10.5	9.4	8.1	5
Total Kjeldahl Nitrogen	mg N/L	12	12	11	11	15	15	13	9
BOD-5	mg/L	11	10	9	9	13	9	19	6
COD	mg/L	61	49	49	58	60	48	74	68
Total Suspended Solids	mg/L	24	28	26	15	31	21.0	26.0	22.0
Nitrate (NO3)	mg N/L	22.3	21.9	21.5	22.3	21.8	20.4	22.5	22.3
Nitrite (NO2)	mg N/L	0.03	0.08	0.01	0.03	0.01	0.0	0.0	0.0
Total Phosphorus	mg/L	12.20	10.40	10.00	10.30	9.90	11.40	9.60	7.70
pH *	units	5.1	5.4	4.6	4.2	4.2	4.4	5.2	4.9
Fecal Coliform	UFC/100 mL	56	68	60	4	132	14	140	240
Total Coliform	UFC/100 mL	900		< 100	< 1000	<1000	< 1 000	***	< 10 000

Sample Location: STP-SEP

Date	Units	2-Jul-12	9-Jul-12	16-Jul-12	23-Jul-12	30-Jul-12	6-Aug-12	15-Aug-12	20-Aug-12	27-Aug-12
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia-Nitrogen	mg N/L	6.9	7.3	7.5	7.2	6.9	11.5	13.6	11.3	8
Total Kjeldahl Nitrogen	mg/L	8	11	11	13	12	18	18	15	13
BOD-5	mg/L	5	6	13	17	9	8	11	9	22
COD	mg/L	35	62	62	59	66	61	84	74	76
Total Suspended Solids	mg N/L	17	17	13	14	18	25	29	12	27
Nitrate (NO3)	mg N/L	19.2	20.9	22.9	25.0	22.0	21.1	22.3	24.4	20.9
Nitrite (NO2)	mg N/L	0.3	0.05	0.0	0.0	0.04	0.06	0.24	0.19	0.1
Total Phosphorus	units	13.8	9.70	9.70	11.50	10.60	11.3	15.7	9.3	11.4
pH *	mg/L	4.6	5.3	4.7	4.3	4.5	5.2	6.1	5.6	5.6
Fecal Coliform	UFC/100 mL	236	16	20	20	56	40	80	170	200
Total Coliform	UFC/100 mL	<10 000	< 1 000	200	< 100 000	< 10 000	1,000	1 600	1 700	<10 000

Sample Location: STP-SEP

Date	Units	3-Sep-12	10-Sep-12	18-Sep-12	24-Sep-12	2-Oct-12	8-Oct-12	15-Oct-12	22-Oct-12	29-Oct-12
Ammonia	mg N/L	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia-Nitrogen	mg N/L	9.5	7.7	19.5	8.4	8.5	6.5	9.3	11	12.7
Total Kjeldahl Nitrogen	mg/L	15	14	21	13	12	11	10	11	24
BOD-5	mg/L	11	10	20	9	14	10	8	19	29
COD	mg/L	93	56	81	79	68	96	71	69	76
Total Suspended Solids	mg N/L	20	29	4	14	19	20	16	17	20
Nitrate (NO3)	mg N/L	19.2	20	20.8	20.3	22.4	19.6	21.4	25.6	24.6
Nitrite (NO2)	mg N/L	0.37	0.13	0.73	0.05	0.08	0.01	0.05	0.06	0.13
Total Phosphorus	units	7.3	7.8	11.3	12.5	9.5	10	10.3	12.9	13
pH *	mg/L	6.1	5.3	6.3	5.3	5.8	5.6	5.6	5.4	5.8
Fecal Coliform	UFC/100 mL	68	108	220	10	32	48	84	20	168
Total Coliform	UFC/100 mL	200	600	1 100	100	32	400	300	<10000	< 1 000

Sample Location: STP-SEP

Date	Units	5-Nov-12	13-Nov-12	19-Nov-12	26-Nov-12	3-Dec-12	10-Dec-12	17-Dec-12
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05
Ammonia-Nitrogen	mg N/L	9.1	2.8	6.3	9.9	14.8	19.6	16.1
Total Kjeldahl Nitrogen	mg/L	11	4	4	14	20	24	19
BOD-5	mg/L	5	3	9	17	12	14	13
COD	mg/L	81	38	58	62	63	173	85
Total Suspended Solids	mg N/L	13	6	15	10	23	22	13
Nitrate (NO3)	mg N/L	21	17.4	19.4	18.3	19	19.7	18.2
Nitrite (NO2)	mg N/L	0.03	0.01	0.01	0.05	0.45	0.84	0.56
Total Phosphorus	units	4.5	9.9	9.2	9	9.7	11.3	11.4
pH *	mg/L	5.6	5.4	5.2	5.7	6.3	6.5	6
Fecal Coliform	UFC/100 mL	12	< 4	12	88	136	56	84
Total Coliform	UFC/100 mL	80	< 100	1500	6000	2 500	1000	1000

Sample Location: LJ-Mix

Date	Units	3-Jan-12	9-Jan-12	16-Jan-12	23-Jan-12	30-Jan-12	6-Feb-12	13-Feb-12	20-Feb-12	27-Feb-12
Ammonia	mg N/L									
Ammonia-nitrogen	mg N/L	13.5	10.7	13.5	8.8	13.7	3.4	28.5		9.4
Total Kjeldahl Nitrogen	mg N/L	19	14	21	15	20	7	30	13	16
BOD-5	mg/L	8	7	17	12	16	5	25	8	10
COD	mg/L	80	66	122	88	86	57	51	55	99
Total Suspended Solids	mg/L	20	11	8	22	36	9	45	20	29
Nitrate (NO3)	mg N/L	29.1	28.1	14.1	21.7	18.6	25	15.6	26.2	33.5
Nitrite (NO2)	mg N/L	8.3	0.62	22.4	5.8	12	0.02	2.5	1.2	0.16
Total Phosphorus	mg/L	12.8	9.3	15.6	10.4	10.6	12	10.2	9.4	15.3
pH *	units	6.6	4.9	5.6	5.6	5.5	5.9	6.8	5.9	4.7
Fecal Coliform	UFC/100 mL	100	16	20000	56	68	28	200	32	44
Total Coliform	UFC/100 mL	1000	30	40000	120	300	<100	200	<100	100

Sample Location: LJ-Mix

Date	Units	5-Mar-12	12-Mar-12	19-Mar-12	26-Mar-12	2-Apr-12	9-Apr-12	16-Apr-12	23-Apr-12	30-Apr-12
Ammonia	mg N/L									
Ammonia-nitrogen	mg N/L	7.5	18.4	9.8	13.2	7.4	13.3	13.3	22	10.7
Total Kjeldahl Nitrogen	mg N/L	13	24	16	20	11	20	18	26	26
BOD-5	mg/L	6	15	9	9	11	11	9	13	143
COD	mg/L	62	85	95	96	56	72	68	80	248
Total Suspended Solids	mg/L	36	34	21	7	31	38	40	30	2
Nitrate (NO3)	mg N/L	28.5	34.1	26	22.9	27.1	28.5	30.2	36.8	0.19
Nitrite (NO2)	mg N/L	0.19	0.2	0.06	0.22	0.04	0.12	<0.01	0.02	0.01
Total Phosphorus	mg/L	10.1	10.5	11.5	10.3	8	11.8	10.4	10.1	10
pH *	units	5.8	5.1	5.1	5.5	5	5.1	4.7	5.3	4.7
Fecal Coliform	UFC/100 mL	400	40	16	80	410	12	60	12	8
Total Coliform	UFC/100 mL	20000	300	100	600	70 000	300	300	< 1000	400

Sample Location: LJ-Mix

Date	Units	7-May-12	14-May-12	22-May-12	28-May-12	4-Jun-12	13-Jun-12	20-Jun-12	25-Jun-12
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.16	<0.05
Ammonia-nitrogen	mg N/L	9.4	16.5	15.1	11.3	12.8	12.9	18.5	12.9
Total Kjeldahl Nitrogen	mg N/L	19	23	23	18	17	21	40	13
BOD-5	mg/L	10	22	21	15	14	10	15	13
COD	mg/L	70	96	65	70	56	43	69	74
Total Suspended Solids	mg/L	23	41	41	15	27	13	32	23
Nitrate (NO3)	mg N/L	25.9	31.6	33.3	27.2	22.8	28.5	22.6	30.5
Nitrite (NO2)	mg N/L	0.18	0.08	0.04	0.13	0.1	0.06	1.6	<0.01
Total Phosphorus	mg/L	12.7	12.9	9	10.8	9.7	9.1	8	7.9
pH *	units	5	5.7	5.8	5.5	5.1	5.3	6.2	5
Fecal Coliform	UFC/100 mL	24	900	300	24	40	140	340	600
Total Coliform	UFC/100 mL	< 1000	300	1 800	300	400	1 400	6 000	<100 000

Sample Location: LJ-Mix

Date	Units	2-Jul-12	9-Jul-12	16-Jul-12	23-Jul-12	30-Jul-12	6-Aug-12	15-Aug-12	20-Aug-12	27-Aug-12
Ammonia	mg N/L	<0.05	<0.05	<0.05	no flow	<0.05	<0.05	<0.05	<0.05	<0.05
Ammonia-nitrogen	mg N/L	11	8.6	7.2	no flow	9.3	17.3	9.8	14.7	10.6
Total Kjeldahl Nitrogen	mg N/L	13	14	13	no flow	16	26	16	21	18
BOD-5	mg/L	8	9	15	no flow	18	19	12	25	42
COD	mg/L	64	73	95	no flow	79	86	92	85	130
Total Suspended Solids	mg/L	40	30	20	no flow	29	50	34	31	63
Nitrate (NO3)	mg N/L	20	22.6	23.1	no flow	22.5	24.3	23.5	22.3	23.2
Nitrite (NO2)	mg N/L	0.07	0.1	0.08	no flow	0.21	0.13	0.14	0.99	0.04
Total Phosphorus	mg/L	14.4	10.4	9.9	no flow	11.5	11.1	17	0.43	12.4
pH *	units	4.8	5.4	5.4	no flow	5.4	5.9	6.1	6	5.8
Fecal Coliform	UFC/100 mL	90	48	60	no flow	80	250	80	<100	100
Total Coliform	UFC/100 mL	<100 000	2 000	200	no flow	<1000	3000	2 400	2 000	3 000

Sample Location: LJ-Mix

Date	Units	3-Sep-12	10-Sep-12	18-Sep-12	24-Sep-12	2-Oct-12	8-Oct-12	15-Oct-12	22-Oct-12	29-Oct-12
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	0.08	<0.05
Ammonia-nitrogen	mg N/L	9.3	10.3	14.9	15.2	16.2	10.4	17.7	21.3	12.8
Total Kjeldahl Nitrogen	mg N/L	18	17	15	20	20	16	16	21	24
BOD-5	mg/L	30	8	9	19	13	24	7	19	29
COD	mg/L	119	65	71	86	89	83	67	81	68
Total Suspended Solids	mg/L	40	44	4	22	27	28	14	24	23
Nitrate (NO3)	mg N/L	23.6	22.3	25.2	23.6	23.5	19.5	20.7	29.2	22.5
Nitrite (NO2)	mg N/L	0.07	0.2	0.16	0.24	0.24	0.24	0.84	0.49	0.33
Total Phosphorus	mg/L	8.2	8.8	11.1	12.3	8.9	10	8.8	14	11
pH *	units	5.8	5.4	6.4	5.4	5.2	5.2	6.6	6.8	6.3
Fecal Coliform	UFC/100 mL	240	1 300	104	40	60	28	100	360	180
Total Coliform	UFC/100 mL	1 000	4 000	300	1700	300	300	300	2000	180

Sample Location: LJ-Mix

Date	Units	5-Nov-12	13-Nov-12	19-Nov-12	26-Nov-12	3-Dec-12	10-Dec-12	17-Dec-12
Ammonia	mg N/L	<0.05	0.09	0.1	<0.05	<0.05	<0.05	<0.05
Ammonia-nitrogen	mg N/L	21.6	24.6	37.1	10.4	14.1	15.2	14
Total Kjeldahl Nitrogen	mg N/L	23	32	31	17	20	18	20
BOD-5	mg/L	15	23	48	7	3	10	18
COD	mg/L	61	76	80	40	43	75	91
Total Suspended Solids	mg/L	17	33	21	11	11	28	30
Nitrate (NO3)	mg N/L	17.7	17.2	24	22.6	27	21.1	18.8
Nitrite (NO2)	mg N/L	0.34	0.3	0.35	0.01	0.04	0.25	0.22
Total Phosphorus	mg/L	6.8	9.5	8.2	10.8	11.5	11	12
pH *	units	6.6	7.1	6.9	5.4	6.1	5.1	6
Fecal Coliform	UFC/100 mL	168	3 600	340	290	40	< 10	20
Total Coliform	UFC/100 mL	800	24 000	1800	290	200	< 100	100

Footnotes:

* parameter measured in field by STP operators

Table 8.12: 2012 Sewage Treatment Plant Waste Volume

Month	Liquid Sewage Volume (m ³)	Sewage Sludge Volume (m ³)
	Readings from Equalization Tank at STP	STP
January	2897	20.4
February	2848	31.4
March	2913	27.2
April	2611	39.1
May	2735	13.6
June	2530	58.4
July	2553	27.2
August	2809	44.5
September	2777	27.2
October	2741	13.6
November	2955	59.3
December	2935	20.4
Total	33,304	382.3

Table 8.13: 2012 Secondary Containment Water Quality at the Meadowbank Bulk Fuel Storage Facility (Mb-Fuel)

	Units	Maximum Allowable Concentration *	28-May-12	4-Sep-12
Arsenic	mg/L		0.0037	0.0015
Benzene	ug/L	370	< 0.3	< 0.3
Toluene	ug/L	2	< 0.3	< 0.3
Ethylbenzene	ug/L	90	< 0.3	< 0.3
Total Xylenes	ug/L		< 0.3	< 0.3
Conductivity			228	504
Copper	mg/L		0.0027	< 0.0005
Total Cyanide	mg/L		< 0.005	0.005
Total oil and grease	mg/L	15	< 1	< 1
Total Suspended Solids	mg/L		12	3
Turbidity			31	1
Nickel	mg/L		0.0051	0.0024
Ammonia	mg N/L		NA	< 0.05
pH**	units		7.59	7.88
Lead	mg/L	0.001	0.0026	0.0016
Zinc	mg/L		0.003	0.001

Footnotes:

* NWB Type A water license 2AM-MEA0815, Part F, Item 6

**Take on field by environment department

Highlighted values exceed the maximum allowable concentration

Table 8.14: 2012 Secondary Containment Water Quality at the Baker Lake Bulk Fuel Storage Facility (ST-40)

	Units	Maximum Allowable Concentration *	BL tank farm 1-4 (old) 27-May-12	BL tank farm 5-6 (new) 27-May-12	BL tank farm 1-4 (old) 27-Sep-12	BL tank farm 5-6 (new) 27-Sep-12
Ammonia nitrogen	mg N/L		< 0.01	< 0.01	NA	0.08
Arsenic	mg/L	1	< 0.0005	< 0.0005	NA	< 0.0005
Benzene	ug/L	370	< 0.30	< 0.06	NA	< 0.30
Copper	mg/L	0.6	0.0039	0.0103	NA	0.004
Ethylbenzene	ug/L	90	< 0.30	< 0.06	NA	< 0.30
Lead**	mg/L	0.001/0.1	< 0.0003	< 0.0003	NA	< 0.0003
Nickel	mg/L	1	0.0012	0.0021	NA	0.0009
pH***	units	6.0-9.5	8.83	9.14	NA	8.28
Toluene	ug/L	2	< 0.30	< 0.06	NA	< 0.30
Total Cyanide	mg/L	0.2	< 0.005	< 0.005	NA	< 0.005
Total oil and grease	mg/L	5	1	< 1	NA	7
Total Xylenes	ug/L		< 0.30	< 0.06	NA	< 0.30
TSS	mg/L	30	< 1	20	NA	6
Zinc	mg/L	1	0.008	0.016	NA	< 0.001
Aluminium	mg/L		0.215	2.26	NA	0.694
Antimony	mg/L		< 0.0001	< 0.0001	NA	< 0.0001
Barium	mg/L		0.0638	0.0295	NA	0.0326
Beryllium	mg/L		< 0.0005	< 0.0005	NA	< 0.0005
Cadmium	mg/L		< 0.00002	< 0.00002	NA	< 0.00002
Chrome	mg/L		0.0015	0.0039	NA	< 0.0006
Cobalt	mg/L		< 0.0005	0.0013	NA	< 0.0005
Tin	mg/L		< 0.001	< 0.001	NA	< 0.001
Iron	mg/L		0.13	2.40	NA	0.52
Lithium	mg/L		< 0.005	< 0.005	NA	< 0.005
Manganese	mg/L		0.0063	0.0469	NA	0.0086
Molybdenum	mg/L		< 0.0005	< 0.0005	NA	0.0036
Selenium	mg/L		< 0.001	< 0.001	NA	0.001
Strontium	mg/L		0.062	0.033	NA	0.110
Thallium	mg/L		< 0.005	< 0.005	NA	< 0.005
Titanium	mg/L		0.01	0.04	NA	0.03

	Units	Maximum Allowable Concentration *	BL tank farm 1-4 (old) 27-May-12	BL tank farm 5-6 (new) 27-May-12	BL tank farm 1-4 (old) 27-Sep-12	BL tank farm 5-6 (new) 27-Sep-12
Uranium	mg/L		< 0.001	0.001	NA	0.007
Vanadium	mg/L		< 0.0005	< 0.0005	NA	< 0.0005
Hydrocarbons C10-C50	mg/L		< 0.1	< 0.1	NA	< 0.1
Turbidity***	mg/L		8.29	98	NA	14.18
Conductivity***	ug/L		211	143	NA	357
Temperature***	°C		9.23	9.61	NA	8.28

Footnotes:

* NWB Type A water license 2AM-MEA0815, Part F, Item 23

** two allowable concentrations are listed in the license

***Take on field by environment department

Highlighted values exceed the maximum allowable concentration

NA: No data, technician didn't take the sample

Table 8.15: 2012 East Dike Seepage Water Quality Monitoring (ST-S-1)

Date		3-Jan-12	3-Jan-12	13-Feb-12	13-Feb-12	6-Mar-12	6-Mar-12	3-Apr-12
Lab Identification		SW-4a South east dike seepage south	SW-4a North east dike seepage north	SW-4 South east dike seepage south	SW-4 North east dike seepage north	SW-4 South east dike seepage south	SW-4 North east dike seepage north	SW-4 ST-S-1
Station Name	Units							
Alkalinity	mg CaCO ₃ /L	45	28	19	25	20	23	34
Ammonia	mg N/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloride	mg/L	1.4	1.5	1.2	1.2	1.5	0.7	2.0
Conductivity*	µs/cm	41	40	52	57	78	57	84
Hardness	mg CaCO ₃ /L	20	22	27	33	24	27	42
Nitrate	mg N/L	0.19	0.14	0.06	0.13	0.24	0.12	0.55
Nitrite	mg N/L	< 0.01	< 0.01					
Sulphate	mg SO ₄ /L	4	< 1	2	3	2	1	7
pH*		7.17	8.12	8.08	8.48	7.09	8.51	7.45
Turbidity*	NTU	0.69	1.71	2.01	4.14	4.55	1.32	1.46
Silver	mg/L	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Aluminium	mg/L	0.053	0.059	< 0.006	< 0.006	0.773	0.047	0.076
Arsenic	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0051
Baryum	mg/L	0.0047	0.0045	0.0067	0.0082	0.0052	0.0054	0.0125
Cadmium	mg/L	< 0.00002	< 0.00002	0.00024	0.00023	< 0.00002	< 0.00002	< 0.00002
Chrome	mg/L	0.0034	0.0075	0.0144	0.0139	0.0042	< 0.0006	< 0.0006
Cooper	mg/L	0.0009	< 0.0005	0.0031	0.0125	< 0.0005	0.0130	0.0011
Fluoride	mg/L	0.08	0.08	0.14	0.10	0.11	0.12	< 0.02
Iron	mg/L	0.06	0.03	0.05	0.05	0.24	< 0.01	0.07
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Manganese	mg/L	0.006	0.001	0.003	0.003	0.011	< 0.001	0.011
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	0.0012	< 0.0005	< 0.0005	0.0025
Nickel	mg/L	0.0011	0.0017	0.0019	0.0025	0.0029	< 0.0005	0.0005
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	0.0017	0.0491	< 0.0003	< 0.0003
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thalium	NTU	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	mg/L	0.010	0.016	0.020	0.032	0.015	0.015	0.001

Footnotes:

* Parameter measured in the field by
environment department

Date		18-Apr-12	1-May-12	15-May-12	29-May-12	12-Jun-12	26-Jun-12	12-Jul-12
Lab Identification		S-ED	S-ED	S-ED	S-ED	S-ED	S-ED	S-ED
Station Name	Units	ST-S-1	ST-S-1	ST-S-1	ST-S-1	ST-S-1	ST-S-1	ST-S-1
Alkalinity	mg CaCO ₃ /L	33	24	30	17	51	43	32
Ammonia	mg N/L	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Chloride	mg/L	0.8	0.9	1.4	1.2	5.0	0.5	0.9
Conductivity*	µs/cm	55	92	141	101	203	60	78
Hardness	mg CaCO ₃ /L	23	21	35	28	54	26	36
Nitrate	mg N/L	0.07	0.07	0.14	0.15	2.60	0.33	0.68
Nitrite	mg N/L							
Sulphate	mg SO ₄ /L	5	5	3	4	23	5	8
pH*		8.08	6.98	7.58	7.41	7.50	7.20	7.69
Turbidity*	NTU	1.34	0.74	2.85	8.18	8.75	1.45	15.58
Silver	mg/L	< 0.0002	< 0.0002	< 0.0002	0.0002	< 0.0002	< 0.0002	0.0343
Aluminium	mg/L	0.023	0.032	0.140	0.146	0.122	0.069	0.243
Arsenic	mg/L	0.0005	< 0.0005	< 0.0005	0.0059	0.0032	< 0.0005	0.0094
Baryum	mg/L	0.0071	0.0062	0.0071	0.0085	0.0206	0.0072	0.0104
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chrome	mg/L	< 0.0006	0.0027	< 0.0006	0.0008	< 0.0006	0.0028	0.0013
Cooper	mg/L	< 0.0005	< 0.0005	0.0005	0.0012	0.0019	0.0013	0.0061
Fluoride	mg/L	0.10	0.08	0.09	0.08	0.33	0.07	0.08
Iron	mg/L	0.03	< 0.01	0.11	0.26	0.21	< 0.01	0.32
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Manganese	mg/L	0.002	0.006	0.004	0.013	0.036	0.004	0.010
Molybdenum	mg/L	< 0.0005	< 0.0005	< 0.0005	< 0.0005	0.0115	< 0.0005	0.0009
Nickel	mg/L	< 0.0005	0.0013	0.0008	0.0029	0.0023	0.0011	0.0020
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	< 0.0003	0.0228	0.0151	< 0.0003
Selenium	mg/L	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Thalium	NTU	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	mg/L	< 0.001	< 0.001	0.001	0.003	< 0.001	0.014	< 0.001

Footnotes:

* Parameter measured in the field by
environment department

Date		24-Jul-12	7-Aug-12	21-Aug-12	4-Sep-12	18-Sep-12	1-Oct-12	17-Oct-12
Lab Identification		S-ED	S-ED	S-ED	S-ED	ST-S-1	ST-S-1	ST-S-1
Station Name	Units	ST-S-1	ST-S-1	ST-S-1	ST-S-1	ST-S-1	ST-S-1	ST-S-1
Alkalinity	mg CaCO ₃ /L	34	59	51	35	49	51	47
Ammonia	mg N/L	< 0.05	< 0.05	< 0.05	0.29	< 0.05	< 0.05	< 0.05
Chloride	mg/L	< 0.0	3.5	3.9	4.6	0.7	< 0.5	1.4
Conductivity*	µs/cm	116	151	172	61	82	72	48
Hardness	mg CaCO ₃ /L	37	121	39	28	36	26	20
Nitrate	mg N/L	0.86	5.40	0.73	0.13	0.33	0.11	0.07
Nitrite	mg N/L					< 0.01	< 0.01	< 0.01
Sulphate	mg SO ₄ /L	14	102	18	5	11	5	3
pH*		6.76	7.56	7.50	8.01	7.10	8.06	7.23
Turbidity*	NTU	10.14	7.59	15.89	8.02	0.73	105.10	1.04
Silver	mg/L	< 0.0002	< 0.0002	< 0.0002	<0.0002	< 0.0002	< 0.0002	< 0.0002
Aluminium	mg/L	0.303	0.145	< 0.006	0.157	0.147	0.082	0.054
Arsenic	mg/L	0.0016	0.0046	< 0.0005	<0.0005	< 0.0005	< 0.0005	0.0011
Baryum	mg/L	0.0106	0.0312	0.0082	0.0110	0.0070	0.0065	0.0042
Cadmium	mg/L	< 0.00002	< 0.00002	< 0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002
Chrome	mg/L	< 0.0006	0.0070	< 0.0006	<0.0006	0.0015	< 0.0006	0.0014
Cooper	mg/L	0.0011	0.0014	< 0.0005	0.0006	0.0014	0.0009	0.0014
Fluoride	mg/L	0.10	0.29	0.09	0.08	0.06	0.08	0.07
Iron	mg/L	0.57	0.22	0.06	0.27	0.07	0.07	0.08
Mercury	mg/L	< 0.00001	< 0.00001	< 0.00001	<0.00001	< 0.00001	< 0.00001	< 0.00001
Manganese	mg/L	0.022	0.035	0.010	0.015	0.011	0.005	0.002
Molybdenum	mg/L	< 0.0005	< 0.0244	< 0.0005	0.0007	< 0.0005	< 0.0005	< 0.0005
Nickel	mg/L	0.0042	0.0053	< 0.0005	0.0009	0.0011	0.0016	0.0028
Lead	mg/L	< 0.0003	< 0.0003	< 0.0003	<0.0003	0.0080	0.0030	0.0020
Selenium	mg/L	< 0.001	< 0.001	< 0.001	<0.001	< 0.001	< 0.001	< 0.001
Thalium	NTU	< 0.005	< 0.005	< 0.005	<0.001	< 0.005	< 0.005	< 0.005
Zinc	mg/L	< 0.001	0.009	< 0.001	<0.001	0.030	< 0.001	< 0.001

Footnotes:

* Parameter measured in the field by
environment department

Date		29-Oct-12	20-Nov-12	26-Nov-12	11-Dec-12
Lab Identification		ST-S-1	ST-S-1	ST-S-1	ST-S-1
Station Name	Units	ST-S-1	ST-S-1	ST-S-1	ST-S-1
Alkalinity	mg CaCO ₃ /L	36	37	52	43
Ammonia	mg N/L	< 0.05	< 0.05	< 0.05	< 0.05
Chloride	mg/L	0.5	0.7	0.6	< 0.5
Conductivity*	µs/cm	51	42	58	185
Hardness	mg CaCO ₃ /L	18	25	18	21
Nitrate	mg N/L	0.07	0.05	0.11	0.03
Nitrite	mg N/L	< 0.01	< 0.01	< 0.01	< 0.01
Sulphate	mg SO ₄ /L	5	4	4	1
pH*		6.88	7.84	6.68	6.94
Turbidity*	NTU	2.96	2.29	12.74	1.62
Silver	mg/L	0.0004	< 0.0010	< 0.0002	< 0.0002
Aluminium	mg/L	0.081	0.110	0.134	0.030
Arsenic	mg/L	0.0011	< 0.0010	0.0015	< 0.0005
Baryum	mg/L	0.0052	< 0.0200	0.0065	0.0057
Cadmium	mg/L	0.00012	0.00030	< 0.00002	< 0.00002
Chrome	mg/L	< 0.0006	< 0.0050	0.0020	0.0036
Cooper	mg/L	< 0.0005	< 0.0020	0.0006	< 0.0005
Fluoride	mg/L	0.06	0.06	0.06	0.08
Iron	mg/L	0.03	0.12	0.24	0.13
Mercury	mg/L	0.00001	< 0.00010	0.00070	< 0.00001
Manganese	mg/L	< 0.001	< 0.004	0.007	0.003
Molybdenum	mg/L	0.0839	< 0.0050	< 0.0005	< 0.0005
Nickel	mg/L	< 0.0005	< 0.0020	< 0.0005	< 0.0005
Lead	mg/L	< 0.0003	< 0.0010	0.0007	< 0.0003
Selenium	mg/L	< 0.001	< 0.010	< 0.001	< 0.001
Thalium	NTU	< 0.005	0.020	< 0.005	< 0.005
Zinc	mg/L	< 0.001	< 0.007	0.003	< 0.001

Footnotes:

* Parameter measured in the field by
environment department

Table 8.16 - 2012 MMER Effluent Monitoring

	Units	Maximum Allowable Concentration							
Date Time	DD-Mon-YY HH-MM		January	February	March	April	15-May-12	22-May-12	28-May-12
Arsenic	mg/L	1	NDEP	NDEP	NDEP	NDEP	<0.0005	NMR	NMR
Copper	mg/L	0.6	NDEP	NDEP	NDEP	NDEP	0.0049	NMR	NMR
Cyanide	mg/L	2	NDEP	NDEP	NDEP	NDEP	0.019	NMR	NMR
Lead	mg/L	0.4	NDEP	NDEP	NDEP	NDEP	<0.0003	NMR	NMR
Nickel	mg/L	1	NDEP	NDEP	NDEP	NDEP	0.0143	NMR	NMR
Zinc	mg/L	1	NDEP	NDEP	NDEP	NDEP	0.005	NMR	NMR
Total Suspended Solids	mg/L	30	NDEP	NDEP	NDEP	NDEP	1	20	10
Radium 226	Bq/L	1.11	NDEP	NDEP	NDEP	NDEP	<0.002	NMR	NMR
pH *	units	6-9.5	NDEP	NDEP	NDEP	NDEP	7.69	7.24	7.01
Daphnia magna	LC50 %		NDEP	NDEP	NDEP	NDEP	>100	NMR	NMR
Rainbow trout	LC50 %		NDEP	NDEP	NDEP	NDEP	>100	NMR	NMR

	Units	Maximum Allowable Concentration							
Date Time	DD-Mon-YY HH-MM		4-Jun-12	11-Jun-12	18-Jun-12	25-Jun-12	2-Jul-12	9-Jul-12	10-Jul-12 8:30
Arsenic	mg/L	1	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Copper	mg/L	0.6	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Cyanide	mg/L	2	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Lead	mg/L	0.4	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Nickel	mg/L	1	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Zinc	mg/L	1	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Total Suspended Solids	mg/L	30	5	10	4	5	2	7	NMR
Radium 226	Bq/L	1.11	NMR	NMR	NMR	NMR	NMR	NMR	NMR
pH *	units	6-9.5	6.95	6.98	7.01	7.1	6.99	7.04	NMR
Daphnia magna	LC50 %		NMR	NMR	NMR	NMR	NMR	NMR	>100
Rainbow trout	LC50 %		NMR	NMR	NMR	NMR	NMR	NMR	>100

	Units	Maximum Allowable Concentration							
Date	DD-Mon-YY		18-Jul-12	26-Jul-12	1-Aug-12	7-Aug-12	13-Aug-12	21-Aug-12	27-Aug-12
Time	HH-MM		7:45			9:15	9:30		
Arsenic	mg/L	1	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Copper	mg/L	0.6	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Cyanide	mg/L	2	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Lead	mg/L	0.4	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Nickel	mg/L	1	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Zinc	mg/L	1	NMR	NMR	NMR	NMR	NMR	NMR	NMR
Total Suspended Solids	mg/L	30	2	4	6	NA	3	6	4
Radium 226	Bq/L	1.11	NMR	NMR	NMR	NMR	NMR	NMR	NMR
pH *	units	6-9.5	7.90	7.81	7.90	7.61	6.96	6.94	6.95
Daphnia magna	LC50 %		NMR	NMR	NMR	>100	NMR	NMR	NMR
Rainbow trout	LC50 %		NMR	NMR	NMR	>100	NMR	NMR	NMR

	Units	Maximum Allowable Concentration							
Date	DD-Mon-YY		3-Sep-12	11-Sep-12	18-Sep-12	26-Sep-12	October	5-Nov-12	December
Time	HH-MM				8:00	9:15		7:55	
Arsenic	mg/L	1	NMR	NMR	0.0023	NMR	NDPR	0.0078	NDPR
Copper	mg/L	0.6	NMR	NMR	0.0071	NMR	NDPR	0.0067	NDPR
Cyanide	mg/L	2	NMR	NMR	0.138	NMR	NDPR	0.245	NDPR
Lead	mg/L	0.4	NMR	NMR	0.0099	NMR	NDPR	<0.0003	NDPR
Nickel	mg/L	1	NMR	NMR	0.0308	NMR	NDPR	0.047	NDPR
Zinc	mg/L	1	NMR	NMR	0.009	NMR	NDPR	<0.001	NDPR
Total Suspended Solids	mg/L	30	2	3	4	4	NDPR	6	NDPR
Radium 226	Bq/L	1.11	NMR	NMR	0.05	NMR	NDPR	0.048	NDPR
pH *	units	6-9.5	7.38	7.26	7.25	7.71	NDPR	6.77	NDPR
Daphnia magna	LC50 %		NMR	NMR	NMR	NMR	NDPR	>100	NDPR
Rainbow trout	LC50 %		NMR	NMR	NMR	NMR	NDPR	>100	NDPR

Footnotes:

* Parameter measured in field by environment department

NDEP (No Deposit) = measurement not taken because there was no deposit from the final discharge point

NMR (No Measurement Required) = measurement not taken in accordance with the conditions set out in section 12 or 13 of the MMER

Table 8.17: 2012 EEM Monitoring

Dewatering Final Discharge 1 OR Attenuation Pond Discharge	Date Time	28 mai 2012 7:30	2-Jul-12 7:00	13-Aug-12 9:30	9-Nov-12 7:50
Alkalinity	mg CaCO ₃ /L	80	54	62	91
Aluminium	mg/L	2.470	0.531	0.642	0.660
Ammonia	mg N/L	<0.05	<0.05	0.08	0.11
Cadmium	mg/L	0.00002	<0.00002	<0.00002	<0.00002
Conductivity	µs/cm	1123	464	746	860
Hardness	mg CaCO ₃ /L	296	90	258	202
Iron	mg/L	0.25	0.19	0.05	<0.01
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	0.0171	0.0073	0.0212	0.0148
Nitrate	mg N/L	2.4	1.4	11.6	17.2
Selenium	mg/L	0.001	<0.001	<0.001	<0.001
Temperature	°C	15.39	15.9	15.19	12.76
Fathead Minnow IC25	% v/v	>100	NR	>100	NA
Fathead Minnow LC50	% v/v	>100	NR	>100	>100
Ceriodaphnia dubia IC25	% v/v	NA	NR	27.44	17.3
Ceriodaphnia dubia LC50	% v/v	NA	NR	>100	>100
Freshwater Alga IC25	% v/v	>90.90	NR	>90.9	>90.9
Lemna minor IC25 (dw)	% v/v	29.32	NR	59.95	66.75
Lemna minor IC25 (f#)	% v/v	23.18	NR	92.98	90.92

TPN (Exposure Area)	Date Time	26-Feb-12 NA	18-Apr-12 NA	14-Aug-12 12:00	19-Sep-12 14:00
Alkalinity	mg CaCO ₃ /L	<2	4	45	41
Aluminum	mg/L	0.01	<0.006	0.156	<0.006
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05
Arsenic	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002
Conductivity	µs/cm	17	NA	13	23
Copper	mg/L	<0.0005	<0.0005	0.0024	<0.0005
Cyanide	mg/L	<0.005	<0.005	<0.005	<0.005
Dissolved oxygen *	mg/L	15.02	11.9	9.61	10.27
Hardness	mg CaCO ₃ /L	10	5	12	7
Iron	mg/L	<0.01	<0.01	0.04	<0.01
Lead	mg/L	<0.0003	0.0270	<0.0003	0.0044
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	<0.0005	<0.0005	<0.0005	0.0006
Nitrate	mg N/L	0.03	0.07	<0.01	0.11
pH *	Units	6.89	7.91	7.59	7.10
Radium 226	Bq/L	<0.002	<0.002	0.003	<0.002
Selenium	mg/L	NA	<0.001	<0.001	<0.001
Temperature *	(°C)	-0.40	0.78	9.92	7.83
Total suspended solids	mg/L	<1	<1	5	<1
Zinc	mg/L	0.006	0.013	0.002	<0.001

TPS (Reference Area)	Date Time	26-Feb-12 NA	18-Apr-12 NA	14-Aug-12 10:25	19-Sep-12 13:00
Alkalinity	mg CaCO ₃ /L	<2	4	42	35
Aluminum	mg/L	0.009	0.0014	0.119	0.173
Ammonia	mg N/L	<0.05	<0.05	<0.05	<0.05
Arsenic	mg/L	<0.0005	0.001	<0.0005	<0.0005
Cadmium	mg/L	<0.00002	<0.00002	<0.00002	<0.00002
Conductivity	µs/cm	14	NA	12	23
Copper	mg/L	<0.0005	0.0007	0.002	<0.0005
Cyanide	mg/L	<0.005	<0.005	0.012	<
Dissolved oxygen *	mg/L	14.22	11.23	2.61	8.89
Hardness	mg CaCO ₃ /L	9	4	13	9
Iron	mg/L	<0.01	<0.01	0.06	<0.01
Lead	mg/L	0.0021	0.0154	<0.0003	<0.0003
Mercury	mg/L	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Nickel	mg/L	<0.0005	<0.0005	<0.0005	<0.0005
Nitrate	mg N/L	0.03	0.03	<0.01	0.06
pH *	Units	7.04	7.04	7.69	7.45
Radium 226	Bq/L	<0.002	<0.002	0.005	<0.002
Selenium	mg/L	NA	<0.001	<0.001	<0.001
Temperature *	(°C)	0.47	0.67	9.77	8.16
Total suspended solids	mg/L	<1	1	8	1
Zinc	mg/L	0.009	0.011	0.003	<0.001

Footnotes:

NDEP : No discharge

NR : Not required

NA: Date not available

* Parameters measured in the field

Table 8.18 - 2012 MMER Effluent Volume

Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	0	0	0	0	0	14970	22690	6669	6300	0	3700	0
2	0	0	0	0	0	26748	25740	4172	6460	0	8670	0
3	0	0	0	0	0	28320	16070	2850	6140	0	13180	0
4	0	0	0	0	0	31210	20560	1080	5240	0	14410	0
5	0	0	0	0	0	30732	26540	4740	0	0	14420	0
6	0	0	0	0	0	31930	11710	570	6420	0	14360	0
7	0	0	0	0	0	31400	10980	2370	5980	0	14570	0
8	0	0	0	0	0	32170	13740	1820	6280	0	12050	0
9	0	0	0	0	0	27430	13690	2510	5720	0	5200	0
10	0	0	0	0	0	31790	4690	2131	6630	0	12570	0
11	0	0	0	0	0	30300	10960	4790	5670	0	8060	0
12	0	0	0	0	0	14060	3710	5560	5530	0	6200	0
13	0	0	0	0	2470	12760	6070	3530	5890	0	0	0
14	0	0	0	0	5780	13810	11600	5520	6550	0	0	0
15	0	0	0	0	6120	12810	17390	14430	6170	0	0	0
16	0	0	0	0	11990	24610	14370	9230	5160	0	0	0
17	0	0	0	0	14262	20330	0	6070	6050	0	0	0
18	0	0	0	0	15788	19573	7310	5970	5810	0	0	0
19	0	0	0	0	16340	23397	6830	4910	1970	0	0	0
20	0	0	0	0	13880	16060	3770	0	0	0	0	0
21	0	0	0	0	17320	16460	8510	5510	2360	0	0	0
22	0	0	0	0	10090	5010	25770	0	0	0	0	0
23	0	0	0	0	15060	17953	11700	0	3230	0	0	0
24	0	0	0	0	12720	18097	0	0	4710	0	0	0
25	0	0	0	0	19880	23010	1020	5870	6530	0	0	0
26	0	0	0	0	17340	30300	5590	5760	6140	0	0	0
27	0	0	0	0	16520	26140	10190	5470	5360	0	0	0
28	0	0	0	0	9010	16860	18050	6190	0	0	0	0
29	0	0	0	0	17730	14745	6170	6390	0	0	0	0
30	0		0	0	19400	17920	2410	6160	0	0	0	0
31	0		0		8640		3011	6300		0		0
Total (m³)	0	0	0	0	250,340	660,905	340,841	136,572	132,300	0	127,390	0

Table 8.19: 2012 MMER & EEM QAQC

Duplicate / Field Blank Analytical Certificate ID	Units	26-Feb-12				14-Aug-12			
		Original ID	Duplicate ID	RPD	Field Blank	Original ID	Duplicate ID	RPD	Field Blank
		TPN	TPN-DUP		TPN-FB	TPS	TPS-DUP		TPS-FB
Total Suspended Solids	mg/L	< 1	< 1	0	< 1	8	7	13	6
Alkalinity	mg CaCO ₃ /L	< 2	5	-86	< 2	42	45	-7	26
Ammonia	mg N/L	< 0.05	< 0.1	0	< 0.05	< 0.05	< 0.05	0	< 0.05
Hardness	mg CaCO ₃ /L	10	6	50	< 1	13	12	8	< 1
Nitrate	mg/L	0.03	0.04	-29	0.01	< 0.01	< 0.01	0	< 0.01
Aluminum	mg/L	0.01	< 0.006	50	< 0.006	0.119	0.075	45	0.025
Arsenic	mg/L	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	0	< 0.0005
Copper	mg/L	< 0.0005	< 0.0005	0	< 0.0005	0.002	0.0009	76	< 0.0005
Cyanide (total)	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	< 0.005
Lead	mg/L	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0.0003	0	0.0046
Nickel	mg/L	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	0	0.0013
Zinc	mg/L	0.006	< 0.001	143	0.003	0.003	< 0.001	100	0.002
Radium 226	mg/L	< 0.002	< 0.002	0	< 0.002	0.005	0.004	22	0.003
Cadmium	mg/L	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	< 0.00002	0	< 0.00002
Iron	mg/L	< 0.01	< 0.01	0	< 0.01	0.06	0.06	0	< 0.01
Mercury	mg/L	< 0.00001	< 0.00001	0	< 0.00001	< 0.00001	< 0.00001	0	< 0.00001
Molybdenum	mg/L	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	0	< 0.0005

Duplicate / Field Blank Analytical Certificate ID	Units	15-May-12				25-Jun-12			
		Original ID MMER-1	Duplicate ID MMER-1- DUP	RPD	Field Blank MMER-1-FB	Original ID MMER-1	Duplicate ID MMER-1- DUP	RPD	Field Blank MMER-1- BLANK
Total Suspended Solids	mg/L	1	1	0	< 1	5	4	22	< 1
Arsenic	mg/L	< 0.0005	< 0.0005	0	< 0.0005				
Copper	mg/L	0.0049	0.0044	11	0.0008				
Cyanide (total)	mg/L	0.019	0.118	-145	0.04				
Lead	mg/L	< 0.0003	< 0.0003	0	< 0.0003				
Nickel	mg/L	0.0143	0.0138	4	< 0.0005				
Zinc	mg/L	0.005	0.002	86	0.006				
Radium 226	Bq/L	< 0.002	< 0.002	0	0.007				

Duplicate / Field Blank Analytical Certificate ID	Units	23-Jul-12				11-Sep-12		
		Original ID MMER-1	Duplicate ID MMER-1- DUP	RPD	Field Blank MMER-1- BLANK	Original ID ST-MMER-1	Duplicate ID ST-MMER- 1-DUP	RPD
Total Suspended Solids	mg/L		< 1		< 1	3	3	0
Arsenic	mg/L							
Copper	mg/L							
Cyanide (total)	mg/L							
Lead	mg/L							
Nickel	mg/L							
Zinc	mg/L							
Radium 226	Bq/L							

Duplicate / Field Blank Analytical Certificate ID	Units	2-Jul-12				RPD	Field Blank EEM-1-FB
		Original ID EEM-1	Duplicate ID EEM-1-DUP				
Alkalinity	mg CaCO3/L	54	55.0	-2		34	
Ammonia	mg N/L	< 0.05	< 0.05	0	<	0.05	
Hardness	mg CaCO3/L	90	90	0	<	1	
Nitrate	mg/L	1.4	1.40	0	<	0.01	
Aluminum	mg/L	0.531	0.531	0	<	0.006	
Cadmium	mg/L	< 0.00002	< 0.00002	0	<	0.00002	
Iron	mg/L	0.19	0.20	-5	<	0.01	
Mercury	mg/L	< 0.00001	< 0.00001	0	<	0.00001	
Molybdenum	mg/L	0.0073	0.0075	-3	<	0.0005	

Footnotes:

RPD = Relative Percent Difference

RPD values in bold represent concentrations within 10x the MDL

Highlighted RPD values represent exceedences of QAQC objectives

Italic RPD values represent one of the result are within 10X the MDL and one exceed 10x the MDL

Table 8.20: 2012 STP QAQC

Duplicate / Field Blank Analytical Certificate ID	Units	16-Jan-12			16-Jan-12		
		Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD
		STP-SEP	STP-SEP-DUP		STP-LJMIX	STP-LJMIX-DUP	
Total Suspended Solids	mg/L	< 1	3	-100	8	22	-93
Ammonia	mg N/L	1.5	1.5	0	13.5	11.9	13
Nitrate	mg N/L	26.4	26.3	0	14.1	17.5	-22
Nitrite	mg N/L	0.27	0.29	-7	22.40	18.10	21
Total Phosphate	mg/L	13.7	13.9	-1	15.6	13.7	13
COD	mg/L	70	73	-4	122	135	-10
BOD5	mg/L	4	4	0	17	13	27

Duplicate / Field Blank Analytical Certificate ID	Units	26-Mar-12			26-Mar-12		
		Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD
		Seprotech STP-OUT	Seprotech STP-OUT-dup		STP-LJMIX	STP-LJMIX-DUP	
Total Suspended Solids	mg/L	32	29	10	7	37	-136
Ammonia	mg N/L	2.9	2.9	0	13.2	6.2	72
Nitrate	mg N/L	21.9	21.6	1	22.9	29.6	-26
Nitrite	mg N/L	0.02	0.02	0	0.20	0.08	86
Total Phosphate	mg/L	11.0	11.1	-1	10.3	10.2	1
COD	mg/L	64	64	0	96	47	69
BOD5	mg/L	5	5	0	9	3	100

Duplicate / Field Blank Analytical Certificate ID	Units	4-Jun-12			4-Jun-12		
		Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD
		Seprotech STP-OUT	Seprotech STP-OUT-dup		STP-LJMIX	STP-LJMIX-DUP	
Total Suspended Solids	mg/L	31	33	-6	27.0	47.0	-54
Ammonia	mg N/L	< 0.1	< 0.1	0	< 0.1	< 0.1	0
Nitrate	mg N/L	21.80	21.90	0	22.8	26.7	-16
Nitrite	mg N/L	0.01	0.03	-100	0.10	0.05	67
Total Phosphate	mg/L	9.9	9.2	7	9.7	8.0	19
COD	mg/L	60	57	5	56.0	67.0	-18
BOD5	mg/L	13	11	17	14.0	20.0	-35

Duplicate / Field Blank Analytical Certificate ID	Units	15-Aug-12			15-Aug-12		
		Original ID Seprotech STP- OUT	Duplicate ID Seprotech STP- OUT-dup	RPD	Original ID STP-LJMIX	Duplicate ID STP-LJMIX- DUP	RPD
Total Suspended Solids	mg/L	29	26	11	34	39	-14
Ammonia	mg N/L	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Nitrate	mg N/L	22.3	22.5	-1	23.5	24.1	-3
Nitrite	mg N/L	0.24	0.23	4	0.14	0.10	33
Total Phosphate	mg/L	15.7	14.6	7	17.0	14.6	15
COD	mg/L	84	80	5	92	93	-1
BOD5	mg/L	11	20	-58	12	24	-67

Duplicate / Field Blank Analytical Certificate ID	Units	22-Oct-12			22-Oct-12		
		Original ID STP-LJMIX	Duplicate ID STP-LJMIX- DUP	RPD	Original ID Seprotech STP- OUT	Duplicate ID Seprotech STP- OUT-dup	RPD
Total Suspended Solids	mg/L	24	23	4	17	14	19
Ammonia	mg N/L	0.08	< 0.05	46	< 0.05	< 0.05	0
Nitrate	mg N/L	29.2	31.9	-9	25.6	26.1	-2
Nitrite	mg N/L	0.49	0.30	48	0.06	0.05	18
Total Phosphate	mg/L	14	14	-1	13	13	-4
COD	mg/L	81	77	5	69	70	-1
BOD5	mg/L	19	23	-19	19	29	-42

Duplicate / Field Blank Analytical Certificate ID	Units	17-Dec-12			17-Dec-12		
		Original ID STP-SEP	Duplicate ID STP-SEP-DUP	RPD	Original ID STP-LJMIX	Duplicate ID STP-LJMIX- DUP	RPD
Total Suspended Solids	mg/L	13	7	60	30	27	11
Ammonia	mg N/L	< 0.05	< 0.05	0	< 0.05	< 0.05	0
Nitrate	mg N/L	18.2	19.2	-5	18.8	21.9	-15
Nitrite	mg N/L	0.56	0.54	4	0.22	0.05	126
Total Phosphate	mg/L	11.4	11.4	0	12.0	10.8	11
COD	mg/L	85	70	19	91	108	-17
BOD5	mg/L	13	8	48	18	20	-11

Footnotes:

RPD = Relative Percent Difference

RPD values in bold represent concentrations within 10x the MDL

Highlighted RPD values represent exceedences of QAQC objectives

Italic RPD values represent one of the result are within 10X the MDL and one exceed 10x the MDL

Table 8.21: 2012 Surface Water QAQC

Duplicate / Field Blank Analytical Certificate ID	Units	15-May-12				18-Jul-12			
		Original ID	Duplicate ID	RPD	Field Blank	Original ID	Duplicate ID	RPD	Field Blank
		ST-9	ST-9			ST-9	ST-9-DUP		ST-9-FB
Alkalinity	mg CaCO3/L	102	73	33	< 2	109	104	5	7
Ammonia	mg N/L	0.09	< 0.05	57	< 0.05	0.31	0.30	3	<0.05
Ammonia-nitrogen	mg N/L	3.20	3.30	-3	0.02	7.90	7.80	1	<0.01
Calcium	mg/L	55.8	58.6	-5	0.1	82.0	83.5	-2	<0.03
Chloride	mg/L	24.9	< 0.5	192	< 0.5	39.6	40.1	-1	<0.5
Cyanide Total	mg/L	0.088	0.109	-21	< 0.005	0.169	0.111	41	<0.005
Dissolved TOC	mg/L	< 5.7	5.7	0		7.3	7.5	-3	1.0
Fluoride	mg/L	0.02	< 0.02	0	< 0.02	0.36	3.20	-160	<0.02
Hardness	mg CaCO3/L	252	264	-5	< 1	396	404	-2	<1
Magnesium	mg/L	27.40	28.70	-5	< 0.02	46.50	47.60	-2	<0.02
Nitrate	mg N/L	2.70	< 0.01	199	0.01	12.90	14.20	-10	<0.01
Nitrite	mg N/L	0.10	< 0.01	164	< 0.01	0.39	0.38	3	<0.01
Ortho-phosphate	mg/L	0.01	0.01	0	< 0.01	< 0.01	< 0.01	0	<0.01
Phosphorous Total	mg/L	0.08	0.04	67	0.06	< 0.01	0.02	-67	<0.01
Potassium	mg/L	7.90	8.20	-4	< 0.05	14.70	14.90	-1	<0.05
Reactive silica	mg/L	6.10	4.90	22	0.17	6.50	6.40	2	0.08
Sodium	mg/L	84.60	82.20	3	0.20	93.00	96.10	-3	<0.05
Sulphate	mg/L	170	< 1	198	< 1	291	287	1	1
TDS	mg/L	498	446	11	2	712	674	5	3
TKN	mg/L	8	3	91	7	14	14	0	<1
TOC	mg/L	< 5.6				7.5	7.6	-1	0.9
Total petroleum hydrocarbons	mg/L	0.10	< 0.10	0	0.10	< 0.10	< 0.10	0	<0.1
TSS	mg/L	4	5	-22	< 1	4	4	0	<1
Aluminum	mg/L	< 1.010	1.010	0	< 0.006	1.060	1.090	-3	<0.006
ilver	mg/L	< 0.0002	< 0.0002	0	< 0.0002	0.0624	0.0371	51	0.0247
Silver	mg/L	< 0.005	< 0.001	164	< 0.005	0.010	0.011	-5	<0.0005
Boron	mg/L	0.03	0.03	0	< 0.01	0.08	0.08	0	<0.01
Barium	mg/L	< 0.0420	0.0462	-10	< 0.0005	0.1359	0.1385	-2	<0.0005
Beryllium	mg/L	< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	0	<0.0005
Cadmium	mg/L	0.00002	0.00002	0	< 0.00002	< 0.00002	< 0.00002	0	<0.00002
Copper	mg/L	< 0.0048	0.0046	4	0.0006	0.0035	0.0026	30	<0.0005
Chromium	mg/L	0.0500	< 0.0006	195	< 0.0006	< 0.0006	< 0.0006	0	<0.0006
Iron	mg/L	< 0.18	0.15	18	< 0.01	0.13	0.13	0	<0.01
Lithium	mg/L	1.072	< 0.001	200	< 0.005	0.005	0.005	0	<0.005
Manganese	mg/L	< 0.0005	1.1320	-200	< 0.0005	1.9200	1.9420	-1	<0.0005
Mercury	mg/L	0.01680	< 0.00001	200	< 0.00001	< 0.00001	< 0.00001	0	<0.00001
Molybdenum	mg/L	0.0144	0.0173	-18	< 0.0005	0.0250	0.0263	-5	<0.0005
Nickel	mg/L	< 0.0005	0.0143	-186	< 0.0005	0.0201	0.0203	-1	<0.0005
Lead	mg/L	< 0.0010	0.0142	-174	< 0.0003	< 0.0003	< 0.0003	0	<0.0003
Selenium	mg/L	0.001	< 0.001	0	< 0.001	< 0.001	0.001	0	<0.001
Antimony	mg/L	< 0.0004	0.0003	29	< 0.0001	< 0.0001	< 0.0001	0	<0.0001
Tin	mg/L	0.001	< 0.001	0	< 0.001	< 0.001	< 0.001	0	<0.001
Strontium	mg/L	0.231	0.249	-8	< 0.005	0.514	0.523	-2	<0.005
Titanium	mg/L	0.04	< 0.01	156	< 0.01	0.07	0.07	0	<0.01
Thallium	mg/L	0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Uranium	mg/L	< 0.002	0.002	0	< 0.001	0.002	0.002	0	<0.001
Vanadium	mg/L	0.0005	< 0.0005	0	< 0.0005	< 0.0005	< 0.0005	0	<0.0005
Zinc	mg/L	0.003	0.014	-129	0.021	0.009	0.003	100	0.008
Dissolved aluminum	mg/L	< 0.01	< 0.01	0	< 0.01	0.11	0.09	20	<0.01
Dissolved silver	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved arsenic	mg/L	< 0.0050	< 0.0050	0	< 0.0005	0.0110	0.0110	0	<0.005
Dissolved boron	mg/L	< 0.05	< 0.05	0	< 0.05	0.08	0.08	0	<0.01
Dissolved barium	mg/L	0.042	0.008	136	< 0.005	0.131	0.137	-4	<0.005
Dissolved beryllium	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved cadmium	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved copper	mg/L	< 0.0050	< 0.0050	0	< 0.0006	< 0.0050	< 0.0050	0	<0.005
Dissolved chromium	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved iron	mg/L	< 0.05	< 0.05	0	< 0.05	< 0.05	< 0.05	0	<0.05
Dissolved lithium	mg/L	< 0.01	0.005	67	< 0.01	< 0.01	< 0.01	0	<0.005
Dissolved manganese	mg/L	1.010	< 0.005	198	< 0.005	1.820	1.860	-2	<0.005
Dissolved mercury	mg/L	< 0.001	< 0.001	0	< 0.005	< 0.001	< 0.001	0	<0.0005
Dissolved molybdenum	mg/L	0.0160	< 0.0050	105	< 0.0005	0.0250	0.0260	-4	<0.005
Dissolved nickel	mg/L	< 0.005	< 0.005	0	< 0.005	0.019	0.018	5	<0.005
Dissolved lead	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.0050	< 0.005	0	<0.005
Dissolved selenium	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved antimony	mg/L	< 0.0050	< 0.0050	0	< 0.0001	< 0.0050	< 0.0050	0	<0.005
Dissolved tin	mg/L	< 0.005	< 0.005	0	< 0.001	< 0.005	< 0.005	0	<0.005
Dissolved strontium	mg/L	0.25	< 0.01	185	< 0.01	0.53	0.53	0	<0.01
Dissolved titanium	mg/L	0.03	< 0.01	100	< 0.01	0.08	0.07	13	<0.01
Dissolved thallium	mg/L	< 0.01	< 0.01	0	< 0.01	< 0.01	0.005	67	<0.01
Dissolved uranium	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved vanadium	mg/L	< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	0	<0.005
Dissolved zinc	mg/L	< 0.005	0.012	-82	0.013	0.007	< 0.005	33	0.005

Table 8.21: 2012 Surf

Duplicate / Field Blank Analytical Certificate ID	26-Sep-12				17-May-12			5-Jun-12		
	Original ID	Duplicate ID	RPD	Field Blank	Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD
	ST-9	ST-9-DUP		ST-9-FB	NCDD	NCDD-DUP		NCDD	NCDD-DUP	
Alkalinity	86	87	-1	32						
Ammonia										
Ammonia-nitrogen	4.20	4.30	-2	0.04						
Calcium	54.6	55.9	-2	0.1						
Chloride	25.0	24.8	1 <	0.5						
Cyanide Total	0.105	0.067	44 <	0.005						
Dissolved TOC										
Fluoride										
Hardness	260	266	-2 <	1						
Magnesium	30.10	30.90	-3 <	0.02						
Nitrate	5.90	5.70	3 <	0.01						
Nitrite	0.20	0.20	0 <	0.01						
Ortho-phosphate	< 0.01	< 0.01	0 <	0.01						
Phosphorous Total	0.03	0.03	0	0.02						
Potassium	10.10	10.00	1	0.25						
Reactive silica	4.70	4.80	-2	1.20						
Sodium	64.50	65.40	-1 <	0.05						
Sulphate	200	193	4 <	1						
TDS	456	473	-4	3						
TKN	7	7	0 <	1						
TOC	5.7	5.9	-3	1.5						
Total petroleum hydrocarbons	< 0.10	< 0.10	0 <	0.10						
TSS	4	4	0 <	1	17	10	52	5	5	0
Aluminum	0.952	0.962	-1	0.027						
silver										
Silver	0.005	0.006	-7	0.001						
Boron	0.08	0.08	0	0.03						
Barium	0.0453	0.0440	3 <	0.0005						
Beryllium	< 0.0005	< 0.0005	0 <	0.0005						
Cadmium	< 0.00002	< 0.00002	0 <	0.00002						
Copper	0.0018	0.0018	0	0.0011						
Chromium	0.0012	0.0025	-70	0.0026						
Iron	0.10	0.10	0	0.01						
Lithium	< 0.005	< 0.005	0 <	0.005						
Manganese	1.2800	1.2110	6	0.0005						
Mercury	< 0.00001	0.00001	0 <	0.00001						
Molybdenum	0.0209	0.0200	4 <	0.0005						
Nickel	0.0248	0.0247	0	0.0005						
Lead	0.0119	0.0051	80	0.0114						
Selenium	0.001	0.001	0 <	0.001						
Antimony	0.0004	0.0010	-86	0.0001						
Tin	< 0.001	< 0.001	0 <	0.005						
Strontium	0.330	0.329	0 <	0.005						
Titanium	0.05	0.05	0 <	0.01						
Thallium	< 0.005	< 0.005	0 <	0.005						
Uranium	0.005	0.005	0 <	0.001						
Vanadium	< 0.0005	< 0.0005	0 <	0.0005						
Zinc	< 0.001	< 0.001	0 <	0.001						
Dissolved aluminum	0.91	0.10	160	< 0.01						
Dissolved silver										
Dissolved arsenic	0.0050	< 0.0050	0 <	0.0050						
Dissolved boron	0.07	< 0.05	33 <	0.05						
Dissolved barium	0.046	0.044	4 <	0.005						
Dissolved beryllium	< 0.005	< 0.005	0 <	0.005						
Dissolved cadmium	< 0.005	< 0.005	0 <	0.005						
Dissolved copper	< 0.0050	< 0.0050	0 <	0.0050						
Dissolved chromium	< 0.005	< 0.005	0 <	0.005						
Dissolved iron	0.05	< 0.05	0 <	0.05						
Dissolved lithium	< 0.01	< 0.01	0 <	0.01						
Dissolved manganese	1.170	1.230	-5 <	0.005						
Dissolved mercury	< 0.001	< 0.001	0 <	0.001						
Dissolved molybdenum	0.0200	0.0190	5 <	0.0050						
Dissolved nickel	0.026	0.024	8 <	0.001						
Dissolved lead	< 0.005	< 0.005	0 <	0.005						
Dissolved selenium	< 0.005	< 0.005	0 <	0.005						
Dissolved antimony	< 0.0050	< 0.0050	0 <	0.0050						
Dissolved tin	< 0.005	0.001	133	< 0.005						
Dissolved strontium	0.33	0.30	10 <	0.01						
Dissolved titanium	0.06	0.05	18 <	0.01						
Dissolved thallium	< 0.01	< 0.01	0 <	0.01						
Dissolved uranium	0.005	0.005	0 <	0.005						
Dissolved vanadium	< 0.005	< 0.005	0 <	0.005						
Dissolved zinc	< 0.005	< 0.005	0 <	0.005						

Table 8.21: 2012 Surf

Duplicate / Field Blank Analytical Certificate ID	5-Jun-12			3-Jul-12		5-Jun-12			3-Jul-12	
	Original ID	Duplicate ID	RPD	Original ID	Field Blank	Original ID	Duplicate ID	RPD	Original ID	Field Blank
	ST-18	ST-18-DUP		ST-18	ST-18-FB	ST-21	ST-21-DUP		ST-21	ST-21-FB
Alkalinity	77	77	0	88	23	75	73	3	98	36
Ammonia	0.12	0.10	18	0.09	<0.05	0.73	0.71	3	1.00	< 0.05
Ammonia-nitrogen	3.70	3.70	0	3.10	0.02	43.00	43.20	0	44.20	0.02
Calcium	57.9	55.3	5	37.0	0.1					
Chloride	29.4	28.4	3	30.1	<0.5				626.0	< 0.5
Cyanide Total	0.125	0.090	33	0.247	<0.005	48.760	50.290	-3	39.260	
Dissolved TOC	7.0	8.2	-16	6.7	1.1					
Fluoride	0.36	0.34	6	0.52	<0.02	< 0.02	< 0.02	0	0.06	< 0.02
Hardness	240	229	5	143	<1	1001	974	3	574	< 1
Magnesium	23.20	22.30	4	12.40	<0.02					
Nitrate	2.10	2.10	0	1.60	0.01	7.30	7.90	-8	8.60	< 0.01
Nitrite	0.11	0.12	-9	0.09	<0.01	0.12	0.12	0	0.10	< <0.01
Ortho-phosphate	< 0.01	< 0.01	0	0.01	0.16					
Phosphorous Total	0.06	0.07	-15	< 0.01	<0.01					
Potassium	7.90	7.50	5	6.30	<0.05					
Reactive silica	6.00	5.90	2	6.30	0.07					
Sodium	55.70	54.30	3	41.50	0.05					
Sulphate	217	204	6	202	<1	1555	1580	-2	1457	< 1
TDS	637	584	9	46	3	4955	5445	-9	2343	1
TKN	10	9	11	5	<1					
TOC	6.3	8.2	-26	6.0	0.5					
Total petroleum hydrocarbon	< 0.10	< 0.10	0	0.10	<0.1					
TSS	64	63	2	15	<1					
Aluminum	1.310	1.280	2	0.231	0.007					
silver	< 0.0002	< 0.0002	0	< 0.0002	<0.0002					
Silver	0.005	0.005	14	0.004	<0.0005					
Boron	0.03	0.04	-29	0.01	<0.01					
Barium	0.0659	0.0631	4	0.0916	<0.0005					
Beryllium	< 0.0005	< 0.0005	0	< 0.0005	<0.0005					
Cadmium	< 0.00002	< 0.00002	0	< 0.00002	<0.00002					
Copper	0.0056	0.0049	13	0.0097	0.0055					
Chromium	0.0019	0.0010	62	< 0.0006	<0.0006					
Iron	1.70	1.50	13	0.63	<0.01					
Lithium	0.008	0.007	13	< 0.005	<0.005					
Manganese	1.3770	1.3070	5	2.1700	<0.0005					
Mercury	< 0.00001	< 0.00001	0	< 0.00001	<0.00001					
Molybdenum	0.0139	0.0121	14	0.0128	<0.0005					
Nickel	0.0195	0.0182	7	0.0149	0.0006					
Lead	0.0009	0.0005	57	< 0.0003	0.0225					
Selenium	< 0.001	< 0.001	0	< 0.001	<0.001					
Antimony	< 0.0001	< 0.0001	0	0.0001	<0.0001					
Tin	< 0.001	< 0.001	0	< 0.001	<0.001					
Strontium	0.322	0.325	-1	0.437	<0.005					
Titanium	0.11	0.08	32	0.05	<0.01					
Thallium	< 0.005	< 0.005	0	< 0.005	<0.005					
Uranium	0.015	0.013	14	0.008	<0.001					
Vanadium	0.0042	0.0038	10	< 0.0005	<0.0005					
Zinc	< 0.001	< 0.001	0	0.060	<0.001					
Dissolved aluminum	< 0.01	< 0.01	0	< 0.01	<0.01	< 0.01	< 0.01	0	< 0.01	< 0.01
Dissolved silver	< 0.005	< 0.005	0	< 0.005	<0.005	< 0.005	< 0.005	0	0.068	< 0.005
Dissolved arsenic	< 0.0050	0.0047	6	< 0.0050	<0.005	0.0060	0.0050	18	0.0110	0.0080
Dissolved boron	< 0.05	< 0.05	0	< 0.05	<0.05					
Dissolved barium	0.057	0.053	7	0.097	<0.005	0.029	0.029	0	0.034	< 0.005
Dissolved beryllium	< 0.005	< 0.005	0	< 0.005	<0.005					
Dissolved cadmium	< 0.005	< 0.005	0	< 0.005	<0.005	< 0.005	< 0.005	0	< 0.005	< 0.005
Dissolved copper	< 0.0050	< 0.0050	0	0.0100	0.0060	20.3900	19.9100	2	19.5800	
Dissolved chromium	< 0.005	< 0.005	0	0.012	0.015					
Dissolved iron	< 0.05	< 0.05	0	< 0.05	<0.05	9.50	9.60	-1		
Dissolved lithium	< 0.01	0.01	35	< 0.01	<0.01					
Dissolved manganese	1.200	1.070	11	1.880	<0.005	< 0.005	< 0.005	0	0.009	< 0.005
Dissolved mercury	< 0.001	< 0.001	0	< 0.001	<0.0005	< 0.001	< 0.001	0	< 0.001	< 0.001
Dissolved molybdenum	0.0110	0.0100	10	0.0100	<0.005	0.2320	0.2320	0	0.2620	< 0.0050
Dissolved nickel	0.018	0.016	12	0.015	<0.005	2.010	2.020	0	2.540	< 0.005
Dissolved lead	< 0.005	< 0.005	0	0.013	<0.005	< 0.005	< 0.005	0	< 0.005	0.005
Dissolved selenium	< 0.005	< 0.005	0	< 0.005	<0.005	0.013	0.013	0	0.009	< 0.005
Dissolved antimony	< 0.0050	< 0.0050	0	< 0.0050	<0.005					
Dissolved tin	< 0.001	< 0.005	-133	< 0.005	<0.005					
Dissolved strontium	0.29	0.30	-3	0.33	<0.01					
Dissolved titanium	0.04	0.04	0	0.03	<0.01					
Dissolved thallium	< 0.01	< 0.01	0	< 0.01	<0.01	< 0.01	< 0.01	0	< 0.01	< 0.01
Dissolved uranium	0.010	0.009	11	0.008	<0.005					
Dissolved vanadium	< 0.005	0.005	0	< 0.005	<0.005					
Dissolved zinc	< 0.005	< 0.005	0	0.037	0.040	< 0.005	< 0.005	0	0.034	0.045

Table 8.21: 2012 Surf

Duplicate / Field Blank Analytical Certificate ID	26-Jun-12				4-Sep-12			26-Jun-12			
	Original ID	Duplicate ID	RPD	Field Blank	Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD	
	S-ED	S-ED DUP		S-ED Blank	S-ED	S-ED-DUP		S-RSF1	S-RSF1 DUP		
Alkalinity	43	47	-9	15	35	48	-31	49	46	6	
Ammonia	< 0.05	< 0.05	0	<0.05	0.29	0.14	70	< 0.05	< 0.05	0	
Ammonia-nitrogen	0.04	0.06	-40	0.05	0.09	0.86	-162	0.21	0.20	5	
Calcium											
Chloride	< 0.5	< 0.5	0	<0.05	4.6	1.5	102	0.9	1.0	-11	
Cyanide Total											
Dissolved TOC											
Fluoride	0.07	0.07	0	<0.02	0.08	0.08	0	0.02	0.07	-111	
Hardness	26	27	-4	<1	28	26	7	35	33	6	
Magnesium											
Nitrate	0.33	0.21	44	0.10	0.13	0.14	-7	0.23	0.25	-8	
Nitrite											
Ortho-phosphate											
Phosphorous Total											
Potassium											
Reactive silica											
Sodium											
Sulphate	5	7	-33	<1	5	3	50	8	8	0	
TDS											
TKN											
TOC											
Total petroleum hydrocarbons											
TSS											
Aluminum	0.069	0.044	44	<0.006	0.157	0.128	20	1.170	1.170	0	
ilver	< 0.0002	< 0.0002	0	<0.0002	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0	
Silver	< 0.001	0.001	-46	<0.0005	< 0.001	< 0.001	0	0.001	0.001	-29	
Boron											
Barium	0.0072	0.0074	-3	<0.0005	0.0110	0.0099	11	0.0177	0.0173	2	
Beryllium											
Cadmium	< 0.00002	< 0.00002	0	<0.00002	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	0	
Copper	0.0013	< 0.0005	89	<0.0005	0.0006	0.0006	0	0.0062	0.0061	2	
Chromium	0.0028	0.0039	-33	0.0064	< 0.0006	0.0012	-67	0.0194	0.0187	4	
Iron	< 0.01	< 0.01	0	<0.01	0.27	0.15	57	3.10	3.00	3	
Lithium											
Manganese	0.0041	0.0039	5	0.0012	0.0154	0.0074	70	0.9625	0.9001	7	
Mercury	< 0.00001	< 0.00001	0	<0.00001	< 0.00001	< 0.00001	0	< 0.00001	< 0.00001	0	
Molybdenum	< 0.0005	< 0.0005	0	<0.0005	0.0007	< 0.0005	33	< 0.0005	< 0.0005	0	
Nickel	0.0011	< 0.0005	75	<0.0005	0.0009	0.0011	-20	0.0352	0.0332	6	
Lead	0.0151	0.0007	182	0.0034	< 0.0003	< 0.0003	0	0.0043	0.0020	73	
Selenium	< 0.001	< 0.001	0	<0.001	< 0.001	< 0.001	0	< 0.001	< 0.001	0	
Antimony											
Tin											
Strontium											
Titanium											
Thallium	< 0.005	< 0.005	0	<0.0005	< 0.005	< 0.005	0	< 0.005	< 0.005	0	
Uranium											
Vanadium											
Zinc	0.014	0.015	-7	0.025	< 0.001	< 0.001	0	0.024	0.024	0	
Dissolved aluminum											
Dissolved silver											
Dissolved arsenic											
Dissolved boron											
Dissolved barium											
Dissolved beryllium											
Dissolved cadmium											
Dissolved copper											
Dissolved chromium											
Dissolved iron											
Dissolved lithium											
Dissolved manganese											
Dissolved mercury											
Dissolved molybdenum											
Dissolved nickel											
Dissolved lead											
Dissolved selenium											
Dissolved antimony											
Dissolved tin											
Dissolved strontium											
Dissolved titanium											
Dissolved thallium											
Dissolved uranium											
Dissolved vanadium											
Dissolved zinc											

Table 8.21: 2012 Surf

Duplicate / Field Blank Analytical Certificate ID	4-Sep-12			7-Aug-12			18-Sep-12			1-Oct-12		
	Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD
	S-RSF-1	S-RSF1-DUP		S-SD1	S-SD1-DUP		ST-20	ST-20-DUP		ST-6	ST-6-DUP	
Alkalinity	90	90	0	55	59	-7	121	124	-2			
Ammonia	< 0.05	< 0.05	0	0.24	0.24	0	0.82	0.85	-4			
Ammonia-nitrogen	0.16	0.15	6	9.00	9.10	-1	16.30	16.40	-1			
Calcium												
Chloride	3.0	2.8	7	16.9	17.3	-2	25.3	25.4	0			
Cyanide Total				0.001	0.008	-164				< 0.005	< 0.005	0
Dissolved TOC												
Fluoride	0.17	0.17	0	0.43	0.44	-2	0.65	0.67	-3			
Hardness	77	83	-8	301	292	3	292	281	4			
Magnesium												
Nitrate	0.15	0.16	-6	34.60	31.30	10	24.30	22.80	6			
Nitrite							0.41	0.41	0			
Ortho-phosphate												
Phosphorous Total												
Potassium												
Reactive silica												
Sodium												
Sulphate	9	9	0	114	120	-5	49	48	2	10	11	-10
TDS							432	431	0			
TKN												
TOC												
Total petroleum hydrocarbons												
TSS										7	6	15
Aluminum	0.197	0.197	0	0.320	0.279	14				0.316	0.346	-9
Silver	< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0						
Silver	0.005	0.006	-16	0.049	0.045	7	0.008	0.007	7	< 0.001	< 0.001	0
Boron												
Barium	0.0270	0.0294	-9	0.0441	0.0440	0						
Beryllium												
Cadmium	< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	0						
Copper	0.0043	0.0034	23	0.0042	0.0042	0	0.0193	0.0245	-24	0.0010	0.0007	35
Chromium	0.0017	< 0.0006	96	0.0014	0.0016	-13						
Iron	2.50	2.70	-8	0.26	0.26	0						
Lithium												
Manganese	1.3010	1.4100	-8	0.2913	0.2878	1						
Mercury	< 0.00001	< 0.00001	0	< 0.00001	< 0.00001	0						
Molybdenum	0.0018	0.0020	-11	0.0332	0.0322	3						
Nickel	0.0216	0.0231	-7	0.0453	0.0444	2	0.0418	0.0429	-3	0.0064	0.0031	69
Lead	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0	0.0042	0.0063	-40	0.0024	< 0.0003	156
Selenium	< 0.001	< 0.001	0	0.006	0.004	40						
Antimony												
Tin												
Strontium												
Titanium												
Thallium	< 0.005	< 0.005	0	< 0.005	< 0.005	0						
Uranium												
Vanadium												
Zinc	0.008	< 0.001	156	0.010	0.007	35	0.030	0.029	3	< 0.001	< 0.001	0
Dissolved aluminum							< 0.01	< 0.01	0			
Dissolved silver							< 0.005	< 0.005	0			
Dissolved arsenic							0.0050	0.0050	0			
Dissolved boron												
Dissolved barium							0.114	0.119	-4			
Dissolved beryllium												
Dissolved cadmium							< 0.005	< 0.005	0			
Dissolved copper							0.0100	0.0100	0			
Dissolved chromium												
Dissolved iron							< 0.05	< 0.05	0			
Dissolved lithium												
Dissolved manganese							0.193	0.194	-1			
Dissolved mercury							< 0.001	< 0.001	0			
Dissolved molybdenum							0.0250	0.0250	0			
Dissolved nickel							0.025	0.022	13			
Dissolved lead							< 0.005	< 0.005	0			
Dissolved selenium							< 0.005	< 0.005	0			
Dissolved antimony												
Dissolved tin												
Dissolved strontium												
Dissolved titanium												
Dissolved thallium							< 0.01	< 0.01	0			
Dissolved uranium												
Dissolved vanadium												
Dissolved zinc							< 0.005	< 0.005	0			

Table 8.21: 2012 Surf

Duplicate / Field Blank Analytical Certificate ID	17-Oct-12			1-Oct-12			17-Oct-12		29-Oct-12			
	Original ID	Duplicate ID	RPD	Original ID	Duplicate ID	RPD	Original ID	Field Blank	Original ID	Duplicate ID	RPD	Field Blank
	ST-19	ST-19-DUP		ST-S-1	ST-S-1-DUP		ST-S-1	ST-S-1-BLANK	ST-S-1	ST-S-1-DUP		ST-S-1-BLANK
Alkalinity	2	51	-185	51	51	0	47	21	36	36	0	31
Ammonia	< 0.05	< 0.05	0				< 0.05	< 0.05	< 0.05	< 0.05	0	< 0.05
Ammonia-nitrogen	0.08	0.08	0	0.03	0.17	-140	0.02	0.01	0.16	0.03	137	0.01
Calcium												
Chloride				< 0.5	< 0.5	0	1.4	1.0	0.5	< 0.5	0	< 0.5
Cyanide Total												
Dissolved TOC												
Fluoride				0.08	0.08	0	0.07	< 0.02	0.06	0.06	0	< 0.02
Hardness				26	26	0	20	< 1	18	19	-5	< 1
Magnesium							1.30	< 0.02				
Nitrate				0.11	0.12	-9	0.07	< 0.01	0.07	0.06	15	0.01
Nitrite				< 0.01	< 0.01	0	< 0.01	< 0.01	< 0.01	< 0.01	0	< 0.01
Ortho-phosphate												
Phosphorous Total												
Potassium												
Reactive silica												
Sodium												
Sulphate				5	4	22	3	< 1	5	2	86	< 1
TDS	52	50	4									
TKN												
TOC												
Total petroleum hydrocarbons												
TSS												
Aluminum				0.082	0.135	-49	0.054	0.008	0.081	0.061	28	0.063
Silver				< 0.0002	< 0.0002	0	< 0.0002	< 0.0002	0.0004	< 0.0002	67	< 0.0002
Silver	0.002	0.002	-29	< 0.001	< 0.001	0	0.001	< 0.001	0.001	0.002	-58	< 0.001
Boron												
Barium				0.0065	0.0066	-2	0.0042	< 0.0005	0.0052	0.0053	-2	< 0.0005
Beryllium												
Cadmium				< 0.00002	< 0.00002	0	< 0.00002	< 0.00002	0.00012	< 0.00002	143	< 0.00002
Copper	0.0012	0.0008	40	0.0009	0.0006	40	0.0014	0.0028	< 0.0005	< 0.0005	0	< 0.0028
Chromium				< 0.0006	< 0.0006	0	0.0014	< 0.0006	< 0.0006	< 0.0006	0	< 0.0006
Iron				0.07	0.06	15	0.08	< 0.01	0.03	0.03	0	< 0.01
Lithium												
Manganese				0.0047	0.0041	14	0.0023	0.0008	< 0.0005	< 0.0005	0	< 0.0005
Mercury				< 0.00001	< 0.00001	0	< 0.00001	< 0.00001	0.00001	< 0.00001	0	< 0.00001
Molybdenum				< 0.0005	< 0.0005	0	< 0.0005	< 0.0005	0.0839	< 0.0005	198	< 0.0005
Nickel	0.0013	0.0010	26	0.0016	0.0007	78	0.0026	< 0.0005	< 0.0005	< 0.0005	0	< 0.0005
Lead	< 0.0003	< 0.0003	0	< 0.0003	< 0.0003	0	0.0020	0.0023	< 0.0003	< 0.0003	0	< 0.0003
Selenium				< 0.001	< 0.001	0	< 0.001	< 0.001	< 0.001	< 0.001	0	< 0.001
Antimony												
Tin												
Strontium												
Titanium												
Thallium				< 0.005	< 0.005	0	< 0.005	< 0.005	< 0.005	< 0.005	0	< 0.005
Uranium												
Vanadium												
Zinc	< 0.001	< 0.001	0	< 0.001	< 0.001	0	< 0.001	0.006	< 0.001	< 0.001	0	< 0.001
Dissolved aluminum												
Dissolved silver												
Dissolved arsenic												
Dissolved boron												
Dissolved barium												
Dissolved beryllium												
Dissolved cadmium												
Dissolved copper												
Dissolved chromium												
Dissolved iron												
Dissolved lithium												
Dissolved manganese												
Dissolved mercury												
Dissolved molybdenum												
Dissolved nickel												
Dissolved lead												
Dissolved selenium												
Dissolved antimony												
Dissolved tin												
Dissolved strontium												
Dissolved titanium												
Dissolved thallium												
Dissolved uranium												
Dissolved vanadium												
Dissolved zinc												

Table 8.22: 2012 Bulk Fuel Storage Facility QAQC

Duplicate / Field Blank Analytical Certificate ID	Units	27-Sep-12			
		Original ID BL TF NEW	Duplicate ID BL TK NEW DUP	RPD	Field Blank BL TF NEW FB
Total Suspended Solids	mg/L	6	6	0	< 1
Ammonia Nitrogen	mg N/L	0.08	0.11	-32	3.70
Arsenic	mg/L	< 0.0005	< 0.0005	0	< 0.0005
Nickel	mg/L	0.0009	0.0006	40	< 0.0005
Lead	mg/L	< 0.0003	0.0009	-100	< 0.0003
Zinc	mg/L	< 0.001	< 0.001	0	0.003
Total Cyanide	mg/L	< 0.005	< 0.005	0	< 0.005
Benzene	µg/L	< 0.3	< 0.3	0	< 0.3
Toluene	µg/L	< 0.3	< 0.3	0	0.4
Ethylbenzene	µg/L	< 0.3	< 0.3	0	< 0.3
Xylene	µg/L	< 0.3	< 0.3	0	< 0.3
Oil & Grease	mg/L	7	4	55	7
Aluminium (Al)	mg/L	0.694	0.654	6	< 0.006
Antimony (Sb)	mg/L	< 0.0001	< 0.0001	0	0.0001
Barium (Ba)	mg/L	0.0326	0.0307	6	< 0.0005
Beryllium (Be)	mg/L	< 0.0005	< 0.0005	0	< 0.0005
Cadmium (Cd)	mg/L	< 0.00002	< 0.00002	0	< 0.00002
Chrome (Cr)	mg/L	< 0.0006	< 0.0006	0	< 0.0006
Cobalt (Co)	mg/L	< 0.0005	< 0.0005	0	< 0.0005
Copper (Cu)	mg/L	0.004	0.0033	19	0.0035
Tin (Sn)	mg/L	< 0.001	< 0.001	0	< 0.0010
Iron (Fe)	mg/L	0.52	0.5500	-6	< 0.0100
Lithium (Li)	mg/L	< 0.005	< 0.005	0	< 0.0050
Manganese (Mn)	mg/L	0.0086	0.0091	-6	< 0.0005
Molybdenum (Mo)	mg/L	0.0036	0.0033	9	< 0.0005
Selenium (Se)	mg/L	0.001	0.0010	0	< 0.0010
Strontium (Sr)	mg/L	0.11	0.1080	2	< 0.0050
Thallium (Tl)	mg/L	< 0.005	< 0.005	0	< 0.0050
Titanium (Ti)	mg/L	0.03	0.0300	0	< 0.0100
Uranium (U)	mg/L	0.007	0.0070	0	< 0.0010
Vanadium (V)	mg/L	< 0.0005	< 0.0005	0	< 0.0005
Hydrocarbons C10-C50	mg/L	< 0.1	< 0.1	0	0.2000

Footnotes:

RPD = Relative Percent Difference

RPD values in bold represent concentrations within 10x the MDL

Highlighted RPD values represent exceedences of QAQC objectives

Italic RPD values represent one of the result are within 10X the MDL and one exceed 10x the MDL

Table 8.23: 2012 Analite NEP 160 Turbidity Meter Calibration

Date	Standard	Initial reading	Final reading
		NTU	NTU
2012-01-03	0	-0.08	0.01
	10	10.01	9.99
	100	100.00	99.80
2012-01-09	0	-0.01	0.00
	10	10.10	10.01
	100	96.30	99.90
2012-01-13	0	-0.28	-0.01
	10	9.93	9.98
	100	104.30	99.80
2012-01-19	0	-0.07	-0.02
	10	9.88	9.99
	100	98.20	100.10
2012-02-13	0	-0.31	0.02
	10	10.41	9.99
	100	99.50	100.00
2012-02-14	0	-0.04	-0.01
	10	9.99	10.04
	100	99.99	99.80
2012-02-26	0	0.05	0.00
	10	10.05	10.02
	100	100.00	99.90
2012-03-06	0	-0.05	0.00
	10	10.12	9.98
	100	100.50	100.00
2012-03-18	0	0.07	0.00
	10	9.75	10.01
	100	99.90	100.00
2012-03-19	0	0.00	0.00
	10	10.03	9.99
	100	100.00	100.00
2012-04-03	0	0.09	0.03
	10	9.90	10.00
	100	99.40	100.10
2012-04-10	0	-0.19	0.02
	10	9.92	9.97
	100	99.90	99.90
2012-04-15	0	-0.06	0.00
	10	9.98	9.98
	100	99.70	100.00
2012-04-16	0	0.03	0.01
	10	11.40	10.10
	100	104.60	99.90
2012-04-18	0	0.00	0.01
	10	9.87	10.00
	100	99.50	99.90
2012-04-19	0	0.29	0.01
	10	11.16	10.01
	100	102.90	100.20
2012-04-23	0	0.01	0.01
	10	10.01	10.00
	100	100.10	100.00

Date	Standard	Initial reading	Final reading
		NTU	NTU
2012-04-30	0	0.00	0.01
	10	10.00	10.00
	100	97.70	99.90
2012-05-01	0	0.23	0.03
	10	9.93	9.97
	100	99.20	99.90
2012-05-08	0	0.07	0.01
	10	9.97	9.99
	100	99.70	99.70
2012-05-09	0	0.22	0.01
	10	10.13	10.01
	100	100.70	100.10
2012-05-10	0	0.05	0.02
	10	9.96	10.00
	100	99.70	99.80
2012-05-11	0	0.05	0.02
	10	9.96	10.05
	100	99.70	100.30
2012-05-14	0	0.01	0.00
	10	10.20	9.99
	100	100.50	99.90
2012-05-15	0	-0.05	0.00
	10	10.01	10.01
	100	99.50	100.10
2012-05-22	0	0.01	0.00
	10	10.10	9.96
	100	100.00	100.00
2012-05-24	0	0.05	0.01
	10	10.12	10.03
	100	101.60	100.20
2012-05-25	0	-0.32	0.03
	10	9.73	9.98
	100	99.00	100.00
2012-05-26	0	0.02	0.01
	10	9.98	10.01
	100	100.60	100.20
2012-05-27	0	0.07	0.01
	10	10.00	9.98
	100	100.30	100.00
2012-05-28	0	0.00	0.00
	10	9.99	9.99
	100	99.80	99.80
2012-05-29	0	0.03	0.00
	10	10.04	10.03
	100	96.80	100.00
2012-05-30	0	-0.03	0.00
	10	9.98	10.00
	100	96.80	100.00
2012-05-31	0	-0.02	0.00
	10	9.99	10.02
	100	99.90	100.20
2012-06-01	0	0.02	0.01
	10	9.98	10.00
	100	100.60	100.10

Date	Standard	Initial reading	Final reading
		NTU	NTU
2012-06-02	0	-0.03	0.00
	10	9.99	9.99
	100	99.90	100.00
2012-06-03	0	0.02	0.01
	10	9.95	9.99
	100	100.00	100.00
2012-06-04	0	0.02	0.00
	10	9.97	10.01
	100	100.10	100.00
2012-06-05	0	0.01	0.00
	10	10.02	9.99
	100	100.10	100.00
2012-06-06	0	0.02	0.01
	10	10.00	10.00
	100	100.10	100.00
2012-06-07	0	0.01	0.01
	10	10.04	10.01
	100	100.10	100.00
2012-06-08	0	-0.01	0.01
	10	10.00	10.01
	100	99.60	99.90
2012-06-09	0	0.04	0.01
	10	9.94	10.03
	100	100.10	100.00
2012-06-10	0	-0.02	0.00
	10	10.01	10.00
	100	100.10	100.00
2012-06-11	0	-0.01	0.00
	10	10.00	10.00
	100	99.80	100.00
2012-06-12	0	0.01	0.03
	10	10.04	9.99
	100	100.10	100.10
2012-06-13	0	0.01	0.00
	10	9.99	10.01
	100	100.10	100.60
2012-06-14	0	0.02	0.00
	10	9.81	10.03
	100	99.50	100.00
2012-06-15	0	0.03	0.01
	10	9.98	9.99
	100	99.80	100.00
2012-06-16	0	0.00	0.00
	10	99.70	9.98
	100	99.90	99.90
2012-06-17	0	0.03	0.01
	10	99.70	9.97
	100	100.00	100.00
2012-06-18	0	0.01	0.01
	10	10.01	10.00
	100	100.00	100.00
2012-06-19	0	0.04	0.01
	10	10.03	10.00
	100	100.20	100.00

Date	Standard	Initial reading NTU	Final reading NTU
2012-06-20	0	0.02	0.00
	10	10.01	9.99
	100	100.10	100.00
2012-06-24	0	0.01	0.01
	10	10.60	10.00
	100	101.00	100.10
2012-06-25	0	0.07	0.04
	10	10.13	10.01
	100	100.50	100.00
2012-06-26	0	-0.03	0.00
	10	9.90	10.01
	100	99.50	100.00
2012-06-27	0	0.03	0.00
	10	10.04	10.02
	100	99.40	100.10
2012-07-02	0	-0.03	0.01
	10	10.04	10.02
	100	100.60	99.80
2012-07-03	0	0.04	0.00
	10	10.06	9.97
	100	100.60	100.00
2012-07-05	0	-0.07	0.01
	10	10.04	99.90
	100	100.60	100.00
2012-07-09	0	0.01	0.03
	10	9.99	10.31
	100	99.80	100.20
2012-07-12	0	-0.02	0.00
	10	9.98	10.00
	100	99.40	100.00
2012-07-18	0	-0.05	0.00
	10	10.04	10.00
	100	100.00	100.00
2012-07-19	0	0.02	0.01
	10	9.96	10.01
	100	99.80	100.10
2012-07-20	0	0.01	0.00
	10	10.08	9.99
	100	99.80	100.00
2012-07-21	0	0.04	0.01
	10	9.96	10.02
	100	99.60	99.90
2012-07-22	0	0.06	0.00
	10	10.03	10.00
	100	104.70	100.10
2012-07-23	0	0.04	0.01
	10	10.05	10.01
	100	98.60	99.90
2012-07-24	0	0.03	0.02
	10	10.03	9.99
	100	101.00	99.90
2012-07-27	0	0.02	0.01
	10	10.06	9.96
	100	100.60	99.90

Date	Standard	Initial reading	Final reading
		NTU	NTU
2012-07-28	0	0.03	0.02
	10	10.02	10.01
	100	100.40	100.10
2012-07-30	0	0.06	0.00
	10	10.90	9.95
	100	106.00	100.10
2012-08-01	0	0.03	0.01
	10	10.10	9.99
	100	100.30	99.90
2012-08-02	0	0.04	0.04
	10	10.06	9.98
	100	99.80	100.00
2012-08-07	0	0.05	0.01
	10	10.05	10.01
	100	100.20	100.00
2012-08-13	0	-0.04	0.04
	10	10.05	10.03
	100	100.60	100.00
2012-08-14	0	0.00	0.00
	10	10.02	10.00
	100	100.70	100.00
2012-08-21	0	0.23	0.00
	10	10.12	9.97
	100	101.30	99.90
2012-08-27	0	0.05	0.05
	10	10.07	10.00
	100	100.30	100.00
2012-08-28	0	0.01	0.01
	10	9.99	10.00
	100	100.10	100.00
2012-09-03	0	-0.12	0.01
	10	9.86	10.02
	100	100.00	100.10
2012-09-04	0	0.01	0.02
	10	9.98	9.99
	100	100.10	99.90
2012-09-05	0	0.04	0.01
	10	9.98	10.00
	100	9.99	100.00
2012-09-10	0	-0.02	0.01
	10	9.89	9.99
	100	99.70	99.90
2012-09-11	0	-0.01	0.00
	10	10.00	10.10
	100	100.10	100.10
2012-09-19	0	0.09	0.02
	10	10.15	10.03
	100	100.10	100.04
2012-09-26	0	0.07	0.03
	10	10.09	10.03
	100	100.40	100.30
2012-09-28	0	0.02	0.01
	10	10.01	10.02
	100	100.10	99.90

Date	Standard	Initial reading	Final reading
		NTU	NTU
2012-10-01	0	0.07	0.02
	10	9.80	9.97
	100	99.50	100.00
2012-10-02	0	0.03	0.01
	10	9.97	10.20
	100	101.30	99.90
2012-10-17	0	0.20	0.07
	10	10.70	10.10
	100	103.20	100.10
2012-10-29	0	0.00	0.00
	10	10.16	10.01
	100	106.00	100.30
2012-11-05	0	0.01	-0.03
	10	10.03	9.99
	100	101.20	99.50
2012-11-09	0	-0.03	-0.01
	10	10.08	10.04
	100	100.10	100.30
2012-11-12	0	0.06	0.02
	10	10.11	10.01
	100	99.90	100.00
2012-11-16	0	0.01	0.00
	10	9.95	10.00
	100	99.50	101.70
2012-11-20	0	-0.02	0.01
	10	9.92	10.00
	100	99.80	99.10
2012-11-26	0	0.00	0.00
	10	9.97	10.00
	100	99.60	100.20
2012-11-27	0	-0.02	-0.03
	10	10.03	10.04
	100	99.80	100.10
2012-12-03	0	-0.03	-0.02
	10	10.01	9.98
	100	100.60	100.80
2012-12-10	0	-0.03	-0.02
	10	10.02	9.99
	100	100.60	100.30
2012-12-11	0	-0.02	0.00
	10	9.95	9.99
	100	100.70	99.70

Table 8.24: 2012 Hoskin Scientific 340I pH Meter Calibration

Date	Standard	Initial reading	Final reading	Slope mV
2012-01-03	4.00	3.91	4.01	-58.4
	7.00	7.00	7.00	
2012-01-08	4.00	4.03	4.01	-55.5
	7.00	7.05	7.00	
2012-01-09	4.00	4.02	4.01	-57.7
	7.00	7.01	7.02	
2012-02-06	4.00	4.02	4.01	-57.7
	7.00	7.01	7.02	
2012-02-13	4.00	4.03	4.00	-58.3
	7.00	7.04	6.99	
2012-02-14	4.00	4.02	4.01	-56.7
	7.00	7.00	7.02	
2012-02-26	4.00	4.07	3.99	-57.8
	7.00	6.96	6.98	
2012-03-06	4.00	3.93	4.04	-58.6
	7.00	6.88	7.03	
2012-03-18	4.00	4.08	4.00	-57.5
	7.00	7.03	7.00	
2012-03-19	4.00	3.98	4.01	-57.7
	7.00	6.99	7.03	
2012-04-15	4.00	4.00	4.01	-57.6
	7.00	7.00	7.02	
2012-04-16	4.00	4.03	4.03	-57.4
	7.00	7.04	7.02	
2012-06-05	4.00	3.95	4.00	-57.4
	7.00	6.97	7.01	
2012-06-11	4.00	4.07	4.00	-57.5
	7.00	7.06	7.01	
2012-06-13	4.00	4.01	4.00	-57.0
	7.00	7.03	7.00	
2012-06-19	4.00	3.99	4.01	-57.6
	7.00	7.02	7.01	
2012-06-20	4.00	4.01	4.01	-57.2
	7.00	7.03	7.02	
2012-06-25	4.00	4.06	4.01	-57.3
	7.00	7.05	7.02	
2012-07-02	4.00	4.09	4.01	-57.7
	7.00	7.15	7.02	
2012-07-03	4.00	4.00	4.00	-58.5
	7.00	7.04	7.00	
2012-07-05	4.00	4.00	4.00	-58.2
	7.00	7.00	7.00	
2012-07-09	4.00	4.00	4.01	-58.2
	7.00	6.97	6.97	
2012-08-17	4.00	3.99	4.00	-57.3
	7.00	6.96	7.02	
2012-10-11	4.00	3.94	4.01	-56.6
	7.00	6.96	7.02	

Table 8.25: 2012 Hanna Multi-Parameter #1 Meter Calibration

Date	pH			Dissolved Oxygen			Conductivity		
	Standard	Initial Reading	Final Reading	Standard	Initial Reading (%)	Final Reading (%)	Standard (µS/cm)	Initial Reading (µS/cm)	Final Reading (µS/cm)
2012-01-03							1413	1397	1408
2012-01-13	4.00	4.21	4.00	0	0	0	1413	1395	1412
	7.00	7.21	7.02	100	102.1%	100%			
2012-01-19	4.00	4.22	3.99	0	0.0%	0.0%	1413	1428	1410
	7.00	7.38	7.00	100	104.0%	100.0%			
2012-01-21	4.00	4.07	3.99	0	0.0%	0.0%	1413	1422	1412
	7.00	7.04	6.98	100	97.3%	100.0%			
2012-03-06							1413	1511	1413
2012-03-18				0	0.3%	0.0%	1413	1438	1412
				100	111.8%	100.0%			
2012-03-19				0	0.0%	0.0%	1413	1403	1412
				100	99.6%	100.0%			
2012-04-03	4.00	4.53	3.99				1413	1430	1412
	7.00	6.55	6.91						
2012-04-15	4.00	4.00	3.99	0	0.0%	0.0%	1413	1417	1413
	7.00	7.10	7.01	100	99.0%	100.0%			
2012-04-16	4.00	4.07	4.01	0	0.0%	0.0%	1413	1419	1413
	7.00	7.14	7.01	100	106.1%	101.0%			
2012-04-18	4.00	4.06	3.99	0	0.0%	0.0%	1413	1438	1413
	7.00	7.08	7.01	100	104.0%	100.0%			
2012-04-19	4.00	3.95	4.01	0	0.0%	0.0%	1413	1411	1413
	7.00	6.91	7.01	100	105.0%	100.0%			
2012-04-23	4.00	4.21	3.99				1413	1404	1407
	7.00	7.29	7.02						
2012-05-11	4.00	4.05	4.03	0	0.0%	0.0%	1413	1397	1410
	7.00	7.05	7.04	100	104.9%	100.1%			
2012-09-03	4.00	3.68	4.00				1413	1453	1414
	7.00	6.71	7.01						
2012-09-04	4.00	4.10	4.00				1413	1423	1413
	7.00	7.22	7.03						
2012-09-05	4.00	4.02	4.00				1413	1433	1431
	7.00	7.10	7.01						
2012-09-10	4.00	3.86	4.01				1413	1446	1412
	7.00	6.76	7.02						
2012-09-11	4.00	4.05	4.01				1413	1420	1411
	7.00	7.04	7.01						
2012-09-12	4.00	4.06	4.01	0	0.0%	0.0%	1413	1390	1411
	7.00	7.09	7.01	100	86.4%	100.0%			
2012-09-14	4.00	4.01	4.01				1413	1480	1415
	7.00	7.02	7.01						
2012-09-16	4.00	4.02	4.01				1413	1460	1416
	7.00	6.99	7.02						
2012-09-17	4.00	4.01	4.00	0	0.0%	0.0%	1413	1425	1417
	7.00	6.98	7.01	100	97.2%	100.0%			
2012-09-18	4.00	3.99	4.00				1413	1430	1416
	7.00	6.96	7.02						

2012-09-19	4.00 7.00	4.02 6.99	4.01 7.01	0 100	0.0% 98.1%	0.0% 100.0%	1413	1663	1413
2012-09-20	4.00 7.00	4.06 6.97	4.01 7.01	0 100	0.0% 100.8%	0.0% 100.0%	1413	1448	1418
2012-09-24	4.00 7.00	4.07 6.96	4.02 7.00				1413	1372	1421
2012-09-28	4.00 7.00	4.00 7.00	4.00 7.02				1413	1661	1410
2012-10-01	4.00 7.00	4.01 7.02	4.00 7.01	0 100	0.0% 114.9%	0.0% 100.0%	1413	1372	1421
2012-10-02	4.00 7.00	4.11 7.16	4.01 7.01				1413	1402	1413
17/10/2012	4.00 7.00	4.14 7.18	4.00 7.01				1413	1389	1413
29/10/2012	4.00 7.00	3.99 7.04	3.99 7.00				1413	1416	1416
2012-11-05	4.00 7.00	4.20 7.43	4.00 7.01				1413	1440	1411
2012-11-09	4.00 7.00	4.02 7.10	3.99 7.01				1413	1418	1414
2012-11-12	4.00 7.00	4.06 7.06	4.00 7.01				1413	1410	1413
2012-11-16	4.00 7.00	3.97 6.93	3.98 6.97				1413	1380	1410
2012-11-20	4.00 7.00	3.98 7.00	4.01 7.00				1413	1404	1410
2012-11-26	4.00 7.00	3.97 7.02	4.00 7.03				1413	1486	1415
2012-11-27	4.00 7.00	4.07 7.08	4.00 7.03	0 100	0.0%		1413	1416	1414
2012-11-29	4.00 7.00	4.04 7.02	4.00 7.04	0 100	0.0%		1413	1400	1414
2012-11-30	4.00 7.00	3.97 7.01	4.01 7.04	0 100	0.0%		1413	1399	1417
2012-12-03	4.00 7.00	3.94 7.09	4.00 7.00	0 100		0.0% 100.0%	1413	1400	1414
2012-12-04	4.00 7.00	3.97 7.09	4.01 7.04	0 100	0.0% 90.1%	0.0% 100.0%	1413	1399	1412
2012-12-06	4.00 7.00	4.08 7.17	4.00 7.03	0 100	0.0% 106.2%	0.0% 100.0%	1413	1420	1411
2012-12-10	4.00 7.00	4.03 7.06	3.99 7.02	0 100	0.0% 102.4%	0.0% 100.0%	1413	1416	1415

Table 8.26: 2012 Hanna Multi-Parameter #2 Meter Calibration

Date	pH			Dissolved Oxygen			Conductivity		
	Standard	Initial Reading	Final Reading	Standard	Initial Reading (%)	Final Reading (%)	Standard (µS/cm)	Initial Reading (µS/cm)	Final Reading (µS/cm)
2012-04-10	4.01 7.00	4.36 7.55	4.02 7.02				1413	1431	1408
2012-04-30	4.01 7.00	3.98 6.95	4.01 7.02				1413	1437	1409
2012-05-01	4.01 7.00	4.13 7.12	3.97 3.97				1413	1357	1409
2012-05-08	4.01 7.00	4.05 7.04	4.01 6.99	100 0	95% 0%	100% 0%	1413	1422	1417
2012-05-09	4.01 7.00	4.05 7.06	4.01 7.01	100 0	96% 0%	100% 0%	1413	1401	1410
2012-05-10	4.01 7.00	3.92 6.97	4.00 7.00	100 0	102% 0%	100% 0%	1413	1410	1407
2012-05-11	4.00 7.00	4.01 7.01	4.01 7.00	100 0	102% 0%	100% 0%	1413	1404	1415
2012-05-14	4.00 7.00	4.00 7.11	3.99 7.01	100 0	98% 0%	100% 0%	1413	1525	1412
2012-05-15	4.00 7.00	4.04 7.07	3.99 6.99	100 0	97% 0%	100% 0%	1413	1412	1413
2012-05-22	4.00 7.00	4.02 7.01	3.99 7.03				1413	1414	1412
2012-05-24	4.00 7.00	3.94 7.07	3.99 7.02				1413	1391	1410
2012-05-27	4.00 7.00	3.99 7.01	3.98 7.01				1413	1433	1410
2012-05-28	4.00 7.00	4.07 7.07	3.99 7.02				1413	1481	1411
2012-05-29	4.00 7.00	4.04 7.04	3.99 7.03				1413	1456	1410
2012-06-24	4.00 7.00	4.02 7.11	3.99 6.97	0 100	0% 105%	0% 100%	1413	1476	1412
2012-06-26	4.00 7.00	3.91 6.89	4.00 7.01	0 100	0% 96%	0% 100%	1413	1453	1416
2012-07-02	4.00 7.00	4.09 7.15	4.01 7.02				1413	772	1409
2012-07-03	4.00 7.00	7.11	7.06				1413	1487	1411
2012-07-09							1413	1455	1417
2012-07-12	4.00 7.00	4.14 7.17	3.98 6.99				1413	1402	1420

2012-07-18	4.00 7.00	3.95 6.98	4.00 7.03		4848	4961
2012-07-19	4.00 7.00	3.95 6.85	4.00 7.01		Quick calibration	
2012-07-20	4.00 7.00	3.85 6.93	4.01 7.01		Quick calibration	
2012-07-21	4.00 7.00	3.91 6.96	4.00 7.01		Quick calibration	
2012-07-22	4.00 7.00	3.85 6.96	3.99 6.99		Quick calibration	
2012-07-24	4.00 7.00	4.01 6.99	3.96 6.99		Quick calibration	
2012-07-27	4.00 7.00	3.96 6.94	3.98 6.99		Quick calibration	
2012-07-28	4.00 7.00	3.85 6.96	3.96 7.01		Quick calibration	
2012-07-30	4.00 7.00	3.89 7.13	3.99 7.02		1413	1397 1411
2012-08-01	4.00 7.00	3.91 7.05	4.01 7.03		Quick calibration	
2012-08-02	Quick calibration				Quick calibration	
2012-08-07	Quick calibration				Quick calibration	
2012-08-13	4.00 7.00	3.93 7.01	3.97 7.01		1413	1444 1410
2012-08-14	4.00 7.00	3.95 6.98	3.99 6.98		1413	1454 1416
2012-08-21	4.00 7.00	4.04 7.12	3.97 7.02		1413	1256 1412
2012-08-28	4.00 7.00	4.05 7.03	4.01 7.00		Quick calibration	

Table 8.27: 2012 YSI Meter Calibration

Date	pH			Dissolved Oxygen			Conductivity		
	Standard	Initial Reading	Final Reading	Standard	Initial Reading (%)	Final Reading (%)	Standard (µS/cm)	Initial Reading (µS/cm)	Final Reading (µS/cm)
16/11/2012	4.00	3.97	3.98				1413	1380	1410
	7.00	6.93	6.97						
20/11/2012	4.00	3.98	4.01				1413	1404	1410
	7.00	7.00	7.00						
26/11/2012	4.00	3.97	4.00		97%	0%	1413	1486	1415
	7.00	7.02	7.03						

Table 8.28: 2012 Freshwater Usage

Water Location	Source Lake	Jan	Feb	Mar	Apr	May	Jun	Jul
Camp	Third Portage Lake	3,243	3,210	3,425	3,491	3,490	3,329	3,300
Mill (freshwater tank)	Third Portage Lake	96,259	81,368	86,357	82,589	89,913	89,120	92,360
Emulsion plant	No-name Lake	142	142	132	191	164	127	160
Water truck	Second Portage Lake	0	0	0	0	0	0	0
Total Freshwater Usage (m³)		99,644	84,720	89,914	86,271	93,567	92,576	95,820
Ore Water (m³)	Ore	3,262	3,343	2,649	4,464	3,323	2,271	2,610
Reclaim Water Usage (m³)	Tailings Pond	238,931	236,668	232,473	222,433	224,223	223,627	251,250

Water Location	Source Lake	Aug	Sep	Oct	Nov	Dec	Total
Camp	Third Portage Lake	3,406	3,401	3,223	3,461	3,410	40,389
Mill (freshwater tank)	Third Portage Lake	94,031	72,544	74,779	81,187	61,979	1,002,486
Emulsion plant	No-name Lake	138	136	138	168	162	1,800
Water truck	Second Portage Lake	0	0	0	0	0	0
Total Freshwater Usage (m³)		97,575	76,081	78,140	84,816	65,551	1,044,675
Ore Water (m³)	Ore	2,706	2,445	3,931	4,226	4,888	40,118
Reclaim Water Usage (m³)	Tailings Pond	248,596	235,191	271,440	262,199	261,808	2,908,839