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2015 ENVIRONMENTAL MONITORING REPORT GOLDEN LANDFILL (MR – 17006), GOLDEN, B.C.

Prepared for:

Columbia Shuswap Regional District
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April 2016
Project: 14-024-16

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April 30, 2016 Project # 14-024-16

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Columbia Shuswap Regional District
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Salmon Arm, B.C., V1E 4P1

Dear Mr. Van Nostrand:

Re: 2015 Environmental Monitoring Report – Golden Landfill, Golden, B.C.

Western Water Associates Ltd. (WWAL) is pleased to provide this report which summarizes environmental monitoring at the Golden Refuse Disposal Facility (RDF) in 2015. For the 2015 reporting, time series plots were created from historic and current data. This temporal analysis helps us understand the degree of impact on groundwater over time. This report satisfies the requirements of the provincially issued Operational Certificate and is suitable for submission to the B.C. Ministry of Environment.

We trust that the professional opinions and advice presented in this document are sufficient for your current requirements. Should you have any questions or if we can be of further assistance in this matter, please contact the undersigned.

WESTERN WATER ASSOCIATES LTD.

Reviewed by:

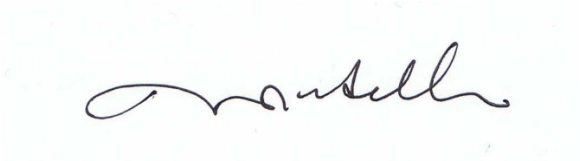

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TABLE OF CONTENTS

List of Figures (following text)

List of Tables

List of Appendices

1. INTRODUCTION AND SITE BACKGROUND

Western Water Associates Limited (WWAL) was retained by the Columbia Shuswap Regional District (CSRD) to prepare the 2015 Annual Environmental Monitoring Report for the Golden Refuse Disposal Facility (RDF) (hereinafter called the "site") as part of a district-wide monitoring contract. This report presents the monitoring for the 2015 report period from January 1 to December 31, 2015. Associated Engineering (formerly Summit Environmental Consultants Inc.) previously reported on the 2008 to 2013 monitoring programs. Prior to 2008, Sperling Hansen Associates (SHA) prepared the annual reports (SHA 2008). In 2014 WWAL was awarded the monitoring contract and we are pleased to provide the results of the 2015 environmental monitoring program at the Golden Landfill in this report.

The Golden RDF has operated as a natural attenuation site since the late 1970's when the permit was transferred to Columbia Shuswap Regional District (CSRD). The site operates under the now referenced Operational Certificate (OC) 17006, issued May 5, 2003 and most recently amended August 29, 2012, by the British Columbia Ministry of Environment (MoE). The Golden waste shed includes the municipality of Golden and CSRD Electoral Area A, which includes the unincorporated communities of Parson and Nicholson and services approximately 7,000 residents (Summit 2013). This report was prepared in accordance with the annual landfill reporting requirements outlined in Section 5.0 of the OC. A copy of the OC is included in Appendix A.

1.1 Objective and Scope

To meet the goal of assessing the long-term monitoring for groundwater impacts from landfill operations, the objectives of the program are to collect and analyze groundwater samples, and interpret analytical results in accordance with the OC (MoE 1996) and the consulting agreement between WWAL and the CSRD. The tasks undertaken were as follows:

- Collect and submit to the laboratory, water samples as scheduled for the year;
- Assess the condition of local on-site vegetation for potential stress;
- Summarize water quality guideline exceedances from the 2015 results;
- Analyze the data and prepare the final annual report (this document); and
- Review the results with the CSRD Project Manager at the end of each year and provide recommendations to revise the program for future years, if warranted.

2. SITE DESCRIPTION

This section describes geographic location, bedrock and surficial geology of the study area, historical climate data, hydrologic data, and hydrogeology data for Golden RDF. Further, a description of the monitoring network that was sampled in the 2015 monitoring program is provided.

2.1 Location

The Golden RDF is located on a southwest facing slope approximately 2 km northeast of downtown Golden (Figure 1). The site covers an area of about 17 ha with the waste foot print covering an area of approximately 4.4 ha. The property is bounded on all sides by forest with Golden-Donald Upper Road located along the western site boundary. The site is approximately 1 km north and above the Kicking Horse River, which is a major surface water body in the area. The nearest privately owned residence is within 100 m of the landfill boundary and is located just east of the site. The Golden RDF site is relatively flat and is at an elevation of 920 m above sea level (m asl), however the northeastern landfill area is located on a southwest facing slope and is at an elevation of 950 m asl. The site layout is provided on Figure 2 and the civic and legal address is as follows.

Civic: 350 Golden-Donald Upper Road in Golden, BC

Legal: Subdivision 12 of Section 18, Township 27, Range 21, West of the fifth Meridian, Kootenay District

2.2 Geology, Hydrology and Hydrogeology

Surficial geology in the Golden area are mainly comprised of a thick continuous glacial till blanket, which may include fluted landforms, morainal deposits, and drumlins (Geological Survey of Canada 2014). Deposits at the Golden RDF site consist of dense gravely sand and silty ablation till along the eastern slopes, with well-sorted bedded sand and gravels and alluvial deposits in the south central and western sections, as well as within the trench at the southwest corner of the site (Kala 1995; SHA 2008). Silt with sand and gravel deposits were observed in test hole 4 (TH-4) at the western edge of the landfill (Kala 1995). Based on well logs for TH-7 and MW-4D the unconsolidated deposits appear to be thicker in the southern sections and thinner towards the north. Deposits in exposures along the west side of Golden-Donald Road (across from the RDF site) consist of dense, well-sorted sands and gravels with traces of silt and clay and occasional bedding planes.

The bedrock at the site consists of sedimentary strata of the Rocky Mountains Cambrian to Ordovician in age (540 to 445 million years ago). Bedrock geology is mapped as limestone, sandstone, shale, minor conglomerate, and associated meta-sedimentary rocks of the McKay Group (Massey et al. 2005). No bedrock was encountered in the five test pits completed during the Kala 1995 hydrogeological investigation. However, limestone bedrock was encountered at approximately 34 m (111 ft) below ground surface (bgs) at MW-6D near the west central boundary of the site. Bedrock outcrops were noted in the northeastern part of the site.

The Kicking Horse River is approximately 1 km southeast of the RDF site and nearly 130 m lower in elevation (800 m asl). The river flows northwest through the western range of the Rocky Mountains and lower Kicking Horse Canyon where it merges into the Columbia River at the Town of Golden. The

Columbia River flows northwest and is approximately 3 km west of the site. Hospital Creek, located in a deeply incised valley northwest of the landfill site, flows southwest into the Columbia River.

Surface drainage at the RDF site is dependent on the local topography. A narrow ravine located midway along the east side of the site collects the surface water from the east side of the site and diverts flow away from the landfill during extreme rain events or periods of high run-off from snowmelt. There are no other surface water drainage courses leading away from the landfill. The permeability of the surficial deposits at the site ranges from low to moderate. Silty surficial deposits along the eastern side of the landfill limit groundwater recharge while the silty sand and gravel located in the south central section of the landfill is typical moderately (SHA 2008).

The B.C. Water Resources Atlas shows MoE sand and gravel Aquifer 456 IIB approximately 60 m southwest of the Golden RDF boundary and is located at the confluence of the Columbia and Kicking Horse Rivers. This aquifer, which is classified as having a moderate demand, high productivity, and moderate vulnerability, covers an area of 10.2 km^2. Demand describes local reliance on the groundwater water source, productivity indicates relative well yields, and vulnerability describes the potential for contaminants to move from the surface into the aquifer. There are no MoE reported aquifers at the site location. Based on site topography and water level elevations from the three wells (MW-4D, TH-8, and DMW-2) completed in the local bedrock aquifer (Summit 2010), groundwater flow direction at the site is from northeast to southwest, moving from the uplands towards the Columbia and Kicking Horse Rivers. The groundwater flow direction should be confirmed once an accurate survey of the top of casing elevation of the wells is completed. Rain and snowmelt percolating through the landfill will likely migrate vertically down until reaching the water table.

2.3 Climate

The climate at the site is humid continental with relatively warm summers and a relatively short dry season, with Golden situated between two mountain ranges. The nearest climatic data available for the region is from the station at the Golden Airport (Climate STN ID 1173210). Climate averages for this station are available for 1981 to 2010. During this period, the recorded average annual temperature and total precipitation at Golden were 5.1°C and 466.8 mm/year, respectively (Environment Canada 2015). Recorded mean monthly temperatures ranged from – 7.9°C in January to 17.3°C in July. The recorded mean precipitation ranged from 24.1 mm/month in February to 51.1 mm/month in November. Table 1 summarizes the climate data from the Golden climate station.

Table 1: Monthly Average Climate Data (STN 1173210: 1981 - 2010)

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year Avg.
Temperature													
Daily Average (°C)	-7.9	-5.0	0.8	6.5	11.3	14.9	17.3	16.7	11.5	5.00	-2.0	-7.8	5.1
Precipitation													
Precipitation (mm)	45.9	24.1	24.4	24.4	34.5	49.7	50.6	45.3	38.0	34.9	51.1	43.9	466.8

Source: Canadian Climate Normals (Environment Canada, 2015)

2.4 2015 Monitoring Network

The 2015 monitoring network included six locations:

- two monitoring wells (TH-8 and MW-6S),
- two domestic wells (DMW-1b and DMW-4); and
- two town supply wells (TW- #4 and TW- #6).

Monitoring Well TH-2 has been dry since 2007 and remained dry through 2015. Summit installed three onsite monitoring wells MW-6S (shallow), MW-6D (deep), and TH-7 in 2009 to replace decommissioned wells TH-4 and TH-3. TH-7 has never been sampled as it has been dry since installation. Nested wells MW-6S and MW-6D are located along the western site boundary north of the landfill gate. Due to similar water chemistry at wells MW-6S and MW-6D, sampling of MW-6D was considered redundant and therefore discontinued in 2011. Landfill gas monitoring points GP-6S/GP-6D and GP-7S/GP-7D were also installed in 2009 and are currently being monitored by the CSRD personnel directly. Monitoring well TH-8 was installed approximately 150 m northwest of the site to assess potential offsite leachate migration. After assessing the geochemical profile, we believe surface contamination from road salting is very likely influencing water quality at TH-8; therefore, this well was only sampled once in 2015 (May) and should be considered for closure.

Domestic well DMW-1b, located east of the site, was added to the program in 2011 as a replacement to upgradient monitor location DMW-1. Monitoring at DMW-1 was discontinued after 2010 as a raw water quality could not be sampled due to a filtration system connected to all the water outlets. DMW-4, located east of the site, was added to the program in 2013, as one of the nearest available cross gradient receptors. DMW-1 characterized background water quality, therefore DMW-1b and DMW-4 are now considered as new background wells.

Town Well #4 is one of Golden's five municipal water supply wells located approximately 1.5 km west of the landfill site. Beginning in 2013, another supply well (Town Well #6) was targeted for sampling because the capture zone for this well is closer to the landfill than Town Well #4 (Golder 2006). Town Well #4 was only sampled once in May 2015 as the well was taken offline from August 2015 until 2016 for maintenance. Table 2 summarizes the current monitoring locations and available well logs are provided in Appendix A.

Prior to 2011, sampling was conducted quarterly, with the exception of 2002 where three sampling events occurred. Beginning in 2011, the monitoring program went to tri-annual monitoring based on statistical analysis of variance (ANOVA) data provided by Summit (Summit 2010).The tri-annual monitoring at the site was approved by the MoE. Sampling at Golden RDF occurs three times annually with the 2015 sampling events occurring on May 25, August 25 and November 9.

Table 2: 2015 Monitoring Program

Sample Location	Depth of Well (m btoc)	Aquifer Type/ Primary Lithology	Approximate Ground Surface Elevation (masl)	Location Description
MW-6S	34.5	Bedrock	920	Located along the western boundary of the landfill site and is the northern most on-site well.
MW-6D	65.9	Bedrock	920	Nested with MW-6S
TH-8	26.2	Unconfined (bedrock)	921	Located approximately 300 m northwest of the site along Golden Donald Upper Rd.
Town Well #4	Unknown	Unknown	790	Located approximately 1.5 km northwest of the site on a strata road north of 14th St N.
Town Well #6	Unknown	Unknown	Unknown	Located approximately 2 km northwest of the site on the west side of 11th Ave. N.
DMW-1b	60	Unconfined (bedrock)	975	Located approximately 150 m east of the landfill site on Hietala Rd.
DMW-4	120	Unknown	Unknown	Located approximately 250 m east of the landfill site just north of Hietala Rd.
Dry Wells				
TH-2	22.5	Unknown	915	Located along the south central boundary of the landfill.
TH-7	31.7	Unconfined (sand silt and gravel)	Unknown	Located along the western boundary of the landfill (south side) near Golden- Donald Upper Rd and Granite Dr.

Note: **masl** = metres above sea level; **mbtoc** = metres below top of casing; Ground surface elevations were measured by Summit, accurate to ±30 cm. Depth for both domestic wells are approximate and are determined from personal communication with home owners.

3. METHODS

The following sections outline the program methods, including parameters sampled and field techniques used for the program.

3.1 Sampling Parameters

The program remained as per 2014. The 2015 laboratory assessed water quality parameters included the following:

- Total Alkalinity (total as $CaCO_3$);
- Total suspended solids (TSS)
- Turbidity;
- pH and Conductivity;
- Hardness (dissolved, as $CaCO_3$);
- Anions (chloride, fluoride, bromide, and sulphate);
- Nutrients: (nitrate (as N), nitrite (as N) and ammonia (as N), phosphorus (dissolved/total), potassium (dissolved/total); and
- Dissolved metals (total metals for domestic and town wells).

The groundwater monitoring program conducted in 2015 consisted of hydraulic (water level) monitoring, field measurements of pH, electrical conductivity (EC), temperature, and oxidation-reduction potential (ORP) and dissolved oxygen (DO) recorded during purging and immediately before sampling. All of the above-listed parameters were analyzed during each sample event.

3.2 Sampling Methods and Protocols

In order to ensure that representative groundwater samples were obtained from the monitoring wells and that no contamination of the recovered samples occurred. Sampling protocols followed the second edition (draft) of the "Landfill Criteria for Municipal Solid Waste" (MoE 2013), "British Columbia Field Sampling Manual for Continuous Monitoring plus the Collection for, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples" (MoE 2003).

Prior to groundwater sample collection, each well was purged of the standing volume of stagnant water using a submersible well pump, dedicated bailers, peristaltic pump or Waterra tubing (as appropriate). The objective of purging is to pump groundwater from the well until a representative sample of the formation groundwater is obtained. This is typically achieved by removal of three to five times the volume of standing water in the well or purging the well dry and letting the well recover to at least half of its pre-pumping level. Purging was considered complete once sediment-free groundwater is obtained and/or the EC, temperature, ORP, and pH of the groundwater stabilize. The pump was decontaminated between each sample location. Groundwater samples were collected in the appropriate laboratory-supplied clean, new sample containers and preserved as required. Groundwater samples designated for metals analysis were field filtered to 0.45 micron and preserved.

All samples were packaged in a cooler and delivered to the laboratory within a 24-hour period for analysis. Groundwater samples were submitted, under chain-of-custody protocol, to Caro Analytical Services (Kelowna, BC), for analysis. The laboratory results were sent directly from the laboratory to Wireless Water, our database manager. The field and laboratory data were then merged and the data were available in one database for analysis by WWAL.

During each monitoring event, the following field data were recorded:

- water level;
- field measured parameters [temperature, pH, ORP, DO, and EC];
- field notes on procedures (e.g. purging rates) and any unusual observations (e.g. well condition, odours, colours, etc.);
- evaluation of vegetation health in the area surround the wells that could be attributed to landfill leachate (luxuriant growth, discolouration, die-off, etc.); and
- signs of leachate breakout zones (e.g. presence of unusual bacteria or algae at all sites, signs of liquid flowing from the surface).

The quality assurance and quality control values for Sunnybrae are similar to past years RPD (relative percent difference) at less than 25%.

4. RESULTS AND DISCUSSION

The following section describes field observations and the results of the water quality sampled at the Golden Refuse Facility in 2015. Annual water level elevations, water quality guideline exceedances in 2015, along with temporal and spatial trends for the Golden RDF monitoring program are discussed. The descriptive statistics (average, maximum, minimum and count) for select water quality results between 2002 and 2015 are summarized in Table 4 with the full water quality database for all historic and current results provided in Appendix C. The 2015 analytical reports provided by the laboratory can be found in Appendix D.

Our analysis of potential leachate impacts on the receiving environment employs two main approaches:

- comparison of monitoring results to guidelines (i.e. does a problem exist); and
- trend analysis (i.e. is the situation changing over time or space).

The ensuing evaluation, elucidated in our discussion below, may then be used to inform decisions about future monitoring priorities as well as the overall program results. Water quality results were assessed both temporally and spatially.

Potential impacts to groundwater from landfill leachate are typically identified by assessing the concentrations of landfill leachate indicators relative to background groundwater concentrations. Typical leachate indicators may include, but are not limited to, ammonia, chloride, total alkalinity, sulphate, manganese, iron, calcium, magnesium, and the heavy metals cadmium, chromium, copper, nickel, and zinc (Christensen et al. 2001).

Figures 3 through 8 depict the time series plots for water quality parameters sampled at the six locations between 2002 and 2015. The landfill leachate associated parameters plotted include the following: chloride, electrical conductivity, dissolved sodium, sulphate, nitrate, dissolved Iron and dissolved manganese. Plotted results below the reportable detection limit are displayed as one-half the reportable detection limit.

- Chloride and Conductivity (Figure 3);
- Dissolved Sodium and Total Sodium (Figure 4);
- Sulphate (Figure 5);
- Nitrate and Modified Nitrate (Figure 6);
- Dissolved Iron and Total Iron (Figure 7); and
- Dissolved Manganese (Figure 8).

4.1 Vegetation

WWAL's assessment continues to indicate that there is perceived stress to the trees just beyond the southern boundary of the Golden RDF and is an area of concern. To determine if the stress is related to landfill activities we continue to recommend assessment of the vegetative biomass and soils at the south property boundary (See Section 6.0). There were no signs of breakout zones at any of the monitored locations at the site. However, minor surface water ponding was evident near dry well TH-2 in November and evidence of recent overland flow near TH-2 was observed during the May sampling event.

4.2 Water Quality Exceedances

Assessing impact on the receiving environment from landfill leachate is the objective of the current monitoring program at Golden. Due to the proximity of domestic water wells and surface water bodies in the vicinity of the site, the 2015 water quality results were compared to the following applicable guidelines and standards:

- Guidelines for Canadian Drinking Water Quality Maximum Acceptable Concentration (health-based guideline) (GCDWQ MAC) and Aesthetic Objective (based on aesthetic considerations) (GCDWQ AO) (Health Canada 2014);
- B.C. Approved Water Quality Guidelines for Drinking Water (BCAWQG DW) (MoE 2015);
- British Columbia Approved Water Quality Guidelines for Aquatic Life (BCAWQG AL) and Working Water Quality Guidelines for Aquatic Life (BCWWQG AL) (MoE 2015); and
- B.C. Contaminated Sites Regulation 375/96, Schedule 6, Generic Numerical Water Standards for Drinking Water (CSR DW) and Aquatic Life (CSR AW) (MoE 1997).

Table 3 provides a list of exceedances in water quality guidelines relevant to landfill leachate impact. Exceedances in the Provincial freshwater aquatic life guidelines at the groundwater monitoring locations are listed on Table 3, however exceedances of these parameters are not relevant to the current water quality assessment as the BCAWQG AL and BCWWQG AL are intended to be applied to surface waters. It should be noted that BCAWQG DW guideline applies to drinking water that is treated with chlorine to address health issues related to production of haloforms (MoE 2001); since none of the monitoring wells are treated with chlorine this guideline does not apply to the well at the site.

Table 3: 2015 Water Quality Exceedances by Guideline

Sampling Location	Guideline	2015 Exceedances
DMW-1b	BCAWQG AL	Arsenic (total), Dissolved oxygen [F]
	GCDWQ MAC	Arsenic (total)
	GCDWQ AO	Iron (total), pH [F]
	BCAWQG DW	Arsenic (total), pH [F]
	BC CSR DW	Arsenic (total), Magnesium (total)
DMW-4	BCAWQG AL	Dissolved oxygen [F]
	GCDWQ AO	pH [F]
	BCAWQG DW	pH [F]
	BC CSR DW	Magnesium (total)
MW6S	BCAWQG AL	Aluminum (dissolved), Boron (dissolved), Chloride, Copper (dissolved), Dissolved oxygen [F], Iron (dissolved), Nitrate (as N), Sulphate
	BCWWQG AL	Beryllium (dissolved), Chromium (dissolved)
	GCDWQ MAC	Nitrate (as N)
	GCDWQ AO	Chloride, Iron (dissolved), Manganese (dissolved), pH [F], Sodium (dissolved), Sulphate
	BCAWQG DW	Aluminum (dissolved), Chloride, Nitrate (as N), pH [F], Sulphate
	BC CSR AW	Copper (dissolved)
	BC CSR DW	Chloride, Magnesium (dissolved), Nitrate (as N), Sodium (dissolved), Sulphate
TH8	BCAWQG AL	Chloride
	GCDWQ AO	Chloride, Sodium (dissolved)
	BCAWQG DW	Chloride
	BC CSR DW	Chloride, Magnesium (dissolved), Sodium (dissolved)
Town Well #4	BCAWQG AL	Dissolved oxygen [F]

[F] = Field Result(s)

Similar to previous years, a number of parameters were detected at concentrations above guidelines in 2015 (Table 3). pH was a new exceedance at wells DMW-1b, DMW-4, and TH-8, which were below GCDWQ AO and BCAWQG DW of 6.5-8.5 in November 2015. There were also a number of new exceedances at monitoring well MW-6S. Copper and beryllium were in exceedance of the BC CSR AW and BCWWQG AL, respectively at this location and aluminum, copper, and iron were in exceedance of BCAWQG AL in 2015. Exceedances that were not detected in 2015 but were in 2014 include iron and beryllium (BCAWQG AL and BCWWQG AL) at DMW-1b, and copper (BCAWQG AL) at DMW-4. As stated above, exceedances of BCAWQG AL and BCWWQG AL are not relevant to the current water quality assessment as they are intended to be applied to surface waters.

Similar to 2014, chloride was detected at concentrations above the BCAWQG DW, CSR DW, GCDWQ AO (all 250 mg/l) and the BCAWQG AL (600 mg/l) in both TH-8 and MW-6S sampling locations. Nitrate

and sulphate concentrations at MW-6S remain in exceedance of GCDWQ MAC (nitrate only), BCAWQG DW, BCAWQG AL, BC CSR DW, and GCDWQ AO (sulphate only). In 2015, exceedances of the applicable guidelines for dissolved metals included: aluminum, arsenic, boron, beryllium, chromium copper, iron, manganese, magnesium, and sodium. Consistent with historical data, the highest arsenic concentrations were found at DMW-1b, where concentrations exceeded the BCAWQG AL of 0.005 mg/l, the GCDWQ MAC and BC CSR DW of 0.010 mg/l, and the BCAWQG DW of 0.025 mg/l during all sampling events in 2015. Boron concentrations remain an order of magnitude greater at MW-6S than at the other wells, and concentrations have increased steadily from below the BCAWQG AL of 1.2 mg/l in 2009 to above guidelines in one year (2010) and was more than 1.7 mg/l during all sampling events in 2015.

It should be noted that residences at DMW-1b were notified by WWAL field staff of exceedances of the drinking water guidelines. These included arsenic (GCDWQ MAC) and iron (GCDWQ AO).

4.3 Water Quality Trend Analysis from 2002 to 2015

Sample locations were selected to monitor potential receptors surrounding the Golden RDF. Monitoring well TH-8 was intended to monitor potential impacts from the landfilling operations offsite, to the northwest (cross gradient). The Town wells (#4 and # 6) both monitor downgradient, off-site water quality in the Columbia River valley. The capture zone for Town Well #6 and Town Well #4 are both southwest of the landfill and include industrial, commercial, and residential areas, which could also contribute other contaminant sources. MW-6S (shallow) monitors the upper (north) section of western boundary just prior to the water flowing off-site. Domestic wells DMW-1b and DMW-4 at both monitor potential off-site contamination directly east of the site (upgradient and cross gradient). Both TH-7 and TH-2 are intended to monitor on-site water quality near the southern boundary of the landfill site; however, they have both been dry since at least 2007.

Table 4: Summary Statistics for Select Water Quality Parameters from 2002 to 2015

Analyte	Sampling Location	Average	Minimum	Maximum	Count	Number of Exceedances
Chloride	DMW-1b	36.9	26	51.7	15	0
	DMW-4	17.1	12.1	22.4	9	0
	MW6S	626	491	732	20	20
	TH8	761	523	988	17	17
	Town Well #4	72	57.6	91.1	24	0
	Town Well #6	27.1	22.9	34.5	7	0
Conductivity	DMW-1b	1063	750	1220	15	0
	DMW-4	1015	900	1130	9	0
	MW6S	4214	480	6600	20	0
	TH8	2704	340	3500	16	0
	Town Well #4	816	640	970	16	0

	Town Well #6	591	401	677	7	0
Analyte	**Sampling Location**	**Average**	**Minimum**	**Maximum**	**Count**	**Number of Exceedances**
Sodium (dissolved/total[1])	DMW-1b[1]	29.9	26.9	33.2	3	0
	DMW-4[1]	48.1	27.2	70.3	3	0
	MW6S	368	290	444	20	20
	TH8	365	178	450	17	16
	Town Well #4[1]	40.8	34.8	46.9	2	0
	Town Well #6[1]	16.6	15.1	18.9	3	0
Sulphate	DMW-1b	127	114	144	15	0
	DMW-4	232	150	275	9	0
	MW6S	821	606	950	20	20
	TH8	47.4	36.5	72.9	17	0
	Town Well #4	39	35.8	44.5	24	0
	Town Well #6	23.6	20.4	24.8	7	0
Nitrate (as N)	DMW-1b	0.044	<0.010	0.397	2	0
	DMW-4	0.409	<0.010	0.725	8	0
	MW6S	51	2.99	66.9	20	19
	TH8	0.42	<0.010	1.11	14	0
	Town Well #4	1.3	0.755	1.63	24	0
	Town Well #6	0.95	0.781	1.23	7	0
Iron (dissolved/total[1])	DMW-1b[1]	0.34	0.23	0.42	3	2
	DMW-4[1]	0.04	0.02	0.04	2	0
	MW6S	0.15	0.01	1.21	14	3
	TH8	0.52	0.011	3.01	17	4
	Town Well #4	0.06	<0.010	0.386	10	1
	Town Well #6[1]	0.02	0.01	0.01	2	0
Magnesium (dissolved/total[1])	DMW-1b[1]	114	111	119	3	3
	DMW-4[1]	98	93.1	102	3	1
	MW6S	314	246	378	20	20
	TH8	136	96.5	160	17	16
	Town Well #4[1]	38.8	37.9	39.8	2	0
	Town Well #6[1]	27.7	26.8	29.2	3	0
Manganese (dissolved/total[1])	DMW-1b[1]	0.005	0.0046	0.005	3	0
	DMW-4[1]	0.004	0.0037	0.0048	3	0
	MW6S	0.136	0.0683	0.518	20	20

	TH8	0.136	0.0031	0.492	17	11
	Town Well #4	0.001	<0.0002	0.0068	5	0
	Town Well #6*	0.001	0.001	0.0011	2	0
Boron (dissolved/total[1])	DMW-1b[1]	0.14	0.139	0.146	3	0
	DMW-4[1]	0.42	0.2	0.659	3	0
	MW6S	1.44	0.921	2.04	20	16
	TH8	0.033	0.017	0.093	17	0
	Town Well #4[1]	0.013	0.015	0.015	1	0
	Town Well #6[1]	0.01	0.006	0.007	2	0

Note: 1. Indicates total metals results; full water quality with historical results for dissolved metal is attached in Appendix C

Overall, MW-6S continues to exhibit the highest degree impact, with elevated average conductivity and concentrations of chloride, nitrate, sodium, and sulphate relative to other sampling locations. Leachate-associated parameters manganese and ammonia show increasing trends at this location. Monitored location TH-8 exhibits elevated concentrations of chloride, sodium, and conductivity without associated nitrates and sulphates, which suggests road salts as the likely sources of contaminant.

4.3.1 Chloride

Historically, chloride concentrations were lower at DMW-1b (average 37 mg/l), DMW-4 (average 17 mg/l), and Town Well #6 (average 27 mg/l) than at TH-8 and MW-6S, with averages over 600 mg/l (Table 4). Chloride concentrations at Town Well #4 were also much lower than those measured at TH-8 and MW-6S at an average of 72 mg/l. Further, concentrations at DMW-1b and Town Well #4 have remained relatively steady over time as have concentrations at recently added DMW-4 and Town Well #6 (Figure 3). At both MW-6S and TH-8 chloride has been variable with no observed upward or downward trends. Chloride concentrations at TH-8 have the largest range, from 523 mg/l to 988 mg/l.

4.3.2 Electrical Conductivity

Electrical conductivity (EC) is relatively high at the monitored locations on-site as well as most locations off-site. Lowest levels are at both Town Well #4 and Town Well #6, which are around 800 µS/cm and 600 µS/cm. EC levels at MW-6S, TH-8, and both domestic wells remain elevated with averages exceeding 1000 µS/cm. Elevated EC at the topographically upgradient domestic wells (DMW-1b and DMW-4) is elevated; however, the levels are likely naturally occurring.

EC at MW-6S is elevated above all other monitored locations (Figure 3) followed by TH-8 with average values of 4214 µS/cm and 2704 µS/cm, respectively (Figure 3). EC values at all locations are relatively stable with the exception of values in November 2012 at MW-6S and TH-8, which are anomalously low and likely incorrectly recorded and should be deleted from the water quality database for future annual reporting.

4.3.3 Sodium

Sodium at both TH-8 and MW-6S exhibits elevated concentrations (greater than 350 mg/l) relative to the other wells (all below 50 mg/l). Concentrations of sodium (Figure 4) at MW-6S decreased from the initial

sampling event in 2009 to late 2011, then increased from 290 mg/l in October 2011 to 444 mg/l in August 2013 but have since remained relatively stable at about 400 mg/l throughout the 2014 and 2015 sampling events. Concentrations at TH-8 have increased from 178 mg/l in November 2010 to 450 mg/l in August 2012; however, they have remained at about 400 mg/l since. At TH-8, the trend observed for sodium concentration is similar to chloride. However, we do not see the same chemical signature at TH-8 as at the on-site MW-6S, suggesting that road salt could be contributing to the observed concentrations. Similar to chloride, sodium levels remain reliability low and relatively consistent at Town Well #4, DMW-1b, DMW-4, and Town Well #6.

4.3.4 Sulphate

Sulphate concentrations (Figure 5) at MW-6S remained elevated relative to the other wells, ranging from 878 mg/l to 950 mg/l in 2015. The next highest sulphate concentrations in 2015 were at DMW-4 with an average of 232 mg/l, followed by DMW-1b, with an average of 127 mg/l. The lowest concentrations were measured at the two town wells and at TH-8, were the sulphate concentrations have remained stable and below 80 mg/l. Sulphate concentrations at MW-6S show a similar trend to sodium, with a general decrease up until late 2011, followed by a relatively steady increase until late 2012 and has remained relatively steady since at about 900 mg/l. The source of the elevated sulphate in MW-6S is considered to be from the Golden RDF.

4.3.5 Nitrate

Nitrate concentrations (Figure 6) at MW-6S are elevated above background and the other monitored locations with an average of 51 mg/l. Concentrations show a decreasing trend at this location from 60 mg/l in November 2009 to 33 mg/l in November 2015. A drop in nitrate concentration in May 2012 was observed, which is likely anomalous as concentrations otherwise has consistently been above 30 mg/l. The high levels of nitrate found at MW-6S are not representative of natural groundwater quality, and the most likely source is the Golden RDF.

The next highest nitrate concentrations in 2015 were at Town Well #4 (sample once in May 2015), which have been relatively stable and range from 0.755 mg/l to 1.63 mg/l. Concentrations at TH-8, DMW-4, and Town Well #6 show a variable yet increasing trend but all remain below 1.2 mg/l. Nitrate at DMW-1b remained relatively stable since its addition into the program in 2011. Nitrate at DMW-1b showed a slight increase of 0.2 mg/l in August and again November 2014 but has since dropped to historically low levels.

4.3.6 Dissolved and Total Metals

As stated above (Section 3.1) dissolved metals were analyzed at both monitoring wells TH-8 and MW-6S, and total metals were analyzed at domestic and community supply wells DMW-1b, DMW-4, and both Town Wells in 2015. Prior to 2015 total metals were analyzed at the domestic and community supply wells; however, those sources are used for drinking water and total metals analysis, which include both dissolved and non-dissolved forms, it is considered more conservative and protective of health concerns.

There are some metals that are slightly elevated at MW-6S, TH-8, and DMW-1b compared to the other sampling locations (Town Wells and DMW-4), which may be related to landfill influence or potentially naturally occurring.

Iron concentrations (Figure 7) at DMW-1b have been increasing since 2011 and are elevated above the other domestic well and both Town Wells with an average of 0.34 mg/l (Table 4). Historically, concentrations of iron up to 3 mg/l were recorded at TH-8, however concentrations have decreased and remained below 0.15 mg/l since late 2011. Concentrations at MW-6S were elevated between 2009 and 2010, but decreased to below 0.1 mg/l between May 2011 and August 2015. Iron increased to its highest concentration on record at MW-6S in November 2015 at 1.15 mg/l. Iron concentrations at all other sampling locations, were at or lower than 0.1 mg/l in 2015. The typically low concentration of iron at MW-6S and the low concentrations at the other sampled locations suggests that the elevated iron at DMW-1b is not related to landfill activity and that the elevated iron concentrations are likely naturally occurring.

Manganese concentrations (Figure 8) at MW-6S and TH-8 are elevated with average concentrations of 0.136 mg/l. Manganese concentrations at MW-6S decreased from the first sampling event in 2009 to mid-2012, after which time they been stable at about 0.1 mg/l. Monitoring well TH-8 has also shown a decrease in manganese over this same time period and continues to decrease in 2015. Stable trends and lower manganese values (< 0.004 mg/l) were detected at the other wells.

Consistent with historical data, the highest arsenic concentrations were found at DMW-1b, where concentrations exceeded guidelines during all sampling events in 2015 and has done so since November 2010. However, arsenic concentrations remain below detection limits at MW-6S, which suggests that the presence of arsenic in DMW-1b is likely unrelated to landfill activity. All other sample locations remain relatively stable and low (≤ 0.006 mg/l) since August 2011.

The highest concentration of boron was recorded at MW-6S with concentrations remaining at or above 1.77 mg/l in 2015. The trend at this location has been increasing since 2009 from 1.09 mg/l (May 2009) to 2.04 mg/l (May 2015). In contrast, boron concentrations in the other wells remain low with average concentrations less than 0.5 mg/l. Concentrations in the other wells are relatively steady over time, with the exception of DMW-4 which has a range of 0.07 mg/l to 0.659 mg/l within the three years it has been sampled (2013-2015). Boron sources include coal combustion products, municipal sewage, leaching of landfill materials, and the production of fertilizers and pesticides. The maximum total boron concentration at DMW-4 was 0.659 mg/l (May 2015), when compared to MW-6S (maximum of 2.04 mg/l) it is far below concentrations that may be of concern at this time. However, continued monitoring is necessary to determine whether concentrations continue to rise.

5. CONCLUSIONS

From the analysis performed for the 2015 reporting the following conclusions are made:

C1 In 2015 (as in previous years), stressed vegetation was observed south of the Golden RDF; however, the degree of stress is yet to assessed. To evaluate the magnitude of the stress on the vegetation and to determine whether it is related to landfill activities, we recommend:

- Assessing the biomass of the vegetation for uptake of heavy metals; and

- Collecting soil samples from the root zones of the affected area to assess potential impacts from leachate-affected surface runoff.

C2 Similar to the 2014 program, exceedances of aquatic life and drinking water guidelines were detected in locations at and beyond the landfill property boundary in 2015, with the following notable observations:

- Groundwater quality in well MW-6S, located near the landfill boundary, continues to show evidence of impacts. Elevated concentrations of chloride, nitrate, sodium, sulphate and dissolved metals including boron and manganese indicate anthropogenic impacts from landfill leachate;
- Monitoring well TH-8 continues to have concentrations of chloride, sodium, and magnesium above guidelines. The relatively consistent ratio between chloride and sodium in this well suggests one possible source of the elevated levels is the application of road salt on the nearby road. Other parameters found at high concentrations at MW-6S (i.e. sulphate, nitrate, and boron) are relatively low at TH-8, which suggests that landfill activities may not be impacting water quality at this location at this time; and
- At DMW-1b, concentrations of arsenic, magnesium, and iron in 2015 were above the GCDWQ MAC, BC CSR DW, and the GCDWQ AO, respectively. These exceedances are not likely related to landfill activity.

6. RECOMMENDATIONS

As per the WWAL 2014 hydrogeological review and based on the results of the monitoring program to-date, the following recommendations are provided:

R1 Off-Site Migration of Landfill Leachate

- After assessing the geochemical profile at the monitoring wells we believe surface contamination from road salting is likely the source of increasing levels of chloride and dissolved sodium at TH-8 since its installation in 2010. We recommend ending sampling at TH-8 and closing the well in accordance with the B.C. Groundwater Protection Regulation;
- Perform a yearly survey to ensure any newly installed wells in the vicinity of the site, intended for domestic water are identified. The yearly survey update would include calling local drillers to assess if new wells were installed in the area, calling the Town of Golden to assess if new building permit applications have been received, and driving the major roads to see if new building activity is apparent.
- Drill a "sentry" monitoring well (a monitoring well between potential drinking water wells and a potential contaminant source) off-site at the junction of Granite Drive and Stoney Lane (approximate UTM coordinates U11, 502899, 568400, elevation 904 masl). Note

that the landfill is approximately 340 m from the edge of the Golder-modeled 10-year capture zone for Town Well #6 (Golder 2006) and this edge of the modelled 10-year capture zone corresponds with the location of the recommend off-site monitoring well;

- If off-site migration of leachate is confirmed after off-site drilling and monitoring for at least one year, the CSRD should perform a cost benefit analysis of either acquiring land downgradient from the landfill or explore leachate management options for the site; and
- Further, we believe both the Town of Golden's water supply well # 6 and Town #4 should be sampled for the next 5 years, with results to be evaluated in 2017 to assess if Town #6 sampling can be ended with just Town Well #4 being sampled.

R2 Monitoring at the southwest toe of the landfill site

- As mentioned above, attempts to drill at the southwest toe of the landfill have been unsuccessful due to refusal during drilling (TH-3) and budget constraints (TH-7). To enable monitoring at the southwest edge of the landfill, we recommend drilling another (likely deeper) monitoring well at this location. The purpose of drilling this new well will be to reach the unconsolidated aquifer and bedrock interface, where we expect to find a groundwater table. Because the depth of the bedrock interface is unknown, in order to be successful at reaching the bedrock interface, budgeting for drilling this well should be done with an over-estimate of the drilling depth; we recommend estimating a 122 m (400 ft) deep well using an air rotary drilling rig.

R3 Water quality exceedances at DMW-1b

- We know it has been challenging to find a representative "background" well to compare water quality downgradient of the Golden Landfill. Attempts have been made to drill a well, on-site and upgradient of the landfilled area without success; therefore, upgradient domestic wells (DMW-1b and DMW-4) were located and permission received to sample the wells was granted. The water quality of these domestic wells has proved to be poor, with exceedances in drinking water guidelines of arsenic, magnesium, and iron occurring regularly. Arsenic is a common water quality parameter to exceed guidelines within some surficial and bedrock aquifers surrounding Golden and throughout B.C.
- We believe the water quality exceedances observed at DMW-1b are likely naturally occurring; however, to confirm this is the case, additional sampling of nearby DMW-2 and DMW-3 should be performed during the yearly monitoring to establish a sound understanding of the background bedrock water quality in the area of the landfill site. With this understanding, we will be able to rule out the possibility of landfill leachate affecting these wells and contributing to poor water quality.

R4 Stressed vegetation south of the landfill site

As noted by Summit (2013), in previous years, stressed vegetation has been observed to the south of the landfill site. To evaluate if the stress on the vegetation is related to landfill activities we recommend the following:

- Have a biologist bio-assay for heavy metals and assess the condition of the trees; and
- Soil samples be collected from the root zones of the affected area to assess potential impacts from leachate-affected surface runoff from the landfill.

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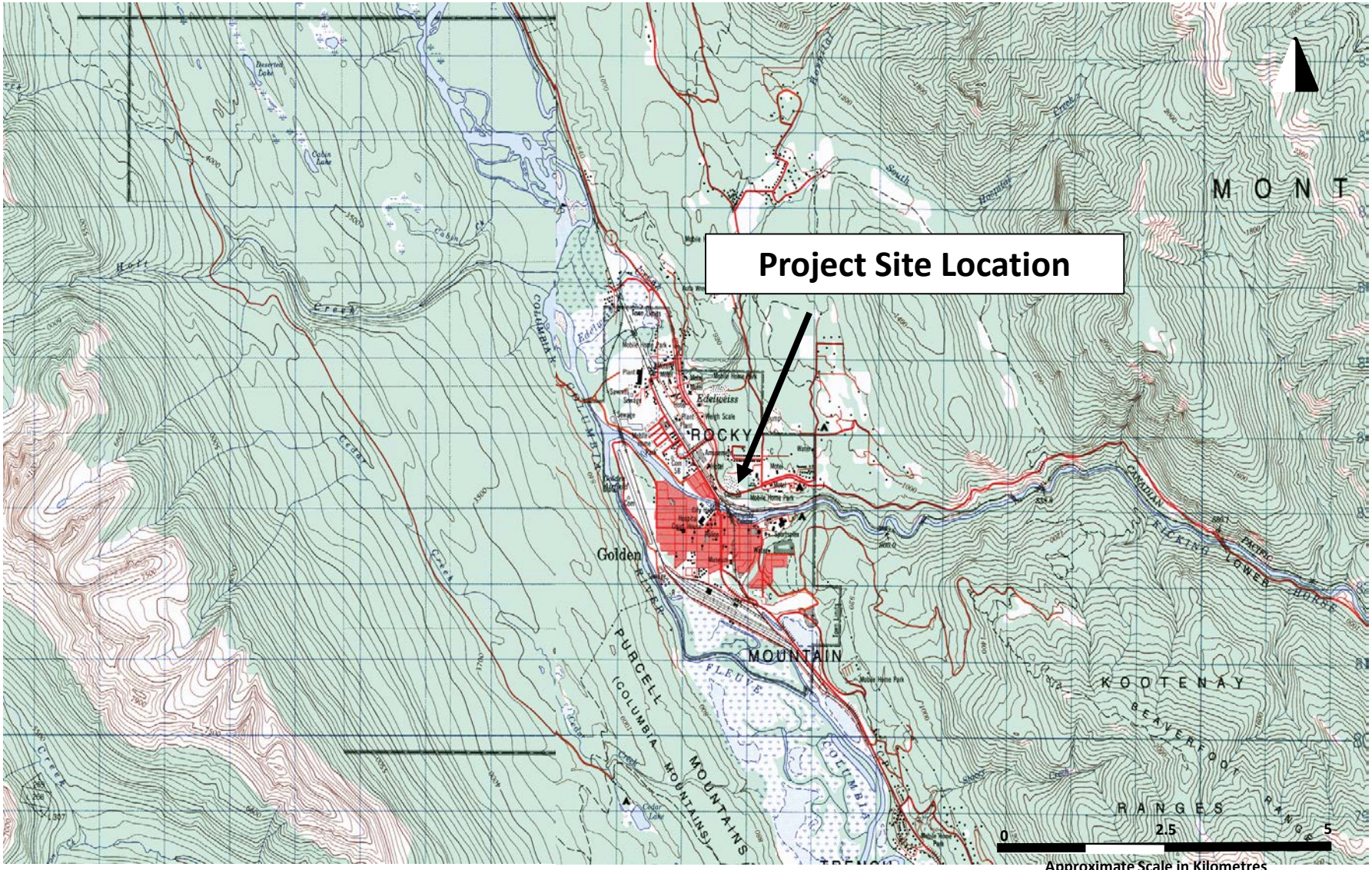
Figures



Columbia Shuswap Regional District

western water ASSOCIATES LTD

TITLE

Figure 1: General Site Map

DRAWN		DATE	April 2016	PROJECT NO.	14-024-16
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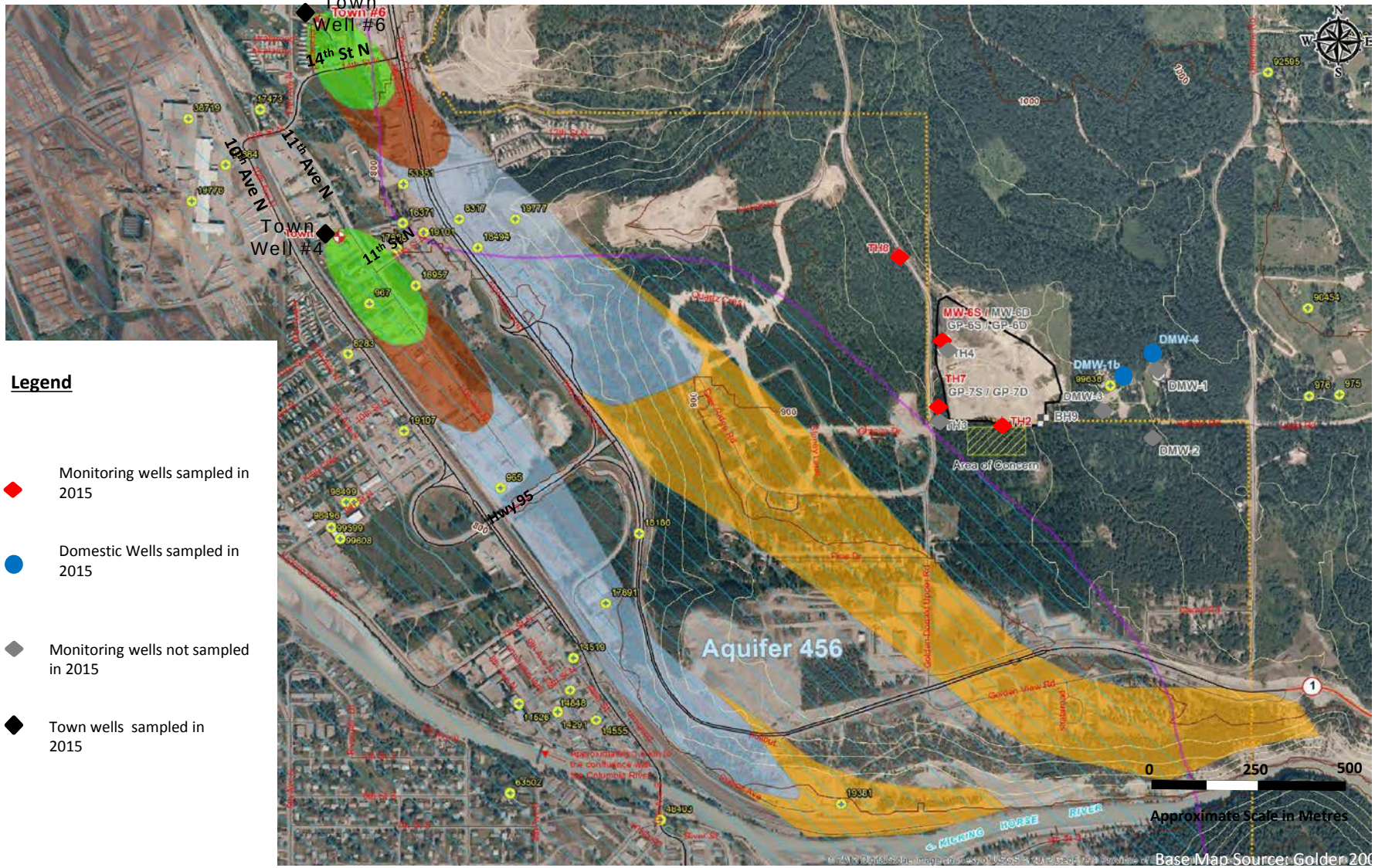
REVIEWED	DG	FILE NO.		FIGURE VERSION NO.	



Columbia Shuswap Regional District

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Figure 2: Sampling Locations at Golden Refuse Disposal Facility

DRAWN		DATE	April 2016	PROJECT NO.	14-024-16
CHECKED	BRM	SCALE	See figure	DWG. NO.	n/a
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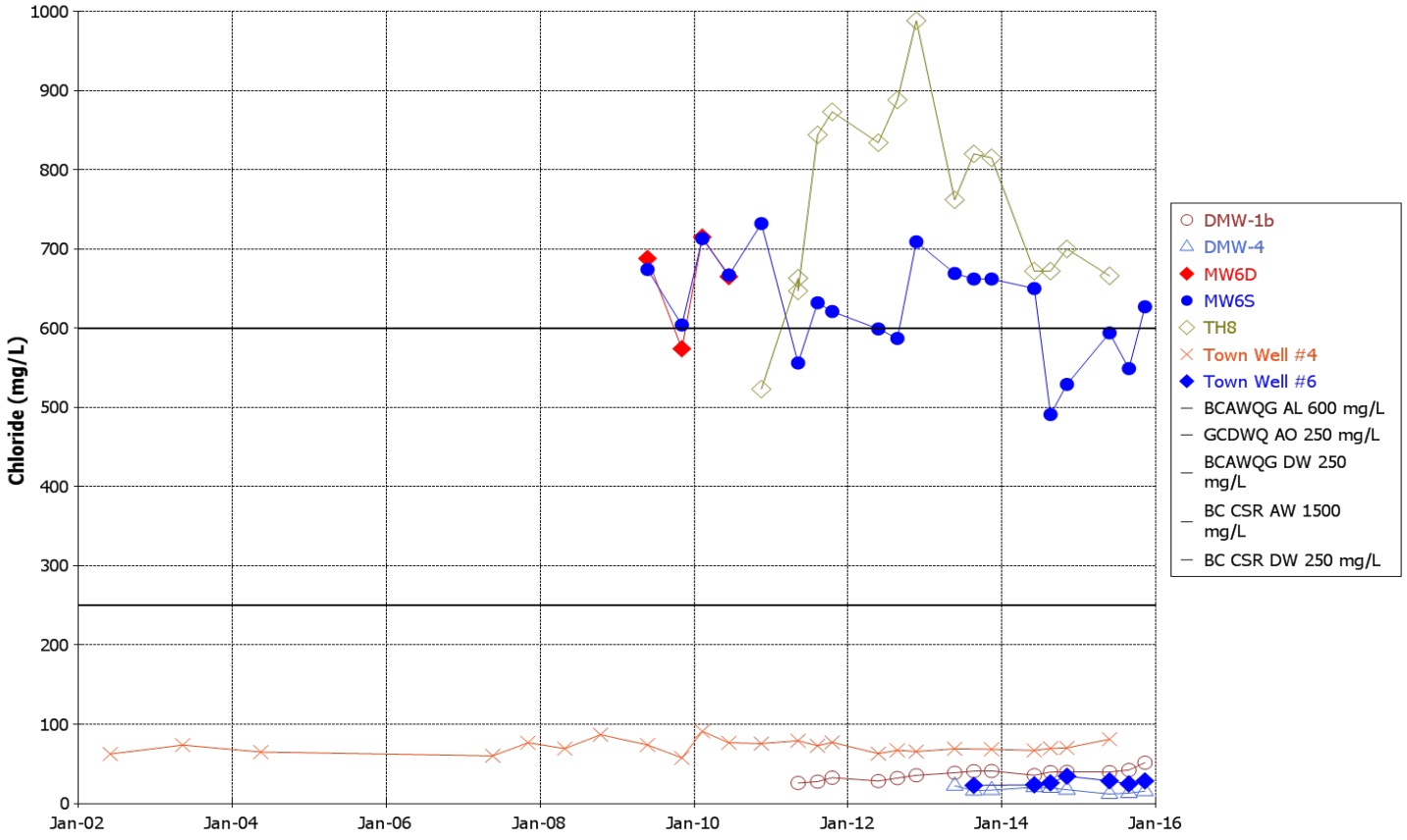

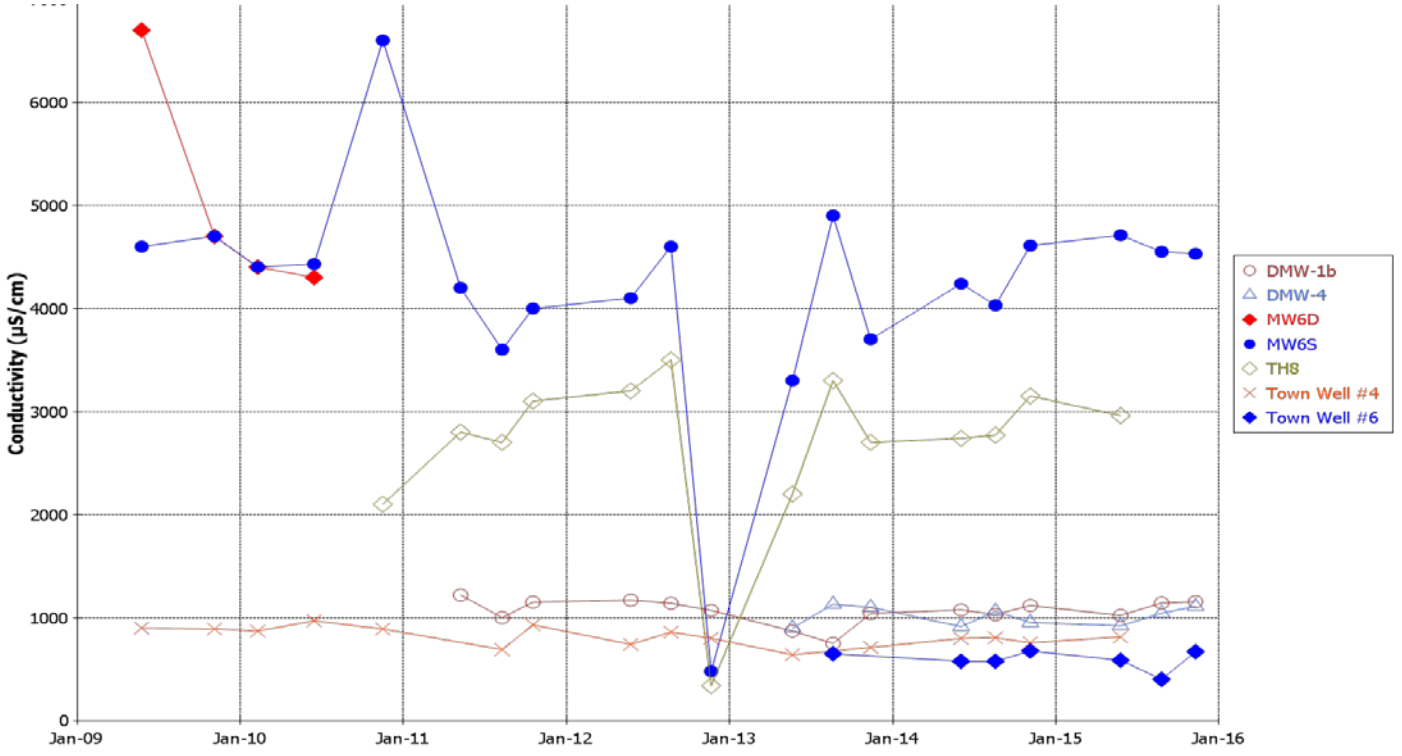

Columbia Shuswap Regional District

TITLE

Figure 3: Chloride (Top) and Conductivity (Bottom) Time Series Plots, Golden RDF

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DRAWN	WW	DATE	April 2016	PROJECT NO.	14-024-16
CHECKED	BRM	SCALE	n/a	DWG. NO.	n/a
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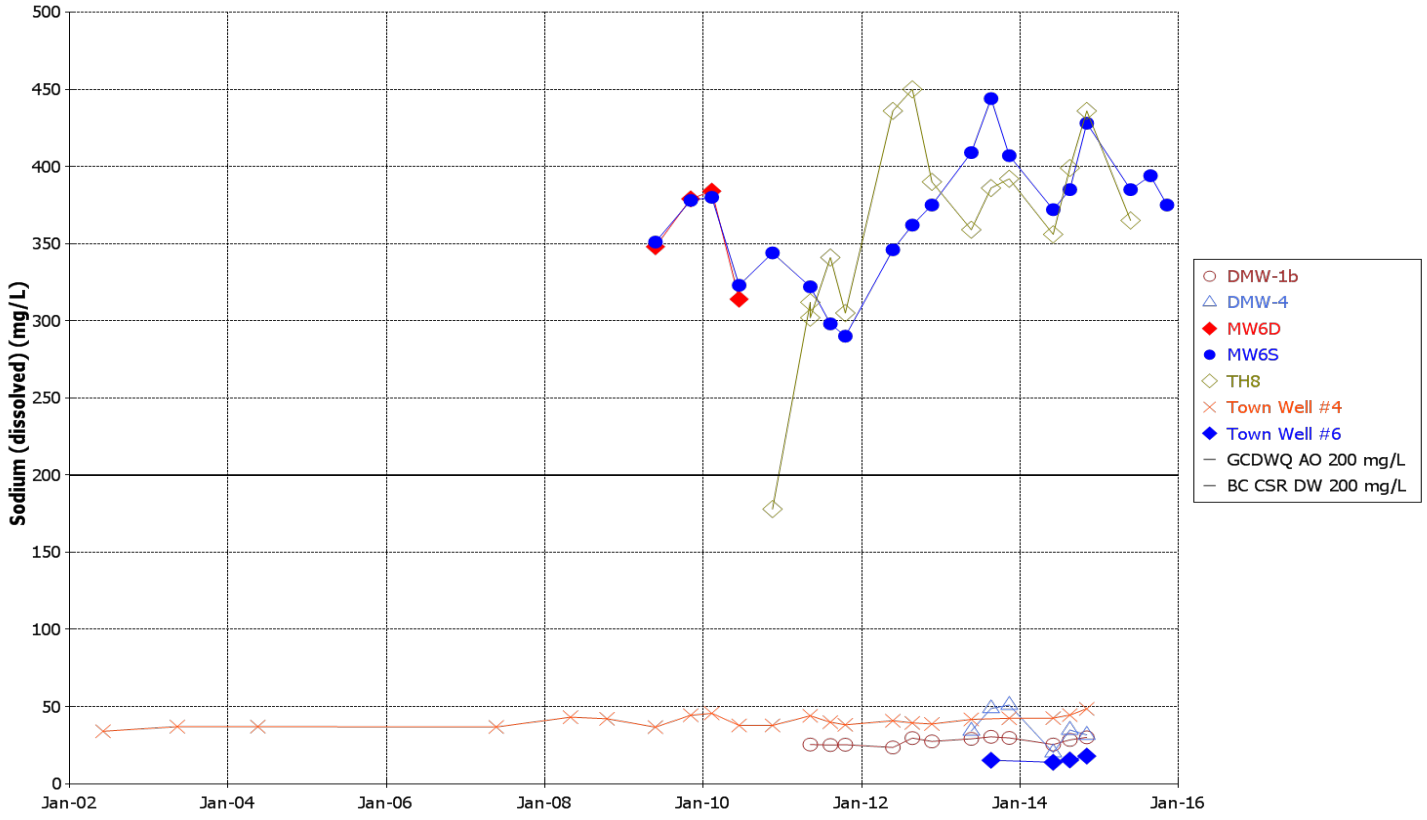

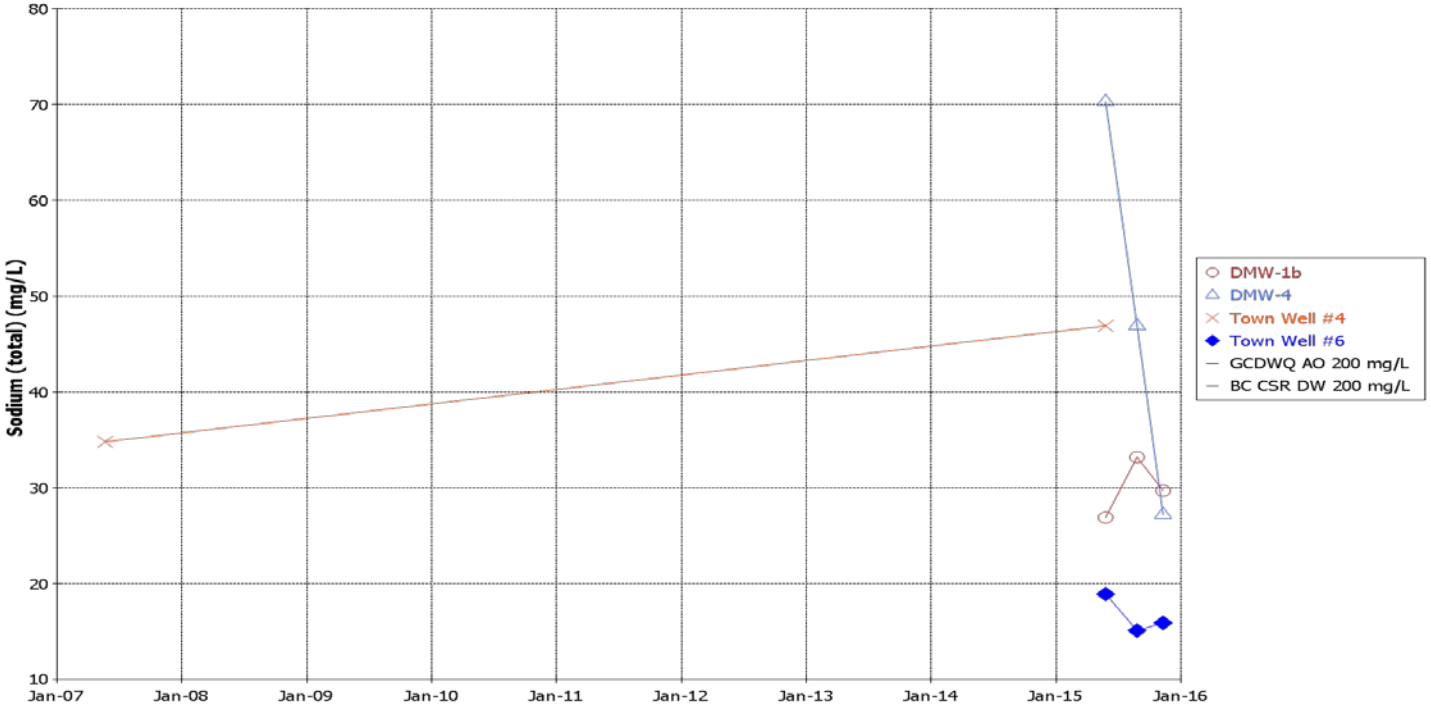

Columbia Shuswap Regional District

TITLE

Figure 4: Dissolved Sodium (Top) and Total Sodium (Bottom) Time Series Plots, Golden RDF

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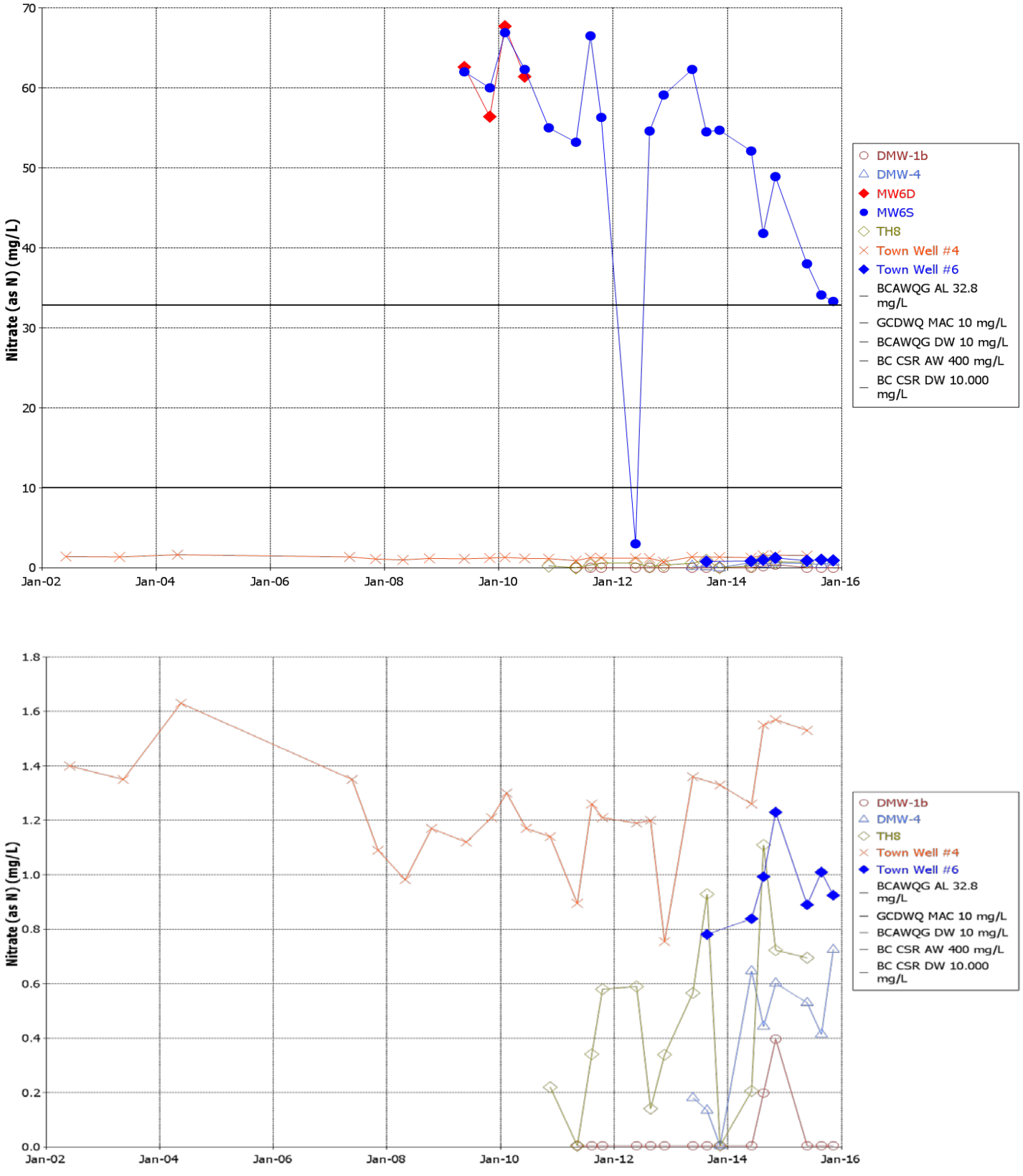

Columbia Shuswap Regional District

TITLE

Figure 6: Nitrate (Top) and Modified Nitrate (Bottom), Time Series Plots, Golden RDF

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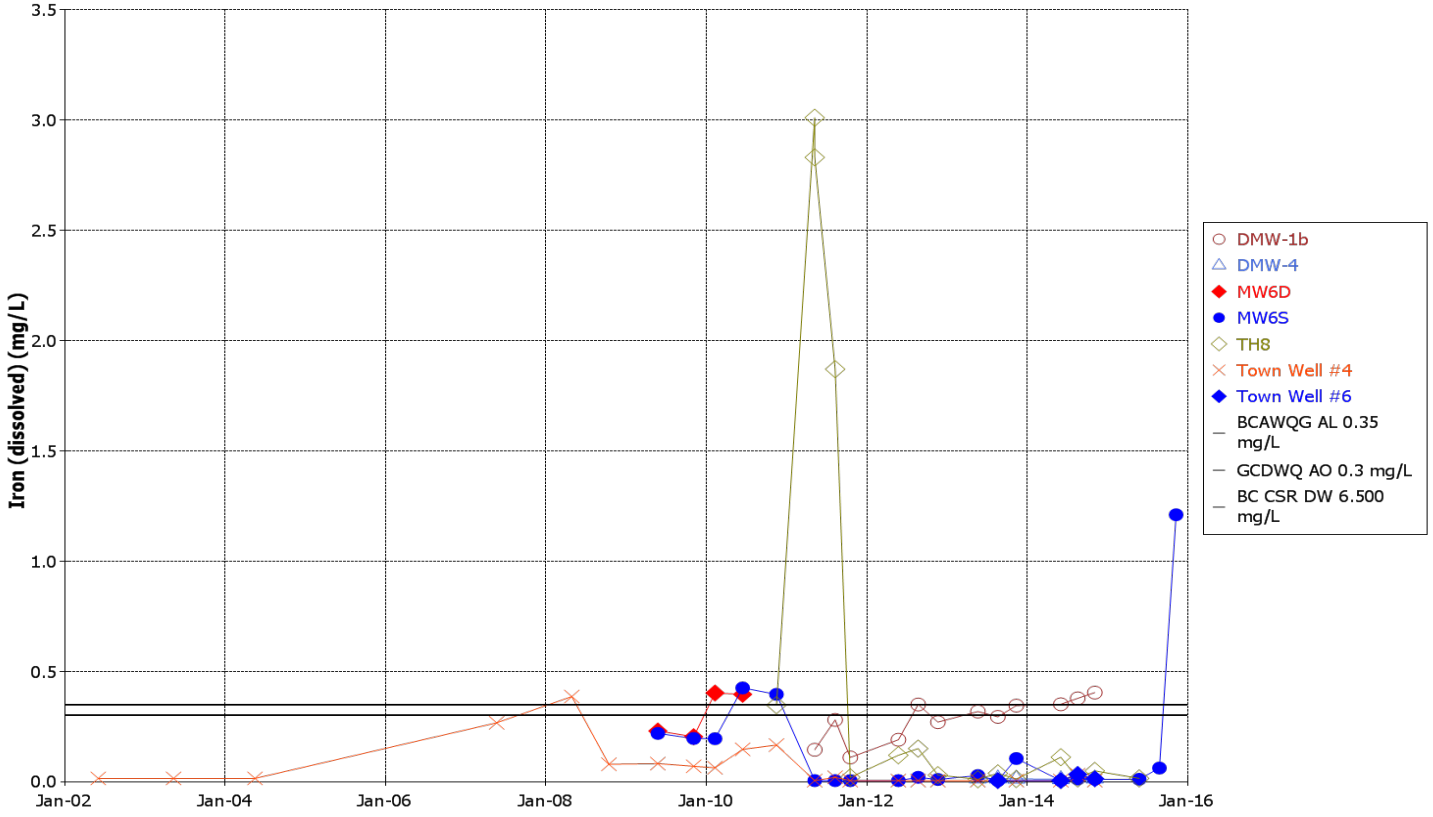

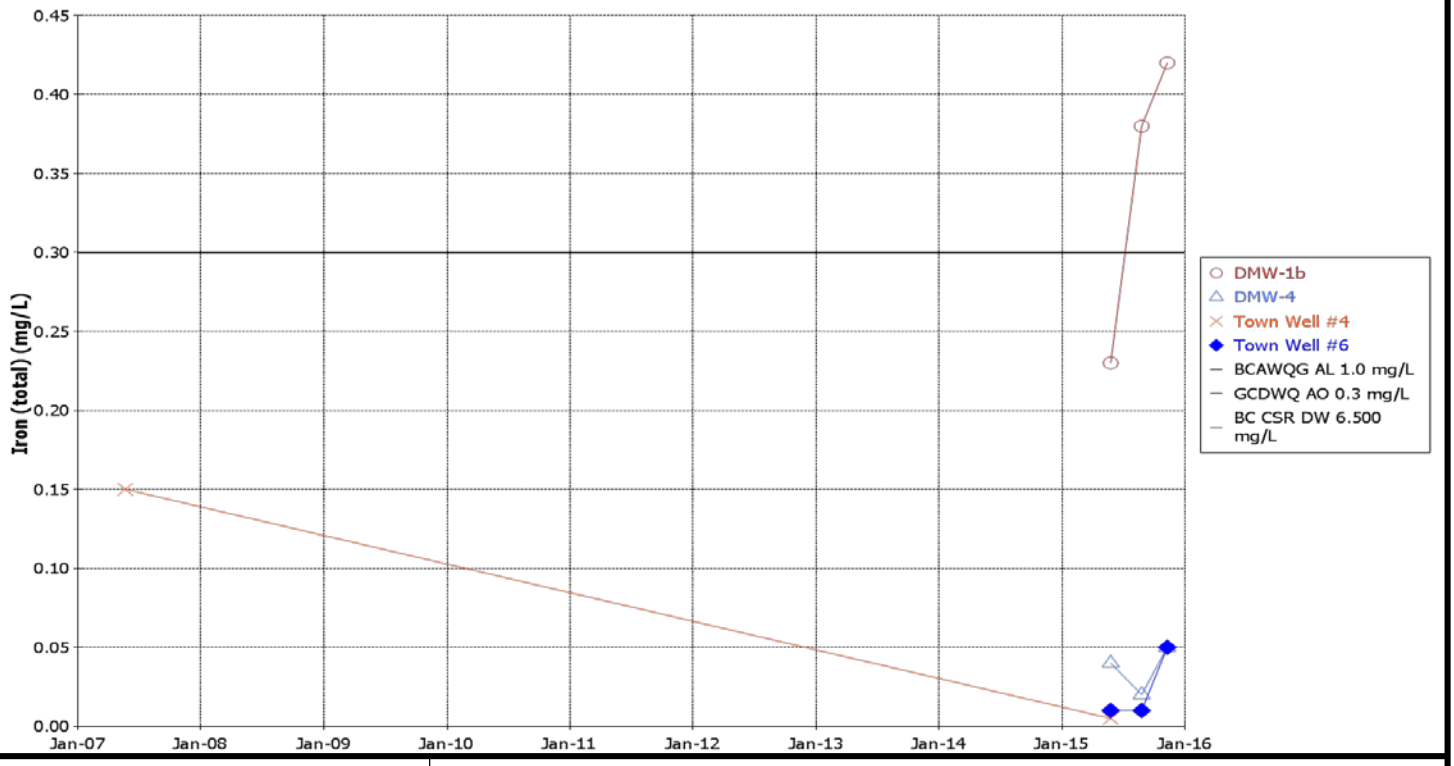

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TITLE

Figure 7: Dissolved Iron (Top) and Dissolved Iron (Bottom) Time Series Plots, Golden RDF

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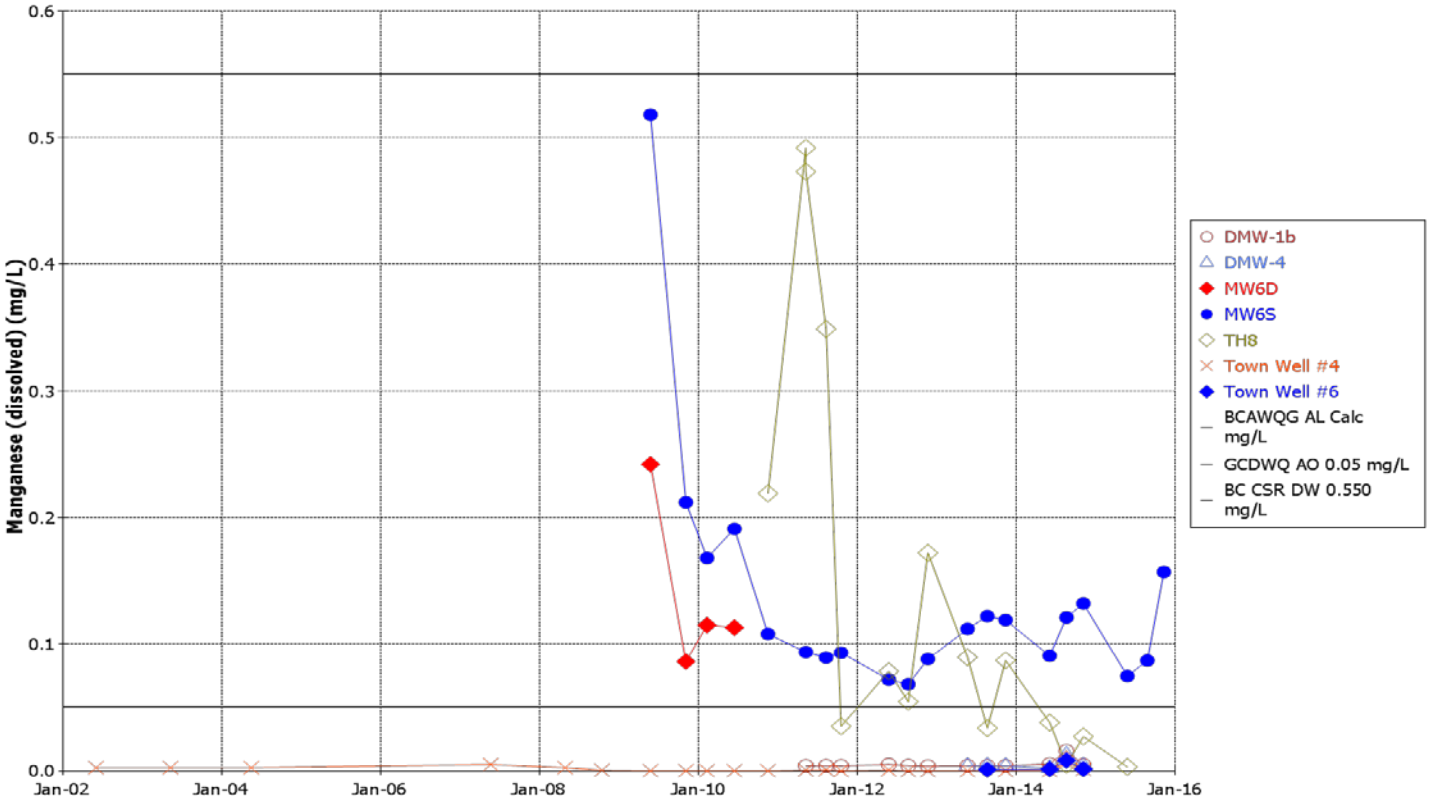
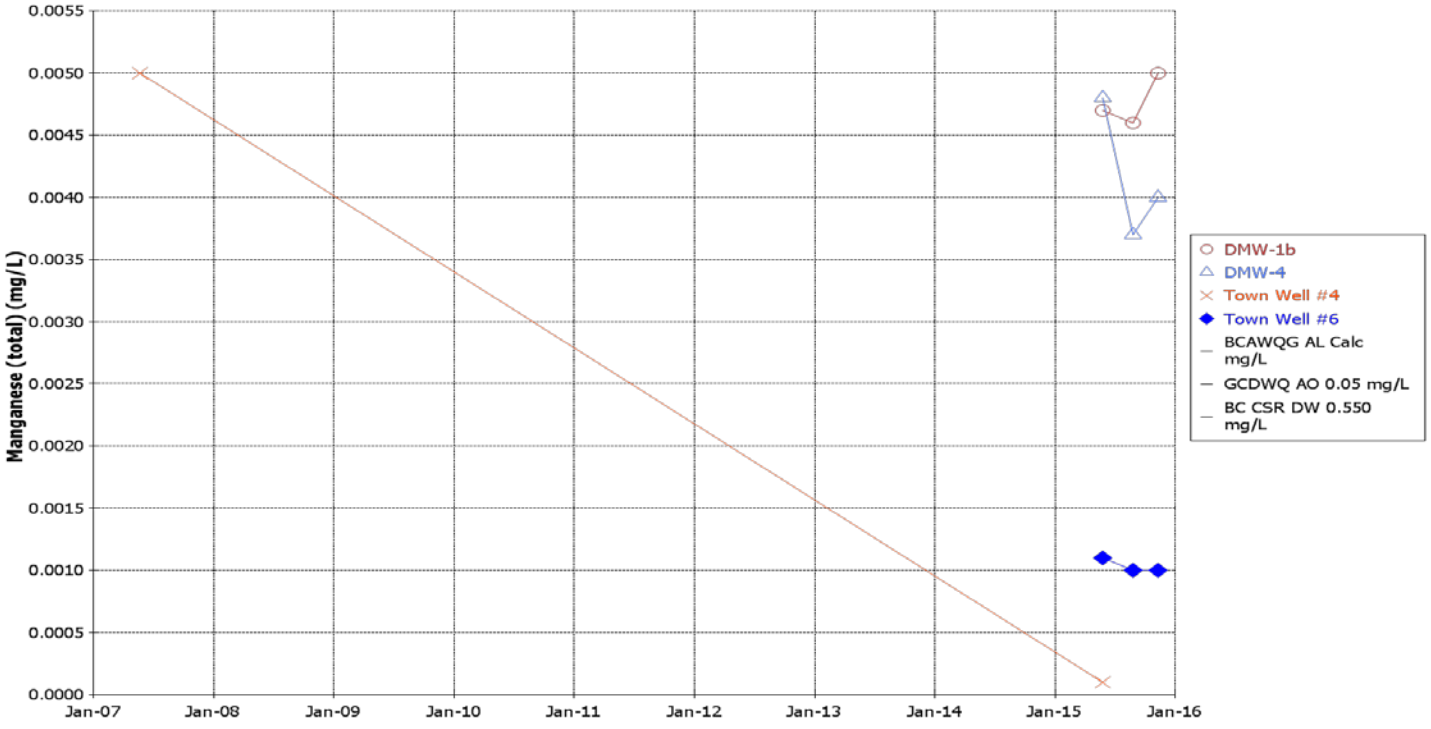
REVIEWED	DG	FILE NO.		FIGURE REV. NO.	





Columbia Shuswap Regional District

TITLE

Figure 8: Dissolved Manganese (Top) and Total Manganese (Bottom) Time Series Plots
Golden RDF

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DRAWN	WW	DATE	April 2016	PROJECT NO.	14-024-16
CHECKED	BRM	SCALE	n/a	DWG. NO.	n/a
REVIEWED	DG	FILE NO.		FIGURE REV. NO.	

Appendix A

Operational Certificate – OC 17006

August 29, 2012

Tracking Number: 243578
Authorization Number: 17006

REGISTERED MAIL

Columbia Shuswap Regional District
Box 978
781 Marine Park Drive NE
Salmon Arm, BC V1E 4P1

Dear Operational Certificate Holder:

Enclosed is Amended Operational Certificate 17006 issued under the provisions of the *Environmental Management Act*. Your attention is respectfully directed to the terms and conditions outlined in the operational certificate. An annual fee will be determined according to the Permit Fees Regulation.

This operational certificate does not authorize entry upon, crossing over, or use for any purpose of private or Crown lands or works, unless and except as authorized by the owner of such lands or works. The responsibility for obtaining such authority rests with the operational certificate holder. It is also the responsibility of the operational certificate holder to ensure that all activities conducted under this authorization are carried out with regard to the rights of third parties, and comply with other applicable legislation that may be in force.

This decision may be appealed to the Environmental Appeal Board in accordance with Part 8 of the *Environmental Management Act*. An appeal must be delivered within 30 days from the date that notice of this decision is given. For further information, please contact the Environmental Appeal Board at (250) 387-3464.

...2

Ministry of Environment
Environmental Protection Division
401 - 333 Victoria St.
Nelson, BC V1L 4K3
Southern Interior Region - Kootenay
Telephone: (250) 354-6333
Facsimile: (250) 354-6332

Administration of this operational certificate will be carried out by staff from the Southern Interior Region - Kootenay. Plans, data and reports pertinent to the operational certificate are to be submitted to the Regional Manager, Environmental Protection, at Ministry of Environment, Regional Operations, Southern Interior Region - Kootenay, 401 - 333 Victoria St., Nelson, BC V1L 4K3.

Yours truly,

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

Enclosure

cc: Environment Canada

MINISTRY OF ENVIRONMENT

OPERATIONAL CERTIFICATE

17006

Under the Provisions of the Environmental Management Act

Columbia Shuswap Regional District

Box 978
781 Marine Park Drive NE
Salmon Arm, BC V1E 4P1

is authorized to manage waste and recyclable material from the Columbia Shuswap Regional District and environs at the Columbia Shuswap Regional District in Golden landfill located near Golden, British Columbia, subject to the conditions listed below. Contravention of any of these conditions is a violation of the *Environmental Management Act* and may result in prosecution.

This Operational Certificate supersedes all previous versions of the Operational Certificate MR-17006 issued under the authority of the *Environmental Management Act.*

1. AUTHORIZED DISCHARGE

This section applies to the discharge of refuse from municipal, commercial and light industrial sources to a sanitary landfill known as the GOLDEN LANDFILL. The site reference number for this discharge is E246600.

1.1 The authorized works are a sanitary landfill and related appurtenances approximately located as shown on the attached location map.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

1.2 The maximum quantity of waste discharges must not exceed the design capacity of the landfill as specified in the approved Design and Operations Plan. The final footprint and profile of the discharged waste must be within that specified in the Design and Operations Plan, and approximately as shown on the attached location map.

1.3 The authorized discharge is municipal solid waste as defined in the *Environmental Management Act* and other waste as may be authorized by the Director.

1.4 The legal description of the location of the authorized landfill facility is Subdivision 12 of Section 18, Township 27, Range 21, West of the 5th Meridian, Kootenay District.

1.5 The site is located approximately 2 kilometres travelling northeast on Highway 1 as shown on the location map.

2. DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design and Operating Plan

The Operational Certificate holder must prepare and maintain a current Design and Operations Plan prepared by a qualified professional. The Plan must be reviewed and updated as needed at least once every five years. The next update must be undertaken and completed in 2013. The Plan must address, but not be limited to, each of the subsections in the Landfill Criteria for Municipal Solid Waste including performance, siting, design, operational, closure and post-closure criteria. The facilities must be developed, operated and closed in accordance with the Plan. Should there be any inconsistency between this Operational Certificate and the Plan, this Operational Certificate must take precedence.

Written authorization from the Director must be obtained prior to implementing any changes to the approved plans. Based on any information obtained in connection with this facility, the Director may require revision of, or addition to, the design, operating and closure plans.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

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Southern Interior Region - Kootenay

2.2 Qualified Professionals

All facilities and information, including works, plans, assessments, monitoring, investigations, surveys, programs and reports, must be certified by Qualified Professionals.

2.3 Maintenance of Works and Emergency Procedures

The authorized works must be inspected regularly and maintained in good working order. In the event of an emergency or condition beyond the control of the Columbia Shuswap Regional District including, but not limited to, unauthorized fires arising from spontaneous combustion or other causes, or detection of surfacing leachate on the property, the Columbia Shuswap Regional District must take appropriate remedial action and notify the Regional Office. The Director may reduce or suspend operations to protect the environment until the authorized works has been restored, and/or corrective steps taken to prevent unauthorized discharges.

2.4 Additional Facilities or Works

The Director may require investigations, surveys, and the construction of additional facilities or works. The Director may also amend any information requirements of this Operational Certificate including plans, programs, monitoring, assessments and reports.

2.5 Public Health, Safety and Nuisance

The landfill must be operated in a manner such that it will not create a public nuisance or become a significant threat to public health or safety with respect to landfill gas, unauthorized access, roads, traffic, airport activity, noise, dust, litter, vectors, or wildlife attraction.

2.6 Ground and Surface Water Quality Impairment

The landfill must be operated in a manner such that ground or surface water quality does not decrease beyond that specified by the British Columbia Water Quality Guidelines, or other appropriate criteria as may be specified by the Director, at or beyond the landfill property boundary.

The certificate holder must take all reasonable measures to ensure that BCWQG are met at or beyond the property boundary. These measures include but are not limited to:

a) Prohibiting the discharge of municipal solid waste into water.

b) Ensuring that no new waste is landfilled within 1.2 m of the highest groundwater level.

c) Ensuring that adequate surface water and groundwater diversion works are constructed and maintained to minimize surface water run-off and groundwater seepage from entering the landfill.

d) Ensuring that the management systems for surface water that has not come in contact with waste are hydraulically separate from those for managing impacted surface water.

e) Ensuring that the landfill is operated in a manner that prevents the exceedance in surface water and groundwater of anticipated leachate indicators or parameters distinctive of leachate or those specified by the Director at the landfill boundary.

f) Ensuring that the indicators in e) above, at specified groundwater monitoring wells within the property boundary are in accordance with those predicted by design and that suitable measures are taken to address the cause of any exceedances above the trigger levels identified in the most current Design and Operations Plan.

g) Ensuring that the landfill is operated in accordance with a Design & Operations Plan which specifies measures to prevent decreases in groundwater and surface water quality at and beyond the property boundary.

If exceedances to the specified water quality criteria occur as a result of landfill operations, the Director may require that leachate management control measures or works be undertaken. Terms of reference for any leachate management study and/or design work must be submitted to the Director for review prior to conducting the work.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

2.7 Landfill Gas Management

The Landfill must not cause combustible gas concentrations to exceed the lower explosive limit in soils at the property boundary or 25% of the lower explosive limit at or in on-site or off-site structures.

The Operational Certificate holder must ensure that the facility is in compliance with the requirements of the Landfill Gas Management Regulation under the *Greenhouse Gas Reduction (Emissions Standards) Statutes Amendment Act*, 2008 on or before applicable dates specified in the regulation. The requirements of the regulation and its guideline documents must be incorporated by the Operational Certificate holder into the Design and Operation Plan revisions as they come into effect and as applicable.

2.8 Buffer Zone

No material must be landfilled within 50 metres of the property boundary.

3. OPERATIONAL REQUIREMENTS

3.1 Waste Compaction and Coverage

The Operational Certificate holder must ensure that waste deposition and compaction meets or exceeds the requirements of the BC Landfill Criteria or its most current version for daily, intermediate and final cover. Control must be exercised to ensure keeping freshly deposited refuse in a well defined and small / manageable working face.

3.2 Prohibited Wastes

The disposal of the following types of wastes is strictly prohibited:

(a) Hazardous Wastes other than those specifically approved for disposal to authorized landfills in the Hazardous Waste Regulation under the *Environmental Management Act*.

(b) Biomedical wastes as defined in the Guidelines for the Management of Biomedical Wastes in Canada (Canadian Council of Ministers of the Environment, February 1992),

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

(c) Bulk liquids and semi-solid wastes, which contain free liquids, as determined by US EPA Method 90954 Paint Filter Liquids Test, Test Methods for Evaluating Solid Wastes-Physical/Chemical Methods (EPA Publication No. Sw-846),

(d) Release of ozone depleting substances from the storage, handling and disposal of used appliances, equipment, or any material containing ozone depleting substances is prohibited in accordance with the requirements of the Ozone Depleting Substances Regulation. Onsite removal or evacuation of Ozone Depleting Substances (ODS) from appliances and the subsequent storage of appliances on site is permitted subject to both activities being in compliance with the Ozone Depleting Substances Regulation.

3.3 Waste Asbestos

Waste asbestos is authorized for disposal subject to compliance with the requirements of section 40 of the Hazardous Waste Regulation and the following conditions:

(a) The asbestos waste may not be mixed with any other hazardous waste.

(b) The Regional District must approve the disposal before disposal takes place.

(c) All other applicable requirements of the Hazardous Waste Regulation, including but not limited to manifesting and waste record keeping, must also be complied with.

3.4 Contaminated Soil

Soil that contains contaminants in concentrations less than "hazardous waste" as defined by the Hazardous Waste Regulation may be disposed of at the landfill site. Disposal includes monofilling, co-disposal with other wastes, use as a refuse cell berm material and use as a refuse cell cover material. Disposal does not include use as final cover material.

3.5 Wildlife and Vector Control

Vectors (carriers capable of transmitting a pathogen from one organism to another including, but not limited to flies and other insects, rodents, and birds) must be controlled by the application of cover material at the required frequency or by such additional methods as specified by the Director. Wildlife control fencing must be maintained around the perimeter of the landfill site and must be

electrified for at least the active bear season of each year.

This landfill must be operated so as to minimize the attraction of wildlife such as bears and birds by applying cover at required frequencies and instituting a good housekeeping program.

3.6 Site Access and Supervision

A landfill operator that has received BC Qualified Landfill Operator training, is familiar with the requirements of the Operational Certificate and the specifications of the Design and Operations Plan, must be present at all times during operating hours.

Locking gates must be maintained at all access routes to the landfill site. Gates, perimeter fencing and/or barriers must be installed where necessary to prevent unauthorized access to the site by vehicles. Gates must be locked during non-operating hours.

3.7 Dust Control

Dust created within the landfill property must be controlled, using methods and materials acceptable to the Director, such that it does not cause a public nuisance.

3.8 Litter Control

The best practical means must be used to prevent the scatter of litter. Any litter scattered into the neighbouring property, along access roads, in drainage ditches, along litter-control fences, into surrounding trees or elsewhere on the landfill site must be cleaned up. The frequency of clean up and other additional requirements for refuse scatter control must be determined by the Director.

3.9 Waste Reduction and Alternate Disposal

The Provincial Government has developed policies to promote the reduction, reuse and recycling of wastes. The Operational Certificate holder is encouraged to segregate for recycling and reuse, where possible, materials destined for disposal at this site.

Public scavenging must not be permitted at the landfill. The controlled salvaging of waste by the landfill operator or persons authorized by the

Operational Certificate holder is encouraged if areas or facilities for separation and storage of recyclable or reusable materials are provided.

In certain landfill environments, some construction and demolition debris or other wastes may create specific air and water quality concerns. If problems arise at this site that are attributable to specific wastes, the Director may require that alternate disposal/storage procedures be implemented.

3.10 Operations and Maintenance Manual

The Operational Certificate holder must prepare an Operations and Maintenance Manual to be reviewed and updated as necessary on at least an annual basis.

4. MONITORING AND REPORTING REQUIREMENTS

4.1 Landfill Monitoring

A monitoring program must be developed by a Qualified Professional and identify potential environmental impacts of the authorized facility and must address but not be limited to the Landfill Criteria for Municipal Solid Waste and Guidelines for Environmental Monitoring. The monitoring program must be updated every five years and submitted to the satisfaction of the Director. The next monitoring plan update is required to be undertaken and completed in 2013. Monitoring must be conducted in accordance with the monitoring program.

The program must be designed to assess and identify:

- The design performance of the landfill as per the Design & Operations Plan including but not limited to compliance with water quality performance standards at the landfill boundary.
- Landfill leachate as a contaminant source.
- Residential well water quality.
- Surface water quality.

The monitoring program must address, but not be limited to relevant sections of the Landfill Criteria for Municipal Solid Waste and the Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills. The Environmental Monitoring Program must take into consideration results from previous monitoring programs and any other investigations conducted at the site to ensure that early detection of potential impacts is possible.

4.2 Sampling Techniques

Sampling must be carried out in accordance with the procedures described in the most recent edition of the "British Columbia Field Sampling Manual for Continuous Monitoring Plus the Collection of Air, Air-Emission, Water, Wastewater, Soil, Sediment, and Biological Samples", or by suitable alternative procedures as authorized by the Director. A copy of the above manual may be purchased from the Queen's Printer Publications Centre, P.O. Box 9452, Stn. Prov. Gov't., Victoria, British Columbia, V8W 9V7 (1-800-663-6105 or (250) 387-6409).

4.3 Analysis

Analyses must be carried out in accordance with procedures described in the most recent edition of the "British Columbia Environmental Laboratory Manual for the Analysis of Water, Wastewater, Sediment and Biological Materials", or by suitable alternative procedures as authorized by the Director. A copy of the above manual may be purchased from the Queen's Printer Publication Centre.

4.4 Quality Assurance

The Operational Certificate holder must produce, within 60 days on the request of the Regional Manager Environmental Protection, 'Field and Laboratory Quality Protocols and Quality Assurance Criteria' acceptable to the Director. The 'Laboratory Quality Protocols' must include the procedures used to assess precision, accuracy and blank quality, including frequency of application of those procedures, the procedures for sampling, handling (e.g. preservation, hold times) and corrective measures to be initiated when deficiencies are indicated. The 'Quality Assurance Criteria' must include the acceptance criteria for accuracy (based on recoveries for reference samples/spikes), for precision (based on deviation in field and lab duplicates) and method blanks (designed to indicate false positives).

5. LANDFILL REPORTING

5.1 Annual Report

The Operation Certificate Holder must submit an Annual Report to the Director on or before April 30th each year for the previous calendar year. The report must contain at least the following information:

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

(a) an executive summary;

(b) the type and tonnage of waste received, recycled, stored on-site and discharged / landfilled for the year;

(c) Any proposed changes to the Design and Operations Plan and the environmental monitoring program (EMP), with rationale for the changes; a description of unanticipated occurrences and any changes to the closure or post-closure plans and funds;

(d) A review of the preceding year of operation or an operations update which summarizes landfill development work completed in the subject reporting year and work planned for the subsequent year. A summary of any new information or changes to the facilities and plans, assessments, surveys, programs and reports;

(e) Occurrences or observations of wildlife (medium and large carnivores) at the facility;

(f) A statement regarding the facility's progress in reducing the regional solid waste stream being landfilled and the objectives of the Regional Solid Waste Management Plan;

(g) An outline of the current Environmental Monitoring Program and a compendium of all environmental monitoring data in accordance with requirements specified in the most recent version of Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills and Landfill Criteria for Municipal Solid Waste. The annual report must document any effect of the discharge on the quality of the receiving environment using appropriate statistical and graphical analysis. Trend analyses, as well as an evaluation of the impacts of the discharges on the receiving environment must be included;

(h) A list of training programs completed for landfill operators during the previous year; and

(i) Any additional information requested by the Director.

All reports must be submitted, suitably formatted and tabulated in both print and electronic format (portable document format).

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
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Southern Interior Region - Kootenay

5.2 Five Year Report

The Operation Certificate Holder must submit a Five Year Report to the Director on or before April 30th on the five year anniversary of the last submission. The next report is due by the end of 2013. The report must contain at least the following information:

(a) An executive summary;

(b) An updated Design and Operations Plan;

(c) A detailed hydrogeological assessment;

(d) The type and tonnage of waste received, recycled, stored on-site and discharged / landfilled for the year;

(e) A current topographic map detailing airspace consumption, on-site borrow pit changes and future developments;

(f) Volume and density analysis or an in-place material summary, updated estimates for the remaining capacity, site life, revised closure date for the current phase or sequence and revised closure date for the current landfill footprint;

(g) An outline of the current Environmental Monitoring Program and a compendium of all environmental monitoring data in accordance with requirements specified in the most recent version of Guidelines for Environmental Monitoring at Municipal Solid Waste Landfills and Landfill Criteria for Municipal Solid Waste. The annual report must document any effect of the discharge on the quality of the receiving environment using appropriate statistical and graphical analysis. Trend analyses, as well as an evaluation of the impacts of the discharges on the receiving environment must be included;

(h) An update on the financial assurance mechanism including a statement of the current dollar value of the Closure Fund and the amount earmarked for the Landfill site; and

(i) Any additional information requested by the Director.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
for Director, *Environmental Management Act*
Southern Interior Region - Kootenay

6. LANDFILL CLOSURE PLAN

6.1 Closure Plan and Post Closure

The Operational Certificate holder must perform closure and post-closure care in accordance with all applicable requirements of the BC Landfill Criteria for Municipal Solid Waste. This Operational Certificate is issued on the condition that a Closure Plan and Final Cover Design that meets or exceeds the requirements of the criteria will be submitted to the Director during the operating life of the landfill. The Closure Plan must be reviewed every five years throughout the operating life of the landfill.

A certification by a Qualified Professional attesting that all closure works have been completed in accordance with the Closure Plan and Final Cover Design is to be submitted to the Director no later than 60 days after the implementation of the Final Cover Design.

The Operational Certificate Holder must submit a Post Closure or Aftercare Plan to the Ministry at least two years prior to the anticipated closure date of the landfill.

6.2 Closure Fund

The Operational Certificate holder must provide for the funding of progressive closure operations, final closure and operations beyond closure by maintaining a closure fund. The value of the closure fund must meet or exceed the estimated closure and post-closure costs as established in the approved Design and Operations Plan and updated in the annual report, plus a reasonable contingency for any remediation which may be required. Reported costs must be adjusted for inflation annually. Alternately, a closure and post-closure financial security acceptable to the Director may be built over time.

The Operational Certificate holder must determine and ensure that the closure fund is adequate by preparing annually a financial statement of the fund which must be made available to the Director upon request. The financial statement must report the accrued capital, interest and additions to the fund for the previous year and review the sufficiency of the fund and the rate of accrual in consideration of the projected costs of closure and post-closure obligations.

Date issued: May 5, 2003
Date amended: August 29, 2012
(most recent)

Chris Stroich, M.Sc., P.Ag.
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Southern Interior Region - Kootenay

6.3 Site Decommissioning

In accordance with Section 40 of the *Environmental Management Act* and Part 2 of the Contaminated Sites Regulation, the Operational Certificate holder must submit a site profile to the manager at least ten days prior to decommissioning the facilities authorized in Section 1.

6.4 Declaration of Landfill

Landfills sited on titled land must register a covenant that the property was used for the purpose of waste disposal as a charge against the title to the property as provided for under Section 215.1 of the *Land Title Act.* Landfills located on crown land are to have a "notation on file" registered that the property was used for the purpose of waste disposal.

The Operational Certificate holder must, upon closure of the landfill, register a charge against the property title, or provide other legal notification acceptable to the Director that the property described in Section 1 was used for the purpose of waste disposal. The Director must be notified of the charge or legal notification.

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Date amended: August 29, 2012
(most recent)

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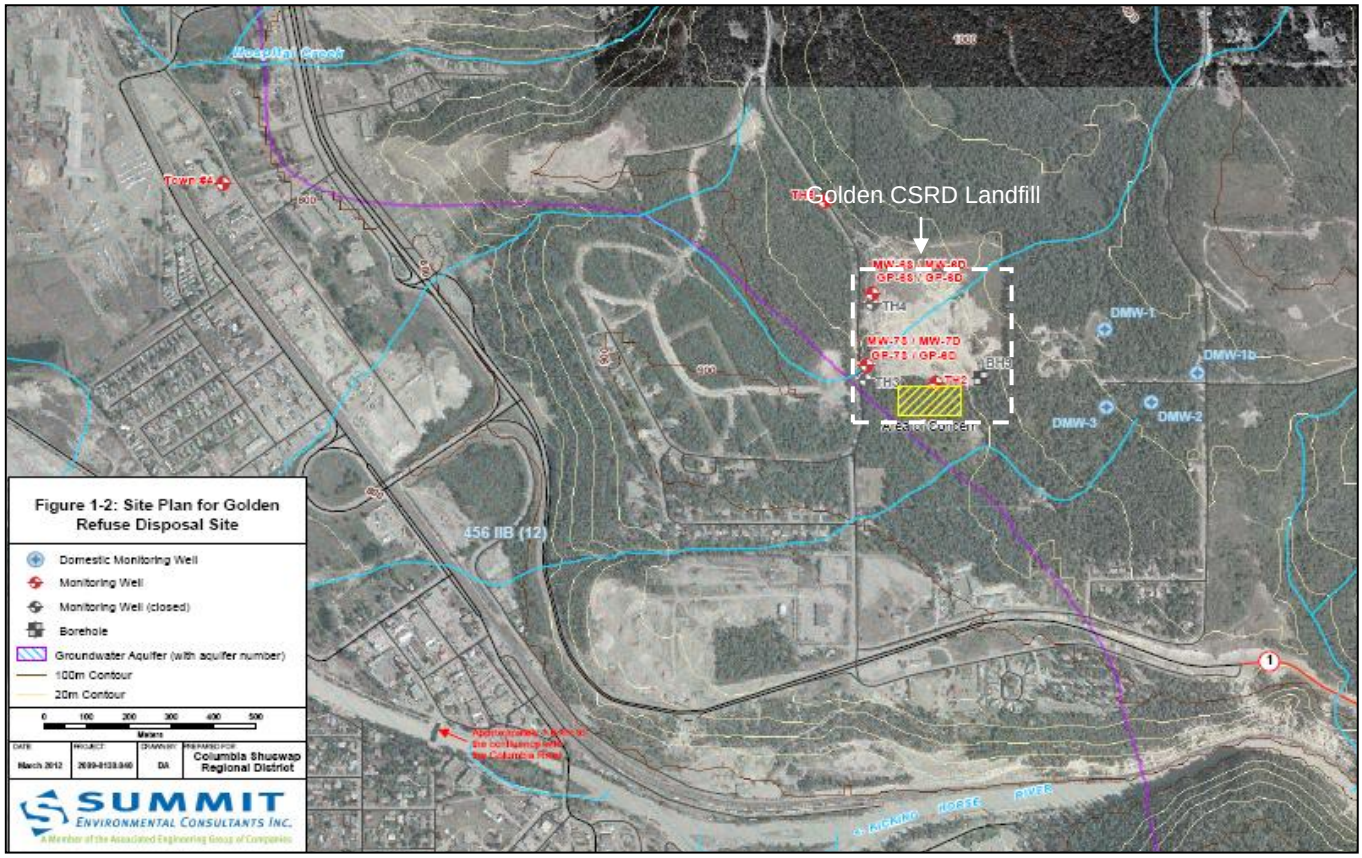
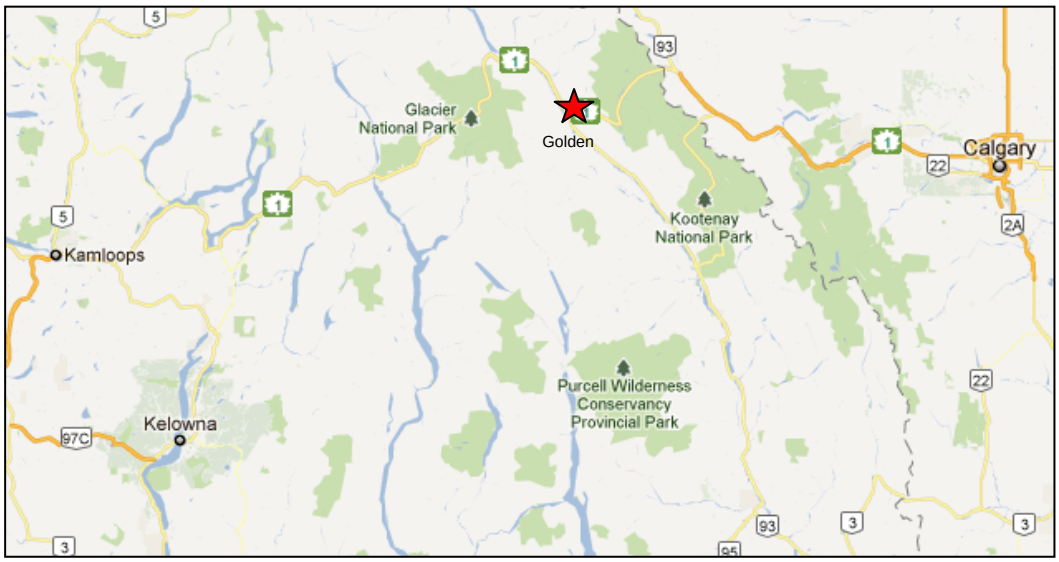
Southern Interior Region - Kootenay

Location Map





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Date amended: August 29, 2012
(most recent)

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Appendix B

Well Logs

Symbol Legend

Common Symbols

 Sand

 Silty Sand

 Sandy Silt

 Clayey Sand

 Sand and Gravel

 Gravel

 Silt

 Clayey Silt

 Clay

 Silty Clay

 Sandy Silty Clay

 Silty Sand and Gravel

 Silty Gravel

 Silty Clay and Gravel

 Topsoil

 Peat

 Limestone

 Shale

Well Symbols

Pipe and Screen

NONE None

 Pipe

 Double Walled Pipe

 Sealed Pipe

 Fine Screen

 Coarse Screen

 Slotted Screen

 Slotted Screen

Top Fittings

NONE None

 Cap

 Flush-mounted Cap

 Above-ground Cap

 Connector

 Reducer

 Pipe Break

 Packer

Bottom Fittings

NONE None

 Cap

 Cone

 Screw-on Cap

 Connector

 Enlarger

 Pipe Break

 Packer

Packing and Backfill

NONE None

 Bentonite

 Clay

 Silt

 Cement

 Sand

 Sand and Gravel

 Gravel

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH-6 (6")

Well I.D.: **MW-6S, MW-6D, GP-6S, GP-6D**

Location on site: **near weight scale (replaces TH4)**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth (ft / m)	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
10 ft		Light brown, GRAVEL, w. sand, loose, dry					
30 ft / 10 m		Light brown, SILT w/ sand, trace gravel, loose, dry					
40 ft		Grey, GRAVEL w/ sand and silt, loose, dry					
50 ft		Grey, GRAVEL w/ sand and silt, loose, dry					
60 ft / 20 m		Note: larger gravel than above					
70 ft		Light brown, (f.) SAND w/ silt and trace gravel, dense, moist					
80 ft		Grey, (m.) SAND, w/ silt and gravel, dense, moist					
90 ft		Grey, cemented GRAVEL, dense, dry					
100 ft / 30 m		Yellow, SILT w/ some angular gravel and m.-c. sand, dense, moist					
110 ft		Black, Limestone bedrock					
120 ft							
130 ft / 40 m							
140 ft							
150 ft							
160 ft / 50 m							
170 ft							
180 ft							
190 ft / 60 m							
200 ft							
210 ft							
220 ft		End of Borehole					

Configuration:

- Two groundwater monitoring wells (each 2" diameter)
- Two gas monitoring probes (each 1" diameter)
- Schedule 40 PVC
- Gas piezos. are threaded
- 20/40 sand pack around each monitoring well

Screen Assembly:

- No. 10 slot PVC

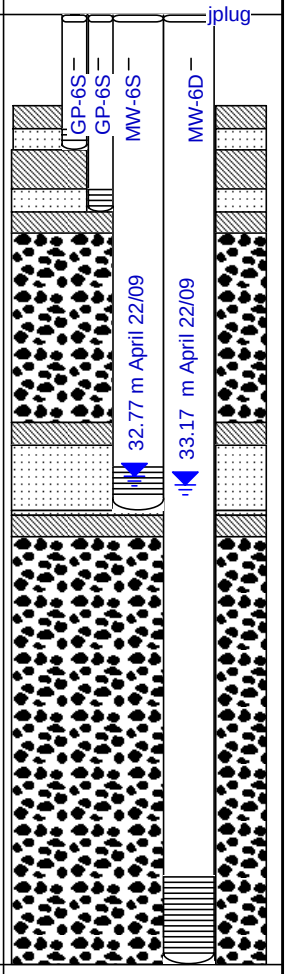
MW6D
-Screened in bedrock - Screened btw 59.76 m (196 ft) and 65.85 (216 ft) bgs

MW6S
-Screened in surficial deposits (overburden)
-Screened btw 31.40 m (103 ft) and 34.45 m (113 ft) bgs

GP6D
-Screened btw 12.20 m (40 ft) and 16.77 m (55 ft) bgs

GP6S
-Screened btw 7.93 m (26 ft) and 9.45 m (31 ft) bgs

Casing height =



SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling Central Ltd.
Operator(s): Jerry Opper
Drill Method: Dual Air Rotary
Ground conditions: bare

Date: April 20, 2009
Time:
Temperature: 10 degC
Sheet: 1 of 1

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

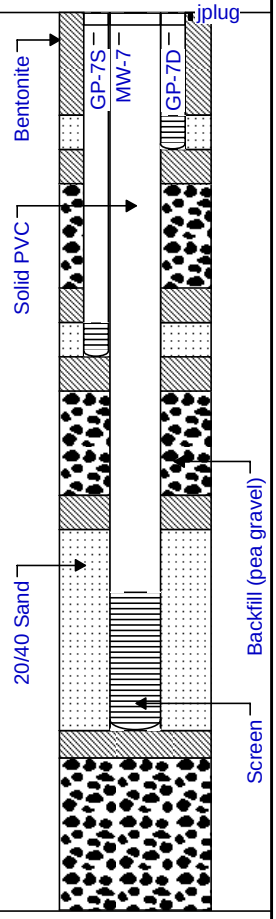
Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH-7 (6")

Well I.D.: **MW-7, GP-7S, GP-7D (replaces TH3)**

Location on site: **Golden-Donald Upper Rd.**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
0–10 ft		Yellow/ brown, SILT, loose, damp				Configuration: ♦ One groundwater monitoring well (2" diameter) ♦ Two gas monitoring probes (each 1" diameter) ♦ Schedule 40 PVC ♦ Gas probes are threaded ♦ 20/40 sand pack around each monitoring well Screen Assembly: - No. 10 slot PVC **MW-7** -Screened in the surficial deposits (overburden) -Screened btw 25.6 m (84 ft) and 31.7 m (104 ft) bgs **GP-7D** -Screened btw 13.72 m (45 ft) and 15.24 m (50 ft) bgs **GP-7S** -Screened btw 4.5 m (15 ft) and 6.10 m (20 ft) bgs Casing Height: 1.2 m (3.9 ft)	
10–20 ft		Grey, SILTand clay, dense, moist					
		Grey, SILT, dense, moist					
20–30 ft		Light brown, SILT w/ (f.) sand and gravel, loose, moist, fining upwards					
30–40 ft		Grey, cemented GRAVEL w/ sand and silt, dense, damp					
40–50 ft		Grey, SILT trace sand, dense, moist					
50–60 ft		Grey, GRAVEL w/ (m.) sand and silt, dense, moist					
60–70 ft		Grey, (f.-m.) SAND w/ silt, dense, moist, coarsening upward					
70–80 ft		Grey, cemented GRAVEL, dense, dry					
80–90 ft		Grey, (f.) angular GRAVEL w/ sand and silt, dense, dry,					
90–100 ft							
100–110 ft							
110–120 ft							
120–130 ft							
130–140 ft		End of Borehole					

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling Central Ltd.

Operator(s): Jerry Opper

Drill Method: Dual Air Rotary

Ground conditions: bare

Date: April 23, 2009

Time:

Temperature: 7 deg C

Sheet: 1 of 1

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

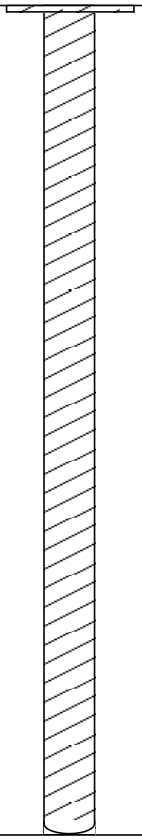
Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH3

Well I.D.: **TH-3 (well closure)**

Location on site: **on Golden-Donald Upper Rd**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
10 ft / 10 m						TH-3 was replaced by MW-7. TH-3 was decommissioned according to the Groundwater Protection Regulation. The surface casing was removed, the 2" piezometer was cut approximately 4" below ground surface and bentonite chips were poured into the casing. Bentonite was poured around the outer annulus of the piezometer to bring the hole to ground surface.	
20 ft / 20 m							
30 ft / 10 m							
40 ft							
50 ft							
60 ft		End of Borehole					
70 ft / 20 m							

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling

Operator(s): Jerry

Drill Method:

Ground conditions: bare

Date: April 20, 2009

Time:

Temperature: 10 degC

Sheet: 1 of 1

KALA GROUNDWATER CONSULTING LTD. **TESTHOLE LOG**

CLIENT:	RCP	PROJECT:	Hydrogeologial	TESTHOLE:	BH95-03
LOCATION:	Golden Landfill		Assessment - Golden BC	PROJECT NO:	KE95-057
DRILL RIG:	Becker Hammer	SURF ELV:	908.5m ASL.	CO-ORDINATES:	

DEPTH (m) ELV. (m)	INDEX: METHANE %	Plot	SOIL DESCRIPTION	Lab Test	SAMPLES		COMPLETION DETAILS
	0 5 10 15 20						
Gravel					Depth (m)	N	Stickup 1.2m
	0-8.54		**Silt**-some fine sand, some gravel, fine to coarse, iso. cobbles, non-plastic, red/brown, dense, damp		AR1 1.5		50mm dia. Solid pipe
2.0 906.5							Bentonite Grout
					AR2 3.0		
					D1 3.5/3.95	50	
4.0 904.5							
					AR3 4.5		
6.0 902.5							Top 6.0m
					AR4 6.0		
					D2 6.5/6.95	50	
8.0 900.2							
	8.54-11.3		**Silt**-and fine sand, trace gravel, fine to coarse, non-plastic, iso. cobbles, grey, hard, moist.		AR5 7.5		
10.0 898.2							Sand
					AR6 10.0		
	11.3-15.5		**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, grey/brown, hard, moist				
12.0 896.2							
					AR7 11.5		
14.0 894.2					AR8 13.0		0.010" slotted pipe
					D3 13.5/13.9	50	
					AR9 14.0		
16.0 892.2	15.5-18.3		**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp.		AR10 15.0		
					D4 16/16.45	75	
					AR11 16.5		
18.0 890.2					AR12 18.0		
							18.3m
20.0 888.2			*End of TH95-01 at 18.3m - No groundwater seepage Monitoring Well installed*				
22.0							

Prepared by: Paul Blackett	Reviewed by:	Figure: 3
Groundwater Depth: no groundwater	Borehole Depth: 18.3m below surface	Date: 10/9/95

Project No: **7130-010.01**

Client: **CSRD**

Location: **Golden, BC**

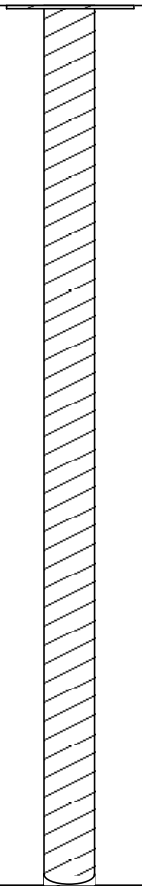
Logged by/ Checked by: **BRM/ MG**

Test Hole / Borehole I.D.: TH4

Well I.D.: **TH-4 (well closure)**

Location on site: **near weight scale**

Northing/ Easting/ Elevation: **0**

SUBSURFACE PROFILE			SAMPLE				
Depth	Symbol	Description	Type	I.D.	Flag for analysis	Well Details	Well Completion Details / Remarks
0 ft / 0 m		Ground Surface					
10 / 10 / 20 / 30 / 40 / 50 / 60 / 70 / 80 / 90 / 100 ft; 10 / 20 / 30 m						TH-4 was replaced by MW-6S. TH-4 was decommissioned according to the Groundwater Protection Regulation. The surface casing was removed, the 2" piezometer was cut approximately 4" below ground surface and bentonite chips were poured into the casing. Bentonite was poured around the outer annulus of the piezometer to bring the hole to ground surface.	
110 ft		End of Borehole					

SUMMIT ENVIRONMENTAL CONSULTANTS LTD.

Contractor: JR Drilling

Operator(s): Jerry

Drill Method:

Ground conditions: bare

Date: April 20, 2009

Time:

Temperature: 10 degC

Sheet: 1 of 1

KALA GROUNDWATER CONSULTING LTD. **TESTHOLE LOG**

CLIENT:	RCP	PROJECT:	Hydrogeologial	TESTHOLE:	BH95-04
LOCATION:	Golden Landfill		Assessment - Golden BC	PROJECT NO:	KE95-057
DRILL RIG:	Becker Hammer	SURF ELV:	916.9m ASL.	CO-ORDINATES:	

DEPTH (m) ELV. (m)	INDEX: METHANE %	Plot	SOIL DESCRIPTION	Lab Test	SAMPLES		COMPLETION DETAILS
	0 5 10 15 20				Depth (m)	N	Stickup 1.2m
Grass							
	0-3.35		**Silt**-and fine sand, trace gravel fine to coarse, occ. cobbles, non-plastic, dense, yellow/brown, damp.		AR1 1.5		50mm dia. Solid pipe
2.0 914.9							Bentonite Grout & backfill
					AR2 3.0		
					D! 3.5/3.95	35	
4.0 912.9	3.35-5.49		**Gravel**-fine to coarse, and silt, trace sand fine to coarse, occ. cobbles, light brown, moist.		AR3 4.5		
6.0 910.9	5.49-11.0		**Silt**-and fine sand, trace coarse sand, trace gravel, fine to coarse, iso. cobbles, non-plastic, grey/brown, hard, moist.		AR4 6.0		
					D2 6.5/6.95	50	
8.0 908.9					AR5 7.5		
10.0 906.9							Sand
					AR6 10.0		
	11.0-12.8		**Sand**-fine to medium, and gravel, fine to coarse, iso. cobbles, trace silt, dense, red/brown, moist.		D3 10/10.45	45	
12.0 904.9					AR7 11.5		
	12.8-17.7		**Sand**- fine to medium, and silt, little gravel fine to coarse, iso. cobbles, brown, hard, moist.		AR8 13.0		0.010" slotted pipe
14.0 902.9					D2 13.5/13.9	50	
					AR9 14.0		
16.0 900.2					AR10 15.0		
					D4 15/15.45	70	
					AR11 16.5		
18.0 898.2	17.7-30.48		**Sand** - fine and silt, trace gravel, fine to coarse, brown, hard, moist.		AR12 18.0		
					AR13 22.0		
20.0 896.2					AR 14 25.0		Top 20.0m
			End of TH95-01 at 30.48m - No groundwater seepage		AR15 27.5		
30.0 894.2			*Monitoring Well installed*		AR 16 30.0		Bot 30.5m

Prepared by: Paul Blackett	Reviewed by:	Figure:
Groundwater Depth: no groundwater	Borehole Depth: 30.5m below surface	Date: 10/9/95

MODIFIED UNIFIED CLASSIFICATION SYSTEM FOR SOILS

MAJOR DIVISION			GROUP SYMBOL	GRAPH SYMBOL	COLOR CODE	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA
COARSE-GRAINED SOILS (MORE THAN HALF BY WEIGHT LARGER THAN 200 SIEVE)	GRAVELS MORE THAN HALF COARSE GRAINS LARGER THAN NO 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)	GW		RED	WELL GRADED GRAVELS, LITTLE OR NO FINES	$C_U = \frac{D_{60}}{D_{10}} > 4 \quad C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			GP		RED	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY GRAVELS (WITH SOME FINES)	GM		YELLOW	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS BELOW "A" LINE OR P.I. LESS THAN 4
			GC		YELLOW	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS ABOVE "A" LINE P.I. MORE THAN 7
	SANDS MORE THAN HALF FINE GRAINS SMALLER THAN NO 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)	SW		RED	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	$C_U = \frac{D_{60}}{D_{10}} > 6 \quad C_C = \frac{(D_{30})^2}{D_{10} \times D_{60}} = 1 \text{ to } 3$
			SP		RED	POORLY GRADED SANDS, LITTLE OR NO FINES	NOT MEETING ABOVE REQUIREMENTS
		DIRTY SANDS (WITH SOME FINES)	SM		YELLOW	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS BELOW "A" LINE P.I. LESS THAN 4
			SC		YELLOW	CLAYEY SANDS, SAND-CLAY MIXTURES	CONTENT OF FINES EXCEEDS 12% — ATTERBERG LIMITS ABOVE "A" LINE P.I. MORE THAN 7
FINE-GRAINED SOILS (MORE THAN HALF BY WEIGHT PASSES 200 SIEVE)	SILTS BELOW "A" LINE NEGLIGIBLE ORGANIC CONTENT	$W_L < 50\%$	ML		GREEN	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY SANDS OF SLIGHT PLASTICITY	CLASSIFICATION IS BASED UPON PLASTICITY CHART (see below)
		$W_L > 50\%$	MH		BLUE	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOILS	
	CLAYS ABOVE "A" LINE ON PLASTICITY CHART NEGLIGIBLE ORGANIC CONTENT	$W_L < 30\%$	CL		GREEN	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, LEAN CLAYS	
		$30\% < W_L < 50\%$	CI		GREEN-BLUE	INORGANIC CLAYS OF MEDIUM PLASTICITY, SILTY CLAYS	
		$W_L > 50\%$	CH		BLUE	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
	ORGANIC SILTS & CLAYS BELOW "A" LINE ON CHART	$W_L < 50\%$	OL		GREEN	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	WHENEVER THE NATURE OF THE FINE CONTENT HAS NOT BEEN DETERMINED, IT IS DESIGNATED BY THE LETTER "F", E.G. SF IS A MIXTURE OF SAND WITH SILT OR CLAY
		$W_L > 50\%$	OH		BLUE	ORGANIC CLAYS OF HIGH PLASTICITY	
HIGHLY ORGANIC SOILS			Pt		ORANGE	PEAT AND OTHER HIGHLY ORGANIC SOILS	STRONG COLOR OR ODOR, AND OFTEN FIBROUS TEXTURE

SPECIAL SYMBOLS

BEDROCK (Undifferentiated)

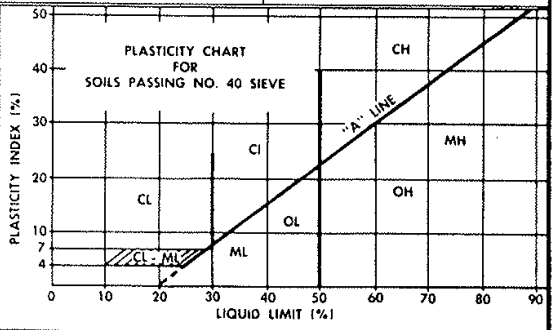
VOLCANIC ASH

SOIL COMPONENTS

FRACTION	U S STANDARD SIEVE SIZE		DEFINING RANGES OF PERCENTAGE BY WEIGHT OF MINOR COMPONENTS	
	PASSING	RETAINED	PERCENT	DESCRIPTOR
GRAVEL			50 - 35	and
coarse	76 mm	19 mm		
fine	19 mm	No 4	35 - 20	some
SAND				
coarse	4.75 mm	2.00 mm	20 - 10	little
medium	2.00 mm	425 μm		
fine	425 μm	75 μm	10 - 1	trace
SILT (non plastic) or CLAY (plastic)	75 μm			

OVERSIZE MATERIAL

Rounded or subrounded	Not rounded
COBBLES 76 mm to 203 mm	ROCK FRAGMENTS > 76 mm
BOULDERS > 203 mm	ROCKS > 0·76 cubic metre in volume



1. ALL SIEVE SIZES MENTIONED ON THIS CHART ARE U.S. STANDARD, A.S.T.M. E.11.
2. BOUNDARY CLASSIFICATIONS POSSESSING CHARACTERISTICS OF TWO GROUPS ARE GIVEN COMBINED GROUP SYMBOLS, E.G. GW-GC IS A WELL GRADED GRAVEL SAND MIXTURE WITH CLAY BINDER BETWEEN 5% AND 12%.

Kala Groundwater Consulting Ltd.
Vernon Kamloops

Testhole Log - TH95-01	
Depth (m)	**Soil Description**
0-5.8	**Silt**-and fine sand, little gravel fine to coarse, iso. cobbles, non-plastic, dense, yellow/brown, moist.
5.8-6.71	**Silt**-and sand fine to medium, some gravel fine to coarse, non-plastic, hard, grey, moist.
6.71-8.54	**Silt**-and fine sand, trace coarse sand, trace gravel, fine to coarse, iso. cobbles, non-plastic, gre/brown, hard, moist.
8.54-11.3	**Silt**-and fine sand, trace gravel, fine to coarse, non-plastic, iso. cobbles, grey, hard, moist.
11.3-14.9	**Silt**-some fine sand, trace gravel, fine to coarse, occ. cobbles, non-plastic, red/brown, hard, damp.
14.9-18.9	**Clay**-and silt, trace fine sand, trace fine gravel, iso. cobbles, low to none plastic, grey, hard, moist.
	End of TH95-01 at 18.9m - No groundwater seepage - Monitoring Well installed

Testhole Log - TH95-02	
Depth (m)	**Soil Description**
0-9.76	**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp. *Upper 0.3m fill*
9.76-12.8	**Sand**-afine and silt, some gravel fine to coarse, iso. cobbles, dense, red/brown, moist.
12.8-15.5	**Sand**-fine, some silt, some gravel fine to coarse, occ. cobbles. dense, red/brown, moist.
15.5-16.5	**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, iso. grey/brown, cobbles, stiff, moist.
16.5-20.1	**Silt**-little fine sand, trace clay, trace gravel, fine to coarse, occ. cobbles, non-plastic, red/brown, hard, damp.
20.1-22.9	**Silt** - some sand, fine to coarse, trace gravel fine to coasre, iso. cobbles, grey, very hard, non-plastic,
	End of TH95-02 at 22.9m - No groundwater seepage - Monitoring Well installed

Testhole Log - TH95-03	
Depth (m)	**Soil Description**
0-8.54	**Silt**-some fine sand, some gravel, fine to coarse, iso. cobbles, non-plastic, red/brown, dense, damp
8.54-11.3	**Silt**-and fine sand, trace gravel, fine to coarse, non-plastic, iso. cobbles, grey, hard, moist
11.3-15.5	**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, grey/brown, hard, moist
15.5-18.3	**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp.
	End of TH95-03at 18.3m - No groundwater seepage -Monitoring Well installed

Testhole Log - TH95-04	
Depth (m)	**Soil Description**
0-3.35	**Silt**-and fine sand, trace gravel fine to coarse, occ. cobbles, non-plastic, dense, yellow/brown, damp.
3.35-5.49	**Gravel**-fine to coarse, and silt, trace sand fine to coarse, occ. cobbles, light brown, moist.
5.49-11.0	**Silt**-and fine sand, trace coarse sand, trace gravel, fine to coarse, iso. cobbles, non-plastic, gre/brown, hard, moist.
11.0-12.8	**Sand**-fine to medium, and gravel, fine to coarse, iso. cobbles, trace silt, dense, red/brown, moist.
12.8-17.7	**Sand**- fine to medium, and silt, little gravel fine to coarse, iso. cobbles, brown, hard, moist.
17.7-30.48	**Sand** - fine and silt, trace gravel, fine to coarse, brown, hard, moist.
	End of TH95-04 at 26.2m - No groundwater seepage - Monitoring Well installed

Testhole Log - TH95-05	
Depth (m)	**Soil Description**
0-1.3	**Silt**-and fine sand, little gravel fine to coarse, iso. cobbles, non- plastic, dense, yellow/brown, moist.
1.3-3.1	**Waste**-municipal debris, paper,tin plastics,mixed with soil, damp.
3.1-3.4	**Sand**-fine to medium, some silt, little gravel, fine to coarse, compact, brown, moist.
3.4-5.1	**Waste**-municipal debris, paper,tin plastics,mixed with soil, damp.
5.1-5.4	**Sand**-fine to medium, some silt, little gravel, fine to coarse, compact, brown, moist.
5.4-6.2	**Waste**-municipal debris, paper,tin plastics,mixed with soil, damp.
6.2-7.1	**Sand**-fine to medium, some silt, little gravel, fine to coarse, compact, brown, moist.
	End of TH5 at 7.1m no groundwater-temporary installation

KALA GROUNDWATER CONSULTING LTD. **TESTHOLE LOG**

CLIENT: RCP	PROJECT: Hydrogeologial	TESTHOLE:	BH95-02
LOCATION: Golden Landfill	Assessment - Golden BC	PROJECT NO:	KE95-057
DRILL RIG: Becker Hammer	SURF ELV: 914.0m ASL	CO-ORDINATES:	

DEPTH (m) ELV. (m)	INDEX: 0 20 40 60 80 100 120 140	Plot	SOIL DESCRIPTION	Lab Test	SAMPLES	N	COMPLETION DETAILS
Grass					Depth (m)		Stickup 1.2m
	0-9.76		**Sand**-fine and silt, some gravel fine to coarse, occ. cobbles, dense, light brown, damp. *Upper 0.3m fill*		AR1 1.5		50mm dia. Solid pipe
2.0 912							Bentonite Grout
					AR2 3.0		
4.0 910							
					AR3 4.5		
6.0 908							Top 6.0m
					AR4 6.0		
					D1 6.5/6.95	50	
8.0 906							
					AR5 7.5		
	9.76-12.8		**Sand**-fine and silt, some gravel fine to coarse, iso. cobbles, dense, grey, moist.				Sand
10.0 904							
					AR6 10.0		
12.0 902							
					AR7 11.5		
	12.8-15.5		**Sand**-fine, some silt, some gravel fine to coarse, occ. cobbles. dense, red/brown, moist.		AR8 13.0		0.010"
14.0 900					D2 13.5/13.9	50	slotted pipe
					AR9 14.0		
	15.5-16.5		**Silt**-some fine sand, trace gravel, fine to coarse, non-plastic, iso. grey/brown, cobbles, stiff, moist.				
16.0 898					AR10 15.0		
	16.5-20.1		**Silt**-little fine sand, trace clay, trace gravel, fine to coarse, occ. cobbles,. non-plastic, red/brown, hard, damp		AR11 16.5		
18.0 896							
					AR12 18.0		
20.0 894							
	20.1-22.9		**Silt** - some sand, fine to coarse, trace gravel fine to coarse, iso.cobbles, grey, very hard, non-plastic, moist.		D3 20/20.45	80	
22.0 892			*End of TH95-01 at 18.9m - No groundwater seepage Well installed*				Well base 22.9m

Prepared by: Paul Blackett	Reviewed by:	Figure:
Groundwater Depth: no groundwater	Borehole Depth: 22.9m below surface	Date: 10/9/95

Project No: 2010-8835.010.006

Well I.D.: BH9

Client: CSRD

First Water: n/a

Ground Elevation: Approx. 928 m asl

Location: Golden Landfill

Stabilized Water Level: n/a

Top of Casing Elevation: 0

Location on site: 5 m SE of landfill

Reviewed by: Tilman Roschinski

Logged by: Bryer Manwell

Subsurface Geology

Depth (ft / m)	Symbol	Description	Well Details and Notes	Well Construction
0 / 0		Ground Surface		
0 – 50 / 0 – 15		**SILT** Silt, occasional cobbles, dry to moist, yellowish-grey.	No well installed.	Natural slough
55		End of Borehole		

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Contractor: Target Drilling Inc.

Drill Method: Coring

Boring Diameter/ Depth: 6 in

Operator(s):

Date: Oct 8 2010

Project No: 2010-8835.010.006

Well I.D.: TH-8

Client: CSRD

First Water: n/a

Ground Elevation: Approx. 915 m asl

Location: Golden Landfill

Stabilized Water Level: 14 m btoc

Top of Casing Elevation: flush mount

Location on site: 150 m NW of landfill on Golden Donald Upper Road

Reviewed by: Tilman Roschinski

Logged by: Bryer Manwell

Subsurface Geology

Depth (ft / m)	Symbol	Description	Well Details and Notes	Well Construction
-1		Ground Surface		
4 / 1		**SAND AND GRAVEL** Sand and gravel, trace fines, light brown.	Flush mount casing, well sealed with j-plug	Flush mount casing
14 / 5				Oct 7 2010
29 / 10				bentonite grout
49 / 15		**CLAYEY TILL** Clay matrix, some gravel, trace sand, dense, wet.		
54		**REGOLITH**		

SUMMIT ENVIRONMENTAL CONSULTANTS INC.
A Member of the Associated Engineering Group of Companies

Contractor: Target Drilling Inc.

Drill Method: Coring

Boring Diameter/ Depth: 6 in / 27.3 m

Operator(s):

Date: Oct 5-7 2010

Project No: 2010-8835.010.006 ***Well I.D.: TH-8***

Client: CSRD ***First Water:*** n/a ***Ground Elevation:*** Approx. 915 m asl

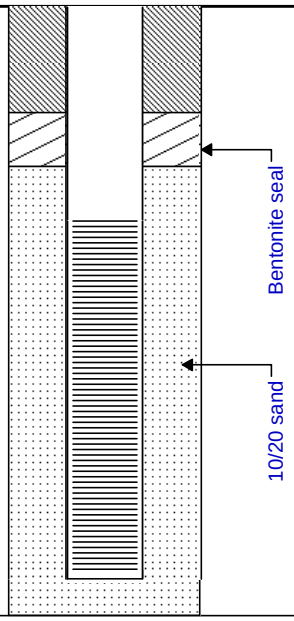
Location: Golden Landfill ***Stabilized Water Level:*** 14 m btoc ***Top of Casing Elevation:*** flush mount

Location on site: 150 m NW of landfill on Golden Donald Upper Road ***Reviewed by:*** Tilman Roschinski

Logged by: Bryer Manwell

Subsurface Geology

Depth	Symbol	Description	Well Details and Notes	Well Construction
60		**SLATE BEDROCK** Slaty bedrock, in places phyllitic, grey, fractured, some fractures filled with clay.	1 m bentonite seal	
65		**QUARTZ BEDROCK** Quartz, likely a large vein. Fluid mixing with sedimentary deposits on either end.		
70	21	**SLATE BEDROCK** Slaty bedrock, as above.	Screen depth: 67-87 ft (20.4 - 26.5 m)	
75		**QUARTZ BEDROCK** Quartz, as above.	Screen details: -10 slot PVC, 2 inch diameter -10/20 sand pack	
80		**SLATE BEDROCK** Slaty bedrock, as above		
85	26			
90		End of Borehole		
95				
100	31			
105				
110				



Contractor: Target Drilling Inc. **Operator(s):**

Drill Method: Coring **Date:** Oct 5-7 2010

Boring Diameter/ Depth: 6 in / 27.3 m

BRITISH COLUMBIA

Report 1 - Detailed Well Record

Well Tag Number: 99638 Owner: KATS CONTRACTING Address: 532 HIETALA ROAD Area: GOLDEN WELL LOCATION: KOOTENAY Land District District Lot: Plan: Lot: Township: 27 Section: 18 Range: 21 Indian Reserve: Meridian: W5M Block: A Quarter: Island: BCGS Number (NAD 27): 082N036121 Well: Class of Well: Water supply Subclass of Well: Domestic Orientation of Well: Vertical Status of Well: New Well Use: Private Domestic Observation Well Number: Observation Well Status: Construction Method: Diameter: inches Casing drive shoe: Y N Well Depth: 276 feet Elevation: feet (ASL) Final Casing Stick Up: 6 inches Well Cap Type: PLASTIC CAP Bedrock Depth: 18 feet Lithology Info Flag: N File Info Flag: N Sieve Info Flag: N Screen Info Flag: N Site Info Details: Other Info Flag: Other Info Details:	Construction Date: 2000-10-25 00:00:00.0 Driller: Owen's Drilling Ltd. Well Identification Plate Number: Plate Attached By: Where Plate Attached: PRODUCTION DATA AT TIME OF DRILLING: Well Yield: 6 (Driller's Estimate) U.S. Gallons per Minute Development Method: Air lifting Pump Test Info Flag: N Artesian Flow: Artesian Pressure (ft): Static Level: 50 feet WATER QUALITY: Character: Colour: Odour: Well Disinfected: N EMS ID: Water Chemistry Info Flag: N Field Chemistry Info Flag: Site Info (SEAM): Water Utility: Water Supply System Name: Water Supply System Well Name: SURFACE SEAL: Flag: N Material: Method: Depth (ft): Thickness (in): Liner from To: feet WELL CLOSURE INFORMATION: Reason For Closure: Method of Closure: Closure Sealant Material: Closure Backfill Material: Details of Closure:

Screen from	to feet	Type	Slot Size

Casing from	to feet	Diameter	Material	Drive Shoe
0	36	6	Steel	Y
36	276	5.88	Open hole	N

GENERAL REMARKS:
260' OF PVC LINER. BOTTOM 40' PERFORATED. SHOE: 1X6" CARBIDE BOTTON. RECOMMENDED PUMP TYPE: SUB

LITHOLOGY INFORMATION:

From	0 to	18 Ft.	CLAY, GRAVEL, COBBLES	
From	18 to	36 Ft.	BEDROCK, BROKEN	
From	36 to	150 Ft.	2 Gallons per Minute (U.S./Imperial)	bedrock
From	150 to	257 Ft.	2 Gallons per Minute (U.S./Imperial)	bedrock
From	256 to	276 Ft.	1 Gallons per Minute (U.S./Imperial)	bedrock

- Return to Main
- Return to Search Options
- Return to Search Criteria

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Appendix C

Water Quality Database

Legend for Reports for CSRD Refuse Disposal Sites Water Quality Results

<	Less than reported detection limit
>	Greater than reported upper detection limit
A	Absent
BC CSR AW	BC CSR, Schedule 6, Generic Numerical Water Standards for Freshwater Aquatic Life
BC CSR DW	BC CSR, Schedule 6 and 10, Generic Numerical Water Standards for Drinking Water
BCAWQG AL	BC Approved Water Quality Guidelines for freshwater aquatic life
BCAWQG DW	BC Approved Water Quality Guidelines for drinking water
BCWWQG AL	Working Water Quality Guidelines for British Columbia for freshwater aquatic life
Calc	Calculated guideline or standard. The guideline or standard is dependent on the value of one or more other analytes, and is calculated from a formula or table.
GCDWQ AO	Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives
GCDWQ MAC	Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations
L	Laboratory reading type (Lab result)
m asl	metres above sea level
N	Narrative type of guideline or standard, or Result Note.
ND	Non-detect. Result is less than lower detection limit.
NG	No Guideline
NR	No Result
NS	No Standard
NT	Not Tested
OG	Overgrown
P	Present
PR	Presumptive
TK	Test kit reading type (Field result)
TNTC	Too numerous to count
	Highlighted value has a lower detection limit that is greater than the guideline/standard maximum and/or the guideline/standard minimum, or has an upper detection limit that is less than the guideline/standard maximum and/or the guideline/standard minimum.
BC CSR AW	Highlighted value exceeds BC CSR AW
BC CSR DW	Highlighted value exceeds BC CSR DW
BCAWQG AL	Highlighted value exceeds BCAWQG AL
BCAWQG DW	Highlighted value exceeds BCAWQG DW
BCWWQG AL	Highlighted value exceeds BCWWQG AL
GCDWQ AO	Highlighted value exceeds GCDWQ AO
GCDWQ MAC	Highlighted value exceeds GCDWQ MAC
SL Criteria Override	Highlighted value exceeds sampling location criteria override

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Guideline							Sampling Location	DMW-1	DMW-1	DMW-1	DMW-1b	DMW-1b
									Date Sampled	09-Feb-10	15-Jun-10	16-Nov-10	09-May-11	10-Aug-11
									Lab Sample ID	K0B0397-04	K0F0788-01	K0K0729-04	K1E0403-05	K1H0536-03
									Sample Type					
		BCAWQG AL	BCWWQG AL	GCDWQ MAC	GCDWQ AO	BCAWQG DW	BC CSR AW	BC CSR DW						
Field Results														
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG	NG		1120	1220	1150	1220	1000
Depth to Water	m	NG	NG	NG	NG	NG	NG	NG						
Dissolved oxygen	mg/L	min 5 [1.1]	NG	NG	NG	NG	NG	NG						
Dissolved oxygen (percent)	%	NG	NG	NG	NG	NG	NG	NG						
Ground Elevation	m	NG	NG	NG	NG	NG	NG	NG					975	975
Oxidation reduction potential	mV	NG	NG	NG	NG	NG	NG	NG			61	-18	-199	40
pH		N [1.2]	NG	NG	6.5 - 8.5	6.5 - 8.5 [5.1]	NG	NG		7.31	7.28	7.3	7.4	7.31
Temperature	°C	19 [1.3]	NG	NG	15	15 [5.2]	NG	NG		6.5	9.9	6.2	8.8	9.5
Lab Results														
General														
Alkalinity (total, as CaCO3)	mg/L	NG	N [2.1]	NG	NG	NG	NG	NG		444	453	475	509	509
Bromide	mg/L	NG	NG	NG	NG	NG	NG	NG						
Chemical Oxygen Demand	mg/L	NG	NG	NG	NG	NG	NG	NG						
Chloride	mg/L	600 [1.4]	NG	NG	250	250 [5.3]	1500	250 [7.1]		26.8	23.3	30.1	26	27.7
Conductivity	µS/cm	NG	NG	NG	NG	NG	NG	NG		1130	1140	1090	1120	1090
Fluoride	mg/L	Calc [1.5]	NG	1.5	NG	1.5	Calc [6.1]	1.5						
Hardness, total (dissolved as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG		583	558	611	655	590
Hardness, Total (total as CaCO3)	mg/L	NG	NG	NG	NG	NG	NG	NG						
pH		N [1.6]	NG	NG	6.5 - 8.5	6.5 - 8.5 [5.4]	NG	NG		7.73	7.89	7.69	7.84	7.79
Sulphate	mg/L	Calc [1.7]	NG	NG	500 [4.1]	500	1000	500 [7.2]		208	213	91.7	137	133
Total suspended solids	mg/L	N [1.8]	NG	NG	NG	NG	NG	NG		2	<1	<1	<1	<1
Turbidity	NTU	N [1.9]	NG	N [3.1]	NG	N [5.5]	NG	NG		0.8	0.5	3.6	2	3.4
Metals														
Aluminum (dissolved)	mg/L	Calc [1.10]	NG	NG	N [4.2]	0.2 [5.6]	NG	9.500 [7.3]		<0.005	0.007	<0.005	<0.005	<0.005
Aluminum (total)	mg/L	NG	NG	NG	N [4.3]	NG	NG	9.500 [7.4]						
Antimony (dissolved)	mg/L	NG	0.009 [2.2]	0.006	NG	NG	0.2	0.006		0.0002	0.0002	<0.0001	0.0002	0.0002
Antimony (total)	mg/L	NG	0.009 [2.3]	0.006	NG	NG	0.2	0.006						
Arsenic (dissolved)	mg/L	0.005 [1.11]	NG	0.010 [3.2]	NG	0.025 [5.7]	0.05	0.01		0.0043	0.007	0.0389	0.026	0.0362
Arsenic (total)	mg/L	0.005	NG	0.010 [3.3]	NG	0.025 [5.8]	0.05	0.01						
Barium (dissolved)	mg/L	NG	1	1	NG	NG	10	1		0.0236	0.023	0.0269	0.0242	0.022
Barium (total)	mg/L	NG	1	1	NG	NG	10	1						
Beryllium (dissolved)	mg/L	NG	0.00013	NG	NG	NG	0.053	NG		<0.0001	<0.0001	0.0001	0.0001	<0.0001
Beryllium (total)	mg/L	NG	0.00013	NG	NG	NG	0.053	NG						
Bismuth (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Boron (dissolved)	mg/L	1.2 [1.12]	NG	5	NG	5 [5.9]	50	5		0.171	0.233	0.174	0.143	0.135
Boron (total)	mg/L	1.2	NG	5	NG	5	50	5						
Cadmium (dissolved)	mg/L	Calc [1.13]	NG	0.005	NG	NG	Calc [6.2]	0.005		0.00002	<0.00001	<0.00001	<0.00001	<0.00001
Cadmium (total)	mg/L	NG	NG	0.005	NG	NG	Calc [6.3]	0.005						
Calcium (dissolved)	mg/L	NG	N [2.4]	NG	NG	NG	NG	NG		73.9	70.9	73.5	71.9	63.2
Calcium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Chromium (dissolved)	mg/L	NG	0.001 [2.5]	0.05	NG	NG	0.010 [6.4]	0.05		0.0146	0.0014	0.0009	<0.0005	<0.0005

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Guideline							Sampling Location	DMW-1	DMW-1	DMW-1	DMW-1b	DMW-1b
									Date Sampled	09-Feb-10	15-Jun-10	16-Nov-10	09-May-11	10-Aug-11
									Lab Sample ID	K0B0397-04	K0F0788-01	K0K0729-04	K1E0403-05	K1H0536-03
									Sample Type					
		BCAWQG AL	BCWWQG AL	GCDWQ MAC	GCDWQ AO	BCAWQG DW	BC CSR AW	BC CSR DW						
Chromium (total)	mg/L	NG	0.001 [2.6]	0.05	NG	NG	0.010 [6.5]	0.05						
Cobalt (dissolved)	mg/L	0.110 [1.14]	NG	NG	NG	NG	0.04	NG		0.00063	0.00075	0.00012	0.00011	0.00009
Cobalt (total)	mg/L	0.110 [1.15]	NG	NG	NG	NG	0.04	NG						
Copper (dissolved)	mg/L	Calc [1.16]	NG	NG	1	0.500 [5.10]	Calc [6.6]	1.000 [7.5]		0.0297	0.0392	0.0004	0.0006	0.0008
Copper (total)	mg/L	Calc [1.17]	NG	NG	1	0.500 [5.11]	Calc [6.7]	1.000 [7.6]						
Iron (dissolved)	mg/L	0.35	NG	NG	0.3	NG	NG	6.500 [7.7]		0.053	0.26	0.418	0.145	0.28
Iron (total)	mg/L	1	NG	NG	0.3	NG	NG	6.500 [7.8]						
Lead (dissolved)	mg/L	Calc [1.18]	NG	0.01	NG	0.050 [5.12]	Calc [6.8]	0.01		0.0001	0.0004	<0.0001	0.0002	0.0001
Lead (total)	mg/L	Calc [1.19]	NG	0.01	NG	0.050 [5.13]	Calc [6.9]	0.01						
Lithium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	0.73		0.0232	0.031	0.026	0.0238	0.0218
Lithium (total)	mg/L	NG	NG	NG	NG	NG	NG	0.73						
Magnesium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	100 [7.9]		96.7	92.5	104	116	104
Magnesium (total)	mg/L	NG	NG	NG	NG	NG	NG	100 [7.10]						
Manganese (dissolved)	mg/L	Calc [1.20]	NG	NG	0.05	NG	NG	0.550 [7.11]		0.0022	0.0032	0.0042	0.0039	0.004
Manganese (total)	mg/L	Calc [1.21]	NG	NG	0.05	NG	NG	0.550 [7.12]						
Mercury (dissolved)	mg/L	0.000020 [1.22]	NG	0.001	NG	0.0010 [5.14]	0.001	0.001		<0.00005	<0.00005	<0.00005	<0.00002	<0.00002
Mercury (total)	mg/L	0.000020 [1.23]	NG	0.001	NG	0.0010 [5.15]	0.001	0.001						
Molybdenum (dissolved)	mg/L	2 [1.24]	NG	NG	NG	0.25 [5.16]	10	0.25		0.0011	0.0008	0.0004	0.0003	0.0004
Molybdenum (total)	mg/L	2 [1.25]	NG	NG	NG	0.25 [5.17]	10	0.25						
Nickel (dissolved)	mg/L	NG	Calc [2.7]	NG	NG	NG	Calc [6.10]	NG		0.0034	0.0046	0.0036	0.0011	0.0014
Nickel (total)	mg/L	NG	Calc [2.8]	NG	NG	NG	Calc [6.11]	NG						
Selenium (dissolved)	mg/L	0.002 [1.26]	NG	0.05	NG	0.010 [5.18]	0.01	0.01		0.0005	<0.0003	<0.0003	<0.0005	<0.0005
Selenium (total)	mg/L	0.002 [1.27]	NG	0.05	NG	0.010 [5.19]	0.01	0.01						
Silicon (dissolved, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG		10.4	6.09	4.55	7.93	8
Silicon (total, as Si)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Silver (dissolved)	mg/L	Calc [1.28]	NG	NG	NG	NG	Calc [6.12]	NG		<0.00005	<0.00005	<0.00005	0.00005	<0.00005
Silver (total)	mg/L	Calc [1.29]	NG	NG	NG	NG	Calc [6.13]	NG						
Sodium (dissolved)	mg/L	NG	NG	NG	200	NG	NG	200 [7.13]		25.8	23.7	26.6	25.4	25.1
Sodium (total)	mg/L	NG	NG	NG	200	NG	NG	200 [7.14]						
Strontium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	22		3.07	3.89	1.88	1.8	1.69
Strontium (total)	mg/L	NG	NG	NG	NG	NG	NG	22						
Sulphur (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Sulphur (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Tellurium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Thallium (dissolved)	mg/L	NG	0.0008 [2.9]	NG	NG	NG	0.003	NG		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Thallium (total)	mg/L	NG	0.0008 [2.10]	NG	NG	NG	0.003	NG						
Thorium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Tin (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	22		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L	NG	NG	NG	NG	NG	NG	22						
Titanium (dissolved)	mg/L	NG	NG	NG	NG	NG	1	NG		<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L	NG	NG	NG	NG	NG	1	NG						
Uranium (dissolved)	mg/L	NG	0.0085	0.02	NG	NG	3	0.02		0.00173	0.00165	0.00008	0.00013	0.00011
Uranium (total)	mg/L	NG	0.0085	0.02	NG	NG	3	0.02						

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Guideline							Sampling Location	DMW-1	DMW-1	DMW-1	DMW-1b	DMW-1b
									Date Sampled	09-Feb-10	15-Jun-10	16-Nov-10	09-May-11	10-Aug-11
									Lab Sample ID	K0B0397-04	K0F0788-01	K0K0729-04	K1E0403-05	K1H0536-03
									Sample Type					
		BCAWQG AL	BCWWQG AL	GCDWQ MAC	GCDWQ AO	BCAWQG DW	BC CSR AW	BC CSR DW						
Vanadium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG		0.0055	0.0028	<0.0010	<0.001	<0.001
Vanadium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Zinc (dissolved)	mg/L	Calc [1.30]	NG	NG	5	5.0 [5.20]	Calc [6.14]	5.000 [7.15]		0.0096	0.0193	0.0097	0.0321	0.005
Zinc (total)	mg/L	Calc [1.31]	NG	NG	5	5.0 [5.21]	Calc [6.15]	5.000 [7.16]						
Zirconium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG		0.0006	0.0004	0.002	0.0015	0.0013
Zirconium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Nutrients														
Ammonia (total, as N)	mg/L	Calc [1.32]	NG	NG	NG	NG	Calc [6.16]	NG		0.65	0.76	0.29	0.2	0.26
Nitrate (as N)	mg/L	32.8 [1.33]	NG	10	NG	10 [5.22]	400 [6.17]	10.000 [7.17]		<0.01	<0.01	<0.01	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L	32.8 [1.34]	NG	10 [3.4]	NG	10 [5.23]	400 [6.18]	10.000 [7.18]						
Nitrate + Nitrite (as N) (calculated)	mg/L	32.8 [1.35]	NG	10 [3.5]	NG	10 [5.24]	400 [6.19]	10.000 [7.19]		<0.01	<0.01	<0.01	<0.01	<0.01
Nitrite (as N)	mg/L	Calc [1.36]	NG	1	NG	1 [5.25]	Calc [6.20]	3.2		<0.01	<0.01	<0.01	<0.01	<0.01
Total kjeldahl nitrogen	mg/L	NG	NG	NG	NG	NG	NG	NG						
Orthophosphate (dissolved, as P)	mg/L	NG	NG	NG	NG	NG	NG	NG						
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	N [1.37]	NG	NG	NG	N [5.26]	NG	NG		<0.020	<0.020	<0.020	<0.020	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L	N [1.38]	NG	NG	NG	N [5.27]	NG	NG						
Potassium (dissolved)	mg/L	NG	NG	NG	NG	NG	NG	NG		6.64	9.66	4.75	4.72	4.85
Potassium (total)	mg/L	NG	NG	NG	NG	NG	NG	NG						

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 18-Oct-11 K1J0685-03	DMW-1b 24-May-12 2051369-01 Normal	DMW-1b 22-Aug-12 2081484-03 Normal	DMW-1b 20-Nov-12 2111131-03 Normal	DMW-1b 21-May-13 3051354-03 Normal	DMW-1b 20-Aug-13 3081378-03 Normal	DMW-1b 12-Nov-13 3110772-03 Normal	DMW-1b 02-Jun-14 4060249-03 Normal	DMW-1b 18-Aug-14 4081094-03 Normal	DMW-1b 04-Nov-14 4110161-03 Normal	DMW-1b 25-May-15 5051773-04 Normal	DMW-1b 25-Aug-15 5081710-02 Normal
Field Results													
Conductivity	µS/cm	1150	1170	1140	1070	870	750	1040	1075	1030	1118	1021	1142
Depth to Water	m	9.89											
Dissolved oxygen	mg/L								0.29	0.59	1.98	1.21	2.34
Dissolved oxygen (percent)	%								2.8	3.5	16.5	10.6	20.5
Ground Elevation	m	975	975	975	975	975	975	975	975	975	975	975	975
Oxidation reduction potential	mV	162	99	44	-12	124	8	19	-41	-86	-65	-28	-26
pH		7.23	7.15	7.54	7.4	7.36	7.22	7.16	7.3	7.3	7	7.5	7.2
Temperature	°C	6.1	8.2	10	8	8.7	7.7	8	7.8	9.1	8.2	9.8	8.5
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	495	486	480	512	497	463	479	499	479	478	490	478
Bromide	mg/L											<0.10	<0.10
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	32.7	28.4	32.2	35.7	38.9	40.9	41.1	35.8	39.7	40.1	39.7	42.4
Conductivity	µS/cm	1100	1150	1120	1120	1110	1140	1150	1160	1140	1160	1150	1120
Fluoride	mg/L		1.1	0.81	1.05	1.23	1.31	1.02	1.13	0.84	1.15	1.25	1.28
Hardness, total (dissolved as CaCO3)	mg/L	550	654	618	590	629	644	641	692	650	606		
Hardness, Total (total as CaCO3)	mg/L											649	678
pH		7.79	7.86	7.85	7.09	7.78	7.86	7.86	7.89	7.66	7.81	7.74	7.7
Sulphate	mg/L	124	144	127	123	121	129	117	135	127	122	133	114
Total suspended solids	mg/L	<1	1	17	12	4	<1	1	<1	1	<1	<2	<2
Turbidity	NTU	1.8	1.6	3	3.4	3	3.4	3.2	4.3	3.7	4.3	1.5	3
Metals													
Aluminum (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	0.005	<0.005		
Aluminum (total)	mg/L											0.005	<0.005
Antimony (dissolved)	mg/L	<0.0020	0.0001	0.0002	0.0004	0.0004	0.0004	0.0005	0.0003	0.0003	0.0002		
Antimony (total)	mg/L											<0.0001	<0.0001
Arsenic (dissolved)	mg/L	0.0285	0.0196	0.0419	0.0392	0.0388	0.0397	0.0382	0.0351	0.0378	0.0436		
Arsenic (total)	mg/L											0.0236	0.0489
Barium (dissolved)	mg/L	0.021	0.024	0.023	0.022	0.023	0.023	0.023	0.024	0.024	0.026		
Barium (total)	mg/L											0.022	0.026
Beryllium (dissolved)	mg/L	0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001	0.0001	0.0002	0.0001	0.0001		
Beryllium (total)	mg/L											<0.0001	0.0001
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001		
Bismuth (total)	mg/L											<0.0001	<0.0001
Boron (dissolved)	mg/L	0.104	0.138	0.137	0.133	0.145	0.166	0.158	0.153	0.138	0.134		
Boron (total)	mg/L											0.146	0.139
Cadmium (dissolved)	mg/L	<0.00001	0.00003	<0.00001	<0.00001	0.00001	<0.00001	<0.00001	<0.00001	0.00001	0.00001		
Cadmium (total)	mg/L											<0.00001	<0.00001
Calcium (dissolved)	mg/L	65.9	61.2	63.9	64	68.7	71.8	73.4	74	73.1	70.5		
Calcium (total)	mg/L											74.3	75.8
Chromium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 18-Oct-11 K1J0685-03	DMW-1b 24-May-12 2051369-01 Normal	DMW-1b 22-Aug-12 2081484-03 Normal	DMW-1b 20-Nov-12 2111131-03 Normal	DMW-1b 21-May-13 3051354-03 Normal	DMW-1b 20-Aug-13 3081378-03 Normal	DMW-1b 12-Nov-13 3110772-03 Normal	DMW-1b 02-Jun-14 4060249-03 Normal	DMW-1b 18-Aug-14 4081094-03 Normal	DMW-1b 04-Nov-14 4110161-03 Normal	DMW-1b 25-May-15 5051773-04 Normal	DMW-1b 25-Aug-15 5081710-02 Normal
Chromium (total)	mg/L											<0.0005	<0.0005
Cobalt (dissolved)	mg/L	<0.00005	0.00017	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00013	0.00012	0.00008		
Cobalt (total)	mg/L											0.00014	<0.00005
Copper (dissolved)	mg/L	0.002	0.0002	0.0002	0.0014	0.0004	<0.0002	<0.0002	0.0007	<0.0002	0.0004		
Copper (total)	mg/L											0.0078	0.0009
Iron (dissolved)	mg/L	0.11	0.19	0.35	0.27	0.318	0.294	0.345	0.351	0.378	0.404		
Iron (total)	mg/L											0.23	0.38
Lead (dissolved)	mg/L	0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	0.0002	<0.0001		
Lead (total)	mg/L											0.0022	0.0003
Lithium (dissolved)	mg/L	0.0209	0.0196	0.0228	0.0227	0.0251	0.0251	0.0259	0.0264	0.0252	0.0252		
Lithium (total)	mg/L											0.0243	0.0244
Magnesium (dissolved)	mg/L	94.7	122	111	104	111	113	111	123	114	104		
Magnesium (total)	mg/L											112	119
Manganese (dissolved)	mg/L	0.0039	0.005	0.0041	0.0037	0.004	0.0039	0.0039	0.0054	0.0158	0.0048		
Manganese (total)	mg/L											0.0047	0.0046
Mercury (dissolved)	mg/L	<0.00002	<0.00002	0.00033	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002		
Mercury (total)	mg/L											<0.00002	
Molybdenum (dissolved)	mg/L	0.0017	0.0006	0.0004	0.0004	0.0004	0.0002	0.0004	0.0003	0.0004	0.0004		
Molybdenum (total)	mg/L											0.0004	0.0004
Nickel (dissolved)	mg/L	0.0011	<0.0002	0.0014	0.0012	0.0014	0.0015	0.0016	0.0012	0.0021	0.0016		
Nickel (total)	mg/L											0.0006	0.0026
Selenium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005		
Selenium (total)	mg/L											<0.0005	<0.0005
Silicon (dissolved, as Si)	mg/L	7.3	7.6	7.9	8	7.9	8	7.4	7.4	8	8.4		
Silicon (total, as Si)	mg/L											7.9	9
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005		
Silver (total)	mg/L											0.00005	0.00163
Sodium (dissolved)	mg/L	25.3	23.5	29.6	27.4	29.1	30.4	29.7	25.4	28.4	30.1		
Sodium (total)	mg/L											26.9	33.2
Strontium (dissolved)	mg/L	1.62	1.69	1.72	1.67	1.76	1.74	1.7	1.81	1.76	1.71		
Strontium (total)	mg/L											1.68	1.99
Sulphur (dissolved)	mg/L		55	50	46	46	45	37	52	46	47		
Sulphur (total)	mg/L											46	51
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		
Tellurium (total)	mg/L											<0.0002	<0.0002
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	0.00004	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002		
Thallium (total)	mg/L											<0.00002	<0.00002
Thorium (dissolved)	mg/L	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Thorium (total)	mg/L											<0.0001	<0.0001
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	0.0003		
Tin (total)	mg/L											0.0004	<0.0002
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005		
Titanium (total)	mg/L											<0.005	<0.005
Uranium (dissolved)	mg/L	0.00009	0.00014	0.00007	0.00009	0.00009	0.00007	0.00008	0.00014	0.00014	0.00009		
Uranium (total)	mg/L											0.00011	0.00007

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 18-Oct-11 K1J0685-03	DMW-1b 24-May-12 2051369-01 Normal	DMW-1b 22-Aug-12 2081484-03 Normal	DMW-1b 20-Nov-12 2111131-03 Normal	DMW-1b 21-May-13 3051354-03 Normal	DMW-1b 20-Aug-13 3081378-03 Normal	DMW-1b 12-Nov-13 3110772-03 Normal	DMW-1b 02-Jun-14 4060249-03 Normal	DMW-1b 18-Aug-14 4081094-03 Normal	DMW-1b 04-Nov-14 4110161-03 Normal	DMW-1b 25-May-15 5051773-04 Normal	DMW-1b 25-Aug-15 5081710-02 Normal
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001		
Vanadium (total)	mg/L											<0.001	<0.001
Zinc (dissolved)	mg/L	0.01	0.009	<0.004	0.005	<0.004	<0.004	<0.004	<0.004	<0.004	0.005		
Zinc (total)	mg/L											<0.004	<0.004
Zirconium (dissolved)	mg/L	0.0011	0.0011	0.0013	0.0014	0.0011	0.001	0.0011	0.0012	0.0012	0.0015		
Zirconium (total)	mg/L											0.0012	0.0019
Nutrients													
Ammonia (total, as N)	mg/L	0.26	0.155	0.263	0.031	0.274	0.274	0.295	0.261	0.28	0.24	0.234	0.21
Nitrate (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.199	0.397	<0.010	<0.010
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	<0.01	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014	0.199	0.397	<0.014	<0.014
Nitrite (as N)	mg/L	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L											<0.01	<0.01
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.04	<0.02		
Phosphorus (total, by ICPMS/ICPOES)	mg/L											<0.020	0.08
Potassium (dissolved)	mg/L	4.24	5.17	5.08	4.72	5.11	5.31	4.86	4.76	5.06	4.94		
Potassium (total)	mg/L											4.93	5.94

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 09-Nov-15 5110693-01 Normal	DMW-4 21-May-13 3051354-05 Normal	DMW-4 20-Aug-13 3081378-04 Normal	DMW-4 12-Nov-13 3110772-04 Normal	DMW-4 02-Jun-14 4060249-04 Normal	DMW-4 18-Aug-14 4081094-04 Normal	DMW-4 04-Nov-14 4110161-04 Normal	DMW-4 25-May-15 5051773-03 Normal	DMW-4 25-Aug-15 5081710-03 Normal	DMW-4 09-Nov-15 5110693-02 Normal	MW6D 25-May-09 K9E0816-03	MW6D 04-Nov-09 K9K0184-01
Field Results													
Conductivity	µS/cm	1155	900	1130	1100	914	1062	953	922	1043	1109	6700	4700
Depth to Water	m											32.972	34
Dissolved oxygen	mg/L	0.34				2.33	0.3	3.22	2.98	2.04	0.4	0.83	1.92
Dissolved oxygen (percent)	%					20	2.6	27.4	25.8	17.9			
Ground Elevation	m	975											
Oxidation reduction potential	mV	53	235	68	204	78	77	-8	69	-5	37		
pH		6.3	7.25	7.16	7.11	7.3	7.1	7.1	7.5	7.3	6.3	6.78	6.86
Temperature	°C	8	8.7	7.8	7.2	7.9	8.6	8.2	9	8.2	8	10.8	9.4
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	500	437	427	435	392	399	416	430	429	422	1380	762
Bromide	mg/L	<0.10							<0.10	<0.10	<0.10		
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	51.7	22.4	16.2	16.9	20.6	19.7	17.4	12.1	13.2	15.7	688	574
Conductivity	µS/cm	<2	1160	1220	1230	979	1170	1120	1220	1130	1090	5110	4820
Fluoride	mg/L	1.31	0.48	0.61	0.52	0.28	0.32	0.42	0.89	0.74	0.48		
Hardness, total (dissolved as CaCO3)	mg/L		619	641	643	571	635	584				1790	1770
Hardness, Total (total as CaCO3)	mg/L	645							619	611	587		
pH		7.63	7.76	7.84	7.77	7.9	7.64	7.81	7.79	7.74	7.72	7.4	7.28
Sulphate	mg/L	116	236	270	268	150	250	213	275	232	196	788	783
Total suspended solids	mg/L	<3	<1	<1	1	<1	<1	<1	<2	<2	<3	2640	34
Turbidity	NTU	4.5	0.2	0.2	0.3	5.5	0.2	0.2	0.5	0.2	0.2	>4000	9.1
Metals													
Aluminum (dissolved)	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				0.006	<0.005
Aluminum (total)	mg/L	<0.05							<0.005	<0.005	<0.05		
Antimony (dissolved)	mg/L		0.0004	0.0005	0.0005	0.0004	0.0004	0.0003				0.0003	0.0003
Antimony (total)	mg/L	<0.001							0.0002	0.0003	<0.001		
Arsenic (dissolved)	mg/L		0.0013	0.0013	0.0014	0.0012	0.0014	0.0013				0.0104	0.0029
Arsenic (total)	mg/L	0.042							0.0014	0.0018	<0.005		
Barium (dissolved)	mg/L		0.015	0.014	0.015	0.015	0.017	0.017				0.101	0.0566
Barium (total)	mg/L	<0.05							0.017	0.016	<0.05		
Beryllium (dissolved)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0001	<0.0001
Beryllium (total)	mg/L	<0.001							<0.0001	<0.0001	<0.001		
Bismuth (dissolved)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0001	<0.0001
Bismuth (total)	mg/L	<0.001							<0.0001	<0.0001	<0.001		
Boron (dissolved)	mg/L		0.263	0.415	0.465	0.07	0.286	0.218				1.12	1.05
Boron (total)	mg/L	0.14							0.659	0.392	0.2		
Cadmium (dissolved)	mg/L		0.00002	0.00003	<0.00001	0.00002	0.00001	0.00002				0.00006	0.00001
Cadmium (total)	mg/L	<0.0001							0.00001	<0.00001	<0.0001		
Calcium (dissolved)	mg/L		78.2	80.7	82.5	75.1	86.4	79.9				235	197
Calcium (total)	mg/L	75.1							79	81.9	81.6		
Chromium (dissolved)	mg/L		<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005				0.006	0.0065

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 09-Nov-15 5110693-01 Normal	DMW-4 21-May-13 3051354-05 Normal	DMW-4 20-Aug-13 3081378-04 Normal	DMW-4 12-Nov-13 3110772-04 Normal	DMW-4 02-Jun-14 4060249-04 Normal	DMW-4 18-Aug-14 4081094-04 Normal	DMW-4 04-Nov-14 4110161-04 Normal	DMW-4 25-May-15 5051773-03 Normal	DMW-4 25-Aug-15 5081710-03 Normal	DMW-4 09-Nov-15 5110693-02 Normal	MW6D 25-May-09 K9E0816-03	MW6D 04-Nov-09 K9K0184-01
Chromium (total)	mg/L	<0.005							<0.0005	<0.0005	<0.005		
Cobalt (dissolved)	mg/L		0.00084	0.00075	0.00059	0.00126	0.00133	0.00106				0.00298	0.00108
Cobalt (total)	mg/L	<0.0005							0.00079	0.00083	0.0009		
Copper (dissolved)	mg/L		0.0036	0.003	0.0024	0.0668	0.006	0.0065				0.008	0.0055
Copper (total)	mg/L	<0.002							0.01	0.0027	0.006		
Iron (dissolved)	mg/L		0.014	0.014	0.013	0.011	0.021	0.014				0.23	0.204
Iron (total)	mg/L	0.42							0.04	0.02	<0.10		
Lead (dissolved)	mg/L		0.0003	0.0004	0.0002	0.0003	0.0002	0.0003				<0.0001	<0.0001
Lead (total)	mg/L	<0.001							0.0004	0.0003	<0.001		
Lithium (dissolved)	mg/L		0.0347	0.0478	0.0516	0.0178	0.0385	0.0317				0.0341	0.0359
Lithium (total)	mg/L	0.026							0.0696	0.0462	0.03		
Magnesium (dissolved)	mg/L		103	107	106	93	102	93.3				292	310
Magnesium (total)	mg/L	111							102	98.6	93.1		
Manganese (dissolved)	mg/L		0.0039	0.0042	0.004	0.0021	0.0127	0.0043				0.242	0.0862
Manganese (total)	mg/L	0.005							0.0048	0.0037	0.004		
Mercury (dissolved)	mg/L		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002				<0.00005	<0.00005
Mercury (total)	mg/L	<0.00002							<0.00002		<0.00002		
Molybdenum (dissolved)	mg/L		0.0008	0.0004	0.0006	0.0014	0.0008	0.001				0.0006	0.0003
Molybdenum (total)	mg/L	<0.001							0.0006	0.0007	0.001		
Nickel (dissolved)	mg/L		0.0018	0.0015	0.0012	0.0027	0.0026	0.0019				0.0163	0.0085
Nickel (total)	mg/L	<0.002							<0.0002	0.0025	<0.002		
Selenium (dissolved)	mg/L		<0.0005	<0.0005	<0.0005	0.0008	0.0007	0.0007				<0.0003	<0.0003
Selenium (total)	mg/L	<0.005							<0.0005	<0.0005	<0.005		
Silicon (dissolved, as Si)	mg/L		7.2	7	6.6	7.4	7.3	7.9				10	10.1
Silicon (total, as Si)	mg/L	8							7	7.2	7		
Silver (dissolved)	mg/L		<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005				<0.00005	<0.00005
Silver (total)	mg/L	<0.0005							0.00005	0.00129	<0.0005		
Sodium (dissolved)	mg/L		34.2	48.8	51	20.2	34.8	31.6				348	379
Sodium (total)	mg/L	29.7							70.3	46.9	27.2		
Strontium (dissolved)	mg/L		4.26	5.03	5.11	2.07	4.53	3.8				2.53	2.21
Strontium (total)	mg/L	1.74							6.04	5.09	3.55		
Sulphur (dissolved)	mg/L		80	95	88	58	87	80					
Sulphur (total)	mg/L	37							98	87	67		
Tellurium (dissolved)	mg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				<0.0002	<0.0002
Tellurium (total)	mg/L	<0.002							<0.0002	<0.0002	<0.002		
Thallium (dissolved)	mg/L		<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002				0.00009	0.00006
Thallium (total)	mg/L	<0.0002							<0.00002	<0.00002	<0.0002		
Thorium (dissolved)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001					<0.0001
Thorium (total)	mg/L	<0.001							<0.0001	<0.0001	<0.001		
Tin (dissolved)	mg/L		<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				0.0002	0.0002
Tin (total)	mg/L	<0.002							0.0003	<0.0002	<0.002		
Titanium (dissolved)	mg/L		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				<0.005	0.006
Titanium (total)	mg/L	<0.05							<0.005	<0.005	<0.05		
Uranium (dissolved)	mg/L		0.00155	0.00115	0.001	0.00262	0.00152	0.00175				0.00761	0.00751
Uranium (total)	mg/L	<0.0002							0.00051	0.00108	0.0017		

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	DMW-1b 09-Nov-15 5110693-01 Normal	DMW-4 21-May-13 3051354-05 Normal	DMW-4 20-Aug-13 3081378-04 Normal	DMW-4 12-Nov-13 3110772-04 Normal	DMW-4 02-Jun-14 4060249-04 Normal	DMW-4 18-Aug-14 4081094-04 Normal	DMW-4 04-Nov-14 4110161-04 Normal	DMW-4 25-May-15 5051773-03 Normal	DMW-4 25-Aug-15 5081710-03 Normal	DMW-4 09-Nov-15 5110693-02 Normal	MW6D 25-May-09 K9E0816-03	MW6D 04-Nov-09 K9K0184-01
Vanadium (dissolved)	mg/L		<0.001	<0.001	<0.001	<0.001	<0.001	<0.001				0.0019	0.002
Vanadium (total)	mg/L	<0.01							<0.001	<0.001	<0.01		
Zinc (dissolved)	mg/L		0.029	0.046	0.019	0.045	0.028	0.032				0.0063	0.0036
Zinc (total)	mg/L	<0.04							0.03	0.03	<0.04		
Zirconium (dissolved)	mg/L		0.0007	0.0007	0.0007	0.0004	0.0006	0.0006				0.0008	0.0002
Zirconium (total)	mg/L	0.001							0.0007	0.0008	<0.001		
Nutrients													
Ammonia (total, as N)	mg/L	0.276	0.596	0.952	1.07	0.028	0.814	0.341	1.26	0.816	0.283	0.29	0.08
Nitrate (as N)	mg/L	<0.010	0.181	0.135	<0.010	0.647	0.443	0.602	0.53	0.414	0.725	62.6	56.4
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	<0.014	0.181	0.135	<0.014	0.647	0.443	0.602	0.53	0.414	0.725	62.6	56.4
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L								<0.01	<0.01			
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L		<0.02	<0.02	<0.02	<0.02	0.02	<0.02				0.039	<0.020
Phosphorus (total, by ICPMS/ICPOES)	mg/L	<0.2							<0.020	<0.02	<0.2		
Potassium (dissolved)	mg/L		7.63	9.49	9.36	3.66	7.73	6.8				131	149
Potassium (total)	mg/L	5.1							11.7	9.42	6.2		

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6D 09-Feb-10 K0B0397-02	MW6D 15-Jun-10 K0F0788-04	MW6S 25-May-09 K9E0816-02	MW6S 04-Nov-09 K9K0184-02	MW6S 09-Feb-10 K0B0397-01	MW6S 15-Jun-10 K0F0788-03	MW6S 16-Nov-10 K0K0729-01	MW6S 09-May-11 K1E0403-03	MW6S 10-Aug-11 K1H0536-02	MW6S 18-Oct-11 K1J0685-01	MW6S 24-May-12 2051369-03 Normal	MW6S 22-Aug-12 2081484-01 Normal
Field Results													
Conductivity	µS/cm	4400	4300	4600	4700	4400	4430	6600	4200	3600	4000	4100	4600
Depth to Water	m	32.69	33.55	32.619	33	33.49	32.68	32.7	31.618	32.625	32.625	32.59	32.605
Dissolved oxygen	mg/L			2.21	1.07								
Dissolved oxygen (percent)	%												
Ground Elevation	m			920	920	920	920	920	920	920	920	920	920
Oxidation reduction potential	mV		73				73	173	175	67	167	135	210
pH		6.76	7.01	6.87	6.84	6.79	6.86	6.91	6.75	6.87	6.73	6.86	6.97
Temperature	°C	9.4	11.3	12.5	10.5	10.9	11.6	10	12.2	12.4	11.1	11.2	12.5
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	768	787	1590	780	794	778	757	801	800	784	805	813
Bromide	mg/L												
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	715	665	674	604	713	667	732	556	632	621	599	587
Conductivity	µS/cm	4790	4720	5090	4840	4780	4680	4640	4250	4230	4320	4380	4670
Fluoride	mg/L											0.11	0.31
Hardness, total (dissolved as CaCO3)	mg/L	1810	1550	1780	1770	1810	1580	1710	1660	1510	1460	1720	1720
Hardness, Total (total as CaCO3)	mg/L												
pH		7.32	7.55	7.4	7.29	7.49	7.57	7.35	7.5	7.39	7.35	7.45	7.35
Sulphate	mg/L	945	873	781	824	925	861	781	606	688	701	719	787
Total suspended solids	mg/L	1110	1690	2320	1720	751	1090	1020	228	96	127	326	321
Turbidity	NTU	1600	3500	2400	2900	830	1500	730	188	79	155	437	267
Metals													
Aluminum (dissolved)	mg/L	0.23	<0.005	0.012	<0.005	0.009	0.006	<0.005	<0.005	<0.005	<0.005	0.005	<0.005
Aluminum (total)	mg/L												
Antimony (dissolved)	mg/L	0.0005	0.0005	0.0006	0.0002	0.0006	0.0004	0.001	0.0006	0.0004	<0.0020	0.0002	0.0009
Antimony (total)	mg/L												
Arsenic (dissolved)	mg/L	0.003	0.0048	0.0033	0.0028	0.0021	0.0044	0.0057	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic (total)	mg/L												
Barium (dissolved)	mg/L	0.0822	0.062	0.087	0.0566	0.0831	0.0676	0.074	0.0595	0.059	0.051	0.062	0.066
Barium (total)	mg/L												
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L												
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L												
Boron (dissolved)	mg/L	1.28	1.08	1.09	0.921	1.24	1.14	1.48	1.31	1.18	1.26	1.23	1.29
Boron (total)	mg/L												
Cadmium (dissolved)	mg/L	0.00002	0.00002	0.00005	0.00003	0.00004	0.00002	0.00002	0.00018	0.00001	0.00002	<0.00001	<0.00001
Cadmium (total)	mg/L												
Calcium (dissolved)	mg/L	217	186	220	192	215	191	212	194	177	177	180	182
Calcium (total)	mg/L												
Chromium (dissolved)	mg/L	0.0342	0.0109	0.004	0.0082	0.0341	0.0117	0.0019	<0.0005	<0.0005	<0.0005	<0.0005	0.0016

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6D 09-Feb-10 K0B0397-02	MW6D 15-Jun-10 K0F0788-04	MW6S 25-May-09 K9E0816-02	MW6S 04-Nov-09 K9K0184-02	MW6S 09-Feb-10 K0B0397-01	MW6S 15-Jun-10 K0F0788-03	MW6S 16-Nov-10 K0K0729-01	MW6S 09-May-11 K1E0403-03	MW6S 10-Aug-11 K1H0536-02	MW6S 18-Oct-11 K1J0685-01	MW6S 24-May-12 2051369-03 Normal	MW6S 22-Aug-12 2081484-01 Normal
Chromium (total)	mg/L												
Cobalt (dissolved)	mg/L	0.00151	0.00142	0.00415	0.0022	0.00258	0.00228	0.0014	0.00124	0.00116	0.00093	0.00136	0.00114
Cobalt (total)	mg/L												
Copper (dissolved)	mg/L	0.0143	0.0097	0.0091	0.0056	0.0157	0.0077	0.0048	0.0019	0.0015	0.017	0.0009	0.0018
Copper (total)	mg/L												
Iron (dissolved)	mg/L	0.402	0.396	0.219	0.196	0.195	0.425	0.396	<0.010	<0.01	<0.01	<0.01	0.02
Iron (total)	mg/L												
Lead (dissolved)	mg/L	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Lead (total)	mg/L												
Lithium (dissolved)	mg/L	0.054	0.0477	0.0305	0.0278	0.0574	0.0488	0.042	0.0377	0.0364	0.0335	0.0361	0.0382
Lithium (total)	mg/L												
Magnesium (dissolved)	mg/L	308	263	299	314	310	269	286	285	259	246	308	308
Magnesium (total)	mg/L												
Manganese (dissolved)	mg/L	0.115	0.113	0.518	0.212	0.168	0.191	0.108	0.0937	0.0894	0.0932	0.072	0.0683
Manganese (total)	mg/L												
Mercury (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00002	<0.00002	0.00005	<0.00002	0.00008
Mercury (total)	mg/L												
Molybdenum (dissolved)	mg/L	0.0003	0.0003	0.0023	0.0009	0.0004	0.0006	0.0005	0.0003	0.0003	0.0036	0.0003	0.0018
Molybdenum (total)	mg/L												
Nickel (dissolved)	mg/L	0.0112	0.0132	0.0148	0.0094	0.0115	0.0137	0.0154	0.007	0.0067	0.0067	0.0073	0.008
Nickel (total)	mg/L												
Selenium (dissolved)	mg/L	<0.0003	0.0018	<0.0003	<0.0003	<0.0003	0.0006	0.0018	0.0006	0.0006	<0.0005	0.0007	<0.0005
Selenium (total)	mg/L												
Silicon (dissolved, as Si)	mg/L	22.4	8.42	9.21	9.1	17.6	10.8	8.95	12.4	11.5	10.2	12.2	11.4
Silicon (total, as Si)	mg/L												
Silver (dissolved)	mg/L	<0.00005	<0.00005	0.00005	<0.00005	<0.00005	0.00006	0.00014	<0.00005	0.00012	0.00009	<0.00005	<0.00005
Silver (total)	mg/L												
Sodium (dissolved)	mg/L	384	314	351	378	380	323	344	322	298	290	346	362
Sodium (total)	mg/L												
Strontium (dissolved)	mg/L	2.04	2.04	2.42	2.09	2.07	2.12	2.25	1.95	1.88	1.74	1.91	2
Strontium (total)	mg/L												
Sulphur (dissolved)	mg/L											266	298
Sulphur (total)	mg/L												
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L												
Thallium (dissolved)	mg/L	0.00006	0.00007	0.00008	0.00006	0.00007	0.00007	0.00007	0.00006	0.00005	0.00006	0.00005	0.00005
Thallium (total)	mg/L												
Thorium (dissolved)	mg/L	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L												
Tin (dissolved)	mg/L	0.0002	0.0002	0.0003	<0.0002	<0.0002	<0.0002	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L												
Titanium (dissolved)	mg/L	0.017	0.008	<0.005	0.005	0.005	0.008	0.014	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L												
Uranium (dissolved)	mg/L	0.00639	0.00741	0.00886	0.00757	0.007	0.00757	0.0079	0.00607	0.00602	0.00607	0.0058	0.00698
Uranium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6D 09-Feb-10 K0B0397-02	MW6D 15-Jun-10 K0F0788-04	MW6S 25-May-09 K9E0816-02	MW6S 04-Nov-09 K9K0184-02	MW6S 09-Feb-10 K0B0397-01	MW6S 15-Jun-10 K0F0788-03	MW6S 16-Nov-10 K0K0729-01	MW6S 09-May-11 K1E0403-03	MW6S 10-Aug-11 K1H0536-02	MW6S 18-Oct-11 K1J0685-01	MW6S 24-May-12 2051369-03 Normal	MW6S 22-Aug-12 2081484-01 Normal
Vanadium (dissolved)	mg/L	0.016	0.0062	0.0014	0.0026	0.0134	0.009	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (total)	mg/L												
Zinc (dissolved)	mg/L	0.0086	0.0047	0.0063	0.0029	0.0103	0.005	0.0044	0.004	<0.004	<0.004	<0.004	<0.004
Zinc (total)	mg/L												
Zirconium (dissolved)	mg/L	0.0004	0.0002	0.001	0.0005	0.0003	0.0003	0.0002	0.0002	0.0001	0.0001	0.0001	0.0003
Zirconium (total)	mg/L												
Nutrients													
Ammonia (total, as N)	mg/L	0.3	0.09	0.54	0.26	0.44	0.26	0.13	0.2	0.18	0.16	0.133	0.274
Nitrate (as N)	mg/L	67.7	61.4	62	60	66.9	62.3	55	53.2	66.5	56.3	2.99	54.6
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	67.7	61.4	62	60	66.9	62.3	55	53.2	66.5	56.3	2.99	54.6
Nitrite (as N)	mg/L	<0.01	0.03	<0.01	<0.01	0.02	0.03	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L												
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	0.03	<0.020	0.043	0.02	0.031	0.024	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Potassium (dissolved)	mg/L	153	147	109	133	153	146	157	167	160	148	170	161
Potassium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6S 20-Nov-12 2111131-01 Normal	MW6S 21-May-13 3051354-01 Normal	MW6S 20-Aug-13 3081378-01 Normal	MW6S 12-Nov-13 3110772-01 Normal	MW6S 02-Jun-14 4060249-06 Normal	MW6S 18-Aug-14 4081094-06 Normal	MW6S 04-Nov-14 4110161-06 Normal	MW6S 25-May-15 5051773-06 Normal	MW6S 25-Aug-15 5081710-04 Normal	MW6S 09-Nov-15 5110693-03 Normal	TH2 03-Jun-02	TH2 26-Aug-02
Field Results													
Conductivity	µS/cm	480	3300	4900	3700	4240	4030	4610	4710	4550	4530		
Depth to Water	m	32.624	32.629	32.64	32.651	32.6	32.61	32.6	32.67	32.78	32.74	9999	9999
Dissolved oxygen	mg/L					0.28	1.56	1.07	1.36	1.74	0.95		
Dissolved oxygen (percent)	%					2.8	14.08	10	13.6	17.2			
Ground Elevation	m	920	920	920	920	920	920	920	920	920	920	915	915
Oxidation reduction potential	mV	164	231	228	-24	96	116	44	-7	-55	45		
pH		6.9	6.87	6.63	6.64	4.8	7.3	6.7	6.5	6.7	6		
Temperature	°C	12.2	12.4	12.1	12.2	13	13	12.3	14.1	12.8	12.5		
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	790	902	771	798	818	802	832	855	865	897		
Bromide	mg/L								0.47	1.09	1.48		
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	709	669	662	662	650	491	529	594	549	627		
Conductivity	µS/cm	5040	5020	5150	5220	4840	4750	4850	4640	4520	4570		
Fluoride	mg/L	0.14	0.12	0.14	<0.10	<0.10	0.11	0.25	0.14	0.1	0.23		
Hardness, total (dissolved as CaCO3)	mg/L	1810	1980	2140	2010	1990	1920	1880	1870	1890	1850		
Hardness, Total (total as CaCO3)	mg/L												
pH		6.96	7.4	7.46	7.36	7.65	7.39	7.49	7.37	7.34	7.3		
Sulphate	mg/L	893	814	910	884	858	784	879	950	878	905		
Total suspended solids	mg/L	42	1080	176	140	19	66	292	22	7	226		
Turbidity	NTU	32.2	448	163	84.6	3.7	47.2	196	6.9	1.6	205		
Metals													
Aluminum (dissolved)	mg/L	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.005	<0.005	0.024	0.859		
Aluminum (total)	mg/L												
Antimony (dissolved)	mg/L	0.0009	0.0009	0.0011	0.001	0.0003	0.0005	0.0003	0.0005	0.0005	0.0004		
Antimony (total)	mg/L												
Arsenic (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.001		
Arsenic (total)	mg/L												
Barium (dissolved)	mg/L	0.067	0.067	0.065	0.061	0.059	0.054	0.058	0.062	0.062	0.071		
Barium (total)	mg/L												
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0006		
Beryllium (total)	mg/L												
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Bismuth (total)	mg/L												
Boron (dissolved)	mg/L	1.43	1.47	1.53	1.64	1.67	1.6	1.61	2.04	1.9	1.77		
Boron (total)	mg/L												
Cadmium (dissolved)	mg/L	0.00002	0.00002	0.00003	0.00001	<0.00001	<0.00001	0.00001	0.00002	<0.00001	0.00003		
Cadmium (total)	mg/L												
Calcium (dissolved)	mg/L	193	218	235	231	218	217	209	199	197	208		
Calcium (total)	mg/L												
Chromium (dissolved)	mg/L	0.0006	0.0009	<0.0005	0.0066	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0017		

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6S 20-Nov-12 2111131-01 Normal	MW6S 21-May-13 3051354-01 Normal	MW6S 20-Aug-13 3081378-01 Normal	MW6S 12-Nov-13 3110772-01 Normal	MW6S 02-Jun-14 4060249-06 Normal	MW6S 18-Aug-14 4081094-06 Normal	MW6S 04-Nov-14 4110161-06 Normal	MW6S 25-May-15 5051773-06 Normal	MW6S 25-Aug-15 5081710-04 Normal	MW6S 09-Nov-15 5110693-03 Normal	TH2 03-Jun-02	TH2 26-Aug-02
Chromium (total)	mg/L												
Cobalt (dissolved)	mg/L	0.00108	0.00148	0.00128	0.00127	0.001	0.00118	0.00133	0.00141	0.00149	0.00204		
Cobalt (total)	mg/L												
Copper (dissolved)	mg/L	0.0016	0.0014	0.0021	0.0013	0.0169	0.0017	0.0018	0.0028	0.042	0.2		
Copper (total)	mg/L												
Iron (dissolved)	mg/L	0.01	0.028	<0.010	0.105	<0.010	0.012	0.011	0.011	0.062	1.21		
Iron (total)	mg/L												
Lead (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001	<0.0001	<0.0001	0.0014	0.0039		
Lead (total)	mg/L												
Lithium (dissolved)	mg/L	0.0395	0.045	0.0479	0.0486	0.052	0.0497	0.0501	0.0483	0.0513	0.0462		
Lithium (total)	mg/L												
Magnesium (dissolved)	mg/L	321	349	378	347	351	335	329	332	339	322		
Magnesium (total)	mg/L												
Manganese (dissolved)	mg/L	0.0882	0.112	0.122	0.119	0.0908	0.121	0.132	0.0747	0.087	0.157		
Manganese (total)	mg/L												
Mercury (dissolved)	mg/L	0.00004	0.00002	0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002		<0.00002		
Mercury (total)	mg/L												
Molybdenum (dissolved)	mg/L	0.0005	0.0006	0.0003	0.0007	0.0003	0.0003	0.0003	0.0004	0.0004	0.0037		
Molybdenum (total)	mg/L												
Nickel (dissolved)	mg/L	0.008	0.0155	0.0097	0.0176	0.0078	0.0097	0.0103	0.0093	0.0109	0.0119		
Nickel (total)	mg/L												
Selenium (dissolved)	mg/L	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	0.0006	0.0006	<0.0005	<0.0005	<0.0005		
Selenium (total)	mg/L												
Silicon (dissolved, as Si)	mg/L	11.9	11.9	12.5	11.1	12	12.3	13.7	12.7	12.7	12.9		
Silicon (total, as Si)	mg/L												
Silver (dissolved)	mg/L	0.00011	0.0001	<0.00005	0.00008	<0.00005	<0.00005	<0.00005	0.00007	<0.00005	<0.00005		
Silver (total)	mg/L												
Sodium (dissolved)	mg/L	375	409	444	407	372	385	428	385	394	375		
Sodium (total)	mg/L												
Strontium (dissolved)	mg/L	2.11	2.18	2.28	2.1	2.15	2.06	2.04	1.92	2.05	1.9		
Strontium (total)	mg/L												
Sulphur (dissolved)	mg/L	339	359	405	366	337	340	398	343	362	342		
Sulphur (total)	mg/L												
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0003	<0.0002		
Tellurium (total)	mg/L												
Thallium (dissolved)	mg/L	0.00022	0.00005	0.00009	0.00007	0.00005	0.00007	0.00007	0.00007	0.00006	0.00007		
Thallium (total)	mg/L												
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0006		
Thorium (total)	mg/L												
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	0.0013		
Tin (total)	mg/L												
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.038		
Titanium (total)	mg/L												
Uranium (dissolved)	mg/L	0.00686	0.00779	0.00823	0.00765	0.00721	0.00777	0.00802	0.00729	0.00779	0.00804		
Uranium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	MW6S 20-Nov-12 2111131-01 Normal	MW6S 21-May-13 3051354-01 Normal	MW6S 20-Aug-13 3081378-01 Normal	MW6S 12-Nov-13 3110772-01 Normal	MW6S 02-Jun-14 4060249-06 Normal	MW6S 18-Aug-14 4081094-06 Normal	MW6S 04-Nov-14 4110161-06 Normal	MW6S 25-May-15 5051773-06 Normal	MW6S 25-Aug-15 5081710-04 Normal	MW6S 09-Nov-15 5110693-03 Normal	TH2 03-Jun-02	TH2 26-Aug-02
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001		
Vanadium (total)	mg/L												
Zinc (dissolved)	mg/L	<0.004	<0.004	<0.004	<0.004	0.009	0.005	0.005	0.006	0.027	0.067		
Zinc (total)	mg/L												
Zirconium (dissolved)	mg/L	0.0001	0.0002	0.0002	0.0001	0.0001	0.0004	0.0004	0.0002	0.0001	0.0008		
Zirconium (total)	mg/L												
Nutrients													
Ammonia (total, as N)	mg/L	0.406	0.432	0.462	0.518	0.39	0.588	0.408	0.644	0.614	0.899		
Nitrate (as N)	mg/L	59.1	62.3	54.5	54.7	52.1	41.8	48.9	38	34.1	33.3		
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	59.1	62.3	54.5	54.7	52.1	41.8	48.9	38	34.1	33.3		
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010		
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L								<0.01	<0.01			
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	<0.02	<0.02	0.04		
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Potassium (dissolved)	mg/L	178	202	228	210	222	232	246	215	217	199		
Potassium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH2 06-Nov-02	TH2 07-Mar-03	TH2 12-May-03	TH2 03-Nov-03	TH2 17-May-04	TH2 08-Nov-04	TH2 25-Apr-05	TH2 02-Nov-05	TH2 17-Apr-06	TH2 05-Nov-06	TH2 22-May-07 K705752-01	TH4 17-May-04
Field Results													
Conductivity	µS/cm												
Depth to Water	m	9999	9999	21.25	21.25	21.3	21.82	21.28	9999	21.18	9999	21.27	26.6
Dissolved oxygen	mg/L												
Dissolved oxygen (percent)	%												
Ground Elevation	m	915	915	915	915	915	915	915	915	915	915	915	
Oxidation reduction potential	mV												
pH													
Temperature	°C			11	11	13	11	12		10.3		10	13
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L			2800	5600	1720	7040	4100		3500		3000	900
Bromide	mg/L												
Chemical Oxygen Demand	mg/L			69	202	108	184	136		129		39	89
Chloride	mg/L			57.5	63.8	72.5	75	128		159		90.5	298
Conductivity	µS/cm			1660	1620	1600	1900	2000		2200		1910	2810
Fluoride	mg/L												
Hardness, total (dissolved as CaCO3)	mg/L						920	1020		930		914	
Hardness, Total (total as CaCO3)	mg/L												
pH				7.1	6.8	6.9	7.1	7.2		7		6.8	7
Sulphate	mg/L			51	78	71	79	104		150		254	640
Total suspended solids	mg/L												
Turbidity	NTU			>4000	>4000	>4000	>4000	>4000		>4000			680
Metals													
Aluminum (dissolved)	mg/L			<0.2	<0.2	<0.2		<0.4		<0.02		<0.050	<0.2
Aluminum (total)	mg/L											<0.10	
Antimony (dissolved)	mg/L			<0.2	<0.2	<0.2		<0.4		<0.02		<0.0050	<0.2
Antimony (total)	mg/L											<0.006	
Arsenic (dissolved)	mg/L			<0.2	<0.2	<0.2		<0.4		<0.02		<0.0050	<0.2
Arsenic (total)	mg/L											<0.010	
Barium (dissolved)	mg/L			0.2	0.19	0.19		0.21		0.15		0.124	0.12
Barium (total)	mg/L											0.114	
Beryllium (dissolved)	mg/L											<0.0010	
Beryllium (total)	mg/L											<0.005	
Bismuth (dissolved)	mg/L											<0.0010	
Bismuth (total)	mg/L											<0.001	
Boron (dissolved)	mg/L			0.6	0.58	0.59		0.6		0.6		0.632	0.65
Boron (total)	mg/L											0.608	
Cadmium (dissolved)	mg/L			<0.01	<0.01	<0.01		<0.02		<0.01		<0.00010	<0.01
Cadmium (total)	mg/L											<0.00010	
Calcium (dissolved)	mg/L			174	177	175		210		210		215	165
Calcium (total)	mg/L											206	
Chromium (dissolved)	mg/L			<0.01	<0.01			<0.02		<0.01		0.0054	<0.01

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH2 06-Nov-02	TH2 07-Mar-03	TH2 12-May-03	TH2 03-Nov-03	TH2 17-May-04	TH2 08-Nov-04	TH2 25-Apr-05	TH2 02-Nov-05	TH2 17-Apr-06	TH2 05-Nov-06	TH2 22-May-07 K705752-01	TH4 17-May-04
Chromium (total)	mg/L											<0.010	
Cobalt (dissolved)	mg/L											0.0037	
Cobalt (total)	mg/L											0.0034	
Copper (dissolved)	mg/L			<0.01	<0.01			<0.02		<0.01		0.0057	<0.01
Copper (total)	mg/L											<0.010	
Iron (dissolved)	mg/L			<0.03	<0.03	<0.03		<0.06		<0.06		0.655	<0.03
Iron (total)	mg/L											0.7	
Lead (dissolved)	mg/L			<0.05	<0.05	<0.05		<0.1		<0.05		<0.0020	<0.05
Lead (total)	mg/L											<0.0020	
Lithium (dissolved)	mg/L											0.0185	
Lithium (total)	mg/L											0.0179	
Magnesium (dissolved)	mg/L			99.4	103	91.3		120		97		103	233
Magnesium (total)	mg/L											97.2	
Manganese (dissolved)	mg/L			0.009	0.083	0.02		0.04		0.007		0.107	0.009
Manganese (total)	mg/L											0.107	
Mercury (dissolved)	mg/L											<0.00050	
Mercury (total)	mg/L											<0.00050	
Molybdenum (dissolved)	mg/L			<0.03	<0.03	<0.03		<0.06		<0.03		<0.0020	<0.03
Molybdenum (total)	mg/L											<0.0050	
Nickel (dissolved)	mg/L			<0.05	<0.05	<0.05		<0.1		<0.05		0.037	<0.05
Nickel (total)	mg/L											<0.020	
Selenium (dissolved)	mg/L			<0.2	<0.2	<0.2		<0.4		<0.2		<0.0100	<0.2
Selenium (total)	mg/L											<0.010	
Silicon (dissolved, as Si)	mg/L											9.58	
Silicon (total, as Si)	mg/L											7.5	
Silver (dissolved)	mg/L											<0.0004	
Silver (total)	mg/L											<0.00050	
Sodium (dissolved)	mg/L			68	73.8	74		120		130		107	234
Sodium (total)	mg/L											98	
Strontium (dissolved)	mg/L											1.12	
Strontium (total)	mg/L											1.1	
Sulphur (dissolved)	mg/L												
Sulphur (total)	mg/L												
Tellurium (dissolved)	mg/L											<0.0050	
Tellurium (total)	mg/L											<0.005	
Thallium (dissolved)	mg/L											<0.0010	
Thallium (total)	mg/L											<0.0010	
Thorium (dissolved)	mg/L											<0.0050	
Thorium (total)	mg/L											<0.005	
Tin (dissolved)	mg/L											<0.0020	
Tin (total)	mg/L											<0.001	
Titanium (dissolved)	mg/L											<0.0200	
Titanium (total)	mg/L											<0.050	
Uranium (dissolved)	mg/L											0.0025	
Uranium (total)	mg/L											0.0028	

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH2 06-Nov-02	TH2 07-Mar-03	TH2 12-May-03	TH2 03-Nov-03	TH2 17-May-04	TH2 08-Nov-04	TH2 25-Apr-05	TH2 02-Nov-05	TH2 17-Apr-06	TH2 05-Nov-06	TH2 22-May-07 K705752-01	TH4 17-May-04
Vanadium (dissolved)	mg/L											<0.0050	
Vanadium (total)	mg/L											<0.010	
Zinc (dissolved)	mg/L			0.017	0.0197	0.02		0.01		0.028		<0.040	0.02
Zinc (total)	mg/L											<0.050	
Zirconium (dissolved)	mg/L											<0.010	
Zirconium (total)	mg/L											<0.010	
Nutrients													
Ammonia (total, as N)	mg/L						0.19	0.04		0.08		0.31	
Nitrate (as N)	mg/L			27.8	16.3	34.5	32.5	65		77		12.5	55.5
Nitrate + Nitrite (as N)	mg/L											14	
Nitrate + Nitrite (as N) (calculated)	mg/L											13.9	
Nitrite (as N)	mg/L			<0.01	0.16	<0.01	0.04	<0.01		<0.01		1.44	0.01
Total kjeldahl nitrogen	mg/L			2.92	13	3.7	4.7	5.12		5.1		7.12	0.84
Orthophosphate (dissolved, as P)	mg/L												
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L			<0.3	<0.3	<0.3		<0.6		<0.3		<0.500	<0.3
Phosphorus (total, by ICPMS/ICPOES)	mg/L											<0.50	
Potassium (dissolved)	mg/L			54	53	50		50		57		59.5	52
Potassium (total)	mg/L											56.4	

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 16-Nov-10 K0K0729-02	TH8 09-May-11 K1E0403-01	TH8 09-May-11 K1E0403-04	TH8 10-Aug-11 K1H0536-01	TH8 18-Oct-11 K1J0685-02	TH8 24-May-12 2051369-04 Normal	TH8 22-Aug-12 2081484-02 Normal	TH8 22-Aug-12 2081484-05 Duplicate	TH8 20-Nov-12 2111131-02 Normal	TH8 21-May-13 3051354-02 Normal	TH8 21-May-13 3051354-06 Duplicate	TH8 20-Aug-13 3081378-05 Normal
Field Results													
Conductivity	µS/cm	2100	2800		2700	3100	3200	3500	3500	340	2200	2200	3300
Depth to Water	m	14.14	13.903		13.945	13.78	13.59	13.85	13.85	14.109	14.252	14.252	14.381
Dissolved oxygen	mg/L												
Dissolved oxygen (percent)	%												
Ground Elevation	m	921	921	921	921	921	921	921	921	921	921	921	921
Oxidation reduction potential	mV	-138	2800		83	143	124	52	52	122	254	254	121
pH		8.44	7.85		7.51	7.33	7.43	7.54	7.54	7.6	7.4	7.4	7.37
Temperature	°C	5.9	8.7		8.1	6.9	7.9	8.4	8.4	7.1	8.9	8.9	8.6
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	425	459	455	462	446	515	768	676	731	619	637	516
Bromide	mg/L												
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	523	663	647	844	873	834	888	888	988	762	679	820
Conductivity	µS/cm	2250	2850	2870	3150	3060	3340	3410	3430	3500	3070	3110	3300
Fluoride	mg/L						0.12	0.13	0.19	0.12	0.23	0.24	0.24
Hardness, total (dissolved as CaCO3)	mg/L	582	878	863	850	790	826	798	803	847	839	839	921
Hardness, Total (total as CaCO3)	mg/L												
pH		7.97	7.84	7.95	7.76	7.78	7.85	7.74	7.75	6.95	7.78	7.78	7.86
Sulphate	mg/L	72.9	44.3	43.5	44.4	55.2	36.5	37.4	37.2	57.6	53.2	53.3	45.1
Total suspended solids	mg/L	117	2960	2800	7470	116	2870	2600	2200	1640	1020	1220	814
Turbidity	NTU	87	641	535	>4000	71.1	>4000	2350	2340	1910	620	800	664
Metals													
Aluminum (dissolved)	mg/L	0.007	<0.005	0.005	<0.005	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aluminum (total)	mg/L												
Antimony (dissolved)	mg/L	0.0008	0.0015	0.0006	0.001	<0.0020	0.0003	0.0016	0.0015	0.0009	0.0007	0.0004	0.0004
Antimony (total)	mg/L												
Arsenic (dissolved)	mg/L	0.0107	0.0149	0.0147	0.0061	0.0031	0.0028	0.0039	0.004	0.0024	0.0024	0.0024	0.0029
Arsenic (total)	mg/L												
Barium (dissolved)	mg/L	0.125	0.257	0.245	0.246	0.195	0.255	0.271	0.272	0.25	0.227	0.223	0.239
Barium (total)	mg/L												
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L												
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L												
Boron (dissolved)	mg/L	0.093	0.034	0.034	0.028	0.027	0.031	0.017	0.02	0.024	0.025	0.028	0.051
Boron (total)	mg/L												
Cadmium (dissolved)	mg/L	0.00009	0.00002	<0.00001	<0.00001	0.00008	<0.00001	<0.00001	<0.00001	0.00003	0.00004	0.00002	0.00001
Cadmium (total)	mg/L												
Calcium (dissolved)	mg/L	73.8	87.6	90.6	103	100	102	107	105	110	107	107	120
Calcium (total)	mg/L												
Chromium (dissolved)	mg/L	0.0025	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 16-Nov-10 K0K0729-02	TH8 09-May-11 K1E0403-01	TH8 09-May-11 K1E0403-04	TH8 10-Aug-11 K1H0536-01	TH8 18-Oct-11 K1J0685-02	TH8 24-May-12 2051369-04 Normal	TH8 22-Aug-12 2081484-02 Normal	TH8 22-Aug-12 2081484-05 Duplicate	TH8 20-Nov-12 2111131-02 Normal	TH8 21-May-13 3051354-02 Normal	TH8 21-May-13 3051354-06 Duplicate	TH8 20-Aug-13 3081378-05 Normal
Chromium (total)	mg/L												
Cobalt (dissolved)	mg/L	0.00537	0.0198	0.0186	0.00674	0.00078	0.00219	0.00342	0.00355	0.00264	0.00126	0.00122	0.00127
Cobalt (total)	mg/L												
Copper (dissolved)	mg/L	0.0031	<0.0002	<0.0002	<0.0002	0.0054	<0.0002	0.001	0.001	0.001	0.0014	0.0013	<0.0002
Copper (total)	mg/L												
Iron (dissolved)	mg/L	0.347	3.01	2.83	1.87	0.02	0.12	0.15	0.13	0.03	0.011	0.014	0.038
Iron (total)	mg/L												
Lead (dissolved)	mg/L	0.0002	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	0.0007	<0.0001	<0.0001	<0.0001
Lead (total)	mg/L												
Lithium (dissolved)	mg/L	0.02	0.0243	0.0248	0.0224	0.0193	0.0182	0.019	0.0187	0.019	0.0203	0.0204	0.022
Lithium (total)	mg/L												
Magnesium (dissolved)	mg/L	96.5	160	155	144	130	139	129	131	139	139	139	151
Magnesium (total)	mg/L												
Manganese (dissolved)	mg/L	0.219	0.492	0.473	0.349	0.035	0.0785	0.0546	0.0577	0.172	0.0896	0.0897	0.0336
Manganese (total)	mg/L												
Mercury (dissolved)	mg/L	<0.00005	<0.00002	0.00002	0.00002	0.00008	0.00003	0.00006	0.00005	0.00003	0.00002	<0.00002	<0.00002
Mercury (total)	mg/L												
Molybdenum (dissolved)	mg/L	0.0149	0.0046	0.0042	0.0019	0.0046	0.0009	0.0024	0.0023	0.0011	0.0007	0.0007	0.0004
Molybdenum (total)	mg/L												
Nickel (dissolved)	mg/L	0.0175	0.0277	0.0259	0.0093	0.0099	0.006	0.0087	0.0088	0.0077	0.0053	0.0051	0.0048
Nickel (total)	mg/L												
Selenium (dissolved)	mg/L	0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (total)	mg/L												
Silicon (dissolved, as Si)	mg/L	4.21	10.1	9.77	9	8.1	10.3	9.6	9.4	9.7	9.4	9.4	9.6
Silicon (total, as Si)	mg/L												
Silver (dissolved)	mg/L	<0.00005	0.00007	<0.00005	0.00016	0.00006	<0.00005	<0.00005	<0.00005	0.00008	<0.00005	<0.00005	<0.00005
Silver (total)	mg/L												
Sodium (dissolved)	mg/L	178	312	302	341	305	436	450	444	390	359	358	386
Sodium (total)	mg/L												
Strontium (dissolved)	mg/L	1.03	1.66	1.62	1.6	1.49	1.53	1.6	1.6	1.64	1.52	1.51	1.61
Strontium (total)	mg/L												
Sulphur (dissolved)	mg/L						19	17	20	23	21	22	20
Sulphur (total)	mg/L												
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L												
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	0.00011	<0.00002	<0.00002	<0.00002	0.00003	0.00007	0.00006	<0.00002
Thallium (total)	mg/L												
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L												
Tin (dissolved)	mg/L	0.001	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L												
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L												
Uranium (dissolved)	mg/L	0.00216	0.00164	0.00166	0.00196	0.00205	0.00173	0.00206	0.002	0.00206	0.00213	0.00214	0.00218
Uranium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 16-Nov-10 K0K0729-02	TH8 09-May-11 K1E0403-01	TH8 09-May-11 K1E0403-04	TH8 10-Aug-11 K1H0536-01	TH8 18-Oct-11 K1J0685-02	TH8 24-May-12 2051369-04 Normal	TH8 22-Aug-12 2081484-02 Normal	TH8 22-Aug-12 2081484-05 Duplicate	TH8 20-Nov-12 2111131-02 Normal	TH8 21-May-13 3051354-02 Normal	TH8 21-May-13 3051354-06 Duplicate	TH8 20-Aug-13 3081378-05 Normal
Vanadium (dissolved)	mg/L	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (total)	mg/L												
Zinc (dissolved)	mg/L	0.0037	<0.0040	<0.0040	<0.004	0.007	0.008	0.008	0.012	<0.004	0.011	0.011	<0.004
Zinc (total)	mg/L												
Zirconium (dissolved)	mg/L	0.0003	0.0002	0.0002	0.0001	0.0002	0.0001	0.0002	0.0002	<0.0001	<0.0001	<0.0001	0.0001
Zirconium (total)	mg/L												
Nutrients													
Ammonia (total, as N)	mg/L	0.05	0.04	<0.02	0.04	0.05	<0.020	0.1	0.091	0.026	0.034	0.06	0.02
Nitrate (as N)	mg/L	0.22	<0.010	<0.010	0.341	0.58	0.59	0.141	0.128	0.339	0.566	0.544	0.929
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	0.22	<0.01	<0.01	0.341	0.58	0.59	0.141	0.128	0.339	0.566	0.544	0.929
Nitrite (as N)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L												
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.020	<0.020	<0.020	<0.02	0.05	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Potassium (dissolved)	mg/L	8.58	6.79	6.6	6.33	6.51	7.89	7.23	7.29	6.55	6.53	6.53	6.9
Potassium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 12-Nov-13 3110772-05 Normal	TH8 02-Jun-14 4060249-05 Normal	TH8 18-Aug-14 4081094-05 Normal	TH8 04-Nov-14 4110161-05 Normal	TH8 25-May-15 5051773-05 Normal	Town Well #4 03-Jun-02	Town Well #4 12-May-03	Town Well #4 17-May-04	Town Well #4 22-May-07 K705752-02	Town Well #4 05-Nov-07 K7K0165-01	Town Well #4 28-Apr-08 K8E0035-01	Town Well #4 14-Oct-08 K8J0452-01
Field Results													
Conductivity	µS/cm	2700	2740	2770	3150	2960							
Depth to Water	m	16.281	15.19	13.84	14.99	15.37	8						
Dissolved oxygen	mg/L		7.43	7.85	8.3	7.05							
Dissolved oxygen (percent)	%		67.1	71.7	71	62.5							
Ground Elevation	m	921	921	921	921	921	790	790	790	790	790	790	790
Oxidation reduction potential	mV	47	87	132	24	23							
pH		7.23	3.1	7.3	7.4	7.3							
Temperature	°C	7.5	8.1	9.5	7.5	9.7		10	12	7.5	5		
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	598	514	476	592	492	287	290	324	310	340	333	345
Bromide	mg/L					<0.10							
Chemical Oxygen Demand	mg/L						<5	5	10	<5	<5		
Chloride	mg/L	815	672	672	700	666	62.5	73.8	65	60.2	76.7	69.4	86.9
Conductivity	µS/cm	3380	2940	3180	3310	2890	845	866	791	822	881	842	884
Fluoride	mg/L	0.25	0.27	0.13	0.26	0.26							
Hardness, total (dissolved as CaCO3)	mg/L	958	800	833	826	734				369	390	394	377
Hardness, Total (total as CaCO3)	mg/L												
pH		7.86	7.94	7.74	7.82	7.81	7.1	7.2	7.3	7.1	7.4	7.4	6.9
Sulphate	mg/L	56.2	38.1	44.7	47.5	39.4	44.5	43	40	37.5	38	38.6	40.6
Total suspended solids	mg/L	1230	300	284	1240	214						<1	<1
Turbidity	NTU	1220	292	186	1180	122	0.4	2.5	0.6			0.2	0.1
Metals													
Aluminum (dissolved)	mg/L	<0.005	<0.005	0.006	0.01	<0.005	<0.2	<0.2	<0.2	<0.050		<0.050	<0.010
Aluminum (total)	mg/L									<0.10			
Antimony (dissolved)	mg/L	0.0007	0.0003	0.0003	0.0013	0.0019	<0.2	<0.2	<0.2	<0.0050		<0.0030	<0.0006
Antimony (total)	mg/L									<0.006			
Arsenic (dissolved)	mg/L	0.0018	0.0024	0.0042	0.0016	0.0039	<0.2	<0.2	<0.2	<0.0050		<0.0050	<0.0010
Arsenic (total)	mg/L									<0.010			
Barium (dissolved)	mg/L	0.257	0.192	0.235	0.242	0.212	0.2	0.2	0.21	0.191		0.191	0.211
Barium (total)	mg/L									0.19			
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0010		<0.0020	<0.0004
Beryllium (total)	mg/L									<0.005			
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0010		<0.0005	<0.0001
Bismuth (total)	mg/L									<0.001			
Boron (dissolved)	mg/L	0.041	0.031	0.035	0.024	0.02	<0.1	<0.1	<0.1	<0.020		<0.020	0.013
Boron (total)	mg/L									<0.020			
Cadmium (dissolved)	mg/L	0.00002	0.00002	0.00003	0.00001	0.00004	<0.01	<0.01	<0.01	<0.00010		<0.00010	<0.00002
Cadmium (total)	mg/L									<0.00010			
Calcium (dissolved)	mg/L	128	103	116	116	101	90	104	88	84.6	88.4	91.2	87
Calcium (total)	mg/L									85.1			
Chromium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	0.0007	<0.01	<0.01	<0.01	<0.0050		0.006	0.006

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 12-Nov-13 3110772-05 Normal	TH8 02-Jun-14 4060249-05 Normal	TH8 18-Aug-14 4081094-05 Normal	TH8 04-Nov-14 4110161-05 Normal	TH8 25-May-15 5051773-05 Normal	Town Well #4 03-Jun-02	Town Well #4 12-May-03	Town Well #4 17-May-04	Town Well #4 22-May-07 K705752-02	Town Well #4 05-Nov-07 K7K0165-01	Town Well #4 28-Apr-08 K8E0035-01	Town Well #4 14-Oct-08 K8J0452-01
Chromium (total)	mg/L									<0.010			
Cobalt (dissolved)	mg/L	0.00151	0.00111	0.00024	0.00096	0.00012				<0.0010		<0.0005	<0.0001
Cobalt (total)	mg/L									<0.0010			
Copper (dissolved)	mg/L	0.0012	0.0011	0.004	0.0008	0.0051	<0.01	<0.01	<0.01	<0.0050		<0.0030	0.0046
Copper (total)	mg/L									<0.010			
Iron (dissolved)	mg/L	0.012	0.111	0.015	0.049	0.015	<0.03	<0.03	<0.03	0.267		0.386	0.079
Iron (total)	mg/L									<0.30			
Lead (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.05	<0.05	<0.0020		<0.0010	0.0002
Lead (total)	mg/L									<0.0020			
Lithium (dissolved)	mg/L	0.0233	0.0223	0.0219	0.0212	0.0188				0.0018		0.002	0.0015
Lithium (total)	mg/L									<0.0050			
Magnesium (dissolved)	mg/L	155	132	132	130	117	37	43.7	38.1	38.4	41.1	40.2	38.9
Magnesium (total)	mg/L									37.9			
Manganese (dissolved)	mg/L	0.0871	0.038	0.0049	0.027	0.0031	<0.005	<0.005	<0.005	<0.0100		<0.0050	<0.0010
Manganese (total)	mg/L									<0.010			
Mercury (dissolved)	mg/L	<0.00002	<0.00002	0.00002	0.00002	<0.00002				<0.00050		<0.00030	<0.00006
Mercury (total)	mg/L									<0.00050			
Molybdenum (dissolved)	mg/L	0.0007	0.0006	0.0004	0.0007	0.0006	<0.03	<0.03	<0.03	<0.0020		<0.0010	0.0002
Molybdenum (total)	mg/L									<0.0050			
Nickel (dissolved)	mg/L	0.006	0.0045	0.0032	0.0039	0.0007	<0.05	<0.05	<0.05	<0.010		<0.005	0.001
Nickel (total)	mg/L									<0.020			
Selenium (dissolved)	mg/L	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.2	<0.2	<0.2	<0.0100		<0.0050	<0.0010
Selenium (total)	mg/L									<0.010			
Silicon (dissolved, as Si)	mg/L	9.1	9.2	9.9	10.4	10.4				3.88		5.01	5.35
Silicon (total, as Si)	mg/L									2.6			
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005				<0.0004		<0.00040	<0.00008
Silver (total)	mg/L									<0.00050			
Sodium (dissolved)	mg/L	392	356	399	436	365	34	37	37	36.8		43.1	42.1
Sodium (total)	mg/L									34.8			
Strontium (dissolved)	mg/L	1.64	1.43	1.52	1.56	1.35				0.414		0.434	0.442
Strontium (total)	mg/L									0.405			
Sulphur (dissolved)	mg/L	18	18	17	20	16							
Sulphur (total)	mg/L												
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				<0.0050		<0.0030	<0.0006
Tellurium (total)	mg/L									<0.005			
Thallium (dissolved)	mg/L	0.00008	<0.00002	0.00004	<0.00002	0.00002				<0.0010		<0.0005	<0.0001
Thallium (total)	mg/L									<0.0010			
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001				<0.0050		<0.0030	<0.0006
Thorium (total)	mg/L									<0.005			
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002				<0.0020		<0.0020	<0.0004
Tin (total)	mg/L									<0.001			
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005				<0.0200		<0.100	<0.020
Titanium (total)	mg/L									<0.050			
Uranium (dissolved)	mg/L	0.00223	0.00205	0.0021	0.00227	0.00193				0.0011		0.0012	0.0014
Uranium (total)	mg/L									0.0012			

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	TH8 12-Nov-13 3110772-05 Normal	TH8 02-Jun-14 4060249-05 Normal	TH8 18-Aug-14 4081094-05 Normal	TH8 04-Nov-14 4110161-05 Normal	TH8 25-May-15 5051773-05 Normal	Town Well #4 03-Jun-02	Town Well #4 12-May-03	Town Well #4 17-May-04	Town Well #4 22-May-07 K705752-02	Town Well #4 05-Nov-07 K7K0165-01	Town Well #4 28-Apr-08 K8E0035-01	Town Well #4 14-Oct-08 K8J0452-01
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001				<0.0050		<0.010	<0.002
Vanadium (total)	mg/L									<0.010			
Zinc (dissolved)	mg/L	<0.004	<0.004	0.005	0.012	0.008	0.01	0.021	0.039	<0.040		<0.030	0.008
Zinc (total)	mg/L									<0.050			
Zirconium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	0.0025	<0.0001				<0.010		<0.005	<0.001
Zirconium (total)	mg/L									<0.010			
Nutrients													
Ammonia (total, as N)	mg/L	1.24	0.118	0.023	0.03	<0.020				<0.02	<0.02	0.04	0.06
Nitrate (as N)	mg/L	<0.010	0.206	1.11	0.723	0.695	1.4	1.35	1.63	1.35	1.09	0.982	1.17
Nitrate + Nitrite (as N)	mg/L									1.35	1.09		
Nitrate + Nitrite (as N) (calculated)	mg/L	<0.014	0.206	1.11	0.723	0.695				1.35	1.09	0.982	1.17
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01
Total kjeldahl nitrogen	mg/L						0.05	<0.05	0.08	0.1	0.06		
Orthophosphate (dissolved, as P)	mg/L					<0.01							
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	<0.02	0.02	<0.02	<0.02	<0.3	<0.3	<0.3	<0.500		<0.200	<0.040
Phosphorus (total, by ICPMS/ICPOES)	mg/L									<0.50			
Potassium (dissolved)	mg/L	6.64	6.05	6.82	6.66	6.34	<2	<2	<2	1.66		2.17	1.82
Potassium (total)	mg/L									1.53			

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 25-May-09 K9E0816-01	Town Well #4 04-Nov-09 K9K0184-03	Town Well #4 09-Feb-10 K0B0397-03	Town Well #4 15-Jun-10 K0F0788-02	Town Well #4 16-Nov-10 K0K0729-03	Town Well #4 09-May-11 K1E0403-02	Town Well #4 10-Aug-11 K1H0536-04	Town Well #4 18-Oct-11 K1J0685-04	Town Well #4 24-May-12 2051369-02 Normal	Town Well #4 22-Aug-12 2081484-04 Normal	Town Well #4 20-Nov-12 2111131-04 Normal	Town Well #4 21-May-13 3051354-04 Normal
Field Results													
Conductivity	µS/cm	900	890	870	970	890		690	930	740	860	800	640
Depth to Water	m												
Dissolved oxygen	mg/L	2.01	3.7										
Dissolved oxygen (percent)	%												
Ground Elevation	m	790	790	790	790	790	790	790	790	790	790	790	790
Oxidation reduction potential	mV				49	159		62	119	111	221	188	258
pH		6.85	7.48	7.2	7.41	7.49		7.35	7.39	7.43	7.59	7.6	7.36
Temperature	°C	8.4	8.4	7.4	12.2	8.2		9.4	7.6	8.2	8.8	8.1	8.4
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	337	330	325	328	313	331	332	327	304	313	332	326
Bromide	mg/L												
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	74	57.6	91.1	76.7	75.7	79.2	72.9	77.2	63	67.2	65.6	69.1
Conductivity	µS/cm	899	902	905	874	854	869	835	873	825	836	838	833
Fluoride	mg/L									<0.10	<0.10	<0.10	<0.10
Hardness, total (dissolved as CaCO3)	mg/L	353	364	382	342	370	388	360	360	347	357	356	366
Hardness, Total (total as CaCO3)	mg/L												
pH		7.7	7.76	7.81	7.93	7.79	7.85	7.81	7.82	7.87	7.8	6.94	7.86
Sulphate	mg/L	38.8	39.8	42.9	41.2	36.1	37.6	35.8	40	37.2	36.6	40.4	36.6
Total suspended solids	mg/L	<1	<1	4	<1	<1	<1	<1	<1	<1	6	2	<1
Turbidity	NTU	<0.1	0.3	0.2	<0.1	0.1	<0.1	0.11	<0.1	<0.1	0.1	<0.1	<0.1
Metals													
Aluminum (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.014	<0.005	<0.005
Aluminum (total)	mg/L												
Antimony (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0004	0.0001	<0.0020	<0.0001	0.0007	0.0003	0.0003
Antimony (total)	mg/L												
Arsenic (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Arsenic (total)	mg/L												
Barium (dissolved)	mg/L	0.227	0.173	0.244	0.216	0.217	0.189	0.195	0.184	0.189	0.193	0.191	0.195
Barium (total)	mg/L												
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Beryllium (total)	mg/L												
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Bismuth (total)	mg/L												
Boron (dissolved)	mg/L	0.015	0.02	0.02	0.015	0.042	0.016	0.018	0.017	0.018	0.012	0.018	0.018
Boron (total)	mg/L												
Cadmium (dissolved)	mg/L	0.00001	<0.00001	<0.00001	<0.00001	<0.00001	0.00005	0.00009	<0.00001	0.00001	<0.00001	<0.00001	0.00001
Cadmium (total)	mg/L												
Calcium (dissolved)	mg/L	83.8	80	87.4	79.1	81.3	90	83.8	84.7	74.7	80.7	82	82.5
Calcium (total)	mg/L												
Chromium (dissolved)	mg/L	0.0033	0.0028	0.0116	0.0022	0.0007	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 25-May-09 K9E0816-01	Town Well #4 04-Nov-09 K9K0184-03	Town Well #4 09-Feb-10 K0B0397-03	Town Well #4 15-Jun-10 K0F0788-02	Town Well #4 16-Nov-10 K0K0729-03	Town Well #4 09-May-11 K1E0403-02	Town Well #4 10-Aug-11 K1H0536-04	Town Well #4 18-Oct-11 K1J0685-04	Town Well #4 24-May-12 2051369-02 Normal	Town Well #4 22-Aug-12 2081484-04 Normal	Town Well #4 20-Nov-12 2111131-04 Normal	Town Well #4 21-May-13 3051354-04 Normal
Chromium (total)	mg/L												
Cobalt (dissolved)	mg/L	0.00009	0.00006	0.00007	0.0001	0.00013	<0.00005	0.00018	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005
Cobalt (total)	mg/L												
Copper (dissolved)	mg/L	0.0038	0.0016	0.0045	0.0025	0.0025	0.0008	0.0038	0.0016	0.0007	0.0013	0.001	0.0008
Copper (total)	mg/L												
Iron (dissolved)	mg/L	0.082	0.07	0.063	0.147	0.166	<0.010	0.02	<0.01	<0.01	<0.01	<0.01	<0.010
Iron (total)	mg/L												
Lead (dissolved)	mg/L	0.0001	<0.0001	0.0002	0.0002	0.0002	0.0001	0.0005	0.0001	<0.0001	0.0002	<0.0001	<0.0001
Lead (total)	mg/L												
Lithium (dissolved)	mg/L	0.0021	0.0013	0.0017	0.0021	0.004	0.002	0.0017	0.0018	0.0017	0.0016	0.0018	0.0018
Lithium (total)	mg/L												
Magnesium (dissolved)	mg/L	34.9	39.8	39.7	35	40.5	39.7	37.3	34.9	39.1	37.7	36.8	38.9
Magnesium (total)	mg/L												
Manganese (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0006	0.0008	<0.0002	0.0007	<0.0002	<0.0002	<0.0002
Manganese (total)	mg/L												
Mercury (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00002	<0.00002	<0.00002	<0.00002	0.00005	0.00002	<0.00002
Mercury (total)	mg/L												
Molybdenum (dissolved)	mg/L	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0012	0.0003	0.0005	0.0003	0.0002
Molybdenum (total)	mg/L												
Nickel (dissolved)	mg/L	0.0014	0.001	0.0012	0.0016	0.0037	0.0002	0.0011	<0.0002	<0.0002	0.0003	<0.0002	<0.0002
Nickel (total)	mg/L												
Selenium (dissolved)	mg/L	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium (total)	mg/L												
Silicon (dissolved, as Si)	mg/L	4.1	3.53	7.83	4	2.33	4.89	4.8	4.4	4.8	4.6	4.9	4.6
Silicon (total, as Si)	mg/L												
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	<0.00005	0.00007	<0.00005	<0.00005	<0.00005	0.00006	<0.00005
Silver (total)	mg/L												
Sodium (dissolved)	mg/L	36.7	44.4	45.6	37.8	37.8	44	39.9	38.2	40.8	39.4	38.7	41.7
Sodium (total)	mg/L												
Strontium (dissolved)	mg/L	0.481	0.409	0.409	0.451	0.628	0.423	0.436	0.37	0.441	0.405	0.399	0.432
Strontium (total)	mg/L												
Sulphur (dissolved)	mg/L									16	17	15	13
Sulphur (total)	mg/L												
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tellurium (total)	mg/L												
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Thallium (total)	mg/L												
Thorium (dissolved)	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Thorium (total)	mg/L												
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Tin (total)	mg/L												
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Titanium (total)	mg/L												
Uranium (dissolved)	mg/L	0.00124	0.00114	0.00102	0.00115	0.00127	0.00113	0.00107	0.00104	0.00103	0.00109	0.00103	0.00112
Uranium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 25-May-09 K9E0816-01	Town Well #4 04-Nov-09 K9K0184-03	Town Well #4 09-Feb-10 K0B0397-03	Town Well #4 15-Jun-10 K0F0788-02	Town Well #4 16-Nov-10 K0K0729-03	Town Well #4 09-May-11 K1E0403-02	Town Well #4 10-Aug-11 K1H0536-04	Town Well #4 18-Oct-11 K1J0685-04	Town Well #4 24-May-12 2051369-02 Normal	Town Well #4 22-Aug-12 2081484-04 Normal	Town Well #4 20-Nov-12 2111131-04 Normal	Town Well #4 21-May-13 3051354-04 Normal
Vanadium (dissolved)	mg/L	<0.0010	<0.0010	0.0046	0.0018	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Vanadium (total)	mg/L												
Zinc (dissolved)	mg/L	0.0088	0.0021	0.0051	0.0058	0.0032	<0.0040	0.016	<0.004	<0.004	0.006	<0.004	<0.004
Zinc (total)	mg/L												
Zirconium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Zirconium (total)	mg/L												
Nutrients													
Ammonia (total, as N)	mg/L	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	0.02	<0.020	0.03	0.025	0.024
Nitrate (as N)	mg/L	1.12	1.21	1.3	1.17	1.14	0.895	1.26	1.21	1.19	1.2	0.755	1.36
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	1.12	1.21	1.3	1.17	1.14	0.895	1.26	1.21	1.19	1.2	0.755	1.36
Nitrite (as N)	mg/L	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.010	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L												
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Phosphorus (total, by ICPMS/ICPOES)	mg/L												
Potassium (dissolved)	mg/L	2.08	1.48	1.93	2.33	1.95	1.74	1.75	1.5	2.04	1.62	1.61	1.69
Potassium (total)	mg/L												

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 12-Nov-13 3110772-02 Normal	Town Well #4 02-Jun-14 4060249-02 Normal	Town Well #4 18-Aug-14 4081094-01 Normal	Town Well #4 04-Nov-14 4110161-01 Normal	Town Well #4 25-May-15 5051773-02 Normal	Town Well #6 20-Aug-13 3081378-02 Normal	Town Well #6 02-Jun-14 4060249-01 Normal	Town Well #6 18-Aug-14 4081094-02 Normal	Town Well #6 04-Nov-14 4110161-02 Normal	Town Well #6 25-May-15 5051773-01 Normal	Town Well #6 25-Aug-15 5081710-01 Normal	Town Well #6 09-Nov-15 5110693-04 Normal
Field Results													
Conductivity	µS/cm	710	799	805	756	813	650	577	577	677	587	401	670
Depth to Water	m												
Dissolved oxygen	mg/L		4.5	3.93	4.38	4.85		8.14	7.68	7.38	6.4	7.04	6.51
Dissolved oxygen (percent)	%		38.2	33.8	37.6	43		68.1	65.3	64	57	63.6	
Ground Elevation	m	790	790	790	790	790							
Oxidation reduction potential	mV	74	165	201	47	68	246	183	172	66	211	46	74
pH		7.2	7.5	7.5	7.2	7.2	7.15	7.3	7.9	7.4	7.4	7.4	6.6
Temperature	°C	8.1	7.9	8.5	8.4	12.9	7.9	7.7	8.1	8.1	7.8	10.2	8.2
Lab Results													
General													
Alkalinity (total, as CaCO3)	mg/L	314	319	320	319	328	268	276	277	291	303	288	295
Bromide	mg/L					<0.10					<0.10	<0.10	<0.10
Chemical Oxygen Demand	mg/L												
Chloride	mg/L	68.5	67	69.7	70.2	81.2	22.9	23.7	26.2	34.5	28.7	24.8	28.6
Conductivity	µS/cm	859	857	880	900	911	620	621	634	679	672	618	661
Fluoride	mg/L	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Hardness, total (dissolved as CaCO3)	mg/L	383	397	392	378		319	324	325	322			
Hardness, Total (total as CaCO3)	mg/L					393					346	332	328
pH		7.82	7.92	7.65	7.85	7.83	7.94	7.87	7.7	7.86	7.81	7.79	7.72
Sulphate	mg/L	38.8	37.6	39.7	40.7	40	20.4	23.5	24.1	24.3	24.3	23.8	24.8
Total suspended solids	mg/L	2	<1	<1	<1	<2	<1	<1	<1	<1	<2	<2	<3
Turbidity	NTU	<0.1	0.2	<0.1	<0.1	<0.1	0.6	<0.1	<0.1	0.1	<0.1	0.2	0.1
Metals													
Aluminum (dissolved)	mg/L	<0.005	<0.005	0.021	<0.005		<0.005	<0.005	0.011	<0.005			
Aluminum (total)	mg/L					<0.005					<0.005	<0.005	<0.05
Antimony (dissolved)	mg/L	0.0007	0.0004	0.0005	0.0002		0.0005	0.0005	0.0003	0.0002			
Antimony (total)	mg/L					<0.0001					0.0001	<0.0001	<0.001
Arsenic (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005			
Arsenic (total)	mg/L					<0.0005					<0.0005	<0.0005	<0.005
Barium (dissolved)	mg/L	0.2	0.192	0.195	0.21		0.133	0.126	0.136	0.146			
Barium (total)	mg/L					0.193					0.142	0.146	0.14
Beryllium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001			
Beryllium (total)	mg/L					<0.0001					<0.0001	<0.0001	<0.001
Bismuth (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001			
Bismuth (total)	mg/L					<0.0001					<0.0001	<0.0001	<0.001
Boron (dissolved)	mg/L	0.032	0.021	0.024	0.014		0.05	0.015	0.012	0.006			
Boron (total)	mg/L					0.015					0.006	0.007	<0.04
Cadmium (dissolved)	mg/L	<0.00001	<0.00001	0.00003	0.00002		0.00002	<0.00001	0.00002	<0.00001			
Cadmium (total)	mg/L					<0.00001					<0.00001	<0.00001	<0.0001
Calcium (dissolved)	mg/L	88.6	90.2	92.1	88.7		81.5	82.8	82.7	84.3			
Calcium (total)	mg/L					91.7					90.4	87.9	87
Chromium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005			

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 12-Nov-13 3110772-02 Normal	Town Well #4 02-Jun-14 4060249-02 Normal	Town Well #4 18-Aug-14 4081094-01 Normal	Town Well #4 04-Nov-14 4110161-01 Normal	Town Well #4 25-May-15 5051773-02 Normal	Town Well #6 20-Aug-13 3081378-02 Normal	Town Well #6 02-Jun-14 4060249-01 Normal	Town Well #6 18-Aug-14 4081094-02 Normal	Town Well #6 04-Nov-14 4110161-02 Normal	Town Well #6 25-May-15 5051773-01 Normal	Town Well #6 25-Aug-15 5081710-01 Normal	Town Well #6 09-Nov-15 5110693-04 Normal
Chromium (total)	mg/L					<0.0005					<0.0005	<0.0005	<0.005
Cobalt (dissolved)	mg/L	<0.00005	<0.00005	0.00007	0.00006		<0.00005	<0.00005	0.00007	0.00006			
Cobalt (total)	mg/L					<0.00005					<0.00005	<0.00005	<0.0005
Copper (dissolved)	mg/L	0.0006	0.0009	0.0014	0.0014		0.0008	0.0013	0.0028	0.0024			
Copper (total)	mg/L					0.0039					0.001	0.0016	<0.002
Iron (dissolved)	mg/L	<0.010	<0.010	0.031	<0.010		<0.010	<0.010	0.033	0.013			
Iron (total)	mg/L					<0.01					0.01	0.01	<0.10
Lead (dissolved)	mg/L	<0.0001	<0.0001	0.0001	0.0001		<0.0001	<0.0001	0.0002	<0.0001			
Lead (total)	mg/L					0.0001					0.0001	0.0001	<0.001
Lithium (dissolved)	mg/L	0.0018	0.002	0.0022	0.002		0.0013	0.0013	0.0014	0.0013			
Lithium (total)	mg/L					0.002					0.0014	0.0012	0.001
Magnesium (dissolved)	mg/L	39.3	41.8	39.4	38		28.1	28.5	28.7	27.1			
Magnesium (total)	mg/L					39.8					29.2	27.1	26.8
Manganese (dissolved)	mg/L	<0.0002	<0.0002	0.0068	0.0012		0.0009	0.0013	0.0082	0.0014			
Manganese (total)	mg/L					<0.0002					0.0011	0.001	<0.002
Mercury (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002		<0.00002	<0.00002	<0.00002	<0.00002			
Mercury (total)	mg/L					<0.00002					<0.00002		<0.00002
Molybdenum (dissolved)	mg/L	0.0003	0.0003	0.0003	0.0002		0.0003	0.0004	0.0004	0.0004			
Molybdenum (total)	mg/L					0.0003					0.0005	0.0003	<0.001
Nickel (dissolved)	mg/L	0.0002	<0.0002	0.0015	0.0004		0.0003	<0.0002	0.0012	0.0004			
Nickel (total)	mg/L					<0.0002					<0.0002	0.0006	<0.002
Selenium (dissolved)	mg/L	<0.0005	<0.0005	<0.0005	<0.0005		<0.0005	<0.0005	<0.0005	<0.0005			
Selenium (total)	mg/L					<0.0005					<0.0005	<0.0005	<0.005
Silicon (dissolved, as Si)	mg/L	4.2	4.5	4.6	4.9		4.1	4	4.4	4.5			
Silicon (total, as Si)	mg/L					4.8					4.7	4.3	<5
Silver (dissolved)	mg/L	<0.00005	<0.00005	<0.00005	<0.00005		<0.00005	<0.00005	<0.00005	<0.00005			
Silver (total)	mg/L					<0.00005					<0.00005	0.00154	<0.0005
Sodium (dissolved)	mg/L	42.4	42.5	44.5	48.5		15.2	13.9	15.4	17.9			
Sodium (total)	mg/L					46.9					18.9	15.1	15.9
Strontium (dissolved)	mg/L	0.4	0.421	0.457	0.438		0.282	0.269	0.301	0.29			
Strontium (total)	mg/L					0.425					0.296	0.298	0.27
Sulphur (dissolved)	mg/L	9	16	12	13		8	10	8	7			
Sulphur (total)	mg/L					14					9	8	<10
Tellurium (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002			
Tellurium (total)	mg/L					<0.0002					<0.0002	<0.0002	<0.002
Thallium (dissolved)	mg/L	<0.00002	<0.00002	<0.00002	<0.00002		<0.00002	<0.00002	<0.00002	<0.00002			
Thallium (total)	mg/L					<0.00002					<0.00002	<0.00002	<0.0002
Thorium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001			
Thorium (total)	mg/L					<0.0001					<0.0001	<0.0001	<0.001
Tin (dissolved)	mg/L	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002	<0.0002			
Tin (total)	mg/L					<0.0002					<0.0002	<0.0002	<0.002
Titanium (dissolved)	mg/L	<0.005	<0.005	<0.005	<0.005		<0.005	<0.005	<0.005	<0.005			
Titanium (total)	mg/L					<0.005					<0.005	<0.005	<0.05
Uranium (dissolved)	mg/L	0.00105	0.00114	0.00143	0.00123		0.00105	0.00103	0.00114	0.00114			
Uranium (total)	mg/L					0.00115					0.00112	0.00111	0.0011

Golden Refuse Disposal Site

Water Quality Results

Analyte	Unit	Town Well #4 12-Nov-13 3110772-02 Normal	Town Well #4 02-Jun-14 4060249-02 Normal	Town Well #4 18-Aug-14 4081094-01 Normal	Town Well #4 04-Nov-14 4110161-01 Normal	Town Well #4 25-May-15 5051773-02 Normal	Town Well #6 20-Aug-13 3081378-02 Normal	Town Well #6 02-Jun-14 4060249-01 Normal	Town Well #6 18-Aug-14 4081094-02 Normal	Town Well #6 04-Nov-14 4110161-02 Normal	Town Well #6 25-May-15 5051773-01 Normal	Town Well #6 25-Aug-15 5081710-01 Normal	Town Well #6 09-Nov-15 5110693-04 Normal
Vanadium (dissolved)	mg/L	<0.001	<0.001	<0.001	<0.001		<0.001	<0.001	<0.001	<0.001			
Vanadium (total)	mg/L					<0.001					<0.001	<0.001	<0.01
Zinc (dissolved)	mg/L	<0.004	<0.004	<0.004	0.005		<0.004	<0.004	0.01	0.005			
Zinc (total)	mg/L					<0.004					<0.004	0.016	<0.04
Zirconium (dissolved)	mg/L	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001			
Zirconium (total)	mg/L					<0.0001					<0.0001	<0.0001	<0.001
Nutrients													
Ammonia (total, as N)	mg/L	0.029	<0.020	<0.020	<0.020	0.038	<0.020	0.024	<0.020	<0.020	<0.020	<0.020	0.02
Nitrate (as N)	mg/L	1.33	1.26	1.55	1.57	1.53	0.781	0.839	0.993	1.23	0.89	1.01	0.925
Nitrate + Nitrite (as N)	mg/L												
Nitrate + Nitrite (as N) (calculated)	mg/L	1.33	1.26	1.55	1.57	1.53	0.781	0.839	0.993	1.23	0.89	1.01	0.925
Nitrite (as N)	mg/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Total kjeldahl nitrogen	mg/L												
Orthophosphate (dissolved, as P)	mg/L					<0.01					<0.01	<0.01	
Phosphorus (dissolved, by ICPMS/ICPOES)	mg/L	<0.02	<0.02	0.11	<0.02		<0.02	<0.02	0.07	<0.02			
Phosphorus (total, by ICPMS/ICPOES)	mg/L					<0.020					<0.020	0.03	<0.2
Potassium (dissolved)	mg/L	1.67	1.7	1.84	1.9		1	0.89	0.95	0.94			
Potassium (total)	mg/L					1.86					1.03	0.99	0.8

Guideline Notes for Reports for CSRD Refuse Disposal Sites Water Quality Results

1. Notes for BC Approved Water Quality Guidelines for freshwater aquatic life (BCAWQG AL)
General Notes:
The Water Quality Guidelines (Criteria) Reports by BC Ministry of Environment were used as references for the guidelines. (Internet address: http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html). Overview Reports (BC MOE) were used as the references for the guidelines unless the note for specific analyte indicates that the Technical Appendix (BC MOE) was used. / For some parameters, guidelines are specified as two values: the maximum value or the acute criterion, and the 30-day average value or the chronic criterion. The maximum value was used in this report for parameters that have both guideline values.
Note 1.1 for Dissolved oxygen:
The instantaneous minimum guideline for dissolved oxygen is 5 mg/L for all life stages other than buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in the water column is 9 mg/L for buried embryo/alevin. The instantaneous minimum guideline for dissolved oxygen in interstitial water is 6 mg/L for buried embryo/alevin.
The 30-day mean guideline (minimum) for dissolved oxygen is 8 mg/L for all life stages other than buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in the water column is 11 mg/L for buried embryo/alevin. The 30-day mean guideline (minimum) for dissolved oxygen in interstitial water is 8 mg/L for buried embryo/alevin.
Note 1.2 for pH:
pH less than 6.5: No statistically significant decrease in pH from background.
pH from 6.5 to 9.0: Unrestricted change permitted within this range.
pH over 9.0: No statistically significant increase in pH from background.
See BC MOE Overview Report for additional details.
Note 1.3 for Temperature:
The maximum daily temperature of 19 degrees Celsius is for streams with unknown fish distribution. See BC MOE Overview Report for additional details for streams with unknown fish distribution, and specific guidelines for streams with known fish distribution, and guideline for lakes and impoundments.
Note 1.4 for Chloride:
To protect freshwater aquatic life from acute and lethal effects, the maximum concentration of chloride (mg/L as NaCl) at any time should not exceed 600 mg/L.
To protect freshwater aquatic life from chronic effects, the average (arithmetic mean computed from five weekly samples collected over a 30-day period) concentration of chloride (mg/L as NaCl) should not exceed 150 mg/L.
Note 1.5 for Fluoride:
Correction by BC MOE Sept. 2011: The criteria for Fluoride (total) in mg/L is 0.4 as a maximum where the water hardness (as CaCO3) is less than or equal to 10 mg/L. Otherwise use the equation:
LC50 fluoride = -51.73 + 92.57 log10 (Hardness) and multiply by 0.01.
Hardness is as CaCO3 in units mg/L.
Note 1.6 for pH:
pH less than 6.5: No statistically significant decrease in pH from background.
pH from 6.5 to 9.0: Unrestricted change permitted within this range.
pH over 9.0: No statistically significant increase in pH from background.
See BC MOE Overview Report for additional details.
Note 1.7 for Sulphate:
The approved 30-day average (minimum of 5 evenly-spaced samples collected in 30 days) water quality guidelines to protect aquatic life in BC for sulphate are:
128 mg/L at hardness of 0 to 30 mg/L as CaCO3
218 mg/L at hardness of 31 to 75 mg/L as CaCO3
309 mg/L at hardness of 76 to 180mg/L as CaCO3
429 mg/L at hardness 181 to 250 mg/L as CaCO3
Need to determine guideline based on site water for hardness greater than 250 mg/L as CaCO3.
For screening purposes in this report, exceedance were flagged for sulphate greater than 429 mg/L at hardness greater than 250 mg/L as CaCO3.
Note 1.8 for Total suspended solids:
Maximum Induced Suspended Sediments - mg/L or % of background:
- 25 mg/L in 24 hours when background is less than or equal to 25;
- Mean of 5 mg/L in 30 days when background is less than or equal to 25;
- 25 mg/L when background is between 25 and 250;
- 10% when background is greater than or equal to 250. / There are two refuse disposal sites (Revelstoke and Skimikin) where up gradient and down gradient samples have been collected in one water body; therefore, this guideline applies to Revelstoke and Skimikin only.
Note 1.9 for Turbidity:
When background is less than or equal to 8 NTU:
- Maximum Induced Turbidity of 8 NTU in 24 hours.
- For sediment inputs that last between 24 hours and 30 days (daily sampling preferred) the mean turbidity should not exceed background by more than 2 NTU.
Maximum Induced Turbidity of 5 NTU when background is between 8 and 50 NTU.
Maximum Induced Turbidity of 10% when background is greater than 50 NTU. / There are two refuse disposal sites (Revelstoke and Skimikin) where up gradient and down gradient samples have been collected in one water body; therefore, this guideline applies to Revelstoke and Skimikin only.

Note 1.10 for Aluminum (dissolved):
The maximum concentration of dissolved aluminum at any time should not exceed:
1. 0.10 mg/L when the pH is greater than or equal to 6.5
2. The value (in mg/L) determined by the following relationship if pH less than 6.5
Dissolved Aluminum = e (1.209-2.426 (pH) + 0.286 (pH)²)
The 30-day average concentration of dissolved aluminum (based on a minimum of 5 approximately weekly samples) should not exceed:
1. 0.05 mg/L when the median pH over 30 days is greater than or equal to 6.5
2. the value determined by the following relationship at median pH less than 6.5
Dissolved Aluminum = e (1.6-3.327 (median pH) + 0.402 (median pH)²)
Note 1.11 for Arsenic (dissolved):
The recommended guideline is for total arsenic.
Note 1.12 for Boron (dissolved):
The recommended guideline is for total boron.
Note 1.13 for Cadmium (dissolved):
The guideline for cadmium is determined on a site-specific basis according to the local water hardness. The guideline for cadmium (dissolved) in µg/L is determined by the following equations for short term exposure:
1. If hardness (as CaCO3) is less than 7 mg/L then maximum is 0.0380 µg/L
2. If hardness (as CaCO3) is from 7 to 45 mg/L then maximum is based on equation:
e to the power of {1.03[ln(hardness)] - 5.274}
3. If hardness (as CaCO3) is greater than 455 mg/L then maximum is 2.8 µg/L.
When water hardness is greater than the upper bound (i.e., highest water hardness tested), a site-specific assessment may be required.
Note 1.14 for Cobalt (dissolved):
The interim maximum concentration for total cobalt is 110 µg/L to protect aquatic life in the freshwater environment from acute effects of cobalt.
The interim 30-day average concentration for total cobalt (based on five weekly samples) is 4 µg/L to protect aquatic life from chronic effects of cobalt.
Note 1.15 for Cobalt (total):
The interim maximum concentration for total cobalt is 110 µg/L to protect aquatic life in the freshwater environment from acute effects of cobalt.
The interim 30-day average concentration for total cobalt (based on five weekly samples) is 4 µg/L to protect aquatic life from chronic effects of cobalt.
Note 1.16 for Copper (dissolved):
The maximum concentration of total copper should not exceed at any time the numerical value (in µg/L) given by the formula "0.094(hardness)+2", where water hardness is reported as mg/L CaCO3.
The 30-day average concentration of total copper (based on a minimum of 5 approximately weekly samples) should not exceed 2 µg/L when average water hardness over the same period (expressed as mg/L CaCO3) is less than 50 mg/L.
When average water hardness is greater than 50 mg/L the 30-day average concentration should not exceed the numerical value (in µg/L) given by the formula "0.04(average hardness)", where water hardness is reported as mg/L CaCO3.
Note 1.17 for Copper (total):
The maximum concentration of total copper should not exceed at any time the numerical value (in µg/L) given by the formula "0.094(hardness)+2", where water hardness is reported as mg/L CaCO3.
The 30-day average concentration of total copper (based on a minimum of 5 approximately weekly samples) should not exceed 2 µg/L when average water hardness over the same period (expressed as mg/L CaCO3) is less than 50 mg/L.
When average water hardness is greater than 50 mg/L the 30-day average concentration should not exceed the numerical value (in µg/L) given by the formula "0.04(average hardness)", where water hardness is reported as mg/L CaCO3.
Note 1.18 for Lead (dissolved):
The maximum guideline for total lead in water, at a water hardness less than or equal to 8 mg/L as CaCO3 is set at 3.0 µg/L. When water hardness exceeds 8.0 mg/L CaCO3 the maximum guideline for lead at any time is given by the following equation:
Maximum Criteria (µg/L) = exp (1.273 ln(hardness) - 1.460).
The 30-day average guideline for total lead in water, when water hardness exceeds 8 mg/L as CaCO3, is as follows:
30-Day Average (µg/L) is less than or equal to 3.31 + exp (1.273 ln (mean hardness) - 4.704).
For hardness less than or equal to 8.0 mg/L there is no 30-day average guideline; hence the maximum concentration of 3.0 µg/L is used.
Note 1.19 for Lead (total):
The maximum guideline for total lead in water, at a water hardness less than or equal to 8 mg/L as CaCO3 is set at 3.0 µg/L. When water hardness exceeds 8.0 mg/L CaCO3 the maximum guideline for lead at any time is given by the following equation:
Maximum Criteria (µg/L) = exp (1.273 ln(hardness) - 1.460).
The 30-day average guideline for total lead in water, when water hardness exceeds 8 mg/L as CaCO3, is as follows:
30-Day Average (µg/L) is less than or equal to 3.31 + exp (1.273 ln (mean hardness) - 4.704).
For hardness less than or equal to 8.0 mg/L there is no 30-day average guideline; hence the maximum concentration of 3.0 µg/L is used.
Note 1.20 for Manganese (dissolved):

The maximum concentration of total manganese in mg/L at any time should not exceed the value as determined by the following relationship:
0.01102 hardness + 0.54
where water hardness is reported as mg/L of CaCO3.
The 30-day mean concentration of total manganese in mg/L should be less than or equal to the value as determined by the following relationship:
0.0044 hardness + 0.605
where water hardness is reported as mg/L of CaCO3.

Note 1.21 for Manganese (total):
The maximum concentration of total manganese in mg/L at any time should not exceed the value as determined by the following relationship:
0.01102 hardness + 0.54
where water hardness is reported as mg/L of CaCO3.
The 30-day mean concentration of total manganese in mg/L should be less than or equal to the value as determined by the following relationship:
0.0044 hardness + 0.605
where water hardness is reported as mg/L of CaCO3.

Note 1.22 for Mercury (dissolved):
The average concentration of total mercury in water as measured over a 30-day period (based on five weekly samples) should not exceed 0.02 µg/L when the methyl mercury (MeHg) constitutes less than or equal to 0.5% of the total mercury concentration. When the proportion of MeHg is greater than 0.5%, the guideline should be adjusted as indicated in the Table 1 and Table 4 of the BC MOE Overview Report - First Update, February 2001.
There is no guideline maximum for total mercury in water, for freshwater aquatic life.

Note 1.23 for Mercury (total):
The average concentration of total mercury in water as measured over a 30-day period (based on five weekly samples) should not exceed 0.02 µg/L when the methyl mercury (MeHg) constitutes less than or equal to 0.5% of the total mercury concentration. When the proportion of MeHg is greater than 0.5%, the guideline should be adjusted as indicated in the Table 1 and Table 4 of the BC MOE Overview Report - First Update, February 2001.
There is no guideline maximum for total mercury in water, for freshwater aquatic life.

Note 1.24 for Molybdenum (dissolved):
The maximum concentration for total molybdenum is 2 mg/L.
The 30-day average concentration for total molybdenum (based on at least five weekly samples in a period of 30 days) is less than or equal to 1 mg/L.

Note 1.25 for Molybdenum (total):
The maximum concentration for total molybdenum is 2 mg/L.
The 30-day average concentration for total molybdenum (based on at least five weekly samples in a period of 30 days) is less than or equal to 1 mg/L.

Note 1.26 for Selenium (dissolved):
The 30-day average water quality guideline for protection of aquatic life is 2 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.
The 30-day average alert concentration for the protection of aquatic life in sensitive ecosystems is 1 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.

Note 1.27 for Selenium (total):
The 30-day average water quality guideline for protection of aquatic life is 2 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.
The 30-day average alert concentration for the protection of aquatic life in sensitive ecosystems is 1 µg/L determined as the mean concentration of 5 evenly spaced samples collected over 30 days, and measured as total selenium.

Note 1.28 for Silver (dissolved):
The guideline maximum for total silver is:
0.1 µg/L maximum if hardness less than or equal to 100 mg/L
3.0 µg/L maximum if hardness greater than 100 mg/L.
The guideline 30-day average for total silver is:
0.05 µg/L as 30-day mean if hardness less than or equal to 100 mg/L
1.5 µg/L as 30-day mean if hardness greater than 100 mg/L.

Note 1.29 for Silver (total):
The guideline maximum for total silver is:
0.1 µg/L maximum if hardness less than or equal to 100 mg/L
3.0 µg/L maximum if hardness greater than 100 mg/L.
The guideline 30-day average for total silver is:
0.05 µg/L as 30-day mean if hardness less than or equal to 100 mg/L
1.5 µg/L as 30-day mean if hardness greater than 100 mg/L.

Note 1.30 for Zinc (dissolved):

The maximum concentration of total zinc (µg/L) at any time should not exceed 33 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
33 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.
The 30-day average concentration of total zinc (µg/L) at any time should not exceed 7.5 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
7.5 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.

Note 1.31 for Zinc (total):
The maximum concentration of total zinc (µg/L) at any time should not exceed 33 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
33 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.
The 30-day average concentration of total zinc (µg/L) at any time should not exceed 7.5 µg/L when water hardness is less than or equal to 90 mg/L as CaCO3.
When water hardness exceeds 90 mg/L CaCO3, the guideline maximum in µg/L for total zinc is the value determined by the following relationship:
7.5 + 0.75 * (hardness - 90)
where water hardness is reported as mg/L of CaCO3.

Note 1.32 for Ammonia (total, as N):
The maximum guideline for ammonia varies as a function of pH and temperature. See Table 3 in Overview Report Update September 2009.
The 30-day average guideline for ammonia varies as a function of pH and temperature. See Table 4 in Overview Report Update September 2009. / The lab pH and field temperature results were used for determining the maximum ammonia for this report. If a lab pH result was not available then the field pH result was used.

Note 1.33 for Nitrate (as N):
The guideline maximum for nitrate (as N) is 32.8 mg/l.
The 30-day average guideline for nitrate (as N) is 3.0 mg /L. The 30-day average (chronic) concentration is based on 5 weekly samples collected within a 30-day period.
Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed these values.

Note 1.34 for Nitrate + Nitrite (as N):
The guideline maximum for nitrate (as N) is 32.8 mg/l.
The 30-day average guideline for nitrate (as N) is 3.0 mg /L. The 30-day average (chronic) concentration is based on 5 weekly samples collected within a 30-day period.
Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed these values.

Note 1.35 for Nitrate + Nitrite (as N) (calculated):
The guideline maximum for nitrate (as N) is 32.8 mg/l.
The 30-day average guideline for nitrate (as N) is 3.0 mg /L. The 30-day average (chronic) concentration is based on 5 weekly samples collected within a 30-day period.
Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed these values.

Note 1.36 for Nitrite (as N):
The guideline maximum for nitrite as N is:
0.06 mg/L if chloride less than 2 mg/L
0.12 mg/L if chloride is 2 to 4 mg/L
0.18 mg/L if chloride is 4 to 6 mg/L
0.24 mg/L if chloride is 6 to 8 mg/L
0.30 mg/L if chloride is 8 to 10 mg/L
0.60 mg/L if chloride is greater than 10 mg/L.
The guideline 30-day average for nitrite as N is:
0.02 mg/L if chloride less than 2 mg/L
0.04 mg/L if chloride is 2 to 4 mg/L
0.06 mg/L if chloride is 4 to 6 mg/L
0.08 mg/L if chloride is 6 to 8 mg/L
0.10 mg/L if chloride is 8 to 10 mg/L
0.20 mg/L if chloride is greater than 10 mg/L.

Note 1.37 for Phosphorus (dissolved, by ICPMS/ICPOES):
Streams: None proposed for streams.
Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

Note 1.38 for Phosphorus (total, by ICPMS/ICPOES):

Streams: None proposed for streams.
Lakes: It is not possible to specify a single phosphorous concentration to achieve protection of aquatic life in lakes. A range of total phosphorous concentrations (5-15 µg/L) is suggested as the criterion which can be used as the basis for site specific water quality objectives.

2. Notes for Working Water Quality Guidelines for British Columbia for freshwater aquatic life (BCWWQG AL)
General Notes:
Reference: Working Water Quality Guidelines for British Columbia (2015). WWQG values are long-term (i.e. average) concentrations unless identified as a short-term maximum in the "Notes" for a specific analyte. Long-term WWQGs represent average substance concentrations calculated from 5 samples in 30 days. WWQG are given for total substance concentrations unless otherwise noted.

Note 2.1 for Alkalinity (total, as CaCO3):
The guideline for alkalinity (total as CaCO3) is as follows:
- Less than 10 mg/L, highly sensitive to acid inputs
- 10 to 20 mg/L, moderately sensitive to acid inputs
- Greater than 20 mg/L, low sensitivity to acid inputs.

Note 2.2 for Antimony (dissolved):
The guideline is for antimony (III).

Note 2.3 for Antimony (total):
The guideline is for antimony (III).

Note 2.4 for Calcium (dissolved):
The guideline for dissolved calcium in mg/L is as follows:
- Less than 4, highly sensitive to acid inputs
- 4 to 8, moderately sensitive
- Greater than 8, low sensitivity.

Note 2.5 for Chromium (dissolved):
The guideline for Cr(VI) is 1 µg/L (total). The guideline for Cr(III) is 8.9 µg/L (total). The guideline of 1 µg/L for Cr(VI) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 2.6 for Chromium (total):
The guideline for Cr(VI) is 1 µg/L (total). The guideline for Cr(III) is 8.9 µg/L (total). The guideline of 1 µg/L for Cr(VI) was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the Cr(VI) and/or Cr(III) guidelines.

Note 2.7 for Nickel (dissolved):
The guideline for nickel in µg/L is determined as follows:
When the water hardness is 0 to ≤ 60 mg/L, the maximum is 25 µg/L
At hardness > 60 to ≤ 180 mg/L the maximum is calculated using the equation:
e raised to the power of {0.76[ln(hardness)] + 1.06}
At hardness >180 mg/L, the maximum is 150 µg/L
Where water hardness is reported as mg/L CaCO3.
If the water hardness is unknown, the maximum is 25 µg/L.

Note 2.8 for Nickel (total):
The guideline for nickel in µg/L is determined as follows:
When the water hardness is 0 to ≤ 60 mg/L, the maximum is 25 µg/L
At hardness > 60 to ≤ 180 mg/L the maximum is calculated using the equation:
e raised to the power of {0.76[ln(hardness)] + 1.06}
At hardness >180 mg/L, the maximum is 150 µg/L
Where water hardness is reported as mg/L CaCO3.
If the water hardness is unknown, the maximum is 25 µg/L.

Note 2.9 for Thallium (dissolved):
30-day average, site-specific objective for the lower Columbia River, BC

Note 2.10 for Thallium (total):
30-day average, site-specific objective for the lower Columbia River, BC

3. Notes for Guidelines for Canadian Drinking Water Quality - Maximum Acceptable Concentrations (GCDWQ MAC)
Note 3.1 for Turbidity:
Waterworks systems that use a surface water source or a groundwater source under the direct influence of surface water should filter the source water to meet health-based turbidity limits, as defined for specific treatment technologies. Where possible, filtration systems should be designed and operated to reduce turbidity levels as low as possible, with a treated water turbidity target of less than 0.1 NTU at all times. Where this is not achievable, the treated water turbidity levels from individual filters should meet the requirements described in GCDWQ.
For systems that use groundwater that is not under the direct influence of surface water, which are considered less vulnerable to faecal contamination, turbidity should generally be below 1.0 NTU.
For effective operation of the distribution system, it is good practice to ensure that water entering the distribution system has turbidity levels below 1.0 NTU.

Note 3.2 for Arsenic (dissolved):
Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 3.3 for Arsenic (total):
Every effort should be made to maintain arsenic levels in drinking water as low as reasonably achievable.

Note 3.4 for Nitrate + Nitrite (as N):

The MAC for Nitrate (as N) is 10 mg/L

Note 3.5 for Nitrate + Nitrite (as N) (calculated):

The MAC for Nitrate (as N) is 10 mg/L

4. Notes for Guidelines for Canadian Drinking Water Quality - Aesthetic Objectives (GCDWQ AO)

Note 4.1 for Sulphate:

There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L. Health authorities should be notified of drinking water sources containing above 500 mg/L.

Note 4.2 for Aluminum (dissolved):

This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance value of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.

Note 4.3 for Aluminum (total):

This is an operational guidance value, designed to apply only to drinking water treatment plants using aluminum-based coagulants. The operational guidance value of 0.1 mg/L applies to conventional treatment plants, and 0.2 mg/L applies to other types of treatment systems.

5. Notes for BC Approved Water Quality Guidelines for drinking water (BCAWQG DW)

General Notes:

The Water Quality Guidelines (Criteria) Reports by BC Ministry of Environment were used as references for the guidelines. (Internet address: http://www.env.gov.bc.ca/wat/wq/wq_guidelines.html). Overview Reports (BC MOE) were used as the references for the guidelines unless the note for specific analyte indicates that the Technical Appendix (BC MOE) was used. Drinking water guidelines are, in some cases, for raw water before treatment.

Note 5.1 for pH:

Designed to minimize solubilization of heavy metals and salts from water distribution pipes and the precipitation of carbonate salts in the distribution system, and maximize the effectiveness of chlorination. However, natural source water outside the guidelines may be safe to drink from a public health perspective.

Note 5.2 for Temperature:

The guideline for maximum temperature for drinking water is 15 degrees.

Note 5.3 for Chloride:

The guideline maximum for chloride in drinking water (for aesthetic reasons) is 250 mg/L.

Note 5.4 for pH:

Designed to minimize solubilization of heavy metals and salts from water distribution pipes and the precipitation of carbonate salts in the distribution system, and maximize the effectiveness of chlorination. However, natural source water outside the guidelines may be safe to drink from a public health perspective.

Note 5.5 for Turbidity:

Turbidity guidelines for raw drinking water follow;

• Drinking Water - raw untreated:

For raw waters of exceptional clarity (less than or equal to 5 NTU) which normally do not require treatment to reduce natural turbidity, induced turbidity should not exceed 1 NTU and the total turbidity should not exceed 5 NTU at any time.

• Drinking Water - raw treated:

For raw waters which normally require some form of treatment to reduce natural turbidity to a level that complies with the standard for finished water (5 NTU) in British Columbia, induced turbidity should not exceed 5 NTU when background turbidity is less than or equal to 50 NTU. When background is greater than 50 NTU, the induced turbidity should not be more than 10% of background.

Note 5.6 for Aluminum (dissolved):

The guideline maximum for dissolved aluminum is 0.2 mg/L (based on aesthetic considerations). This criterion would apply to both untreated raw water and raw water treated to remove suspended solids.

Note 5.7 for Arsenic (dissolved):

The interim guideline maximum for total arsenic in drinking water is 25 µg/L.

Note 5.8 for Arsenic (total):

The interim guideline maximum for total arsenic in drinking water is 25 µg/L.

Note 5.9 for Boron (dissolved):

The guideline maximum for total boron in drinking water is 5 mg/L.

Note 5.10 for Copper (dissolved):

In raw drinking water with or without treatment, total copper should not exceed 500 µg/L.

Note 5.11 for Copper (total):

In raw drinking water with or without treatment, total copper should not exceed 500 µg/L.

Note 5.12 for Lead (dissolved):

In raw drinking water, with and without treatment, the total lead concentration should not exceed 50 µg/L at any time.

Note 5.13 for Lead (total):

In raw drinking water, with and without treatment, the total lead concentration should not exceed 50 µg/L at any time.

Note 5.14 for Mercury (dissolved):

The concentration of total mercury in raw drinking water should not exceed 1.0 µg/L at any time.

Note 5.15 for Mercury (total):

The concentration of total mercury in raw drinking water should not exceed 1.0 µg/L at any time.

Note 5.16 for Molybdenum (dissolved):

The guideline maximum for total molybdenum in raw untreated drinking water is 0.25 mg/L.

Note 5.17 for Molybdenum (total):

The guideline maximum for total molybdenum in raw untreated drinking water is 0.25 mg/L.

Note 5.18 for Selenium (dissolved):

The guideline maximum for total selenium in drinking water is 10 µg/L.
Note 5.19 for Selenium (total):
The guideline maximum for total selenium in drinking water is 10 µg/L.
Note 5.20 for Zinc (dissolved):
The guideline maximum for total zinc in drinking water is 5.0 mg/L.
Note 5.21 for Zinc (total):
The guideline maximum for total zinc in drinking water is 5.0 mg/L.
Note 5.22 for Nitrate (as N):
Overview Report Update, September 2009
Note 5.23 for Nitrate + Nitrite (as N):
The guideline maximum for nitrate as nitrogen is 10 mg/l. Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed this value. Overview Report Update, September 2009
Note 5.24 for Nitrate + Nitrite (as N) (calculated):
The guideline maximum for nitrate as nitrogen is 10 mg/l. Where nitrate and nitrite are present, the total nitrate+nitrite nitrogen should not exceed this value. Overview Report Update, September 2009
Note 5.25 for Nitrite (as N):
Overview Report Update, September 2009
Note 5.26 for Phosphorus (dissolved, by ICPMS/ICPOES):
For lakes used as a source of drinking water, the total phosphorous concentration should not exceed 10 µg/L. No guideline is recommended for streams.
Note 5.27 for Phosphorus (total, by ICPMS/ICPOES):
For lakes used as a source of drinking water, the total phosphorous concentration should not exceed 10 µg/L. No guideline is recommended for streams.

6. Notes for BC CSR, Schedule 6, Generic Numerical Water Standards for Freshwater Aquatic Life (BC CSR AW)
General Notes:
Water Standards from Schedule 6, for freshwater aquatic life, have been applied.
Aquatic life standards assume minimum 1:10 dilution available.
Standards for all organic substances are for total substance concentrations. Standards for surface water samples to be analyzed for heavy metals, metalloids and inorganic ions are total substance concentrations. Standards for groundwater samples for heavy metals, metalloids and inorganic ions are for dissolved substance concentrations.
Note 6.1 for Fluoride:
The standard for fluoride is:
2000 µg/L where water hardness is less than 50 mg/L as CaCO3;
3000 µg/L where water hardness is greater than or equal to 50 mg/L as CaCO3
Note 6.2 for Cadmium (dissolved):
The standard for cadmium is as follows:
0.1 µg/L at hardness less than 30 mg/L as CaCO3
0.3 µg/L at hardness of 30 to 90 mg/L as CaCO3
0.5 µg/L at hardness of 90 to 150 mg/L as CaCO3
0.6 µg/L at hardness of 150 to 210 mg/L as CaCO3
0.6 µg/L at hardness greater than 210 mg/L as CaCO3
Note 6.3 for Cadmium (total):
The standard for cadmium is as follows:
0.1 µg/L at hardness less than 30 mg/L as CaCO3
0.3 µg/L at hardness of 30 to 90 mg/L as CaCO3
0.5 µg/L at hardness of 90 to 150 mg/L as CaCO3
0.6 µg/L at hardness of 150 to 210 mg/L as CaCO3
0.6 µg/L at hardness greater than 210 mg/L as CaCO3
Note 6.4 for Chromium (dissolved):
Standard Standard is 0.010 mg/L for chromium VI. Standard is 0.090 mg/L for chromium III. The guideline of 0.010 mg/L was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the chromium VI and/or chromium III guidelines.
Note 6.5 for Chromium (total):
Standard Standard is 0.010 mg/L for chromium VI. Standard is 0.090 mg/L for chromium III. The guideline of 0.010 mg/L was used, in this report, to identify exceedances for dissolved chromium, and total chromium as a means for determining the potential for exceeding the chromium VI and/or chromium III guidelines.
Note 6.6 for Copper (dissolved):
The standard for copper is as follows:
20 µg/L at hardness less than 50 mg/L as CaCO3
30 µg/L at hardness of 50 to 75 mg/L as CaCO3
40 µg/L at hardness of 75 to 100 mg/L as CaCO3
50 µg/L at hardness of 100 to 125 mg/L as CaCO3
60 µg/L at hardness of 125 to 150 mg/L as CaCO3
70 µg/L at hardness of 150 to 175 mg/L as CaCO3
80 µg/L at hardness of 175 to 200 mg/L as CaCO3
90 µg/L at hardness greater than 200 mg/L as CaCO3
Note 6.7 for Copper (total):

The standard for copper is as follows:
20 µg/L at hardness less than 50 mg/L as CaCO3
30 µg/L at hardness of 50 to 75 mg/L as CaCO3
40 µg/L at hardness of 75 to 100 mg/L as CaCO3
50 µg/L at hardness of 100 to 125 mg/L as CaCO3
60 µg/L at hardness of 125 to 150 mg/L as CaCO3
70 µg/L at hardness of 150 to 175 mg/L as CaCO3
80 µg/L at hardness of 175 to 200 mg/L as CaCO3
90 µg/L at hardness greater than 200 mg/L as CaCO3

Note 6.8 for Lead (dissolved):
The standard for lead is as follows:
40 µg/L for hardness less than 50 mg/L as CaCO3
50 µg/L at hardness of 50 to 100 mg/L as CaCO3
60 µg/L at hardness of 100 to 200 mg/L as CaCO3
110 µg/L at hardness of 200 to 300 mg/L as CaCO3
160 µg/L at hardness greater than 300 mg/L as CaCO3

Note 6.9 for Lead (total):
The standard for lead is as follows:
40 µg/L for hardness less than 50 mg/L as CaCO3
50 µg/L at hardness of 50 to 100 mg/L as CaCO3
60 µg/L at hardness of 100 to 200 mg/L as CaCO3
110 µg/L at hardness of 200 to 300 mg/L as CaCO3
160 µg/L at hardness greater than 300 mg/L as CaCO3

Note 6.10 for Nickel (dissolved):
The standard for nickel is as follows:
250 µg/L for hardness less than 60 mg/L as CaCO3
650 µg/L at hardness of 60 to 120 mg/L as CaCO3
1100 µg/L at hardness of 120 to 180mg/L as CaCO3
1500 µg/L at hardness greater than 180 mg/L as CaCO3

Note 6.11 for Nickel (total):
The standard for nickel is as follows:
250 µg/L for hardness less than 60 mg/L as CaCO3
650 µg/L at hardness of 60 to 120 mg/L as CaCO3
1100 µg/L at hardness of 120 to 180mg/L as CaCO3
1500 µg/L at hardness greater than 180 mg/L as CaCO3

Note 6.12 for Silver (dissolved):
The standard for silver is:
0.5 µg/L where water hardness is less than 100 mg/L as CaCO3;
15 µg/L where water hardness is greater than or equal to 100 mg/L as CaCO3

Note 6.13 for Silver (total):
The standard for silver is:
0.5 µg/L where water hardness is less than 100 mg/L as CaCO3;
15 µg/L where water hardness is greater than or equal to 100 mg/L as CaCO3

Note 6.14 for Zinc (dissolved):
The standard for zinc is as follows:
75 µg/L for hardness less than 90 mg/L as CaCO3
150 µg/L at hardness of 90 to 100 mg/L as CaCO3
900 µg/L at hardness of 100 to 200mg/L as CaCO3
1650 µg/L at hardness of 200 to 300mg/L as CaCO3
2400 µg/L at hardness of 300 to 400mg/L as CaCO3
2400 µg/L at hardness greater than 400 mg/L as CaCO3

Note 6.15 for Zinc (total):
The standard for zinc is as follows:
75 µg/L for hardness less than 90 mg/L as CaCO3
150 µg/L at hardness of 90 to 100 mg/L as CaCO3
900 µg/L at hardness of 100 to 200mg/L as CaCO3
1650 µg/L at hardness of 200 to 300mg/L as CaCO3
2400 µg/L at hardness of 300 to 400mg/L as CaCO3
2400 µg/L at hardness greater than 400 mg/L as CaCO3

Note 6.16 for Ammonia (total, as N):
Standard varies with pH and temperature.The freshwater CSR Schedule 6 aquatic life standards are based on “Table 4. Average 30-day Concentration of Total Ammonia Nitrogen for Protection of Aquatic Life” from the approved guidelines, which is available at: http://www.env.gov.bc.ca/wat/wq/BCguidelines/nitrogen/nitrogen.html#tab4. That table provides pH (6.5 – 9.0) and temperature (0° C – 20° C) dependent freshwater guidelines for ammonia.
The above table is used to derive pH and temperature specific freshwater water quality standards in this report. / The lab pH and field temperature results were used for determining the maximum ammonia for this report. If a lab pH result was not available then the field pH result was used.

Note 6.17 for Nitrate (as N):
Standard may not protect all amphibians. Consult director for further advice.

Note 6.18 for Nitrate + Nitrite (as N):
Standard may not protect all amphibians. Consult director for further advice.
Note 6.19 for Nitrate + Nitrite (as N) (calculated):
Standard may not protect all amphibians. Consult director for further advice.
Note 6.20 for Nitrite (as N):
The standard for nitrite as N is:
200 µg/L if chloride less than 2 mg/L
400 µg/L if chloride is 2 to 4 mg/L
600 µg/L if chloride is 4 to 6 mg/L
800 µg/L if chloride is 6 to 8 mg/L
1000 µg/L if chloride is 8 to 10 mg/L
2000 µg/L if chloride is greater than 10 mg/L
7. Notes for BC CSR, Schedule 6 and 10, Generic Numerical Water Standards for Drinking Water (BC CSR DW)
General Notes:
Water Standards from Schedule 6, and 10, for drinking water, have been applied.
Drinking water standards are for unfiltered samples obtained at the point of consumption. Heavy metals, metalloids and inorganic ions are expressed as total substance concentrations unless otherwise indicated.
Note 7.1 for Chloride:
Standard to protect against taste and odour concerns.
Note 7.2 for Sulphate:
Standard to protect against taste and odour concerns.
Note 7.3 for Aluminum (dissolved):
Standard is specific to protection of human health. Standard has been derived based on a toxicological reference value (TRV) protective of adults. Standard may not adequately protect other age groups.
Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.
Note 7.4 for Aluminum (total):
Standard is specific to protection of human health. Standard has been derived based on a toxicological reference value (TRV) protective of adults. Standard may not adequately protect other age groups.
Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.
Note 7.5 for Copper (dissolved):
Standard to protect against taste and odour concerns.
Note 7.6 for Copper (total):
Standard to protect against taste and odour concerns.
Note 7.7 for Iron (dissolved):
Standard is specific to protection of human health. Standard has been derived based on a toxicological reference value (TRV) protective of adults. Standard may not adequately protect other age groups.
Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.
The water standards for iron only apply to sites with one or more Schedule 2 Industrial and Commercial Purposes and Activities (Schedule 2 activities).
The water standards for iron apply to the following Schedule 2 activities:
A6. ink or dye manufacturing or wholesale bulk storage
A7. leather or hides tanning
A8. paint, lacquer or varnish manufacturing, formulation, recycling or wholesale bulk storage
A11. textile dying
C1. foundries or scrap metal smelting
C2. galvanizing
C3. metal plating or finishing
C4. metal salvage operations
C6. welding or machine shops (repair or fabrication)
D2. coal coke manufacture, wholesale bulk storage or shipping
D3. coal or lignite mining, milling, wholesale bulk storage or shipping
D5. nonferrous metal concentrate wholesale bulk storage or shipping
D6. nonferrous metal mining or milling
E4. coal gasification (manufactured gas production)
H14. mine tailings waste disposal
The water standards for iron apply to sites used for the following additional Schedule 2 activities, but only if they occurred in conjunction with one or more of the Schedule 2 activities listed above:
H11. industrial waste lagoons or impoundments
H20. hazardous waste storage, treatment or disposal
Note 7.8 for Iron (total):

Standard is specific to protection of human health. Standard has been derived based on a toxicological reference value (TRV) protective of adults. Standard may not adequately protect other age groups.
Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.
The water standards for iron only apply to sites with one or more Schedule 2 Industrial and Commercial Purposes and Activities (Schedule 2 activities).
The water standards for iron apply to the following Schedule 2 activities:
A6. ink or dye manufacturing or wholesale bulk storage
A7. leather or hides tanning
A8. paint, lacquer or varnish manufacturing, formulation, recycling or wholesale bulk storage
A11. textile dying
C1. foundries or scrap metal smelting
C2. galvanizing
C3. metal plating or finishing
C4. metal salvage operations
C6. welding or machine shops (repair or fabrication)
D2. coal coke manufacture, wholesale bulk storage or shipping
D3. coal or lignite mining, milling, wholesale bulk storage or shipping
D5. nonferrous metal concentrate wholesale bulk storage or shipping
D6. nonferrous metal mining or milling
E4. coal gasification (manufactured gas production)
H14. mine tailings waste disposal
The water standards for iron apply to sites used for the following additional Schedule 2 activities, but only if they occurred in conjunction with one or more of the Schedule 2 activities listed above:
H11. industrial waste lagoons or impoundments
H20. hazardous waste storage, treatment or disposal

Note 7.9 for Magnesium (dissolved):
Standard to protect against taste and odour concerns.

Note 7.10 for Magnesium (total):
Standard to protect against taste and odour concerns.

Note 7.11 for Manganese (dissolved):
Standard is specific to protection of human health. Standard has been derived based on a toxicological reference value (TRV) protective of adults. Standard may not adequately protect other age groups.
Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.
The water standards for manganese only apply to sites with one or more Schedule 2 Industrial and Commercial Purposes and Activities (Schedule 2 activities).
The water standards for manganese apply to sites used for the following Schedule 2 activities:
B1. battery (lead acid or other) manufacturing or wholesale bulk storage
C1. foundries or scrap metal smelting
C3. metal plating or finishing
C4. metal salvage operations
D2. coal coke manufacture, wholesale bulk storage or shipping
D3. coal or lignite mining, milling, wholesale bulk storage or shipping
D5. nonferrous metal concentrate wholesale bulk storage or shipping
D6. nonferrous metal mining or milling
E4. coal gasification (manufactured gas production)
H3. battery (lead acid or other) recycling
H14. mine tailings waste disposal
The water standards for manganese apply to sites used for the following additional Schedule 2 activities, but only if they occurred in conjunction with one or more of the Schedule 2 activities listed above:
H11. industrial waste lagoons or impoundments
H20. hazardous waste storage, treatment or disposal

Note 7.12 for Manganese (total):

Standard is specific to protection of human health. Standard has been derived based on a toxicological reference value (TRV) protective of adults. Standard may not adequately protect other age groups.
Standard may not address aesthetic (organoleptic) concerns related to drinking water quality. Water treatment may be required.
The water standards for manganese only apply to sites with one or more Schedule 2 Industrial and Commercial Purposes and Activities (Schedule 2 activities).
The water standards for manganese apply to sites used for the following Schedule 2 activities:
B1. battery (lead acid or other) manufacturing or wholesale bulk storage
C1. foundries or scrap metal smelting
C3. metal plating or finishing
C4. metal salvage operations
D2. coal coke manufacture, wholesale bulk storage or shipping
D3. coal or lignite mining, milling, wholesale bulk storage or shipping
D5. nonferrous metal concentrate wholesale bulk storage or shipping
D6. nonferrous metal mining or milling
E4. coal gasification (manufactured gas production)
H3. battery (lead acid or other) recycling
H14. mine tailings waste disposal
The water standards for manganese apply to sites used for the following additional Schedule 2 activities, but only if they occurred in conjunction with one or more of the Schedule 2 activities listed above:
H11. industrial waste lagoons or impoundments
H20. hazardous waste storage, treatment or disposal

Note 7.13 for Sodium (dissolved):
Standard to protect against taste and odour concerns.

Note 7.14 for Sodium (total):
Standard to protect against taste and odour concerns.

Note 7.15 for Zinc (dissolved):
Standard to protect against taste and odour concerns.

Note 7.16 for Zinc (total):
Standard to protect against taste and odour concerns.

Note 7.17 for Nitrate (as N):
Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 7.18 for Nitrate + Nitrite (as N):
Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Note 7.19 for Nitrate + Nitrite (as N) (calculated):
Where nitrate and nitrite are present, total nitrate plus nitrite-nitrogen should not exceed this value.

Appendix D

Water Quality Reports

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4	**TEL** **FAX**	(250) 541-1030 (250) 575-4764
ATTENTION	Bryer Manwell	**WORK ORDER**	5051773
PO NUMBER		**RECEIVED / TEMP**	May-26-15 08:05 / 7°C
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15
PROJECT INFO	14-024-016	**COC NUMBER**	B 34191

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

The results in this report apply to the samples analyzed in accordance with the Chain of Custody or Sample Requisition document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Authorized By: **Ed Hoppe, B.Sc., P.Chem.**
Division Manager, Kelowna

Please contact CARO if more information is needed or to provide feedback on our services.

Locations:

#110 4011 Viking Way
Richmond, BC V6V 2K9
Tel: 604-279-1499 Fax: 604-279-1599

#102 3677 Highway 97N
Kelowna, BC V1X 5C3
Tel: 250-765-9646 Fax: 250-765-3893

17225 109 Avenue
Edmonton, AB T5S 1H7
Tel: 780-489-9100 Fax: 780-489-9700

www.caro.ca

ANALYSIS INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analysis Description	Method Reference	Technique	Location
Alkalinity (Total)	APHA 2320 B	Titration with H2SO4 to pH 4.5	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3)	APHA 2340 B	Calculation	N/A
Mercury, dissolved by CVAFS	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Mercury, total by CVAFS	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Ammonia-N in Water	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Total Recoverable Metals	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Total Suspended Solids	APHA 2540 D*	Gravimetry (Dried at 103-105C)	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation
EPA	United States Environmental Protection Agency Test Methods

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre

SAMPLE ANALYTICAL DATA

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (5051773-01) [Waste Water] Sampled: May-25-15 10:00						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	May-28-15	
Chloride	**28.7**	0.10	mg/L	N/A	May-28-15	
Fluoride	< 0.10	0.10	mg/L	N/A	May-28-15	
Nitrate as N	**0.890**	0.010	mg/L	N/A	May-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	May-28-15	
Sulfate	**24.3**	1.0	mg/L	N/A	May-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**303**	1	mg/L	N/A	May-28-15	
Conductivity (EC)	**672**	2	µS/cm	N/A	May-28-15	
Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	May-28-15	
pH	**7.81**	0.01	pH units	N/A	May-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	May-28-15	May-29-15	
Turbidity	< 0.1	0.1	NTU	N/A	May-28-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**346**	0.50	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Antimony, total	**0.0001**	0.0001	mg/L	May-31-15	Jun-01-15	
Arsenic, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Barium, total	**0.142**	0.005	mg/L	May-31-15	Jun-01-15	
Beryllium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Boron, total	**0.006**	0.004	mg/L	May-31-15	Jun-01-15	
Cadmium, total	< 0.00001	0.00001	mg/L	May-31-15	Jun-01-15	
Calcium, total	**90.4**	0.2	mg/L	May-31-15	Jun-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Cobalt, total	< 0.00005	0.00005	mg/L	May-31-15	Jun-01-15	
Copper, total	**0.0010**	0.0002	mg/L	May-31-15	Jun-01-15	
Iron, total	**0.01**	0.01	mg/L	May-31-15	Jun-01-15	
Lead, total	**0.0001**	0.0001	mg/L	May-31-15	Jun-01-15	
Lithium, total	**0.0014**	0.0001	mg/L	May-31-15	Jun-01-15	
Magnesium, total	**29.2**	0.01	mg/L	May-31-15	Jun-01-15	
Manganese, total	**0.0011**	0.0002	mg/L	May-31-15	Jun-01-15	
Mercury, total	< 0.00002	0.00002	mg/L	Jun-01-15	Jun-02-15	
Molybdenum, total	**0.0005**	0.0001	mg/L	May-31-15	Jun-01-15	
Nickel, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Phosphorus, total	< 0.020	0.020	mg/L	May-31-15	Jun-01-15	
Potassium, total	**1.03**	0.02	mg/L	May-31-15	Jun-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Silicon, total	**4.7**	0.5	mg/L	May-31-15	Jun-01-15	
Silver, total	< 0.00005	0.00005	mg/L	May-31-15	Jun-01-15	
Sodium, total	**18.9**	0.02	mg/L	May-31-15	Jun-01-15	
Strontium, total	**0.296**	0.001	mg/L	May-31-15	Jun-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (5051773-01) [Waste Water] Sampled: May-25-15 10:00, Continued						
Total Recoverable Metals, Continued						
Sulfur, total	**9**	1	mg/L	May-31-15	Jun-01-15	
Tellurium, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	May-31-15	Jun-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Tin, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Titanium, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Uranium, total	**0.00112**	0.00002	mg/L	May-31-15	Jun-01-15	
Vanadium, total	< 0.001	0.001	mg/L	May-31-15	Jun-01-15	
Zinc, total	< 0.004	0.004	mg/L	May-31-15	Jun-01-15	
Zirconium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Sample ID: Town Well #4 (5051773-02) [Waste Water] Sampled: May-25-15 10:20						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	May-28-15	
Chloride	**81.2**	0.10	mg/L	N/A	May-28-15	
Fluoride	< 0.10	0.10	mg/L	N/A	May-28-15	
Nitrate as N	**1.53**	0.010	mg/L	N/A	May-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	May-28-15	
Sulfate	**40.0**	1.0	mg/L	N/A	May-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**328**	1	mg/L	N/A	May-28-15	
Conductivity (EC)	**911**	2	µS/cm	N/A	May-28-15	
Ammonia as N, Total	**0.038**	0.020	mg/L	N/A	May-28-15	
pH	**7.83**	0.01	pH units	N/A	May-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	May-28-15	May-29-15	
Turbidity	< 0.1	0.1	NTU	N/A	May-28-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**393**	0.50	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Antimony, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Arsenic, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Barium, total	**0.193**	0.005	mg/L	May-31-15	Jun-01-15	
Beryllium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Boron, total	**0.015**	0.004	mg/L	May-31-15	Jun-01-15	
Cadmium, total	< 0.00001	0.00001	mg/L	May-31-15	Jun-01-15	
Calcium, total	**91.7**	0.2	mg/L	May-31-15	Jun-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Cobalt, total	< 0.00005	0.00005	mg/L	May-31-15	Jun-01-15	
Copper, total	**0.0039**	0.0002	mg/L	May-31-15	Jun-01-15	
Iron, total	< 0.01	0.01	mg/L	May-31-15	Jun-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #4 (5051773-02) [Waste Water] Sampled: May-25-15 10:20, Continued						
Total Recoverable Metals, Continued						
Lead, total	**0.0001**	0.0001	mg/L	May-31-15	Jun-01-15	
Lithium, total	**0.0020**	0.0001	mg/L	May-31-15	Jun-01-15	
Magnesium, total	**39.8**	0.01	mg/L	May-31-15	Jun-01-15	
Manganese, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Mercury, total	< 0.00002	0.00002	mg/L	Jun-01-15	Jun-02-15	
Molybdenum, total	**0.0003**	0.0001	mg/L	May-31-15	Jun-01-15	
Nickel, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Phosphorus, total	< 0.020	0.020	mg/L	May-31-15	Jun-01-15	
Potassium, total	**1.86**	0.02	mg/L	May-31-15	Jun-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Silicon, total	**4.8**	0.5	mg/L	May-31-15	Jun-01-15	
Silver, total	< 0.00005	0.00005	mg/L	May-31-15	Jun-01-15	
Sodium, total	**46.9**	0.02	mg/L	May-31-15	Jun-01-15	
Strontium, total	**0.425**	0.001	mg/L	May-31-15	Jun-01-15	
Sulfur, total	**14**	1	mg/L	May-31-15	Jun-01-15	
Tellurium, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	May-31-15	Jun-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Tin, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Titanium, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Uranium, total	**0.00115**	0.00002	mg/L	May-31-15	Jun-01-15	
Vanadium, total	< 0.001	0.001	mg/L	May-31-15	Jun-01-15	
Zinc, total	< 0.004	0.004	mg/L	May-31-15	Jun-01-15	
Zirconium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Sample ID: DMW - 4 (5051773-03) [Water] Sampled: May-25-15 11:10						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	May-28-15	
Chloride	**12.1**	0.10	mg/L	N/A	May-28-15	
Fluoride	**0.89**	0.10	mg/L	N/A	May-28-15	
Nitrate as N	**0.530**	0.010	mg/L	N/A	May-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	May-28-15	
Sulfate	**275**	1.0	mg/L	N/A	May-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**430**	1	mg/L	N/A	May-28-15	
Conductivity (EC)	**1220**	2	µS/cm	N/A	May-28-15	
Ammonia as N, Total	**1.26**	0.020	mg/L	N/A	May-28-15	
pH	**7.79**	0.01	pH units	N/A	May-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	May-28-15	May-29-15	
Turbidity	**0.5**	0.1	NTU	N/A	May-28-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**619**	0.50	mg/L	N/A	N/A	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (5051773-03) [Water] Sampled: May-25-15 11:10, Continued						
Total Recoverable Metals						
Aluminum, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Antimony, total	**0.0002**	0.0001	mg/L	May-31-15	Jun-01-15	
Arsenic, total	**0.0014**	0.0005	mg/L	May-31-15	Jun-01-15	
Barium, total	**0.017**	0.005	mg/L	May-31-15	Jun-01-15	
Beryllium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Boron, total	**0.659**	0.004	mg/L	May-31-15	Jun-01-15	
Cadmium, total	**0.00001**	0.00001	mg/L	May-31-15	Jun-01-15	
Calcium, total	**79.0**	0.2	mg/L	May-31-15	Jun-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Cobalt, total	**0.00079**	0.00005	mg/L	May-31-15	Jun-01-15	
Copper, total	**0.0100**	0.0002	mg/L	May-31-15	Jun-01-15	
Iron, total	**0.04**	0.01	mg/L	May-31-15	Jun-01-15	
Lead, total	**0.0004**	0.0001	mg/L	May-31-15	Jun-01-15	
Lithium, total	**0.0696**	0.0001	mg/L	May-31-15	Jun-01-15	
Magnesium, total	**102**	0.01	mg/L	May-31-15	Jun-01-15	
Manganese, total	**0.0048**	0.0002	mg/L	May-31-15	Jun-01-15	
Mercury, total	< 0.00002	0.00002	mg/L	Jun-01-15	Jun-02-15	
Molybdenum, total	**0.0006**	0.0001	mg/L	May-31-15	Jun-01-15	
Nickel, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Phosphorus, total	< 0.020	0.020	mg/L	May-31-15	Jun-01-15	
Potassium, total	**11.7**	0.02	mg/L	May-31-15	Jun-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Silicon, total	**7.0**	0.5	mg/L	May-31-15	Jun-01-15	
Silver, total	**0.00005**	0.00005	mg/L	May-31-15	Jun-01-15	
Sodium, total	**70.3**	0.02	mg/L	May-31-15	Jun-01-15	
Strontium, total	**6.04**	0.001	mg/L	May-31-15	Jun-01-15	
Sulfur, total	**98**	1	mg/L	May-31-15	Jun-01-15	
Tellurium, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	May-31-15	Jun-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Tin, total	**0.0003**	0.0002	mg/L	May-31-15	Jun-01-15	
Titanium, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Uranium, total	**0.00051**	0.00002	mg/L	May-31-15	Jun-01-15	
Vanadium, total	< 0.001	0.001	mg/L	May-31-15	Jun-01-15	
Zinc, total	**0.030**	0.004	mg/L	May-31-15	Jun-01-15	
Zirconium, total	**0.0007**	0.0001	mg/L	May-31-15	Jun-01-15	
Sample ID: DMW - 1b (5051773-04) [Water] Sampled: May-25-15 11:45						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	May-28-15	
Chloride	**39.7**	0.10	mg/L	N/A	May-28-15	
Fluoride	**1.25**	0.10	mg/L	N/A	May-28-15	
Nitrate as N	< 0.010	0.010	mg/L	N/A	May-28-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (5051773-04) [Water] Sampled: May-25-15 11:45, Continued						
Anions, Continued						
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	May-28-15	
Sulfate	**133**	1.0	mg/L	N/A	May-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**490**	1	mg/L	N/A	May-28-15	
Conductivity (EC)	**1150**	2	µS/cm	N/A	May-28-15	
Ammonia as N, Total	**0.234**	0.020	mg/L	N/A	May-28-15	
pH	**7.74**	0.01	pH units	N/A	May-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	May-28-15	May-29-15	
Turbidity	**1.5**	0.1	NTU	N/A	May-28-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**649**	0.50	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	**0.005**	0.005	mg/L	May-31-15	Jun-01-15	
Antimony, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Arsenic, total	**0.0236**	0.0005	mg/L	May-31-15	Jun-01-15	
Barium, total	**0.022**	0.005	mg/L	May-31-15	Jun-01-15	
Beryllium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	
Boron, total	**0.146**	0.004	mg/L	May-31-15	Jun-01-15	
Cadmium, total	< 0.00001	0.00001	mg/L	May-31-15	Jun-01-15	
Calcium, total	**74.3**	0.2	mg/L	May-31-15	Jun-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Cobalt, total	**0.00014**	0.00005	mg/L	May-31-15	Jun-01-15	
Copper, total	**0.0078**	0.0002	mg/L	May-31-15	Jun-01-15	
Iron, total	**0.23**	0.01	mg/L	May-31-15	Jun-01-15	
Lead, total	**0.0022**	0.0001	mg/L	May-31-15	Jun-01-15	
Lithium, total	**0.0243**	0.0001	mg/L	May-31-15	Jun-01-15	
Magnesium, total	**112**	0.01	mg/L	May-31-15	Jun-01-15	
Manganese, total	**0.0047**	0.0002	mg/L	May-31-15	Jun-01-15	
Mercury, total	< 0.00002	0.00002	mg/L	Jun-01-15	Jun-02-15	
Molybdenum, total	**0.0004**	0.0001	mg/L	May-31-15	Jun-01-15	
Nickel, total	**0.0006**	0.0002	mg/L	May-31-15	Jun-01-15	
Phosphorus, total	< 0.020	0.020	mg/L	May-31-15	Jun-01-15	
Potassium, total	**4.93**	0.02	mg/L	May-31-15	Jun-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	May-31-15	Jun-01-15	
Silicon, total	**7.9**	0.5	mg/L	May-31-15	Jun-01-15	
Silver, total	**0.00005**	0.00005	mg/L	May-31-15	Jun-01-15	
Sodium, total	**26.9**	0.02	mg/L	May-31-15	Jun-01-15	
Strontium, total	**1.68**	0.001	mg/L	May-31-15	Jun-01-15	
Sulfur, total	**46**	1	mg/L	May-31-15	Jun-01-15	
Tellurium, total	< 0.0002	0.0002	mg/L	May-31-15	Jun-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	May-31-15	Jun-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	May-31-15	Jun-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (5051773-04) [Water] Sampled: May-25-15 11:45, Continued						
Total Recoverable Metals, Continued						
Tin, total	**0.0004**	0.0002	mg/L	May-31-15	Jun-01-15	
Titanium, total	< 0.005	0.005	mg/L	May-31-15	Jun-01-15	
Uranium, total	**0.00011**	0.00002	mg/L	May-31-15	Jun-01-15	
Vanadium, total	< 0.001	0.001	mg/L	May-31-15	Jun-01-15	
Zinc, total	< 0.004	0.004	mg/L	May-31-15	Jun-01-15	
Zirconium, total	**0.0012**	0.0001	mg/L	May-31-15	Jun-01-15	
Sample ID: TH-8 (5051773-05) [Water] Sampled: May-25-15 12:30						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	May-28-15	
Chloride	**666**	0.10	mg/L	N/A	May-28-15	
Fluoride	**0.26**	0.10	mg/L	N/A	May-28-15	
Nitrate as N	**0.695**	0.010	mg/L	N/A	May-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	May-28-15	
Sulfate	**39.4**	1.0	mg/L	N/A	May-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**492**	1	mg/L	N/A	May-28-15	
Conductivity (EC)	**2890**	2	µS/cm	N/A	May-28-15	
Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	May-28-15	
pH	**7.81**	0.01	pH units	N/A	May-28-15	HT2
Solids, Total Suspended	**214**	2	mg/L	May-28-15	May-29-15	
Turbidity	**122**	0.1	NTU	N/A	May-28-15	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**734**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-01-15	
Antimony, dissolved	**0.0019**	0.0001	mg/L	N/A	Jun-01-15	
Arsenic, dissolved	**0.0039**	0.0005	mg/L	N/A	Jun-01-15	
Barium, dissolved	**0.212**	0.005	mg/L	N/A	Jun-01-15	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Boron, dissolved	**0.020**	0.004	mg/L	N/A	Jun-01-15	
Cadmium, dissolved	**0.00004**	0.00001	mg/L	N/A	Jun-01-15	
Calcium, dissolved	**101**	0.2	mg/L	N/A	Jun-01-15	
Chromium, dissolved	**0.0007**	0.0005	mg/L	N/A	Jun-01-15	
Cobalt, dissolved	**0.00012**	0.00005	mg/L	N/A	Jun-01-15	
Copper, dissolved	**0.0051**	0.0002	mg/L	N/A	Jun-01-15	
Iron, dissolved	**0.015**	0.010	mg/L	N/A	Jun-01-15	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Lithium, dissolved	**0.0188**	0.0001	mg/L	N/A	Jun-01-15	
Magnesium, dissolved	**117**	0.01	mg/L	N/A	Jun-01-15	
Manganese, dissolved	**0.0031**	0.0002	mg/L	N/A	Jun-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: TH-8 (5051773-05) [Water] Sampled: May-25-15 12:30, Continued						
Dissolved Metals, Continued						
Mercury, dissolved	< 0.00002	0.00002	mg/L	Jun-01-15	Jun-02-15	
Molybdenum, dissolved	**0.0006**	0.0001	mg/L	N/A	Jun-01-15	
Nickel, dissolved	**0.0007**	0.0002	mg/L	N/A	Jun-01-15	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-01-15	
Potassium, dissolved	**6.34**	0.02	mg/L	N/A	Jun-01-15	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-01-15	
Silicon, dissolved	**10.4**	0.5	mg/L	N/A	Jun-01-15	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Jun-01-15	
Sodium, dissolved	**365**	0.02	mg/L	N/A	Jun-01-15	
Strontium, dissolved	**1.35**	0.001	mg/L	N/A	Jun-01-15	
Sulfur, dissolved	**16**	1	mg/L	N/A	Jun-01-15	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-01-15	
Thallium, dissolved	**0.00002**	0.00002	mg/L	N/A	Jun-01-15	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-01-15	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-01-15	
Uranium, dissolved	**0.00193**	0.00002	mg/L	N/A	Jun-01-15	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-01-15	
Zinc, dissolved	**0.008**	0.004	mg/L	N/A	Jun-01-15	
Zirconium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Sample ID: MW-6s (5051773-06) [Waste Water] Sampled: May-25-15 13:00						
Anions						
Bromide	**0.47**	0.10	mg/L	N/A	May-28-15	
Chloride	**594**	0.10	mg/L	N/A	May-28-15	
Fluoride	**0.14**	0.10	mg/L	N/A	May-28-15	
Nitrate as N	**38.0**	0.010	mg/L	N/A	May-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	May-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	May-28-15	
Sulfate	**950**	1.0	mg/L	N/A	May-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**855**	1	mg/L	N/A	May-28-15	
Conductivity (EC)	**4640**	2	µS/cm	N/A	May-28-15	
Ammonia as N, Total	**0.644**	0.020	mg/L	N/A	May-28-15	
pH	**7.37**	0.01	pH units	N/A	May-28-15	HT2
Solids, Total Suspended	**22**	2	mg/L	May-28-15	May-29-15	
Turbidity	**6.9**	0.1	NTU	N/A	May-28-15	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**1870**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	< 0.005	0.005	mg/L	N/A	Jun-01-15	
Antimony, dissolved	**0.0005**	0.0001	mg/L	N/A	Jun-01-15	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (5051773-06) [Waste Water] Sampled: May-25-15 13:00, Continued						
Dissolved Metals, Continued						
Barium, dissolved	**0.062**	0.005	mg/L	N/A	Jun-01-15	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Boron, dissolved	**2.04**	0.004	mg/L	N/A	Jun-01-15	
Cadmium, dissolved	**0.00002**	0.00001	mg/L	N/A	Jun-01-15	
Calcium, dissolved	**199**	0.2	mg/L	N/A	Jun-01-15	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-01-15	
Cobalt, dissolved	**0.00141**	0.00005	mg/L	N/A	Jun-01-15	
Copper, dissolved	**0.0028**	0.0002	mg/L	N/A	Jun-01-15	
Iron, dissolved	**0.011**	0.010	mg/L	N/A	Jun-01-15	
Lead, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Lithium, dissolved	**0.0483**	0.0001	mg/L	N/A	Jun-01-15	
Magnesium, dissolved	**332**	0.01	mg/L	N/A	Jun-01-15	
Manganese, dissolved	**0.0747**	0.0002	mg/L	N/A	Jun-01-15	
Mercury, dissolved	< 0.00002	0.00002	mg/L	Jun-01-15	Jun-02-15	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Jun-01-15	
Nickel, dissolved	**0.0093**	0.0002	mg/L	N/A	Jun-01-15	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Jun-01-15	
Potassium, dissolved	**215**	0.02	mg/L	N/A	Jun-01-15	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Jun-01-15	
Silicon, dissolved	**12.7**	0.5	mg/L	N/A	Jun-01-15	
Silver, dissolved	**0.00007**	0.00005	mg/L	N/A	Jun-01-15	
Sodium, dissolved	**385**	0.02	mg/L	N/A	Jun-01-15	
Strontium, dissolved	**1.92**	0.001	mg/L	N/A	Jun-01-15	
Sulfur, dissolved	**343**	1	mg/L	N/A	Jun-01-15	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-01-15	
Thallium, dissolved	**0.00007**	0.00002	mg/L	N/A	Jun-01-15	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Jun-01-15	
Tin, dissolved	< 0.0002	0.0002	mg/L	N/A	Jun-01-15	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Jun-01-15	
Uranium, dissolved	**0.00729**	0.00002	mg/L	N/A	Jun-01-15	
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Jun-01-15	
Zinc, dissolved	**0.006**	0.004	mg/L	N/A	Jun-01-15	
Zirconium, dissolved	**0.0002**	0.0001	mg/L	N/A	Jun-01-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5051773
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Jun-02-15

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5E1446										
Blank (B5E1446-BLK1)				Prepared: May-27-15, Analyzed: May-27-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Phosphate, Ortho as P	< 0.01	0.01	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B5E1446-BLK2)				Prepared: May-28-15, Analyzed: May-28-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Phosphate, Ortho as P	< 0.01	0.01	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B5E1446-BS1)				Prepared: May-27-15, Analyzed: May-27-15						
Bromide	3.93	0.10	mg/L	4.00		98	85-115			
Chloride	16.0	0.10	mg/L	16.0		100	85-115			
Fluoride	3.97	0.10	mg/L	4.00		99	85-115			
Nitrate as N	3.95	0.010	mg/L	4.00		99	85-115			
Nitrite as N	1.98	0.010	mg/L	2.00		99	85-115			
Phosphate, Ortho as P	2.04	0.01	mg/L	2.00		102	85-115			
Sulfate	15.8	1.0	mg/L	16.0		99	85-115			
LCS (B5E1446-BS2)				Prepared: May-28-15, Analyzed: May-28-15						
Bromide	3.88	0.10	mg/L	4.00		97	85-115			
Chloride	16.0	0.10	mg/L	16.0		100	85-115			
Fluoride	3.96	0.10	mg/L	4.00		99	85-115			
Nitrate as N	3.93	0.010	mg/L	4.00		98	85-115			
Nitrite as N	1.98	0.010	mg/L	2.00		99	85-115			
Phosphate, Ortho as P	2.01	0.01	mg/L	2.00		101	85-115			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5E1446, Continued										
LCS (B5E1446-BS2), Continued				Prepared: May-28-15, Analyzed: May-28-15						
Sulfate	15.8	1.0	mg/L	16.0		99	85-115			
Dissolved Metals, Batch B5F0019										
Blank (B5F0019-BLK1)				Prepared: Jun-01-15, Analyzed: Jun-01-15						
Aluminum, dissolved	< 0.005	0.005	mg/L							
Antimony, dissolved	< 0.0001	0.0001	mg/L							
Arsenic, dissolved	< 0.0005	0.0005	mg/L							
Barium, dissolved	< 0.005	0.005	mg/L							
Beryllium, dissolved	< 0.0001	0.0001	mg/L							
Bismuth, dissolved	< 0.0001	0.0001	mg/L							
Boron, dissolved	< 0.004	0.004	mg/L							
Cadmium, dissolved	< 0.00001	0.00001	mg/L							
Calcium, dissolved	< 0.2	0.2	mg/L							
Chromium, dissolved	< 0.0005	0.0005	mg/L							
Cobalt, dissolved	< 0.00005	0.00005	mg/L							
Copper, dissolved	< 0.0002	0.0002	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.0001	0.0001	mg/L							
Lithium, dissolved	< 0.0001	0.0001	mg/L							
Magnesium, dissolved	< 0.01	0.01	mg/L							
Manganese, dissolved	< 0.0002	0.0002	mg/L							
Molybdenum, dissolved	< 0.0001	0.0001	mg/L							
Nickel, dissolved	< 0.0002	0.0002	mg/L							
Phosphorus, dissolved	< 0.02	0.02	mg/L							
Potassium, dissolved	< 0.02	0.02	mg/L							
Selenium, dissolved	< 0.0005	0.0005	mg/L							
Silicon, dissolved	< 0.5	0.5	mg/L							
Silver, dissolved	< 0.00005	0.00005	mg/L							
Sodium, dissolved	< 0.02	0.02	mg/L							
Strontium, dissolved	< 0.001	0.001	mg/L							
Sulfur, dissolved	< 1	1	mg/L							
Tellurium, dissolved	< 0.0002	0.0002	mg/L							
Thallium, dissolved	< 0.00002	0.00002	mg/L							
Thorium, dissolved	< 0.0001	0.0001	mg/L							
Tin, dissolved	< 0.0002	0.0002	mg/L							
Titanium, dissolved	< 0.005	0.005	mg/L							
Uranium, dissolved	< 0.00002	0.00002	mg/L							
Vanadium, dissolved	< 0.001	0.001	mg/L							
Zinc, dissolved	< 0.004	0.004	mg/L							
Zirconium, dissolved	< 0.0001	0.0001	mg/L							
Duplicate (B5F0019-DUP1)		**Source: 5051773-05**		Prepared: Jun-01-15, Analyzed: Jun-01-15						
Aluminum, dissolved	< 0.005	0.005	mg/L		< 0.005				11	
Antimony, dissolved	0.0020	0.0001	mg/L		0.0019			< 1	44	
Arsenic, dissolved	0.0038	0.0005	mg/L		0.0039			2	8	
Barium, dissolved	0.203	0.005	mg/L		0.212			4	7	
Beryllium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				20	
Boron, dissolved	0.037	0.004	mg/L		0.020			59	13	
Cadmium, dissolved	0.00002	0.00001	mg/L		0.00004				27	
Calcium, dissolved	105	0.2	mg/L		101			3	8	
Chromium, dissolved	0.0007	0.0005	mg/L		0.0007				14	
Cobalt, dissolved	0.00013	0.00005	mg/L		0.00012				10	
Copper, dissolved	0.0050	0.0002	mg/L		0.0051			2	28	
Iron, dissolved	0.014	0.010	mg/L		0.015				14	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5F0019, Continued										
Duplicate (B5F0019-DUP1), Continued		**Source: 5051773-05**		Prepared: Jun-01-15, Analyzed: Jun-01-15						
Lead, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				26	
Lithium, dissolved	0.0184	0.0001	mg/L		0.0188			2	14	
Magnesium, dissolved	115	0.01	mg/L		117			1	6	
Manganese, dissolved	0.0032	0.0002	mg/L		0.0031			2	9	
Molybdenum, dissolved	0.0005	0.0001	mg/L		0.0006			19	19	
Nickel, dissolved	0.0006	0.0002	mg/L		0.0007				21	
Phosphorus, dissolved	< 0.02	0.02	mg/L		< 0.02				14	
Potassium, dissolved	6.24	0.02	mg/L		6.34			2	8	
Selenium, dissolved	< 0.0005	0.0005	mg/L		< 0.0005				36	
Silicon, dissolved	10.4	0.5	mg/L		10.4			< 1	12	
Silver, dissolved	< 0.00005	0.00005	mg/L		< 0.00005				20	
Sodium, dissolved	362	0.02	mg/L		365			< 1	6	
Strontium, dissolved	1.30	0.001	mg/L		1.35			3	6	
Sulfur, dissolved	15	1	mg/L		16			3	26	
Tellurium, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				20	
Thallium, dissolved	0.00002	0.00002	mg/L		0.00002				13	
Thorium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				30	
Tin, dissolved	0.0002	0.0002	mg/L		0.0002				6	
Titanium, dissolved	< 0.005	0.005	mg/L		< 0.005				20	
Uranium, dissolved	0.00191	0.00002	mg/L		0.00193			1	14	
Vanadium, dissolved	< 0.001	0.001	mg/L		< 0.001				20	
Zinc, dissolved	0.008	0.004	mg/L		0.008				11	
Zirconium, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				36	
Matrix Spike (B5F0019-MS1)		**Source: 5051773-06**		Prepared: Jun-01-15, Analyzed: Jun-01-15						
Antimony, dissolved	0.389	0.0001	mg/L	0.400	0.0005	97	76-114			
Arsenic, dissolved	0.199	0.0005	mg/L	0.200	< 0.0005	99	81-115			
Barium, dissolved	0.957	0.005	mg/L	1.00	0.062	90	80-113			
Beryllium, dissolved	0.0896	0.0001	mg/L	0.100	< 0.0001	90	69-109			
Cadmium, dissolved	0.0899	0.00001	mg/L	0.100	0.00002	90	83-110			
Chromium, dissolved	0.410	0.0005	mg/L	0.400	< 0.0005	102	85-115			
Cobalt, dissolved	0.396	0.00005	mg/L	0.400	0.00141	99	86-114			
Copper, dissolved	0.389	0.0002	mg/L	0.400	0.0028	97	82-119			
Iron, dissolved	2.02	0.010	mg/L	2.00	0.011	100	80-116			
Lead, dissolved	0.179	0.0001	mg/L	0.200	< 0.0001	90	83-112			
Manganese, dissolved	0.455	0.0002	mg/L	0.400	0.0747	95	62-131			
Nickel, dissolved	0.376	0.0002	mg/L	0.400	0.0093	92	81-115			
Selenium, dissolved	0.102	0.0005	mg/L	0.100	< 0.0005	102	79-115			
Silver, dissolved	0.0897	0.00005	mg/L	0.100	0.00007	90	69-121			
Thallium, dissolved	0.0932	0.00002	mg/L	0.100	0.00007	93	84-115			
Vanadium, dissolved	0.410	0.001	mg/L	0.400	< 0.001	103	83-113			
Zinc, dissolved	0.934	0.004	mg/L	1.00	0.006	93	82-115			
Reference (B5F0019-SRM1)				Prepared: Jun-01-15, Analyzed: Jun-01-15						
Aluminum, dissolved	0.213	0.005	mg/L	0.233		91	58-142			
Antimony, dissolved	0.0458	0.0001	mg/L	0.0430		107	75-125			
Arsenic, dissolved	0.407	0.0005	mg/L	0.438		93	81-119			
Barium, dissolved	3.10	0.005	mg/L	3.35		93	83-117			
Beryllium, dissolved	0.195	0.0001	mg/L	0.213		91	80-120			
Boron, dissolved	1.75	0.004	mg/L	1.74		100	74-117			
Cadmium, dissolved	0.202	0.00001	mg/L	0.224		90	83-117			
Calcium, dissolved	7.8	0.2	mg/L	7.69		101	76-124			
Chromium, dissolved	0.428	0.0005	mg/L	0.437		98	81-119			
Cobalt, dissolved	0.126	0.00005	mg/L	0.128		98	76-124			
Copper, dissolved	0.835	0.0002	mg/L	0.844		99	84-116			
Iron, dissolved	1.25	0.010	mg/L	1.29		97	74-126			
Lead, dissolved	0.107	0.0001	mg/L	0.112		96	72-128			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5F0019, Continued										
Reference (B5F0019-SRM1), Continued				Prepared: Jun-01-15, Analyzed: Jun-01-15						
Lithium, dissolved	0.0999	0.0001	mg/L	0.104		96	60-140			
Magnesium, dissolved	6.64	0.01	mg/L	6.92		96	81-119			
Manganese, dissolved	0.326	0.0002	mg/L	0.345		94	84-116			
Molybdenum, dissolved	0.434	0.0001	mg/L	0.426		102	83-117			
Nickel, dissolved	0.831	0.0002	mg/L	0.840		99	74-126			
Phosphorus, dissolved	0.44	0.02	mg/L	0.495		90	68-132			
Potassium, dissolved	3.00	0.02	mg/L	3.19		94	74-126			
Selenium, dissolved	0.0292	0.0005	mg/L	0.0331		88	70-130			
Sodium, dissolved	18.3	0.02	mg/L	19.1		96	72-128			
Strontium, dissolved	0.858	0.001	mg/L	0.916		94	84-113			
Thallium, dissolved	0.0369	0.00002	mg/L	0.0393		94	57-143			
Uranium, dissolved	0.251	0.00002	mg/L	0.266		94	85-115			
Vanadium, dissolved	0.821	0.001	mg/L	0.869		94	87-113			
Zinc, dissolved	0.819	0.004	mg/L	0.881		93	72-128			
Dissolved Metals, Batch B5F0039										
Blank (B5F0039-BLK1)				Prepared: Jun-01-15, Analyzed: Jun-02-15						
Mercury, dissolved	< 0.00002	0.00002	mg/L							
Reference (B5F0039-SRM1)				Prepared: Jun-01-15, Analyzed: Jun-02-15						
Mercury, dissolved	0.00359	0.00002	mg/L	0.00456		79	50-150			
General Parameters, Batch B5E1472										
Blank (B5E1472-BLK1)				Prepared: May-28-15, Analyzed: May-28-15						
Ammonia as N, Total	< 0.005	0.020	mg/L							
Blank (B5E1472-BLK2)				Prepared: May-28-15, Analyzed: May-28-15						
Ammonia as N, Total	< 0.005	0.020	mg/L							
LCS (B5E1472-BS1)				Prepared: May-28-15, Analyzed: May-28-15						
Ammonia as N, Total	10.5	0.020	mg/L	10.0		105	86-111			
LCS (B5E1472-BS2)				Prepared: May-28-15, Analyzed: May-28-15						
Ammonia as N, Total	9.82	0.020	mg/L	10.0		98	86-111			
General Parameters, Batch B5E1507										
Blank (B5E1507-BLK1)				Prepared: May-28-15, Analyzed: May-29-15						
Solids, Total Suspended	< 2	2	mg/L							
Blank (B5E1507-BLK2)				Prepared: May-28-15, Analyzed: May-29-15						
Solids, Total Suspended	< 2	2	mg/L							
LCS (B5E1507-BS1)				Prepared: May-28-15, Analyzed: May-29-15						
Solids, Total Suspended	50	2	mg/L	50.0		100	85-110			
LCS (B5E1507-BS2)				Prepared: May-28-15, Analyzed: May-29-15						
Solids, Total Suspended	50	2	mg/L	50.0		100	85-110			
Reference (B5E1507-SRM1)				Prepared: May-28-15, Analyzed: May-29-15						
Solids, Total Suspended	128	2	mg/L	159		80	80-120			
General Parameters, Batch B5E1511										

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B5E1511, Continued										
Blank (B5E1511-BLK1)				Prepared: May-28-15, Analyzed: May-28-15						
Turbidity	< 0.1	0.1	NTU							
Blank (B5E1511-BLK2)				Prepared: May-28-15, Analyzed: May-28-15						
Turbidity	< 0.1	0.1	NTU							
LCS (B5E1511-BS1)				Prepared: May-28-15, Analyzed: May-28-15						
Turbidity	40.7	0.1	NTU	40.0		102	90-110			
LCS (B5E1511-BS2)				Prepared: May-28-15, Analyzed: May-28-15						
Turbidity	40.7	0.1	NTU	40.0		102	90-110			
General Parameters, Batch B5E1522										
Blank (B5E1522-BLK1)				Prepared: May-28-15, Analyzed: May-28-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
LCS (B5E1522-BS1)				Prepared: May-28-15, Analyzed: May-28-15						
Alkalinity, Total as CaCO3	106	1	mg/L	100		106	96-108			
LCS (B5E1522-BS2)				Prepared: May-28-15, Analyzed: May-28-15						
Conductivity (EC)	1380	2	µS/cm	1410		98	93-104			
Reference (B5E1522-SRM1)				Prepared: May-28-15, Analyzed: May-28-15						
pH	7.00	0.01	pH units	7.00		100	98-102			
General Parameters, Batch B5E1572										
Blank (B5E1572-BLK1)				Prepared: May-28-15, Analyzed: May-28-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
LCS (B5E1572-BS1)				Prepared: May-28-15, Analyzed: May-28-15						
Alkalinity, Total as CaCO3	102	1	mg/L	100		102	96-108			
LCS (B5E1572-BS2)				Prepared: May-28-15, Analyzed: May-28-15						
Conductivity (EC)	1410	2	µS/cm	1410		100	93-104			
Duplicate (B5E1572-DUP1)		**Source: 5051773-06**		Prepared: May-28-15, Analyzed: May-28-15						
Alkalinity, Total as CaCO3	857	1	mg/L		855			< 1	10	
Conductivity (EC)	4650	2	µS/cm		4640			< 1	5	
pH	7.36	0.01	pH units		7.37			< 1	5	HT2
Reference (B5E1572-SRM1)				Prepared: May-28-15, Analyzed: May-28-15						
pH	7.00	0.01	pH units	7.00		100	98-102			HT2
Total Recoverable Metals, Batch B5E1692										
Blank (B5E1692-BLK1)				Prepared: May-31-15, Analyzed: Jun-01-15						
Aluminum, total	< 0.005	0.005	mg/L							
Antimony, total	< 0.0001	0.0001	mg/L							
Arsenic, total	< 0.0005	0.0005	mg/L							
Barium, total	< 0.005	0.005	mg/L							
Beryllium, total	< 0.0001	0.0001	mg/L							
Bismuth, total	< 0.0001	0.0001	mg/L							
Boron, total	< 0.004	0.004	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5E1692, Continued										
Blank (B5E1692-BLK1), Continued				Prepared: May-31-15, Analyzed: Jun-01-15						
Cadmium, total	< 0.00001	0.00001	mg/L							
Calcium, total	< 0.2	0.2	mg/L							
Chromium, total	< 0.0005	0.0005	mg/L							
Cobalt, total	< 0.00005	0.00005	mg/L							
Copper, total	< 0.0002	0.0002	mg/L							
Iron, total	< 0.01	0.01	mg/L							
Lead, total	< 0.0001	0.0001	mg/L							
Lithium, total	< 0.0001	0.0001	mg/L							
Magnesium, total	< 0.01	0.01	mg/L							
Manganese, total	< 0.0002	0.0002	mg/L							
Molybdenum, total	< 0.0001	0.0001	mg/L							
Nickel, total	< 0.0002	0.0002	mg/L							
Phosphorus, total	< 0.020	0.020	mg/L							
Potassium, total	< 0.02	0.02	mg/L							
Selenium, total	< 0.0005	0.0005	mg/L							
Silicon, total	< 0.5	0.5	mg/L							
Silver, total	< 0.00005	0.00005	mg/L							
Sodium, total	< 0.02	0.02	mg/L							
Strontium, total	< 0.001	0.001	mg/L							
Sulfur, total	< 1	1	mg/L							
Tellurium, total	< 0.0002	0.0002	mg/L							
Thallium, total	< 0.00002	0.00002	mg/L							
Thorium, total	< 0.0001	0.0001	mg/L							
Tin, total	< 0.0002	0.0002	mg/L							
Titanium, total	< 0.005	0.005	mg/L							
Uranium, total	< 0.00002	0.00002	mg/L							
Vanadium, total	< 0.001	0.001	mg/L							
Zinc, total	< 0.004	0.004	mg/L							
Zirconium, total	< 0.0001	0.0001	mg/L							
Duplicate (B5E1692-DUP1)		**Source: 5051773-03**		Prepared: May-31-15, Analyzed: Jun-01-15						
Aluminum, total	< 0.005	0.005	mg/L		< 0.005				29	
Antimony, total	< 0.0001	0.0001	mg/L		0.0002				31	
Arsenic, total	0.0014	0.0005	mg/L		0.0014				15	
Barium, total	0.017	0.005	mg/L		0.017				9	
Beryllium, total	< 0.0001	0.0001	mg/L		< 0.0001				16	
Bismuth, total	< 0.0001	0.0001	mg/L		< 0.0001				20	
Boron, total	0.710	0.004	mg/L		0.659			8	29	
Cadmium, total	0.00001	0.00001	mg/L		0.00001				33	
Calcium, total	78.7	0.2	mg/L		79.0			< 1	12	
Chromium, total	< 0.0005	0.0005	mg/L		< 0.0005				12	
Cobalt, total	0.00078	0.00005	mg/L		0.00079			2	13	
Copper, total	0.0101	0.0002	mg/L		0.0100			1	37	
Iron, total	0.04	0.01	mg/L		0.04				18	
Lead, total	0.0003	0.0001	mg/L		0.0004				23	
Lithium, total	0.0771	0.0001	mg/L		0.0696			10	19	
Magnesium, total	102	0.01	mg/L		102			< 1	10	
Manganese, total	0.0047	0.0002	mg/L		0.0048			3	13	
Molybdenum, total	0.0007	0.0001	mg/L		0.0006			19	20	
Nickel, total	< 0.0002	0.0002	mg/L		< 0.0002				28	
Phosphorus, total	< 0.020	0.020	mg/L		< 0.020				24	
Potassium, total	11.5	0.02	mg/L		11.7			1	13	
Selenium, total	< 0.0005	0.0005	mg/L		< 0.0005				24	
Silicon, total	7.0	0.5	mg/L		7.0			< 1	11	
Silver, total	0.00013	0.00005	mg/L		0.00005				18	
Sodium, total	70.4	0.02	mg/L		70.3			< 1	10	
Strontium, total	6.02	0.001	mg/L		6.04			< 1	9	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5E1692, Continued										
Duplicate (B5E1692-DUP1), Continued		**Source: 5051773-03**		Prepared: May-31-15, Analyzed: Jun-01-15						
Sulfur, total	100	1	mg/L		98			3	24	
Tellurium, total	< 0.0002	0.0002	mg/L		< 0.0002				20	
Thallium, total	< 0.00002	0.00002	mg/L		< 0.00002				24	
Thorium, total	< 0.0001	0.0001	mg/L		< 0.0001				18	
Tin, total	0.0002	0.0002	mg/L		0.0003				18	
Titanium, total	< 0.005	0.005	mg/L		< 0.005				32	
Uranium, total	0.00051	0.00002	mg/L		0.00051			< 1	14	
Vanadium, total	< 0.001	0.001	mg/L		< 0.001				17	
Zinc, total	0.029	0.004	mg/L		0.030			3	8	
Zirconium, total	0.0007	0.0001	mg/L		0.0007			4	60	
Matrix Spike (B5E1692-MS1)		**Source: 5051773-04**		Prepared: May-31-15, Analyzed: Jun-01-15						
Antimony, total	0.468	0.0001	mg/L	0.400	< 0.0001	117	84-125			
Arsenic, total	0.226	0.0005	mg/L	0.200	0.0236	101	85-116			
Barium, total	1.02	0.005	mg/L	1.00	0.022	100	87-114			
Beryllium, total	0.105	0.0001	mg/L	0.100	< 0.0001	105	72-116			
Cadmium, total	0.102	0.00001	mg/L	0.100	< 0.00001	102	90-112			
Chromium, total	0.425	0.0005	mg/L	0.400	< 0.0005	106	89-120			
Cobalt, total	0.413	0.00005	mg/L	0.400	0.00014	103	88-120			
Copper, total	0.425	0.0002	mg/L	0.400	0.0078	104	88-125			
Iron, total	2.35	0.01	mg/L	2.00	0.23	106	88-119			
Lead, total	0.206	0.0001	mg/L	0.200	0.0022	102	89-118			
Manganese, total	0.412	0.0002	mg/L	0.400	0.0047	102	84-120			
Nickel, total	0.401	0.0002	mg/L	0.400	0.0006	100	87-119			
Selenium, total	0.102	0.0005	mg/L	0.100	< 0.0005	102	85-113			
Silver, total	0.106	0.00005	mg/L	0.100	0.00005	106	89-119			
Thallium, total	0.105	0.00002	mg/L	0.100	< 0.00002	105	92-119			
Vanadium, total	0.416	0.001	mg/L	0.400	< 0.001	104	87-117			
Zinc, total	0.997	0.004	mg/L	1.00	0.004	99	85-116			
Reference (B5E1692-SRM1)				Prepared: May-31-15, Analyzed: Jun-01-15						
Aluminum, total	0.279	0.005	mg/L	0.296		94	81-129			
Antimony, total	0.0523	0.0001	mg/L	0.0505		104	88-114			
Arsenic, total	0.118	0.0005	mg/L	0.122		97	88-114			
Barium, total	0.693	0.005	mg/L	0.777		89	72-104			
Beryllium, total	0.0455	0.0001	mg/L	0.0488		93	76-131			
Boron, total	3.51	0.004	mg/L	3.40		103	75-121			
Cadmium, total	0.0471	0.00001	mg/L	0.0490		96	89-111			
Calcium, total	10.0	0.2	mg/L	10.2		98	86-121			
Chromium, total	0.239	0.0005	mg/L	0.242		99	89-114			
Cobalt, total	0.0382	0.00005	mg/L	0.0366		104	91-113			
Copper, total	0.501	0.0002	mg/L	0.487		103	91-115			
Iron, total	0.48	0.01	mg/L	0.469		102	77-124			
Lead, total	0.197	0.0001	mg/L	0.193		102	92-113			
Lithium, total	0.377	0.0001	mg/L	0.390		97	85-115			
Magnesium, total	3.32	0.01	mg/L	3.31		100	78-120			
Manganese, total	0.105	0.0002	mg/L	0.109		96	90-114			
Molybdenum, total	0.207	0.0001	mg/L	0.197		105	90-111			
Nickel, total	0.244	0.0002	mg/L	0.242		101	90-111			
Phosphorus, total	0.202	0.020	mg/L	0.233		87	85-115			
Potassium, total	5.96	0.02	mg/L	5.93		100	84-113			
Selenium, total	0.109	0.0005	mg/L	0.115		95	85-115			
Sodium, total	7.56	0.02	mg/L	7.64		99	82-123			
Strontium, total	0.348	0.001	mg/L	0.363		96	88-112			
Thallium, total	0.0811	0.00002	mg/L	0.0794		102	91-114			
Uranium, total	0.0185	0.00002	mg/L	0.0192		96	85-120			
Vanadium, total	0.360	0.001	mg/L	0.376		96	86-111			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5051773
REPORTED Jun-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5E1692, Continued										
Reference (B5E1692-SRM1), Continued				Prepared: May-31-15, Analyzed: Jun-01-15						
Zinc, total	2.32	0.004	mg/L	2.42		96	85-111			
Total Recoverable Metals, Batch B5F0041										
Blank (B5F0041-BLK1)				Prepared: Jun-01-15, Analyzed: Jun-02-15						
Mercury, total	< 0.00002	0.00002	mg/L							
Reference (B5F0041-SRM1)				Prepared: Jun-01-15, Analyzed: Jun-02-15						
Mercury, total	0.00349	0.00002	mg/L	0.00456		77	50-150			

QC Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4	**TEL** **FAX**	(250) 541-1030 (250) 575-4764
ATTENTION	Bryer Manwell	**WORK ORDER**	5081710
PO NUMBER		**RECEIVED / TEMP**	Aug-26-15 08:30 / 8°C
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15
PROJECT INFO	14-024-016	**COC NUMBER**	B 27527

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

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Authorized By: **Ed Hoppe, B.Sc., P.Chem.**
Division Manager, Kelowna

If you have any questions or concerns, please contact your Account Manager:
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TABLE OF CONTENTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

ANALYSIS INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analysis Description	Method Reference	Technique	Location
Alkalinity in Water (Total)	APHA 2320 B*	Titration with H2SO4	Kelowna
Ammonia-N in Water (total)	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3)	APHA 2340 B	Calculation	N/A
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Recoverable Metals	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Total Suspended Solids	APHA 2540 D*	Gravimetry (Dried at 103-105C)	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (5081710-01) [Waste Water] Sampled: Aug-25-15 09:35						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	Aug-28-15	
Chloride	**24.8**	0.10	mg/L	N/A	Aug-28-15	
Fluoride	< 0.10	0.10	mg/L	N/A	Aug-28-15	
Nitrate as N	**1.01**	0.010	mg/L	N/A	Aug-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	Aug-28-15	
Sulfate	**23.8**	1.0	mg/L	N/A	Aug-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**288**	1	mg/L	N/A	Aug-28-15	
Conductivity (EC)	**618**	2	µS/cm	N/A	Aug-28-15	
Ammonia as N, Total	< 0.020	0.020	mg/L	N/A	Aug-28-15	
pH	**7.79**	0.01	pH units	N/A	Aug-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	N/A	Sep-01-15	
Turbidity	**0.2**	0.1	NTU	N/A	Aug-27-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**332**	0.50	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.005	0.005	mg/L	Aug-31-15	Sep-01-15	
Antimony, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Arsenic, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Barium, total	**0.146**	0.005	mg/L	Aug-31-15	Sep-01-15	
Beryllium, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Boron, total	**0.007**	0.004	mg/L	Aug-31-15	Sep-01-15	
Cadmium, total	< 0.00001	0.00001	mg/L	Aug-31-15	Sep-01-15	
Calcium, total	**87.9**	0.2	mg/L	Aug-31-15	Sep-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Cobalt, total	< 0.00005	0.00005	mg/L	Aug-31-15	Sep-01-15	
Copper, total	**0.0016**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Iron, total	**0.01**	0.01	mg/L	Aug-31-15	Sep-01-15	
Lead, total	**0.0001**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Lithium, total	**0.0012**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Magnesium, total	**27.1**	0.01	mg/L	Aug-31-15	Sep-01-15	
Manganese, total	**0.0010**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Molybdenum, total	**0.0003**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Nickel, total	**0.0006**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Phosphorus, total	**0.03**	0.02	mg/L	Aug-31-15	Sep-01-15	
Potassium, total	**0.99**	0.02	mg/L	Aug-31-15	Sep-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Silicon, total	**4.3**	0.5	mg/L	Aug-31-15	Sep-01-15	
Silver, total	**0.00154**	0.00005	mg/L	Aug-31-15	Sep-01-15	
Sodium, total	**15.1**	0.02	mg/L	Aug-31-15	Sep-01-15	
Strontium, total	**0.298**	0.001	mg/L	Aug-31-15	Sep-01-15	
Sulfur, total	**8**	1	mg/L	Aug-31-15	Sep-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (5081710-01) [Waste Water] Sampled: Aug-25-15 09:35, Continued						
Total Recoverable Metals, Continued						
Tellurium, total	< 0.0002	0.0002	mg/L	Aug-31-15	Sep-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	Aug-31-15	Sep-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Tin, total	< 0.0002	0.0002	mg/L	Aug-31-15	Sep-01-15	
Titanium, total	< 0.005	0.005	mg/L	Aug-31-15	Sep-01-15	
Uranium, total	**0.00111**	0.00002	mg/L	Aug-31-15	Sep-01-15	
Vanadium, total	< 0.001	0.001	mg/L	Aug-31-15	Sep-01-15	
Zinc, total	**0.016**	0.004	mg/L	Aug-31-15	Sep-01-15	
Zirconium, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Sample ID: DMW - 1b (5081710-02) [Water] Sampled: Aug-25-15 10:20						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	Aug-28-15	
Chloride	**42.4**	0.10	mg/L	N/A	Aug-28-15	
Fluoride	**1.28**	0.10	mg/L	N/A	Aug-28-15	
Nitrate as N	< 0.010	0.010	mg/L	N/A	Aug-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	Aug-28-15	
Sulfate	**114**	1.0	mg/L	N/A	Aug-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**478**	1	mg/L	N/A	Aug-28-15	
Conductivity (EC)	**1120**	2	µS/cm	N/A	Aug-28-15	
Ammonia as N, Total	**0.210**	0.020	mg/L	N/A	Aug-28-15	
pH	**7.70**	0.01	pH units	N/A	Aug-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	N/A	Sep-01-15	
Turbidity	**3.0**	0.1	NTU	N/A	Aug-27-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**678**	0.50	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.005	0.005	mg/L	Aug-31-15	Sep-01-15	
Antimony, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Arsenic, total	**0.0489**	0.0005	mg/L	Aug-31-15	Sep-01-15	
Barium, total	**0.026**	0.005	mg/L	Aug-31-15	Sep-01-15	
Beryllium, total	**0.0001**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Boron, total	**0.139**	0.004	mg/L	Aug-31-15	Sep-01-15	
Cadmium, total	< 0.00001	0.00001	mg/L	Aug-31-15	Sep-01-15	
Calcium, total	**75.8**	0.2	mg/L	Aug-31-15	Sep-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Cobalt, total	< 0.00005	0.00005	mg/L	Aug-31-15	Sep-01-15	
Copper, total	**0.0009**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Iron, total	**0.38**	0.01	mg/L	Aug-31-15	Sep-01-15	
Lead, total	**0.0003**	0.0001	mg/L	Aug-31-15	Sep-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (5081710-02) [Water] Sampled: Aug-25-15 10:20, Continued						
Total Recoverable Metals, Continued						
Lithium, total	**0.0244**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Magnesium, total	**119**	0.01	mg/L	Aug-31-15	Sep-01-15	
Manganese, total	**0.0046**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Molybdenum, total	**0.0004**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Nickel, total	**0.0026**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Phosphorus, total	**0.08**	0.02	mg/L	Aug-31-15	Sep-01-15	
Potassium, total	**5.94**	0.02	mg/L	Aug-31-15	Sep-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Silicon, total	**9.0**	0.5	mg/L	Aug-31-15	Sep-01-15	
Silver, total	**0.00163**	0.00005	mg/L	Aug-31-15	Sep-01-15	
Sodium, total	**33.2**	0.02	mg/L	Aug-31-15	Sep-01-15	
Strontium, total	**1.99**	0.001	mg/L	Aug-31-15	Sep-01-15	
Sulfur, total	**51**	1	mg/L	Aug-31-15	Sep-01-15	
Tellurium, total	< 0.0002	0.0002	mg/L	Aug-31-15	Sep-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	Aug-31-15	Sep-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Tin, total	< 0.0002	0.0002	mg/L	Aug-31-15	Sep-01-15	
Titanium, total	< 0.005	0.005	mg/L	Aug-31-15	Sep-01-15	
Uranium, total	**0.00007**	0.00002	mg/L	Aug-31-15	Sep-01-15	
Vanadium, total	< 0.001	0.001	mg/L	Aug-31-15	Sep-01-15	
Zinc, total	< 0.004	0.004	mg/L	Aug-31-15	Sep-01-15	
Zirconium, total	**0.0019**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Sample ID: DMW - 4 (5081710-03) [Water] Sampled: Aug-25-15 10:50						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	Aug-28-15	
Chloride	**13.2**	0.10	mg/L	N/A	Aug-28-15	
Fluoride	**0.74**	0.10	mg/L	N/A	Aug-28-15	
Nitrate as N	**0.414**	0.010	mg/L	N/A	Aug-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	Aug-28-15	
Sulfate	**232**	1.0	mg/L	N/A	Aug-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**429**	1	mg/L	N/A	Aug-28-15	
Conductivity (EC)	**1130**	2	µS/cm	N/A	Aug-28-15	
Ammonia as N, Total	**0.816**	0.020	mg/L	N/A	Aug-28-15	
pH	**7.74**	0.01	pH units	N/A	Aug-28-15	HT2
Solids, Total Suspended	< 2	2	mg/L	N/A	Sep-01-15	
Turbidity	**0.2**	0.1	NTU	N/A	Aug-27-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**611**	0.50	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.005	0.005	mg/L	Aug-31-15	Sep-01-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (5081710-03) [Water] Sampled: Aug-25-15 10:50, Continued						
Total Recoverable Metals, Continued						
Antimony, total	**0.0003**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Arsenic, total	**0.0018**	0.0005	mg/L	Aug-31-15	Sep-01-15	
Barium, total	**0.016**	0.005	mg/L	Aug-31-15	Sep-01-15	
Beryllium, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Bismuth, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Boron, total	**0.392**	0.004	mg/L	Aug-31-15	Sep-01-15	
Cadmium, total	< 0.00001	0.00001	mg/L	Aug-31-15	Sep-01-15	
Calcium, total	**81.9**	0.2	mg/L	Aug-31-15	Sep-01-15	
Chromium, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Cobalt, total	**0.00083**	0.00005	mg/L	Aug-31-15	Sep-01-15	
Copper, total	**0.0027**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Iron, total	**0.02**	0.01	mg/L	Aug-31-15	Sep-01-15	
Lead, total	**0.0003**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Lithium, total	**0.0462**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Magnesium, total	**98.6**	0.01	mg/L	Aug-31-15	Sep-01-15	
Manganese, total	**0.0037**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Molybdenum, total	**0.0007**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Nickel, total	**0.0025**	0.0002	mg/L	Aug-31-15	Sep-01-15	
Phosphorus, total	< 0.02	0.02	mg/L	Aug-31-15	Sep-01-15	
Potassium, total	**9.42**	0.02	mg/L	Aug-31-15	Sep-01-15	
Selenium, total	< 0.0005	0.0005	mg/L	Aug-31-15	Sep-01-15	
Silicon, total	**7.2**	0.5	mg/L	Aug-31-15	Sep-01-15	
Silver, total	**0.00129**	0.00005	mg/L	Aug-31-15	Sep-01-15	
Sodium, total	**46.9**	0.02	mg/L	Aug-31-15	Sep-01-15	
Strontium, total	**5.09**	0.001	mg/L	Aug-31-15	Sep-01-15	
Sulfur, total	**87**	1	mg/L	Aug-31-15	Sep-01-15	
Tellurium, total	< 0.0002	0.0002	mg/L	Aug-31-15	Sep-01-15	
Thallium, total	< 0.00002	0.00002	mg/L	Aug-31-15	Sep-01-15	
Thorium, total	< 0.0001	0.0001	mg/L	Aug-31-15	Sep-01-15	
Tin, total	< 0.0002	0.0002	mg/L	Aug-31-15	Sep-01-15	
Titanium, total	< 0.005	0.005	mg/L	Aug-31-15	Sep-01-15	
Uranium, total	**0.00108**	0.00002	mg/L	Aug-31-15	Sep-01-15	
Vanadium, total	< 0.001	0.001	mg/L	Aug-31-15	Sep-01-15	
Zinc, total	**0.030**	0.004	mg/L	Aug-31-15	Sep-01-15	
Zirconium, total	**0.0008**	0.0001	mg/L	Aug-31-15	Sep-01-15	
Sample ID: MW-6s (5081710-04) [Waste Water] Sampled: Aug-25-15 11:50						
Anions						
Bromide	**1.09**	0.10	mg/L	N/A	Aug-28-15	
Chloride	**549**	0.10	mg/L	N/A	Aug-28-15	
Fluoride	**0.10**	0.10	mg/L	N/A	Aug-28-15	
Nitrate as N	**34.1**	0.010	mg/L	N/A	Aug-28-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Aug-28-15	
Phosphate, Ortho as P	< 0.01	0.01	mg/L	N/A	Aug-28-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (5081710-04) [Waste Water] Sampled: Aug-25-15 11:50, Continued						
Anions, Continued						
Sulfate	**878**	1.0	mg/L	N/A	Aug-28-15	
General Parameters						
Alkalinity, Total as CaCO3	**865**	1	mg/L	N/A	Aug-28-15	
Conductivity (EC)	**4520**	2	µS/cm	N/A	Aug-28-15	
Ammonia as N, Total	**0.614**	0.020	mg/L	N/A	Aug-28-15	
pH	**7.34**	0.01	pH units	N/A	Aug-28-15	HT2
Solids, Total Suspended	**7**	2	mg/L	N/A	Sep-01-15	
Turbidity	**1.6**	0.1	NTU	N/A	Aug-27-15	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**1890**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.024**	0.005	mg/L	N/A	Aug-31-15	
Antimony, dissolved	**0.0005**	0.0001	mg/L	N/A	Aug-31-15	
Arsenic, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-31-15	
Barium, dissolved	**0.062**	0.005	mg/L	N/A	Aug-31-15	
Beryllium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-31-15	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-31-15	
Boron, dissolved	**1.90**	0.004	mg/L	N/A	Aug-31-15	
Cadmium, dissolved	< 0.00001	0.00001	mg/L	N/A	Aug-31-15	
Calcium, dissolved	**197**	0.2	mg/L	N/A	Aug-31-15	
Chromium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-31-15	
Cobalt, dissolved	**0.00149**	0.00005	mg/L	N/A	Aug-31-15	
Copper, dissolved	**0.0420**	0.0002	mg/L	N/A	Aug-31-15	
Iron, dissolved	**0.062**	0.010	mg/L	N/A	Aug-31-15	
Lead, dissolved	**0.0014**	0.0001	mg/L	N/A	Aug-31-15	
Lithium, dissolved	**0.0513**	0.0001	mg/L	N/A	Aug-31-15	
Magnesium, dissolved	**339**	0.01	mg/L	N/A	Aug-31-15	
Manganese, dissolved	**0.0870**	0.0002	mg/L	N/A	Aug-31-15	
Molybdenum, dissolved	**0.0004**	0.0001	mg/L	N/A	Aug-31-15	
Nickel, dissolved	**0.0109**	0.0002	mg/L	N/A	Aug-31-15	
Phosphorus, dissolved	< 0.02	0.02	mg/L	N/A	Aug-31-15	
Potassium, dissolved	**217**	0.02	mg/L	N/A	Aug-31-15	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Aug-31-15	
Silicon, dissolved	**12.7**	0.5	mg/L	N/A	Aug-31-15	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Aug-31-15	
Sodium, dissolved	**394**	0.02	mg/L	N/A	Aug-31-15	
Strontium, dissolved	**2.05**	0.001	mg/L	N/A	Aug-31-15	
Sulfur, dissolved	**362**	1	mg/L	N/A	Aug-31-15	
Tellurium, dissolved	**0.0003**	0.0002	mg/L	N/A	Aug-31-15	
Thallium, dissolved	**0.00006**	0.00002	mg/L	N/A	Aug-31-15	
Thorium, dissolved	< 0.0001	0.0001	mg/L	N/A	Aug-31-15	
Tin, dissolved	**0.0005**	0.0002	mg/L	N/A	Aug-31-15	
Titanium, dissolved	< 0.005	0.005	mg/L	N/A	Aug-31-15	
Uranium, dissolved	**0.00779**	0.00002	mg/L	N/A	Aug-31-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (5081710-04) [Waste Water] Sampled: Aug-25-15 11:50, Continued						
Dissolved Metals, Continued						
Vanadium, dissolved	< 0.001	0.001	mg/L	N/A	Aug-31-15	
Zinc, dissolved	**0.027**	0.004	mg/L	N/A	Aug-31-15	
Zirconium, dissolved	**0.0001**	0.0001	mg/L	N/A	Aug-31-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5081710
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Sep-02-15

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5H1494										
Blank (B5H1494-BLK1)				Prepared: Aug-26-15, Analyzed: Aug-26-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Phosphate, Ortho as P	< 0.01	0.01	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B5H1494-BLK2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Phosphate, Ortho as P	< 0.01	0.01	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B5H1494-BLK3)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.010	0.010	mg/L							
Nitrite as N	< 0.010	0.010	mg/L							
Phosphate, Ortho as P	< 0.01	0.01	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B5H1494-BS1)				Prepared: Aug-26-15, Analyzed: Aug-26-15						
Bromide	4.01	0.10	mg/L	4.00		100	85-115			
Chloride	16.0	0.10	mg/L	16.0		100	85-115			
Fluoride	3.97	0.10	mg/L	4.00		99	85-115			
Nitrate as N	4.03	0.010	mg/L	4.00		101	85-115			
Nitrite as N	1.99	0.010	mg/L	2.00		100	85-115			
Phosphate, Ortho as P	1.99	0.01	mg/L	2.00		99	85-115			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5H1494, Continued										
LCS (B5H1494-BS1), Continued				Prepared: Aug-26-15, Analyzed: Aug-26-15						
Sulfate	16.0	1.0	mg/L	16.0		100	85-115			
LCS (B5H1494-BS2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Bromide	3.82	0.10	mg/L	4.00		95	85-115			
Chloride	16.0	0.10	mg/L	16.0		100	85-115			
Fluoride	4.00	0.10	mg/L	4.00		100	85-115			
Nitrate as N	4.00	0.010	mg/L	4.00		100	85-115			
Nitrite as N	2.01	0.010	mg/L	2.00		100	85-115			
Phosphate, Ortho as P	2.01	0.01	mg/L	2.00		101	85-115			
Sulfate	16.0	1.0	mg/L	16.0		100	85-115			
LCS (B5H1494-BS3)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Bromide	4.00	0.10	mg/L	4.00		100	85-115			
Chloride	16.0	0.10	mg/L	16.0		100	85-115			
Fluoride	4.01	0.10	mg/L	4.00		100	85-115			
Nitrate as N	4.02	0.010	mg/L	4.00		101	85-115			
Nitrite as N	1.99	0.010	mg/L	2.00		99	85-115			
Phosphate, Ortho as P	2.01	0.01	mg/L	2.00		101	85-115			
Sulfate	16.0	1.0	mg/L	16.0		100	85-115			
Dissolved Metals, Batch B5H1672										
Blank (B5H1672-BLK1)				Prepared: Aug-31-15, Analyzed: Aug-31-15						
Aluminum, dissolved	< 0.005	0.005	mg/L							
Antimony, dissolved	< 0.0001	0.0001	mg/L							
Arsenic, dissolved	< 0.0005	0.0005	mg/L							
Barium, dissolved	< 0.005	0.005	mg/L							
Beryllium, dissolved	< 0.0001	0.0001	mg/L							
Bismuth, dissolved	< 0.0001	0.0001	mg/L							
Boron, dissolved	< 0.004	0.004	mg/L							
Cadmium, dissolved	< 0.00001	0.00001	mg/L							
Calcium, dissolved	< 0.2	0.2	mg/L							
Chromium, dissolved	< 0.0005	0.0005	mg/L							
Cobalt, dissolved	< 0.00005	0.00005	mg/L							
Copper, dissolved	< 0.0002	0.0002	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.0001	0.0001	mg/L							
Lithium, dissolved	< 0.0001	0.0001	mg/L							
Magnesium, dissolved	< 0.01	0.01	mg/L							
Manganese, dissolved	< 0.0002	0.0002	mg/L							
Molybdenum, dissolved	< 0.0001	0.0001	mg/L							
Nickel, dissolved	< 0.0002	0.0002	mg/L							
Phosphorus, dissolved	< 0.02	0.02	mg/L							
Potassium, dissolved	< 0.02	0.02	mg/L							
Selenium, dissolved	< 0.0005	0.0005	mg/L							
Silicon, dissolved	< 0.5	0.5	mg/L							
Silver, dissolved	< 0.00005	0.00005	mg/L							
Sodium, dissolved	< 0.02	0.02	mg/L							
Strontium, dissolved	< 0.001	0.001	mg/L							
Sulfur, dissolved	< 1	1	mg/L							
Tellurium, dissolved	< 0.0002	0.0002	mg/L							
Thallium, dissolved	< 0.00002	0.00002	mg/L							
Thorium, dissolved	< 0.0001	0.0001	mg/L							
Tin, dissolved	< 0.0002	0.0002	mg/L							
Titanium, dissolved	< 0.005	0.005	mg/L							
Uranium, dissolved	< 0.00002	0.00002	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5H1672, Continued										
Blank (B5H1672-BLK1), Continued				Prepared: Aug-31-15, Analyzed: Aug-31-15						
Vanadium, dissolved	< 0.001	0.001	mg/L							
Zinc, dissolved	< 0.004	0.004	mg/L							
Zirconium, dissolved	< 0.0001	0.0001	mg/L							
Reference (B5H1672-SRM1)				Prepared: Aug-31-15, Analyzed: Aug-31-15						
Aluminum, dissolved	0.216	0.005	mg/L	0.233		93	58-142			
Antimony, dissolved	0.0473	0.0001	mg/L	0.0430		110	75-125			
Arsenic, dissolved	0.431	0.0005	mg/L	0.438		98	81-119			
Barium, dissolved	3.51	0.005	mg/L	3.35		105	83-117			
Beryllium, dissolved	0.232	0.0001	mg/L	0.213		109	80-120			
Boron, dissolved	1.75	0.004	mg/L	1.74		101	74-117			
Cadmium, dissolved	0.222	0.00001	mg/L	0.224		99	83-117			
Calcium, dissolved	7.7	0.2	mg/L	7.69		100	76-124			
Chromium, dissolved	0.432	0.0005	mg/L	0.437		99	81-119			
Cobalt, dissolved	0.133	0.00005	mg/L	0.128		104	76-124			
Copper, dissolved	0.851	0.0002	mg/L	0.844		101	84-116			
Iron, dissolved	1.27	0.010	mg/L	1.29		98	74-126			
Lead, dissolved	0.114	0.0001	mg/L	0.112		102	72-128			
Lithium, dissolved	0.107	0.0001	mg/L	0.104		103	60-140			
Magnesium, dissolved	6.59	0.01	mg/L	6.92		95	81-119			
Manganese, dissolved	0.341	0.0002	mg/L	0.345		99	84-116			
Molybdenum, dissolved	0.456	0.0001	mg/L	0.426		107	83-117			
Nickel, dissolved	0.846	0.0002	mg/L	0.840		101	74-126			
Phosphorus, dissolved	0.44	0.02	mg/L	0.495		89	68-132			
Potassium, dissolved	3.00	0.02	mg/L	3.19		94	74-126			
Selenium, dissolved	0.0355	0.0005	mg/L	0.0331		107	70-130			
Sodium, dissolved	18.4	0.02	mg/L	19.1		96	72-128			
Strontium, dissolved	0.910	0.001	mg/L	0.916		99	84-113			
Thallium, dissolved	0.0389	0.00002	mg/L	0.0393		99	57-143			
Uranium, dissolved	0.263	0.00002	mg/L	0.266		99	85-115			
Vanadium, dissolved	0.837	0.001	mg/L	0.869		96	87-113			
Zinc, dissolved	0.846	0.004	mg/L	0.881		96	72-128			
General Parameters, Batch B5H1453										
Blank (B5H1453-BLK1)				Prepared: Aug-27-15, Analyzed: Aug-27-15						
Turbidity	< 0.1	0.1	NTU							
Blank (B5H1453-BLK2)				Prepared: Aug-27-15, Analyzed: Aug-27-15						
Turbidity	< 0.1	0.1	NTU							
Blank (B5H1453-BLK3)				Prepared: Aug-27-15, Analyzed: Aug-27-15						
Turbidity	< 0.1	0.1	NTU							
LCS (B5H1453-BS1)				Prepared: Aug-27-15, Analyzed: Aug-27-15						
Turbidity	39.1	0.1	NTU	40.0		98	90-110			
LCS (B5H1453-BS2)				Prepared: Aug-27-15, Analyzed: Aug-27-15						
Turbidity	39.1	0.1	NTU	40.0		98	90-110			
LCS (B5H1453-BS3)				Prepared: Aug-27-15, Analyzed: Aug-27-15						
Turbidity	39.0	0.1	NTU	40.0		98	90-110			
General Parameters, Batch B5H1520										

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B5H1520, Continued										
Blank (B5H1520-BLK1)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Ammonia as N, Total	< 0.005	0.020	mg/L							
Blank (B5H1520-BLK2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Ammonia as N, Total	< 0.005	0.020	mg/L							
LCS (B5H1520-BS1)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Ammonia as N, Total	1.04	0.020	mg/L	1.00		104	86-111			
LCS (B5H1520-BS2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Ammonia as N, Total	1.04	0.020	mg/L	1.00		104	86-111			
Duplicate (B5H1520-DUP2)		**Source: 5081710-02**		Prepared: Aug-28-15, Analyzed: Aug-28-15						
Ammonia as N, Total	0.218	0.020	mg/L		0.210			4	15	
Matrix Spike (B5H1520-MS1)		**Source: 5081710-02**		Prepared: Aug-28-15, Analyzed: Aug-28-15						
Ammonia as N, Total	0.508	0.020	mg/L	0.250	0.210	119	76-121			
General Parameters, Batch B5H1608										
Blank (B5H1608-BLK1)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 1	2	µS/cm							
Blank (B5H1608-BLK2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 1	2	µS/cm							
Blank (B5H1608-BLK3)				Prepared: Aug-29-15, Analyzed: Aug-29-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 1	2	µS/cm							
LCS (B5H1608-BS1)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Alkalinity, Total as CaCO3	101	1	mg/L	100		101	96-108			
LCS (B5H1608-BS2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Alkalinity, Total as CaCO3	100	1	mg/L	100		100	96-108			
LCS (B5H1608-BS3)				Prepared: Aug-29-15, Analyzed: Aug-29-15						
Alkalinity, Total as CaCO3	102	1	mg/L	100		102	96-108			
LCS (B5H1608-BS4)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Conductivity (EC)	1370	2	µS/cm	1410		97	93-104			
LCS (B5H1608-BS5)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
Conductivity (EC)	1380	2	µS/cm	1410		98	93-104			
LCS (B5H1608-BS6)				Prepared: Aug-29-15, Analyzed: Aug-29-15						
Conductivity (EC)	1400	2	µS/cm	1410		99	93-104			
Duplicate (B5H1608-DUP1)		**Source: 5081710-01**		Prepared: Aug-28-15, Analyzed: Aug-28-15						
Alkalinity, Total as CaCO3	290	1	mg/L		288			< 1	10	
Conductivity (EC)	622	2	µS/cm		618			< 1	5	
pH	7.81	0.01	pH units		7.79			< 1	5	
Reference (B5H1608-SRM1)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
pH	7.00	0.01	pH units	7.00		100	98-102			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B5H1608, Continued										
Reference (B5H1608-SRM2)				Prepared: Aug-28-15, Analyzed: Aug-28-15						
pH	6.99	0.01	pH units	7.00		100	98-102			
Reference (B5H1608-SRM3)				Prepared: Aug-29-15, Analyzed: Aug-29-15						
pH	6.99	0.01	pH units	7.00		100	98-102			
General Parameters, Batch B5I0032										
Blank (B5I0032-BLK1)				Prepared: Sep-01-15, Analyzed: Sep-01-15						
Solids, Total Suspended	< 1	2	mg/L							
Blank (B5I0032-BLK2)				Prepared: Sep-01-15, Analyzed: Sep-01-15						
Solids, Total Suspended	< 1	2	mg/L							
LCS (B5I0032-BS1)				Prepared: Sep-01-15, Analyzed: Sep-01-15						
Solids, Total Suspended	49	2	mg/L	50.0		98	85-110			
LCS (B5I0032-BS2)				Prepared: Sep-01-15, Analyzed: Sep-01-15						
Solids, Total Suspended	47	2	mg/L	50.0		93	85-110			
Total Recoverable Metals, Batch B5H1696										
Blank (B5H1696-BLK1)				Prepared: Aug-31-15, Analyzed: Sep-01-15						
Aluminum, total	< 0.005	0.005	mg/L							
Antimony, total	< 0.0001	0.0001	mg/L							
Arsenic, total	< 0.0005	0.0005	mg/L							
Barium, total	< 0.005	0.005	mg/L							
Beryllium, total	< 0.0001	0.0001	mg/L							
Bismuth, total	< 0.0001	0.0001	mg/L							
Boron, total	< 0.004	0.004	mg/L							
Cadmium, total	< 0.00001	0.00001	mg/L							
Calcium, total	< 0.2	0.2	mg/L							
Chromium, total	< 0.0005	0.0005	mg/L							
Cobalt, total	< 0.00005	0.00005	mg/L							
Copper, total	< 0.0002	0.0002	mg/L							
Iron, total	< 0.01	0.01	mg/L							
Lead, total	< 0.0001	0.0001	mg/L							
Lithium, total	< 0.0001	0.0001	mg/L							
Magnesium, total	< 0.01	0.01	mg/L							
Manganese, total	< 0.0002	0.0002	mg/L							
Molybdenum, total	< 0.0001	0.0001	mg/L							
Nickel, total	< 0.0002	0.0002	mg/L							
Phosphorus, total	< 0.02	0.02	mg/L							
Potassium, total	< 0.02	0.02	mg/L							
Selenium, total	< 0.0005	0.0005	mg/L							
Silicon, total	< 0.5	0.5	mg/L							
Silver, total	< 0.00005	0.00005	mg/L							
Sodium, total	< 0.02	0.02	mg/L							
Strontium, total	< 0.001	0.001	mg/L							
Sulfur, total	< 1	1	mg/L							
Tellurium, total	< 0.0002	0.0002	mg/L							
Thallium, total	< 0.00002	0.00002	mg/L							
Thorium, total	< 0.0001	0.0001	mg/L							
Tin, total	< 0.0002	0.0002	mg/L							
Titanium, total	< 0.005	0.005	mg/L							
Uranium, total	< 0.00002	0.00002	mg/L							
Vanadium, total	< 0.001	0.001	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5H1696, Continued										
Blank (B5H1696-BLK1), Continued				Prepared: Aug-31-15, Analyzed: Sep-01-15						
Zinc, total	< 0.004	0.004	mg/L							
Zirconium, total	< 0.0001	0.0001	mg/L							
Duplicate (B5H1696-DUP1)				**Source: 5081710-01**	Prepared: Aug-31-15, Analyzed: Sep-01-15					
Aluminum, total	< 0.005	0.005	mg/L		< 0.005				29	
Antimony, total	< 0.0001	0.0001	mg/L		< 0.0001				31	
Arsenic, total	< 0.0005	0.0005	mg/L		< 0.0005				15	
Barium, total	0.155	0.005	mg/L		0.146			6	9	
Beryllium, total	< 0.0001	0.0001	mg/L		< 0.0001				16	
Bismuth, total	< 0.0001	0.0001	mg/L		< 0.0001				20	
Boron, total	0.007	0.004	mg/L		0.007				29	
Cadmium, total	< 0.00001	0.00001	mg/L		< 0.00001				33	
Calcium, total	93.9	0.2	mg/L		87.9			7	12	
Chromium, total	< 0.0005	0.0005	mg/L		< 0.0005				12	
Cobalt, total	0.00005	0.00005	mg/L		< 0.00005				13	
Copper, total	0.0018	0.0002	mg/L		0.0016			11	37	
Iron, total	0.01	0.01	mg/L		0.01				18	
Lead, total	0.0001	0.0001	mg/L		0.0001				23	
Lithium, total	0.0014	0.0001	mg/L		0.0012			9	19	
Magnesium, total	28.7	0.01	mg/L		27.1			5	10	
Manganese, total	0.0010	0.0002	mg/L		0.0010			< 1	13	
Molybdenum, total	0.0004	0.0001	mg/L		0.0003				20	
Nickel, total	0.0003	0.0002	mg/L		0.0006				28	
Phosphorus, total	< 0.02	0.02	mg/L		0.03				24	
Potassium, total	1.03	0.02	mg/L		0.99			4	13	
Selenium, total	< 0.0005	0.0005	mg/L		< 0.0005				24	
Silicon, total	4.5	0.5	mg/L		4.3			2	11	
Silver, total	0.00181	0.00005	mg/L		0.00154			16	18	
Sodium, total	15.8	0.02	mg/L		15.1			4	10	
Strontium, total	0.315	0.001	mg/L		0.298			5	9	
Sulfur, total	10	1	mg/L		8			19	24	
Tellurium, total	< 0.0002	0.0002	mg/L		< 0.0002				20	
Thallium, total	< 0.00002	0.00002	mg/L		< 0.00002				24	
Thorium, total	< 0.0001	0.0001	mg/L		< 0.0001				18	
Tin, total	< 0.0002	0.0002	mg/L		< 0.0002				18	
Titanium, total	< 0.005	0.005	mg/L		< 0.005				32	
Uranium, total	0.00114	0.00002	mg/L		0.00111			2	14	
Vanadium, total	< 0.001	0.001	mg/L		< 0.001				17	
Zinc, total	0.004	0.004	mg/L		0.016				8	
Zirconium, total	< 0.0001	0.0001	mg/L		< 0.0001				60	
Reference (B5H1696-SRM1)				Prepared: Aug-31-15, Analyzed: Sep-01-15						
Aluminum, total	0.293	0.005	mg/L	0.296		99	81-129			
Antimony, total	0.0534	0.0001	mg/L	0.0505		106	88-114			
Arsenic, total	0.135	0.0005	mg/L	0.122		111	88-114			
Barium, total	0.752	0.005	mg/L	0.777		97	72-104			
Beryllium, total	0.0482	0.0001	mg/L	0.0488		99	76-131			
Boron, total	3.38	0.004	mg/L	3.40		100	75-121			
Cadmium, total	0.0495	0.00001	mg/L	0.0490		101	89-111			
Calcium, total	11.0	0.2	mg/L	10.2		107	86-121			
Chromium, total	0.254	0.0005	mg/L	0.242		105	89-114			
Cobalt, total	0.0399	0.00005	mg/L	0.0366		109	91-113			
Copper, total	0.518	0.0002	mg/L	0.487		106	91-115			
Iron, total	0.50	0.01	mg/L	0.469		107	77-124			
Lead, total	0.215	0.0001	mg/L	0.193		112	92-113			
Lithium, total	0.380	0.0001	mg/L	0.390		97	85-115			
Magnesium, total	3.39	0.01	mg/L	3.31		103	78-120			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5H1696, Continued										
Reference (B5H1696-SRM1), Continued				Prepared: Aug-31-15, Analyzed: Sep-01-15						
Manganese, total	0.113	0.0002	mg/L	0.109		103	90-114			
Molybdenum, total	0.203	0.0001	mg/L	0.197		103	90-111			
Nickel, total	0.251	0.0002	mg/L	0.242		104	90-111			
Phosphorus, total	0.20	0.02	mg/L	0.233		85	85-115			
Potassium, total	6.49	0.02	mg/L	5.93		109	84-113			
Selenium, total	0.127	0.0005	mg/L	0.115		111	85-115			
Sodium, total	7.76	0.02	mg/L	7.64		102	82-123			
Strontium, total	0.382	0.001	mg/L	0.363		105	88-112			
Thallium, total	0.0871	0.00002	mg/L	0.0794		110	91-114			
Uranium, total	0.0205	0.00002	mg/L	0.0192		107	85-120			
Vanadium, total	0.387	0.001	mg/L	0.376		103	86-111			
Zinc, total	2.52	0.004	mg/L	2.42		104	85-111			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

		5081710-01	5081710-02	5081710-03	5081710-04
		Water	**Water**	**Water**	**Water**
		Aug-25-15	**Aug-25-15**	**Aug-25-15**	**Aug-25-15**
		Town Well #6	**DMW - 1b**	**DMW - 4**	**MW-6s**
Anions	Bromide (mg/L)	< 0.10	< 0.10	< 0.10	1.09
	Chloride (mg/L)	24.8	42.4	13.2	549
	Fluoride (mg/L)	< 0.10	1.28	0.74	0.10
	Nitrate as N (mg/L)	1.01	< 0.010	0.414	34.1
	Nitrite as N (mg/L)	< 0.010	< 0.010	< 0.010	< 0.010
	Phosphate, Ortho as P (mg/L)	< 0.01	< 0.01	< 0.01	< 0.01
	Sulfate (mg/L)	23.8	114	232	878
General Parameters	Alkalinity, Total as CaCO3 (mg/L)	288	478	429	865
	Conductivity (EC) (uS/cm)	618	1120	1130	4520
	Ammonia as N, Total (mg/L)	< 0.020	0.210	0.816	0.614
	pH (pH units)	7.79	7.70	7.74	7.34
	Solids, Total Suspended (mg/L)	< 2	< 2	< 2	7
	Turbidity (NTU)	0.2	3.0	0.2	1.6
Calculated Parameters	Hardness, Total (Diss. as CaCO3) (mg/L)				1890
	Hardness, Total (Total as CaCO3) (mg/L)	332	678	611	
Dissolved Metals	Aluminum, dissolved (mg/L)				0.024
	Antimony, dissolved (mg/L)				0.0005
	Arsenic, dissolved (mg/L)				< 0.0005
	Barium, dissolved (mg/L)				0.062
	Beryllium, dissolved (mg/L)				< 0.0001
	Bismuth, dissolved (mg/L)				< 0.0001
	Boron, dissolved (mg/L)				1.90
	Cadmium, dissolved (mg/L)				< 0.00001
	Calcium, dissolved (mg/L)				197
	Chromium, dissolved (mg/L)				< 0.0005
	Cobalt, dissolved (mg/L)				0.00149
	Copper, dissolved (mg/L)				0.0420
	Iron, dissolved (mg/L)				0.062
	Lead, dissolved (mg/L)				0.0014
	Lithium, dissolved (mg/L)				0.0513
	Magnesium, dissolved (mg/L)				339
	Manganese, dissolved (mg/L)				0.0870
	Molybdenum, dissolved (mg/L)				0.0004
	Nickel, dissolved (mg/L)				0.0109
	Phosphorus, dissolved (mg/L)				< 0.02
	Potassium, dissolved (mg/L)				217
	Selenium, dissolved (mg/L)				< 0.0005
	Silicon, dissolved (mg/L)				12.7
	Silver, dissolved (mg/L)				< 0.00005
	Sodium, dissolved (mg/L)				394
	Strontium, dissolved (mg/L)				2.05
	Sulfur, dissolved (mg/L)				362
	Tellurium, dissolved (mg/L)				0.0003
	Thallium, dissolved (mg/L)				0.00006

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5081710
REPORTED Sep-02-15

		5081710-01	5081710-02	5081710-03	5081710-04
		Water	**Water**	**Water**	**Water**
		Aug-25-15	**Aug-25-15**	**Aug-25-15**	**Aug-25-15**
		Town Well #6	**DMW - 1b**	**DMW - 4**	**MW-6s**
Dissolved Metals	Thorium, dissolved (mg/L)				< 0.0001
	Tin, dissolved (mg/L)				0.0005
	Titanium, dissolved (mg/L)				< 0.005
	Uranium, dissolved (mg/L)				0.00779
	Vanadium, dissolved (mg/L)				< 0.001
	Zinc, dissolved (mg/L)				0.027
	Zirconium, dissolved (mg/L)				0.0001
Total Recoverable Metals	Aluminum, total (mg/L)	< 0.005	< 0.005	< 0.005	
	Antimony, total (mg/L)	< 0.0001	< 0.0001	0.0003	
	Arsenic, total (mg/L)	< 0.0005	0.0489	0.0018	
	Barium, total (mg/L)	0.146	0.026	0.016	
	Beryllium, total (mg/L)	< 0.0001	0.0001	< 0.0001	
	Bismuth, total (mg/L)	< 0.0001	< 0.0001	< 0.0001	
	Boron, total (mg/L)	0.007	0.139	0.392	
	Cadmium, total (mg/L)	< 0.00001	< 0.00001	< 0.00001	
	Calcium, total (mg/L)	87.9	75.8	81.9	
	Chromium, total (mg/L)	< 0.0005	< 0.0005	< 0.0005	
	Cobalt, total (mg/L)	< 0.00005	< 0.00005	0.00083	
	Copper, total (mg/L)	0.0016	0.0009	0.0027	
	Iron, total (mg/L)	0.01	0.38	0.02	
	Lead, total (mg/L)	0.0001	0.0003	0.0003	
	Lithium, total (mg/L)	0.0012	0.0244	0.0462	
	Magnesium, total (mg/L)	27.1	119	98.6	
	Manganese, total (mg/L)	0.0010	0.0046	0.0037	
	Molybdenum, total (mg/L)	0.0003	0.0004	0.0007	
	Nickel, total (mg/L)	0.0006	0.0026	0.0025	
	Phosphorus, total (mg/L)	0.03	0.08	< 0.02	
	Potassium, total (mg/L)	0.99	5.94	9.42	
	Selenium, total (mg/L)	< 0.0005	< 0.0005	< 0.0005	
	Silicon, total (mg/L)	4.3	9.0	7.2	
	Silver, total (mg/L)	0.00154	0.00163	0.00129	
	Sodium, total (mg/L)	15.1	33.2	46.9	
	Strontium, total (mg/L)	0.298	1.99	5.09	
	Sulfur, total (mg/L)	8	51	87	
	Tellurium, total (mg/L)	< 0.0002	< 0.0002	< 0.0002	
	Thallium, total (mg/L)	< 0.00002	< 0.00002	< 0.00002	
	Thorium, total (mg/L)	< 0.0001	< 0.0001	< 0.0001	
	Tin, total (mg/L)	< 0.0002	< 0.0002	< 0.0002	
	Titanium, total (mg/L)	< 0.005	< 0.005	< 0.005	
	Uranium, total (mg/L)	0.00111	0.00007	0.00108	
	Vanadium, total (mg/L)	< 0.001	< 0.001	< 0.001	
	Zinc, total (mg/L)	0.016	< 0.004	0.030	
	Zirconium, total (mg/L)	< 0.0001	0.0019	0.0008	

CERTIFICATE OF ANALYSIS

REPORTED TO	Western Water Associates Ltd 106 - 5145 26th Street Vernon, BC V1T 8G4	**TEL** **FAX**	(250) 541-1030 (250) 575-4764
ATTENTION	Bryer Manwell	**WORK ORDER**	5110693
PO NUMBER		**RECEIVED / TEMP**	Nov-10-15 08:00 / 6°C
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15
PROJECT INFO	14-024-016	**COC NUMBER**	B25668

General Comments:

CARO Analytical Services employs methods which are conducted according to procedures accepted by appropriate regulatory agencies, and/or are conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts, except where otherwise agreed to by the client.

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Authorized By: **Ed Hoppe, B.Sc., P.Chem.**
Division Manager, Kelowna

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TABLE OF CONTENTS

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

ANALYSIS INFORMATION

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analysis Description	Method Reference	Technique	Location
Alkalinity in Water (Total)	APHA 2320 B*	Titration with H2SO4	Kelowna
Ammonia-N in Water (total)	APHA 4500-NH3 G*	Automated Colorimetry (Phenate)	Kelowna
Anions in Water by IC	APHA 4110 B	Ion Chromatography with Chemical Suppression of Eluent Conductivity	Kelowna
Conductivity in Water	APHA 2510 B	Conductivity Meter	Kelowna
Dissolved Metals	APHA 3030 B / APHA 3125 B	0.45 µm Filtration / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Hardness (as CaCO3)	APHA 2340 B	Calculation: 2.497 [Ca] + 4.118 [Mg]	N/A
Mercury, dissolved by CVAFS	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Mercury, total by CVAFS	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
pH in Water	APHA 4500-H+ B	Electrometry	Kelowna
Total Recoverable Metals	APHA 3030E* / APHA 3125 B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma Mass Spectrometry (ICP-MS)	Richmond
Total Suspended Solids	APHA 2540 D*	Gravimetry (Dried at 103-105C)	Kelowna
Turbidity	APHA 2130 B	Nephelometry	Kelowna

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Method Reference Descriptions:

APHA	Standard Methods for the Examination of Water and Wastewater, 22nd Edition, American Public Health Association/American Water Works Association/Water Environment Federation
EPA	United States Environmental Protection Agency Test Methods

Glossary of Terms:

MRL	Method Reporting Limit
<	Less than the Reported Detection Limit (RDL) - the RDL may be higher than the MRL due to various factors such as dilutions, limited sample volume, high moisture, or interferences
mg/L	Milligrams per litre
NTU	Nephelometric Turbidity Units
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (5110693-01) [Water] Sampled: Nov-09-15 09:40						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	Nov-12-15	
Chloride	**51.7**	0.10	mg/L	N/A	Nov-12-15	
Fluoride	**1.31**	0.10	mg/L	N/A	Nov-12-15	
Nitrate as N	< 0.010	0.010	mg/L	N/A	Nov-12-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-12-15	
Sulfate	**116**	1.0	mg/L	N/A	Nov-12-15	
General Parameters						
Alkalinity, Total as CaCO3	**500**	1	mg/L	N/A	Nov-10-15	
Conductivity (EC)	< 2	2	µS/cm	N/A	Nov-10-15	
Ammonia as N, Total	**0.276**	0.020	mg/L	N/A	Nov-17-15	
pH	**7.63**	0.01	pH units	N/A	Nov-10-15	HT2
Solids, Total Suspended	< 3	2	mg/L	Nov-13-15	Nov-16-15	
Turbidity	**4.5**	0.1	NTU	N/A	Nov-10-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**645**	5.0	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Antimony, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Arsenic, total	**0.042**	0.005	mg/L	Nov-16-15	Nov-17-15	
Barium, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Beryllium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Bismuth, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Boron, total	**0.14**	0.04	mg/L	Nov-16-15	Nov-17-15	
Cadmium, total	< 0.0001	0.0001	mg/L	Nov-16-15	Nov-17-15	
Calcium, total	**75.1**	2.0	mg/L	Nov-16-15	Nov-17-15	
Chromium, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Cobalt, total	< 0.0005	0.0005	mg/L	Nov-16-15	Nov-17-15	
Copper, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Iron, total	**0.42**	0.10	mg/L	Nov-16-15	Nov-17-15	
Lead, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Lithium, total	**0.026**	0.001	mg/L	Nov-16-15	Nov-17-15	
Magnesium, total	**111**	0.1	mg/L	Nov-16-15	Nov-17-15	
Manganese, total	**0.005**	0.002	mg/L	Nov-16-15	Nov-17-15	
Mercury, total	< 0.00002	0.00002	mg/L	Nov-16-15	Nov-16-15	
Molybdenum, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Nickel, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Phosphorus, total	< 0.2	0.2	mg/L	Nov-16-15	Nov-17-15	
Potassium, total	**5.1**	0.2	mg/L	Nov-16-15	Nov-17-15	
Selenium, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Silicon, total	**8**	5	mg/L	Nov-16-15	Nov-17-15	
Silver, total	< 0.0005	0.0005	mg/L	Nov-16-15	Nov-17-15	
Sodium, total	**29.7**	0.2	mg/L	Nov-16-15	Nov-17-15	
Strontium, total	**1.74**	0.01	mg/L	Nov-16-15	Nov-17-15	
Sulfur, total	**37**	10	mg/L	Nov-16-15	Nov-17-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 1b (5110693-01) [Water] Sampled: Nov-09-15 09:40, Continued						
Total Recoverable Metals, Continued						
Tellurium, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Thallium, total	< 0.0002	0.0002	mg/L	Nov-16-15	Nov-17-15	
Thorium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Tin, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Titanium, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Uranium, total	< 0.0002	0.0002	mg/L	Nov-16-15	Nov-17-15	
Vanadium, total	< 0.01	0.01	mg/L	Nov-16-15	Nov-17-15	
Zinc, total	< 0.04	0.04	mg/L	Nov-16-15	Nov-17-15	
Zirconium, total	**0.001**	0.001	mg/L	Nov-16-15	Nov-17-15	
Sample ID: DMW - 4 (5110693-02) [Water] Sampled: Nov-09-15 10:05						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	Nov-12-15	
Chloride	**15.7**	0.10	mg/L	N/A	Nov-12-15	
Fluoride	**0.48**	0.10	mg/L	N/A	Nov-12-15	
Nitrate as N	**0.725**	0.010	mg/L	N/A	Nov-12-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-12-15	
Sulfate	**196**	1.0	mg/L	N/A	Nov-12-15	
General Parameters						
Alkalinity, Total as CaCO3	**422**	1	mg/L	N/A	Nov-10-15	
Conductivity (EC)	**1090**	2	µS/cm	N/A	Nov-10-15	
Ammonia as N, Total	**0.283**	0.020	mg/L	N/A	Nov-17-15	
pH	**7.72**	0.01	pH units	N/A	Nov-10-15	HT2
Solids, Total Suspended	< 3	2	mg/L	Nov-13-15	Nov-16-15	
Turbidity	**0.2**	0.1	NTU	N/A	Nov-10-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**587**	5.0	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Antimony, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Arsenic, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Barium, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Beryllium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Bismuth, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Boron, total	**0.20**	0.04	mg/L	Nov-16-15	Nov-17-15	
Cadmium, total	< 0.0001	0.0001	mg/L	Nov-16-15	Nov-17-15	
Calcium, total	**81.6**	2.0	mg/L	Nov-16-15	Nov-17-15	
Chromium, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Cobalt, total	**0.0009**	0.0005	mg/L	Nov-16-15	Nov-17-15	
Copper, total	**0.006**	0.002	mg/L	Nov-16-15	Nov-17-15	
Iron, total	< 0.10	0.10	mg/L	Nov-16-15	Nov-17-15	
Lead, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Lithium, total	**0.030**	0.001	mg/L	Nov-16-15	Nov-17-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: DMW - 4 (5110693-02) [Water] Sampled: Nov-09-15 10:05, Continued						
Total Recoverable Metals, Continued						
Magnesium, total	**93.1**	0.1	mg/L	Nov-16-15	Nov-17-15	
Manganese, total	**0.004**	0.002	mg/L	Nov-16-15	Nov-17-15	
Mercury, total	< 0.00002	0.00002	mg/L	Nov-16-15	Nov-16-15	
Molybdenum, total	**0.001**	0.001	mg/L	Nov-16-15	Nov-17-15	
Nickel, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Phosphorus, total	< 0.2	0.2	mg/L	Nov-16-15	Nov-17-15	
Potassium, total	**6.2**	0.2	mg/L	Nov-16-15	Nov-17-15	
Selenium, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Silicon, total	**7**	5	mg/L	Nov-16-15	Nov-17-15	
Silver, total	< 0.0005	0.0005	mg/L	Nov-16-15	Nov-17-15	
Sodium, total	**27.2**	0.2	mg/L	Nov-16-15	Nov-17-15	
Strontium, total	**3.55**	0.01	mg/L	Nov-16-15	Nov-17-15	
Sulfur, total	**67**	10	mg/L	Nov-16-15	Nov-17-15	
Tellurium, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Thallium, total	< 0.0002	0.0002	mg/L	Nov-16-15	Nov-17-15	
Thorium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Tin, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Titanium, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Uranium, total	**0.0017**	0.0002	mg/L	Nov-16-15	Nov-17-15	
Vanadium, total	< 0.01	0.01	mg/L	Nov-16-15	Nov-17-15	
Zinc, total	< 0.04	0.04	mg/L	Nov-16-15	Nov-17-15	
Zirconium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Sample ID: MW-6s (5110693-03) [Waste Water] Sampled: Nov-09-15 11:00						
Anions						
Bromide	**1.48**	0.10	mg/L	N/A	Nov-12-15	
Chloride	**627**	0.10	mg/L	N/A	Nov-12-15	
Fluoride	**0.23**	0.10	mg/L	N/A	Nov-12-15	
Nitrate as N	**33.3**	0.010	mg/L	N/A	Nov-12-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-12-15	
Sulfate	**905**	1.0	mg/L	N/A	Nov-12-15	
General Parameters						
Alkalinity, Total as CaCO3	**897**	1	mg/L	N/A	Nov-12-15	
Conductivity (EC)	**4570**	2	µS/cm	N/A	Nov-12-15	
Ammonia as N, Total	**0.899**	0.020	mg/L	N/A	Nov-17-15	
pH	**7.30**	0.01	pH units	N/A	Nov-12-15	HT2
Solids, Total Suspended	**226**	2	mg/L	Nov-13-15	Nov-16-15	
Turbidity	**205**	0.1	NTU	N/A	Nov-10-15	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	**1850**	0.50	mg/L	N/A	N/A	
Dissolved Metals						
Aluminum, dissolved	**0.859**	0.005	mg/L	N/A	Nov-17-15	
Antimony, dissolved	**0.0004**	0.0001	mg/L	N/A	Nov-17-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: MW-6s (5110693-03) [Waste Water] Sampled: Nov-09-15 11:00, Continued						
Dissolved Metals, Continued						
Arsenic, dissolved	**0.0010**	0.0005	mg/L	N/A	Nov-17-15	
Barium, dissolved	**0.071**	0.005	mg/L	N/A	Nov-17-15	
Beryllium, dissolved	**0.0006**	0.0001	mg/L	N/A	Nov-17-15	
Bismuth, dissolved	< 0.0001	0.0001	mg/L	N/A	Nov-17-15	
Boron, dissolved	**1.77**	0.004	mg/L	N/A	Nov-17-15	
Cadmium, dissolved	**0.00003**	0.00001	mg/L	N/A	Nov-17-15	
Calcium, dissolved	**208**	0.2	mg/L	N/A	Nov-17-15	
Chromium, dissolved	**0.0017**	0.0005	mg/L	N/A	Nov-17-15	
Cobalt, dissolved	**0.00204**	0.00005	mg/L	N/A	Nov-17-15	
Copper, dissolved	**0.200**	0.0002	mg/L	N/A	Nov-17-15	
Iron, dissolved	**1.21**	0.010	mg/L	N/A	Nov-17-15	
Lead, dissolved	**0.0039**	0.0001	mg/L	N/A	Nov-17-15	
Lithium, dissolved	**0.0462**	0.0001	mg/L	N/A	Nov-17-15	
Magnesium, dissolved	**322**	0.01	mg/L	N/A	Nov-17-15	
Manganese, dissolved	**0.157**	0.0002	mg/L	N/A	Nov-17-15	
Mercury, dissolved	< 0.00002	0.00002	mg/L	Nov-16-15	Nov-17-15	
Molybdenum, dissolved	**0.0037**	0.0001	mg/L	N/A	Nov-17-15	
Nickel, dissolved	**0.0119**	0.0002	mg/L	N/A	Nov-17-15	
Phosphorus, dissolved	**0.04**	0.02	mg/L	N/A	Nov-17-15	
Potassium, dissolved	**199**	0.02	mg/L	N/A	Nov-17-15	
Selenium, dissolved	< 0.0005	0.0005	mg/L	N/A	Nov-17-15	
Silicon, dissolved	**12.9**	0.5	mg/L	N/A	Nov-17-15	
Silver, dissolved	< 0.00005	0.00005	mg/L	N/A	Nov-17-15	
Sodium, dissolved	**375**	0.02	mg/L	N/A	Nov-17-15	
Strontium, dissolved	**1.90**	0.001	mg/L	N/A	Nov-17-15	
Sulfur, dissolved	**342**	1	mg/L	N/A	Nov-17-15	
Tellurium, dissolved	< 0.0002	0.0002	mg/L	N/A	Nov-17-15	
Thallium, dissolved	**0.00007**	0.00002	mg/L	N/A	Nov-17-15	
Thorium, dissolved	**0.0006**	0.0001	mg/L	N/A	Nov-17-15	
Tin, dissolved	**0.0013**	0.0002	mg/L	N/A	Nov-17-15	
Titanium, dissolved	**0.038**	0.005	mg/L	N/A	Nov-17-15	
Uranium, dissolved	**0.00804**	0.00002	mg/L	N/A	Nov-17-15	
Vanadium, dissolved	**0.001**	0.001	mg/L	N/A	Nov-17-15	
Zinc, dissolved	**0.067**	0.004	mg/L	N/A	Nov-17-15	
Zirconium, dissolved	**0.0008**	0.0001	mg/L	N/A	Nov-17-15	
Sample ID: Town Well #6 (5110693-04) [Waste Water] Sampled: Nov-09-15 14:15						
Anions						
Bromide	< 0.10	0.10	mg/L	N/A	Nov-12-15	
Chloride	**28.6**	0.10	mg/L	N/A	Nov-12-15	
Fluoride	< 0.10	0.10	mg/L	N/A	Nov-12-15	
Nitrate as N	**0.925**	0.010	mg/L	N/A	Nov-12-15	
Nitrite as N	< 0.010	0.010	mg/L	N/A	Nov-12-15	
Sulfate	**24.8**	1.0	mg/L	N/A	Nov-12-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (5110693-04) [Waste Water] Sampled: Nov-09-15 14:15, Continued						
General Parameters						
Alkalinity, Total as CaCO3	**295**	1	mg/L	N/A	Nov-12-15	
Conductivity (EC)	**661**	2	µS/cm	N/A	Nov-12-15	
Ammonia as N, Total	**0.020**	0.020	mg/L	N/A	Nov-17-15	
pH	**7.72**	0.01	pH units	N/A	Nov-12-15	HT2
Solids, Total Suspended	< 3	2	mg/L	Nov-13-15	Nov-16-15	
Turbidity	**0.1**	0.1	NTU	N/A	Nov-10-15	
Calculated Parameters						
Hardness, Total (Total as CaCO3)	**328**	5.0	mg/L	N/A	N/A	
Total Recoverable Metals						
Aluminum, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Antimony, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Arsenic, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Barium, total	**0.14**	0.05	mg/L	Nov-16-15	Nov-17-15	
Beryllium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Bismuth, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Boron, total	< 0.04	0.04	mg/L	Nov-16-15	Nov-17-15	
Cadmium, total	< 0.0001	0.0001	mg/L	Nov-16-15	Nov-17-15	
Calcium, total	**87.0**	2.0	mg/L	Nov-16-15	Nov-17-15	
Chromium, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Cobalt, total	< 0.0005	0.0005	mg/L	Nov-16-15	Nov-17-15	
Copper, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Iron, total	< 0.10	0.10	mg/L	Nov-16-15	Nov-17-15	
Lead, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Lithium, total	**0.001**	0.001	mg/L	Nov-16-15	Nov-17-15	
Magnesium, total	**26.8**	0.1	mg/L	Nov-16-15	Nov-17-15	
Manganese, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Mercury, total	< 0.00002	0.00002	mg/L	Nov-16-15	Nov-16-15	
Molybdenum, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Nickel, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Phosphorus, total	< 0.2	0.2	mg/L	Nov-16-15	Nov-17-15	
Potassium, total	**0.8**	0.2	mg/L	Nov-16-15	Nov-17-15	
Selenium, total	< 0.005	0.005	mg/L	Nov-16-15	Nov-17-15	
Silicon, total	< 5	5	mg/L	Nov-16-15	Nov-17-15	
Silver, total	< 0.0005	0.0005	mg/L	Nov-16-15	Nov-17-15	
Sodium, total	**15.9**	0.2	mg/L	Nov-16-15	Nov-17-15	
Strontium, total	**0.27**	0.01	mg/L	Nov-16-15	Nov-17-15	
Sulfur, total	< 10	10	mg/L	Nov-16-15	Nov-17-15	
Tellurium, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Thallium, total	< 0.0002	0.0002	mg/L	Nov-16-15	Nov-17-15	
Thorium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	
Tin, total	< 0.002	0.002	mg/L	Nov-16-15	Nov-17-15	
Titanium, total	< 0.05	0.05	mg/L	Nov-16-15	Nov-17-15	
Uranium, total	**0.0011**	0.0002	mg/L	Nov-16-15	Nov-17-15	
Vanadium, total	< 0.01	0.01	mg/L	Nov-16-15	Nov-17-15	

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

Analyte	Result / *Recovery*	MRL / *Limits*	Units	Prepared	Analyzed	Notes
Sample ID: Town Well #6 (5110693-04) [Waste Water] Sampled: Nov-09-15 14:15, Continued						
Total Recoverable Metals, Continued						
Zinc, total	< 0.04	0.04	mg/L	Nov-16-15	Nov-17-15	
Zirconium, total	< 0.001	0.001	mg/L	Nov-16-15	Nov-17-15	

Sample / Analysis Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

REPORTED TO	Western Water Associates Ltd	**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006	**REPORTED**	Nov-18-15

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: Laboratory reagent water is carried through sample preparation and analysis steps. Method Blanks indicate that results are free from contamination, i.e. not biased high from sources such as the sample container or the laboratory environment
- **Duplicate (Dup)**: Preparation and analysis of a replicate aliquot of a sample. Duplicates provide a measure of the analytical method's precision, i.e. how reproducible a result is. Duplicates are only reported if they are associated with your sample data.
- **Blank Spike (BS)**: A known amount of standard is carried through sample preparation and analysis steps. Blank Spikes, also known as laboratory control samples (LCS), are prepared from a different source of standard than used for the calibration. They ensure that the calibration is acceptable (i.e. not biased high or low) and also provide a measure of the analytical method's accuracy (i.e. closeness of the result to a target value).
- **Standard Reference Material (SRM)**: A material of similar matrix to the samples, externally certified for the parameter(s) listed. Standard Reference Materials ensure that the preparation steps in the method are adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5K0755										
Blank (B5K0755-BLK1)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.005	0.010	mg/L							
Nitrite as N	< 0.002	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B5K0755-BLK2)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.005	0.010	mg/L							
Nitrite as N	< 0.002	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B5K0755-BLK3)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Bromide	< 0.10	0.10	mg/L							
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Nitrate as N	< 0.005	0.010	mg/L							
Nitrite as N	< 0.002	0.010	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B5K0755-BS1)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Bromide	4.07	0.10	mg/L	4.00		102	85-115			
Chloride	15.7	0.10	mg/L	16.0		98	90-110			
Fluoride	4.00	0.10	mg/L	4.00		100	85-115			
Nitrate as N	4.01	0.010	mg/L	4.00		100	85-115			
Nitrite as N	2.01	0.010	mg/L	2.00		101	85-115			
Sulfate	15.6	1.0	mg/L	16.0		98	85-115			
LCS (B5K0755-BS2)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Bromide	4.13	0.10	mg/L	4.00		103	85-115			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Anions, Batch B5K0755, Continued										
LCS (B5K0755-BS2), Continued				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Chloride	15.1	0.10	mg/L	16.0		94	90-110			
Fluoride	3.65	0.10	mg/L	4.00		91	85-115			
Nitrate as N	4.09	0.010	mg/L	4.00		102	85-115			
Nitrite as N	2.01	0.010	mg/L	2.00		100	85-115			
Sulfate	15.6	1.0	mg/L	16.0		98	85-115			
LCS (B5K0755-BS3)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Bromide	4.16	0.10	mg/L	4.00		104	85-115			
Chloride	15.5	0.10	mg/L	16.0		97	90-110			
Fluoride	3.75	0.10	mg/L	4.00		94	85-115			
Nitrate as N	4.16	0.010	mg/L	4.00		104	85-115			
Nitrite as N	1.98	0.010	mg/L	2.00		99	85-115			
Sulfate	15.7	1.0	mg/L	16.0		98	85-115			
Dissolved Metals, Batch B5K0855										
Blank (B5K0855-BLK1)				Prepared: Nov-16-15, Analyzed: Nov-17-15						
Mercury, dissolved	< 0.00002	0.00002	mg/L							
Blank (B5K0855-BLK2)				Prepared: Nov-16-15, Analyzed: Nov-17-15						
Mercury, dissolved	< 0.00002	0.00002	mg/L							
Reference (B5K0855-SRM1)				Prepared: Nov-16-15, Analyzed: Nov-17-15						
Mercury, dissolved	0.00296	0.00002	mg/L	0.00456		65	50-150			
Reference (B5K0855-SRM2)				Prepared: Nov-16-15, Analyzed: Nov-17-15						
Mercury, dissolved	0.00289	0.00002	mg/L	0.00456		63	50-150			
Dissolved Metals, Batch B5K0897										
Blank (B5K0897-BLK1)				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Aluminum, dissolved	< 0.005	0.005	mg/L							
Antimony, dissolved	< 0.0001	0.0001	mg/L							
Arsenic, dissolved	< 0.0005	0.0005	mg/L							
Barium, dissolved	< 0.005	0.005	mg/L							
Beryllium, dissolved	< 0.0001	0.0001	mg/L							
Bismuth, dissolved	< 0.0001	0.0001	mg/L							
Boron, dissolved	< 0.004	0.004	mg/L							
Cadmium, dissolved	< 0.00001	0.00001	mg/L							
Calcium, dissolved	< 0.2	0.2	mg/L							
Chromium, dissolved	< 0.0005	0.0005	mg/L							
Cobalt, dissolved	< 0.00005	0.00005	mg/L							
Copper, dissolved	< 0.0002	0.0002	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.0001	0.0001	mg/L							
Lithium, dissolved	< 0.0001	0.0001	mg/L							
Magnesium, dissolved	< 0.01	0.01	mg/L							
Manganese, dissolved	< 0.0002	0.0002	mg/L							
Molybdenum, dissolved	< 0.0001	0.0001	mg/L							
Nickel, dissolved	< 0.0002	0.0002	mg/L							
Phosphorus, dissolved	< 0.02	0.02	mg/L							
Potassium, dissolved	< 0.02	0.02	mg/L							
Selenium, dissolved	< 0.0005	0.0005	mg/L							
Silicon, dissolved	< 0.5	0.5	mg/L							
Silver, dissolved	< 0.00005	0.00005	mg/L							
Sodium, dissolved	< 0.02	0.02	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5K0897, Continued										
Blank (B5K0897-BLK1), Continued				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Strontium, dissolved	< 0.001	0.001	mg/L							
Sulfur, dissolved	< 1	1	mg/L							
Tellurium, dissolved	< 0.0002	0.0002	mg/L							
Thallium, dissolved	< 0.00002	0.00002	mg/L							
Thorium, dissolved	< 0.0001	0.0001	mg/L							
Tin, dissolved	< 0.0002	0.0002	mg/L							
Titanium, dissolved	< 0.005	0.005	mg/L							
Uranium, dissolved	< 0.00002	0.00002	mg/L							
Vanadium, dissolved	< 0.001	0.001	mg/L							
Zinc, dissolved	< 0.004	0.004	mg/L							
Zirconium, dissolved	< 0.0001	0.0001	mg/L							
Duplicate (B5K0897-DUP1)		**Source: 5110693-03**		Prepared: Nov-17-15, Analyzed: Nov-17-15						
Aluminum, dissolved	0.810	0.005	mg/L		0.859			6	11	
Antimony, dissolved	0.0004	0.0001	mg/L		0.0004				44	
Arsenic, dissolved	0.0010	0.0005	mg/L		0.0010				8	
Barium, dissolved	0.067	0.005	mg/L		0.071			6	7	
Beryllium, dissolved	0.0006	0.0001	mg/L		0.0006			< 1	14	
Bismuth, dissolved	< 0.0001	0.0001	mg/L		< 0.0001				20	
Boron, dissolved	1.93	0.004	mg/L		1.77			8	13	
Cadmium, dissolved	0.00003	0.00001	mg/L		0.00003				27	
Calcium, dissolved	224	0.2	mg/L		208			7	8	
Chromium, dissolved	0.0015	0.0005	mg/L		0.0017				14	
Cobalt, dissolved	0.00200	0.00005	mg/L		0.00204			2	10	
Copper, dissolved	0.199	0.0002	mg/L		0.200			< 1	28	
Iron, dissolved	1.21	0.010	mg/L		1.21			< 1	14	
Lead, dissolved	0.0041	0.0001	mg/L		0.0039			6	26	
Lithium, dissolved	0.0503	0.0001	mg/L		0.0462			8	14	
Magnesium, dissolved	324	0.01	mg/L		322			< 1	6	
Manganese, dissolved	0.158	0.0002	mg/L		0.157			< 1	9	
Molybdenum, dissolved	0.0037	0.0001	mg/L		0.0037			1	19	
Nickel, dissolved	0.0120	0.0002	mg/L		0.0119			< 1	21	
Phosphorus, dissolved	0.05	0.02	mg/L		0.04				14	
Potassium, dissolved	198	0.02	mg/L		199			< 1	8	
Selenium, dissolved	< 0.0005	0.0005	mg/L		< 0.0005				36	
Silicon, dissolved	12.4	0.5	mg/L		12.9			4	12	
Silver, dissolved	< 0.00005	0.00005	mg/L		< 0.00005				20	
Sodium, dissolved	375	0.02	mg/L		375			< 1	6	
Strontium, dissolved	1.86	0.001	mg/L		1.90			2	6	
Sulfur, dissolved	342	1	mg/L		342			< 1	26	
Tellurium, dissolved	< 0.0002	0.0002	mg/L		< 0.0002				20	
Thallium, dissolved	0.00007	0.00002	mg/L		0.00007				13	
Thorium, dissolved	0.0005	0.0001	mg/L		0.0006			10	30	
Tin, dissolved	0.0013	0.0002	mg/L		0.0013			6	6	
Titanium, dissolved	0.023	0.005	mg/L		0.038			50	20	RPD
Uranium, dissolved	0.00853	0.00002	mg/L		0.00804			6	14	
Vanadium, dissolved	0.001	0.001	mg/L		0.001				20	
Zinc, dissolved	0.068	0.004	mg/L		0.067			< 1	11	
Zirconium, dissolved	0.0006	0.0001	mg/L		0.0008			27	36	
Reference (B5K0897-SRM1)				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Aluminum, dissolved	0.208	0.005	mg/L	0.233		89	58-142			
Antimony, dissolved	0.0462	0.0001	mg/L	0.0430		107	75-125			
Arsenic, dissolved	0.426	0.0005	mg/L	0.438		97	81-119			
Barium, dissolved	3.29	0.005	mg/L	3.35		98	83-117			
Beryllium, dissolved	0.203	0.0001	mg/L	0.213		95	80-120			
Boron, dissolved	1.70	0.004	mg/L	1.74		98	74-117			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Dissolved Metals, Batch B5K0897, Continued										
Reference (B5K0897-SRM1), Continued				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Cadmium, dissolved	0.220	0.00001	mg/L	0.224		98	83-117			
Calcium, dissolved	7.8	0.2	mg/L	7.69		102	76-124			
Chromium, dissolved	0.414	0.0005	mg/L	0.437		95	81-119			
Cobalt, dissolved	0.128	0.00005	mg/L	0.128		100	76-124			
Copper, dissolved	0.846	0.0002	mg/L	0.844		100	84-116			
Iron, dissolved	1.25	0.010	mg/L	1.29		97	74-126			
Lead, dissolved	0.112	0.0001	mg/L	0.112		100	72-128			
Lithium, dissolved	0.105	0.0001	mg/L	0.104		101	60-140			
Magnesium, dissolved	6.59	0.01	mg/L	6.92		95	81-119			
Manganese, dissolved	0.322	0.0002	mg/L	0.345		93	84-116			
Molybdenum, dissolved	0.434	0.0001	mg/L	0.426		102	83-117			
Nickel, dissolved	0.824	0.0002	mg/L	0.840		98	74-126			
Phosphorus, dissolved	0.40	0.02	mg/L	0.495		81	68-132			
Potassium, dissolved	2.98	0.02	mg/L	3.19		93	74-126			
Selenium, dissolved	0.0339	0.0005	mg/L	0.0331		103	70-130			
Sodium, dissolved	18.6	0.02	mg/L	19.1		97	72-128			
Strontium, dissolved	0.843	0.001	mg/L	0.916		92	84-113			
Thallium, dissolved	0.0381	0.00002	mg/L	0.0393		97	57-143			
Uranium, dissolved	0.261	0.00002	mg/L	0.266		98	85-115			
Vanadium, dissolved	0.809	0.001	mg/L	0.869		93	87-113			
Zinc, dissolved	0.855	0.004	mg/L	0.881		97	72-128			
General Parameters, Batch B5K0601										
Blank (B5K0601-BLK1)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
Blank (B5K0601-BLK2)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
LCS (B5K0601-BS1)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Alkalinity, Total as CaCO3	99	1	mg/L	100		99	96-108			
LCS (B5K0601-BS2)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Alkalinity, Total as CaCO3	100	1	mg/L	100		100	96-108			
LCS (B5K0601-BS3)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Conductivity (EC)	1410	2	µS/cm	1410		100	93-104			
LCS (B5K0601-BS4)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Conductivity (EC)	1430	2	µS/cm	1410		101	93-104			
Duplicate (B5K0601-DUP2)		**Source: 5110693-02**		Prepared: Nov-10-15, Analyzed: Nov-10-15						
Alkalinity, Total as CaCO3	418	1	mg/L		422			1	10	
Conductivity (EC)	1100	2	µS/cm		1090			< 1	5	
pH	7.73	0.01	pH units		7.72			< 1	5	
Reference (B5K0601-SRM1)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
pH	6.96	0.01	pH units	7.00		99	98-102			
Reference (B5K0601-SRM2)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
pH	6.96	0.01	pH units	7.00		99	98-102			
General Parameters, Batch B5K0622										

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B5K0622, Continued										
Blank (B5K0622-BLK1)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Turbidity	< 0.1	0.1	NTU							
Blank (B5K0622-BLK2)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Turbidity	< 0.1	0.1	NTU							
LCS (B5K0622-BS1)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Turbidity	40.7	0.1	NTU	40.0		102	90-110			
LCS (B5K0622-BS2)				Prepared: Nov-10-15, Analyzed: Nov-10-15						
Turbidity	40.9	0.1	NTU	40.0		102	90-110			
General Parameters, Batch B5K0635										
Blank (B5K0635-BLK1)				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Ammonia as N, Total	< 0.020	0.020	mg/L							
Blank (B5K0635-BLK2)				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Ammonia as N, Total	< 0.020	0.020	mg/L							
LCS (B5K0635-BS1)				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Ammonia as N, Total	1.09	0.020	mg/L	1.00		109	86-111			
LCS (B5K0635-BS2)				Prepared: Nov-17-15, Analyzed: Nov-17-15						
Ammonia as N, Total	1.07	0.020	mg/L	1.00		107	86-111			
Duplicate (B5K0635-DUP1)			**Source: 5110693-01**	Prepared: Nov-17-15, Analyzed: Nov-17-15						
Ammonia as N, Total	0.270	0.020	mg/L		0.276			2	15	
Matrix Spike (B5K0635-MS1)			**Source: 5110693-01**	Prepared: Nov-17-15, Analyzed: Nov-17-15						
Ammonia as N, Total	0.575	0.020	mg/L	0.250	0.276	120	76-121			
General Parameters, Batch B5K0656										
Blank (B5K0656-BLK1)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
Blank (B5K0656-BLK2)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Alkalinity, Total as CaCO3	< 1	1	mg/L							
Conductivity (EC)	< 2	2	µS/cm							
LCS (B5K0656-BS1)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Alkalinity, Total as CaCO3	105	1	mg/L	100		105	96-108			
LCS (B5K0656-BS2)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Alkalinity, Total as CaCO3	100	1	mg/L	100		100	96-108			
LCS (B5K0656-BS3)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Conductivity (EC)	1370	2	µS/cm	1410		97	93-104			
LCS (B5K0656-BS4)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
Conductivity (EC)	1390	2	µS/cm	1410		99	93-104			
Reference (B5K0656-SRM1)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
pH	6.97	0.01	pH units	7.00		100	98-102			

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
General Parameters, Batch B5K0656, Continued										
Reference (B5K0656-SRM2)				Prepared: Nov-12-15, Analyzed: Nov-12-15						
pH	6.96	0.01	pH units	7.00		99	98-102			
General Parameters, Batch B5K0773										
Blank (B5K0773-BLK1)				Prepared: Nov-13-15, Analyzed: Nov-16-15						
Solids, Total Suspended	< 0.5	2	mg/L							
Blank (B5K0773-BLK2)				Prepared: Nov-13-15, Analyzed: Nov-16-15						
Solids, Total Suspended	< 0.5	2	mg/L							
LCS (B5K0773-BS1)				Prepared: Nov-13-15, Analyzed: Nov-16-15						
Solids, Total Suspended	51	2	mg/L	50.0		102	85-110			
LCS (B5K0773-BS2)				Prepared: Nov-13-15, Analyzed: Nov-16-15						
Solids, Total Suspended	52	2	mg/L	50.0		104	85-110			
Total Recoverable Metals, Batch B5K0848										
Blank (B5K0848-BLK1)				Prepared: Nov-16-15, Analyzed: Nov-17-15						
Aluminum, total	< 0.05	0.05	mg/L							
Antimony, total	< 0.001	0.001	mg/L							
Arsenic, total	< 0.005	0.005	mg/L							
Barium, total	< 0.05	0.05	mg/L							
Beryllium, total	< 0.001	0.001	mg/L							
Bismuth, total	< 0.001	0.001	mg/L							
Boron, total	< 0.04	0.04	mg/L							
Cadmium, total	< 0.0001	0.0001	mg/L							
Calcium, total	< 2.0	2.0	mg/L							
Chromium, total	< 0.005	0.005	mg/L							
Cobalt, total	< 0.0005	0.0005	mg/L							
Copper, total	< 0.002	0.002	mg/L							
Iron, total	< 0.10	0.10	mg/L							
Lead, total	< 0.001	0.001	mg/L							
Lithium, total	< 0.001	0.001	mg/L							
Magnesium, total	< 0.1	0.1	mg/L							
Manganese, total	< 0.002	0.002	mg/L							
Molybdenum, total	< 0.001	0.001	mg/L							
Nickel, total	< 0.002	0.002	mg/L							
Phosphorus, total	< 0.2	0.2	mg/L							
Potassium, total	< 0.2	0.2	mg/L							
Selenium, total	< 0.005	0.005	mg/L							
Silicon, total	< 5	5	mg/L							
Silver, total	< 0.0005	0.0005	mg/L							
Sodium, total	< 0.2	0.2	mg/L							
Strontium, total	< 0.01	0.01	mg/L							
Sulfur, total	< 10	10	mg/L							
Tellurium, total	< 0.002	0.002	mg/L							
Thallium, total	< 0.0002	0.0002	mg/L							
Thorium, total	< 0.001	0.001	mg/L							
Tin, total	< 0.002	0.002	mg/L							
Titanium, total	< 0.05	0.05	mg/L							
Uranium, total	< 0.0002	0.0002	mg/L							
Vanadium, total	< 0.01	0.01	mg/L							
Zinc, total	< 0.04	0.04	mg/L							
Zirconium, total	< 0.001	0.001	mg/L							

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

Analyte	Result	MRL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Notes
Total Recoverable Metals, Batch B5K0848, Continued										
Reference (B5K0848-SRM1)				Prepared: Nov-16-15, Analyzed: Nov-17-15						
Aluminum, total	0.28	0.05	mg/L	0.296		95	81-129			
Antimony, total	0.053	0.001	mg/L	0.0505		104	88-114			
Arsenic, total	0.121	0.005	mg/L	0.122		99	88-114			
Barium, total	0.71	0.05	mg/L	0.777		91	72-104			
Beryllium, total	0.045	0.001	mg/L	0.0488		93	76-131			
Boron, total	3.40	0.04	mg/L	3.40		100	75-121			
Cadmium, total	0.0492	0.0001	mg/L	0.0490		100	89-111			
Calcium, total	10.2	2.0	mg/L	10.2		100	86-121			
Chromium, total	0.233	0.005	mg/L	0.242		96	89-114			
Cobalt, total	0.0381	0.0005	mg/L	0.0366		104	91-113			
Copper, total	0.497	0.002	mg/L	0.487		102	91-115			
Iron, total	0.47	0.10	mg/L	0.469		101	77-124			
Lead, total	0.198	0.001	mg/L	0.193		103	92-113			
Lithium, total	0.400	0.001	mg/L	0.390		103	85-115			
Magnesium, total	3.3	0.1	mg/L	3.31		100	78-120			
Manganese, total	0.103	0.002	mg/L	0.109		95	90-114			
Molybdenum, total	0.198	0.001	mg/L	0.197		101	90-111			
Nickel, total	0.236	0.002	mg/L	0.242		97	90-111			
Phosphorus, total	0.2	0.2	mg/L	0.233		87	85-115			
Potassium, total	6.1	0.2	mg/L	5.93		102	84-113			
Selenium, total	0.113	0.005	mg/L	0.115		99	85-115			
Sodium, total	7.8	0.2	mg/L	7.64		102	82-123			
Strontium, total	0.35	0.01	mg/L	0.363		98	88-112			
Thallium, total	0.0807	0.0002	mg/L	0.0794		102	91-114			
Uranium, total	0.0196	0.0002	mg/L	0.0192		102	85-120			
Vanadium, total	0.36	0.01	mg/L	0.376		96	86-111			
Zinc, total	2.33	0.04	mg/L	2.42		96	85-111			
Total Recoverable Metals, Batch B5K0856										
Blank (B5K0856-BLK1)				Prepared: Nov-16-15, Analyzed: Nov-16-15						
Mercury, total	< 0.00002	0.00002	mg/L							
Blank (B5K0856-BLK2)				Prepared: Nov-16-15, Analyzed: Nov-16-15						
Mercury, total	< 0.00002	0.00002	mg/L							
Reference (B5K0856-SRM1)				Prepared: Nov-16-15, Analyzed: Nov-16-15						
Mercury, total	0.00310	0.00002	mg/L	0.00456		68	50-150			
Reference (B5K0856-SRM2)				Prepared: Nov-16-15, Analyzed: Nov-16-15						
Mercury, total	0.00291	0.00002	mg/L	0.00456		64	50-150			

QC Qualifiers:

RPD Relative percent difference (RPD) of duplicate analysis are outside of control limits for unknown reason(s).

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

		5110693-01	5110693-02	5110693-03	5110693-04
		Water	**Water**	**Water**	**Water**
		Nov-09-15	**Nov-09-15**	**Nov-09-15**	**Nov-09-15**
		DMW - 1b	**DMW - 4**	**MW-6s**	**Town Well #6**
Anions	Bromide (mg/L)	< 0.10	< 0.10	1.48	< 0.10
	Chloride (mg/L)	51.7	15.7	627	28.6
	Fluoride (mg/L)	1.31	0.48	0.23	< 0.10
	Nitrate as N (mg/L)	< 0.010	0.725	33.3	0.925
	Nitrite as N (mg/L)	< 0.010	< 0.010	< 0.010	< 0.010
	Sulfate (mg/L)	116	196	905	24.8
General Parameters	Alkalinity, Total as CaCO3 (mg/L)	500	422	897	295
	Conductivity (EC) (uS/cm)	< 2	1090	4570	661
	Ammonia as N, Total (mg/L)	0.276	0.283	0.899	0.020
	pH (pH units)	7.63	7.72	7.30	7.72
	Solids, Total Suspended (mg/L)	< 3	< 3	226	< 3
	Turbidity (NTU)	4.5	0.2	205	0.1
Calculated Parameters	Hardness, Total (Diss. as CaCO3) (mg/L)			1850	
	Hardness, Total (Total as CaCO3) (mg/L)	645	587		328
Dissolved Metals	Aluminum, dissolved (mg/L)			0.859	
	Antimony, dissolved (mg/L)			0.0004	
	Arsenic, dissolved (mg/L)			0.0010	
	Barium, dissolved (mg/L)			0.071	
	Beryllium, dissolved (mg/L)			0.0006	
	Bismuth, dissolved (mg/L)			< 0.0001	
	Boron, dissolved (mg/L)			1.77	
	Cadmium, dissolved (mg/L)			0.00003	
	Calcium, dissolved (mg/L)			208	
	Chromium, dissolved (mg/L)			0.0017	
	Cobalt, dissolved (mg/L)			0.00204	
	Copper, dissolved (mg/L)			0.200	
	Iron, dissolved (mg/L)			1.21	
	Lead, dissolved (mg/L)			0.0039	
	Lithium, dissolved (mg/L)			0.0462	
	Magnesium, dissolved (mg/L)			322	
	Manganese, dissolved (mg/L)			0.157	
	Mercury, dissolved (mg/L)			< 0.00002	
	Molybdenum, dissolved (mg/L)			0.0037	
	Nickel, dissolved (mg/L)			0.0119	
	Phosphorus, dissolved (mg/L)			0.04	
	Potassium, dissolved (mg/L)			199	
	Selenium, dissolved (mg/L)			< 0.0005	
	Silicon, dissolved (mg/L)			12.9	
	Silver, dissolved (mg/L)			< 0.00005	
	Sodium, dissolved (mg/L)			375	
	Strontium, dissolved (mg/L)			1.90	
	Sulfur, dissolved (mg/L)			342	

REPORTED TO Western Water Associates Ltd
PROJECT CSRD Refuse Disposal - Golden MR17006

WORK ORDER 5110693
REPORTED Nov-18-15

		5110693-01	5110693-02	5110693-03	5110693-04
		Water	**Water**	**Water**	**Water**
		Nov-09-15	**Nov-09-15**	**Nov-09-15**	**Nov-09-15**
		DMW - 1b	**DMW - 4**	**MW-6s**	**Town Well #6**
Dissolved Metals	Tellurium, dissolved (mg/L)			< 0.0002	
	Thallium, dissolved (mg/L)			0.00007	
	Thorium, dissolved (mg/L)			0.0006	
	Tin, dissolved (mg/L)			0.0013	
	Titanium, dissolved (mg/L)			0.038	
	Uranium, dissolved (mg/L)			0.00804	
	Vanadium, dissolved (mg/L)			0.001	
	Zinc, dissolved (mg/L)			0.067	
	Zirconium, dissolved (mg/L)			0.0008	
Total Recoverable Metals	Aluminum, total (mg/L)	< 0.05	< 0.05		< 0.05
	Antimony, total (mg/L)	< 0.001	< 0.001		< 0.001
	Arsenic, total (mg/L)	0.042	< 0.005		< 0.005
	Barium, total (mg/L)	< 0.05	< 0.05		0.14
	Beryllium, total (mg/L)	< 0.001	< 0.001		< 0.001
	Bismuth, total (mg/L)	< 0.001	< 0.001		< 0.001
	Boron, total (mg/L)	0.14	0.20		< 0.04
	Cadmium, total (mg/L)	< 0.0001	< 0.0001		< 0.0001
	Calcium, total (mg/L)	75.1	81.6		87.0
	Chromium, total (mg/L)	< 0.005	< 0.005		< 0.005
	Cobalt, total (mg/L)	< 0.0005	0.0009		< 0.0005
	Copper, total (mg/L)	< 0.002	0.006		< 0.002
	Iron, total (mg/L)	0.42	< 0.10		< 0.10
	Lead, total (mg/L)	< 0.001	< 0.001		< 0.001
	Lithium, total (mg/L)	0.026	0.030		0.001
	Magnesium, total (mg/L)	111	93.1		26.8
	Manganese, total (mg/L)	0.005	0.004		< 0.002
	Mercury, total (mg/L)	< 0.00002	< 0.00002		< 0.00002
	Molybdenum, total (mg/L)	< 0.001	0.001		< 0.001
	Nickel, total (mg/L)	< 0.002	< 0.002		< 0.002
	Phosphorus, total (mg/L)	< 0.2	< 0.2		< 0.2
	Potassium, total (mg/L)	5.1	6.2		0.8
	Selenium, total (mg/L)	< 0.005	< 0.005		< 0.005
	Silicon, total (mg/L)	8	7		< 5
	Silver, total (mg/L)	< 0.0005	< 0.0005		< 0.0005
	Sodium, total (mg/L)	29.7	27.2		15.9
	Strontium, total (mg/L)	1.74	3.55		0.27
	Sulfur, total (mg/L)	37	67		< 10
	Tellurium, total (mg/L)	< 0.002	< 0.002		< 0.002
	Thallium, total (mg/L)	< 0.0002	< 0.0002		< 0.0002
	Thorium, total (mg/L)	< 0.001	< 0.001		< 0.001
	Tin, total (mg/L)	< 0.002	< 0.002		< 0.002
	Titanium, total (mg/L)	< 0.05	< 0.05		< 0.05
	Uranium, total (mg/L)	< 0.0002	0.0017		0.0011
	Vanadium, total (mg/L)	< 0.01	< 0.01		< 0.01
	Zinc, total (mg/L)	< 0.04	< 0.04		< 0.04

REPORTED TO	Western Water Associates Ltd			**WORK ORDER**	5110693
PROJECT	CSRD Refuse Disposal - Golden MR17006			**REPORTED**	Nov-18-15

		5110693-01	5110693-02	5110693-03	5110693-04
		Water	**Water**	**Water**	**Water**
		Nov-09-15	**Nov-09-15**	**Nov-09-15**	**Nov-09-15**
		DMW - 1b	**DMW - 4**	**MW-6s**	**Town Well #6**
Total Recoverable Metals	Zirconium, total (mg/L)	0.001	< 0.001		< 0.001

Western Water Associates Ltd.
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Groundwater Supply Development and Management

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Groundwater Modeling

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Applied Research

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