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Environmental Sciences Ltd.

Bear Creek

Water Quality Study

Prepared for: City of Grande Prairie

In collaboration with: Palmer Environmental Consulting Group Ltd.

September 2015

City of Grande Prairie RfP #: 117-552-14
HESL Project #: 140048

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September 21, 2015 HESL Project #: P140048

Kase DeVries
Environmental Sustainability Coordinator
City of Grande Prairie
10205 – 98 Street
Grande Prairie, AB T8V 2E7

Dear Mr. DeVries:

Re: Final Report: Bear Creek Water Quality Study

We are pleased to submit this final report to you for the "Bear Creek Water Quality Study", which was prepared by Hutchinson Environmental Sciences (HESL) in partnership with Palmer Environmental Consulting Group Ltd. (PECG).

The report describes the study design, methodology and results of the study, discusses major patterns in water quality and data gaps and provides recommendations to further improve understanding of the Bear Creek ecosystem and any impacts on it.

We have addressed all comments on the draft report provided by the project team in the preparation of this final report. We thank you for the opportunity to assist the City of Grande Prairie with this interesting assignment.

Sincerely,

Hutchinson Environmental Sciences Ltd.

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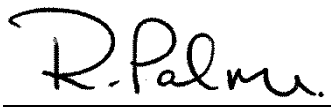

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Acknowledgements

Above all, we would like to thank Kase DeVries, Sustainability Coordinator at the City of Grande Prairie, for organizing, leading and completing the field work in a very efficient and professional manner. We thank the field crews who assisted Kase in collecting the data for this study, including Lauren Makowecki, Adrian Meinke, Lisa Schaubel (Alberta Environment and Parks) and Richard Sali (City of Grande Prairie).

We thank Eric Cleveland (Palmer Environmental Consulting Group) for setting up the flow station, providing training in flow measurements and level logger operation to City staff and his work on the discharge assessment.

We are grateful to the City of Grande Prairie staff and members of the Wapiti River Water Management Plan Steering Committee, whose constructive comments on a draft version of this document helped to improve the report.

Executive Summary

The Wapiti River Water Management Plan (WRWMP) Steering Committee was established to make water resource decisions for the Wapiti River. The primary objective of the WRWMP is to provide guidance on water allocation for human consumption and industrial practice while maintaining water quality and quantity requirements for a healthy aquatic ecosystem. Bear Creek is an important tributary of the Wapiti River, draining a significant portion of the area that is subject to the WRWMP. There were limited data for sites in and near the City of Grande Prairie and hence limited understanding of the impact of City runoff on water quality in Bear Creek. The City of Grande Prairie therefore initiated a one-year monitoring study to address this data gap and to obtain water quality, water quantity and epilithic (attached) algae data for Bear Creek throughout the open-water season.

Five sites along Bear Creek were sampled for water quality and biological indicators at four occasions: in August and October 2014 and April and June 2015. One site was located upstream of the City ("North City Limits"), two sites within the City (100th Ave and 84th Ave), one at the southern City limits ("South City Limits") and one site downstream of all City influence near the Aspen Ridge development. A flow station was set up in August 2014 at the southern City limits and operated throughout summer and fall 2014 and spring and summer 2015, to allow evaluating the influence of stream discharge on the observed water quality.

Almost one complete year of open-water stream discharge data were produced using a level logger, regular discharge measurements and extrapolation of discharge using the continuous level data. Stream discharge started at over 2 m^3/s in August 2014, declined throughout the fall to levels around 0.4 m^3/s. The first spring discharge estimate was almost at 8 m^3/s, but April and May discharge data are associated with some uncertainty, given that these flows were extrapolated beyond the highest point on the rating curve.

Bear Creek was characterized as an alkaline, nutrient rich and moderately productive stream. Water quality varied seasonally and spatially and some of the spatial patterns observed in spring 2015 and summer 2014 were also observed in historical data collected in April 2008 and May 2007, providing confidence that they are representative.

Applicable water quality guidelines were exceeded for a variety of parameters at different times of the year. The most notable occurrences of exceeded guidelines were as follows:

1) Temperature and oxygen were at potentially stressful levels for fish in August 2014.

2) Relatively frequent bacteria levels above irrigation guidelines indicated that Bear Creek waters may not be suitable for crop irrigation.

3) Metals guidelines were exceeded at times of high seasonal sediment loads in the creek, which is a natural occurrence, but levels increased within the City, further enhancing this natural pattern. Total cadmium, silver, lead and zinc exceeded guidelines only in October and April and only at downstream sites, indicating that in-City stormwater and spring runoff influence increases the frequency at which metals guidelines are exceeded in Bear Creek.

Key influences on seasonal and spatial water quality patterns were flow levels and the related relative contribution of groundwater, seasonally varying upstream water quality and sources of various substances within the City from stormwater and spring runoff. A summary of these patterns are provided in the table below.

Summary of Spatial and Temporal Water Quality Patterns in Bear Creek

Description of Pattern	Parameters Affected	Nature of Pattern
Highest in Spring Upstream of City	TP, SRP, NH_3+NH_4, NO_3+NO_2, Chloride, Pesticides	Seasonal
Increase from Upstream to Downstream of City during Spring runoff	TSS, Turbidity, TP, TKN, Total Metals, Chloride	Spatial and Seasonal
Increase Upstream to Downstream	Pesticides and Organic Priority Pollutants	Spatial
Increase from Upstream to Downstream following a rain event in fall	TSS, TP, Total Metals, Bacteria, NH_3+NH_4, NO_3+NO_2	Spatial, Event-based
Decrease Upstream to Downstream in August	BOD, TKN, SRP, TDP, TP, Total sulfide	Spatial and Seasonal
Decrease Upstream to Downstream during spring runoff	NO_3, NH_3+NH_4, E. coli, Dissolved Al	Spatial and Seasonal

The current dataset is limited as it only covers one sampling event per season within the period of one year and is supported only by one historical sampling point later during spring runoff (April 2008) and one representing summer conditions (May 2007). This represents a minimal surveillance level program that serves to scope out areas and problems but not to make any solid technical assessment of water quality or influence of Bear Creek on the Wapiti River. In order to confirm observed patterns and to address limitations of this study, we provide the following recommendations for future assessments of Bear Creek aquatic health:

1) Collect additional water quality and biological data from different years,

2) Add at least one site (at 68th Ave) to refine in-City spatial patterns,

3) Collect wet and dry weather samples in storm sewers of the City of Grande Prairie to better characterize stormwater loads to Bear Creek,

4) Investigate spring runoff pollutant sources downstream of the City, in the County of Grande Prairie,

5) Coordinate City sampling program with sampling in the upper watershed (upstream of Bear Lake, Grande Prairie Creek) to put City sources into a watershed context,

6) Standardize site conditions for periphyton collection, add upstream sites and possibly other biological indicators (benthic invertebrates, fish) to assess aquatic ecosystem health,

7) Assess diurnal dissolved oxygen fluctuations,

8) Improve rating curve by including higher measured flows,

9) Increase cost-efficiency of the program by focussing on field parameters, sediments, nutrients, bacteria and possibly metals, but with pesticides and organics sampled less frequently.

10) Ensure consistency of detection limits, and

11) Collect biological data on different days than water quality to shorten the time span between water quality sampling events and therefore improve confidence in spatial trends.

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1. Introduction

The Wapiti River watershed is the single most important water source for the City of Grande Prairie. In 2012, the Wapiti River Water Management Plan (WRWMP) Steering Committee was established to make water resource decisions for the Wapiti River. The primary objective of the WRWMP is to provide guidance on water allocation for human consumption and industrial practice while maintaining water quality and quantity requirements for a healthy aquatic ecosystem (Charette Pell Poscente Environmental Corp 2013). Bear Creek is an important tributary of the Wapiti River, draining a significant portion of the area that is subject to the WRWMP.

Symptoms of nutrient enrichment were observed in the Wapiti River downstream of the Bear Creek confluence (Hatfield Consultants 2007), but there is limited understanding of the relative importance of Bear Creek loads for Wapiti River water quality and of the effect of different point- and non-point source loadings to Bear Creek. In addition, streams in the area are naturally rich in nutrients (Charette Pell Poscente Environmental Corp. and Hutchinson Environmental Sciences Ltd. 2012), adding complexity to interpretation of stream water quality in this area. Although water quality data have been collected on several occasions at the mouth of Bear Creek, there are limited data for sites in and near the City of Grande Prairie and hence limited understanding of the impact of City runoff on water quality in Bear Creek. Sites within the City have only been sampled on two occasions, in May 2007 and April 2008.

The City of Grande Prairie therefore initiated a one-year monitoring study to address this data gap and to obtain water quality, water quantity and epilithic (attached) algae data for Bear Creek throughout the open-water season. These data will help to establish an aquatic health baseline, identify sources of pollutants that cause water quality degradation and will contribute to an understanding of previous water quality data collected in the creek and at the confluence with the Wapiti River. The City of Grande Prairie retained the team of Hutchinson Environmental Sciences Ltd. and Palmer Environmental Consulting Group Ltd. to design an appropriate 1-year monitoring program, to train and supervise City staff in sample collection and to compile, analyze and report on the resulting data. This report outlines the study design rationale, methods applied and presents a discussion and interpretation of the results.

2. Study Area

Bear Creek is a tributary of the Wapiti River in the Peace River basin. Bear Creek originates about 100 km north-west of the City of Grande Prairie, in the boreal forest natural region, and then flows south-eastward mainly through the parkland natural region towards the Wapiti River valley (Mighty Peace Watershed Alliance 2015). Bear Creek passes through two lakes, La Glace Lake and Bear Lake, and flows through the City of Grande Prairie (Figure 1). Bear Creek receives contributions from a number of smaller tributaries, the largest one, Grande Prairie Creek, joins Bear Creek just downstream of Bear Lake. Bear Creek is impounded at the northern end of the City to form Grande Prairie Reservoir. These lakes and reservoirs can serve as sinks for suspended sediments, but can also be sources of nutrients through internal loading from sediments and organic matter through increased algae production.

The upper 22% of the watershed is forested, but the main land use in the Bear Creek watershed upstream of the City of Grande Prairie is agriculture (75%, Golder Associates 2012). Agricultural intensity in the watershed of Grande Prairie Creek was classified as moderate (Anderson et al. 1999). This

classification was the result of ranking a large variety of agricultural watersheds in the province of Alberta. The Grande Prairie Creek watershed fell within the 40 to 75th percentile range for chemical and fertilizer expenses, indicators of crop intensity, and at the 40th percentile of manure production, an indicator of livestock intensity. Given the proximity, same ecoregion and land cover, it is likely that the other agricultural areas in the Bear Creek watershed have similar land use characteristics.

Other human activities in the watershed that can have a potential effect on water quality include oil and gas industry (ALMS 2014), intermittent municipal lagoon discharges (La Glace and Clairmont lagoons) and stormwater discharges from urban sources, in particular throughout the City of Grande Prairie (Golder Associates 2012).

3. Methodology

This section describes the study design; including site selection, schedule, field methods and sample analyses. The City's Request for Proposal dictated the scope of the study as it required sampling for the complete list of parameters used in the Alberta Environment and Parks (AEP) (formerly Environment and Sustainable Resource Development (AESRD)) monitoring program and these were to be sampled at 5 locations on 4 occasions.

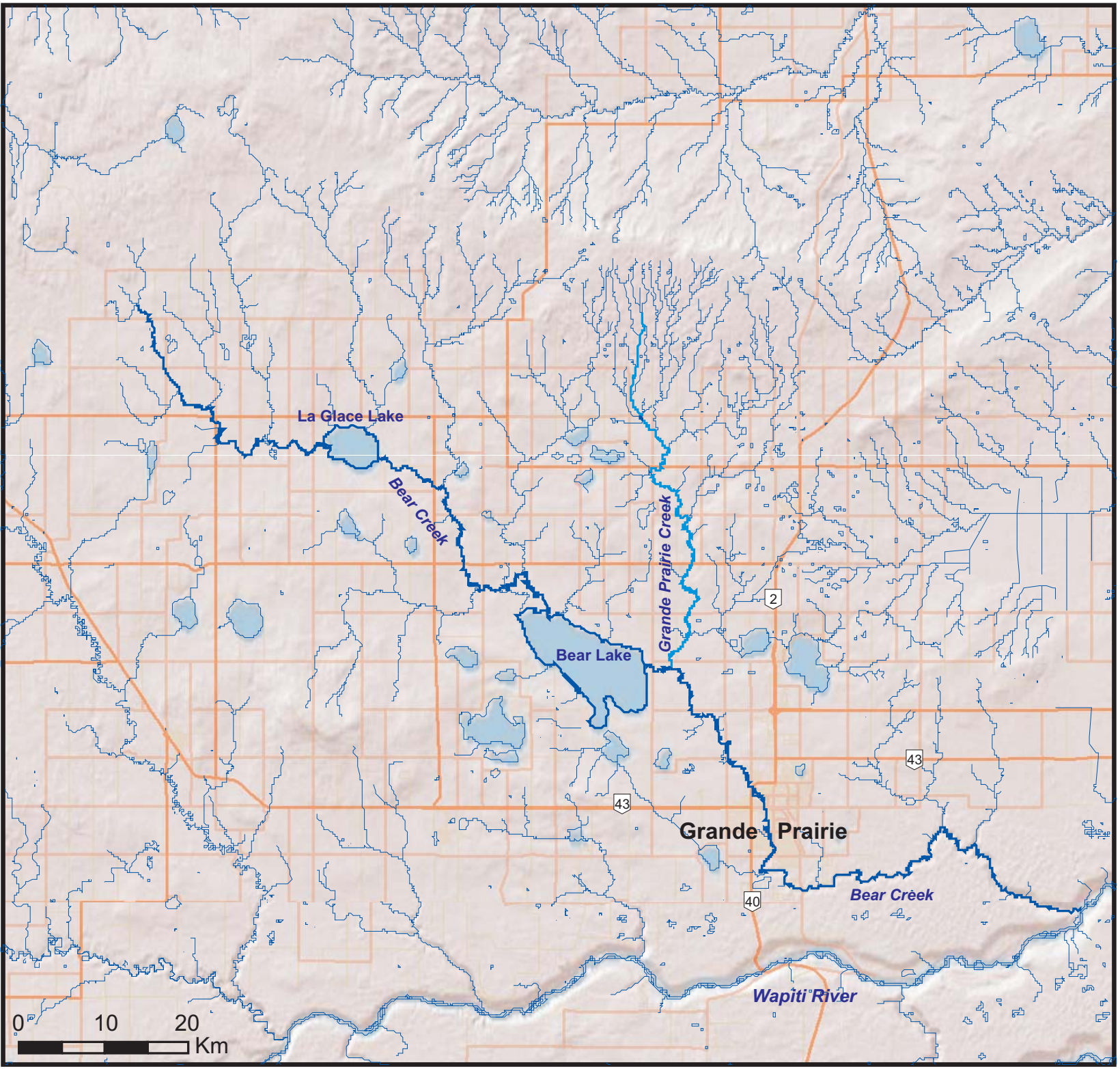
Staff of HESL worked with the City of Grande Prairie to finalize the study sites, established and maintained contact with the analytical laboratory and provided support to City and Alberta Environment and Parks staff who collected water quality samples. Staff of PECG trained City staff in measurement and acquisition of water quantity data.

3.1 Sampling Sites

The study was not intended as a comprehensive watershed study of pollutant loads from all sources – but to collect current water quality data for different seasons as input into Wapiti River water quality analyses and to identify pollutant sources of urban runoff to Bear Creek from within the City. Sampling sites were selected based on:

- City of Grande Prairie suggestions (Request for Proposals, subsequent communication),
- historical Government of Alberta sampling sites,
- strategic locations that allowed evaluation of possible sources of pollutants that influence the water quality of Bear Creek.

The final sampling design consisted of five sites, one site upstream of the City ("North City Limits"), two sites within the City (100th Ave and 84th Ave), one at the southern City limits ("South City Limits") and one site downstream of all City influence near the Aspen Ridge development (Figure 2), which was selected due to its road accessibility and its location upstream of other tributaries to Bear Creek.



Legend

- Primary Highways
- Secondary Roads

N

Project lead: Dörte Köster
Prepared by: Kris Hadley
Data Source: Esri and the GIS User Community
Coordinate system: World Geodetic System 1984

Figure 1: Bear Creek Watershed

Project Name:
Bear Creek Water Quality Study

Project #: 140048

September 15th, 2015

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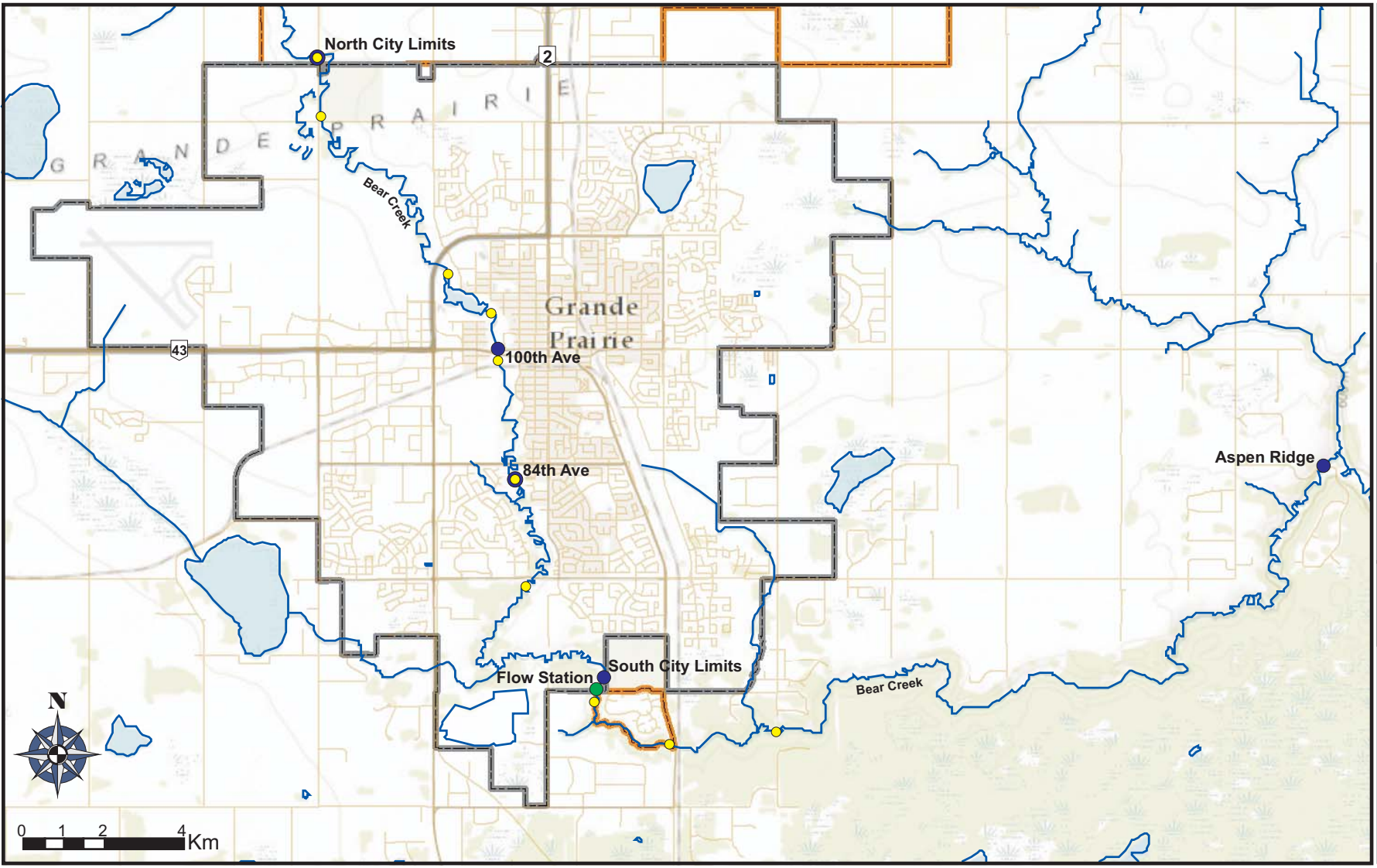


Legend

- Primary highways
- Secondary highways
- Local, neighbourhood, or city street
- Municipal boundaries
- Hamlet
- 2014/2015 Sampling location
- 2014/2015 Flow station
- Historical sampling locations

Project lead: Dörte Köster
Prepared by: Kris Hadley
Data Source: ESRI, HERE, DeLorne, USGS, Intermap, increment P Corp., NRCAN, ESRI Japan, METI, ESRI China (Hong Kong), ESRI (Thailand), MapmyIndia, OpenStreetMap
Coordinate system: World Geodetic System 1984

Figure 2:Map of Sampling Sites

Project Name:
Bear Creek Water Quality Study

Project #: 140048

September 15, 2015

Hutchinson Environmental Sciences Ltd

3.2 Sampling Schedule

The sampling schedule was limited to a total of four sampling events and was intended to focus on significant seasons for the Bear Creek ecosystem and on periods when Bear Creek could contribute significant loading to the Wapiti River. We therefore selected one sampling date each in summer and fall 2014 and one in each of early and late spring 2015 (Table 1). We focused sampling on the open-water season, as winter flows in Bear Creek are low and minimal storm water discharge would be expected from the City of Grande Prairie. Sampling usually took two to three days, moving from the most downstream site towards upstream, to avoid sample contamination from upstream in-river sampling activities.

The sampling design did not target lagoon discharges, but rather focused on storm water sources in the City. This was accomplished by placing the "North City Limits" site downstream of the lagoon that is located upstream of the City and by sampling outside the discharge period of the lagoon that discharges near the "South City Limits" site.

Table 1. Sampling Sites and Schedule for Bear Creek Monitoring Program2014-2015

Site	Coordinates	Summer 2014	Fall 2014	Early Spring 2015	Late Spring 2015
North City Limits	N 55° 12' 29.12 W 118° 50' 45.70"	20-Aug-14, 05-Sep-14[1]	16-Oct-14	01-Apr-15, 09-Apr-15[2]	18-Jun-15
100th Ave	N 55° 10' 06.15" W 118° 48' 20.51"	20-Aug-14, 05-Sep-14	16-Oct-14	02-Apr-15, 09-Apr-15	17-Jun-15
84th Ave	N 55° 9' 17.33" W 118° 48' 12.34"	19-Aug-14, 05-Sep-14	16-Oct-14	02-Apr-15, 09-Apr-15	18-Jun-15
South City Limits	N 55° 7' 39.97" W 118° 47'	19-Aug-14, 05-Sep-14	15-Oct-14	01-Apr-15, 09-Apr-15	17-Jun-15
Aspen Ridge	N 55° 9' 22.10" W 118° 37' 13.03"	18-Aug-14, 05-Sep-14	15-Oct-14	01-Apr-15, 09-Apr-15	17-Jun-15

The first sampling event was conducted in late August of 2014 to represent typical summer conditions. At this time, PECG and HESL scientists helped identify a suitable location for and install the water level logger and trained City staff on procedures in water quality and epilithic algae sampling, quality assurance and health and safety. After the August results were returned from the laboratory, we determined that

[1] *Second summer sampling event only for pesticides.*
[2] *Samples collected for bacteria only due to delays in analyses of earlier sample.*

samples were analyzed past their holding times. A second round of pesticide only samples was therefore collected on September 5, 2014 and analyzed within the required holding time.

The second sampling occurred in October to capture the lowest open water seasonal flows.

The third set of samples was collected during local spring freshet in April 2015, because we hypothesized that the accumulated contaminants in snow would be washed into Bear Creek within a short period of time during freshet. The spring freshet resulted in extremely high flows and unsafe sampling conditions in April 2015 and therefore samples were collected once the peak flows had somewhat receded, but were still elevated. Due to shipping delays on a holiday long weekend, bacteria samples were analyzed 4 days past the holding times and therefore a second round of bacteria samples was collected one week later (April 9, 2015).

The fourth sampling event was conducted in June of 2015.

Most samples collected represented dry weather conditions, except in fall 2014, when a short, intense storm (8.6 mm) was recorded one to two days before sampling. The decision to schedule sampling events in advance to allow for the AEP field technician to assist with sampling, precluded sampling a during a rain storm.

3.3 Field Methods

Water chemistry samples were collected at each site on all dates. Water quality samples were collected from a depth of 30 cm and, where required, were preserved using the laboratory-supplied preserving agent in the field. Field parameters, including dissolved oxygen (DO), pH, conductivity and temperature were measured at the time of sampling using a YSI multi-meter.

Periphyton was sampled at all sites on all occasions except at the North City Limits, where the lack of appropriate and accessible periphyton substrate (rocks) at the recommended depth range prevented sample collection. No periphyton samples were collected at any site in April, when high water levels precluded safe access to suitable rock substrate and rocks were no longer attainable at the recommended depth.

Periphyton samples were collected in replicates of three, where for each replicate the periphyton was scraped from a predefined area on three large cobbles. Two samples were collected for each replicate. One was preserved with magnesium carbonate and submitted for chlorophyll-a analysis to estimate the attached algae biomass. The other sample was submitted for ash-free dry mass estimation, which is an indicator of total organic mass of periphyton (algae) and heterotrophs (bacteria, fungi, invertebrates) and dead algae material.

Samples were placed in coolers with ice for preservation and shipped the same day to the laboratory for analysis.

3.4 Sample Analysis

The parameter list was extensive, as the study was scoped to match the AEP analytical package used on the Wapiti River[3]. The complete suite of analytes consisted of over 100 parameters (Table 2).

Table 2. Complete Parameter List and Analytical Laboratories Proposed in RfP.

Field/Lab		Parameters
Field		DO, PH, Cond, Temp
Lab		WATPOT (major ions, hardness, alkalinity etc.)
Lab		TP, DP
Lab		NH3-N, TKN
Lab		DOC
Lab		TDS (FR)
Lab		TSS (NFR)
Lab		True Colour
Lab		TOC
Lab		Total Cyanide
Lab		Hexavalent Cr
Lab		Silica
Lab		Nitrates, Nitrites (N)
Lab		BOD
Lab		Total Phenolics
Lab		FCOL, ECOLI,
Lab		Phytoplankton Chlorophyll a - water
Lab		Total metals (ICP) - MET 29
Lab		Diss Metals (ICP) - MET 29
Lab		Ultra trace total Hg (clean/dirty hands collection method)
Lab		Epilithic Chlorophyll a
Lab		Pesticides-Peste Scan (ARCV - 62 compounds)
Lab		Organics: EPP/VPP
Lab		PCBs

Notes: Results presented in appendices show a complete list of metals, pesticides, EPP and VPP.

[3] *The RfP states "Conduct or arrange for appropriate laboratory analysis of the water samples for all four (4) sampling events, including a QA/QC component. Parameters analyzed must coincide with the ESRD analytical package used on the Wapiti River to ensure compatibility of data sets and to allow for comparison with historical data."*

AEP uses a variety of laboratories for different parameters. We therefore attempted to obtain all AEP analyses within one accredited laboratory (CARO Analytical) to simplify sample submission by the field staff and project administration as well as reduce shipping cost. Unfortunately CARO could not complete all analysis and meet expected detection limits and ended up subcontracting the analysis of organics and ultra-trace mercury to the laboratory that usually conducts these analyses for AEP (Alberta Innovates and Technology Futures (AITF) laboratory in Vegreville) to assure compatibility. The resultant changes in detection limits and re-sampling to obtain all required parameters during the first sampling survey complicated reporting.

Most of this program was adhered to at all sampling sites, with some minor modifications and limitations:

- Periphyton samples were not collected at the North City Limits site. The site did not allow safe access to the river bed, which is deep in this area therefore no rocks were available at the acceptable depths for sampling (40 cm). In addition, there was no suitable rocky substrate found that was not shaded by the bridge, which would create an artificial limit to algae growth.
- As the August pesticide samples exceeded holding times due to a lab error, pesticide samples were re-collected on September 5th,
- Detection limits were not consistent among sampling dates, especially for metals and organic parameters, due to differing subcontractor laboratories.
- In August, organic priority pollutants (EPP/VPP) were subcontracted out to ALS Environmental laboratories, resulting in the omission of 13 out of 189 organic parameters from the requested list. This omission was communicated when parameters were past holding times and there was not enough sample volume left to redo the analysis. Given the very low number of detections overall in organics, we believe that the impact to the project is minimal.

Fecal coliform and *E. coli* counts were provided in units of Maximum Probable Number (mpn) /100 mL, instead of the standard Colony Forming Units (CFU)/100 mL that is used by AEP. These units are derived from two different methods and results are not always directly comparable. The limitations of these results in comparison with AEP results is discussed in the respective results section of this report (section 4.8).

For the parameters Anthracene, Fluoranthene, Phenanthrene, Pyrene, Endosulfan I, and Chlorpyrifos detection limits were above the guidelines for the majority of the study and therefore results have to be viewed with caution.

3.5 Stream Discharge Determination

Stream discharge measurements in Bear Creek were collected to help the interpretation of the water quality study during the 2014-2015 field program. One level logger was installed and recorded hourly water level measurements to provide a continuous record of flow for the open-water seasons during the study period.

The location of the level logger was determined during the August 2014 field visit, near the South City Limits water quality sampling site (Figure 2). Criteria for site selection included:

- Safe access

- Downstream location relative to the City to make data useful for City stormwater planning
- Simplicity of cross section for ease of discharge determinations.

The logger was installed on August 18, 2014 by a PECG environmental professional and the location surveyed to establish a local benchmark and water level. The PECG technician provided training to City staff on general maintenance of the gauging station, data download and site-specific Health and Safety concerns. In addition, the following specific training was provided:

- Taking spot measurements of stream velocity using a Gurley Mini Flow Meter supplied by Alberta Fish & Wildlife,
- Downloading the continuous recording data logger,
- Surveying the water level compared to the local benchmark (installed on first sampling event), in order to provide error correction for the stage discharge curve development,
- Proper removal of the logger and gauging station before winter and
- Reinstalling it in the spring of 2015.

For the installation of the gauging station, a Solinst Edge Levelogger and Barologger pair were installed. This combination is an efficient design that can be installed to be more protected from pedestrian and wildlife tampering and have proven robust and simple to maintain in previous projects.

The level logger was removed when ice started to form on the creek on November 5, 2014. The logger was re-installed on April 9, 2015, when the highest levels had receded and access to the flow station became feasible and safe. Due high water levels, it was not possible to install the level logger at or before the dates when water quality samples were collected.

The logger was removed on August 4, 2015, thereby providing an almost complete 1-year, open-water season flow record for 2014-2015, with the exception of early spring runoff flows.

Discharge measurements were taken at the flow station on 2-3 week intervals or when a large change in flows was expected, resulting in a sampling frequency of one to three times per month (Table 3). Water velocity and levels were still high and not safe for wading when the logger was re-installed in early spring 2015 and so it was not possible to measure discharge.

Table 3. Schedule of Discharge Measurements in Bear Creek 2014-2015

Month	Aug-14	Sep-14	Oct-14	Nov-14	May-15	Jun-15	Jul-15	Aug-15
Days	18, 29	5, 16, 26	15	5	28	6, 17	7	4

Based on these discharge measurements, a stage-discharge curve was developed for Bear Creek. This stage-discharge curve was then used to extrapolate discharge for every day for which water level data were collected by the level logger. Measured flows used to develop the stage-discharge curve ranged from 0.14 to 3.9 m^3/s. Any flows above 3.9 m^3/s would be associated with greater uncertainty as they have been extrapolated beyond the data used for the stage-discharge curve; and, peak flows in Bear Creek were higher than 4.7 m^3/s during the spring of 2015. Any flows above 4.7 m^3/s extrapolated from

this stage-discharge curve are associated with higher uncertainty, because they were not included in the derivation of the curve. Peak flows in the upstream Grande Prairie Creek are generally higher, with an average annual peak flow of 12 m^3/s throughout the period of record from 1971 to 2014 at the site Grande Prairie Creek near Sexsmith (07GE003, Hydrometric Survey of Canada, http://wateroffice.ec.gc.ca), which is located about 14 km upstream of the confluence with Bear Creek. It can therefore be expected that peak flows in Bear Creek are often above the 3.9 m^3/s that is captured by the rating curve developed here.

3.6 Quality Assurance and Quality Control

Standard professional sample collection techniques were applied for the water quality sampling and flow measurements. The City field staff had previous training in water quality sampling and the City and AEP staff received additional training for the specific project requirements. This included the confirmation of sampling protocols for duplicate and blank samples, procedure to collect epilithic algae samples from aquatic substrates and "clean-hand-dirty-hand"[4] method to collect low-level mercury samples. HESL scientists provided ongoing support and advice throughout the sampling program to solve any problems or provide input to decisions that needed to be made.

On October 15th 2014, field blanks were collected for routine, nutrient, total metal and four dissolved metal parameters to determine if there was any source of contamination in the field (Table 4). Field blanks were prepared at the South City Limits site using purchased distilled water. On April 2nd, 2015, triplicate samples were collected at the 84th Avenue site for the same suite of parameters as for field blanks, with the exception of total recoverable phosphorus, which was collected but could not be used because holding times for this parameter were exceeded. The selected parameters and frequency of sample collection for quality assurance and quality control reflects those employed by Alberta Environment and Parks in similar monitoring programs, in this case the Wapiti River and Watershed Monitoring Program (A. Wolanski, personal communication). Triplicate samples were collected to estimate the precision of sampled parameters achieved by the field program. Precision was calculated using the relative standard deviation (RSD) (Mitchell, 2006).

The acceptable level of contamination and imprecision was developed using guidance provided in the literature.

Table 4. Parameters Sampled for Quality Assurance and Quality Control

Parameters	Field Blank	Triplicates
Routine		
Hardness, Total (Diss. as $CaCO_3$)	x	x
Hardness, Total (Total as $CaCO_3$)	x	x
Ion Balance	x	x
Solids, Total Dissolved	x	x
Conductivity (EC)	x	x

[4] *This method is designed to minimize contamination of mercury samples through touch and requires two people working together.*

Parameters	Field Blank	Triplicates
pH	x	x
Alkalinity, Total as $CaCO_3$	x	x
Bicarbonate (HCO_3)	x	x
Carbonate (CO_3)	x	x
Chloride	x	x
Fluoride	x	x
Hydroxide (OH)	x	x
Sulfate	x	x
Nutrients		
Nitrogen, Nitrate as N	x	x
Nitrogen, Nitrite as N	x	x
Nitrogen, Total Kjeldahl	x	x
Phosphorus, Dissolved Reactive	x	
Phosphorus, Total as P	x	x
Phosphorus, Total Dissolved	x	x
Total Metals		
Aluminum, total	x	x
Antimony, total	x	x
Arsenic, total	x	x
Barium, total	x	x
Beryllium, total	x	x
Bismuth, total	x	x
Boron, total	x	x
Cadmium, total	x	x
Calcium, total	x	x
Chromium, total	x	x
Cobalt, total	x	x
Copper, total	x	x
Iron, total	x	x
Lead, total	x	x
Lithium, total	x	x
Magnesium, total	x	x
Manganese, total	x	x

Parameters	Field Blank	Triplicates
Mercury, total	x	x
Molybdenum, total	x	x
Nickel, total	x	x
Phosphorus, total	x	x
Potassium, total	x	x
Selenium, total	x	x
Silicon, total	x	x
Silver, total	x	x
Sodium, total	x	x
Strontium, total	x	x
Sulfur, total	x	x
Tellurium, total	x	x
Thallium, total	x	x
Thorium, total	x	x
Tin, total	x	x
Titanium, total	x	x
Uranium, total	x	x
Vanadium, total	x	x
Zinc, total	x	x
Zirconium, total	x	x
Dissolved Metals		
Calcium, dissolved	x	x
Magnesium, dissolved	x	x
Potassium, dissolved	x	x
Sodium, dissolved	x	x

4. Results

In this section, we discuss results of water quantity and quality sampling, grouped by parameter group. We compare water quality spatially, as it passes through the City, between seasons and years where possible. We compare the results to applicable guidelines for the protection of aquatic life to assess aquatic health of the creek ecosystem and provide a discussion of local and regional natural and anthropogenic influences on water quality.

4.1 Quality Assurance Quality Control

All field blanks were below the detection limit and so there was no contamination introduced by the field procedures.

The percent relative standard deviation for triplicates had a median value of 1.5% and ranged from 0% to 17%. Triplicate samples with percent relative standard deviations less than 18% are considered acceptable, while differences greater than this should be viewed with caution (Mitchell 2006). The low percent relative standard deviation observed with these samples confirms that the field sampling procedure was not a significant source of between-sample variation in water quality.

4.2 Stream Discharge

Stream discharge is an important driver of water quality; for example low flows make streams more susceptible to point source inputs and high flows cause bed and bank erosion, resulting in high concentrations of sediments and the associated metals and nutrients in the stream. Stream discharge is also an indicator of precipitation events, which in turn influence stream water quality temporarily due to increased surface runoff. Stream discharge was therefore recorded for most of the duration of the 2014-2015 Bear Creek Water Quality Study, with the help of a flow station and bi-weekly to monthly discharge measurements (see section 3.5), to help interpret water quality data collected in this study.

Stream discharge measurements decreased from August into the autumn with the exception of one measurement late in September that was related to a significant rain event of 25.2 mm on September 26, 2014. Flows declined in a linear fashion in 2015 as well but discharge values were substantially higher than the majority measured in 2014, likely as a result of spring snowmelt which was not captured in 2014 because monitoring was initiated in August, and greater precipitation.

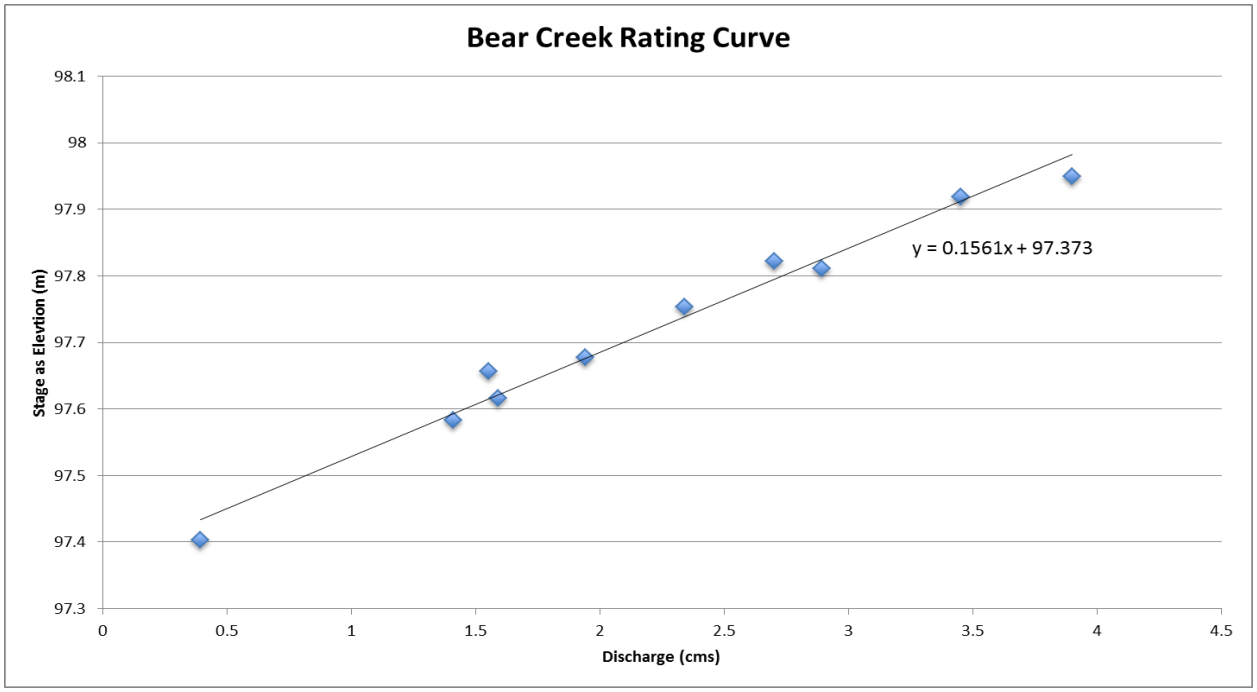
There was a strong positive linear relationship ($R^2 = 0.98$) between creek stage and discharge (Figure 7). This is unusual, as rating curves often rather produce a logarithmic function. The reason for this discrepancy is likely that a part of the upper range of flows was not covered by this rating curve. The included stage and discharge values only included the lower end of the curve, which in logarithmic functions approximates a linear shape. The measured stage-discharge relationship (Table 5, Figure 2) showed little error and captured most of the range in stage (97.533 - 97.949 m) measured by the continuous recorder). Discharge values from the period of April 9 to early June 2015 exceeded measured discharges of the rating curve, representing extrapolated values associated with uncertainty, as discharge measurements could not be made safely at high April flows and the May discharge measurement could not be included in the rating curve due to visual obstruction by high flows.

Table 5. Stream Discharge Measured in Bear Creek in 2014 and 2015

Date	Time	Measured Discharge (m^3/s)	Stage (m)	Stage elevation (m)	Comments
18/08/2014	11:00	2.34	0.344	97.754	
29/08/2014	15:31	1.94	0.42	97.678	
05/09/2014	14:48	1.59	0.482	97.616	
16/09/2014	14:30	1.41	0.515	97.583	
26/09/2014	15:26	2.7	0.276	97.822	
15/10/2014	15:27	0.39	0.695	97.403	
05/11/2014	14:02	0.14	0.565	97.533	Ice forming near gauging station, measurement excluded from curve
05/28/2015	15:05	4.68	n/a[1]	n/a[1]	
06/10/2015	14:35	3.9	0.149	97.949	
06/17/2015	10:53	3.45	0.179	97.919	
07/07/2015	14:29	2.89	0.287	97.811	
08/04/2015	15:43	1.55	0.441	97.657	

[1] Stage was not measured on April 28, 2015 because high flows obscured visual observations.

Figure 3. Bear Creek 2014 Stage-Discharge Relationship.



4.2.1 Hydrograph

The 2014 hydrograph illustrates decreasing flow from summer to fall with a small increase towards the end of October (Figure 3). Discharge was not graphed after the 27th of October because ice began forming in the channel and the rating curve is not valid beyond this date. Precipitation data showed that the fall of 2014 was wetter than average, while the annual total was lower than average (Table 6).

The 2015 hydrograph depicts decreasing flow from April to August with a few discharge spikes in June and August that were responses to high precipitation events. Precipitation from January to April 2015 was unusually high, exceeding the 30-year monthly averages by 60-170% (Table 6). The first spring discharge estimate was almost at 8 m^3/s, although the peak spring runoff was not captured given the stilling well to install the level logger was fully submerged and not accessible during the early days after ice-break-up.

Discharge at the South City limits site is likely variable and does not always mirror precipitation patterns because of upstream urban inputs and intermittent discharges from the municipal Clairmont wastewater lagoon upstream of the City of Grande Prairie. It should also be noted that operational height adjustments to the weir upstream of 100th Avenue might have resulted in slight alterations to the discharge values. In order to assess the effects of urban runoff and reservoir operations on the Bear Creek hydrograph, simultaneous flow records from upstream of the Grande Prairie Reservoir and downstream of the City would be required or, in the absence of such data, could be assessed by modeling.

Table 6. Monthly Precipitation in 2014 and 2015 Compared to 30-Year Average

	Total Precipitation (mm)			**Percent Difference Compared to 30-yr average**	
Month	30 year Average	2014	2015	2014	2015
January	29.9	16.2	62.8	-46%	110%
February	16.4	16.8	26.4	2%	61%
March	16.9	10.4	46.2	-38%	173%
April	19.8	42	33.2	112%	68%
May	41	18	25	-56%	-39%
June	75.9	52.4	136.2	-31%	79%
July	76.1	50.2	22.6	-34%	-70%
August	55.8	1.2	36.6	-98%	-34%
September	43	43.6		1%	
October	26	46.5		79%	
November	25.4	62.9		148%	
December	18.9	14.1		-25%	
Annual	445.1	374.3	389	-16%	

Figure 4. 2014 Hydrograph and Precipitation Volumes

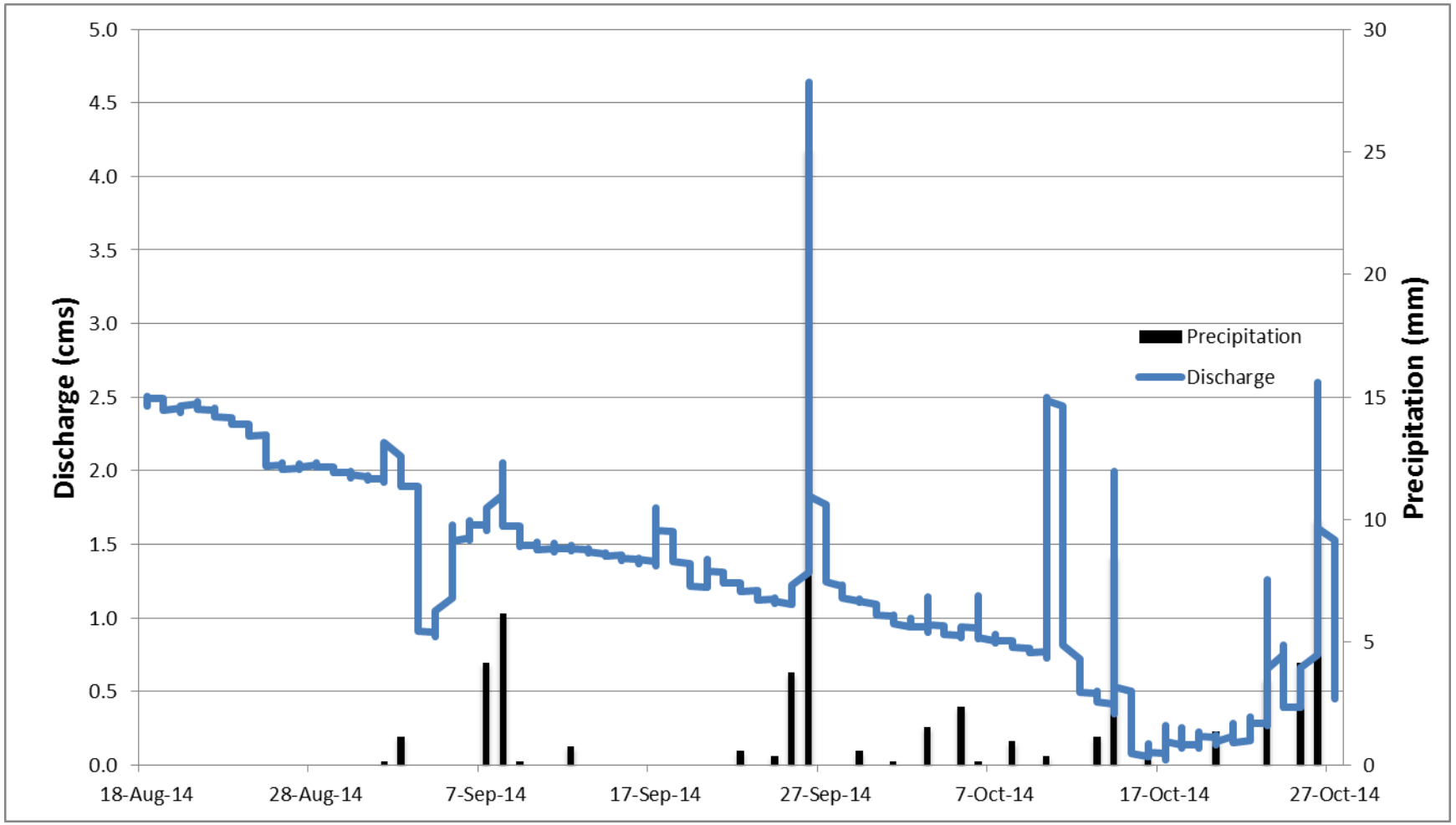
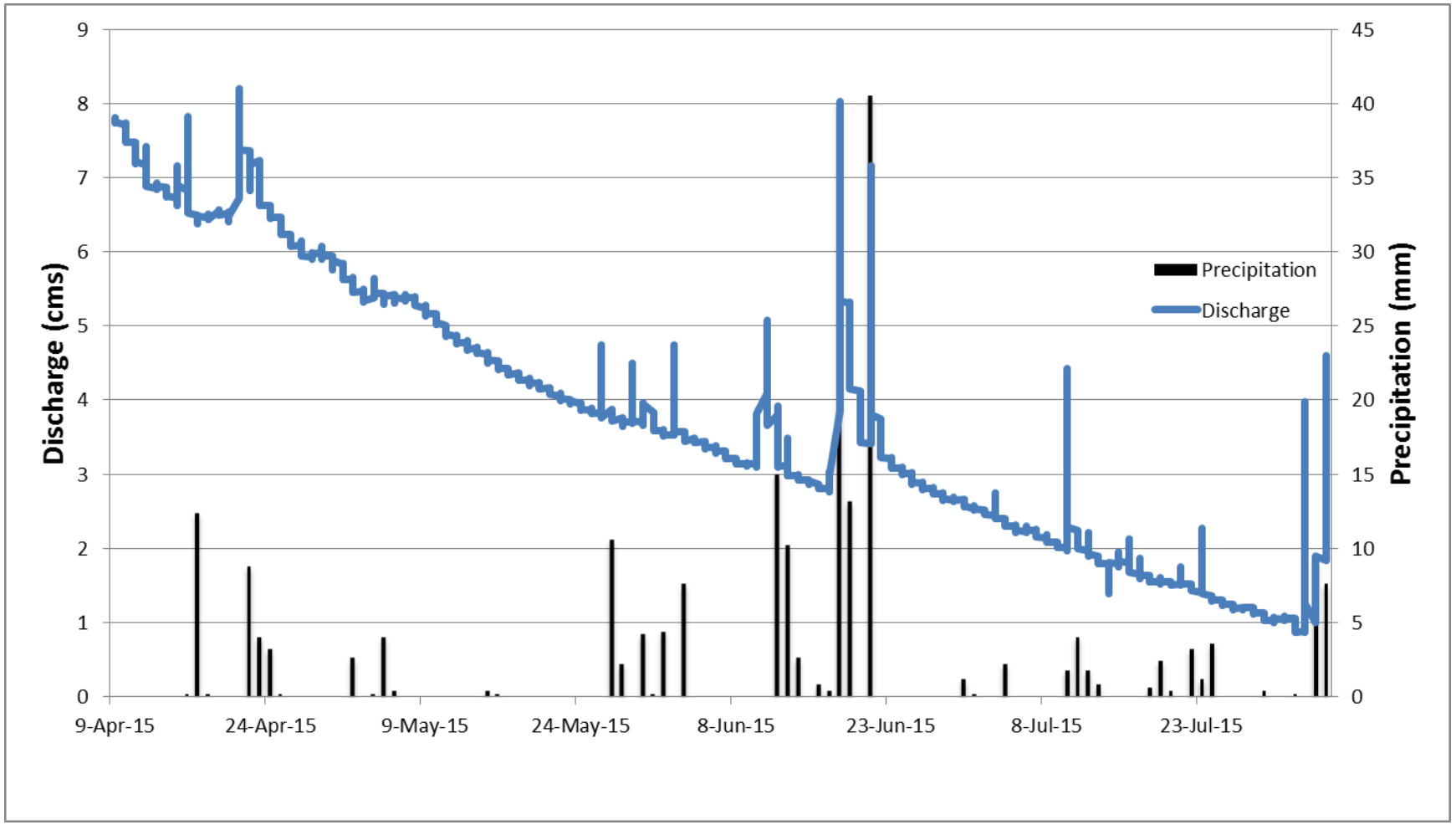


Figure 5. 2015 Hydrograph and Precipitation Volumes



4.3 Field Parameters

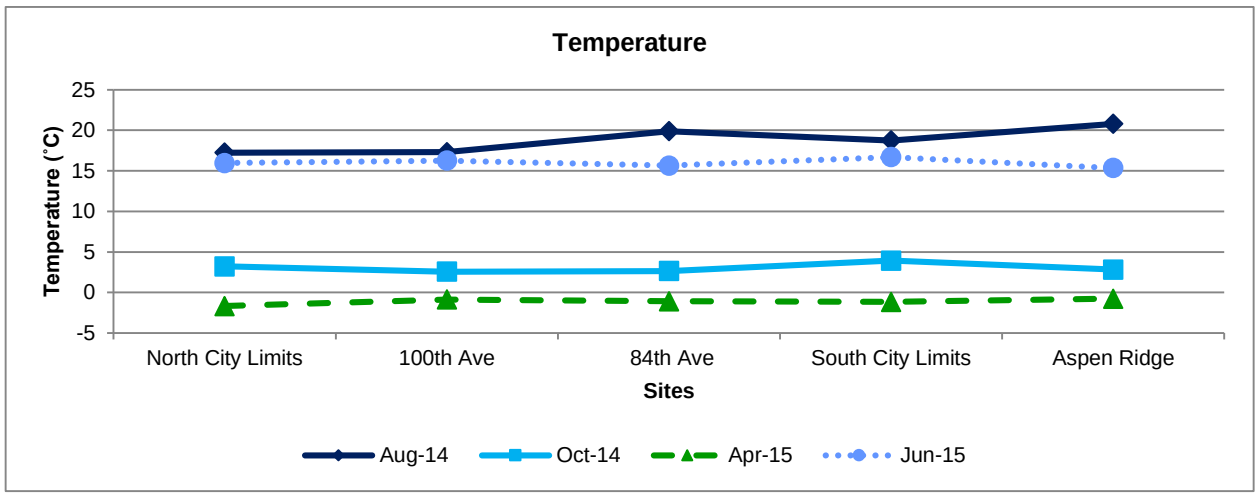
4.3.1 Temperature and pH

The greatest temperature variations occurred between seasons, with the warmest temperatures occurring in August (17.2 ˚C - 20.8˚C) and the coldest temperatures in April ranging from -1.68˚C to -0.76˚C. Warm temperatures can be stressful to fish and while Alberta does not have an explicit water temperature guideline, the BC Ministry of the Environment set 18 ˚C as the water quality guideline for protection of aquatic life for streams with unknown fish distribution (Government of British Columbia 2001). At the North City Limits this guideline was just met in August, but stream temperatures increased by 3 degrees within the City to the maximum value of 20.8 ˚C at Aspen Ridge. Similar temperature increases of 3 degrees (late May 2008) and 4 degrees (late May 2007) from the North to the South City limits were observed in previous sampling visits (Appendix D).

Temperatures in late May 2007 were most similar to those observed in June 2014, while temperatures in late April 2008 were more similar to April 2015 data. This comparison indicates that data from late May 2007 represent summer conditions while the late April 2008 data represent spring runoff. This is important when comparing these historical water quality data to the 2014/2015 study data.

Temperatures did not show a consistent spatial pattern as the stream passed through the city (Figure 6) but did increase during August.

Figure 6. Temperature Upstream and Downstream in Bear Creek.



pH showed neutral to alkaline conditions, which are typical for water bodies in the area, and remained within the acceptable range of provincial and federal guidelines. pH was lowest in April 2015 ranging from 6.06 at Aspen Ridge to 7.09 at 100th Avenue, likely reflecting the influence of low-pH snow melt. pH was highest in August 2014 ranging from 7.97 at the South City Limits site to 8.66 at the North City Limits site, likely due to the larger relative importance of alkaline groundwater inputs and the increased photosynthetic activity of algae that shift the carbonate balance towards higher pH. There were no consistent pH patterns from upstream to downstream of the City.

4.3.2 Dissolved Oxygen

The highest DO concentrations were observed in April when cold water allowed greater saturation and levels above 15 mg/L. The lowest DO concentrations were recorded in August 2014 (between 7.3 mg/L and 11.1 mg/L), likely due to lower DO concentrations at saturation under warm temperatures. DO concentrations were not spatially related to algae growth in the water column, as shown by a lack of spatial correlation. The fact that the low DO concentrations occurred during the period of largest algae growth, indicated by largest sestonic chlorophyll-a concentrations in August (Figure 24) can be explained by the lower saturation level of warmer water. This is supported by a larger oxygen saturation in August compared to October, when sestonic chorophyll-a concentrations were lower, but oxygen concentrations were higher due to colder temperatures (Figure 8).

There are three provincial oxygen guidelines (AESRD 2014). The first is >6.5 mg/L for regular conditions, the second is >8.3 mg/L which applies only from mid-May to the end of June to protect mayfly emergence and the third is >9.5 mg/L and applies to areas and times where larval fish development in gravel beds is possible. Given that Bear Creek is fish habitat and that all sites with the exception of North of City have at least a partial gravel substrate, the latter, most stringent guidelines should be applied to Bear Creek. This guideline was met in October 2014, April and June 2015, but not in August 2014.

The minimum guideline for regular conditions was always met. The second guideline was met during the June sampling, the only sampling time it applied to. Three sites (North City Limits, 84th Avenue, South City Limits) were below the third guideline in August, August indicating some degree of impairment and likely due to the elevated temperatures that also exceeded guidelines for fish habitat. More local knowledge about fish populations and their spawning schedule would be required to assess if these oxygen levels below the guideline have any negative impact on fish population.

Figure 7. Dissolved Oxygen Concentrations Upstream to Downstream in Bear Creek.

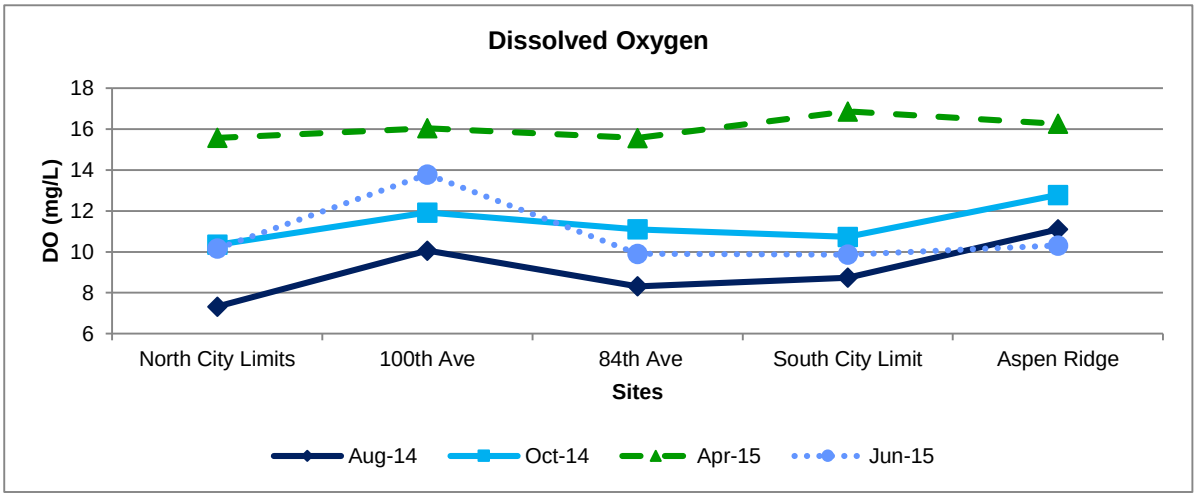
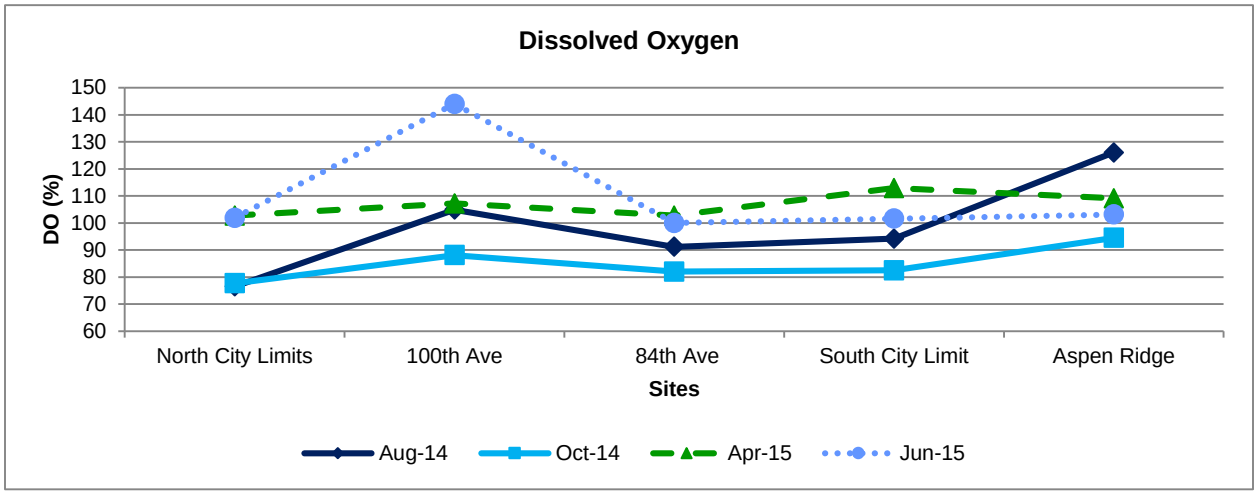


Figure 8. Dissolved Oxygen Saturation Upstream to Downstream in Bear Creek.



Dissolved oxygen (DO) showed a consistent spatial pattern in Bear Creek. Concentrations increased between the North City Limits and 100th Avenue and decreased from 100th Avenue to 84th Avenue. This pattern was also observed during the spring 2007 and 2008 study (Appendix D). The increase at 100th Ave could be explained by oxygenation of waters at the weir of the reservoir at all times and by benthic algae growth in June, August and October, which was also higher there than at the next two downstream sites (Figure 21).

During all sampling events, DO concentrations increased between the South City Limits and Aspen Ridge with the exception of April when DO concentrations reached their peak at the South City Limits (16.86 mg/L) (Figure 7). The increase at Aspen Ridge may also stem from oxygenation in riffles upstream of the sampling site or through increased benthic algae growth observed at this site (Figure 21).

In April, sestonic chlorophyll-a concentrations follow the same spatial pattern as dissolved oxygen and may have contributed to the observed spatial DO patterns, although chl-a levels remained low (between 0.7 and 6.2 µg/L). Periphyton samples could not be collected in April due to high water levels therefore the influence of benthic algae could not be assessed, although it can be assumed to be minimal due to limited growth during spring runoff due to high turbidity and high stream velocities.

4.4 Conductivity and Major Ions

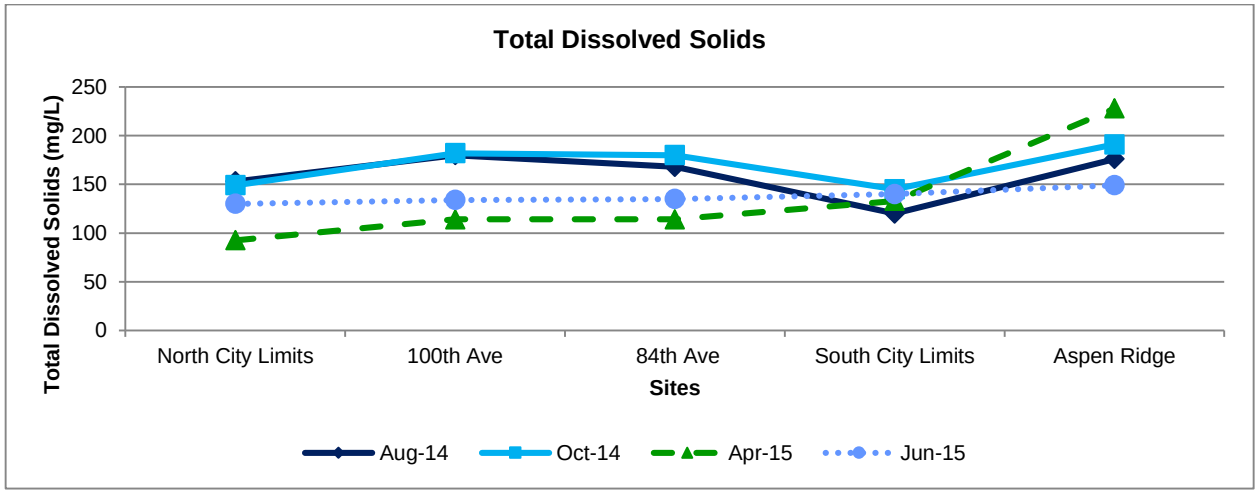
4.4.1 Total Dissolved Solids

TDS concentrations were highest (ranging between 120 mg/L and 191 mg/L) in late summer and early fall, reflecting the large proportional seasonal groundwater influence. Concentrations in June 2015 were mostly below 2014 values (ranging between 130 mg/L and 149 mg/L), indicating larger surface runoff or lake contributions (average Bear Lake TDS = 138 mg/L) that would dilute any in-City sources, compared to low flow periods, when both groundwater and any pollutant sources increase in relative contribution to

water volumes. In late May 2007, TDS concentrations were comparable to 2014 summer and fall concentrations (150-200 mg/L) and in April 2008, were higher than any TDS recorded in 2014 or 2015, ranging from 250 to 380 mg/L. This large inter-annual variation remains unexplained and indicates that at least another season of water quality data would be necessary to better characterize seasonal TDS patterns in Bear Creek.

April 2015 concentrations had the greatest range with the lowest concentration at North City Limits (92.5 mg/L) and the greatest concentration at Aspen Ridge (228 mg/L). These may relate to the runoff of road salt that accumulates on City roads in winter, as chloride showed similar patterns in April 2015 (Figure 10).

Figure 9. Total Dissolved Solids Concentrations Upstream to Downstream Bear Creek.



Total dissolved solids (TDS) showed similar spatial patterns in August and October 2014, increasing from North City Limits to 100th Avenue, remaining similar between there and 84th Ave, then dropping at South City Limits and increasing to peak concentrations at Aspen Ridge. A similar pattern was observed in April but TDS concentrations increased from 84th Avenue to Aspen Ridge, similar to the April 2008 sampling, when TDS increased from 280 mg/L at the North City Limits to 380 mg/L at the Pine Acres Crossing, which is upstream of the Aspen Ridge site (Appendix D). In June TDS concentrations increased moderately from upstream to downstream in Bear Creek (Figure 9).

The low-flow patterns in TDS were also shown by dissolved ions that make up the natural hardness of the creek, including sodium, potassium and calcium (Appendix C). This indicates that sites with increases in TDS and ions were likely receiving groundwater influence at these times, while decreasing trends indicated dilution by surface water that is more influenced by soft precipitation water. The large and consistent increase in TDS at Aspen Ridge may be related to groundwater influence in this area, which is located at a lower elevation within the creek valley as it descends to the confluence with the Wapiti River. The decrease of TDS from 84th Ave to the South City Limits during low flow periods (August and October) may be explained by the contribution of a tributary that originates south-west of the City, flows through Flyingshot Lake and joins Bear Creek.

The peak TDS at Aspen Ridge in April cannot be explained by groundwater influence, given the large spring melt volumes in the creek at that time, compared to which groundwater flows would be negligible. This increase is rather part of a general pattern in enriched water quality at that date and site, which was also seen for TSS, turbidity, total and dissolved metals, phosphorus and a few of the more common pesticides, picloram and 2,4 D. This parameter combination in the absence of increases in wastewater indicators such as biological oxygen demand (BOD) and nitrogen species, indicates that the influence of accumulated pollutants over the winter period that are washed into the creek during snow melt. These would include sediments, the associated metals and road salt. It is surprising that only half of the observed increase (10 mg/L from 15 to 25 mg/L) occurred from upstream to downstream of the City and that another 10 mg/L increase to 35 mg/L occurred within the stretch until Aspen Ridge, where the watershed is much less developed, indicating a concentrated spring runoff source in this area. Further investigation in this area of the County of Grande Prairie is warranted.

4.4.2 Chloride

The chloride concentrations observed in Bear Creek remained well below the federal and provincial chronic guidelines for the protection of aquatic life of 120 mg/L. The highest concentrations were observed during spring freshet and the lowest concentrations in the two summer samples (August 2014 and June 2015), ranging between 5 mg/L and 9.3 mg/L, similar to the late May 2007 samples ranging from 8 to 10 mg/L.

Figure 10. Chloride Concentrations Upstream to Downstream Bear Creek 2014/2015.

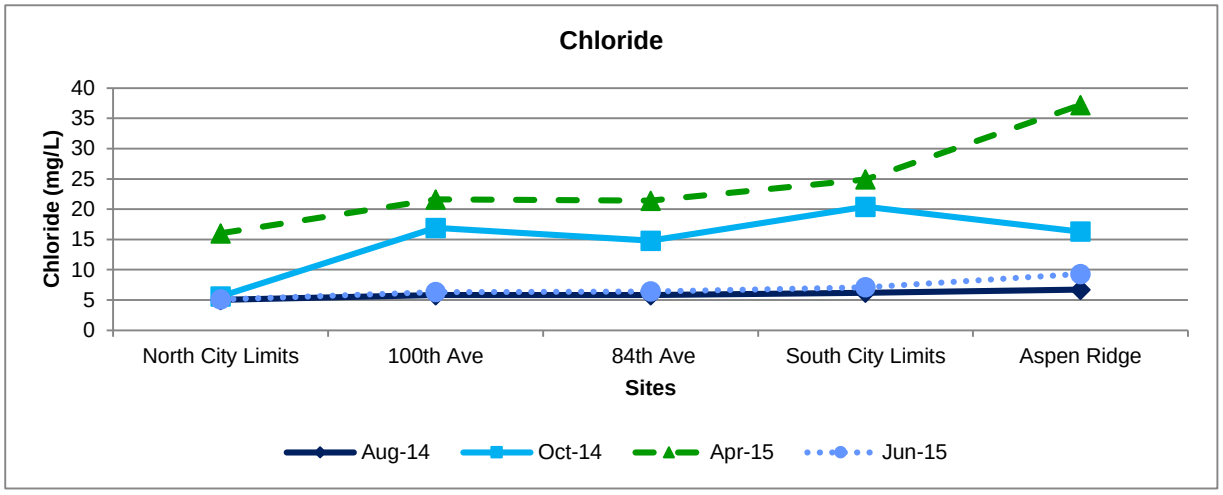
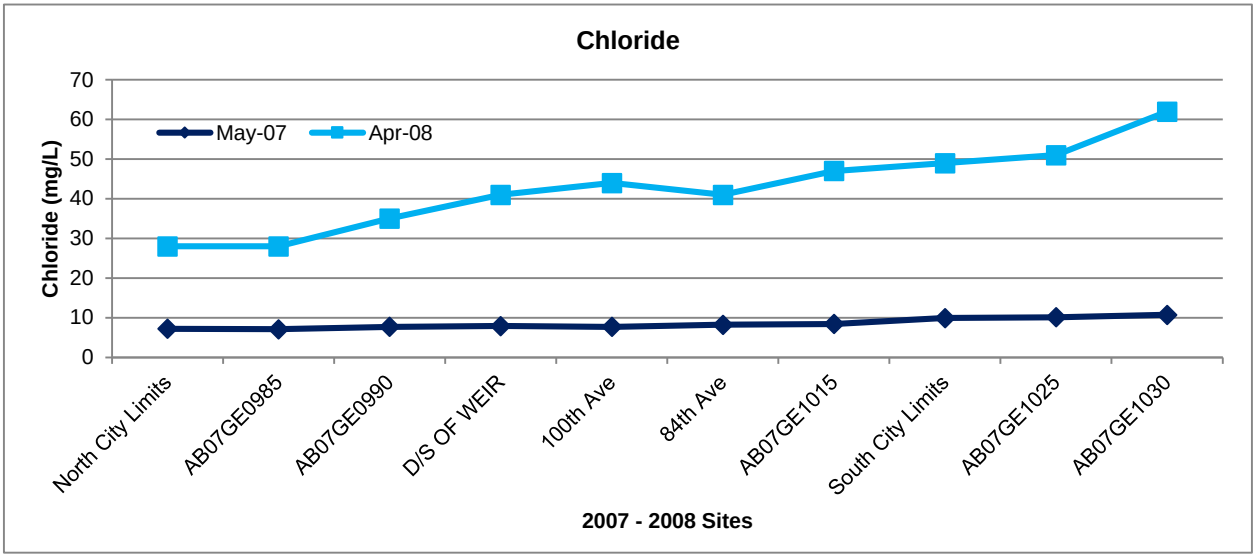


Figure 11. Chloride Concentrations Upstream to Downstream Bear Creek Spring 2007/2008



Note: Where 2007/2008 coincided with 2014/2015 Study sites, the site names for the 2014/2015 study were used for ease of comparison. All other sites were indicated with the Government of Alberta site code or description.

Chloride concentrations increased from upstream to downstream during all sample events in 2014 and 2015 (Figure 10) as well as in spring 2007 and 2008 (Figure 11). The largest absolute increase from upstream of the City to Aspen Ridge were observed during spring freshet in April 2015 (from 16 mg/L to 37.2 mg/L) and April 2008 (from 28 mg/L to 62 mg/L). This trend can likely be attributed to road salt, which accumulates on City streets during the winter period and is being washed into the creek during spring melt. The largest increase was observed downstream of the City, similar to that observed for TDS. The spatial patterns throughout the city in April 2015 showed striking resemblance with those observed in April 2008 (Figure 11), with the first largest increase observed from the North City limits to 100th Avenue, a somewhat smaller increase towards South City Limits and then further increases downstream of the City.

The largest percent increase over background from upstream to downstream of the City occurred in October 2014, with an increase from about 5 mg/L to 20 mg/L, indicating an in-City source of chloride. This source may be stormwater discharge following the rain event in previous days, although chloride concentrations from road salt in stormwater decreases significantly from spring to fall (as observed in Edmonton, Golder Associates 2015). Another possible influence may be water softeners in raw sewage that may reach the storm sewers from cross connections (inadvertent connection of a sanitary service to the storm sewer system), which are a recognized occurrence in urban drainage systems (http://www.edmonton.ca/city_government/utilities/drainage-and-sewer-terms.aspx). Monitoring water quality in the City of Grande Prairies storm sewer system during dry and wet weather would be required to better distinguish the sources of chloride and other pollutants originating from the City throughout the seasons.

4.5 Solids and Turbidity

Total suspended solids (TSS) and turbidity are indicators of the amount of particles suspended in the water column. TSS is a direct measurement of sediments in the water and turbidity measures the degree of light scattering.

4.5.1 Total Suspended Solids

TSS concentrations were lowest in June, ranging from 14 mg/L to 67 mg/L, yet were higher than those seen in clear-flow waters in the Wapiti River that usually remain below 10 mg/L (AEP data from Wapiti River long term river network (LTRN) site). October and April TSS concentrations were the highest, ranging from 38 mg/L to 954 mg/L, as discussed further below. The intermediate TSS concentrations observed in August 2014 were unusual since flows were lower than in April and June 2015, but some of the suspended solids in August may be explained by high algal biomass that was indicated by elevated sestonic chlorophyll-a concentrations (Figure 24).

The high suspended solids concentrations within the City in October 2014 probably indicate stormwater influence from the short, intense rain event recorded on October 14 (8.6 mm, Environment Canada). This event occurred one day before the South City Limits and Aspen Ridge sites were sampled and two days before the North City Limits, 100 Ave and 84 Ave sites were sampled. While the storm flow peak of 1.99 m^3/s observed at mid-day at the South City Limits had receded to the previous fall lows of 0.4 m^3/s by the morning of the 15th, the pollutant concentrations in the creek may still have been elevated due to the storage capacity of the Bear Creek Reservoir. The reservoir has an annual average residence time of less than 1 day (Golder Associates 2012), but under low fall flows, its water levels would be low and storage capacity relative to inflows would be larger; likely resulting in increased residence time. Seven stormwater outfalls draining about 8 km^2 of urban Grande Prairie discharge directly to the reservoir or to outfalls immediately upstream of the reservoir (Golder Associates 2012) contributing to storm loads, in addition to storm loads from the upstream watershed.

Additional wet weather sampling during and immediately after a rain event would be required to confirm the nature and degree of impact that City stormwater has on Bear Creek.

Figure 12. Total Suspended Solids Concentrations Upstream to Downstream in Bear Creek.

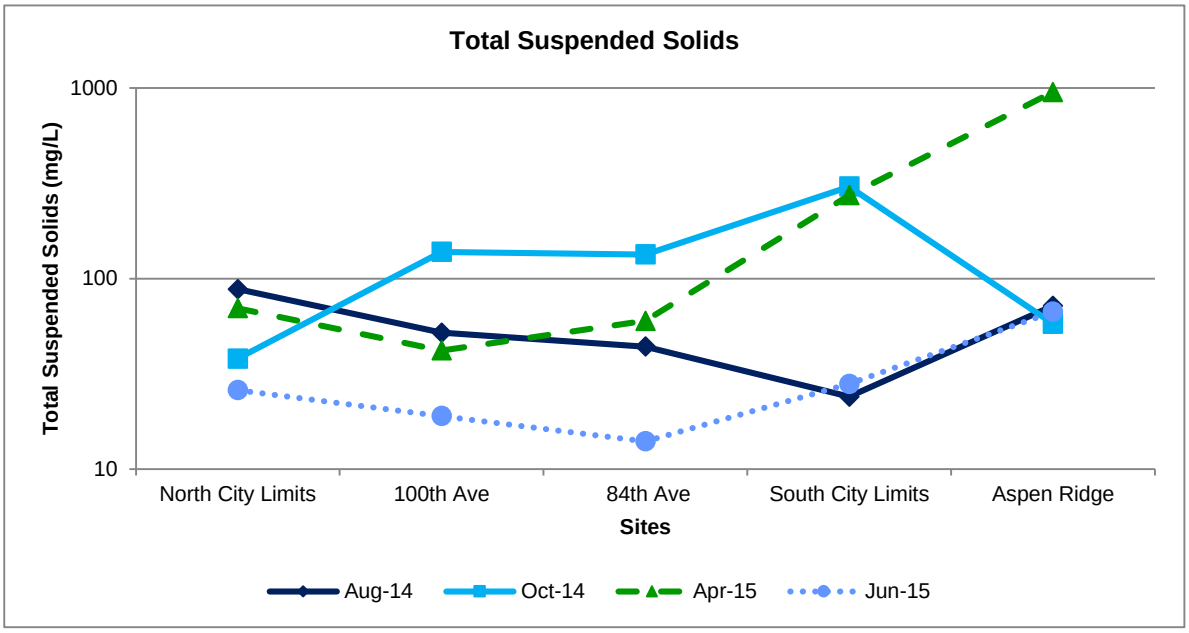
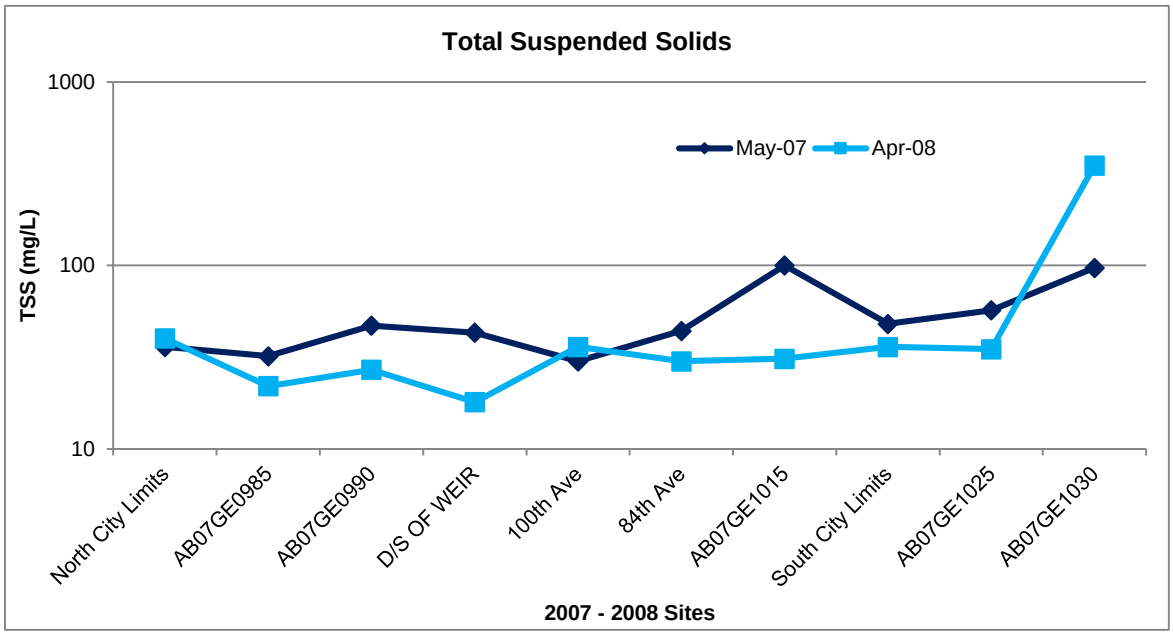


Figure 13. Total Suspended Solids Upstream to Downstream Bear Creek in 2007/2008



During several sampling events (August 2014, April and June 2015, April 2008) TSS concentrations started off slightly higher at the North City Limits and decreased to 100th Avenue, possibly due to the

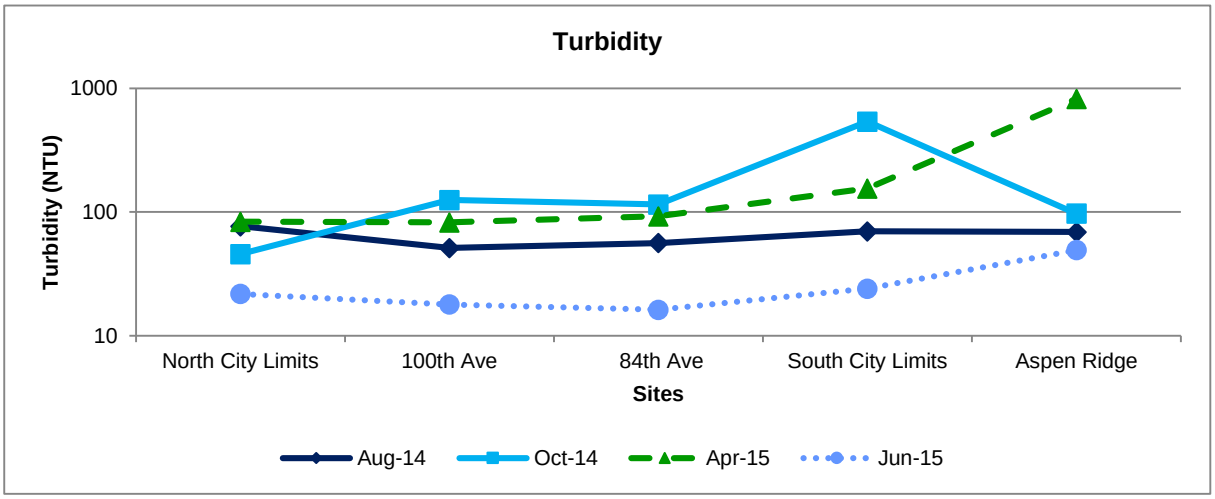
retention capacity of the reservoir. In October 2014, April and June 2015, concentrations increased from 84th Avenue to the South City Limits, which may indicate the influence of City stormwater or spring runoff. Similar, but much smaller increases were observed in May 2007 and April 2008 as well (Figure 13). The smaller degree of change may be due to the fact that sampling in 2008 occurred later in spring (April 28 2008 versus April 9 in 2015), when peak spring flows had passed and spring runoff had been on decline for two weeks (peak flows in the upstream Grande Prairie Creek occurred on April 12, 2008, hydrometric data, Environment Canada).

In spring, TSS concentrations continued to increase to Aspen Ridge (954 mg/L) (Figure 12), as part of the general pattern described above. The high concentrations observed in spring at Aspen Ridge were likely due to high flows associated with snow melt during spring freshet. Snow melt carries a high sediment load, made up of eroded soils, dust and de-icing sand accumulated from roads. Sheet flow and rill erosion on un-vegetated fields during spring thaw also adds to the particulate load in river. A combination of high snow melt load and increased flows scouring river beds and banks keeps the high sediment load in suspension. Such high concentrations would also be expected upstream and throughout the City due to the ongoing freshet in the watershed, but a large variability between sites may be due to differences in sampling times and high variability in suspended sediment loads due to diurnal freeze-thaw cycles in the watersheds and differing water travel times from different source areas.

4.5.2 Turbidity

Turbidity showed a very similar pattern to TSS, but turbidity increased from 84th Avenue to the South City Limits during all seasons. Summer turbidity (August and June) was the lowest while fall and spring turbidity were highest (Figure 14).

Figure 14. Turbidity Upstream to Downstream Bear Creek.



4.6 Nutrients

4.6.1 Total Phosphorus

Total phosphorus (TP) concentrations in Bear Creek were relatively high, ranging from 0.17 mg/L to 0.78 mg/L. June 2015 concentrations (0.17-0.2 mg/L) were similar to concentrations measured in May 2007 (0.18 – 0.2 mg/L) (data source: AEP) and April 2015 concentrations (0.26 - 0.78 mg/L) were similarly high to those measured in April 2008 (0.47 – 0.59 mg/L) (data source: AEP). Average TP concentrations in the upstream Grande Prairie Creek from an 8-year sampling program 1999-2006 were 0.17 mg/L (n=104), with a maximum of 0.72 mg/L (Lorenz et al. 2008), so the range of TP concentrations in Bear Creek in 2014/2015 fell within the average to high concentrations measured in Grande Prairie Creek in the early 2000s. These high concentrations are typical of streams in the region; for example median TP concentrations at various sites in the nearby Beaverlodge River ranged from 0.078 mg/L to 0.261 between 1994 and 2007 (HESL 2014).

Another explanation for high TP concentrations in Bear Creek can be the influence of the upstream Bear Lake. Bear Lake is hypereutrophic (very nutrient-rich) and had TP concentrations between 0.071 mg/L in July 2014 to 0.353 mg/L in August 2014 (ALMS 2014). Internal phosphorus loads lead to more elevated concentrations in late summer illustrated by the increase in TP concentrations in Bear Lake in 2014, and the largest TP concentrations in August 2014 in Bear Creek. The TP concentrations measured in Bear Lake on August 21st 2014 were still only about half of those measured on August 20th at the North City limits site, so it is likely that Grande Prairie Creek adds phosphorus-rich waters to Bear Creek as well.

Total phosphorus did not display a consistent spatial pattern throughout the city. In August 2014 TP concentrations decreased from 100th Avenue to the South City Limits. In October 2014 and April 2015 TP concentrations increased from 100th Avenue to the South City Limits (Figure 15). TP concentrations remained stable in June 2015 and late May 2007 and showed only minor variations in April 2008.

The fall and spring TP concentrations reflected a similar pattern as those displayed by TSS, indicating that TP concentrations were associated with suspended sediments during these two sampling events. A strong relationship (R^2=0.95) between these two parameters existed during these two seasons (Figure 16). These patterns may be due to an influence of stormwater in October, given that turbidity, TSS and chloride only increased at 100th Street and downstream, indicating an in-City source.

Figure 15. TP Concentrations Upstream to Downstream Bear Creek.

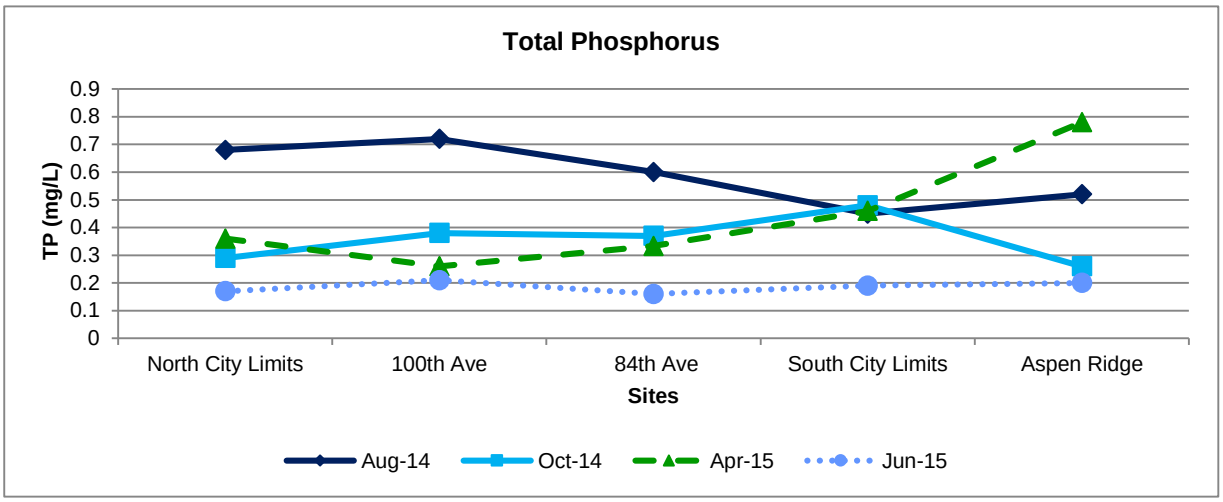
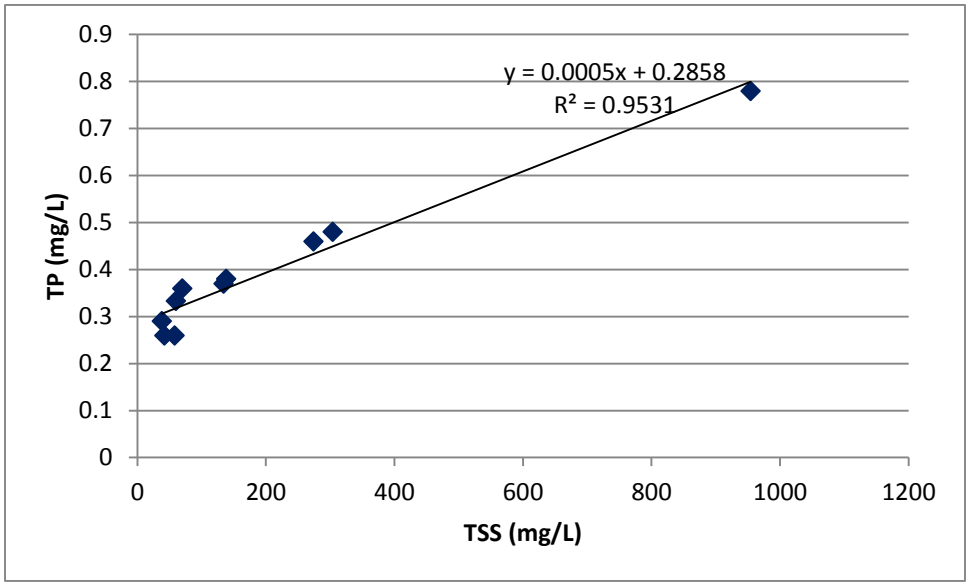


Figure 16. Relationship between Spring and Fall TP and TSS.

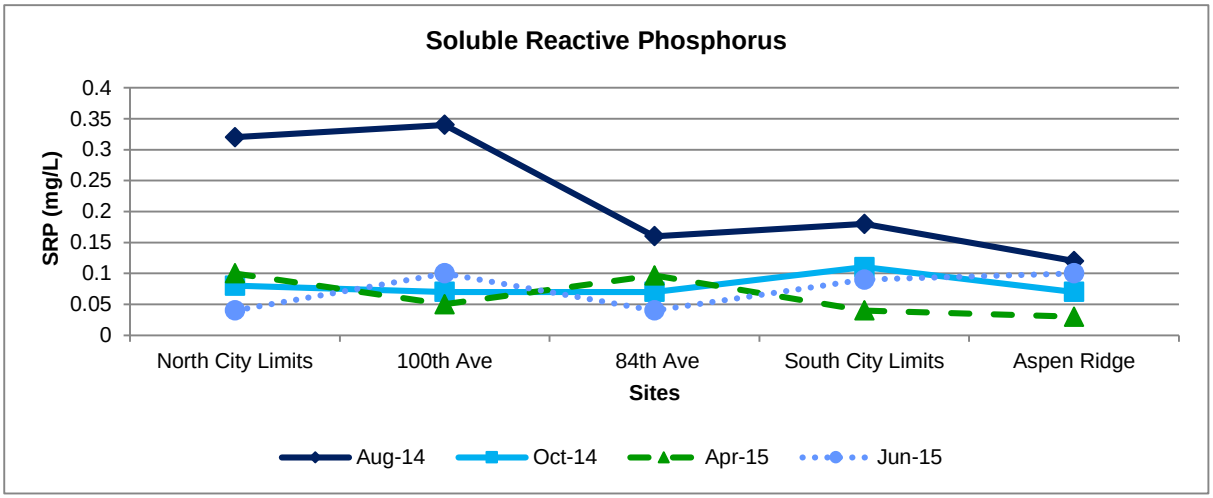


4.6.2 Soluble Reactive Phosphorus

Soluble reactive phosphorus (SRP) is a measure of orthophosphate, the form of phosphorus which is biologically available to plants and algae. August 2014 concentrations were the highest of all seasons (ranging from 0.12 to 0.34 mg/L), which may be due to the influence of Bear Lake upstream, where internal phosphorus loads in summer may increase concentrations, or due to agricultural sources in the upstream watershed of Grande Prairie Creek. The annual flow-weighted mean total dissolved phosphorus (TDP) concentrations in the upstream Grande Prairie Creek were estimated at 0.092 mg/L during the AESA studies (Lorenz et al. 2008). While TDP also contains other dissolved phosphorus fractions in addition to SRP, these values are very similar to those observed in this study and affirm that high dissolved phosphorus levels are typical for Bear Creek.

SRP did not display a consistent spatial pattern throughout the city and mostly varied within a small range, similar to spring 2007 and 2008 data. An exception to that was a major decline between 100th Avenue and 84th street (0.34 mg/L to 0.16 mg/L) in August 2014, possibly related to algae uptake or the fact that the two upstream samples were collected on a different day (see Table 1). Late summer, fall, and spring concentrations of SRP declined from the South City Limits to Aspen Ridge, likely related to dilution by groundwater. There are currently no guidelines for any forms of phosphorus, however concentrations of all nutrients must be low enough to prevent nuisance growth of macrophytes and algae and none of these were observed in Bear Creek during this study.

Figure 17. Soluble Reactive Phosphorus Concentrations Upstream to Downstream Bear Creek.



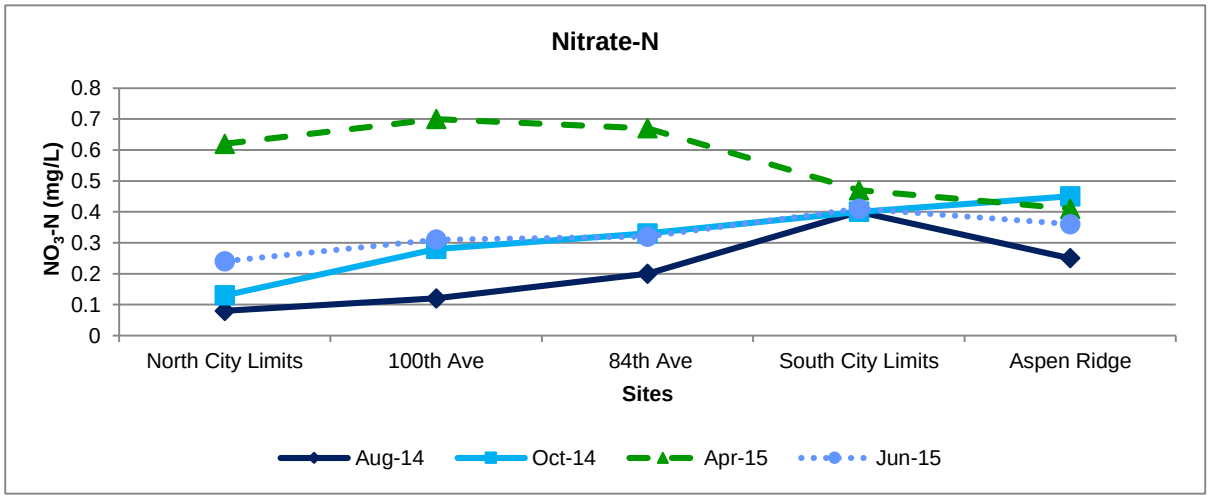
4.6.3 Nitrate

Spring nitrate concentrations were the greatest, ranging from 0.41 to 0.7 mg/L, possibly due to spring runoff from agricultural lands in the upstream watershed. These values were comparable to those observed in May 2007 (0.19-0.24 mg/L) and April 2008 (0.16 – 0.8 mg/L) and were at the higher end of nitrate and nitrite-N concentrations measured in Grande Prairie Creek between 1999 and 2006 (mean: 0.43 mg/L, median 0.017). Late summer nitrate concentrations were the lowest, ranging from 0.08 mg/L to 0.4 mg/L indicating reduced runoff as well as uptake by plant growth within the creek and the watershed. Nitrate concentrations always remained below the guideline of 3 mg/L.

Nitrate concentrations increased from the North City Limits to the South City Limits in fall, early and late summer, indicating a source of nitrate or ammonia in the city. A similar increasing trend throughout the City was observed in April 2008, when nitrate concentrations increased from 0.17 mg/L at the North City limits to 0.72 mg/L at the South City limits. April 2015 samples displayed a very different pattern than the other three sampling events, decreasing from 100th Avenue to the South City Limits. During all seasons nitrate concentrations declined from the South City Limits site to Aspen Ridge with the exception of October 2014, when concentrations increased (Figure 18), possibly due to stormwater influence at this sampling event.

While both nitrate and ammonia increased from the North City limits to 100th Avenue, nitrate continued to increase throughout the City, while ammonia decreased during most sampling events, a pattern that was observed in spring 2015 and in 2008 (Figure 19, Appendix D). This may indicate that some of the ammonia derived in the upper part of the City is being assimilated by nitrifying stream microflora, resulting in a transformation of ammonia to nitrate.

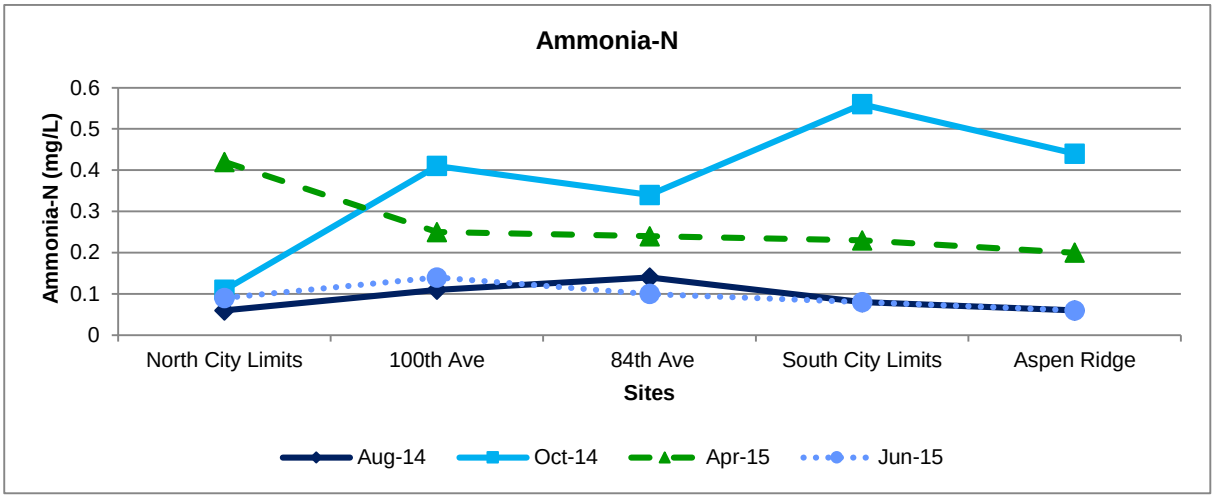
Figure 18. Nitrate Concentration Upstream to Downstream Bear Creek.



4.6.4 Ammonia

Ammonia concentrations varied between the four sampling periods. Concentrations were lowest and spatial patterns most similar in the two summer visits (June 2015 and August 2014), ranging from 0.06 mg/L to 0.14 mg/L and increasing from North City Limits to 100th Avenue and decreasing from 84th Avenue to Aspen Ridge. Concentrations in the City were highest in the fall ranging from 0.11 mg/L to 0.56 increasing from North of the City Limits to South City Limits (Figure 19), indicating a City source of ammonia at these times. Ammonia is a common pollutant in stormwater, so this pattern is likely related to the stormwater discharge discussed for TSS and other parameters above (e.g., section 4.5).

Figure 19. Ammonia Concentrations Upstream to Downstream Bear Creek.



The highest upstream (North City Limits) concentration of ammonia was recorded in April 2015, with 0.4 mg/L, which is close to the maximum recorded ammonia concentrations in Grande Prairie Creek of 0.6 mg/L (Lorenz et al. 2008). Average and median ammonia concentrations in 1999-2006 were 0.04 and 0.038 mg/L, respectively, indicating that the 2014/2015 levels were in the average to higher range of these historical values.

Unionized-ammonia, the most toxic form of ammonia those proportion of total ammonia depends on water temperature and pH, remained below the provincial and federal water quality guidelines for the protection of aquatic life (0.016 mg/L as NH_4-N), but was close to it on one occasion, when it reached a maximum of 0.014 mg/L in August at 84th Ave. This was due to a combination of high pH, high temperatures and intermediate total ammonia concentrations and indicates that chronic effects on aquatic life in this reach of the creek may be possible in summer.

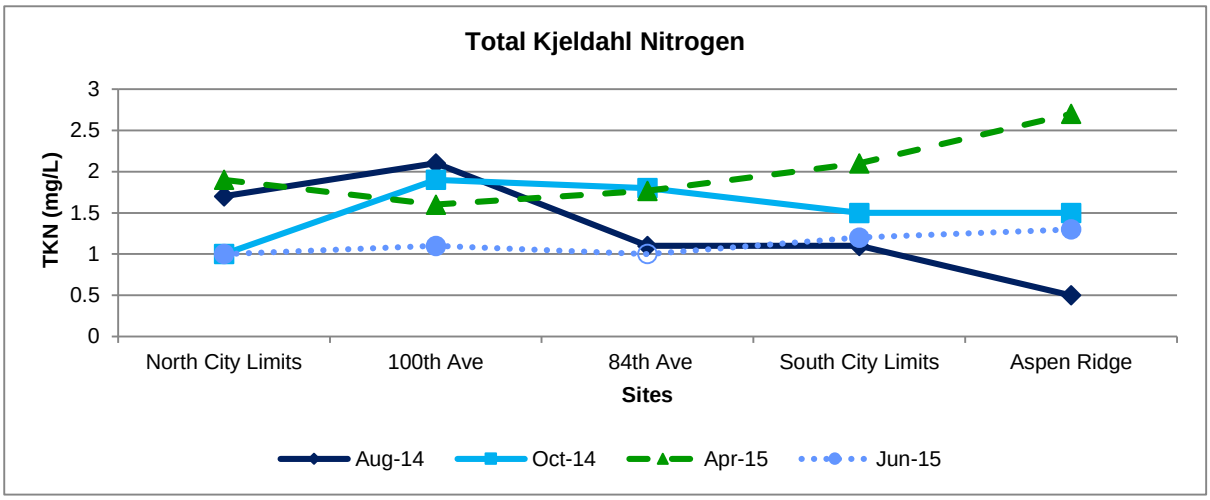
4.6.5 Total Kjeldahl Nitrogen

Total Kjeldahl nitrogen concentrations are a general indicator of organic forms of nitrogen and hence aquatic productivity and were relatively high ranging from 0.5 mg/L to 2.7 mg/L. Concentrations in the range of 0.1 mg/L to 0.5 mg/L are typical of natural surface waters not affected by excessive organic

inputs (McNeeley et al. 1979). TKN concentrations in the upstream Bear Lake in summer 2014 ranged from 1 to 2.4 mg/L, which falls into the hypereutrophic classification for lakes (ALMS 2014). Average TKN concentrations in the upstream Grande Prairie Creek in 1999-2006 were 1.64 mg/L, with a maximum of 4.6 mg/L. The concentrations observed in 2014/2015 therefore well reflected upstream 2014 Bear Lake and historical Grande Prairie Creek water quality.

Spatial and seasonal TKN patterns were very similar to TP patterns, both in 2014/2015 and 2007/2008 (Figure 20, Appendix D), indicating that the total nutrient patterns were related.

Figure 20. Total Kjeldahl Nitrogen Concentrations Upstream to Downstream Bear Creek.



Note: Open symbols indicate values below detection.

4.7 Algae Biomass

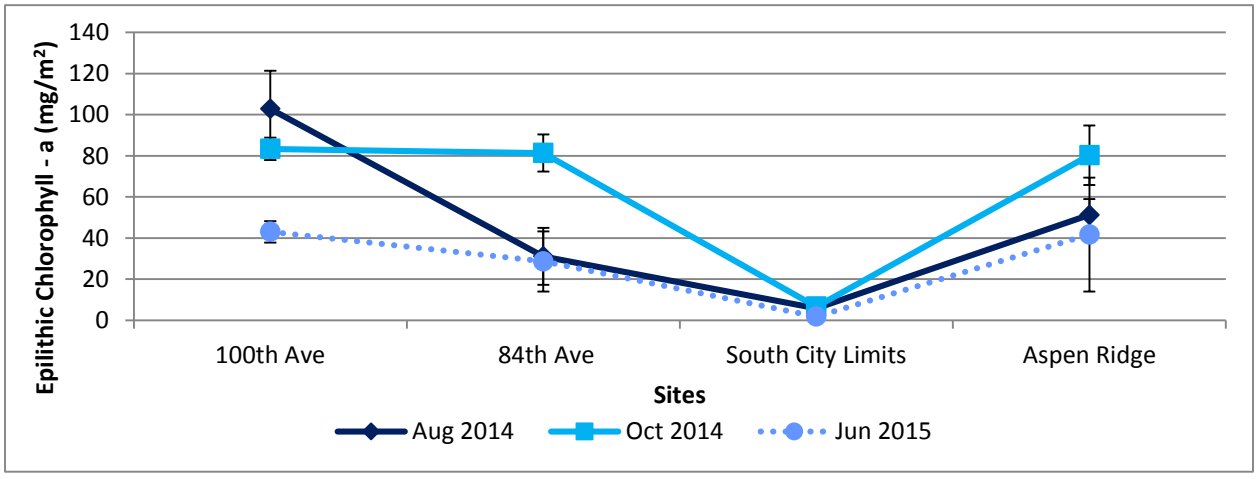
Algae biomass in the watercolumn was assessed though sestonic chlorophyll-a, attached algae biomass by epilithic chlorophyll-a (attached to rocks) and overall periphyton production through attached ash-free dry weights. These data were only collected in 2014/2015, so no comparison with historical data was possible.

4.7.1 Epilithic Chlorophyll-a

Epilithic chlorophyll-a is a measure of algae biomass that lives attached to submerged rocks. It is an indicator of autotrophic productivity in streams, representing the base of the aquatic ecosystem food chain, and is sensitive to nutrient enrichment. Attached algae biomass develops over time spans of several days to weeks and therefore provide complementary water quality information in addition to spot-water samples.

Epilithic Chlorophyll–a was, on average, highest in October 2014 (low flow), and lowest in June 2015, under high flow. This likely reflects a combination of higher nutrient concentrations in the creek throughout summer and fall 2014 compared to June 2015 and more time for periphyton to build up biomass throughout the season. Epilithic chl-a ranged between 25 and 100 mg/m^2, representing mesotrophic, i.e., moderately productive conditions in streams (Dodds et al. 1998). An exception to that was the South City Limits site, where periphyton growth was always low, likely due to limiting light availability at this well-shaded location. We therefore excluded epilithic biomass values at this location from our interpretations with regards to periphyton biomass as an indicator of nutrient enrichment.

Figure 21. Epilithic Chlorophyll-a Upstream to Downstream Bear Creek.



Note: Error bars represent the standard deviation of three replicates collected at each site at each sampling event. Periphyton sampling was not feasible at North City Limits location and at all sites in April 2015 (see section 3.1).

Spatial patterns were similar among the three sampling events, with highest algae biomass at the 100th Avenue location, similar or lower biomass at 84th Avenue and a return to higher biomass at Aspen Ridge. The spatial and temporal patterns observed in the data were confirmed by visual observations in the field (L. Makowecki, personal communication), supporting the validity of the collected data.

Attached chlorophyll–a concentrations showed similar patterns as TP and TKN concentrations during the June 2015 and August 2014 surveys, indicating that nutrient concentrations may have controlled attached algal biomass in summer. In June, TP and TKN concentrations were stable across the City and epilithic chlorophyll-a remained within the replicate variation throughout, if excluding the Couth City limits site and in August 2014 both showed the decreasing trend between 100th and 84th Avenue. Given that October water quality was likely influenced by a storm event, the algae would not be representative of the water quality but rather that of the weeks prior to sampling.

N:P ratios were low at all sites and dates (<7), which could indicate that algae growth was nitrogen limited, but there is a high uncertainty associated with stream nutrient limitation without direct experimental data (Allan and Castillo 2002).

The limited collected data do not allow conclusions with regards to the relationship of epilithic algae growth with seasonal and spatial nutrient patterns in Bear Creek. More clear-flow attached algae data and water quality data would be required to confirm such relationships.

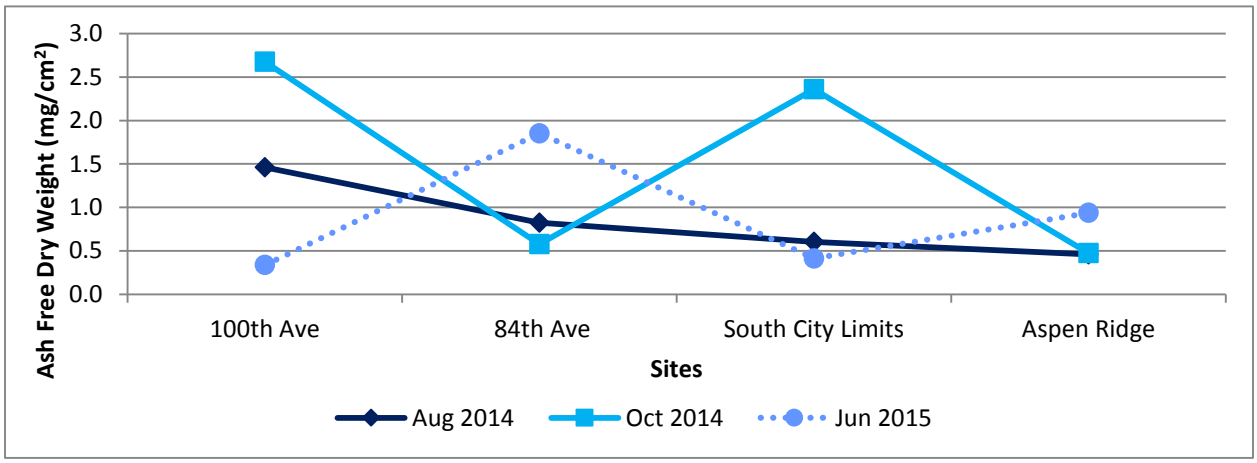
The amount of variation around the periphyton biomass values was relatively low and smaller than between-site differences, indicating that the sampling procedure provided repeatable results and sufficiently captured spatial variability at the sites (Appendix C).

4.7.2 Epilithic Ash-Free Dry Weight

Ash-free dry weight is an indicator of total periphyton and heterotrophic biomass, including algae, fungi, bacteria, invertebrates and also includes decaying material.

Ash-free dry weight did not show any consistent spatial or temporal patterns, except that Aspen Ridge had, on average, the lowest ash-free dry weight. This may be explained by the highest velocity in this area, only allowing specifically adapted algae to remain attached to the rocks, while loose organic materials could be more easily washed away.

Figure 22. Ash-Free Dry Weight Upstream to Downstream Bear Creek



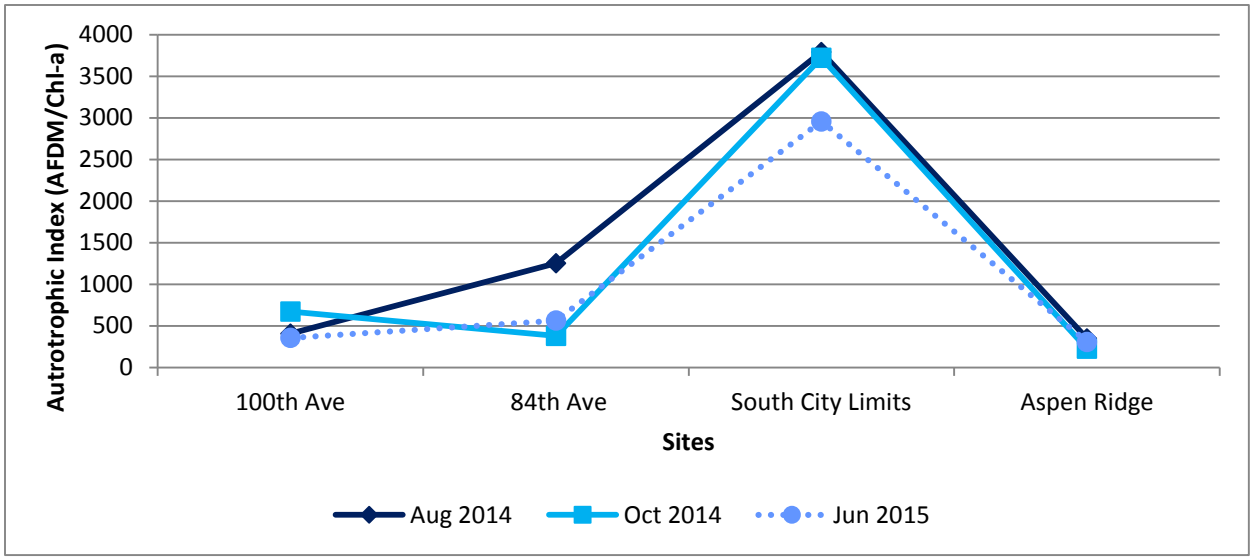
4.7.3 Autotrophic Index

The relative importance of autotrophic productivity (algae growth fueled by nutrients, such as P and N) compared to heterotrophy (fungi, bacteria and invertebrate growth nourished by organic matter) in periphyton, can be expressed by the ratio of Ash-free dry mass and chlorophyll-a. AFDM/Chl-a or the inverse have been used in the literature, but most available values to indicate the presence of nutrient or organic pollution were derived by the former and is therefore used here.

The autotrophic index, expressed as the ratio of epilithic AFDM to Chl-a, ranged from 200 to 700 at most sites, indicating a slight dominance of heterotrophic organisms (Weber 1973). The exception were a high value of 1300 at 84th Ave in August 2014, which indicates clear dominance of heterotrophy for unknown reasons, and all South City Limits samples, where heterotrophic production dominated due to the strong light limitation of algae growth. Ratios of 250-300 were observed at Aspen Ridge, which are indicative of nutrient-enrichment in streams (Biggs 1996).

The patterns in autotrophic index did not reflect any of the observed water quality patterns. BOD remained stable throughout the study area at all sampling dates (Appendix C), not indicating any organic pollution source in the City, and phosphorus levels were lower at Aspen Ridge than in the City, contrary to the lower autotrophic index. The most likely explanation for the absence of correlation of the autotrophic index with water quality is that local habitat factors influenced the composition of periphyton more than water quality. Such factors could include light availability, water velocity, and physical disturbance. For example, velocity was consistently highest at Aspen Ridge, which may have resulted in less accumulation of organic matter, associated bacteria and fungi, dead biomass and attached invertebrates than in calmer areas of the stream found with the City.

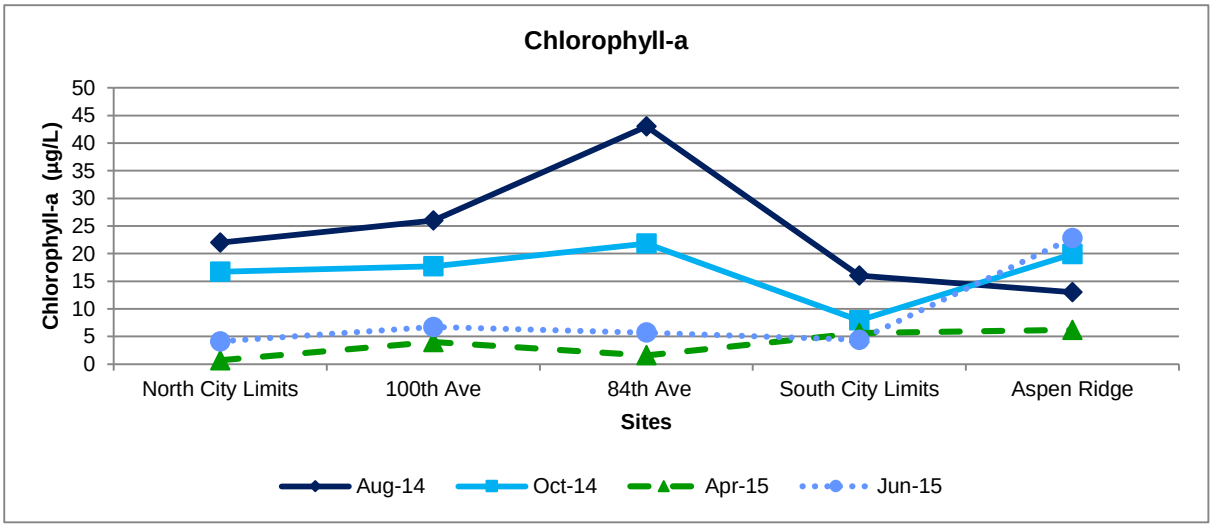
Figure 23. Autotrophic Index Upstream to Downstream in Bear Creek



4.7.4 Water Column Chlorophyll-a

Chlorophyll-a measured in the water samples, also called sestonic chl-a, measures the biomass of floating algae and can also contain minor portions of detached benthic algae. Sestonic chl-a ranged from 0 to 43 µg/L. The April and June 2015 values were likely limited by high turbidity in the water, while the August and October concentrations can be used to evaluate algae productivity related to nutrient availability in the water. The chlorophyll-a concentrations of 15 to 43 µg/L observed at these two sampling events are indicative of mesotrophic conditions, which confirms the moderate level of productivity indicated by the epilithic chlorophyll-a.

Figure 24. Sestonic Chlorophyll-a Upstream to Downstream Bear Creek.



Bear Lake had chlorophyll-a levels of up to 94 µg/L, indicating that either some of the algae biomass is lost through settling or grazing before reaching the City of Grande Prairie, or that waters are diluted by Grande Prairie Creek.

Algae growth takes time; the short distance and hence water travel time between sites would therefore in theory prevent major changes in sestonic ch-a. It is therefore somewhat surprising that sestonic chl-a showed consistent peaks at 84th Ave and a dip at South City Limits in August and October 2014. The decrease at the South City Limits may be related to the influence of the small tributary, which may have a diluting effect on chlorophyll levels in Bear Creek.

4.8 Bacteria

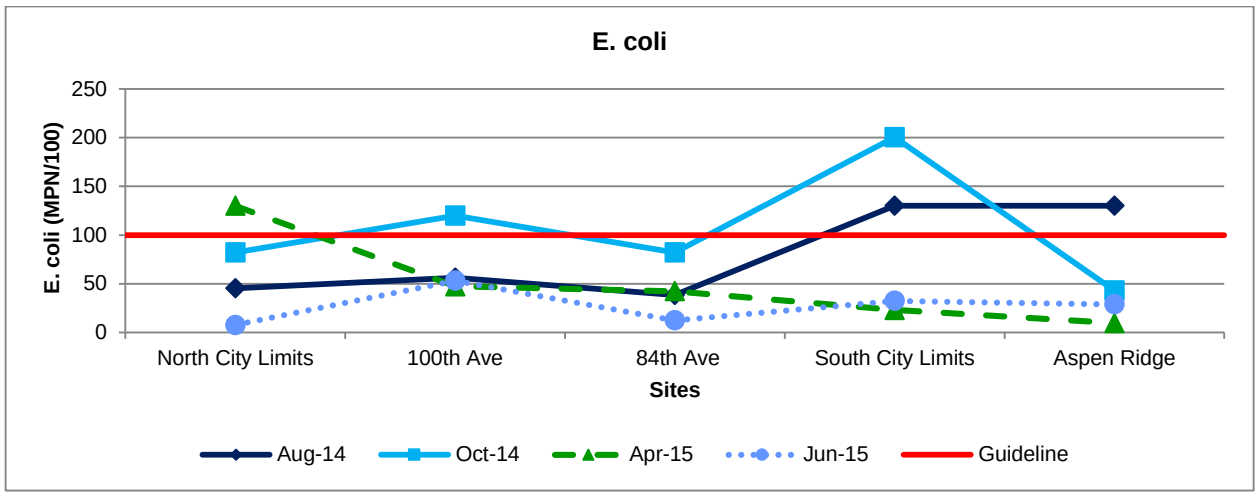
Bacteria are important parameters to monitor due to their potential impacts on public health. *Escherichia coli* (*E. coli*) is a group of bacteria commonly monitored to indicate the presence of fecal wastes and other harmful bacteria.

Fecal coliforms showed the same spatial pattern upstream to downstream over all season as *E. coli*; therefore the trends in *E. coli* discussed in this report are applicable to fecal coliforms as well.

E. coli concentrations at the North City Limits in April (130 MPN/100 mL) were above the provincial guideline for the protection of irrigation of raw produce crops of 100 #/100 mL (Alberta Environment and Sustainable Resource Development 2014). This was likely not an exceptional occurrence, as average E. coli counts in Grande Prairie Creek in 1999-2006 were 162/100mL (Lorenz et al. 2008). At the 100th Avenue site *E. coli* concentrations (120 MPN/100 mL) were above the provincial guideline in fall 2014. South City Limits *E. coli* concentration were above this guideline in late summer (130 MPN/100 mL) and fall (200.5 MPN/100 mL) 2014. Aspen Ridge concentrations (130 MPN/100 ml) were above the guideline in late summer of 2014. *E. coli* numbers remained below 40/100 mL in May 2007 and April 2008 with minor variations throughout the City. These data imply that Bear Creek water may temporarily be unsuitable for irrigation of raw produce crops.

The guideline for protection of recreation and esthetics of 126 #/100 mL (as geometric mean of weekly samples collected within 30 days) was exceeded in samples downstream of the City in August and October and upstream of the City in April, but the low sampling frequency prevents a conclusive statement about the suitability of Bear Creek for recreational purposes.

Figure 25. *E. coli* Concentrations Upstream to Downstream Bear Creek



During spring sampling *E. coli* concentration decreased upstream to downstream, but this pattern was not observed during any other season. In June and October there were some minor increases from the North City Limits to 100 Ave, but the largest increases occurred from 84th Ave to South City Limits in August and October 2014. In October 2014 *E. coli* concentrations were higher than in all other seasons within the City, which was likely related to similar observed water quality patterns in suspended solids and some metals, indicating an influence of stormwater from the rain event that occurred prior to sampling.

The bacteria data produced in this study were not derived with the same method as those produced by the provincial monitoring program at LTRN sites in the Wapiti River. Both methods are commonly employed to analyze fecal coliform and *E. coli* concentrations. One method results in a unit referred to as CFU/100mL (Colony Forming Units/100 ml) and is the method used by the Provincial laboratory used for the LTRN monitoring programs. It is the count of bacterial colonies produced on agar plates. The second method, which was applied by the laboratory in this study, uses a multiple-tube fermentation decimal dilution method and is based on a statistical estimation, resulting in most probable number (MPN/100 mL). The multiple-tube fermentation decimal dilution analysis has been observed to be more variable and often results in higher numbers than the membrane filtration CFU procedure (Gronewold and Wolpert 2008). While results usually are within the same order of magnitude and both methods are recognized in Alberta's guidelines, which use the unit #/100 mL, this potential source of uncertainty needs to be acknowledged if both datasets are to be used in any future water quality study or comparison.

4.9 Metals

Some metals (total aluminum, beryllium, chromium, thallium, thorium, and vanadium) showed higher concentrations in spring than in fall, likely related to the high inorganic solids loads, while others showed highest concentrations in fall (e.g., total barium (Figure 27), cadmium, copper, cobalt, lead, iron, lithium, uranium and zinc).

Several metals exceeded federal and provincial guidelines at certain times and sites (Table 7). The majority of values above guideline were observed during October and April, when TSS concentrations were highest and were therefore likely associated with erosion of soils and stream banks and bed during spring runoff and stormwater discharges in October. Notably, the metals that only exceeded guidelines in October and April, e.g., cadmium, silver, lead and zinc, did so only at downstream sites, indicating that the influx of in-City stormwater and spring runoff increased the frequency at which metals guidelines were exceeded in Bear Creek. Urban sources of metals include automobile wear and abrasion, combustion processes, parking lots and highways, atmospheric deposition, industrial areas, and corroding metal surfaces (U.S. EPA 2006). These metals did not or only rarely exceed guidelines during the 2007 and 2008 sampling events, when spring runoff was less pronounced, further supporting the evidence that urban runoff was the key reason for these metals to exceed guidelines in Bear Creek.

The dissolved forms of aluminum and iron exceeded provincial water quality guidelines in all seasons but August 2014. Dissolved iron exceeded the guideline at all sites and only during wet weather or spring melt, pointing to an upstream source, possibly from watershed soil leaching. Dissolved aluminum concentrations, on the other hand, mostly exceeded guidelines at sites in the City, pointing to an in-City source.

Table 7. Metals that Exceeded Water Quality Guidelines

	Count of Measurements above Guideline by Site (out of 4)					Date when Guideline was exceeded				Largest Factor by which Guide-line was exceeded	# of Sites where Guideline was exceeded (out of 10)	
Metal*	North City Limits	100th Ave	84th Ave	South City Limits	Aspen Ridge	Aug 2014	Oct 2014	Apr 2015	Jun 2015	2014/ 2015	May 2007	April 2008
Aluminum	4	4	4	4	3	x	x	x	x	145	10	10
Cadmium		0	0	2	1		x	x		5	0	1
Calcium	4	4	4	4	4	x	x	x	x	44	10	10
Copper	2	3	3	3	3		x	x	x	2.5/9**	10	9
Iron	4	4	4	4	4	x	x	x	x	70	10	10
Lead	1	2	2	2	2		x	x		8/14**	10	1
Manganese		1	1	1	1		x			2.5	0	0
Mercury[5]	2	2	2	2	2		x	x	x	4	n/a	n/a
Selenium	0	0	1	1	1			x		3	0	4
Silver[6]	0	0	0	1	1		x	x		1.8	0	0
Zinc	0	0	0	2	1		x	x		4	0	0
Aluminum, dissolved	1	3	2	2	2		x	x	x	50	10	0
Iron, dissolved	2	2	2	2	3		x	x	x	33	0	0

*Notes: *All metals are total metals, except where noted.*

***the lower factor for provincial guideline, the higher factor for federal guideline. Exceedance counts were based on federal guideline, but were lower for provincial guideline.*

n/a: not measured.

[5] *In August the detection limit for total mercury was 10 ng/L which is above the federal guideline of 26 ng/L and the provincial chronic (5 ng/L) and acute (13 ng/L) guidelines. The requirement for ultra-trace mercury was communicated with the lab however their definition of ultra-trace was 10 ng/L. An agreement with the lab to contract the ultra-trace mercury analysis to another ATIF was made. The detection limit for the remaining months was reduced to 0.08 ng/L.*

[6] *In June the detection limit for total silver was 0.5 µg/L which is above the federal and provincial guideline of 0.1 µg/L. Between the April and June sampling AITF undertook a review of their analytical methods. As part of the review they undertook a formal validation exercise including method detection limit determinations using the accepted practices and procedures demanded by the International Union of Pure and Applied Chemistry, the US EPA and Industry accreditation bodies such as the Canadian Association for Laboratory Accreditation and EURACHEM. This process resulted in detection limit changes.*

Several metals demonstrated similar spatial patterns in spring and fall. In April 2015, concentrations of total aluminum (Figure 26), arsenic, barium, beryllium, cadmium, copper, chromium, cobalt, lead, copper, iron, lithium, thallium, thorium, uranium, vanadium, and zinc increased from North City Limits to Aspen Ridge. Similar increases throughout the City were also observed in April 2008, but were much less pronounced, and not displayed by as many parameters (Appendix D). Concentrations of the same set of metals increased from the North City Limits to the South City Limits in October 2014 and then decreased from South City Limits to Aspen Ridge.

These spatial patterns were similar to those displayed by TSS during these seasons. There was a positive relationship between these metals and TSS during these two sampling periods with R^2 values ranging from 0.60 (total zinc) and 0.99 (total cobalt). Metals are often found bound to particulate matter and are a component of natural soils and therefore these patterns are expected.

Figure 26. Total Aluminum Concentrations Upstream to Downstream Bear Creek.

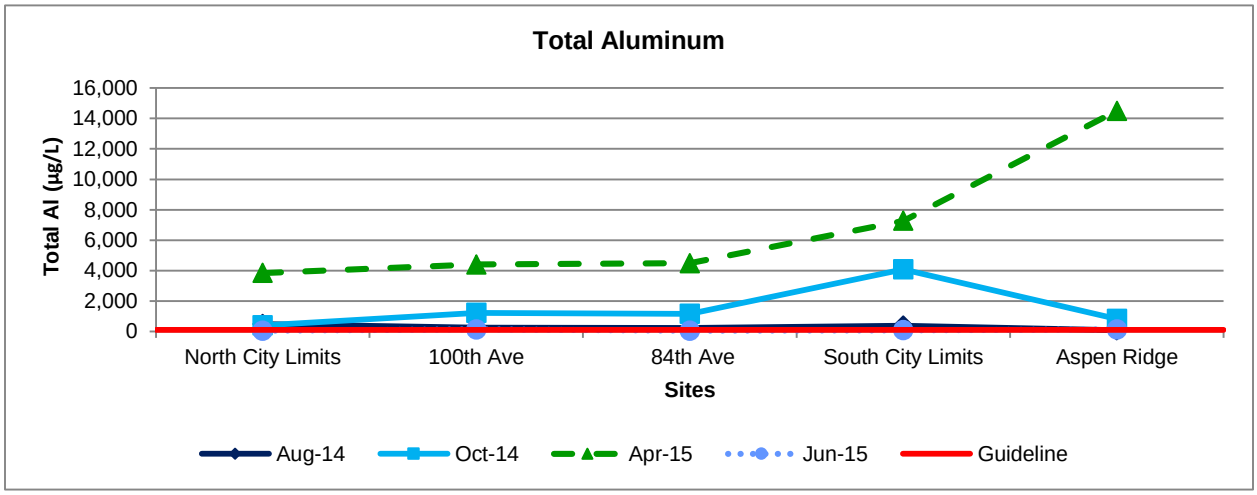


Figure 27. Total Cadmium Concentrations Upstream to Downstream Bear Creek.

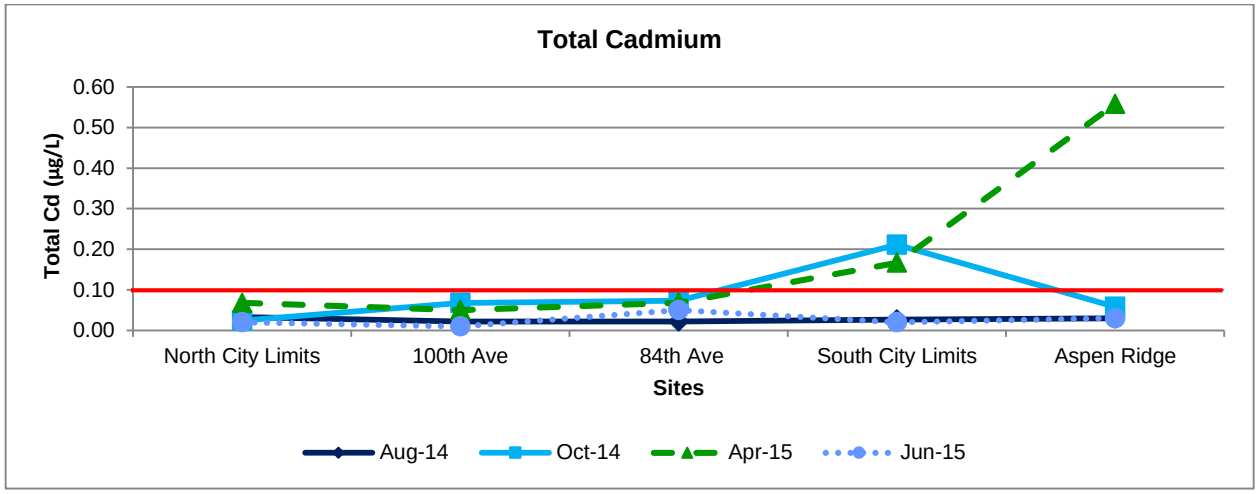
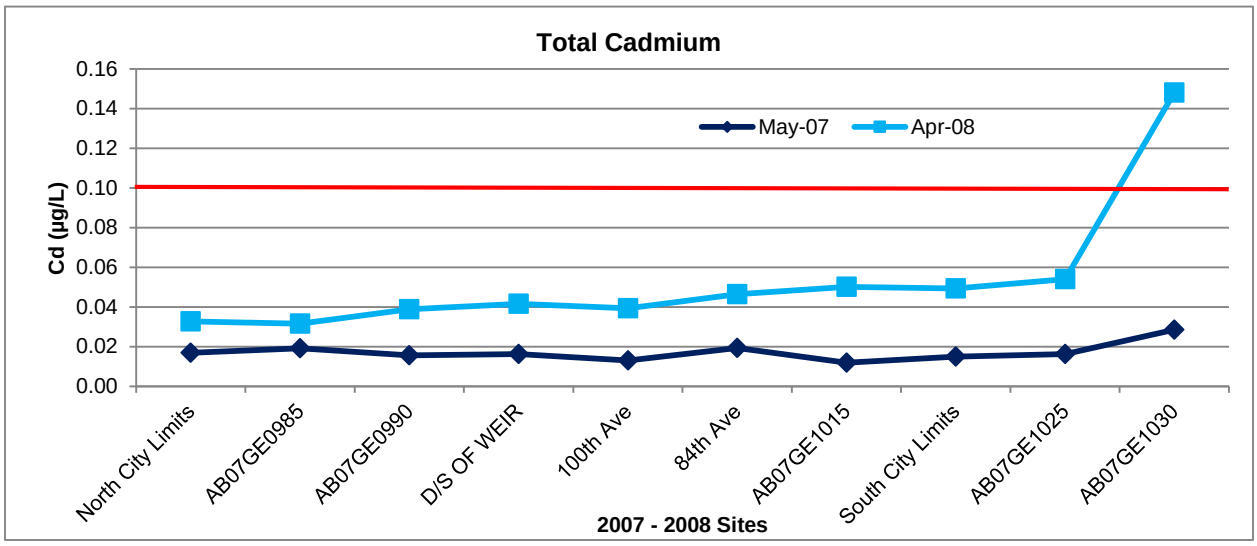


Figure 28. Total Cadmium Concentrations Upstream to Downstream Bear Creek in 2007/2008



4.10 Pesticides

Most of the pesticides included in the analytical package were below detection limits in all samples (Table 8). Some pesticides were detected, however, and can be divided into two general types: those that originated from upstream sources and those that originated from in-City sources.

The large agricultural watershed upstream of Bear Creek was a source of several pesticides (4-chloro-2-methylphenol, bentazon, clopyralid, azinphos methyl (guthion), imazamox, MCPA, methomyl, picloram, quizalofop, and triallate) in either April or June or both. Concentrations of 4-chloro-2-methylphenol, clopyralid, MCPA, methomyl, picloram and triallate were detected at the North City Limits and remained elevated through the City. Concentrations of bentazon, Azinphos methyl (guthion), and quizalofop were above detection limits at the North City Limits and were reduced to below detection throughout the City. Several of these pesticides were detected in the 1999-2006 sampling program in Grande Prairie Creek as well, for example 2,4-D, MCPA, picloram, and triallate (Lorenz et al. 2008).

The sourthern section of the City appeared to be the source of several pesticides, where 2,4-D, was detected at South City Limits in October and April and Aspen Ridge in August, April and June. Fluroxypyr was detected at the South City Limits and Aspen Ridge in April, MCPP was detected at the South City Limits in October and Quinclorac was detected at Aspen Ridge in June. 2,4-D was also detected in October and April and at 100th Avenue and 84th Avenue. The only pesticide with guidelines is 2, 4-D (4 µg/L) and all concentrations detected in Bear Creek were well below this guideline.

As a result of these patterns, the Southern City Limits and Aspen Ridge sites had the largest total number of pesticide detections (Table 8). The southern section of the City thus appeared to be the source of pesticides, however, the agricultural watershed of Flyingshot Lake and its outflow, which enters Bear Creek upstream of the site, could be a confounding influence.

Table 8. Detection Counts of Pesticides Upstream to Downstream Bear Creek.

Pesticides	North City Limits	100th Ave	84th Ave	South City Limits	Aspen Ridge
2,4-D	0	1	1	2	3
Dichlorprop (2,4-DP)	1	1	1	1	1
4-Chloro-2-Methylphenol	1	1	1	1	1
Endosulfan I	1	1	1	1	1
Azinphos methyl (Guthion)	2	2	2	2	2
Bentazon	3	2	2	1	1
Clopyralid	2	2	2	2	2
Desisopropyl atrazine	2	2	2	2	2
Desisopropyl atrazine	1	1	1	1	1
Dichlorprop (2,4-DP)	3	3	3	3	3
Dimethoate	0	0	1	0	0
Endosulfan I	3	3	3	3	3
Fluroxypyr	0	0	0	2	1
Azinphos methyl (Guthion)	2	1	1	2	1
Hexaconazole	0	1	0	0	1
Imazamox	1	1	1	0	1
Imazethapyr	1	0	0	0	1
MCPA	2	2	2	3	2
MCPP	0	0	0	1	0
Methomyl	1	1	1	1	1
Picloram	1	1	1	1	1
Quinclorac	0	0	0	0	1
Quizalofop	1	0	0	0	0
Simazine	0	0	0	0	1
Triallate	2	1	2	2	2
Total	30	27	28	31	33

4.11 Other Organic Contaminants

The majority of analyzed organics were below the detection limit. Several extractable priority pollutants (Polynuclear Aromatic Hydrocarbons (PAH): acenaphthylene, benzo (a) anthracene, benzo (b) fluoranthene, benzo (g,h,i) perylene, chrysene, dibenz (a,h) anthracene, fluorene, indeno (1,2,3-cd) pyrene, naphthalene, and phenanthrene) were detected at low concentrations (between 0.003 µg/L and 0.03 µg/L) in August ALS laboratories had completed the organic analysis in August, but were unable to analyze the entire suite of organics. In October AITF was contracted to complete the organic analysis. Due to the change in laboratories the detection limit of these organics changed from between 0.0026µg/L and 0.011 µg/L with ALS to 0.1 µg/L and 0.8 µg/L with AITF. The detection limits used by AITF can be used with confidence as this is the lab AEP uses for their monitoring program.

In October and April two volatile organic compounds (VOCs) were above the detection limit; chloroform (all sites in October and North City Limits in April) and p-isopropyltoluene (North City Limits, 84th Avenue, and Aspen Ridge in October and South City Limits in April). Chloroform concentrations were below the guideline. No guideline exists for p-isopropyltoluene but concentrations were below 5 µg/L. The location of these detections varied with sampling date. Toluene was also detected in at the South City Limits and Aspen Ridge in April.

Over the course of sampling program six (1,2-diphenylhydrazine, benzidine, bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, and di-n-octyl phthalate) extractable priority pollutants were above the detection limits (Table 9). Most detections occurred in June while di-n-butyl phthalate, and di-n-octyl phthalate were detected in October. Bis(2-ethylhexyl) phthalate was detected in October, April and June. Of the six priority pollutants detected only one has a guideline (Di-n-butyl phthalate: 19 µg/L), which was not exceeded.

The highest total number of organic pollutant detections were observed at the South City Limits (52) and Aspen Ridge (51). Least numbers of detections (43) were observed at the North City Limits site and 84th Ave, with 100th Ave with intermediate numbers of detection (48). There appears to be a general increasing trend of detections within the City, with the largest increase between the 84th Ave and South City Limits sites. The Clairmont Lagoon was not discharging during sampling so this cannot be a source of organics, but Flyingshot Lake and its outflow could be a confounding factor.

Table 9. Volatile and Extractable Priority Pollutant Detections in Bear Creek.

Volatile Priority Pollutants	North City Limits	100th Ave	84th Ave	South City Limits	Aspen Ridge
2-Chloroethyl Vinyl Ether	1	1	1	1	1
Chloroform	2	2	1	1	1
Naphthalene	1	1	1	1	1
p-Isopropyltoluene	1	1	1	2	2
Toluene	0	0	0	1	1
Xylenes (total)	3	3	3	3	3

Volatile Priority Pollutants	North City Limits	100th Ave	84th Ave	South City Limits	Aspen Ridge
Priority Pollutants					
1,2-Diphenylhydrazine	0	0	0	1	0
2,3,4,6-Tetrachlorophenol	1	1	1	1	1
2,4,6-Trichlorophenol	1	1	1	1	1
2,4-Dichlorophenol	1	1	1	1	1
2,4-Dimethylphenol	1	1	1	1	1
2,4-Dinitrophenol	1	1	1	1	1
2-Chlorophenol	1	1	1	1	1
2-Methyl-4,6-dinitrophenol	1	1	1	1	1
2-Nitrophenol	1	1	1	1	1
4-Chlorophenyl phenyl ether	1	1	1	1	1
4-Nitrophenol	1	1	1	1	1
Acenaphthylene	1	1	0	1	1
Benzidine	1	0	1	1	1
Benzo (a) anthracene	1	1	1	1	1
Benzo (a) pyrene	0	1	0	1	1
Benzo (b) fluoranthene	0	0	0	1	2
Benzo (g,h,i) perylene	1	1	1	1	1
Benzo (k) fluoranthene	0	0	0	0	1
Bis(2-ethylhexyl) phthalate	1	3	2	3	2
Butyl benzyl phthalate	1	1	1	1	1
Chrysene	0	1	1	1	0
Dibenz (a,h) anthracene	1	0	1	1	1
Di-n-butyl phthalate	0	1	1	0	0
Di-n-octyl phthalate	0	1	0	1	2
Fluoranthene	0	1	0	1	0
Fluoranthene-d10	4	4	4	4	4
Fluorene	1	1	0	0	0
Fluorene-d10	4	4	4	4	4
Indeno (1,2,3-cd) pyrene	1	1	1	2	2
Naphthalene	1	1	1	1	1
Pentachlorophenol	1	1	1	1	1
Phenanthrene	1	1	1	1	1
Phenol	1	1	1	1	1
Terphenyl-d14	4	4	4	4	4
Total	43	48	43	52	51

5. Summary

The Bear Creek Water Quality study has produced seasonal data on stream discharge and physical, chemical and biological water quality characteristics in Bear Creek from upstream of the City of Grande Prairie to downstream of the City.

Almost one complete year of open-water stream discharge data were produced using a level logger, regular discharge measurements and extrapolation of discharge using the continuous level data. Stream discharge started at over 2 m^3/s in August 2014, declined throughout the fall to levels around 0.4 m^3/s. The first spring discharge estimate was almost at 8 m^3/s, but April and May discharge data are associated with some uncertainty, given that these flows were extrapolated beyond the highest point on the rating curve.

Bear Creek was characterized as an alkaline, nutrient rich and moderately productive stream. Water quality varied seasonally and spatially in Bear Creek and some of the spatial patterns observed in spring 2015 and summer 2014 were also observed in historical data collected in April 2008 and May 2007, providing confidence that they are representative. Key influences on seasonal and spatial water quality patterns were flow levels and the related relative contribution of groundwater, seasonally varying upstream water quality and sources of various substances within the City from stormwater and spring runoff (Table 10).

Table 10. Major Water Quality Patterns in Bear Creek

Description of Pattern	Parameters Affected	Nature of Pattern
Highest in Spring Upstream of City	TP, SRP, NH_3+NH_4, NO_3+NO_2, Chloride, Pesticides	Seasonal
Increase from Upstream to Downstream of City during Spring runoff	TSS, Turbidity, TP, TKN, Total Metals, Chloride	Spatial and Seasonal
Increase Upstream to Downstream	Pesticides and Organic Priority Pollutants	Spatial
Increase from Upstream to Downstream following a rain event in fall	TSS, TP, Total Metals, Bacteria, NH_3+NH_4, NO_3+NO_2	Spatial, Event-based
Decrease Upstream to Downstream in August	BOD, TKN, SRP, TDP, TP, Total sulfide	Spatial and Seasonal
Decrease Upstream to Downstream during spring runoff	NO_3, NH_3+NH_4, E. coli, Dissolved Al	Spatial and Seasonal

The largest seasonal variations in upstream water quality were observed in chloride and nutrients, which were highest during spring freshet in April 2008 and 2015.

During spring freshet, the City was a source of sediment and road-salt related pollutants, as indicated by a spatial increase in April 2015, and, to a lesser degree in 2008, when spring runoff was captured at a later stage.

Other increases from upstream to downstream of the City included the frequency of detection of pesticides and other organic priority pollutants. These were spread across the seasons, so could not be assigned a seasonal pattern.

One spatial pattern in a number of stormwater-related pollutants was observed following a rain event in October 2014. No storm event was captured in historical data.

Seasonal decreases in some water quality parameters were observed in April 2015 and August 2014. Organic and nutrient indicators decreased in August 2014, which may either be due to biological uptake by algae and benthic invertebrates in the City reach or dilution by groundwater influence. The reasons for decreases in dissolved nitrogen, *E. coli* and dissolved aluminum are more difficult to ascertain but may include microbial transformations or dilution from snowmelt.

Applicable water quality guidelines were exceeded for a variety of parameters at different times of the year. The most significant occurrences of values not meeting guidelines were temperature and oxygen in summer, which were at potentially stressful levels for fish. Relatively frequent bacteria levels above irrigation guidelines indicated that Bear Creek waters may not be suitable for crop irrigation.

Metals guidelines were exceeded at times of high seasonal sediment loads in the creek, which is a natural occurrence, but levels increased within the City, further enhancing this natural pattern. Total cadmium, silver, lead and zinc exceeded guidelines only in October and April and only at downstream sites, indicating that in-City stormwater and spring runoff influence increases the frequency at which metals guidelines are exceeded in Bear Creek.

6. Data Gaps and Recommendations

The current dataset is limited as it only covers one sampling event per season within the period of one year and is supported only by one historical sampling point later during spring runoff (April 2008) and one representing summer conditions (May 2007). This represents a minimal surveillance level program that serves to scope out areas and problems but not to make any solid technical assessment of water quality or influence of Bear Creek on the Wapiti River.

In order to confirm that the observed patterns are typical for Bear Creek and not due to specific weather and flow patterns encountered in 2014-2015, more data from similar seasons but different years are needed. This is true for both stream discharge and water quality data.

The spatial and temporal extent of the above summarized patterns was not sufficiently constrained. Large changes occurred between 84th Ave and South City Limits, so an additional site, such as the previously sampled site by AEP at 68th Ave, for example, may be useful to identify pollutant sources more precisely. More detail is also warranted between South City Limit and Aspen Ridge in the County of Grande Prairie, to investigate large changes in spring runoff water quality, which could be from newer development in the south-east of the City or from the watershed downstream of the City. In addition, wet and dry weather samples collected from the City of Grande Prairie storm sewer system would be helpful to better characterize stormwater loads to Bear Creek.

A coordinated sampling program of upper watershed and lagoons alongside the within-in City sites, and that also during lagoon discharge periods would help to better characterize year-round loadings from Bear Creek to the Wapiti River. The 2014 sampling program at Bear Lake was useful to characterize the nutrient status, TDS and physical parameters of one upstream water source for summer 2014, and a detailed nutrient dataset from Grande Prairie Creek collected in 1999-2006 provided insight to upstream nutrient loads. These datasets, however, were focused on nutrient-related parameters, so should be complemented by other key parameters, such as stream oxygen and temperature, solids and metals.

The absence of periphyton data from the upstream site prevented us from assessing the effect of the City on epilithic algae communities compared to upstream and the South-City site was not comparable in terms of habitat with the other sites. We recommend reviewing the sites and try to standardize substrate and light exposure for periphyton. In addition, we recommend to survey a larger stretch of Bear Creek upstream of the City to locate suitable substrate for periphyton sampling to better assess biological changes in Bear Creek. The inclusion of additional biological indicators, such benthic invertebrates, eplilithic algae community composition and fish communities would provide a more complete picture of aquatic health changes through this reach of the creek.

Low DO concentrations were observed during daytime in summer. Given the potentially large daily variations in DO, we recommend conducting diurnal DO measurements to evaluate if DO levels decrease during the night, which would provide a more thorough assessment of the effects of nutrient enrichment and temperatures on fish habitat.

Since ice-breakup occurred in early April and the level logger was installed afterwards, a short period of high stream discharge and pollutant loading to the Wapiti River was missed in the flow record. If pollutant load to the Wapiti was to be calculated, the flows for that period would need to be estimated, possibly by

applying the decreasing trend observed in the data after April 2009 backwards to the date of ice-off. In addition, the estimated discharge for April and May 2015 was extrapolated beyond the range of measured discharge captured in the rating curve, adding a source of uncertainty to flows and therefore loads during that critical spring runoff time.

For the detailed design of any future sampling programs, it is recommended to confirm prior to study begin that the selected laboratory is capable to offer the required analyses and achieve desired detection limits on a consistent basis. The parameter suite can be reduced in scope to make it cost effective and allow a larger sampling frequency (e.g., monthly for one year). The focus should be on field parameters, sediments, nutrients, bacteria and possibly metals, but with pesticides and organics sampled less frequently.

Biological parameters are time-consuming to collect, so it is recommended to collect water quality samples only in the least time possible to capture upstream-downstream changes reliably, while biological sampling can be conducted in a separate program. Biological indicators integrate over longer periods of time and therefore do not need to be collected at the same day as water quality samples.

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Appendix A. Water Quality Data Compared to Applicable Guidelines

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Field Parameters													
Water Temp	˚C			17.2	17.3	19.9	18.8	20.8	3.2	2.6	2.6	3.9	2.8
pH		6.5 to 9.0		8.66	8.00	8.46	7.97	8.57	7.31	6.93	7.33	7.29	7.37
Conductivity	µS/cm			210	221	217	223	231	281	352	340	285	363
Dissolved Oxygen	mg/L	6.5, 8.3, 9.5		7.3	10.1	8.3	8.7	11.1	10.4	11.9	11.1	10.7	12.8
Dissolved Oxygen	%			76.5	104.9	91.2	94.2	126	77.7	88.1	82	82.5	94.5
Calculated Parameters													
Hardness, Diss. as CaCO3	mg/L			72	70	68	73	78	87	104	103	90	112
Hardness, Total as CaCO3	mg/L			78	78	75	80	84	94	117	113	102	116
Ion Balance	mg/L			128	116	120	118	108	102	102	100	103	100
Nitrogen, Nitrate+Nitrite as N	mg/L		100**	0.1	0.1	0.2	0.4	0.2	0.1	0.3	0.3	0.5	0.4
Solids, Total Dissolved	mg/L			153	180	168	120	176	149	182	180	145	191
Solids, Total Dissolved	mg/L			110	114	111	117	133	-	-	-	-	-
Total Anions	meq/L			-	-	-	-	-	2.6	3.2	3.2	2.6	3.4
Total Cations	meq/L			-	-	-	-	-	2.87	3.61	3.48	2.93	3.51
Misc. Inorganics													
BOD, 5-day	mg/L			10	9	8	8	7	7	7	7	7	4
Chlorophyll-a	ug/L			22	26	43	16	13	16.7	17.7	21.8	7.9	19.9
Chromium, Hexavalent	mg/L	0.001	0.001	0.002	<0.001	<0.001	0.002	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Colour, True	CU			30	40	30	30	50	25	30	25	30	30
Conductivity (EC)	uS/cm			215	224	223	229	239	268	333	324	271	343
pH	pH units	6.5 - 9.0		8.77	7.86	8.53	8.01	8.62	7.22	7.18	7.26	6.96	7.63
Silica, Reactive (as SiO2)	mg/L			12	12	11	11	12	7	7	6	6	5
Solids, Total Suspended	mg/L			88	52	44	24	72	38	138	134	304	58
Turbidity	NTU	Narrative		77	51	56	70	69	46	125	115	539	97
Anions													
Alkalinity, Total as CaCO3	mg/L	20		62	70	65	68	83	83	92	96	71	105
Bicarbonate (HCO3)	mg/L			76	86	79	83	111	102	112	117	87	128
Carbonate (CO3)	mg/L			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Field Parameters													
Water Temp	˚C			-1.68	-0.87	-1.08	-1.16	-0.76	15.95	16.25	15.64	16.68	15.34
pH		6.5 to 9.0		6.57	7.09	6.83	6.4	6.06	7.52	7.19	7.28	7.89	7.85
Conductivity	µS/cm			189	231	234	257	341	259	269	269	278	295
Dissolved Oxygen	mg/L	6.5, 8.3, 9.5		15.57	16.04	15.56	16.86	16.26	10.16	13.78	9.90	9.86	10.31
Dissolved Oxygen	%			102.7	107.2	102.7	112.9	109.1	101.9	144.0	100.0	101.6	103.1
Calculated Parameters													
Hardness, Diss. as CaCO3	mg/L			49	59.9	62.1	83.1	180	78.3	80	80.8	86.5	90.9
Hardness, Total as CaCO3	mg/L			45.3	53.4	56	74.3	243	78	85.7	82.6	89.4	102
Ion Balance	mg/L			106	109	109	112	206	106	105	106	111	106
Nitrogen, Nitrate+Nitrite as N	mg/L		100**	0.6	0.7	0.67	0.5	0.4	0.4	0.5	0.4	0.6	0.5
Solids, Total Dissolved	mg/L			92.5	114	0.7	133	228	130	134	135	140	149
Solids, Total Dissolved	mg/L												
Total Anions	meq/L												
Total Cations	meq/L												
Misc. Inorganics													
BOD, 5-day	mg/L			4	3	4	4	3	3	4	3	4	5
Chlorophyll-a	ug/L			0.7	4	1.6	5.6	6.2	4.1	6.7	5.7	4.4	22.8
Chromium, Hexavalent	mg/L	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Colour, True	CU			70	80	100	80	60	37	38	38	44	39
Conductivity (EC)	uS/cm			170	210	212	240	315	235	245	245	250	265
pH	pH units	6.5 - 9.0		6.87	6.93	7.04	7.15	7.58	7.4	7.43	7.51	7.58	7.65
Silica, Reactive (as SiO2)	mg/L			4.5	4.5	4.4	4.5	4.6	0.98	1.35	1.06	1.02	<0.21
Solids, Total Suspended	mg/L			70	42	60	274	954	26	19	14	28	67
Turbidity	NTU	Narrative		83.4	82.4	92.3	155	822	21.8	17.9	16.2	24	49.3
Anions													
Alkalinity, Total as CaCO3	mg/L	20		44	48	49	59	77	77	78	78	79	86
Bicarbonate (HCO3)	mg/L			53	58	59	72	94	94	95	95	96	104
Carbonate (CO3)	mg/L			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Chloride	mg/L	120	120	5	5.8	5.8	6.2	6.7	5.6	16.9	14.8	20.4	16.3
Cyanide, total	mg/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluoride	mg/L	1*	0.12	0.1	0.1	0.1	0.1	0.1	0.1	<0.1	0.1	<0.1	0.1
Hydroxide (OH)	mg/L			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sulfate	mg/L			18.2	17.3	17.9	19	18.8	37.1	40.4	39.4	25.8	38.8
Sulfide, total	mg/L			0.04	0.05	0.02	0.01	0.02	0.03	0.03	0.02	0.02	0.03
Nutrients													
Carbon, Dissolved Organic	mg/L			11.3	12.4	12	17.8	17.3	16.6	17.1	16.6	10.1	15.7
Carbon, Total Organic	mg/L			11.6	12.4	15.2	18	19	17.2	17.5	16.8	13.6	16.3
Nitrogen, Ammonia as N, Total	mg/L	Site Specific	Site Specific	0.06	0.11	0.14	0.08	0.06	0.11	0.41	0.34	0.56	0.44
Nitrogen, Nitrate as N	mg/L	3		0.08	0.12	0.2	0.4	0.25	0.13	0.28	0.33	0.4	0.45
Nitrogen, Nitrite as N	mg/L	0.2	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	<0.05
Nitrogen, Total Kjeldahl	mg/L			1.7	2.1	1.1	1.1	0.5	1	1.9	1.8	1.5	1.5
Phosphorus, Dissolved Reactive[1]	mg/L			0.32	0.34	0.16	0.18	0.12	0.08	0.07	0.07	0.11	0.07
Phosphorus, Total as P	mg/L	Narrative		0.68	0.72	0.6	0.45	0.52	0.29	0.38	0.37	0.48	0.26
Phosphorus, Total Dissolved	mg/L	Narrative		0.53	0.61	0.52	0.31	0.16	0.16	0.18	0.15	0.16	0.12
Microbiological Parameters													
Fecal Coliforms (Q-Tray)[1]	MPN/100 mL	100***	100*	53.1	59.1	42.9	144	130	82	120	82	> 200.5	22.2
E. coli (Q-Tray)[1]	MPN/100 mL		1000*	45.3	56	38.4	130	130	82	120	82	> 200.5	42.9
Total Metals													
Aluminum, total	ug/L	100****	100	477	257	242	384	87	404	1230	1170	4080	824
Antimony, total	ug/L			0.17	0.16	0.17	0.16	0.15	0.10	0.19	0.18	0.56	0.20
Arsenic, total	ug/L	5	5	3.6	3.78	3.84	3.66	3.53	1.25	1.97	1.99	4.06	1.89
Barium, total	ug/L			58	54	46	52	52	84	113	111	167	108
Beryllium, total	ug/L	100*	100*	0.05	0.03	0.03	0.04	0.03	0.04	0.09	0.09	0.29	0.06
Bismuth, total	ug/L			0.02	0.01	0.01	0.01	<0.01	0.01	0.03	0.03	0.09	0.02
Boron, total	ug/L	1500	1500	59	60	59	60	61	52	56	55	39	54
Cadmium, total	ug/L	0.11	0.09	0.033	0.022	0.022	0.027	0.03	0.024	0.068	0.073	0.211	0.058

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Chloride	mg/L	120	120	16	21.6	21.1	24.9	37.2	5.1	6.3	6.4	7.1	9.3
Cyanide, total	mg/L				<0.010	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	mg/L	1*	0.12	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hydroxide (OH)	mg/L			<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Sulfate	mg/L			10.8	15.3	15.3	16.8	20.7	27.3	28	28	28.5	28.8
Sulfide, total	mg/L			<0.05	<0.05	<0.05	0.1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nutrients													
Carbon, Dissolved Organic	mg/L			11.2	11.2	11	10.4	9.4	11.3	10.3	11.2	10.4	10
Carbon, Total Organic	mg/L			11.4	11.5	11.7	10.6	9.4	12.5	10.6	12	10.7	10.5
Nitrogen, Ammonia as N, Total	mg/L	Site Specific	Site Specific	0.42	0.25	0.24	0.23	0.2	0.09	0.14	0.1	0.08	0.06
Nitrogen, Nitrate as N	mg/L	3		0.62	0.7	0.67	0.47	0.41	0.24	0.31	0.32	0.41	0.36
Nitrogen, Nitrite as N	mg/L	0.2	0.06	<0.05	<0.05	<0.05	<0.05	<0.05	0.11	0.15	0.12	0.13	0.13
Nitrogen, Total Kjeldahl	mg/L			1.9	1.6	1.8	2.1	2.7	1	1.1	1	1.2	1.3
Phosphorus, Dissolved Reactive[1]	mg/L			0.1	0.05	0.05	0.04	0.03	0.04	0.1	0.04	0.09	0.1
Phosphorus, Total as P	mg/L	Narrative		0.36	0.26	0.33	0.46	0.78	0.17	0.21	0.16	0.19	0.2
Phosphorus, Total Dissolved	mg/L	Narrative		0.28	0.11	0.32	0.43	0.76	0.08	0.12	0.08	0.1	0.11
Microbiological Parameters													
Fecal Coliforms (Q-Tray)[1]	MPN/100 mL	100***	100*	130	47.4	42.2	23	9.5	19.2	62.4	16.4	47.8	42.9
E. coli (Q-Tray)[1]	MPN/100 mL		1000*	130	47.4	42.2	23	9.5	7.5	53.1	12.4	32.4	28.8
Total Metals													
Aluminum, total	ug/L	100****	100	3850	4400	4370	7270	14500	452	522	440	733	1460
Antimony, total	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	0.2	<0.1	0.2	0.1	0.1
Arsenic, total	ug/L	5	5	1.78	1.91	2.04	3.58	8.22	1.1	1.6	1.5	1.7	2.3
Barium, total	ug/L			65.9	69.9	77.4	139	343	57	61	58	66	89
Beryllium, total	ug/L	100*	100*	0.16	0.15	0.18	0.31	0.77	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth, total	ug/L			<0.10	<0.10	<0.10	<0.10	0.22	<0.1	<0.1	<0.1	<0.1	<0.1
Boron, total	ug/L	1500	1500	34	35	33	39	42	45	54	46	55	64
Cadmium, total	ug/L	0.11	0.09	0.068	0.05	0.064	0.167	0.558	0.02	0.02	0.01	0.03	0.06

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Calcium, total	ug/L	1000**	1000**	22000	22100	21000	22500	23700	26100	32500	31700	29500	32800
Chromium, total	ug/L			0.9	0.5	0.4	0.7	0.2	0.7	2.3	2.3	9	1.6
Cobalt, total	ug/L	2500	50000*	0.803	0.686	0.641	0.800	0.593	0.643	1.660	1.550	3.910	1.060
Copper, total	ug/L	7	2	1.2	0.8	0.7	1.1	1.8	2.0	5.4	4.9	17.6	3.6
Iron, total	ug/L	300****	300	1550	1150	897	1180	583	1500	3870	3830	9590	2610
Lead, total	ug/L	1.8	1	0.81	0.59	0.50	0.72	0.63	0.72	2.88	2.17	8.80	1.74
Lithium, total	ug/L	2500*	2500*	5.15	5.02	4.93	5.34	5.68	5.62	8.35	8.05	10.20	7.14
Magnesium, total	ug/L			5490	5580	5460	5770	5930	7000	8710	8310	6820	8290
Manganese, total	ug/L	200*	200*	107	103	86	99	104	145	288	285	268	121
Mercury, total	ug/L	0.005	0.026	<0.01	<0.01	<0.01	<0.01	<0.01	-	-	-	-	-
Molybdenum, total	ug/L	73	73	0.97	0.92	0.94	0.99	0.91	0.87	1.00	0.89	1.76	0.95
Nickel, total	ug/L	36	71.29	3.62	3.12	2.93	3.42	2.74	3.66	6.23	5.89	13.00	5.06
Phosphorus, total	ug/L			500	500	430	390	260	200	300	300	340	180
Potassium, total	ug/L			8680	8740	8620	8530	8410	9400	9600	9540	5610	8780
Selenium, total	ug/L	1	1	0.2	0.2	0.1	0.2	<0.1	0.3	0.5	0.4	1.0	0.4
Silicon, total	ug/L			6200	5800	5700	5900	5100	4000	5000	4700	8100	3300
Silver, total	ug/L	0.1	0.1	0.02	0.01	0.02	0.01	<0.01	<0.01	0.03	0.03	0.18	0.02
Sodium, total	ug/L			14500	14800	14700	14800	15200	17100	23000	21700	16400	21400
Strontium, total	ug/L			103	105	101	104	108	134	157	154	135	152
Sulfur, total	ug/L			5500	5300	5700	5700	5100	12000	13000	13000	8100	12000
Tellurium, total	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Thallium, total	ug/L	0.8	0.8	0.011	0.006	0.006	0.009	0.006	0.009	0.024	0.027	0.078	0.021
Thorium, total	ug/L			0.10	0.07	0.05	0.07	0.03	0.09	0.19	0.17	0.96	0.14
Tin, total	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	0.08	0.31	0.06
Titanium, total	ug/L			8.4	5.1	4.6	7.5	1.3	6	16.8	16.4	36.4	11.5
Uranium, total	ug/L	15	15	0.275	0.264	0.267	0.318	0.303	0.195	0.448	0.390	0.705	0.455
Vanadium, total	ug/L	100*	100*	3.7	3.0	3.1	3.3	2.7	2.1	4.7	4.5	14.8	3.4
Zinc, total	ug/L	30	30	5	4	3	5	4	7	26	25	118	15
Zirconium, total	ug/L			0.56	0.47	0.42	0.47	0.27	0.33	1.40	0.69	2.30	0.51

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Calcium, total	ug/L	1000**	1000**	12100	15000	15600	20700	44700	21000	23100	22300	24000	27500
Chromium, total	ug/L			5	6.3	5.9	10.1	22.1	0.8	0.9	0.9	1.1	2.3
Cobalt, total	ug/L	2500	50000*	1.36	1.38	1.49	3.62	10.3	0.41	0.46	0.4	0.64	1.15
Copper, total	ug/L	7	2	3.9	4	4.7	10	**29.3**	2.5	3	2.5	3.4	4.8
Iron, total	ug/L	300****	300	3350	3500	4080	8020	21700	970	1240	1100	1570	2750
Lead, total	ug/L	1.8	1	1.5	1.64	2	4.87	13.8	0.5	0.6	0.5	0.8	1.6
Lithium, total	ug/L	2500*	2500*	5.93	6.66	6.8	10.2	20.1	4.3	4.8	4.6	5.3	6.4
Magnesium, total	ug/L			4540	5440	5600	7660	16700	6170	6780	6530	7130	8020
Manganese, total	ug/L	200*	200*	113	105	118	196	542	44.9	76	69.6	79.8	106
Mercury, total	ug/L	0.005	0.026						3010	2950	2490	3390	4640
Molybdenum, total	ug/L	73	73	0.53	0.6	0.7	0.85	1.03	0.8	0.8	0.8	0.9	1.1
Nickel, total	ug/L	36	71.29	5.28	5.46	6.12	11.4	30.6	3.3	3.3	3.2	3.8	5.5
Phosphorus, total	ug/L			330	340	330	450	960	120	230	160	210	250
Potassium, total	ug/L			7990	8200	8280	8940	10200	8340	8550	8000	8430	8550
Selenium, total	ug/L	1	1	<1.0	<1.0	1.4	1.5	3.3	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon, total	ug/L			12000	13000	13000	19000	34000	1600	1900	1700	2100	3600
Silver, total	ug/L	0.1	0.1	<0.10	<0.10	<0.10	<0.10	0.16	<0.5	<0.5	<0.5	<0.5	<0.5
Sodium, total	ug/L			15300	20400	20400	21600	30000	14200	15700	15400	16000	17100
Strontium, total	ug/L			57.4	69	71	87.2	176	103	120	110	121	132
Sulfur, total	ug/L			<5000	5200	<5000	6400	7600	8000	14000	8000	13000	11000
Tellurium, total	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	<0.2	<0.2	<0.2	<0.2	<0.2
Thallium, total	ug/L	0.8	0.8	0.05	0.055	0.058	0.114	0.241	<0.02	<0.02	<0.02	<0.02	0.04
Thorium, total	ug/L			0.39	0.5	0.58	1	2.76	<0.1	<0.1	<0.1	0.1	0.2
Tin, total	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	<0.2	<0.2	<0.2	<0.2	<0.2
Titanium, total	ug/L			136	123	137	223	254	9	10	8	17	54
Uranium, total	ug/L	15	15	0.238	0.319	0.321	0.658	1.62	0.21	0.25	0.23	0.32	0.43
Vanadium, total	ug/L	100*	100*	8.2	10.2	10.4	18	37.2	2	2	2	3	5
Zinc, total	ug/L	30	30	19	21	23	44	103	5	6	5	8	14
Zirconium, total	ug/L			3.1	8.2	3.9	5.8	6.2	0.4	0.5	0.3	0.6	1.2

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Dissolved Metals													
Aluminum, dissolved	ug/L	100		23	28	11	11	54	34	121	152	785	71
Antimony, dissolved	ug/L			0.12	0.13	0.13	0.2	0.17	0.08	0.14	0.13	0.47	0.16
Arsenic, dissolved	ug/L			3.22	3.39	3.59	3.31	3.31	0.76	0.94	1.06	1.51	0.97
Barium, dissolved	ug/L			39	39.9	35.6	38.6	40.4	62.3	73.5	77.0	99.4	82.7
Beryllium, dissolved	ug/L			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.03	0.10	0.01
Bismuth, dissolved	ug/L			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Boron, dissolved	ug/L			55	53	48	52	58	47	48	46	31	49
Cadmium, dissolved	ug/L			0.007	0.006	0.009	0.009	0.009	0.008	0.022	0.027	0.085	0.017
Calcium, dissolved	ug/L			20400	19400	18600	20000	21900	24100	28900	28800	26500	31700
Chromium, dissolved	ug/L			<0.1	<0.1	0.1	<0.1	0.1	<0.1	0.3	0.3	2.0	0.2
Cobalt, dissolved	ug/L			0.357	0.407	0.427	0.404	0.416	0.212	0.459	0.548	1.200	0.298
Copper, dissolved	ug/L			1	1.8	1.3	1.1	1.4	1.1	2.2	2.4	7.8	1.8
Iron, dissolved	ug/L	300		241	259	214	190	202	341	891	1130	2240	529
Lead, dissolved	ug/L			0.17	0.15	0.14	0.16	0.17	0.18	0.60	0.77	3.59	0.46
Lithium, dissolved	ug/L			4.83	4.57	4.57	4.90	5.21	5.00	6.26	6.00	5.62	5.91
Magnesium, dissolved	ug/L			5130	5230	5220	5500	5710	6450	7800	7500	5700	8040
Manganese, dissolved	ug/L			14	11	13	8	9	47	90	114	95	34
Molybdenum, dissolved	ug/L			0.89	0.88	0.9	0.94	1.00	0.75	0.85	0.81	1.48	0.88
Nickel, dissolved	ug/L			2.1	2.7	2.9	2.3	2.3	2.4	3.1	3.2	5.0	2.9
Phosphorus, dissolved	ug/L			294	295	272	247	206	99	109	126	137	69
Potassium, dissolved	ug/L			8500	8510	8450	8480	8430	8900	8850	9000	5090	8810
Selenium, dissolved	ug/L			0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.5	0.2
Silicon, dissolved	ug/L			5530	5650	5520	5450	5290	3150	2870	2860	2350	2090
Silver, dissolved	ug/L			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Sodium, dissolved	ug/L			14000	14400	14400	14700	15000	16000	21500	20500	16400	21200
Strontium, dissolved	ug/L			100	102	99	102	104	120	141	139	122	145
Sulfur, dissolved	ug/L			5570	4960	5600	5740	5470	11400	12200	12000	7940	11900
Tellurium, dissolved	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Dissolved Metals													
Aluminum, dissolved	ug/L	100		1100	1770	1520	907	5080	53	130	47	83	130
Antimony, dissolved	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	0.2	0.4	0.2	0.1	0.2
Arsenic, dissolved	ug/L			1.08	1.15	1.17	1.36	3.6	0.9	1.1	1.1	1.2	1.2
Barium, dissolved	ug/L			48.8	55.9	61.4	97.7	342	48	46	48	50	54
Beryllium, dissolved	ug/L			0.15	0.15	0.15	0.24	0.83	<0.1	<0.1	<0.1	<0.1	<0.1
Bismuth, dissolved	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Boron, dissolved	ug/L			34	30	31	33	37	45	43	45	46	46
Cadmium, dissolved	ug/L			0.058	0.064	0.048	0.139	0.553	0.02	0.01	0.05	0.02	0.03
Calcium, dissolved	ug/L			11800	13600	14600	19500	67900	20800	21500	21800	22800	24200
Chromium, dissolved	ug/L			1.4	2.2	1.9	1.3	7.1	<0.5	<0.5	<0.5	<0.5	<0.5
Cobalt, dissolved	ug/L			0.794	0.799	0.933	1.94	10.3	0.18	0.24	0.22	0.18	0.19
Copper, dissolved	ug/L			2.8	3.2	3.5	5.8	26	2.2	2.1	2.3	2.7	2.6
Iron, dissolved	ug/L	300		1260	1470	1430	2030	10200	78	238	109	148	318
Lead, dissolved	ug/L			0.96	1.04	1.34	2.93	13.8	<0.1	0.1	<0.1	<0.1	<0.1
Lithium, dissolved	ug/L			4.03	4.45	4.42	4.67	12.1	3.9	4	4.3	4.4	4.5
Magnesium, dissolved	ug/L			3830	4750	4730	6220	16000	6370	6390	6440	7160	7400
Manganese, dissolved	ug/L			94.8	91.8	100	162	570	23.2	48.6	40.7	21.3	6.3
Molybdenum, dissolved	ug/L			0.29	0.45	0.38	0.22	0.25	0.8	0.8	0.9	0.9	0.9
Nickel, dissolved	ug/L			3.79	3.79	4.11	6	24.3	2.8	2.6	2.6	2.6	2.6
Phosphorus, dissolved	ug/L			239	251	217	319	850	90	100	70	120	100
Potassium, dissolved	ug/L			6500	7200	6730	6900	7500	8180	7980	8120	8470	8260
Selenium, dissolved	ug/L			<1.0	1.2	<1.0	1.4	2.4	<0.5	<0.5	<0.5	<0.5	<0.5
Silicon, dissolved	ug/L			4440	6500	5470	3410	12400	600	900	800	900	700
Silver, dissolved	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.05	<0.05	<0.05	<0.05	<0.05
Sodium, dissolved	ug/L			14200	19500	18800	20500	28100	14400	14900	15200	16100	16900
Strontium, dissolved	ug/L			51	65.5	65.1	78.7	160	105	106	109	115	118
Sulfur, dissolved	ug/L			<5000	6810	<5000	<5000	6410	9000	8000	8000	9000	8000
Tellurium, dissolved	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	<0.2	<0.2	<0.2	<0.2	<0.2

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Thallium, dissolved	ug/L			<0.004	<0.004	<0.004	<0.004	0.006	<0.004	0.004	0.006	0.015	0.006
Thorium, dissolved	ug/L			0.03	0.02	0.02	0.02	0.03	0.04	0.06	0.06	0.10	0.03
Tin, dissolved	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.08	<0.05
Titanium, dissolved	ug/L			0.7	1.8	0.4	0.4	3.8	0.8	2.7	3.2	13.3	1.5
Uranium, dissolved	ug/L			0.235	0.219	0.239	0.269	0.320	0.138	0.301	0.265	0.396	0.372
Vanadium, dissolved	ug/L			2.8	2.4	2.6	2.4	2.5	0.5	1.0	1.2	3.3	0.8
Zinc, dissolved	ug/L			3	4	3	2	2	1	7	8	53	4
Zirconium, dissolved	ug/L			0.14	0.25	0.13	0.13	0.37	0.10	0.33	0.40	1.32	0.22
Polychlorinated Biphenyls													
PCB-1016	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1221	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1232	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1242	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1248	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1254	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1260	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total PCBs	ug/L	0.001	0.001	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Volatile Priority Pollutants													
1,1,1,2-Tetrachloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,1-Trichloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2-Trichloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,1-Dichloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,1-Dichloroethene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.3	<0.3	<0.3	<0.3	<0.3
1,1-Dichloropropene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,2,3-Trichlorobenzene	ug/L	8	8	<1.0	<1.0	<1.0	<1.0	<1.0	<0.4	<0.4	<0.4	<0.4	<0.4
1,2,3-Trichloropropane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2
1,2,4-Trichlorobenzene	ug/L	24	24	<1.0	<1.0	<1.0	<1.0	<1.0	<0.3	<0.3	<0.3	<0.3	<0.3
1,2,4-Trimethylbenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Thallium, dissolved	ug/L			<0.040	<0.040	<0.040	<0.040	0.09	<0.02	<0.02	<0.02	<0.02	<0.02
Thorium, dissolved	ug/L			0.22	0.27	0.32	0.23	0.82	<0.1	<0.1	<0.1	<0.1	<0.1
Tin, dissolved	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	<0.2	<0.2	<0.2	<0.2	<0.2
Titanium, dissolved	ug/L			43.1	66.1	42.5	8.1	118	<0.5	<0.5	<0.5	<0.5	<0.5
Uranium, dissolved	ug/L			0.19	0.233	0.261	0.459	1.67	0.19	0.22	0.2	0.26	0.31
Vanadium, dissolved	ug/L			3.2	4.7	4.7	3.6	20.4	<1	<1	<1	<1	<1
Zinc, dissolved	ug/L			11	13	15	24	83	<4	<4	<4	<4	<4
Zirconium, dissolved	ug/L			1.79	3.08	2.88	1.61	3.74	0.2	0.3	0.2	0.3	0.3
Polychlorinated Biphenyls													
PCB-1016	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1221	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1232	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1242	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1248	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1254	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
PCB-1260	ug/L			<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Total PCBs	ug/L	0.001	0.001	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Volatile Priority Pollutants													
1,1,1,2-Tetrachloroethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
1,1,1-Trichloroethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,2,2-Tetrachloroethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
1,1,2-Trichloroethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.06	<0.06	<0.06	<0.06	<0.06
1,1-Dichloroethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.07	<0.07	<0.07	<0.07	<0.07
1,1-Dichloroethene	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2
1,1-Dichloropropene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.06	<0.06	<0.06	<0.06	<0.06
1,2,3-Trichlorobenzene	ug/L	8	8	<0.4	<0.4	<0.4	<0.4	<0.4	<0.05	<0.05	<0.05	<0.05	<0.05
1,2,3-Trichloropropane	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,2,4-Trichlorobenzene	ug/L	24	24	<0.3	<0.3	<0.3	<0.3	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2
1,2,4-Trimethylbenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
1,2-Dibromo-3-chloropropane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.2	<0.2	<0.2	<0.2	<0.2
1,2-Dibromoethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichlorobenzene	ug/L	0.7	0.7	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichloroethane	ug/L	100	100	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Dichloropropane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,3,5-Trimethylbenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichlorobenzene	ug/L	150	150	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,3-Dichloropropane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
1,4-Dichlorobenzene	ug/L	26	26	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
2,2-Dichloropropane	ug/L			<2.0	<2.0	<2.0	<2.0	<2.0	<0.2	<0.2	<0.2	<0.2	<0.2
2-Chloroethyl Vinyl Ether	ug/L			-	-	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3
2-Chlorotoluene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorotoluene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	ug/L	40	370	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1
Bromobenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Bromodichloromethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Bromoform	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Bromomethane	ug/L			<2.0	<2.0	<2.0	<2.0	<2.0	<0.3	<0.3	<0.3	<0.3	<0.3
Carbon tetrachloride	ug/L	13.3	13.3	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorobenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Chloroethane	ug/L			<2.0	<2.0	<2.0	<2.0	<2.0	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroform	ug/L	1.8	1.8	<1.0	<1.0	<1.0	<1.0	<1.0	0.4	0.5	0.5	0.5	0.4
Chloromethane	ug/L			<2.0	<2.0	<2.0	<2.0	<2.0	<0.1	<0.1	<0.1	<0.1	<0.1
cis-1,2-Dichloroethene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
cis-1,3-Dichloropropene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.3	<0.3	<0.3	<0.3	<0.3
Dibromochloromethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Dibromomethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Ethylbenzene	ug/L	90	90	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	ug/L	1.3	1.3	<2.0	<2.0	<2.0	<2.0	<2.0	<0.2	<0.2	<0.2	<0.2	<0.2

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
1,2-Dibromo-3-chloropropane	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.8	<0.8	<0.8	<0.8	<0.8
1,2-Dibromoethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichlorobenzene	ug/L	0.7	0.7	<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
1,2-Dichloroethane	ug/L	100	100	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
1,2-Dichloropropane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
1,3,5-Trimethylbenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
1,3-Dichlorobenzene	ug/L	150	150	<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
1,3-Dichloropropane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04
1,4-Dichlorobenzene	ug/L	26	26	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
2,2-Dichloropropane	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloroethyl Vinyl Ether	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.5	<0.05	<0.05	<0.05	<0.05
2-Chlorotoluene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
4-Chlorotoluene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Benzene	ug/L	40	370	<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Bromobenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.1	<0.1	<0.1	<0.1
Bromodichloromethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bromoform	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.06	<0.06	<0.06	<0.06	<0.06
Bromomethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon tetrachloride	ug/L	13.3	13.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
Chlorobenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
Chloroethane	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chloroform	ug/L	1.8	1.8	0.2	<0.1	<0.1	<0.1	<0.1	<0.05	0.1	<0.05	<0.05	<0.05
Chloromethane	ug/L			<0.1	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
cis-1,2-Dichloroethene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
cis-1,3-Dichloropropene	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.03	<0.3	<0.3	<0.3	<0.3
Dibromochloromethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.04	<0.04	<0.04	<0.04	<0.04
Dibromomethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03	<0.03
Ethylbenzene	ug/L	90	90	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02
Hexachlorobutadiene	ug/L	1.3	1.3	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Isopropylbenzene (Cumene)	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
m,p-Xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Methyl tert-butyl ether	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Methylene chloride	ug/L	98.1	50**	<3.0	<3.0	<3.0	<3.0	<3.0	<0.4	<0.4	<0.4	<0.4	<0.4
Naphthalene	ug/L	1		-	-	-	-	-	<0.3	<0.3	<0.3	<0.3	<0.3
n-Butylbenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
n-Propylbenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
o-Xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
p-Isopropyltoluene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	3.6	<0.1	2.3	<0.1	4.5
sec-Butylbenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Styrene	ug/L	72	72	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
tert-Butylbenzene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Tetrachloroethene	ug/L	110	110	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Toluene	ug/L	0.5	2	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
trans-1,2-Dichloroethene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,3-Dichloropropene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Trichloroethene	ug/L	21	21	<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Trichlorofluoromethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0	<0.1	<0.1	<0.1	<0.1	<0.1
Vinyl chloride	ug/L			<2.0	<2.0	<2.0	<2.0	<2.0	<0.2	<0.2	<0.2	<0.2	<0.2
Xylenes (total)	ug/L	30		<2.0	<2.0	<2.0	<2.0	<2.0	-	-	-	-	-
Misc. Organics													
Phenolics, Total	mg/L			<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Trihalomethanes	mg/L			<0.004	<0.004	<0.004	<0.004	<0.004	-	-	-	-	-
Priority Pollutants													
1,2,4-Trichlorobenzene	ug/L	24	24	<0.36	<0.36	<0.36	<0.36	<0.36	<0.1	<0.1	<0.1	<0.1	<0.1
1,2-Diphenylhydrazine	ug/L			<0.51	<0.51	<0.51	<0.51	<0.51	<0.1	<0.1	<0.1	<0.1	<0.1
2,3,4,6-Tetrachlorophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dichlorophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Isopropylbenzene (Cumene)	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
m,p-Xylene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
Methyl tert-butyl ether	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Methylene chloride	ug/L	98.1	50**	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Naphthalene	ug/L	1		<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
n-Butylbenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
n-Propylbenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02
o-Xylene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02
p-Isopropyltoluene	ug/L			<0.1	<0.1	<0.1	0.6	<0.1	<0.3	0.8	<0.3	0.5	0.6
sec-Butylbenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3
Styrene	ug/L	72	72	<0.1	<0.1	<0.1	<0.1	<0.1	<0.02	<0.02	<0.02	<0.02	<0.02
tert-Butylbenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.3	<0.3	<0.3	<0.3	<0.3
Tetrachloroethene	ug/L	110	110	<0.1	<0.1	<0.1	<0.1	<0.1	<0.06	<0.06	<0.06	<0.06	<0.06
Toluene	ug/L	0.5	2	<0.1	<0.1	<0.1	0.3	0.2	<0.3	<0.3	<0.3	<0.3	<0.3
trans-1,2-Dichloroethene	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.2	<0.2	<0.2	<0.2	<0.2
trans-1,3-Dichloropropene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.05	<0.05	<0.05	<0.05	<0.05
Trichloroethene	ug/L	21	21	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
Trichlorofluoromethane	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2	<0.2
Vinyl chloride	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.06	<0.06	<0.06	<0.06	<0.06
Xylenes (total)	ug/L	30											
Misc. Organics													
Phenolics, Total	mg/L			<0.002	0.002	0.002	<0.002	0.003	<0.002	<0.002	0.003	0.002	<0.002
Total Trihalomethanes	mg/L												
Priority Pollutants													
1,2,4-Trichlorobenzene	ug/L	24	24	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
1,2-Diphenylhydrazine	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1
2,3,4,6-Tetrachlorophenol	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
2,4,6-Trichlorophenol	ug/L			<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
2,4-Dichlorophenol	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
2,4-Dimethylphenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
2,4-Dinitrotoluene	ug/L			<0.27	<0.27	<0.27	<0.27	<0.27	<0.1	<0.1	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	ug/L			<0.35	<0.35	<0.35	<0.35	<0.35	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chloronaphthalene	ug/L			<0.29	<0.29	<0.29	<0.29	<0.29	<0.1	<0.1	<0.1	<0.1	<0.1
2-Chlorophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
2-Methyl-4,6-dinitrophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
2-Nitrophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
4-Bromophenyl phenyl ether	ug/L			<0.27	<0.27	<0.27	<0.27	<0.27	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	ug/L			<0.28	<0.28	<0.28	<0.28	<0.28	<0.1	<0.1	<0.1	<0.1	<0.1
4-Chlorophenyl phenyl ether	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
4-Nitrophenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	ug/L	5.8	5.8	<0.0044	<0.0044	<0.0044	<0.0044	<0.0044	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	ug/L			0.015	0.018	<0.0034	0.012	0.0063	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	ug/L	0.012	0.012	<0.0036	<0.0036	<0.0036	<0.0036	<0.0036	<0.1	<0.1	<0.1	<0.1	<0.1
Benzidine	ug/L			<19	<19	<19	<19	<19	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (a) anthracene	ug/L			0.0038	0.0042	0.0046	0.0044	0.0048	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (a) pyrene	ug/L			<0.0043	<0.0043	<0.0043	<0.0043	<0.0043	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (b) fluoranthene	ug/L			<0.0041	<0.0041	<0.0041	<0.0041	0.0046	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (g,h,i) perylene	ug/L			0.0053	0.003	0.0044	0.0064	0.0049	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (k) fluoranthene	ug/L			<0.0030	<0.0030	<0.0030	<0.0030	0.0032	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroethoxy) methane	ug/L			<0.28	<0.28	<0.28	<0.28	<0.0030	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroethyl) ether	ug/L			<0.33	<0.33	<0.33	<0.33	<0.28	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroisopropyl) ether	ug/L			<0.31	<0.31	<0.31	<0.31	<0.33	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-ethylhexyl) phthalate	ug/L	16	16	<1.9	<1.9	<1.9	<1.9	<0.31	<0.1	0.9	1	2.3	0.8
Butyl benzyl phthalate	ug/L			<0.47	<0.47	<0.47	<0.47	<1.9	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	ug/L			<0.0034	0.0045	ND	ND	<0.47	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenz (a,h) anthracene	ug/L			0.0039	<0.0025	0.0034	0.0043	0.0035	<0.1	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	ug/L			<0.29	<0.29	<0.29	<0.29	<0.29	<0.1	<0.1	<0.1	<0.1	<0.1

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
2,4-Dimethylphenol	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2,4-Dinitrophenol	ug/L			<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
2,4-Dinitrotoluene	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
2,6-Dinitrotoluene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Chloronaphthalene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Chlorophenol	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
2-Methyl-4,6-dinitrophenol	ug/L			<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7
2-Nitrophenol	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
4-Bromophenyl phenyl ether	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
4-Chloro-3-methylphenol	ug/L			<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8	<0.8
4-Chlorophenyl phenyl ether	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
4-Nitrophenol	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	ug/L	5.8	5.8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	ug/L	0.012	0.012	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Benzidine	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	0.8	<0.2	0.8	0.8	0.8
Benzo (a) anthracene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (a) pyrene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	0.1	0.1
Benzo (b) fluoranthene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.3
Benzo (g,h,i) perylene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo (k) fluoranthene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Bis(2-chloroethoxy) methane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Bis(2-chloroethyl) ether	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Bis(2-chloroisopropyl) ether	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Bis(2-ethylhexyl) phthalate	ug/L	16	16	0.7	0.4	0.4	0.6	0.6	<0.3	0.3	<0.3	0.4	<0.3
Butyl benzyl phthalate	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	0.2	0.2	0.2	0.2	0.2
Chrysene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dibenz (a,h) anthracene	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.1	<0.1	<0.1	<0.1
Diethyl phthalate	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Dimethyl phthalate	ug/L			<0.25	<0.25	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1
Di-n-butyl phthalate	ug/L	19	19	<0.65	<0.65	<0.65	<0.65	<0.65	<0.1	0.3	0.1	<0.1	<0.1
Di-n-octyl phthalate	ug/L			<0.63	<0.63	<0.63	<0.63	<0.63	<0.1	<0.1	<0.1	<0.1	0.2
Fluoranthene	ug/L	0.04	0.04	<0.010	0.031	<0.010	0.018	<0.010	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene-d10	PERCENT			87	91	90	94	86	-	-	-	-	-
Fluorene	ug/L	3	3	0.0047	0.0042	<0.0038	<0.0038	<0.0038	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene-d10	PERCENT			82	86	85	84	83	-	-	-	-	-
Hexachlorobenzene (HCB)	ug/L			<0.63	<0.63	<0.63	<0.63	<0.63	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	ug/L			<0.29	<0.29	<0.29	<0.29	<0.29	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	ug/L			<1.2	<1.2	<1.2	<1.2	<1.2	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	ug/L			<0.29	<0.29	<0.29	<0.29	<0.29	<0.1	<0.1	<0.1	<0.1	<0.1
Indeno (1,2,3-cd) pyrene	ug/L			0.0047	0.0034	0.0034	0.0062	0.0052	<0.1	<0.1	<0.1	<0.1	<0.1
Isophorone	ug/L			<0.25	<0.25	<0.25	<0.25	<0.25	<0.1	<0.1	<0.1	<0.1	<0.1
Naphthalene	ug/L	1	1.1	0.018	0.016	0.014	0.015	0.016	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrobenzene	ug/L			<0.57	<0.57	<0.57	<0.57	<0.57	<0.1	<0.1	<0.1	<0.1	<0.1
N-Nitrosodi-n-propylamine	ug/L			<0.50	<0.50	<0.50	<0.50	<0.50	<0.1	<0.1	<0.1	<0.1	<0.1
N-Nitrosodiphenylamine	ug/L			<0.48	<0.48	<0.48	<0.48	<0.48	<0.1	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	ug/L	0.5	0.5	-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	ug/L	0.4	0.4	0.0069	0.0054	0.0067	0.0075	0.011	<0.1	<0.1	<0.1	<0.1	<0.1
Phenol	ug/L			-	-	-	-	-	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	ug/L	0.025	0.025	<0.0053	<0.0053	<0.0053	<0.0053	<0.0053	<0.1	<0.1	<0.1	<0.1	<0.1
Terphenyl-d14	PERCENT			64	71	69	78	71	-	-	-	-	-
Pesticides													
2,4-D	ug/L	4	4	<0.005	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	0.16	<0.005
2,4-DB	ug/L	25		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4-Dichlorophenol	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dichlorprop (2,4-DP)	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	-	-	-	-	-
4-Chloro-2-Methylphenol	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Aldicarb	ug/L	1	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Dimethyl phthalate	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Di-n-butyl phthalate	ug/L	19	19	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.03	<0.03	<0.03	<0.03
Di-n-octyl phthalate	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.5	<0.2	0.5	0.5
Fluoranthene	ug/L	0.04	0.04	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene-d10	PERCENT												
Fluorene	ug/L	3	3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene-d10	PERCENT												
Hexachlorobenzene (HCB)	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorobutadiene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Hexachloroethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Indeno (1,2,3-cd) pyrene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	0.2	0.2
Isophorone	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Naphthalene	ug/L	1	1.1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Nitrobenzene	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.2	<0.2	<0.2	<0.2
N-Nitrosodi-n-propylamine	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
N-Nitrosodiphenylamine	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1	<0.1	<0.1
Pentachlorophenol	ug/L	0.5	0.5	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6
Phenanthrene	ug/L	0.4	0.4	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Phenol	ug/L			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Pyrene	ug/L	0.025	0.025	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Terphenyl-d14	PERCENT												
Pesticides													
2,4-D	ug/L	4	4	<0.005	0.005	0.007	0.008	0.02	<0.005	<0.005	<0.005	<0.005	0.009
2,4-DB	ug/L	25		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
2,4-Dichlorophenol	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.010	<0.010	<0.010	<0.010	<0.010
Dichlorprop (2,4-DP)	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.005	<0.005	<0.005	<0.005	<0.005
4-Chloro-2-Methylphenol	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	0.01	0.01	0.01	0.01	0.01
Aldicarb	ug/L	1	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Aldrin	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
alpha-BHC	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan I	ug/L	0.003	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	-	-	-	-	-
Aminopyralid	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Atrazine	ug/L	1.8	1.8	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Atrazine-desethyl	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.050	<0.050	<0.050	<0.050	<0.050
Azinphos methyl (Guthion)	ug/L	0.01		-	-	-	-	-	<0.20	<0.20	<0.20	<0.20	<0.20
Bentazon	ug/L			-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
Bromacil	ug/L	5	5	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Bromoxynil	ug/L	5	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carboxin	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorothalonil	ug/L	0.18	0.18	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorpyrifos	ug/L	0.002	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Clodinafop acid metabolite	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Clodinafop-propargyl	ug/L			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Clopyralid	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Cyanazine	ug/L	2	2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Desisopropyl atrazine	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Desisopropyl atrazine	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	-	-	-	-	-
Diazinon	ug/L	0.17		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dicamba	ug/L	10	10	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dichlorprop (2,4-DP)	ug/L			-	-	-	-	-	<0.010	<0.010	<0.010	<0.010	<0.010
Diclofop-methyl	ug/L	6.1	6.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dieldrin	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dimethoate	ug/L	6.2	6.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Disulfoton	ug/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Diuron	ug/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Endosulfan I	ug/L			-	-	-	-	-	<0.005	<0.005	<0.005	<0.005	<0.005
Ethalfluralin	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Aldrin	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
alpha-BHC	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Endosulfan I	ug/L	0.003	0.003	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Aminopyralid	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Atrazine	ug/L	1.8	1.8	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Atrazine-desethyl	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Azinphos methyl (Guthion)	ug/L	0.01											
Bentazon	ug/L			0.008	0.008	0.008	<0.005	<0.005	0.027	<0.005	<0.005	<0.005	<0.005
Bromacil	ug/L	5	5	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Bromoxynil	ug/L	5	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Carboxin	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Chlorothalonil	ug/L	0.18	0.18	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Chlorpyrifos	ug/L	0.002	0.02	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Clodinafop acid metabolite	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Clodinafop-propargyl	ug/L			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Clopyralid	ug/L			0.04	0.04	0.03	0.04	0.03	0.05	0.05	0.05	0.05	0.05
Cyanazine	ug/L	2	2	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Desisopropyl atrazine	ug/L												
Desisopropyl atrazine	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Diazinon	ug/L	0.17		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dicamba	ug/L	10	10	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dichlorprop (2,4-DP)	ug/L												
Diclofop-methyl	ug/L	6.1	6.1	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Dieldrin	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Dimethoate	ug/L	6.2	6.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005	<0.005
Disulfoton	ug/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Diuron	ug/L			<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Endosulfan I	ug/L												
Ethalfluralin	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Ethion	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethofumesate	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fenoxaprop-P-ethyl	ug/L			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Fluazifop	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluroxypyr	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
gamma-BHC (Lindane)	ug/L	0.01	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Azinphos methyl (Guthion)	ug/L			<0.20	<0.20	<0.20	<0.20	<0.20	-	-	-	-	-
Hexaconazole	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Imazamethabenz-methyl	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Imazamox	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Imazethapyr	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Iprodione	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Linuron	ug/L	7	7	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Malathion	ug/L	0.1		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
MCPA	ug/L	2.6	2.6	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.015	<0.005
MCPB	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MCPP	ug/L	13		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.059	<0.005
Metalaxyl	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Methomyl	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Metolachlor	ug/L	7.8	7.8	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Metribuzin	ug/L	1	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Napropamide	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Oxycarboxin	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
p,p-Methoxychlor	ug/L	0.03		<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Parathion	ug/L	0.013		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phorate	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Picloram	ug/L	29	29	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Propiconazole (Tilt)	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Pyridaben	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Ethion	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Ethofumesate	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fenoxaprop-P-ethyl	ug/L			<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040	<0.040
Fluazifop	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Fluroxypyr	ug/L			<0.010	<0.010	<0.010	0.01	0.01	<0.010	<0.010	<0.010	0.01	<0.010
gamma-BHC (Lindane)	ug/L	0.01	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Azinphos methyl (Guthion)	ug/L			<0.20	<0.20	<0.20	<0.20	<0.20	0.2	<0.20	<0.20	0.2	<0.20
Hexaconazole	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	0.006
Imazamethabenz-methyl	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Imazamox	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	0.008	0.008	0.008	<0.005	0.008
Imazethapyr	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	0.05	<0.020	<0.020	<0.020	0.05
Iprodione	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Linuron	ug/L	7	7	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Malathion	ug/L	0.1		<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
MCPA	ug/L	2.6	2.6	0.011	0.011	0.012	0.013	0.012	0.015	0.018	0.02	0.019	0.019
MCPB	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
MCPP	ug/L	13		<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Metalaxyl	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Methomyl	ug/L			<0.10	<0.10	<0.10	<0.10	<0.10	0.2	0.2	0.2	0.2	0.2
Metolachlor	ug/L	7.8	7.8	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Metribuzin	ug/L	1	1	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Napropamide	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Oxycarboxin	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
p,p-Methoxychlor	ug/L	0.03		<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Parathion	ug/L	0.013		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Phorate	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Picloram	ug/L	29	29	0.015	0.015	0.014	0.011	0.017	<0.005	<0.005	<0.005	<0.005	<0.005
Propiconazole (Tilt)	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Pyridaben	ug/L			<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	20-Aug-14	20-Aug-14	19-Aug-14	19-Aug-14	18-Aug-14	16-Oct-14	16-Oct-14	16-Oct-14	15-Oct-14	15-Oct-14
	Units												
Quinclorac	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Quizalofop	ug/L			<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Simazine	ug/L	10	10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Terbufos	ug/L			<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Thiamethoxam	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Triallate	ug/L	0.24	0.24	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Triclopyr	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trifluralin	ug/L	0.2	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinclozolin	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

[1]April samples were collected on April 9th because original samples were analyzed past holding times.

*Guideline is for irrigation

**Guideline for livestock

***Units differ between guidelines and those reported by the lab.

****Guideline is for dissolved fraction of metal

Above provincial guidelines

Above federal guidelines

Table A-1. Bear Creek Water Chemistry

Location		Water Quality Guidelines		North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge	North City Limits	100th Ave	84th Ave	South City Limit	Aspen Ridge
Date Sampled		**Provincial**	**Federal**	01-Apr-15	02-Apr-15	02-Apr-15	01-Apr-15	01-Apr-15	18-Jun-15	17-Jun-15	18-Jun-15	17-Jun-15	17-Jun-15
	Units												
Quinclorac	ug/L			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.006
Quizalofop	ug/L			<0.030	<0.030	<0.030	<0.030	<0.030	0.04	<0.030	<0.030	<0.030	<0.030
Simazine	ug/L	10	10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.04
Terbufos	ug/L			<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Thiamethoxam	ug/L			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Triallate	ug/L	0.24	0.24	0.008	0.01	0.008	0.006	0.005	0.006	<0.005	0.006	0.007	0.006
Triclopyr	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Trifluralin	ug/L	0.2	0.2	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Vinclozolin	ug/L			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.002	<0.010	<0.010

[1]April samples were collected on April 9th because original samples were analyzed past holding times.

*Guideline is for irrigation

**Guideline for livestock

***Units differ between guidelines and those reported by the lab.

****Guideline is for dissolved fraction of metal

Above provincial guidelines

Above federal guidelines

Appendix B. Periphyton Data

Table B-1. Raw Periphyton Data - Chlorophyll a

			Epi Chlorophyll - a (ug)			
Date	**Replicate**	**Site**	**100th Ave**	**84th Ave**	**South City Limits**	**Aspen Ridge**
August 2014	1		110.0	110.0	26.1	71.0
	2		111.0	111.0	35.4	52.4
	3		149.0	226.0	21.9	60.9
		Mean	130.0	168.5	28.7	56.7
	Standard Deviation		26.9	81.3	9.5	6.0
October 2014	1		98.8	92.2	26.5	93.2
	2		107.0	110.0	22.7	115.0
	3		94.2	90.6	45.4	80.7
		Mean	100.6	100.3	34.1	97.9
	Standard Deviation		9.1	13.7	16.1	24.3
June 2015	1		44.6	54.3	12.3	11.8
	2		56.7	21.6	7.2	73.0
	3		53.4	27.0	6.2	65.2
		Mean	51.6	34.3	8.6	50.0
	Standard Deviation		6.3	17.5	3.3	33.3

Table B-2. Raw Periphyton Data - Ash Free Dry Weight

			Ash Free Dry Weight (g)			
Date	**Replicate**	**Site**	**100th Ave**	**84th Ave**	**South City Limits**	**Aspen Ridge**
August 2014	1		0.051	0.04	0.03	0.015
	2		0.032	0.042	0.018	0.025
	3		0.067	0.058	0.031	0.024
		Mean	0.050	0.050	0.025	0.025
	Standard Deviation		0.025	0.011	0.009	0.001
October 2014	1		0.101	0.033	0.014	0.02
	2		0.064	0.033	0.012	0.017
	3		0.037	0.045	0.062	0.028
		Mean	0.051	0.039	0.037	0.023
	Standard Deviation		0.019	0.008	0.035	0.008
June 2015	1		0.022	0.006	0.004	0.003
	2		0.014	0.045	0.012	0.025
	3		0.019	0.007	0.003	0.018
		Mean	0.017	0.026	0.008	0.022
	Standard Deviation		0.004	0.027	0.006	0.005

Table B-3. Periphyton Biomass - Chlorophyll a

			Epi Chlorophyll - a (mg/m^2)			
Date	**Replicate**	**Site**	**100th Ave**	**84th Ave**	**South City Limits**	**Aspen Ridge**
August 2014	1		91.7	22.9	5.4	59.2
	2		92.5	23.1	7.4	43.7
	3		124.2	47.1	4.6	50.8
		Mean	108.3	35.1	6.0	47.2
		Standard Deviation	22.4	16.9	2.0	5.0
October 2014	1		82.3	76.8	5.5	77.7
	2		89.2	91.7	4.7	95.8
	3		78.5	75.5	9.5	67.3
		Mean	83.8	83.6	7.1	81.5
		Standard Deviation	7.5	11.4	3.3	20.2
June 2015	1		37.2	45.3	2.6	9.8
	2		47.3	18.0	1.5	60.8
	3		44.5	22.5	1.3	54.3
		Mean	43.0	28.6	1.8	41.7
		Standard Deviation	5.2	14.6	0.7	27.8

Table B-4. Periphyton Biomass - Ash Free Dry Weight

			Ash Free Dry Weight (mg/cm^2)			
Date	**Replicate**	**Site**	**100th Ave**	**84th Ave**	**South City Limits**	**Aspen Ridge**
August 2014	1		43	33	25	13
	2		27	35	15	21
	3		56	48	26	20
		Mean	41	42	20	20
		Standard Deviation	21	9	8	1
October 2014	1		84	28	12	17
	2		53	28	10	14
	3		31	38	52	23
		Mean	42	33	31	19
		Standard Deviation	16	7	29	6
June 2015	1		18	5	3	3
	2		12	38	10	21
	3		16	6	3	15
		Mean	14	22	6	18
		Standard Deviation	3	22	5	4

Appendix C. QA/QC Data

Table C-1. Triplicate and Field Blank Water Chemistry

Location		84th Ave	84th Ave	84th Ave	RSD	Field Blank
Date Sampled		02-Apr-15	02-Apr-15	02-Apr-15	02-Apr-15	15-Oct-14
	Units				(%)	
Calculated Parameters						
Hardness, Total (Diss. as CaCO3)	mg/L	62.1	60.8	61.5	1.1	<5
Hardness, Total (Total as CaCO3)	mg/L	56	52.6	52.5	3.7	<0.1
Ion Balance	mg/L	109	104	104	2.7	<0.001
Solids, Total Dissolved	mg/L	114	112	112	1.0	<2
Misc. Inorganics						
Conductivity (EC)	uS/cm	212	212	211	0.3	<2
pH	pH units	7.04	6.96	6.97	0.6	5.11
Anions						
Alkalinity, Total as CaCO3	mg/L	49	48	48	1.2	<2
Bicarbonate (HCO3)	mg/L	59	59	58	1.0	<2
Carbonate (CO3)	mg/L	<2	<2	<2	0.0	<2
Chloride	mg/L	21.1	21.5	21.6	1.2	<0.5
Fluoride	mg/L	0.1	<0.1	<0.1	0.0	<0.1
Hydroxide (OH)	mg/L	<2	<2	<2	0.0	<2
Sulfate	mg/L	15.3	15.4	15.5	0.6	<0.5
Nutrients						
Nitrogen, Nitrate as N	mg/L	0.67	0.67	0.67	0.0	<0.05
Nitrogen, Nitrite as N	mg/L	<0.05	<0.05	<0.05	0.0	<0.05
Nitrogen, Total Kjeldahl	mg/L	1.8	1.7	1.8	3.3	<0.2
Phosphorus, Dissolved Reactive[1]	mg/L	0.05	0.12	0.12	41.8	<0.004
Phosphorus, Total as P	mg/L	0.33	0.34	0.33	1.7	<0.008
Phosphorus, Total Dissolved	mg/L	0.32	0.3	0.28	6.7	<0.004
Total Metals						
Aluminum, total	ug/L	4370	4570	4530	2.4	<1
Antimony, total	ug/L	<0.50	<0.50	<0.50	0.0	<0.05
Arsenic, total	ug/L	2.04	1.95	2.04	2.6	<0.05
Barium, total	ug/L	77.4	74.9	74.8	1.9	<0.1
Beryllium, total	ug/L	0.18	0.19	0.17	5.6	<0.01
Bismuth, total	ug/L	<0.10	<0.10	<0.10	0.0	<0.01
Boron, total	ug/L	33	33	33	0.0	<1
Cadmium, total	ug/L	0.064	0.072	0.069	5.9	<0.002
Calcium, total	ug/L	15600	15300	15400	1.0	<40
Chromium, total	ug/L	5.9	5.8	6.2	3.5	<0.1
Cobalt, total	ug/L	1.49	1.45	1.57	4.1	<0.005
Copper, total	ug/L	4.7	4.6	4.7	1.2	<0.1
Iron, total	ug/L	4080	3830	3880	3.4	<2
Lead, total	ug/L	2	1.97	2.01	1.0	<0.05
Lithium, total	ug/L	6.8	6.8	6.95	1.3	<0.05
Magnesium, total	ug/L	5600	5500	5570	0.9	<5
Manganese, total	ug/L	118	112	116	2.6	<0.05
Molybdenum, total	ug/L	0.7	0.68	0.92	17.4	<0.01

Table C-1. Triplicate and Field Blank Water Chemistry

Location		84th Ave	84th Ave	84th Ave	RSD	Field Blank
Date Sampled		02-Apr-15	02-Apr-15	02-Apr-15	02-Apr-15	15-Oct-14
	Units				(%)	
Nickel, total	ug/L	6.12	5.8	6.03	2.8	<0.02
Phosphorus, total	ug/L	330	320	350	4.6	<10
Potassium, total	ug/L	8280	8050	8300	1.7	<10
Selenium, total	ug/L	1.4	1.1	1.1	14.4	<0.1
Silicon, total	ug/L	13000	14000	14000	4.2	<50
Silver, total	ug/L	<0.10	<0.10	<0.10	0.0	<0.01
Sodium, total	ug/L	20400	20200	20200	0.6	<10
Strontium, total	ug/L	71	69.8	70.8	0.9	<0.1
Sulfur, total	ug/L	<5000	<5000	<5000	0.0	<500
Tellurium, total	ug/L	<0.50	<0.50	<0.50	0.0	<0.05
Thallium, total	ug/L	0.058	0.053	0.057	4.7	<0.004
Thorium, total	ug/L	0.58	0.53	0.46	11.5	<0.01
Tin, total	ug/L	<0.50	<0.50	<0.50	0.0	<0.05
Titanium, total	ug/L	137	150	161	8.0	<0.2
Uranium, total	ug/L	0.321	0.334	0.325	2.0	<0.001
Vanadium, total	ug/L	10.4	10.2	10.3	1.0	<0.2
Zinc, total	ug/L	23	24	23	2.5	<1
Zirconium, total	ug/L	3.9	4.5	5	12.3	<0.01
Dissolved Metals						
Calcium, dissolved	ug/L	14600	14000	14100	2.3	<2000
Magnesium, dissolved	ug/L	4730	4300	4200	6.4	<100
Potassium, dissolved	ug/L	6730	6300	6500	3.3	<200
Sodium, dissolved	ug/L	18800	18500	18300	1.4	<200

Appendix D. Spatial Water Quality Trends on May 30th, 31st 2007 and April 28th, 29th 2008

Field Parameters

Figure 1. Historical Bear Creek Temperatures.

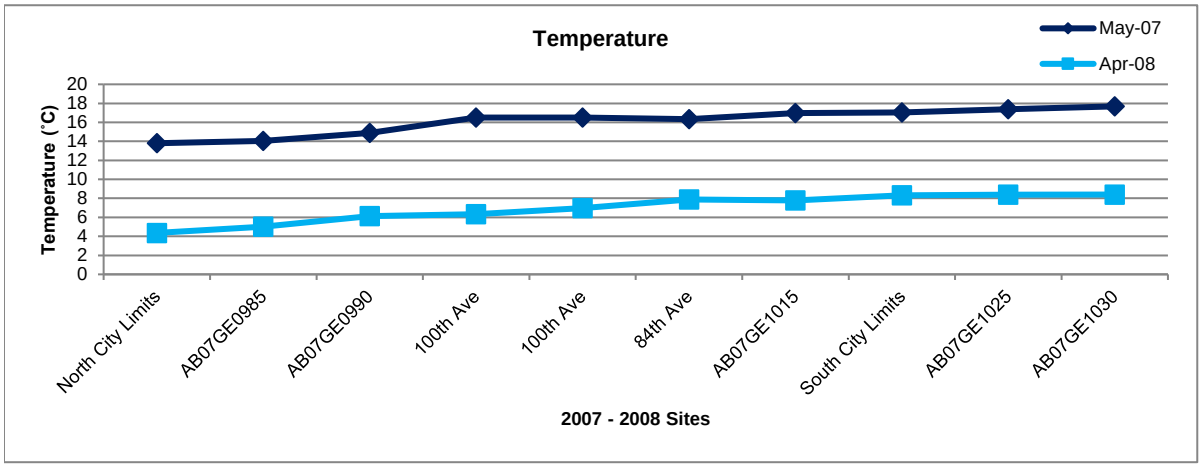


Figure 2. Historical Bear Creek pH.

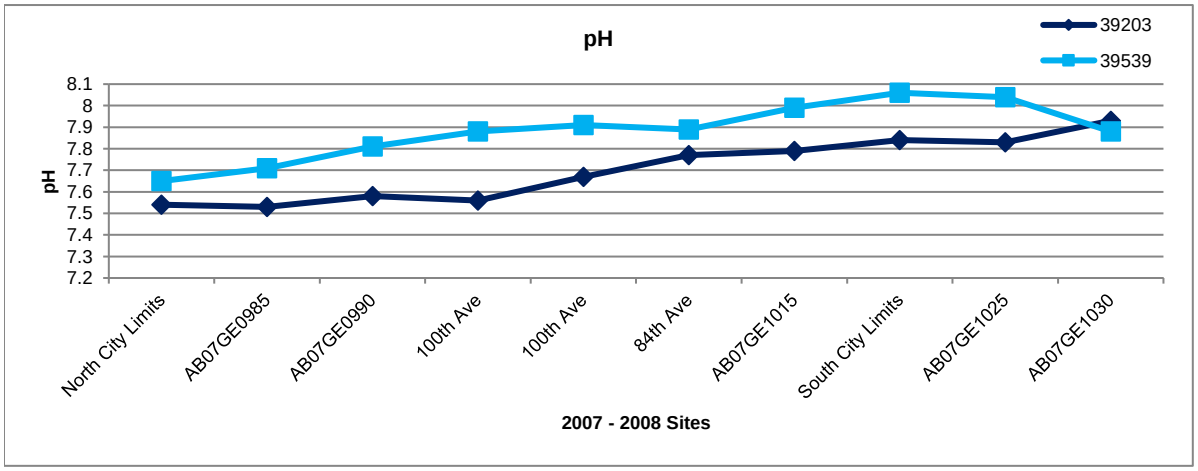
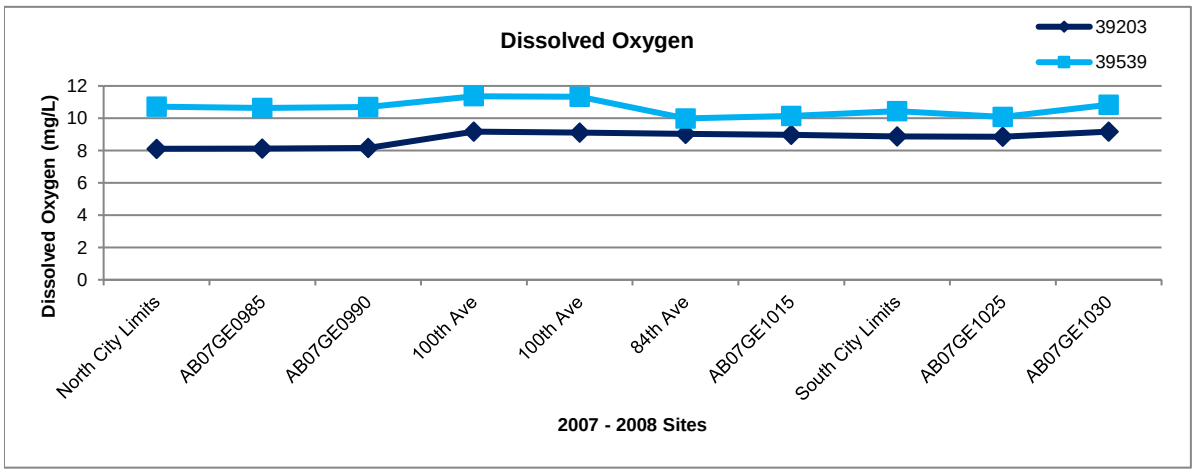


Figure 3. Historical Bear Creek Dissolved Oxygen Concentrations.



Major Ions

Figure 4. Historical Bear Creek Total Dissolved Solids Concentrations.

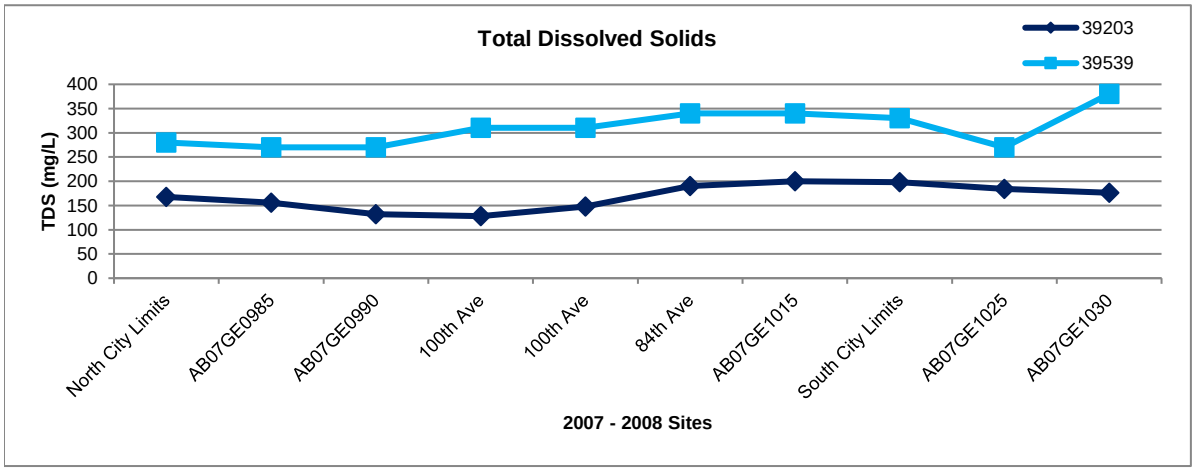
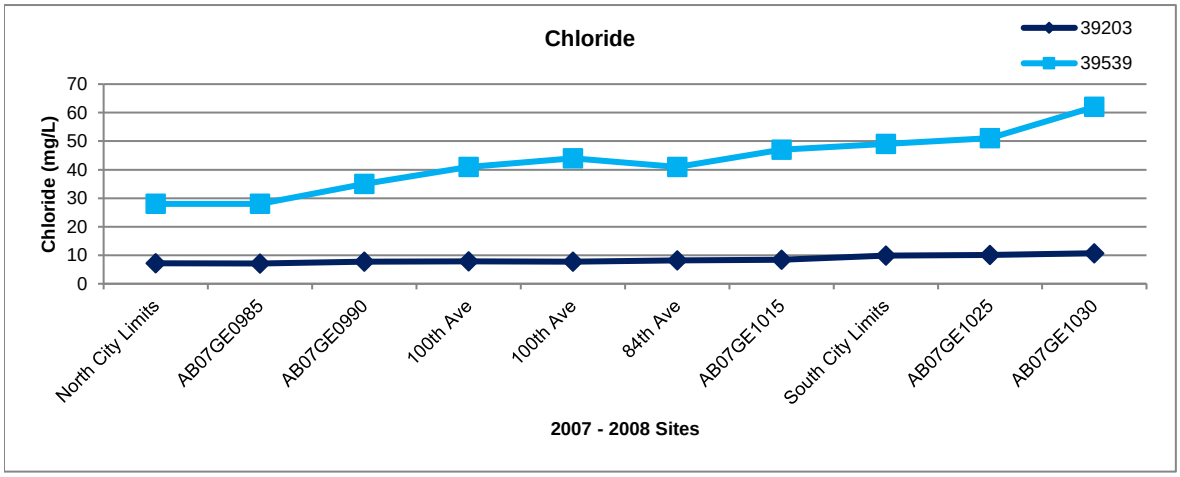


Figure 5. Historical Bear Creek Chloride Concentrations.



Solids and Turbidity

Figure 6. Historical Bear Creek Total Suspended Solids Concentrations.

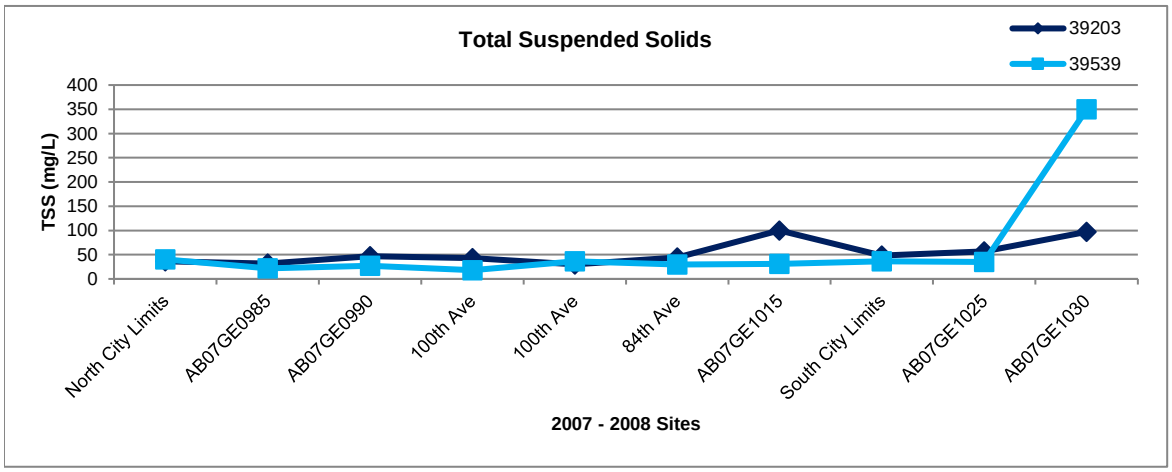
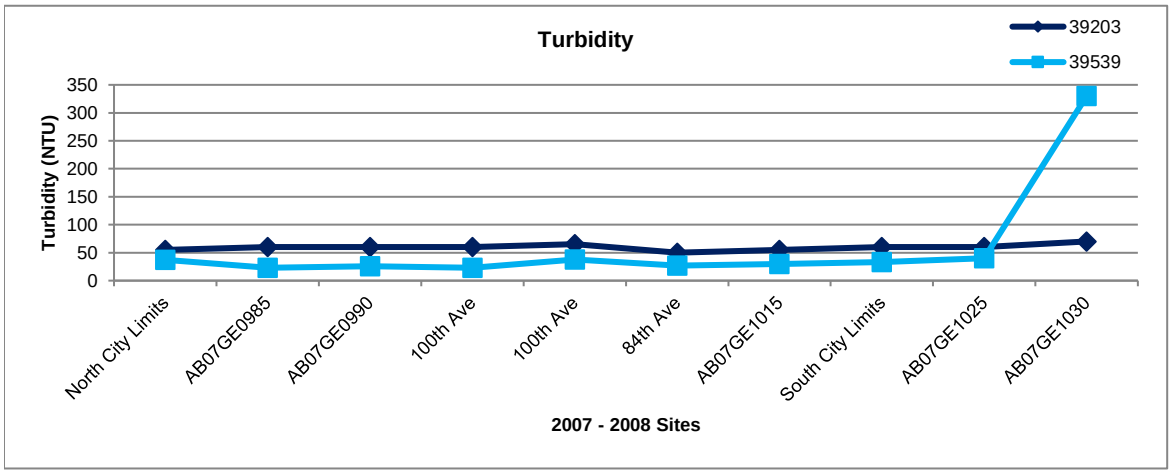


Figure 7. Historical Bear Creek Turbidity Concentrations.



Nutrients

Figure 8. Historical Bear Creek Total Phosphorus Concentrations.

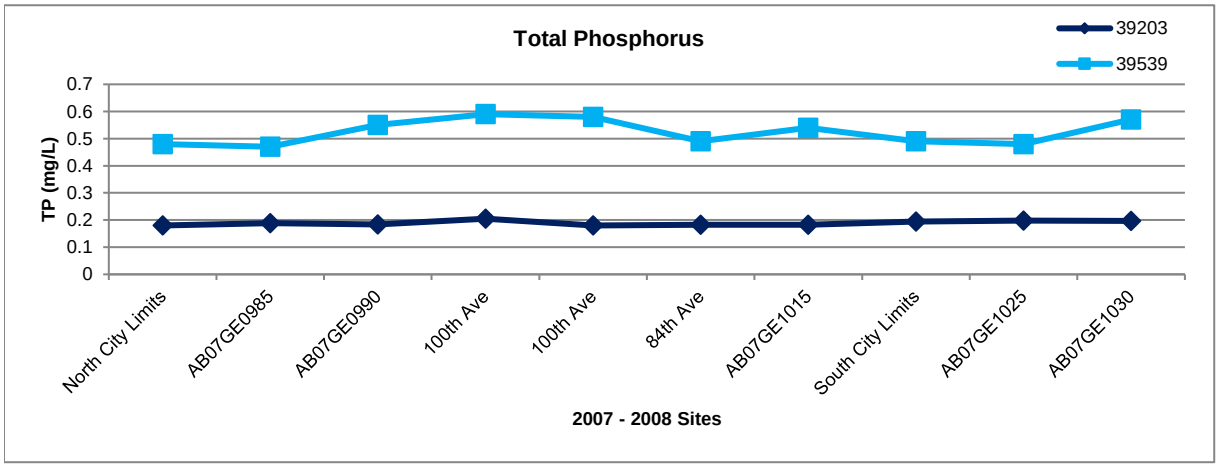


Figure 9. Historical Bear Creek Nitrate-N Concentrations.

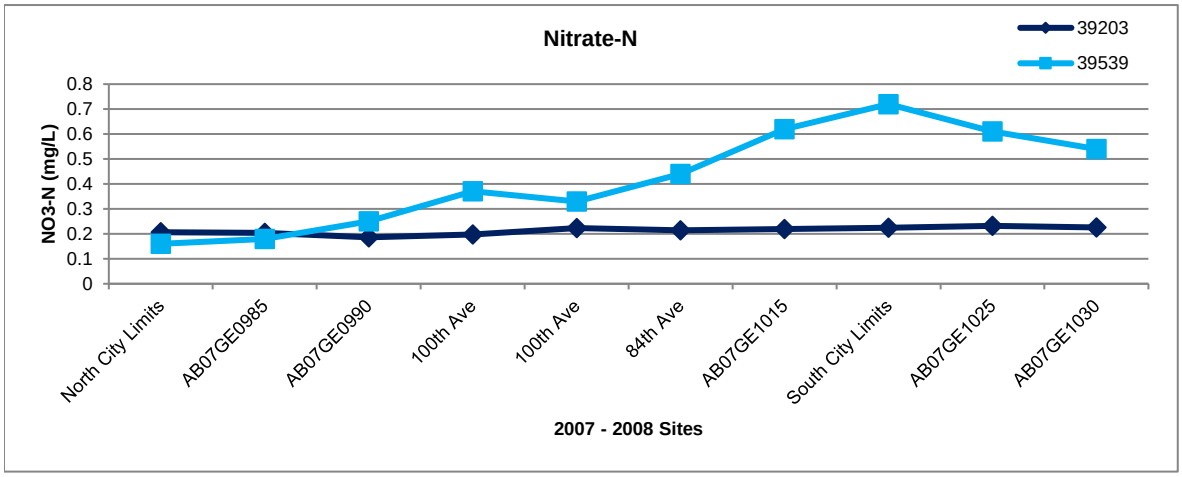
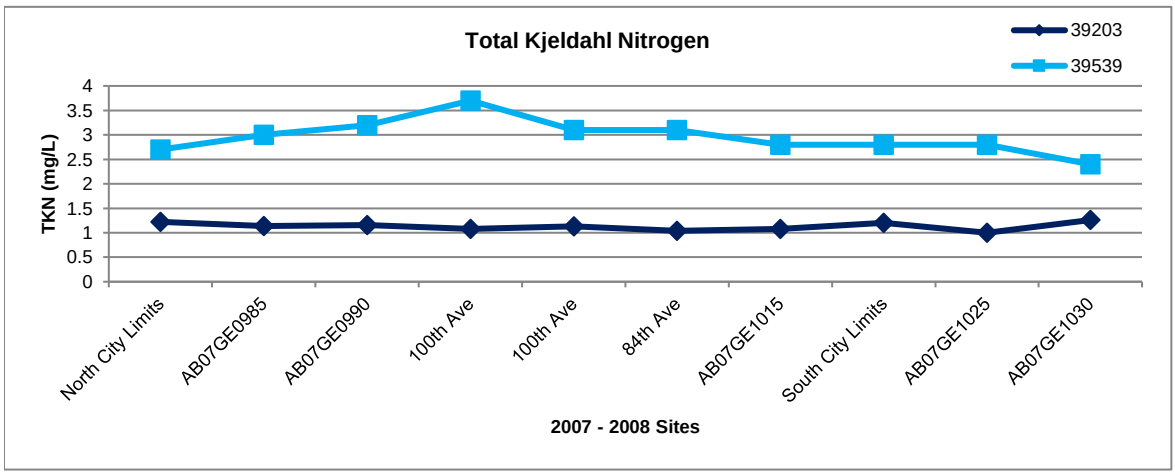
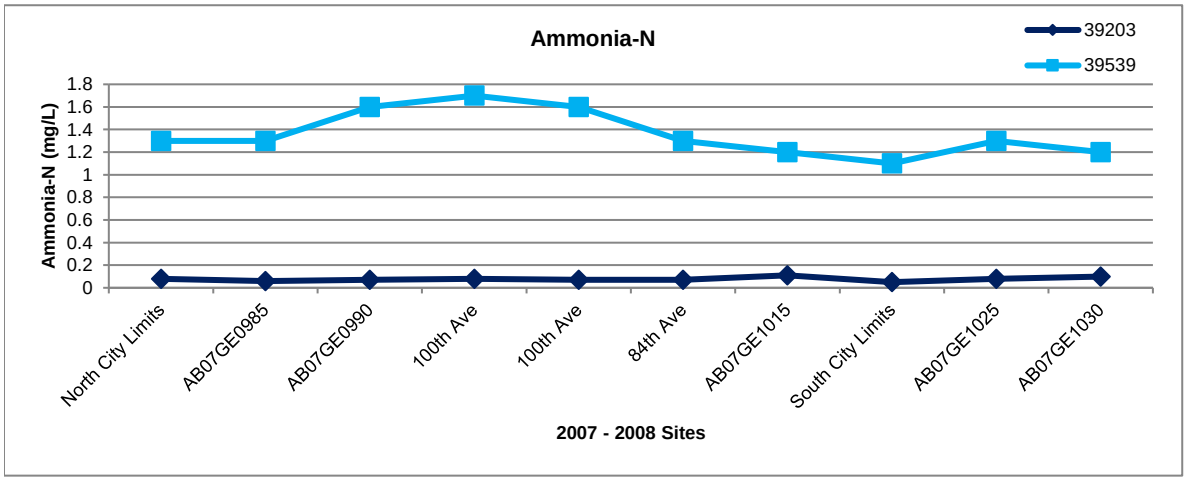


Figure 10. Historical Bear Creek Total Kjeldahl Nitrogen Concentrations.



Nutrients

Figure 11. Historical Bear Creek Ammonia-N Concentrations.



Total Metals

Figure 12. Historical Bear Creek Total Aluminum Concentrations.

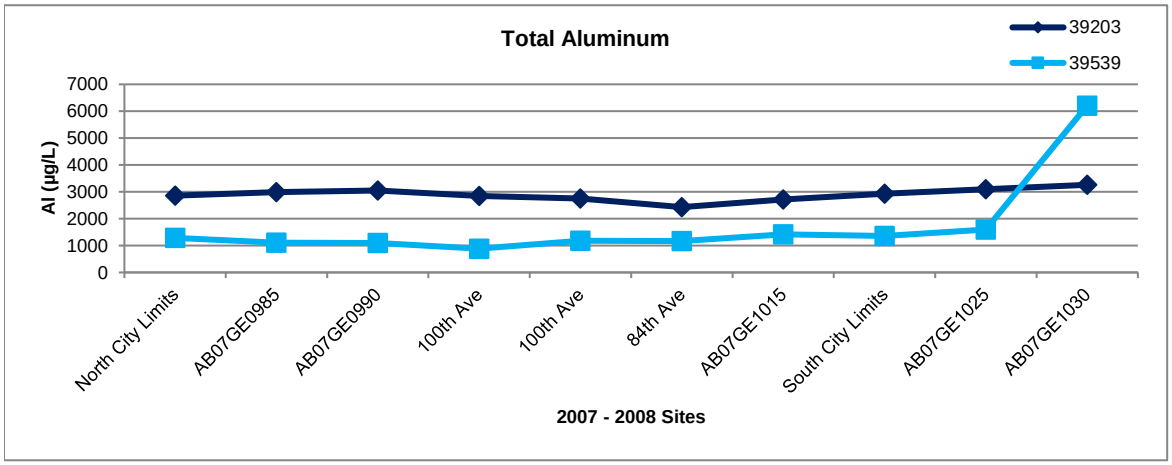


Figure 13. Historical Bear Creek Total Antimony.

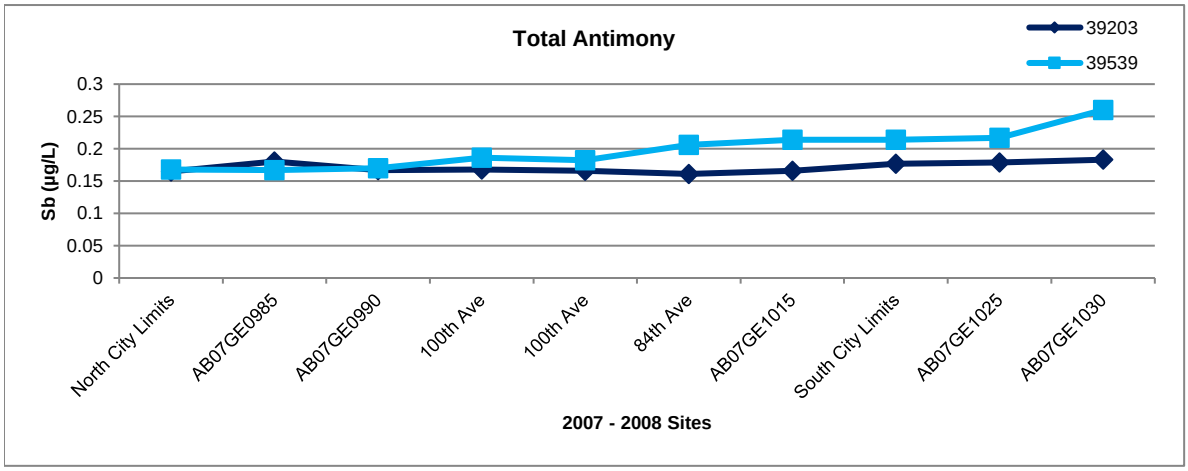
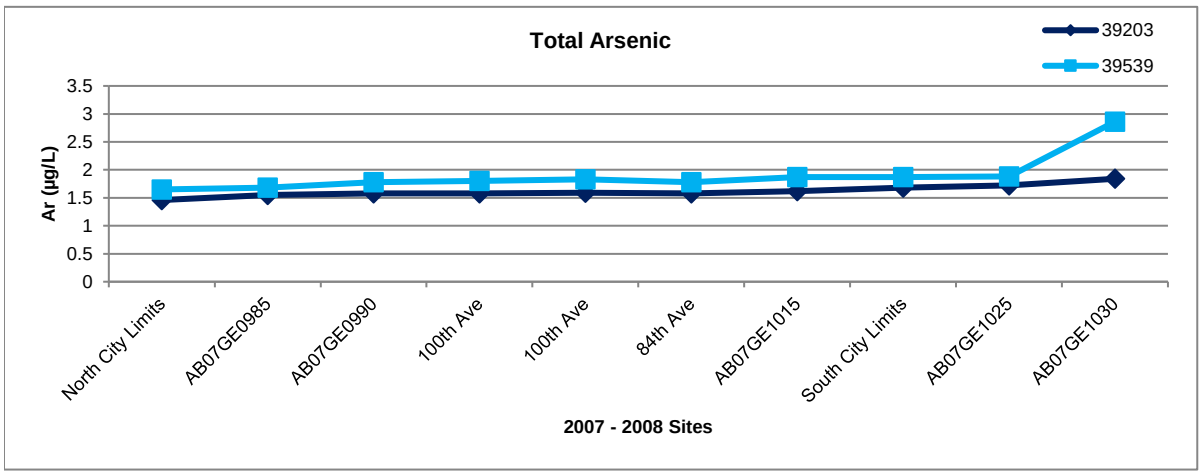


Figure 14. Historical Bear Creek Total Arsenic



Total Metals

Figure 15. Historical Bear Creek Total Barium Concentrations.

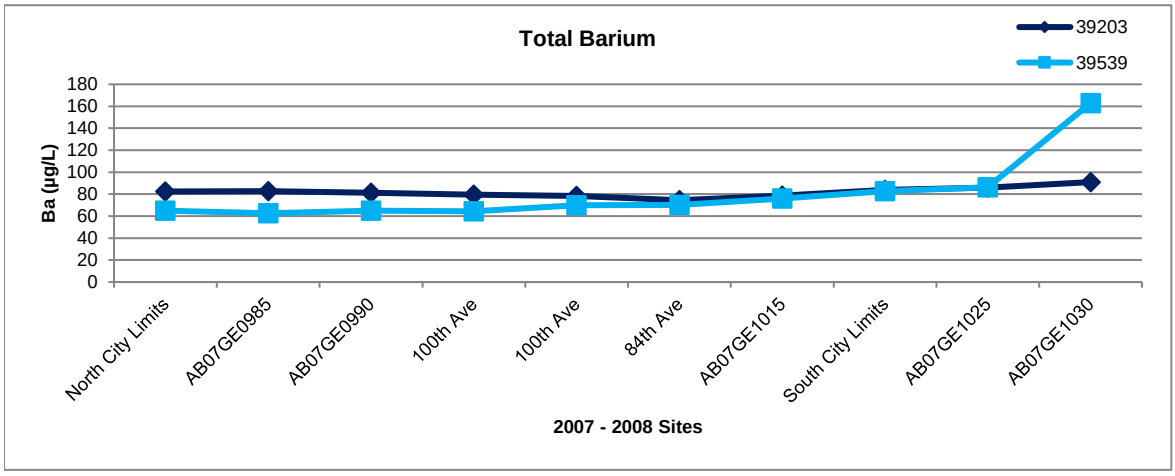


Figure 16. Historical Bear Creek Total Beryllium Concentrations.

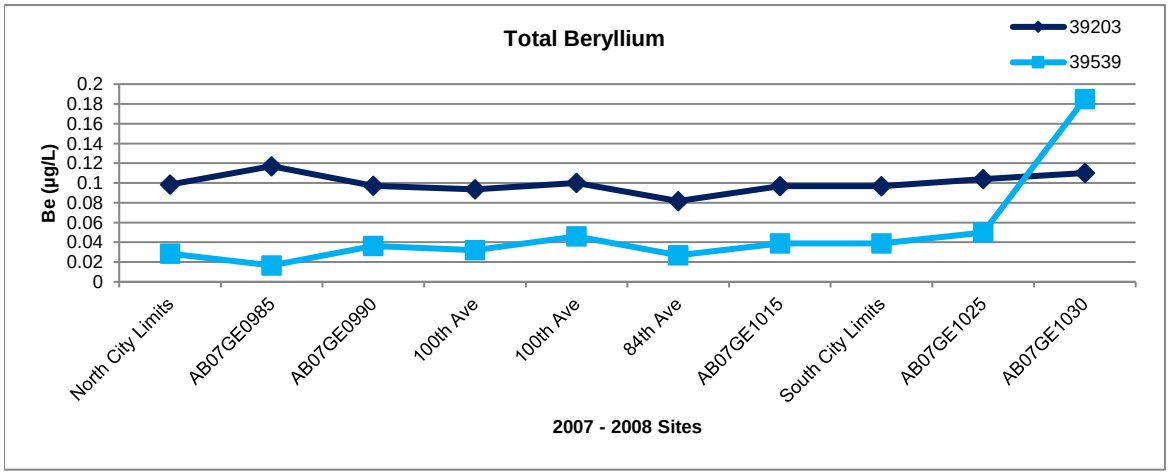
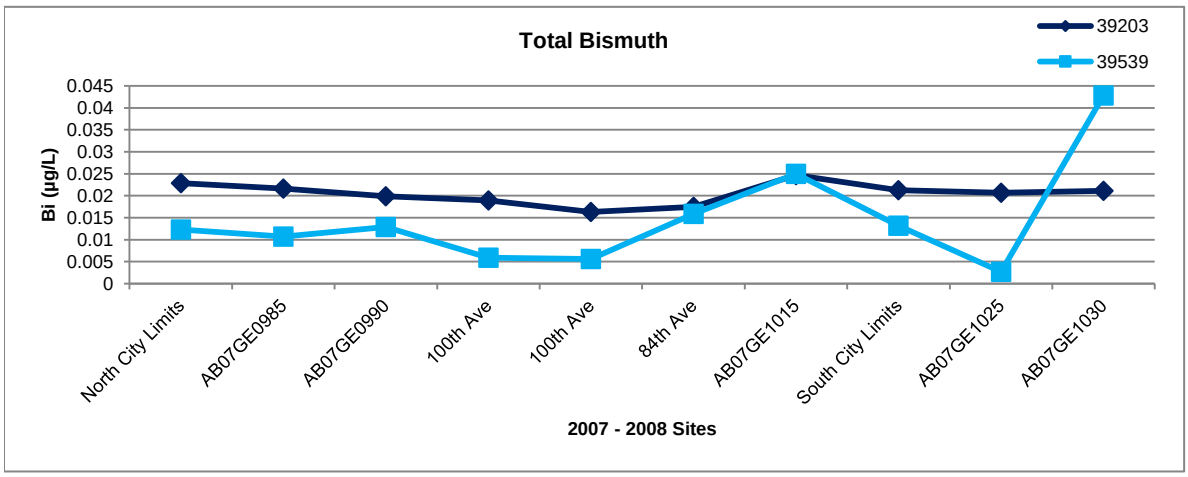


Figure 17. Historical Bear Creek Total Bismuth Concentrations.



Total Metals

Figure 18. Historical Bear Creek Total Boron Concentrations.

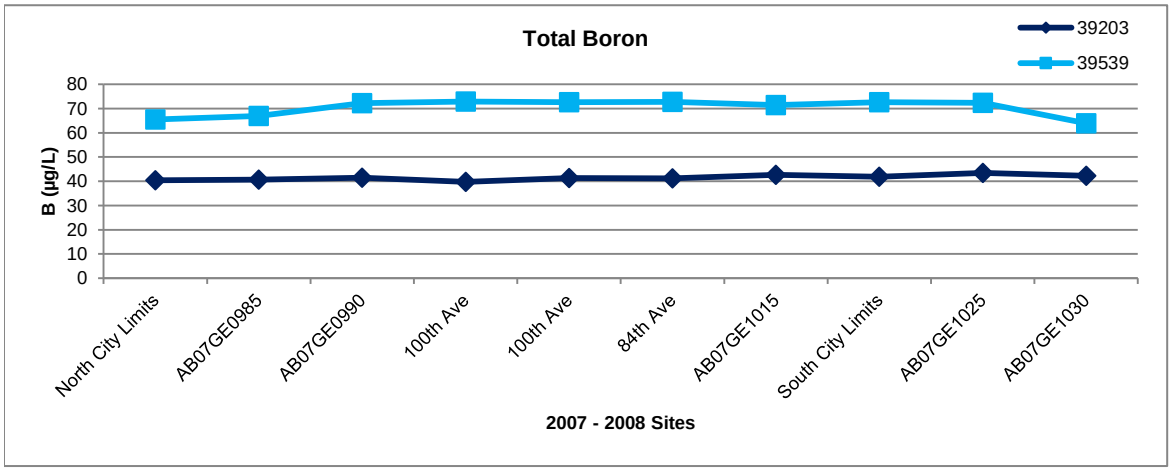


Figure 19. Historical Bear Creek Total Cadmium Concentrations.

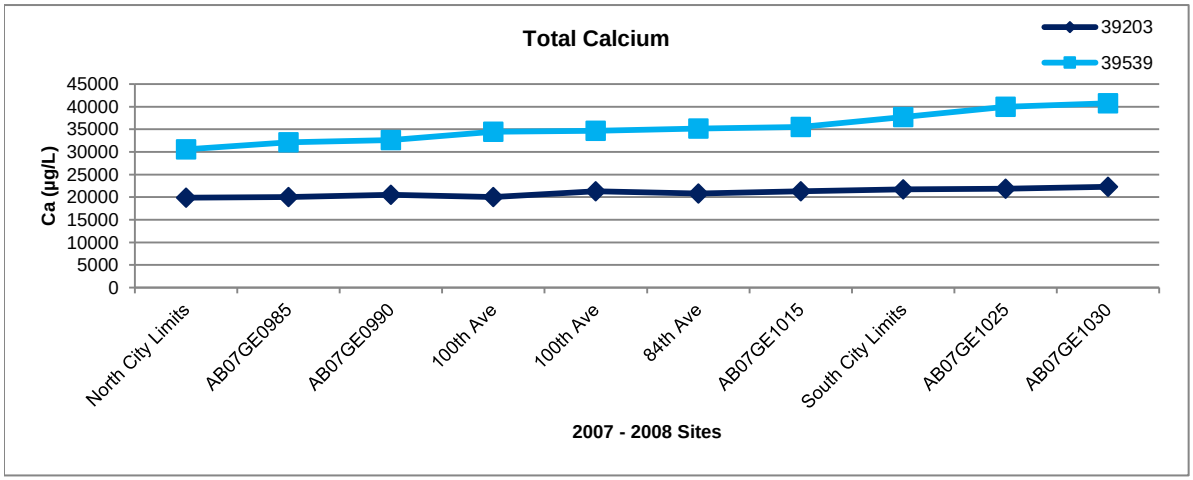
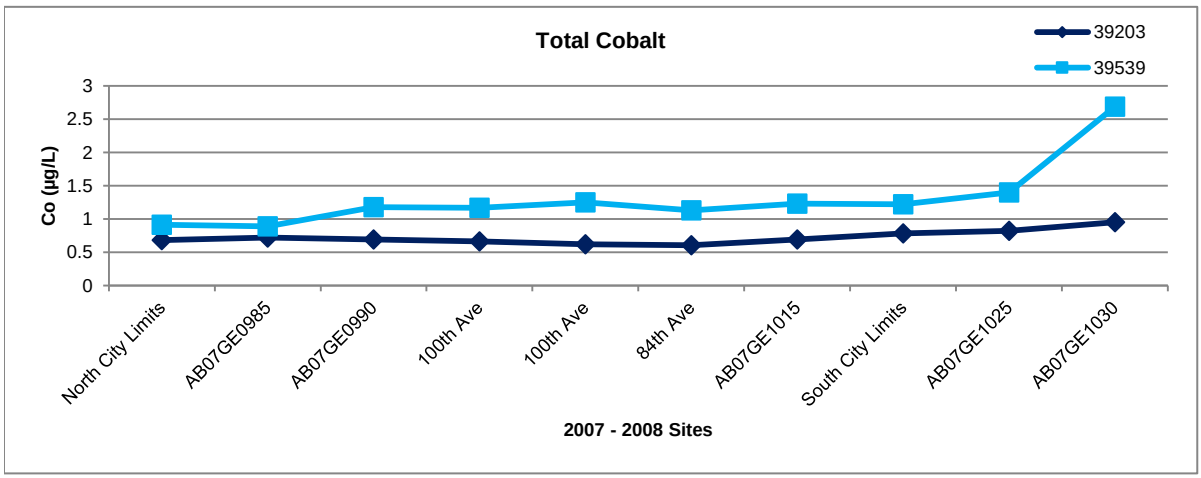


Figure 20. Historical Bear Creek Total Cobalt Concentrations.



Total Metals

Figure 21. Historical Bear Creek Total Copper Concentrations.

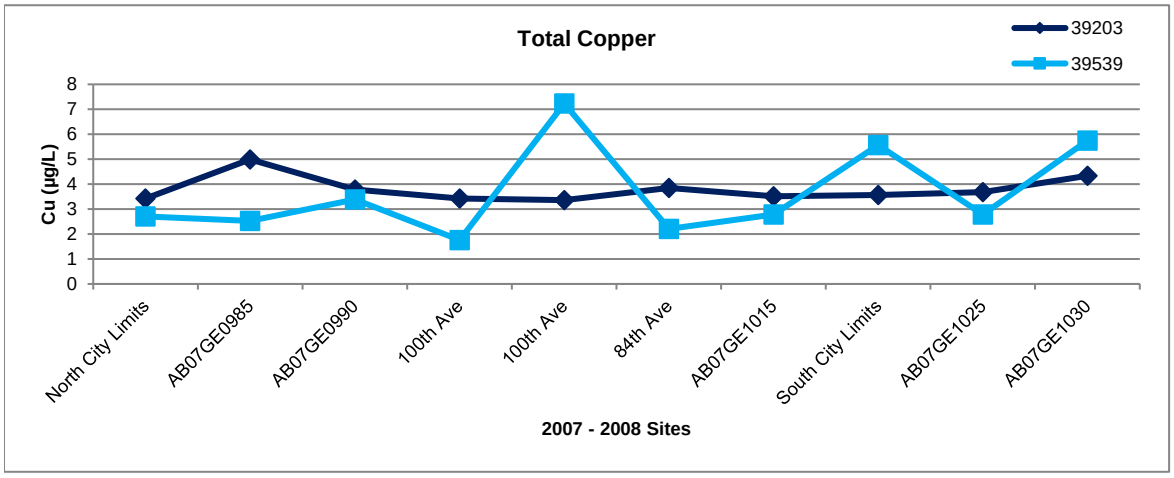


Figure 22. Historical Bear Creek Total Iron Concentrations.

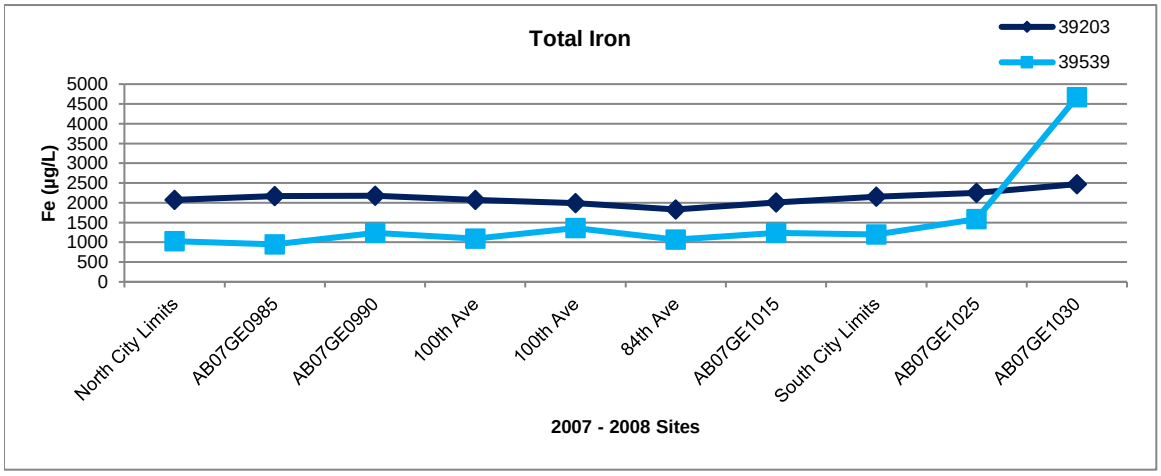
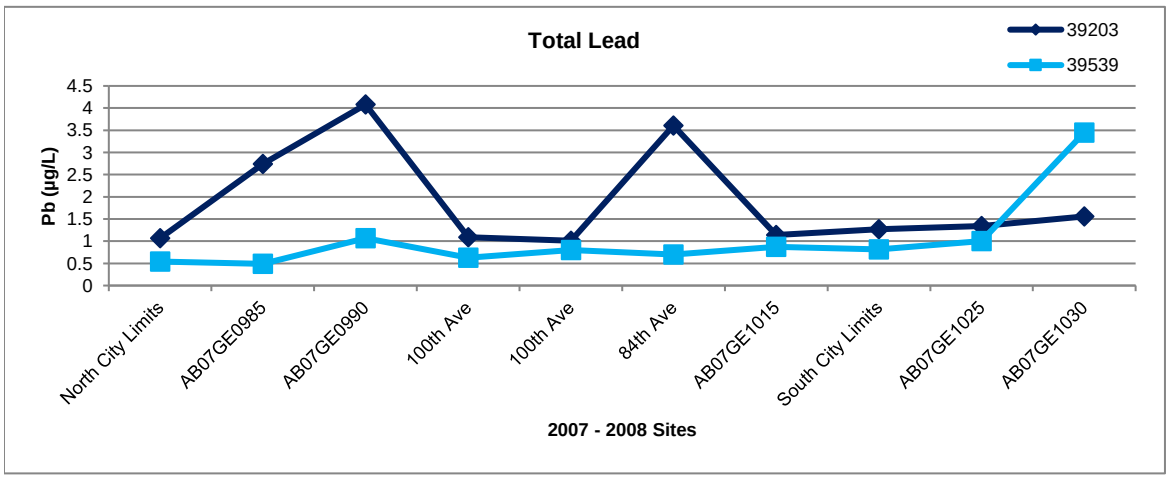


Figure 23. Historical Bear Creek Total Lead Concentrations.



Total Metals

Figure 24. Historical Bear Creek Total Lithium Concentrations.

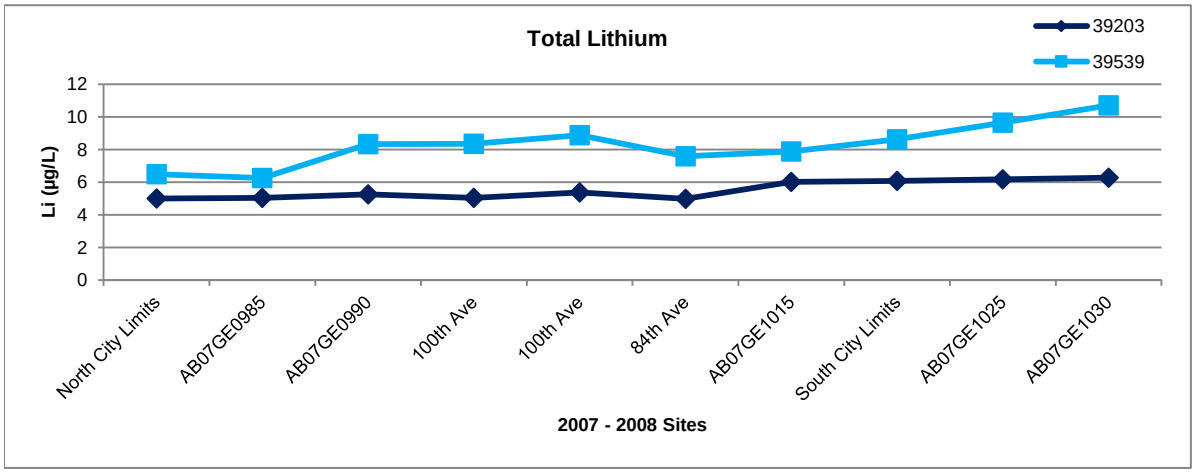


Figure 25. Historical Bear Creek Total Manganese Concentrations.

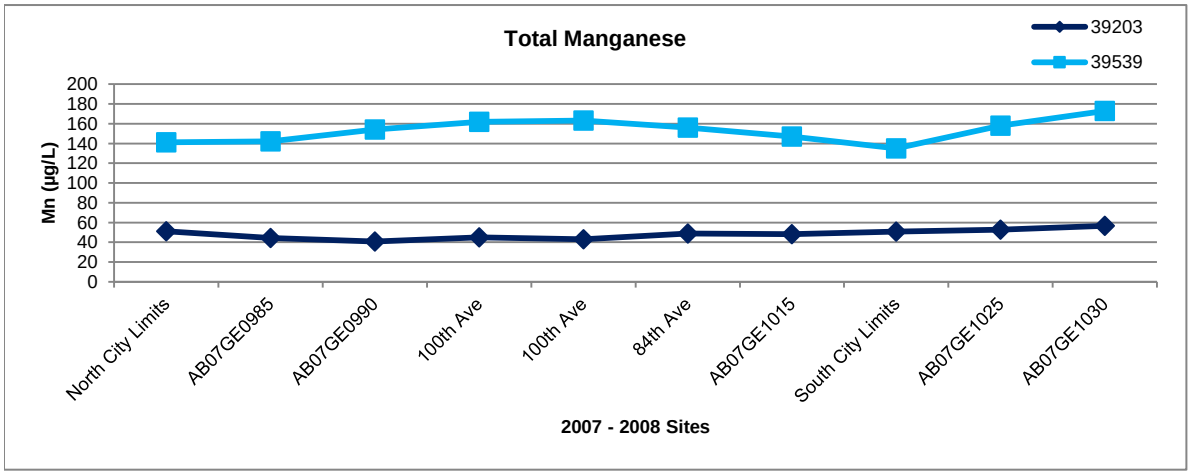
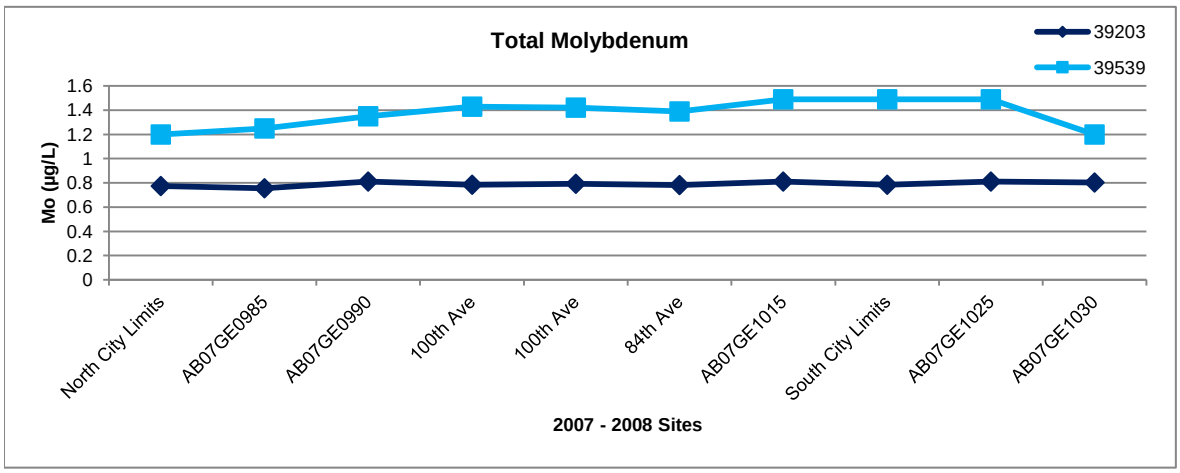


Figure 26. Historical Bear Creek Total Molybdenum Concentrations.



Total Metals

Figure 27. Historical Bear Creek Total Nickel Concentrations.

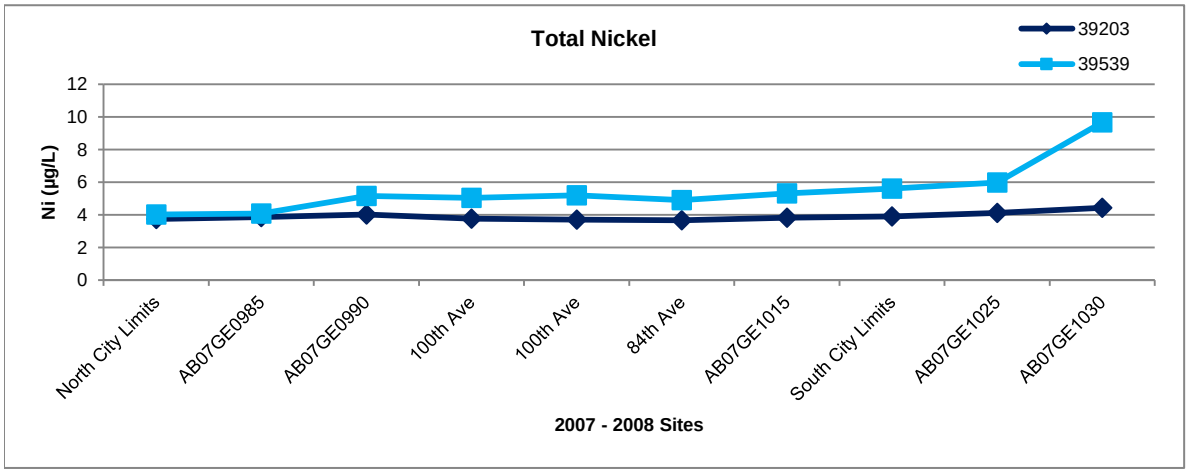


Figure 28. Historical Bear Creek Total Selenium Concentrations.

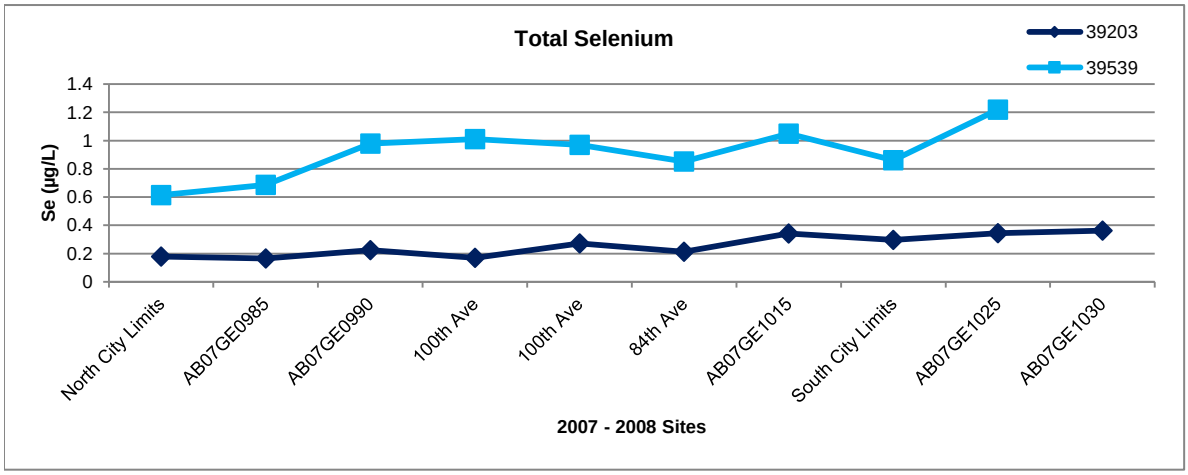
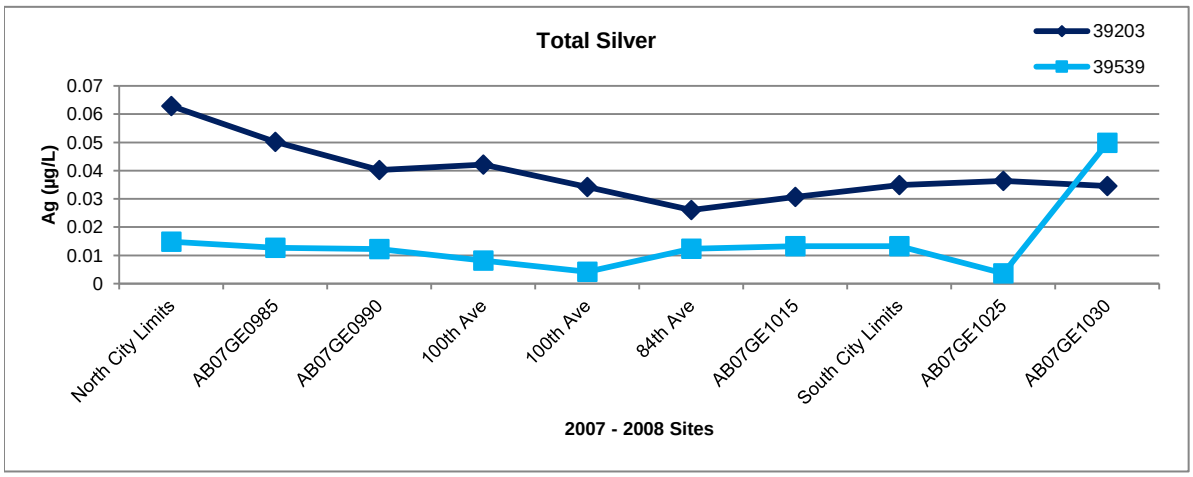


Figure 29. Historical Bear Creek Total



Total Metals

Figure 30. Historical Bear Creek Total Strontium Concentrations.

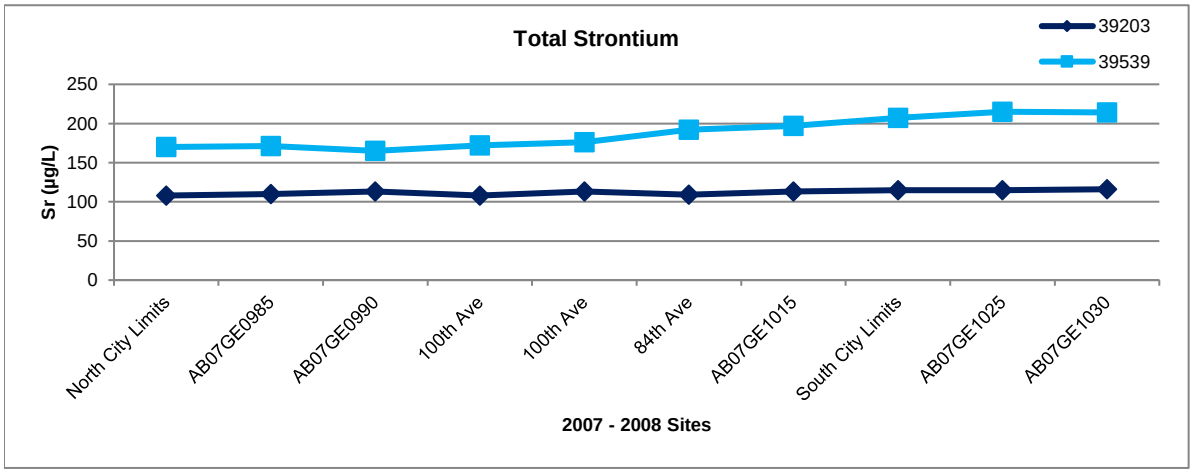


Figure 31. Historical Bear Creek Total Thallium Concentrations.

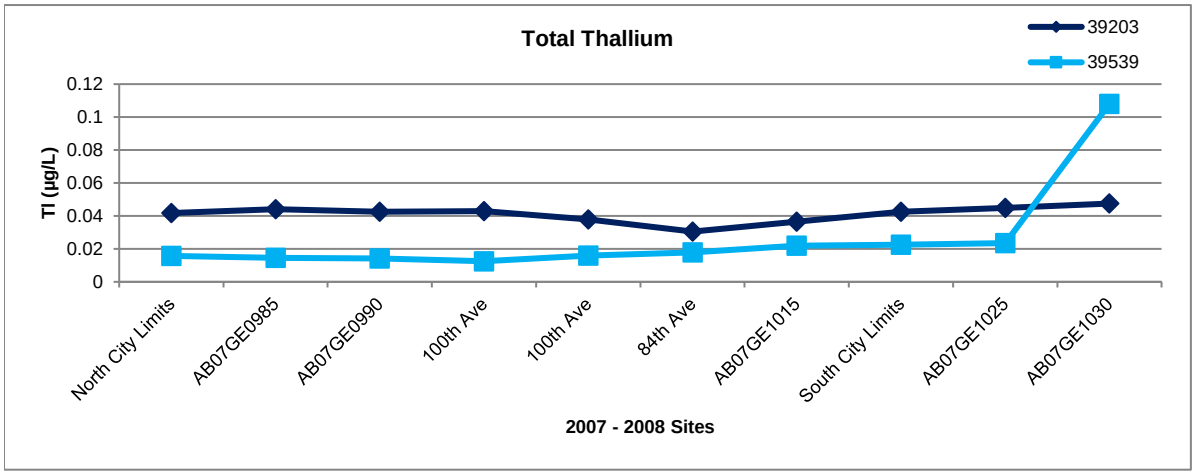
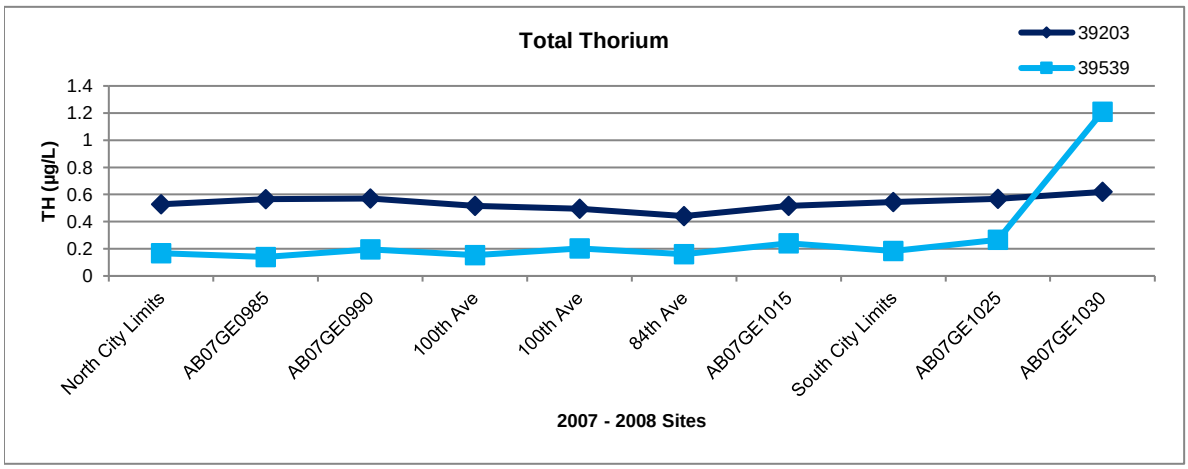


Figure 32. Historical Bear Creek Total Thorium Concentrations.



Total Metals

Figure 33. Histroical Bear Creek Total Tin Concentrations.

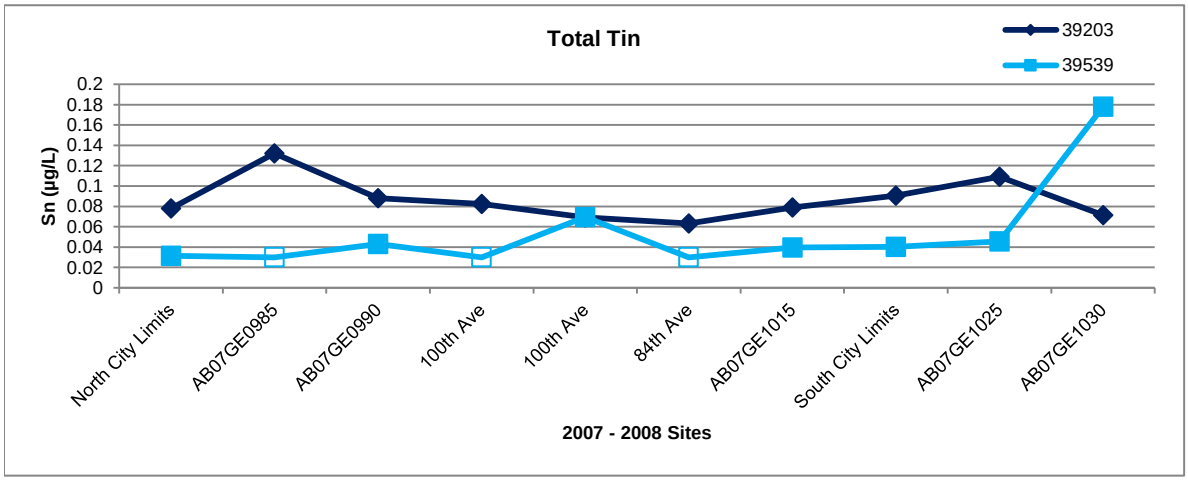


Figure 34. Historical Bear Creek Total Titanium Concentrations.

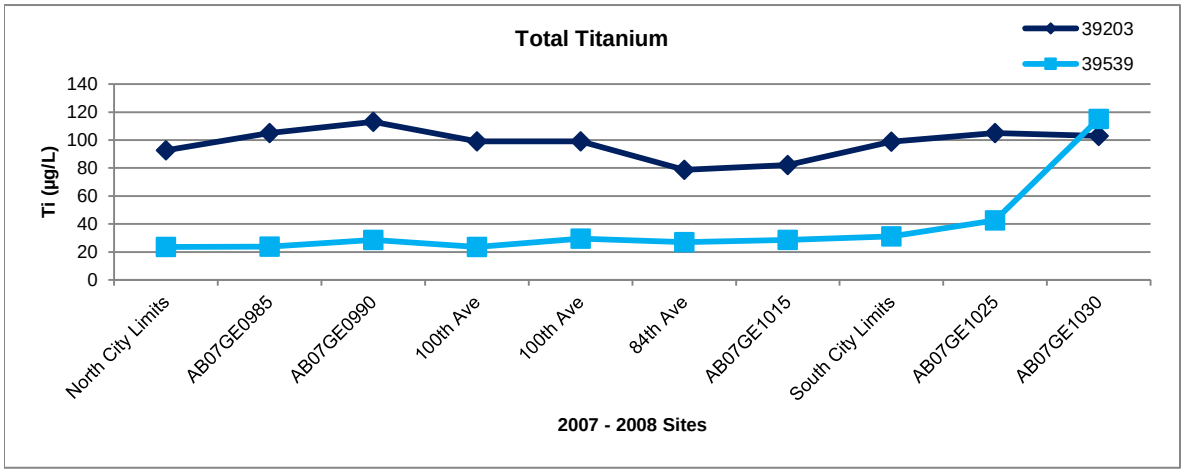
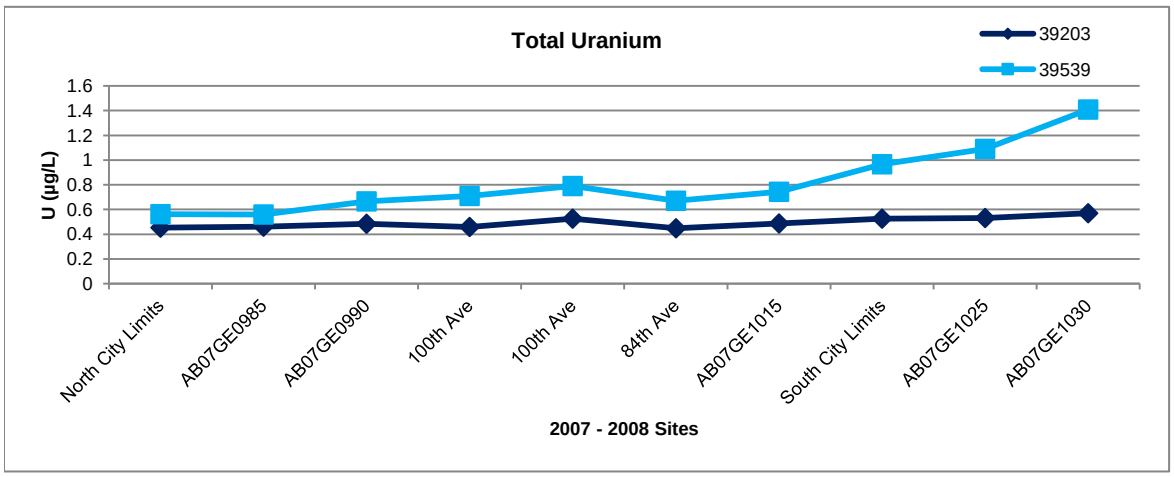


Figure 35. Historical Bear Creek Total Uranium Concentrations.



Total Metals

Figure 36. Historical Bear Creek Total Vanadium Concentrations.

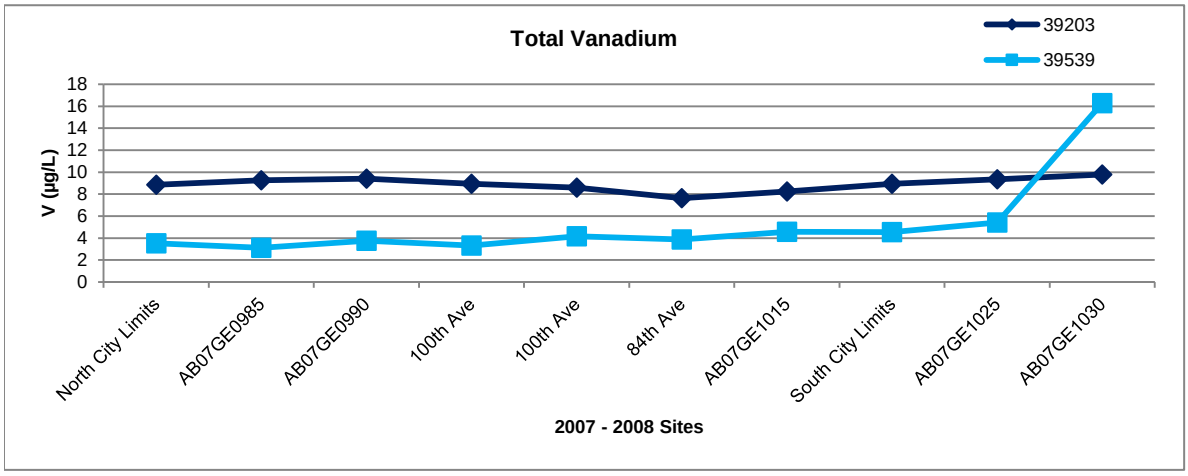
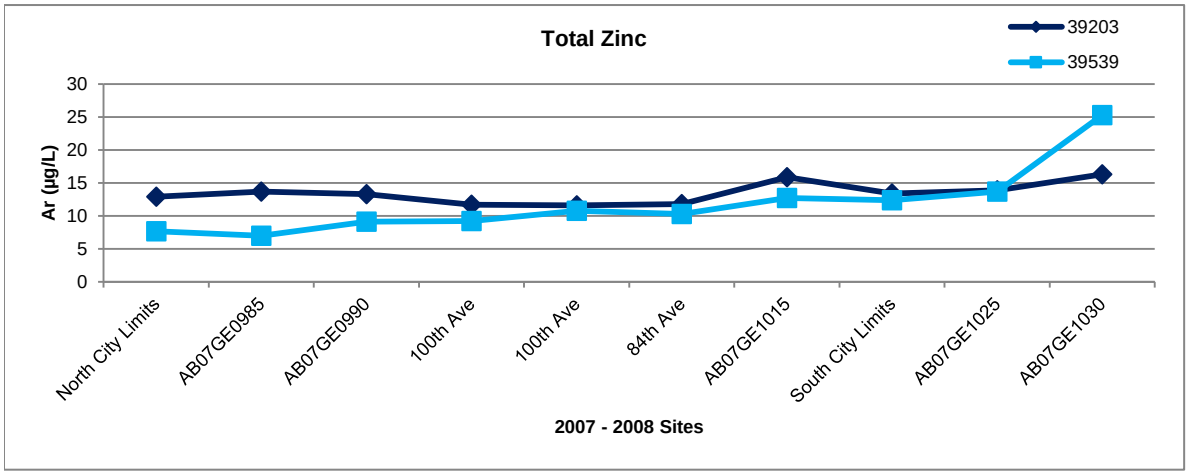


Figure 37. Historical Bear Creek Total Zinc Concentrations.



Dissolved Metals

Figure 38. Historical Bear Creek Dissolved Aluminum Concentrations.

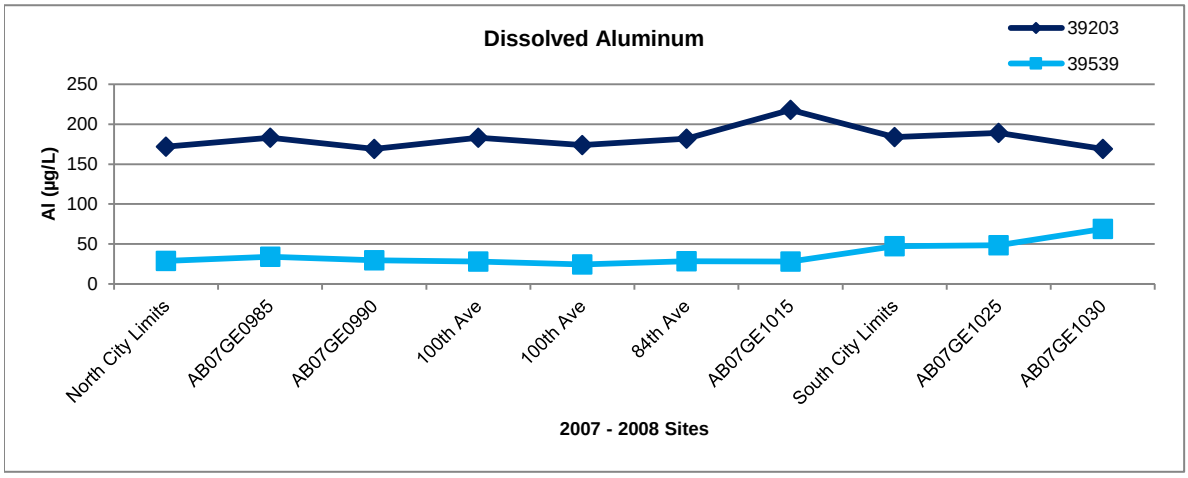
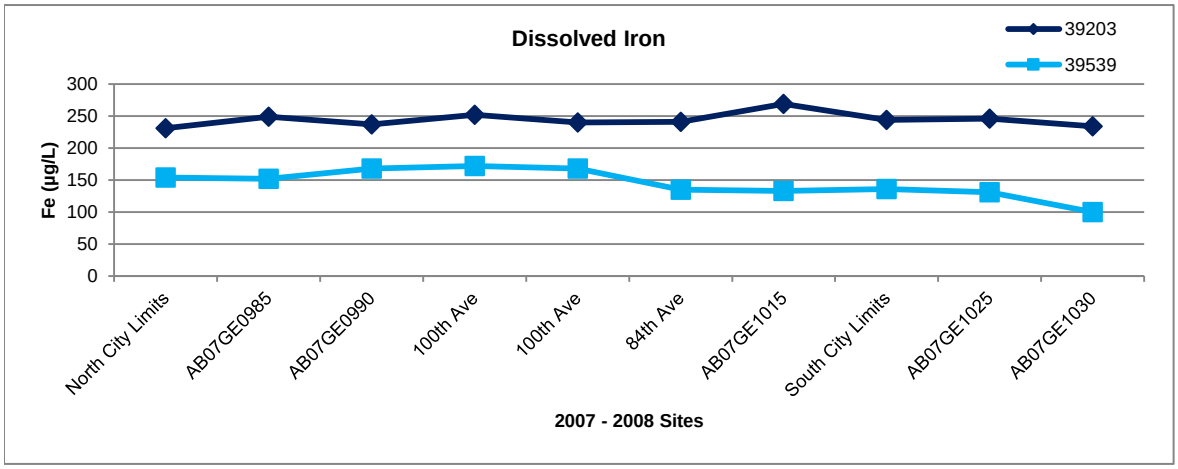
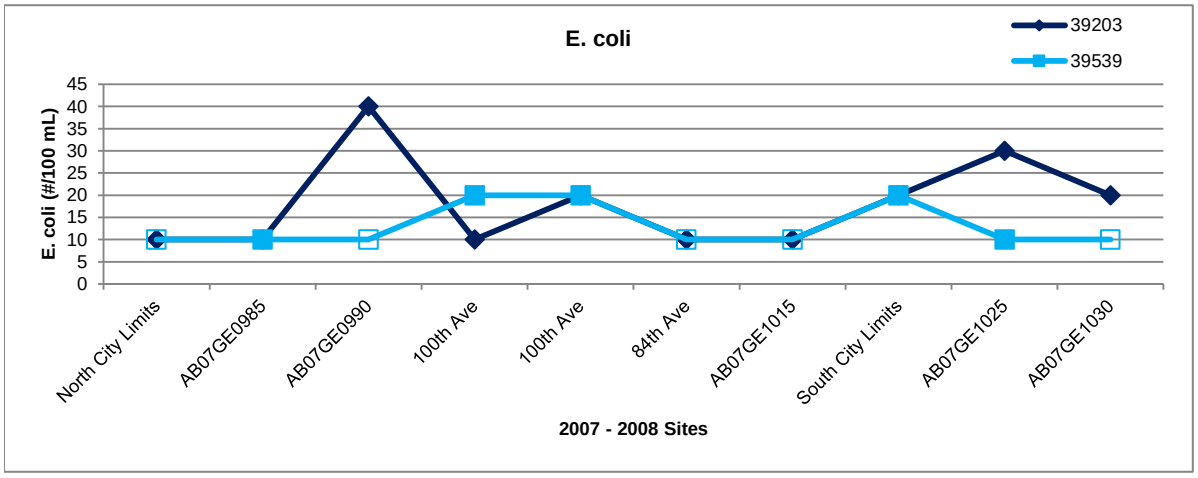


Figure 39. Historical Bear Creek Dissolved Iron Concentrations.



Bacteria

Figure 40. Historical Bear Creek *E. coli* Concentrations.



Appendix E. Stream Discharge Data

Table E-1. Stage Elevation and Calculated Discharge

Date	Time	Stage Elevation	Calculated Q (cms)
18/08/2014	11:00:00	97.75	2.72
18/08/2014	12:00:00	97.76	2.75
18/08/2014	13:00:00	97.76	2.78
18/08/2014	14:00:00	97.76	2.77
18/08/2014	15:00:00	97.76	2.77
18/08/2014	16:00:00	97.76	2.77
18/08/2014	17:00:00	97.76	2.76
18/08/2014	18:00:00	97.76	2.77
18/08/2014	19:00:00	97.76	2.74
18/08/2014	20:00:00	97.76	2.75
18/08/2014	21:00:00	97.76	2.76
18/08/2014	22:00:00	97.76	2.77
18/08/2014	23:00:00	97.76	2.77
19/08/2014	0:00:00	97.76	2.77
19/08/2014	1:00:00	97.76	2.76
19/08/2014	2:00:00	97.76	2.75
19/08/2014	3:00:00	97.76	2.77
19/08/2014	4:00:00	97.76	2.77
19/08/2014	5:00:00	97.76	2.76
19/08/2014	6:00:00	97.76	2.75
19/08/2014	7:00:00	97.76	2.76
19/08/2014	8:00:00	97.76	2.76
19/08/2014	9:00:00	97.76	2.76
19/08/2014	10:00:00	97.76	2.76
19/08/2014	11:00:00	97.76	2.75
19/08/2014	12:00:00	97.76	2.75
19/08/2014	13:00:00	97.76	2.74
19/08/2014	14:00:00	97.76	2.75
19/08/2014	15:00:00	97.76	2.73
19/08/2014	16:00:00	97.76	2.73
19/08/2014	17:00:00	97.76	2.74
19/08/2014	18:00:00	97.76	2.73
19/08/2014	19:00:00	97.76	2.72
19/08/2014	20:00:00	97.75	2.71
19/08/2014	21:00:00	97.75	2.70
19/08/2014	22:00:00	97.75	2.71
19/08/2014	23:00:00	97.75	2.68
20/08/2014	0:00:00	97.75	2.70
20/08/2014	1:00:00	97.75	2.70
20/08/2014	2:00:00	97.75	2.70
20/08/2014	3:00:00	97.75	2.69
20/08/2014	4:00:00	97.75	2.70
20/08/2014	5:00:00	97.75	2.70
20/08/2014	6:00:00	97.75	2.72

Date	Time	Stage Elevation	Calculated Q (cms)
20/08/2014	7:00:00	97.75	2.70
20/08/2014	8:00:00	97.75	2.70
20/08/2014	9:00:00	97.75	2.70
20/08/2014	10:00:00	97.75	2.70
20/08/2014	11:00:00	97.75	2.70
20/08/2014	12:00:00	97.75	2.70
20/08/2014	13:00:00	97.75	2.68
20/08/2014	14:00:00	97.75	2.70
20/08/2014	15:00:00	97.75	2.68
20/08/2014	16:00:00	97.75	2.70
20/08/2014	17:00:00	97.75	2.68
20/08/2014	18:00:00	97.75	2.68
20/08/2014	19:00:00	97.75	2.68
20/08/2014	20:00:00	97.75	2.67
20/08/2014	21:00:00	97.75	2.68
20/08/2014	22:00:00	97.75	2.72
20/08/2014	23:00:00	97.75	2.72
21/08/2014	0:00:00	97.76	2.73
21/08/2014	1:00:00	97.76	2.73
21/08/2014	2:00:00	97.76	2.73
21/08/2014	3:00:00	97.76	2.74
21/08/2014	4:00:00	97.76	2.72
21/08/2014	5:00:00	97.75	2.72
21/08/2014	6:00:00	97.76	2.73
21/08/2014	7:00:00	97.76	2.72
21/08/2014	8:00:00	97.75	2.72
21/08/2014	9:00:00	97.75	2.72
21/08/2014	10:00:00	97.75	2.72
21/08/2014	11:00:00	97.76	2.72
21/08/2014	12:00:00	97.76	2.74
21/08/2014	13:00:00	97.76	2.73
21/08/2014	14:00:00	97.75	2.72
21/08/2014	15:00:00	97.75	2.70
21/08/2014	16:00:00	97.75	2.71
21/08/2014	17:00:00	97.75	2.70
21/08/2014	18:00:00	97.75	2.71
21/08/2014	19:00:00	97.75	2.71
21/08/2014	20:00:00	97.75	2.71
21/08/2014	21:00:00	97.75	2.70
21/08/2014	22:00:00	97.75	2.69
21/08/2014	23:00:00	97.75	2.69
22/08/2014	0:00:00	97.75	2.68
22/08/2014	1:00:00	97.75	2.70
22/08/2014	2:00:00	97.75	2.68
22/08/2014	3:00:00	97.75	2.67

Date	Time	Stage Elevation	Calculated Q (cms)
22/08/2014	4:00:00	97.75	2.66
22/08/2014	5:00:00	97.75	2.66
22/08/2014	6:00:00	97.74	2.65
22/08/2014	7:00:00	97.75	2.66
22/08/2014	8:00:00	97.75	2.66
22/08/2014	9:00:00	97.74	2.65
22/08/2014	10:00:00	97.74	2.65
22/08/2014	11:00:00	97.74	2.65
22/08/2014	12:00:00	97.75	2.67
22/08/2014	13:00:00	97.75	2.66
22/08/2014	14:00:00	97.75	2.67
22/08/2014	15:00:00	97.75	2.66
22/08/2014	16:00:00	97.75	2.66
22/08/2014	17:00:00	97.75	2.66
22/08/2014	18:00:00	97.75	2.66
22/08/2014	19:00:00	97.75	2.66
22/08/2014	20:00:00	97.74	2.65
22/08/2014	21:00:00	97.74	2.65
22/08/2014	22:00:00	97.74	2.64
22/08/2014	23:00:00	97.74	2.64
23/08/2014	0:00:00	97.74	2.63
23/08/2014	1:00:00	97.74	2.63
23/08/2014	2:00:00	97.74	2.62
23/08/2014	3:00:00	97.74	2.63
23/08/2014	4:00:00	97.74	2.62
23/08/2014	5:00:00	97.74	2.63
23/08/2014	6:00:00	97.74	2.63
23/08/2014	7:00:00	97.74	2.62
23/08/2014	8:00:00	97.74	2.61
23/08/2014	9:00:00	97.74	2.60
23/08/2014	10:00:00	97.74	2.61
23/08/2014	11:00:00	97.74	2.61
23/08/2014	12:00:00	97.74	2.60
23/08/2014	13:00:00	97.74	2.62
23/08/2014	14:00:00	97.74	2.61
23/08/2014	15:00:00	97.74	2.61
23/08/2014	16:00:00	97.73	2.59
23/08/2014	17:00:00	97.74	2.60
23/08/2014	18:00:00	97.74	2.61
23/08/2014	19:00:00	97.74	2.61
23/08/2014	20:00:00	97.74	2.60
23/08/2014	21:00:00	97.73	2.59
23/08/2014	22:00:00	97.74	2.59
23/08/2014	23:00:00	97.73	2.59
24/08/2014	0:00:00	97.73	2.59

Date	Time	Stage Elevation	Calculated Q (cms)
24/08/2014	1:00:00	97.73	2.57
24/08/2014	2:00:00	97.73	2.58
24/08/2014	3:00:00	97.73	2.56
24/08/2014	4:00:00	97.73	2.56
24/08/2014	5:00:00	97.73	2.56
24/08/2014	6:00:00	97.73	2.54
24/08/2014	7:00:00	97.73	2.54
24/08/2014	8:00:00	97.73	2.55
24/08/2014	9:00:00	97.73	2.55
24/08/2014	10:00:00	97.72	2.52
24/08/2014	11:00:00	97.73	2.53
24/08/2014	12:00:00	97.73	2.55
24/08/2014	13:00:00	97.73	2.53
24/08/2014	14:00:00	97.73	2.54
24/08/2014	15:00:00	97.73	2.54
24/08/2014	16:00:00	97.73	2.54
24/08/2014	17:00:00	97.73	2.54
24/08/2014	18:00:00	97.73	2.53
24/08/2014	19:00:00	97.72	2.52
24/08/2014	20:00:00	97.73	2.53
24/08/2014	21:00:00	97.72	2.52
24/08/2014	22:00:00	97.72	2.52
24/08/2014	23:00:00	97.72	2.51
25/08/2014	0:00:00	97.72	2.52
25/08/2014	1:00:00	97.72	2.50
25/08/2014	2:00:00	97.72	2.50
25/08/2014	3:00:00	97.72	2.49
25/08/2014	4:00:00	97.72	2.50
25/08/2014	5:00:00	97.72	2.49
25/08/2014	6:00:00	97.72	2.49
25/08/2014	7:00:00	97.72	2.47
25/08/2014	8:00:00	97.72	2.48
25/08/2014	9:00:00	97.72	2.47
25/08/2014	10:00:00	97.72	2.49
25/08/2014	11:00:00	97.72	2.49
25/08/2014	12:00:00	97.72	2.49
25/08/2014	13:00:00	97.72	2.49
25/08/2014	14:00:00	97.72	2.49
25/08/2014	15:00:00	97.72	2.48
25/08/2014	16:00:00	97.72	2.48
25/08/2014	17:00:00	97.71	2.45
25/08/2014	18:00:00	97.70	2.36
25/08/2014	19:00:00	97.69	2.31
25/08/2014	20:00:00	97.69	2.31
25/08/2014	21:00:00	97.69	2.31

Date	Time	Stage Elevation	Calculated Q (cms)
25/08/2014	22:00:00	97.69	2.31
25/08/2014	23:00:00	97.69	2.31
26/08/2014	0:00:00	97.69	2.31
26/08/2014	1:00:00	97.69	2.30
26/08/2014	2:00:00	97.69	2.31
26/08/2014	3:00:00	97.69	2.31
26/08/2014	4:00:00	97.69	2.30
26/08/2014	5:00:00	97.69	2.31
26/08/2014	6:00:00	97.69	2.31
26/08/2014	7:00:00	97.69	2.33
26/08/2014	8:00:00	97.69	2.31
26/08/2014	9:00:00	97.69	2.31
26/08/2014	10:00:00	97.69	2.31
26/08/2014	11:00:00	97.69	2.31
26/08/2014	12:00:00	97.69	2.33
26/08/2014	13:00:00	97.69	2.32
26/08/2014	14:00:00	97.69	2.31
26/08/2014	15:00:00	97.69	2.33
26/08/2014	16:00:00	97.69	2.33
26/08/2014	17:00:00	97.69	2.31
26/08/2014	18:00:00	97.69	2.30
26/08/2014	19:00:00	97.69	2.30
26/08/2014	20:00:00	97.69	2.30
26/08/2014	21:00:00	97.69	2.30
26/08/2014	22:00:00	97.69	2.31
26/08/2014	23:00:00	97.69	2.29
27/08/2014	0:00:00	97.69	2.29
27/08/2014	1:00:00	97.69	2.29
27/08/2014	2:00:00	97.69	2.30
27/08/2014	3:00:00	97.69	2.31
27/08/2014	4:00:00	97.69	2.31
27/08/2014	5:00:00	97.69	2.30
27/08/2014	6:00:00	97.69	2.31
27/08/2014	7:00:00	97.69	2.30
27/08/2014	8:00:00	97.69	2.31
27/08/2014	9:00:00	97.69	2.31
27/08/2014	10:00:00	97.69	2.31
27/08/2014	11:00:00	97.69	2.30
27/08/2014	12:00:00	97.69	2.31
27/08/2014	13:00:00	97.69	2.31
27/08/2014	14:00:00	97.69	2.30
27/08/2014	15:00:00	97.69	2.31
27/08/2014	16:00:00	97.69	2.31
27/08/2014	17:00:00	97.69	2.32
27/08/2014	18:00:00	97.69	2.31

Date	Time	Stage Elevation	Calculated Q (cms)
27/08/2014	19:00:00	97.69	2.30
27/08/2014	20:00:00	97.69	2.31
27/08/2014	21:00:00	97.69	2.30
27/08/2014	22:00:00	97.69	2.30
27/08/2014	23:00:00	97.69	2.30
28/08/2014	0:00:00	97.69	2.31
28/08/2014	1:00:00	97.69	2.31
28/08/2014	2:00:00	97.69	2.31
28/08/2014	3:00:00	97.69	2.30
28/08/2014	4:00:00	97.69	2.31
28/08/2014	5:00:00	97.69	2.30
28/08/2014	6:00:00	97.69	2.31
28/08/2014	7:00:00	97.69	2.31
28/08/2014	8:00:00	97.69	2.31
28/08/2014	9:00:00	97.69	2.30
28/08/2014	10:00:00	97.69	2.31
28/08/2014	11:00:00	97.69	2.32
28/08/2014	12:00:00	97.69	2.33
28/08/2014	13:00:00	97.69	2.31
28/08/2014	14:00:00	97.69	2.31
28/08/2014	15:00:00	97.69	2.32
28/08/2014	16:00:00	97.69	2.33
28/08/2014	17:00:00	97.69	2.33
28/08/2014	18:00:00	97.69	2.32
28/08/2014	19:00:00	97.69	2.31
28/08/2014	20:00:00	97.69	2.31
28/08/2014	21:00:00	97.69	2.31
28/08/2014	22:00:00	97.69	2.30
28/08/2014	23:00:00	97.69	2.30
29/08/2014	0:00:00	97.69	2.30
29/08/2014	1:00:00	97.69	2.29
29/08/2014	2:00:00	97.69	2.29
29/08/2014	3:00:00	97.69	2.28
29/08/2014	4:00:00	97.69	2.29
29/08/2014	5:00:00	97.69	2.29
29/08/2014	6:00:00	97.69	2.27
29/08/2014	7:00:00	97.69	2.28
29/08/2014	8:00:00	97.69	2.29
29/08/2014	9:00:00	97.68	2.27
29/08/2014	10:00:00	97.69	2.27
29/08/2014	11:00:00	97.69	2.28
29/08/2014	12:00:00	97.69	2.27
29/08/2014	13:00:00	97.69	2.29
29/08/2014	14:00:00	97.69	2.27
29/08/2014	15:00:00	97.69	2.27

Date	Time	Stage Elevation	Calculated Q (cms)
29/08/2014	16:00:00	97.69	2.29
29/08/2014	17:00:00	97.69	2.28
29/08/2014	18:00:00	97.69	2.27
29/08/2014	19:00:00	97.69	2.29
29/08/2014	20:00:00	97.69	2.28
29/08/2014	21:00:00	97.68	2.27
29/08/2014	22:00:00	97.68	2.27
29/08/2014	23:00:00	97.68	2.26
30/08/2014	0:00:00	97.68	2.26
30/08/2014	1:00:00	97.68	2.27
30/08/2014	2:00:00	97.68	2.26
30/08/2014	3:00:00	97.68	2.25
30/08/2014	4:00:00	97.68	2.25
30/08/2014	5:00:00	97.68	2.25
30/08/2014	6:00:00	97.68	2.25
30/08/2014	7:00:00	97.68	2.24
30/08/2014	8:00:00	97.68	2.25
30/08/2014	9:00:00	97.68	2.24
30/08/2014	10:00:00	97.68	2.25
30/08/2014	11:00:00	97.68	2.25
30/08/2014	12:00:00	97.68	2.23
30/08/2014	13:00:00	97.68	2.26
30/08/2014	14:00:00	97.68	2.25
30/08/2014	15:00:00	97.68	2.25
30/08/2014	16:00:00	97.68	2.24
30/08/2014	17:00:00	97.68	2.24
30/08/2014	18:00:00	97.68	2.24
30/08/2014	19:00:00	97.68	2.24
30/08/2014	20:00:00	97.68	2.24
30/08/2014	21:00:00	97.68	2.24
30/08/2014	22:00:00	97.68	2.24
30/08/2014	23:00:00	97.68	2.25
31/08/2014	0:00:00	97.68	2.24
31/08/2014	1:00:00	97.68	2.23
31/08/2014	2:00:00	97.68	2.23
31/08/2014	3:00:00	97.68	2.23
31/08/2014	4:00:00	97.68	2.22
31/08/2014	5:00:00	97.68	2.22
31/08/2014	6:00:00	97.68	2.21
31/08/2014	7:00:00	97.68	2.24
31/08/2014	8:00:00	97.68	2.22
31/08/2014	9:00:00	97.68	2.21
31/08/2014	10:00:00	97.68	2.22
31/08/2014	11:00:00	97.68	2.22
31/08/2014	12:00:00	97.68	2.23

Date	Time	Stage Elevation	Calculated Q (cms)
31/08/2014	13:00:00	97.68	2.22
31/08/2014	14:00:00	97.68	2.24
31/08/2014	15:00:00	97.68	2.23
31/08/2014	16:00:00	97.68	2.24
31/08/2014	17:00:00	97.68	2.23
31/08/2014	18:00:00	97.68	2.22
31/08/2014	19:00:00	97.68	2.22
31/08/2014	20:00:00	97.68	2.23
31/08/2014	21:00:00	97.68	2.22
31/08/2014	22:00:00	97.68	2.22
31/08/2014	23:00:00	97.68	2.22
01/09/2014	0:00:00	97.68	2.22
01/09/2014	1:00:00	97.68	2.22
01/09/2014	2:00:00	97.68	2.21
01/09/2014	3:00:00	97.67	2.20
01/09/2014	4:00:00	97.68	2.22
01/09/2014	5:00:00	97.68	2.22
01/09/2014	6:00:00	97.67	2.20
01/09/2014	7:00:00	97.67	2.20
01/09/2014	8:00:00	97.67	2.20
01/09/2014	9:00:00	97.67	2.20
01/09/2014	10:00:00	97.67	2.20
01/09/2014	11:00:00	97.68	2.21
01/09/2014	12:00:00	97.68	2.21
01/09/2014	13:00:00	97.68	2.22
01/09/2014	14:00:00	97.67	2.20
01/09/2014	15:00:00	97.68	2.21
01/09/2014	16:00:00	97.68	2.21
01/09/2014	17:00:00	97.68	2.21
01/09/2014	18:00:00	97.67	2.20
01/09/2014	19:00:00	97.68	2.21
01/09/2014	20:00:00	97.68	2.22
01/09/2014	21:00:00	97.68	2.22
01/09/2014	22:00:00	97.68	2.25
01/09/2014	23:00:00	97.72	2.47
02/09/2014	0:00:00	97.70	2.37
02/09/2014	1:00:00	97.69	2.27
02/09/2014	2:00:00	97.68	2.23
02/09/2014	3:00:00	97.68	2.21
02/09/2014	4:00:00	97.67	2.20
02/09/2014	5:00:00	97.67	2.20
02/09/2014	6:00:00	97.67	2.20
02/09/2014	7:00:00	97.67	2.20
02/09/2014	8:00:00	97.68	2.22
02/09/2014	9:00:00	97.67	2.19

Date	Time	Stage Elevation	Calculated Q (cms)
02/09/2014	10:00:00	97.67	2.20
02/09/2014	11:00:00	97.67	2.19
02/09/2014	12:00:00	97.67	2.20
02/09/2014	13:00:00	97.67	2.19
02/09/2014	14:00:00	97.67	2.19
02/09/2014	15:00:00	97.67	2.20
02/09/2014	16:00:00	97.67	2.18
02/09/2014	17:00:00	97.67	2.18
02/09/2014	18:00:00	97.67	2.19
02/09/2014	19:00:00	97.67	2.19
02/09/2014	20:00:00	97.67	2.18
02/09/2014	21:00:00	97.67	2.17
02/09/2014	22:00:00	97.67	2.17
02/09/2014	23:00:00	97.67	2.17
03/09/2014	0:00:00	97.67	2.17
03/09/2014	1:00:00	97.67	2.17
03/09/2014	2:00:00	97.67	2.15
03/09/2014	3:00:00	97.66	2.14
03/09/2014	4:00:00	97.66	2.13
03/09/2014	5:00:00	97.66	2.11
03/09/2014	6:00:00	97.66	2.10
03/09/2014	7:00:00	97.66	2.11
03/09/2014	8:00:00	97.66	2.09
03/09/2014	9:00:00	97.64	1.98
03/09/2014	10:00:00	97.64	1.95
03/09/2014	11:00:00	97.64	1.96
03/09/2014	12:00:00	97.64	1.95
03/09/2014	13:00:00	97.64	1.96
03/09/2014	14:00:00	97.63	1.93
03/09/2014	15:00:00	97.59	1.65
03/09/2014	16:00:00	97.54	1.34
03/09/2014	17:00:00	97.52	1.23
03/09/2014	18:00:00	97.52	1.22
03/09/2014	19:00:00	97.52	1.21
03/09/2014	20:00:00	97.52	1.20
03/09/2014	21:00:00	97.52	1.20
03/09/2014	22:00:00	97.52	1.19
03/09/2014	23:00:00	97.52	1.19
04/09/2014	0:00:00	97.51	1.18
04/09/2014	1:00:00	97.51	1.18
04/09/2014	2:00:00	97.51	1.16
04/09/2014	3:00:00	97.51	1.15
04/09/2014	4:00:00	97.51	1.16
04/09/2014	5:00:00	97.51	1.16
04/09/2014	6:00:00	97.51	1.16

Date	Time	Stage Elevation	Calculated Q (cms)
04/09/2014	7:00:00	97.51	1.17
04/09/2014	8:00:00	97.51	1.18
04/09/2014	9:00:00	97.51	1.17
04/09/2014	10:00:00	97.51	1.18
04/09/2014	11:00:00	97.52	1.19
04/09/2014	12:00:00	97.52	1.20
04/09/2014	13:00:00	97.52	1.20
04/09/2014	14:00:00	97.52	1.22
04/09/2014	15:00:00	97.52	1.22
04/09/2014	16:00:00	97.52	1.22
04/09/2014	17:00:00	97.52	1.21
04/09/2014	18:00:00	97.52	1.20
04/09/2014	19:00:00	97.52	1.20
04/09/2014	20:00:00	97.52	1.22
04/09/2014	21:00:00	97.52	1.23
04/09/2014	22:00:00	97.53	1.27
04/09/2014	23:00:00	97.54	1.33
05/09/2014	0:00:00	97.55	1.41
05/09/2014	1:00:00	97.56	1.47
05/09/2014	2:00:00	97.57	1.52
05/09/2014	3:00:00	97.57	1.56
05/09/2014	4:00:00	97.58	1.61
05/09/2014	5:00:00	97.59	1.65
05/09/2014	6:00:00	97.59	1.67
05/09/2014	7:00:00	97.60	1.70
05/09/2014	8:00:00	97.60	1.72
05/09/2014	9:00:00	97.60	1.75
05/09/2014	10:00:00	97.61	1.77
05/09/2014	11:00:00	97.61	1.81
05/09/2014	12:00:00	97.62	1.83
05/09/2014	13:00:00	97.62	1.83
05/09/2014	14:00:00	97.62	1.85
05/09/2014	15:00:00	97.62	1.88
05/09/2014	16:00:00	97.63	1.90
05/09/2014	17:00:00	97.62	1.85
05/09/2014	18:00:00	97.61	1.79
05/09/2014	19:00:00	97.61	1.79
05/09/2014	20:00:00	97.61	1.79
05/09/2014	21:00:00	97.61	1.78
05/09/2014	22:00:00	97.61	1.78
05/09/2014	23:00:00	97.61	1.79
06/09/2014	0:00:00	97.61	1.82
06/09/2014	1:00:00	97.61	1.81
06/09/2014	2:00:00	97.62	1.84
06/09/2014	3:00:00	97.62	1.84

Date	Time	Stage Elevation	Calculated Q (cms)
06/09/2014	4:00:00	97.62	1.86
06/09/2014	5:00:00	97.63	1.89
06/09/2014	6:00:00	97.63	1.91
06/09/2014	7:00:00	97.63	1.91
06/09/2014	8:00:00	97.63	1.91
06/09/2014	9:00:00	97.63	1.92
06/09/2014	10:00:00	97.63	1.92
06/09/2014	11:00:00	97.63	1.93
06/09/2014	12:00:00	97.63	1.93
06/09/2014	13:00:00	97.63	1.92
06/09/2014	14:00:00	97.63	1.92
06/09/2014	15:00:00	97.63	1.92
06/09/2014	16:00:00	97.63	1.92
06/09/2014	17:00:00	97.63	1.90
06/09/2014	18:00:00	97.63	1.92
06/09/2014	19:00:00	97.63	1.90
06/09/2014	20:00:00	97.63	1.90
06/09/2014	21:00:00	97.63	1.92
06/09/2014	22:00:00	97.63	1.92
06/09/2014	23:00:00	97.63	1.90
07/09/2014	0:00:00	97.63	1.90
07/09/2014	1:00:00	97.63	1.91
07/09/2014	2:00:00	97.63	1.89
07/09/2014	3:00:00	97.63	1.90
07/09/2014	4:00:00	97.63	1.90
07/09/2014	5:00:00	97.63	1.90
07/09/2014	6:00:00	97.63	1.90
07/09/2014	7:00:00	97.63	1.90
07/09/2014	8:00:00	97.63	1.90
07/09/2014	9:00:00	97.63	1.90
07/09/2014	10:00:00	97.63	1.90
07/09/2014	11:00:00	97.63	1.90
07/09/2014	12:00:00	97.63	1.89
07/09/2014	13:00:00	97.62	1.88
07/09/2014	14:00:00	97.63	1.90
07/09/2014	15:00:00	97.62	1.88
07/09/2014	16:00:00	97.62	1.87
07/09/2014	17:00:00	97.62	1.88
07/09/2014	18:00:00	97.63	1.89
07/09/2014	19:00:00	97.63	1.89
07/09/2014	20:00:00	97.63	1.90
07/09/2014	21:00:00	97.63	1.92
07/09/2014	22:00:00	97.64	1.95
07/09/2014	23:00:00	97.65	2.02
08/09/2014	0:00:00	97.66	2.11

Date	Time	Stage Elevation	Calculated Q (cms)
08/09/2014	1:00:00	97.68	2.22
08/09/2014	2:00:00	97.69	2.29
08/09/2014	3:00:00	97.69	2.33
08/09/2014	4:00:00	97.68	2.23
08/09/2014	5:00:00	97.66	2.14
08/09/2014	6:00:00	97.66	2.08
08/09/2014	7:00:00	97.66	2.10
08/09/2014	8:00:00	97.67	2.17
08/09/2014	9:00:00	97.67	2.15
08/09/2014	10:00:00	97.68	2.22
08/09/2014	11:00:00	97.68	2.22
08/09/2014	12:00:00	97.66	2.13
08/09/2014	13:00:00	97.65	2.06
08/09/2014	14:00:00	97.65	2.04
08/09/2014	15:00:00	97.65	2.04
08/09/2014	16:00:00	97.65	2.04
08/09/2014	17:00:00	97.65	2.06
08/09/2014	18:00:00	97.65	2.08
08/09/2014	19:00:00	97.65	2.02
08/09/2014	20:00:00	97.64	1.97
08/09/2014	21:00:00	97.63	1.93
08/09/2014	22:00:00	97.63	1.92
08/09/2014	23:00:00	97.63	1.90
09/09/2014	0:00:00	97.63	1.90
09/09/2014	1:00:00	97.62	1.88
09/09/2014	2:00:00	97.62	1.86
09/09/2014	3:00:00	97.62	1.84
09/09/2014	4:00:00	97.62	1.85
09/09/2014	5:00:00	97.62	1.84
09/09/2014	6:00:00	97.62	1.83
09/09/2014	7:00:00	97.62	1.83
09/09/2014	8:00:00	97.62	1.83
09/09/2014	9:00:00	97.62	1.83
09/09/2014	10:00:00	97.61	1.81
09/09/2014	11:00:00	97.61	1.81
09/09/2014	12:00:00	97.61	1.79
09/09/2014	13:00:00	97.61	1.80
09/09/2014	14:00:00	97.61	1.79
09/09/2014	15:00:00	97.61	1.79
09/09/2014	16:00:00	97.61	1.80
09/09/2014	17:00:00	97.61	1.78
09/09/2014	18:00:00	97.61	1.77
09/09/2014	19:00:00	97.61	1.77
09/09/2014	20:00:00	97.61	1.77
09/09/2014	21:00:00	97.61	1.77

Date	Time	Stage Elevation	Calculated Q (cms)
09/09/2014	22:00:00	97.61	1.76
09/09/2014	23:00:00	97.61	1.77
10/09/2014	0:00:00	97.61	1.77
10/09/2014	1:00:00	97.61	1.77
10/09/2014	2:00:00	97.61	1.77
10/09/2014	3:00:00	97.60	1.76
10/09/2014	4:00:00	97.60	1.74
10/09/2014	5:00:00	97.60	1.75
10/09/2014	6:00:00	97.60	1.75
10/09/2014	7:00:00	97.60	1.74
10/09/2014	8:00:00	97.60	1.74
10/09/2014	9:00:00	97.60	1.74
10/09/2014	10:00:00	97.60	1.74
10/09/2014	11:00:00	97.60	1.75
10/09/2014	12:00:00	97.61	1.79
10/09/2014	13:00:00	97.61	1.78
10/09/2014	14:00:00	97.61	1.78
10/09/2014	15:00:00	97.61	1.77
10/09/2014	16:00:00	97.61	1.77
10/09/2014	17:00:00	97.61	1.77
10/09/2014	18:00:00	97.61	1.77
10/09/2014	19:00:00	97.61	1.77
10/09/2014	20:00:00	97.61	1.76
10/09/2014	21:00:00	97.60	1.74
10/09/2014	22:00:00	97.60	1.74
10/09/2014	23:00:00	97.60	1.74
11/09/2014	0:00:00	97.60	1.75
11/09/2014	1:00:00	97.60	1.74
11/09/2014	2:00:00	97.60	1.74
11/09/2014	3:00:00	97.60	1.73
11/09/2014	4:00:00	97.60	1.73
11/09/2014	5:00:00	97.60	1.74
11/09/2014	6:00:00	97.60	1.73
11/09/2014	7:00:00	97.60	1.74
11/09/2014	8:00:00	97.60	1.72
11/09/2014	9:00:00	97.60	1.74
11/09/2014	10:00:00	97.60	1.74
11/09/2014	11:00:00	97.61	1.76
11/09/2014	12:00:00	97.61	1.78
11/09/2014	13:00:00	97.61	1.77
11/09/2014	14:00:00	97.61	1.77
11/09/2014	15:00:00	97.61	1.77
11/09/2014	16:00:00	97.61	1.76
11/09/2014	17:00:00	97.61	1.76
11/09/2014	18:00:00	97.61	1.76

Date	Time	Stage Elevation	Calculated Q (cms)
11/09/2014	19:00:00	97.61	1.77
11/09/2014	20:00:00	97.60	1.76
11/09/2014	21:00:00	97.60	1.76
11/09/2014	22:00:00	97.60	1.74
11/09/2014	23:00:00	97.60	1.75
12/09/2014	0:00:00	97.60	1.74
12/09/2014	1:00:00	97.60	1.75
12/09/2014	2:00:00	97.60	1.74
12/09/2014	3:00:00	97.60	1.74
12/09/2014	4:00:00	97.60	1.74
12/09/2014	5:00:00	97.61	1.76
12/09/2014	6:00:00	97.60	1.75
12/09/2014	7:00:00	97.60	1.75
12/09/2014	8:00:00	97.60	1.75
12/09/2014	9:00:00	97.60	1.74
12/09/2014	10:00:00	97.60	1.75
12/09/2014	11:00:00	97.60	1.76
12/09/2014	12:00:00	97.61	1.76
12/09/2014	13:00:00	97.61	1.76
12/09/2014	14:00:00	97.61	1.76
12/09/2014	15:00:00	97.61	1.76
12/09/2014	16:00:00	97.61	1.77
12/09/2014	17:00:00	97.61	1.76
12/09/2014	18:00:00	97.61	1.76
12/09/2014	19:00:00	97.60	1.76
12/09/2014	20:00:00	97.60	1.73
12/09/2014	21:00:00	97.60	1.74
12/09/2014	22:00:00	97.60	1.73
12/09/2014	23:00:00	97.60	1.74
13/09/2014	0:00:00	97.60	1.74
13/09/2014	1:00:00	97.60	1.74
13/09/2014	2:00:00	97.60	1.74
13/09/2014	3:00:00	97.60	1.74
13/09/2014	4:00:00	97.60	1.72
13/09/2014	5:00:00	97.60	1.74
13/09/2014	6:00:00	97.60	1.72
13/09/2014	7:00:00	97.60	1.72
13/09/2014	8:00:00	97.60	1.73
13/09/2014	9:00:00	97.60	1.72
13/09/2014	10:00:00	97.60	1.72
13/09/2014	11:00:00	97.60	1.72
13/09/2014	12:00:00	97.60	1.72
13/09/2014	13:00:00	97.60	1.75
13/09/2014	14:00:00	97.60	1.74
13/09/2014	15:00:00	97.60	1.74

Date	Time	Stage Elevation	Calculated Q (cms)
13/09/2014	16:00:00	97.60	1.74
13/09/2014	17:00:00	97.60	1.74
13/09/2014	18:00:00	97.60	1.73
13/09/2014	19:00:00	97.60	1.74
13/09/2014	20:00:00	97.60	1.74
13/09/2014	21:00:00	97.60	1.74
13/09/2014	22:00:00	97.60	1.73
13/09/2014	23:00:00	97.60	1.72
14/09/2014	0:00:00	97.60	1.71
14/09/2014	1:00:00	97.60	1.70
14/09/2014	2:00:00	97.60	1.72
14/09/2014	3:00:00	97.60	1.70
14/09/2014	4:00:00	97.60	1.72
14/09/2014	5:00:00	97.60	1.70
14/09/2014	6:00:00	97.60	1.70
14/09/2014	7:00:00	97.59	1.69
14/09/2014	8:00:00	97.60	1.70
14/09/2014	9:00:00	97.60	1.70
14/09/2014	10:00:00	97.60	1.70
14/09/2014	11:00:00	97.59	1.69
14/09/2014	12:00:00	97.59	1.69
14/09/2014	13:00:00	97.60	1.70
14/09/2014	14:00:00	97.60	1.70
14/09/2014	15:00:00	97.60	1.70
14/09/2014	16:00:00	97.60	1.70
14/09/2014	17:00:00	97.60	1.70
14/09/2014	18:00:00	97.60	1.70
14/09/2014	19:00:00	97.60	1.70
14/09/2014	20:00:00	97.60	1.71
14/09/2014	21:00:00	97.60	1.70
14/09/2014	22:00:00	97.60	1.70
14/09/2014	23:00:00	97.59	1.69
15/09/2014	0:00:00	97.60	1.70
15/09/2014	1:00:00	97.60	1.70
15/09/2014	2:00:00	97.59	1.69
15/09/2014	3:00:00	97.59	1.68
15/09/2014	4:00:00	97.59	1.69
15/09/2014	5:00:00	97.59	1.68
15/09/2014	6:00:00	97.59	1.68
15/09/2014	7:00:00	97.59	1.68
15/09/2014	8:00:00	97.59	1.68
15/09/2014	9:00:00	97.59	1.67
15/09/2014	10:00:00	97.59	1.68
15/09/2014	11:00:00	97.59	1.68
15/09/2014	12:00:00	97.59	1.69

Date	Time	Stage Elevation	Calculated Q (cms)
15/09/2014	13:00:00	97.59	1.68
15/09/2014	14:00:00	97.59	1.68
15/09/2014	15:00:00	97.59	1.69
15/09/2014	16:00:00	97.59	1.68
15/09/2014	17:00:00	97.59	1.69
15/09/2014	18:00:00	97.59	1.68
15/09/2014	19:00:00	97.59	1.69
15/09/2014	20:00:00	97.59	1.68
15/09/2014	21:00:00	97.59	1.68
15/09/2014	22:00:00	97.59	1.68
15/09/2014	23:00:00	97.59	1.68
16/09/2014	0:00:00	97.59	1.67
16/09/2014	1:00:00	97.59	1.67
16/09/2014	2:00:00	97.59	1.67
16/09/2014	3:00:00	97.59	1.66
16/09/2014	4:00:00	97.59	1.67
16/09/2014	5:00:00	97.59	1.65
16/09/2014	6:00:00	97.59	1.65
16/09/2014	7:00:00	97.59	1.65
16/09/2014	8:00:00	97.59	1.65
16/09/2014	9:00:00	97.59	1.66
16/09/2014	10:00:00	97.59	1.67
16/09/2014	11:00:00	97.59	1.67
16/09/2014	12:00:00	97.59	1.66
16/09/2014	13:00:00	97.59	1.66
16/09/2014	14:00:00	97.59	1.66
16/09/2014	15:00:00	97.59	1.68
16/09/2014	16:00:00	97.59	1.68
16/09/2014	17:00:00	97.59	1.67
16/09/2014	18:00:00	97.59	1.67
16/09/2014	19:00:00	97.59	1.67
16/09/2014	20:00:00	97.59	1.68
16/09/2014	21:00:00	97.59	1.66
16/09/2014	22:00:00	97.59	1.66
16/09/2014	23:00:00	97.59	1.67
17/09/2014	0:00:00	97.59	1.66
17/09/2014	1:00:00	97.59	1.65
17/09/2014	2:00:00	97.59	1.65
17/09/2014	3:00:00	97.59	1.65
17/09/2014	4:00:00	97.59	1.65
17/09/2014	5:00:00	97.59	1.65
17/09/2014	6:00:00	97.59	1.65
17/09/2014	7:00:00	97.59	1.64
17/09/2014	8:00:00	97.59	1.63
17/09/2014	9:00:00	97.59	1.64

Date	Time	Stage Elevation	Calculated Q (cms)
17/09/2014	10:00:00	97.58	1.63
17/09/2014	11:00:00	97.59	1.63
17/09/2014	12:00:00	97.59	1.65
17/09/2014	13:00:00	97.59	1.63
17/09/2014	14:00:00	97.60	1.75
17/09/2014	15:00:00	97.64	1.97
17/09/2014	16:00:00	97.65	2.02
17/09/2014	17:00:00	97.64	2.00
17/09/2014	18:00:00	97.64	1.98
17/09/2014	19:00:00	97.63	1.94
17/09/2014	20:00:00	97.63	1.93
17/09/2014	21:00:00	97.63	1.92
17/09/2014	22:00:00	97.63	1.91
17/09/2014	23:00:00	97.62	1.87
18/09/2014	0:00:00	97.62	1.86
18/09/2014	1:00:00	97.62	1.84
18/09/2014	2:00:00	97.62	1.83
18/09/2014	3:00:00	97.62	1.83
18/09/2014	4:00:00	97.61	1.79
18/09/2014	5:00:00	97.61	1.78
18/09/2014	6:00:00	97.61	1.77
18/09/2014	7:00:00	97.61	1.76
18/09/2014	8:00:00	97.60	1.74
18/09/2014	9:00:00	97.60	1.74
18/09/2014	10:00:00	97.60	1.73
18/09/2014	11:00:00	97.60	1.74
18/09/2014	12:00:00	97.60	1.73
18/09/2014	13:00:00	97.60	1.73
18/09/2014	14:00:00	97.60	1.70
18/09/2014	15:00:00	97.60	1.70
18/09/2014	16:00:00	97.59	1.68
18/09/2014	17:00:00	97.59	1.68
18/09/2014	18:00:00	97.59	1.68
18/09/2014	19:00:00	97.59	1.68
18/09/2014	20:00:00	97.59	1.67
18/09/2014	21:00:00	97.59	1.66
18/09/2014	22:00:00	97.59	1.67
18/09/2014	23:00:00	97.59	1.66
19/09/2014	0:00:00	97.59	1.65
19/09/2014	1:00:00	97.59	1.63
19/09/2014	2:00:00	97.59	1.63
19/09/2014	3:00:00	97.58	1.61
19/09/2014	4:00:00	97.59	1.63
19/09/2014	5:00:00	97.58	1.62
19/09/2014	6:00:00	97.58	1.62

Date	Time	Stage Elevation	Calculated Q (cms)
19/09/2014	7:00:00	97.58	1.61
19/09/2014	8:00:00	97.58	1.61
19/09/2014	9:00:00	97.58	1.61
19/09/2014	10:00:00	97.58	1.62
19/09/2014	11:00:00	97.59	1.63
19/09/2014	12:00:00	97.58	1.60
19/09/2014	13:00:00	97.58	1.58
19/09/2014	14:00:00	97.58	1.61
19/09/2014	15:00:00	97.58	1.60
19/09/2014	16:00:00	97.58	1.58
19/09/2014	17:00:00	97.57	1.55
19/09/2014	18:00:00	97.58	1.57
19/09/2014	19:00:00	97.57	1.55
19/09/2014	20:00:00	97.57	1.52
19/09/2014	21:00:00	97.57	1.52
19/09/2014	22:00:00	97.56	1.50
19/09/2014	23:00:00	97.56	1.49
20/09/2014	0:00:00	97.56	1.49
20/09/2014	1:00:00	97.56	1.49
20/09/2014	2:00:00	97.56	1.49
20/09/2014	3:00:00	97.57	1.52
20/09/2014	4:00:00	97.57	1.52
20/09/2014	5:00:00	97.57	1.55
20/09/2014	6:00:00	97.57	1.56
20/09/2014	7:00:00	97.58	1.60
20/09/2014	8:00:00	97.58	1.62
20/09/2014	9:00:00	97.59	1.64
20/09/2014	10:00:00	97.59	1.64
20/09/2014	11:00:00	97.59	1.67
20/09/2014	12:00:00	97.59	1.67
20/09/2014	13:00:00	97.59	1.66
20/09/2014	14:00:00	97.59	1.66
20/09/2014	15:00:00	97.59	1.66
20/09/2014	16:00:00	97.59	1.65
20/09/2014	17:00:00	97.59	1.63
20/09/2014	18:00:00	97.59	1.64
20/09/2014	19:00:00	97.58	1.63
20/09/2014	20:00:00	97.59	1.63
20/09/2014	21:00:00	97.58	1.62
20/09/2014	22:00:00	97.58	1.60
20/09/2014	23:00:00	97.58	1.60
21/09/2014	0:00:00	97.58	1.59
21/09/2014	1:00:00	97.58	1.57
21/09/2014	2:00:00	97.58	1.57
21/09/2014	3:00:00	97.57	1.56

Date	Time	Stage Elevation	Calculated Q (cms)
21/09/2014	4:00:00	97.57	1.56
21/09/2014	5:00:00	97.57	1.56
21/09/2014	6:00:00	97.57	1.54
21/09/2014	7:00:00	97.57	1.55
21/09/2014	8:00:00	97.57	1.56
21/09/2014	9:00:00	97.57	1.56
21/09/2014	10:00:00	97.57	1.54
21/09/2014	11:00:00	97.57	1.54
21/09/2014	12:00:00	97.57	1.55
21/09/2014	13:00:00	97.57	1.55
21/09/2014	14:00:00	97.57	1.52
21/09/2014	15:00:00	97.57	1.54
21/09/2014	16:00:00	97.57	1.52
21/09/2014	17:00:00	97.57	1.53
21/09/2014	18:00:00	97.57	1.52
21/09/2014	19:00:00	97.57	1.52
21/09/2014	20:00:00	97.57	1.52
21/09/2014	21:00:00	97.57	1.52
21/09/2014	22:00:00	97.57	1.51
21/09/2014	23:00:00	97.57	1.51
22/09/2014	0:00:00	97.57	1.51
22/09/2014	1:00:00	97.56	1.49
22/09/2014	2:00:00	97.56	1.49
22/09/2014	3:00:00	97.56	1.49
22/09/2014	4:00:00	97.56	1.48
22/09/2014	5:00:00	97.56	1.49
22/09/2014	6:00:00	97.56	1.48
22/09/2014	7:00:00	97.56	1.47
22/09/2014	8:00:00	97.56	1.47
22/09/2014	9:00:00	97.56	1.47
22/09/2014	10:00:00	97.56	1.47
22/09/2014	11:00:00	97.56	1.48
22/09/2014	12:00:00	97.56	1.48
22/09/2014	13:00:00	97.56	1.47
22/09/2014	14:00:00	97.56	1.47
22/09/2014	15:00:00	97.56	1.47
22/09/2014	16:00:00	97.56	1.47
22/09/2014	17:00:00	97.56	1.48
22/09/2014	18:00:00	97.56	1.47
22/09/2014	19:00:00	97.56	1.47
22/09/2014	20:00:00	97.56	1.47
22/09/2014	21:00:00	97.56	1.49
22/09/2014	22:00:00	97.56	1.47
22/09/2014	23:00:00	97.56	1.45
23/09/2014	0:00:00	97.56	1.46

Date	Time	Stage Elevation	Calculated Q (cms)
23/09/2014	1:00:00	97.56	1.46
23/09/2014	2:00:00	97.56	1.45
23/09/2014	3:00:00	97.56	1.45
23/09/2014	4:00:00	97.55	1.43
23/09/2014	5:00:00	97.55	1.43
23/09/2014	6:00:00	97.55	1.43
23/09/2014	7:00:00	97.55	1.41
23/09/2014	8:00:00	97.55	1.43
23/09/2014	9:00:00	97.55	1.43
23/09/2014	10:00:00	97.55	1.42
23/09/2014	11:00:00	97.55	1.42
23/09/2014	12:00:00	97.55	1.43
23/09/2014	13:00:00	97.55	1.42
23/09/2014	14:00:00	97.55	1.42
23/09/2014	15:00:00	97.55	1.42
23/09/2014	16:00:00	97.55	1.42
23/09/2014	17:00:00	97.55	1.42
23/09/2014	18:00:00	97.55	1.42
23/09/2014	19:00:00	97.55	1.43
23/09/2014	20:00:00	97.55	1.43
23/09/2014	21:00:00	97.55	1.41
23/09/2014	22:00:00	97.55	1.41
23/09/2014	23:00:00	97.55	1.40
24/09/2014	0:00:00	97.55	1.40
24/09/2014	1:00:00	97.55	1.40
24/09/2014	2:00:00	97.55	1.40
24/09/2014	3:00:00	97.55	1.39
24/09/2014	4:00:00	97.55	1.40
24/09/2014	5:00:00	97.55	1.40
24/09/2014	6:00:00	97.55	1.40
24/09/2014	7:00:00	97.55	1.40
24/09/2014	8:00:00	97.55	1.39
24/09/2014	9:00:00	97.55	1.38
24/09/2014	10:00:00	97.55	1.40
24/09/2014	11:00:00	97.55	1.40
24/09/2014	12:00:00	97.55	1.39
24/09/2014	13:00:00	97.55	1.41
24/09/2014	14:00:00	97.55	1.40
24/09/2014	15:00:00	97.55	1.40
24/09/2014	16:00:00	97.55	1.41
24/09/2014	17:00:00	97.55	1.41
24/09/2014	18:00:00	97.55	1.40
24/09/2014	19:00:00	97.55	1.40
24/09/2014	20:00:00	97.55	1.39
24/09/2014	21:00:00	97.55	1.38

Date	Time	Stage Elevation	Calculated Q (cms)
24/09/2014	22:00:00	97.55	1.38
24/09/2014	23:00:00	97.55	1.39
25/09/2014	0:00:00	97.54	1.36
25/09/2014	1:00:00	97.54	1.37
25/09/2014	2:00:00	97.55	1.43
25/09/2014	3:00:00	97.55	1.39
25/09/2014	4:00:00	97.55	1.38
25/09/2014	5:00:00	97.54	1.37
25/09/2014	6:00:00	97.55	1.38
25/09/2014	7:00:00	97.55	1.39
25/09/2014	8:00:00	97.55	1.39
25/09/2014	9:00:00	97.55	1.39
25/09/2014	10:00:00	97.55	1.39
25/09/2014	11:00:00	97.55	1.40
25/09/2014	12:00:00	97.55	1.40
25/09/2014	13:00:00	97.55	1.40
25/09/2014	14:00:00	97.55	1.40
25/09/2014	15:00:00	97.55	1.40
25/09/2014	16:00:00	97.55	1.41
25/09/2014	17:00:00	97.55	1.42
25/09/2014	18:00:00	97.55	1.40
25/09/2014	19:00:00	97.55	1.40
25/09/2014	20:00:00	97.55	1.41
25/09/2014	21:00:00	97.55	1.42
25/09/2014	22:00:00	97.55	1.43
25/09/2014	23:00:00	97.56	1.50
26/09/2014	0:00:00	97.58	1.58
26/09/2014	1:00:00	97.58	1.63
26/09/2014	2:00:00	97.63	1.93
26/09/2014	3:00:00	97.74	2.61
26/09/2014	4:00:00	97.87	3.48
26/09/2014	5:00:00	97.95	4.00
26/09/2014	6:00:00	98.04	4.54
26/09/2014	7:00:00	98.09	4.88
26/09/2014	8:00:00	98.10	4.91
26/09/2014	9:00:00	98.06	4.69
26/09/2014	10:00:00	98.05	4.61
26/09/2014	11:00:00	98.00	4.30
26/09/2014	12:00:00	97.94	3.91
26/09/2014	13:00:00	97.88	3.54
26/09/2014	14:00:00	97.85	3.34
26/09/2014	15:00:00	97.82	3.14
26/09/2014	16:00:00	97.81	3.04
26/09/2014	17:00:00	97.79	2.94
26/09/2014	18:00:00	97.77	2.84

Date	Time	Stage Elevation	Calculated Q (cms)
26/09/2014	19:00:00	97.75	2.66
26/09/2014	20:00:00	97.71	2.43
26/09/2014	21:00:00	97.69	2.28
26/09/2014	22:00:00	97.67	2.18
26/09/2014	23:00:00	97.66	2.10
27/09/2014	0:00:00	97.65	2.04
27/09/2014	1:00:00	97.64	1.99
27/09/2014	2:00:00	97.63	1.94
27/09/2014	3:00:00	97.63	1.90
27/09/2014	4:00:00	97.62	1.85
27/09/2014	5:00:00	97.61	1.81
27/09/2014	6:00:00	97.61	1.77
27/09/2014	7:00:00	97.60	1.76
27/09/2014	8:00:00	97.60	1.72
27/09/2014	9:00:00	97.60	1.71
27/09/2014	10:00:00	97.59	1.67
27/09/2014	11:00:00	97.59	1.67
27/09/2014	12:00:00	97.59	1.65
27/09/2014	13:00:00	97.59	1.63
27/09/2014	14:00:00	97.58	1.63
27/09/2014	15:00:00	97.58	1.61
27/09/2014	16:00:00	97.58	1.60
27/09/2014	17:00:00	97.58	1.60
27/09/2014	18:00:00	97.58	1.58
27/09/2014	19:00:00	97.57	1.56
27/09/2014	20:00:00	97.57	1.55
27/09/2014	21:00:00	97.57	1.54
27/09/2014	22:00:00	97.57	1.52
27/09/2014	23:00:00	97.57	1.52
28/09/2014	0:00:00	97.56	1.49
28/09/2014	1:00:00	97.56	1.50
28/09/2014	2:00:00	97.56	1.49
28/09/2014	3:00:00	97.56	1.47
28/09/2014	4:00:00	97.56	1.48
28/09/2014	5:00:00	97.56	1.46
28/09/2014	6:00:00	97.56	1.45
28/09/2014	7:00:00	97.56	1.46
28/09/2014	8:00:00	97.56	1.45
28/09/2014	9:00:00	97.56	1.45
28/09/2014	10:00:00	97.56	1.44
28/09/2014	11:00:00	97.56	1.44
28/09/2014	12:00:00	97.56	1.44
28/09/2014	13:00:00	97.56	1.45
28/09/2014	14:00:00	97.56	1.45
28/09/2014	15:00:00	97.56	1.44

Date	Time	Stage Elevation	Calculated Q (cms)
28/09/2014	16:00:00	97.56	1.45
28/09/2014	17:00:00	97.55	1.43
28/09/2014	18:00:00	97.55	1.43
28/09/2014	19:00:00	97.55	1.42
28/09/2014	20:00:00	97.55	1.42
28/09/2014	21:00:00	97.55	1.41
28/09/2014	22:00:00	97.55	1.41
28/09/2014	23:00:00	97.55	1.41
29/09/2014	0:00:00	97.55	1.39
29/09/2014	1:00:00	97.55	1.39
29/09/2014	2:00:00	97.55	1.40
29/09/2014	3:00:00	97.55	1.40
29/09/2014	4:00:00	97.55	1.40
29/09/2014	5:00:00	97.55	1.40
29/09/2014	6:00:00	97.55	1.39
29/09/2014	7:00:00	97.55	1.40
29/09/2014	8:00:00	97.55	1.39
29/09/2014	9:00:00	97.55	1.39
29/09/2014	10:00:00	97.55	1.40
29/09/2014	11:00:00	97.55	1.40
29/09/2014	12:00:00	97.55	1.40
29/09/2014	13:00:00	97.55	1.39
29/09/2014	14:00:00	97.55	1.39
29/09/2014	15:00:00	97.55	1.40
29/09/2014	16:00:00	97.55	1.39
29/09/2014	17:00:00	97.55	1.40
29/09/2014	18:00:00	97.55	1.40
29/09/2014	19:00:00	97.55	1.40
29/09/2014	20:00:00	97.55	1.38
29/09/2014	21:00:00	97.55	1.39
29/09/2014	22:00:00	97.55	1.39
29/09/2014	23:00:00	97.55	1.39
30/09/2014	0:00:00	97.54	1.36
30/09/2014	1:00:00	97.54	1.36
30/09/2014	2:00:00	97.54	1.35
30/09/2014	3:00:00	97.54	1.35
30/09/2014	4:00:00	97.54	1.35
30/09/2014	5:00:00	97.54	1.34
30/09/2014	6:00:00	97.54	1.34
30/09/2014	7:00:00	97.54	1.33
30/09/2014	8:00:00	97.54	1.33
30/09/2014	9:00:00	97.54	1.32
30/09/2014	10:00:00	97.54	1.33
30/09/2014	11:00:00	97.54	1.35
30/09/2014	12:00:00	97.54	1.33

Date	Time	Stage Elevation	Calculated Q (cms)
30/09/2014	13:00:00	97.54	1.35
30/09/2014	14:00:00	97.54	1.34
30/09/2014	15:00:00	97.54	1.35
30/09/2014	16:00:00	97.54	1.35
30/09/2014	17:00:00	97.54	1.33
30/09/2014	18:00:00	97.54	1.33
30/09/2014	19:00:00	97.54	1.32
30/09/2014	20:00:00	97.54	1.31
30/09/2014	21:00:00	97.53	1.31
30/09/2014	22:00:00	97.53	1.31
30/09/2014	23:00:00	97.53	1.29
01/10/2014	0:00:00	97.53	1.29
01/10/2014	1:00:00	97.53	1.28
01/10/2014	2:00:00	97.53	1.28
01/10/2014	3:00:00	97.53	1.29
01/10/2014	4:00:00	97.53	1.29
01/10/2014	5:00:00	97.53	1.28
01/10/2014	6:00:00	97.53	1.29
01/10/2014	7:00:00	97.53	1.28
01/10/2014	8:00:00	97.53	1.29
01/10/2014	9:00:00	97.53	1.27
01/10/2014	10:00:00	97.53	1.27
01/10/2014	11:00:00	97.53	1.27
01/10/2014	12:00:00	97.53	1.29
01/10/2014	13:00:00	97.53	1.27
01/10/2014	14:00:00	97.53	1.29
01/10/2014	15:00:00	97.53	1.29
01/10/2014	16:00:00	97.53	1.27
01/10/2014	17:00:00	97.53	1.28
01/10/2014	18:00:00	97.53	1.27
01/10/2014	19:00:00	97.53	1.26
01/10/2014	20:00:00	97.53	1.26
01/10/2014	21:00:00	97.53	1.25
01/10/2014	22:00:00	97.53	1.25
01/10/2014	23:00:00	97.52	1.24
02/10/2014	0:00:00	97.52	1.22
02/10/2014	1:00:00	97.52	1.22
02/10/2014	2:00:00	97.52	1.22
02/10/2014	3:00:00	97.52	1.23
02/10/2014	4:00:00	97.52	1.21
02/10/2014	5:00:00	97.52	1.22
02/10/2014	6:00:00	97.52	1.22
02/10/2014	7:00:00	97.52	1.22
02/10/2014	8:00:00	97.52	1.22
02/10/2014	9:00:00	97.52	1.22

Date	Time	Stage Elevation	Calculated Q (cms)
02/10/2014	10:00:00	97.52	1.22
02/10/2014	11:00:00	97.52	1.24
02/10/2014	12:00:00	97.53	1.25
02/10/2014	13:00:00	97.53	1.27
02/10/2014	14:00:00	97.53	1.27
02/10/2014	15:00:00	97.53	1.27
02/10/2014	16:00:00	97.53	1.26
02/10/2014	17:00:00	97.53	1.25
02/10/2014	18:00:00	97.53	1.26
02/10/2014	19:00:00	97.53	1.26
02/10/2014	20:00:00	97.52	1.24
02/10/2014	21:00:00	97.52	1.23
02/10/2014	22:00:00	97.52	1.23
02/10/2014	23:00:00	97.52	1.21
03/10/2014	0:00:00	97.52	1.22
03/10/2014	1:00:00	97.52	1.21
03/10/2014	2:00:00	97.52	1.22
03/10/2014	3:00:00	97.52	1.20
03/10/2014	4:00:00	97.52	1.21
03/10/2014	5:00:00	97.52	1.20
03/10/2014	6:00:00	97.52	1.20
03/10/2014	7:00:00	97.52	1.20
03/10/2014	8:00:00	97.52	1.20
03/10/2014	9:00:00	97.51	1.18
03/10/2014	10:00:00	97.52	1.19
03/10/2014	11:00:00	97.52	1.20
03/10/2014	12:00:00	97.52	1.24
03/10/2014	13:00:00	97.53	1.27
03/10/2014	14:00:00	97.54	1.31
03/10/2014	15:00:00	97.54	1.37
03/10/2014	16:00:00	97.55	1.42
03/10/2014	17:00:00	97.55	1.42
03/10/2014	18:00:00	97.54	1.36
03/10/2014	19:00:00	97.54	1.31
03/10/2014	20:00:00	97.53	1.27
03/10/2014	21:00:00	97.53	1.26
03/10/2014	22:00:00	97.52	1.24
03/10/2014	23:00:00	97.52	1.23
04/10/2014	0:00:00	97.52	1.22
04/10/2014	1:00:00	97.52	1.22
04/10/2014	2:00:00	97.52	1.21
04/10/2014	3:00:00	97.52	1.21
04/10/2014	4:00:00	97.52	1.22
04/10/2014	5:00:00	97.52	1.20
04/10/2014	6:00:00	97.52	1.20

Date	Time	Stage Elevation	Calculated Q (cms)
04/10/2014	7:00:00	97.52	1.20
04/10/2014	8:00:00	97.52	1.20
04/10/2014	9:00:00	97.52	1.20
04/10/2014	10:00:00	97.51	1.18
04/10/2014	11:00:00	97.52	1.20
04/10/2014	12:00:00	97.52	1.20
04/10/2014	13:00:00	97.52	1.20
04/10/2014	14:00:00	97.52	1.20
04/10/2014	15:00:00	97.52	1.20
04/10/2014	16:00:00	97.52	1.20
04/10/2014	17:00:00	97.52	1.20
04/10/2014	18:00:00	97.52	1.20
04/10/2014	19:00:00	97.52	1.20
04/10/2014	20:00:00	97.52	1.19
04/10/2014	21:00:00	97.51	1.18
04/10/2014	22:00:00	97.51	1.17
04/10/2014	23:00:00	97.51	1.17
05/10/2014	0:00:00	97.51	1.15
05/10/2014	1:00:00	97.51	1.15
05/10/2014	2:00:00	97.51	1.15
05/10/2014	3:00:00	97.51	1.15
05/10/2014	4:00:00	97.51	1.14
05/10/2014	5:00:00	97.51	1.15
05/10/2014	6:00:00	97.51	1.16
05/10/2014	7:00:00	97.51	1.17
05/10/2014	8:00:00	97.51	1.15
05/10/2014	9:00:00	97.51	1.15
05/10/2014	10:00:00	97.51	1.15
05/10/2014	11:00:00	97.51	1.17
05/10/2014	12:00:00	97.51	1.18
05/10/2014	13:00:00	97.52	1.19
05/10/2014	14:00:00	97.52	1.19
05/10/2014	15:00:00	97.52	1.19
05/10/2014	16:00:00	97.52	1.19
05/10/2014	17:00:00	97.52	1.19
05/10/2014	18:00:00	97.52	1.19
05/10/2014	19:00:00	97.52	1.19
05/10/2014	20:00:00	97.52	1.19
05/10/2014	21:00:00	97.52	1.19
05/10/2014	22:00:00	97.52	1.19
05/10/2014	23:00:00	97.52	1.22
06/10/2014	0:00:00	97.52	1.20
06/10/2014	1:00:00	97.52	1.22
06/10/2014	2:00:00	97.53	1.29
06/10/2014	3:00:00	97.55	1.43

Date	Time	Stage Elevation	Calculated Q (cms)
06/10/2014	4:00:00	97.55	1.42
06/10/2014	5:00:00	97.54	1.33
06/10/2014	6:00:00	97.53	1.30
06/10/2014	7:00:00	97.53	1.26
06/10/2014	8:00:00	97.52	1.23
06/10/2014	9:00:00	97.52	1.20
06/10/2014	10:00:00	97.52	1.19
06/10/2014	11:00:00	97.52	1.19
06/10/2014	12:00:00	97.51	1.18
06/10/2014	13:00:00	97.52	1.19
06/10/2014	14:00:00	97.51	1.15
06/10/2014	15:00:00	97.51	1.17
06/10/2014	16:00:00	97.51	1.15
06/10/2014	17:00:00	97.51	1.16
06/10/2014	18:00:00	97.51	1.17
06/10/2014	19:00:00	97.51	1.17
06/10/2014	20:00:00	97.51	1.14
06/10/2014	21:00:00	97.51	1.15
06/10/2014	22:00:00	97.51	1.13
06/10/2014	23:00:00	97.51	1.14
07/10/2014	0:00:00	97.51	1.12
07/10/2014	1:00:00	97.51	1.13
07/10/2014	2:00:00	97.51	1.13
07/10/2014	3:00:00	97.50	1.11
07/10/2014	4:00:00	97.51	1.13
07/10/2014	5:00:00	97.51	1.13
07/10/2014	6:00:00	97.51	1.13
07/10/2014	7:00:00	97.51	1.13
07/10/2014	8:00:00	97.50	1.10
07/10/2014	9:00:00	97.50	1.11
07/10/2014	10:00:00	97.50	1.11
07/10/2014	11:00:00	97.51	1.14
07/10/2014	12:00:00	97.51	1.14
07/10/2014	13:00:00	97.51	1.15
07/10/2014	14:00:00	97.51	1.14
07/10/2014	15:00:00	97.51	1.17
07/10/2014	16:00:00	97.51	1.15
07/10/2014	17:00:00	97.51	1.14
07/10/2014	18:00:00	97.51	1.15
07/10/2014	19:00:00	97.51	1.14
07/10/2014	20:00:00	97.51	1.13
07/10/2014	21:00:00	97.51	1.13
07/10/2014	22:00:00	97.51	1.12
07/10/2014	23:00:00	97.51	1.12
08/10/2014	0:00:00	97.51	1.12

Date	Time	Stage Elevation	Calculated Q (cms)
08/10/2014	1:00:00	97.51	1.12
08/10/2014	2:00:00	97.50	1.11
08/10/2014	3:00:00	97.50	1.11
08/10/2014	4:00:00	97.51	1.12
08/10/2014	5:00:00	97.51	1.12
08/10/2014	6:00:00	97.50	1.11
08/10/2014	7:00:00	97.50	1.10
08/10/2014	8:00:00	97.50	1.11
08/10/2014	9:00:00	97.50	1.10
08/10/2014	10:00:00	97.50	1.09
08/10/2014	11:00:00	97.50	1.09
08/10/2014	12:00:00	97.50	1.10
08/10/2014	13:00:00	97.50	1.10
08/10/2014	14:00:00	97.50	1.10
08/10/2014	15:00:00	97.50	1.10
08/10/2014	16:00:00	97.50	1.10
08/10/2014	17:00:00	97.50	1.09
08/10/2014	18:00:00	97.50	1.08
08/10/2014	19:00:00	97.50	1.08
08/10/2014	20:00:00	97.50	1.09
08/10/2014	21:00:00	97.50	1.08
08/10/2014	22:00:00	97.50	1.08
08/10/2014	23:00:00	97.50	1.08
09/10/2014	0:00:00	97.50	1.07
09/10/2014	1:00:00	97.50	1.06
09/10/2014	2:00:00	97.50	1.06
09/10/2014	3:00:00	97.49	1.05
09/10/2014	4:00:00	97.50	1.06
09/10/2014	5:00:00	97.49	1.05
09/10/2014	6:00:00	97.49	1.04
09/10/2014	7:00:00	97.49	1.04
09/10/2014	8:00:00	97.49	1.04
09/10/2014	9:00:00	97.49	1.05
09/10/2014	10:00:00	97.49	1.04
09/10/2014	11:00:00	97.49	1.05
09/10/2014	12:00:00	97.49	1.04
09/10/2014	13:00:00	97.49	1.04
09/10/2014	14:00:00	97.50	1.06
09/10/2014	15:00:00	97.50	1.07
09/10/2014	16:00:00	97.50	1.06
09/10/2014	17:00:00	97.50	1.06
09/10/2014	18:00:00	97.50	1.06
09/10/2014	19:00:00	97.49	1.05
09/10/2014	20:00:00	97.49	1.05
09/10/2014	21:00:00	97.50	1.06

Date	Time	Stage Elevation	Calculated Q (cms)
09/10/2014	22:00:00	97.49	1.04
09/10/2014	23:00:00	97.49	1.04
10/10/2014	0:00:00	97.49	1.04
10/10/2014	1:00:00	97.49	1.03
10/10/2014	2:00:00	97.49	1.02
10/10/2014	3:00:00	97.49	1.02
10/10/2014	4:00:00	97.49	1.01
10/10/2014	5:00:00	97.49	1.01
10/10/2014	6:00:00	97.49	1.01
10/10/2014	7:00:00	97.49	1.01
10/10/2014	8:00:00	97.49	1.01
10/10/2014	9:00:00	97.49	1.01
10/10/2014	10:00:00	97.49	1.02
10/10/2014	11:00:00	97.49	1.02
10/10/2014	12:00:00	97.49	1.03
10/10/2014	13:00:00	97.49	1.04
10/10/2014	14:00:00	97.49	1.02
10/10/2014	15:00:00	97.49	1.02
10/10/2014	16:00:00	97.49	1.03
10/10/2014	17:00:00	97.49	1.04
10/10/2014	18:00:00	97.52	1.20
10/10/2014	19:00:00	97.51	1.13
10/10/2014	20:00:00	97.49	1.04
10/10/2014	21:00:00	97.70	2.38
10/10/2014	22:00:00	97.76	2.77
10/10/2014	23:00:00	97.76	2.75
11/10/2014	0:00:00	97.75	2.72
11/10/2014	1:00:00	97.75	2.68
11/10/2014	2:00:00	97.74	2.63
11/10/2014	3:00:00	97.73	2.59
11/10/2014	4:00:00	97.73	2.55
11/10/2014	5:00:00	97.72	2.49
11/10/2014	6:00:00	97.72	2.47
11/10/2014	7:00:00	97.71	2.42
11/10/2014	8:00:00	97.70	2.36
11/10/2014	9:00:00	97.69	2.33
11/10/2014	10:00:00	97.69	2.28
11/10/2014	11:00:00	97.68	2.25
11/10/2014	12:00:00	97.67	2.17
11/10/2014	13:00:00	97.66	2.10
11/10/2014	14:00:00	97.65	2.02
11/10/2014	15:00:00	97.64	1.97
11/10/2014	16:00:00	97.63	1.89
11/10/2014	17:00:00	97.61	1.81
11/10/2014	18:00:00	97.60	1.71

Date	Time	Stage Elevation	Calculated Q (cms)
11/10/2014	19:00:00	97.58	1.60
11/10/2014	20:00:00	97.56	1.49
11/10/2014	21:00:00	97.54	1.35
11/10/2014	22:00:00	97.52	1.20
11/10/2014	23:00:00	97.50	1.09
12/10/2014	0:00:00	97.49	0.99
12/10/2014	1:00:00	97.47	0.92
12/10/2014	2:00:00	97.47	0.87
12/10/2014	3:00:00	97.46	0.84
12/10/2014	4:00:00	97.46	0.82
12/10/2014	5:00:00	97.46	0.80
12/10/2014	6:00:00	97.46	0.81
12/10/2014	7:00:00	97.46	0.81
12/10/2014	8:00:00	97.45	0.79
12/10/2014	9:00:00	97.46	0.80
12/10/2014	10:00:00	97.46	0.82
12/10/2014	11:00:00	97.46	0.83
12/10/2014	12:00:00	97.46	0.83
12/10/2014	13:00:00	97.46	0.85
12/10/2014	14:00:00	97.46	0.84
12/10/2014	15:00:00	97.46	0.84
12/10/2014	16:00:00	97.46	0.83
12/10/2014	17:00:00	97.46	0.84
12/10/2014	18:00:00	97.46	0.83
12/10/2014	19:00:00	97.46	0.81
12/10/2014	20:00:00	97.46	0.80
12/10/2014	21:00:00	97.45	0.78
12/10/2014	22:00:00	97.45	0.78
12/10/2014	23:00:00	97.45	0.77
13/10/2014	0:00:00	97.45	0.76
13/10/2014	1:00:00	97.45	0.75
13/10/2014	2:00:00	97.45	0.75
13/10/2014	3:00:00	97.45	0.75
13/10/2014	4:00:00	97.45	0.74
13/10/2014	5:00:00	97.45	0.74
13/10/2014	6:00:00	97.44	0.72
13/10/2014	7:00:00	97.44	0.73
13/10/2014	8:00:00	97.44	0.72
13/10/2014	9:00:00	97.44	0.73
13/10/2014	10:00:00	97.45	0.74
13/10/2014	11:00:00	97.45	0.75
13/10/2014	12:00:00	97.45	0.76
13/10/2014	13:00:00	97.45	0.76
13/10/2014	14:00:00	97.45	0.78
13/10/2014	15:00:00	97.45	0.77

Date	Time	Stage Elevation	Calculated Q (cms)
13/10/2014	16:00:00	97.45	0.77
13/10/2014	17:00:00	97.45	0.77
13/10/2014	18:00:00	97.45	0.78
13/10/2014	19:00:00	97.45	0.76
13/10/2014	20:00:00	97.45	0.76
13/10/2014	21:00:00	97.45	0.74
13/10/2014	22:00:00	97.44	0.72
13/10/2014	23:00:00	97.44	0.70
14/10/2014	0:00:00	97.44	0.69
14/10/2014	1:00:00	97.44	0.67
14/10/2014	2:00:00	97.43	0.67
14/10/2014	3:00:00	97.43	0.63
14/10/2014	4:00:00	97.43	0.63
14/10/2014	5:00:00	97.43	0.65
14/10/2014	6:00:00	97.43	0.63
14/10/2014	7:00:00	97.43	0.62
14/10/2014	8:00:00	97.43	0.66
14/10/2014	9:00:00	97.45	0.78
14/10/2014	10:00:00	97.44	0.70
14/10/2014	11:00:00	97.47	0.88
14/10/2014	12:00:00	97.64	2.01
14/10/2014	13:00:00	97.68	2.27
14/10/2014	14:00:00	97.63	1.94
14/10/2014	15:00:00	97.58	1.60
14/10/2014	16:00:00	97.54	1.36
14/10/2014	17:00:00	97.51	1.17
14/10/2014	18:00:00	97.50	1.08
14/10/2014	19:00:00	97.49	1.00
14/10/2014	20:00:00	97.48	0.95
14/10/2014	21:00:00	97.47	0.90
14/10/2014	22:00:00	97.46	0.85
14/10/2014	23:00:00	97.46	0.81
15/10/2014	0:00:00	97.45	0.78
15/10/2014	1:00:00	97.45	0.74
15/10/2014	2:00:00	97.44	0.72
15/10/2014	3:00:00	97.44	0.70
15/10/2014	4:00:00	97.43	0.67
15/10/2014	5:00:00	97.43	0.65
15/10/2014	6:00:00	97.43	0.62
15/10/2014	7:00:00	97.42	0.59
15/10/2014	8:00:00	97.42	0.59
15/10/2014	9:00:00	97.42	0.57
15/10/2014	10:00:00	97.42	0.58
15/10/2014	11:00:00	97.42	0.55
15/10/2014	12:00:00	97.42	0.55

Date	Time	Stage Elevation	Calculated Q (cms)
15/10/2014	13:00:00	97.42	0.54
15/10/2014	14:00:00	97.42	0.54
15/10/2014	15:00:00	97.42	0.54
15/10/2014	16:00:00	97.41	0.53
15/10/2014	17:00:00	97.41	0.50
15/10/2014	18:00:00	97.40	0.45
15/10/2014	19:00:00	97.40	0.43
15/10/2014	20:00:00	97.39	0.40
15/10/2014	21:00:00	97.39	0.37
15/10/2014	22:00:00	97.39	0.37
15/10/2014	23:00:00	97.39	0.35
16/10/2014	0:00:00	97.38	0.33
16/10/2014	1:00:00	97.38	0.34
16/10/2014	2:00:00	97.38	0.34
16/10/2014	3:00:00	97.39	0.36
16/10/2014	4:00:00	97.39	0.36
16/10/2014	5:00:00	97.39	0.35
16/10/2014	6:00:00	97.39	0.37
16/10/2014	7:00:00	97.39	0.38
16/10/2014	8:00:00	97.39	0.38
16/10/2014	9:00:00	97.39	0.40
16/10/2014	10:00:00	97.39	0.39
16/10/2014	11:00:00	97.39	0.40
16/10/2014	12:00:00	97.39	0.40
16/10/2014	13:00:00	97.39	0.40
16/10/2014	14:00:00	97.39	0.40
16/10/2014	15:00:00	97.39	0.40
16/10/2014	16:00:00	97.40	0.42
16/10/2014	17:00:00	97.39	0.41
16/10/2014	18:00:00	97.39	0.41
16/10/2014	19:00:00	97.39	0.41
16/10/2014	20:00:00	97.39	0.39
16/10/2014	21:00:00	97.39	0.37
16/10/2014	22:00:00	97.39	0.36
16/10/2014	23:00:00	97.39	0.36
17/10/2014	0:00:00	97.39	0.35
17/10/2014	1:00:00	97.38	0.33
17/10/2014	2:00:00	97.38	0.31
17/10/2014	3:00:00	97.38	0.31
17/10/2014	4:00:00	97.38	0.32
17/10/2014	5:00:00	97.38	0.34
17/10/2014	6:00:00	97.38	0.35
17/10/2014	7:00:00	97.39	0.36
17/10/2014	8:00:00	97.39	0.36
17/10/2014	9:00:00	97.38	0.35

Date	Time	Stage Elevation	Calculated Q (cms)
17/10/2014	10:00:00	97.39	0.37
17/10/2014	11:00:00	97.39	0.37
17/10/2014	12:00:00	97.39	0.40
17/10/2014	13:00:00	97.39	0.41
17/10/2014	14:00:00	97.39	0.41
17/10/2014	15:00:00	97.40	0.42
17/10/2014	16:00:00	97.40	0.42
17/10/2014	17:00:00	97.40	0.42
17/10/2014	18:00:00	97.40	0.42
17/10/2014	19:00:00	97.40	0.42
17/10/2014	20:00:00	97.42	0.54
17/10/2014	21:00:00	97.42	0.54
17/10/2014	22:00:00	97.41	0.48
17/10/2014	23:00:00	97.40	0.44
18/10/2014	0:00:00	97.39	0.41
18/10/2014	1:00:00	97.39	0.40
18/10/2014	2:00:00	97.39	0.40
18/10/2014	3:00:00	97.39	0.41
18/10/2014	4:00:00	97.40	0.42
18/10/2014	5:00:00	97.40	0.42
18/10/2014	6:00:00	97.39	0.41
18/10/2014	7:00:00	97.39	0.41
18/10/2014	8:00:00	97.39	0.39
18/10/2014	9:00:00	97.40	0.44
18/10/2014	10:00:00	97.40	0.45
18/10/2014	11:00:00	97.41	0.48
18/10/2014	12:00:00	97.41	0.49
18/10/2014	13:00:00	97.41	0.53
18/10/2014	14:00:00	97.41	0.49
18/10/2014	15:00:00	97.41	0.49
18/10/2014	16:00:00	97.41	0.49
18/10/2014	17:00:00	97.41	0.48
18/10/2014	18:00:00	97.41	0.49
18/10/2014	19:00:00	97.40	0.47
18/10/2014	20:00:00	97.40	0.46
18/10/2014	21:00:00	97.40	0.43
18/10/2014	22:00:00	97.39	0.39
18/10/2014	23:00:00	97.39	0.41
19/10/2014	0:00:00	97.39	0.41
19/10/2014	1:00:00	97.39	0.41
19/10/2014	2:00:00	97.39	0.40
19/10/2014	3:00:00	97.40	0.42
19/10/2014	4:00:00	97.39	0.41
19/10/2014	5:00:00	97.39	0.41
19/10/2014	6:00:00	97.39	0.39

Date	Time	Stage Elevation	Calculated Q (cms)
19/10/2014	7:00:00	97.39	0.39
19/10/2014	8:00:00	97.39	0.40
19/10/2014	9:00:00	97.39	0.40
19/10/2014	10:00:00	97.40	0.43
19/10/2014	11:00:00	97.40	0.45
19/10/2014	12:00:00	97.41	0.48
19/10/2014	13:00:00	97.40	0.47
19/10/2014	14:00:00	97.41	0.49
19/10/2014	15:00:00	97.41	0.49
19/10/2014	16:00:00	97.41	0.50
19/10/2014	17:00:00	97.41	0.49
19/10/2014	18:00:00	97.41	0.49
19/10/2014	19:00:00	97.41	0.49
19/10/2014	20:00:00	97.40	0.47
19/10/2014	21:00:00	97.40	0.47
19/10/2014	22:00:00	97.40	0.47
19/10/2014	23:00:00	97.40	0.47
20/10/2014	0:00:00	97.40	0.46
20/10/2014	1:00:00	97.40	0.45
20/10/2014	2:00:00	97.40	0.46
20/10/2014	3:00:00	97.40	0.47
20/10/2014	4:00:00	97.41	0.48
20/10/2014	5:00:00	97.40	0.46
20/10/2014	6:00:00	97.40	0.43
20/10/2014	7:00:00	97.40	0.43
20/10/2014	8:00:00	97.40	0.44
20/10/2014	9:00:00	97.40	0.44
20/10/2014	10:00:00	97.40	0.42
20/10/2014	11:00:00	97.39	0.41
20/10/2014	12:00:00	97.39	0.41
20/10/2014	13:00:00	97.40	0.42
20/10/2014	14:00:00	97.40	0.44
20/10/2014	15:00:00	97.40	0.45
20/10/2014	16:00:00	97.40	0.43
20/10/2014	17:00:00	97.40	0.44
20/10/2014	18:00:00	97.40	0.43
20/10/2014	19:00:00	97.40	0.42
20/10/2014	20:00:00	97.40	0.42
20/10/2014	21:00:00	97.40	0.43
20/10/2014	22:00:00	97.40	0.44
20/10/2014	23:00:00	97.40	0.44
21/10/2014	0:00:00	97.40	0.47
21/10/2014	1:00:00	97.41	0.48
21/10/2014	2:00:00	97.40	0.47
21/10/2014	3:00:00	97.40	0.47

Date	Time	Stage Elevation	Calculated Q (cms)
21/10/2014	4:00:00	97.40	0.45
21/10/2014	5:00:00	97.40	0.45
21/10/2014	6:00:00	97.40	0.45
21/10/2014	7:00:00	97.40	0.44
21/10/2014	8:00:00	97.40	0.44
21/10/2014	9:00:00	97.40	0.46
21/10/2014	10:00:00	97.40	0.46
21/10/2014	11:00:00	97.41	0.49
21/10/2014	12:00:00	97.41	0.49
21/10/2014	13:00:00	97.42	0.55
21/10/2014	14:00:00	97.41	0.51
21/10/2014	15:00:00	97.41	0.52
21/10/2014	16:00:00	97.41	0.52
21/10/2014	17:00:00	97.41	0.53
21/10/2014	18:00:00	97.41	0.51
21/10/2014	19:00:00	97.41	0.51
21/10/2014	20:00:00	97.42	0.56
21/10/2014	21:00:00	97.41	0.52
21/10/2014	22:00:00	97.40	0.47
21/10/2014	23:00:00	97.40	0.43
22/10/2014	0:00:00	97.40	0.44
22/10/2014	1:00:00	97.41	0.48
22/10/2014	2:00:00	97.41	0.49
22/10/2014	3:00:00	97.41	0.48
22/10/2014	4:00:00	97.41	0.49
22/10/2014	5:00:00	97.41	0.48
22/10/2014	6:00:00	97.41	0.49
22/10/2014	7:00:00	97.41	0.48
22/10/2014	8:00:00	97.41	0.49
22/10/2014	9:00:00	97.41	0.51
22/10/2014	10:00:00	97.41	0.53
22/10/2014	11:00:00	97.42	0.56
22/10/2014	12:00:00	97.42	0.56
22/10/2014	13:00:00	97.42	0.58
22/10/2014	14:00:00	97.42	0.60
22/10/2014	15:00:00	97.42	0.60
22/10/2014	16:00:00	97.42	0.59
22/10/2014	17:00:00	97.42	0.59
22/10/2014	18:00:00	97.42	0.60
22/10/2014	19:00:00	97.42	0.58
22/10/2014	20:00:00	97.42	0.58
22/10/2014	21:00:00	97.42	0.58
22/10/2014	22:00:00	97.42	0.56
22/10/2014	23:00:00	97.42	0.56
23/10/2014	0:00:00	97.42	0.56

Date	Time	Stage Elevation	Calculated Q (cms)
23/10/2014	1:00:00	97.42	0.56
23/10/2014	2:00:00	97.42	0.56
23/10/2014	3:00:00	97.42	0.56
23/10/2014	4:00:00	97.42	0.54
23/10/2014	5:00:00	97.42	0.56
23/10/2014	6:00:00	97.42	0.58
23/10/2014	7:00:00	97.42	0.60
23/10/2014	8:00:00	97.44	0.69
23/10/2014	9:00:00	97.44	0.71
23/10/2014	10:00:00	97.44	0.67
23/10/2014	11:00:00	97.44	0.71
23/10/2014	12:00:00	97.46	0.83
23/10/2014	13:00:00	97.54	1.33
23/10/2014	14:00:00	97.57	1.53
23/10/2014	15:00:00	97.56	1.45
23/10/2014	16:00:00	97.53	1.29
23/10/2014	17:00:00	97.52	1.20
23/10/2014	18:00:00	97.50	1.09
23/10/2014	19:00:00	97.48	0.99
23/10/2014	20:00:00	97.48	0.93
23/10/2014	21:00:00	97.47	0.91
23/10/2014	22:00:00	97.47	0.91
23/10/2014	23:00:00	97.48	0.93
24/10/2014	0:00:00	97.49	1.02
24/10/2014	1:00:00	97.50	1.09
24/10/2014	2:00:00	97.50	1.06
24/10/2014	3:00:00	97.49	0.99
24/10/2014	4:00:00	97.48	0.93
24/10/2014	5:00:00	97.47	0.86
24/10/2014	6:00:00	97.46	0.83
24/10/2014	7:00:00	97.45	0.78
24/10/2014	8:00:00	97.45	0.75
24/10/2014	9:00:00	97.45	0.74
24/10/2014	10:00:00	97.44	0.72
24/10/2014	11:00:00	97.44	0.72
24/10/2014	12:00:00	97.44	0.72
24/10/2014	13:00:00	97.45	0.76
24/10/2014	14:00:00	97.45	0.75
24/10/2014	15:00:00	97.44	0.73
24/10/2014	16:00:00	97.44	0.72
24/10/2014	17:00:00	97.44	0.72
24/10/2014	18:00:00	97.44	0.70
24/10/2014	19:00:00	97.44	0.70
24/10/2014	20:00:00	97.44	0.71
24/10/2014	21:00:00	97.44	0.69

Date	Time	Stage Elevation	Calculated Q (cms)
24/10/2014	22:00:00	97.44	0.68
24/10/2014	23:00:00	97.43	0.67
25/10/2014	0:00:00	97.43	0.67
25/10/2014	1:00:00	97.44	0.69
25/10/2014	2:00:00	97.44	0.67
25/10/2014	3:00:00	97.44	0.67
25/10/2014	4:00:00	97.44	0.67
25/10/2014	5:00:00	97.44	0.69
25/10/2014	6:00:00	97.44	0.68
25/10/2014	7:00:00	97.44	0.69
25/10/2014	8:00:00	97.44	0.69
25/10/2014	9:00:00	97.44	0.70
25/10/2014	10:00:00	97.44	0.71
25/10/2014	11:00:00	97.44	0.71
25/10/2014	12:00:00	97.45	0.74
25/10/2014	13:00:00	97.45	0.74
25/10/2014	14:00:00	97.45	0.75
25/10/2014	15:00:00	97.45	0.76
25/10/2014	16:00:00	97.45	0.76
25/10/2014	17:00:00	97.45	0.77
25/10/2014	18:00:00	97.45	0.77
25/10/2014	19:00:00	97.46	0.82
25/10/2014	20:00:00	97.46	0.85
25/10/2014	21:00:00	97.46	0.85
25/10/2014	22:00:00	97.47	0.89
25/10/2014	23:00:00	97.48	0.94
26/10/2014	0:00:00	97.49	1.02
26/10/2014	1:00:00	97.53	1.29
26/10/2014	2:00:00	97.58	1.62
26/10/2014	3:00:00	97.60	1.73
26/10/2014	4:00:00	97.60	1.70
26/10/2014	5:00:00	97.58	1.63
26/10/2014	6:00:00	97.57	1.55
26/10/2014	7:00:00	97.56	1.50
26/10/2014	8:00:00	97.57	1.52
26/10/2014	9:00:00	97.58	1.60
26/10/2014	10:00:00	97.59	1.64
26/10/2014	11:00:00	97.59	1.65
26/10/2014	12:00:00	97.58	1.61
26/10/2014	13:00:00	97.58	1.58
26/10/2014	14:00:00	97.60	1.72
26/10/2014	15:00:00	97.60	1.74
26/10/2014	16:00:00	97.62	1.88
26/10/2014	17:00:00	97.78	2.88
26/10/2014	18:00:00	97.78	2.86

Date	Time	Stage Elevation	Calculated Q (cms)
26/10/2014	19:00:00	97.75	2.66
26/10/2014	20:00:00	97.71	2.41
26/10/2014	21:00:00	97.67	2.18
26/10/2014	22:00:00	97.64	2.01
26/10/2014	23:00:00	97.62	1.88
27/10/2014	0:00:00	97.61	1.81
27/10/2014	1:00:00	97.60	1.73
27/10/2014	2:00:00	97.58	1.61
27/10/2014	3:00:00	97.56	1.48
27/10/2014	4:00:00	97.55	1.38
27/10/2014	5:00:00	97.53	1.27
27/10/2014	6:00:00	97.51	1.16
27/10/2014	7:00:00	97.50	1.07
27/10/2014	8:00:00	97.48	0.99
27/10/2014	9:00:00	97.48	0.93
27/10/2014	10:00:00	97.47	0.88
27/10/2014	11:00:00	97.46	0.86
27/10/2014	12:00:00	97.46	0.82
27/10/2014	13:00:00	97.46	0.85
27/10/2014	14:00:00	97.46	0.81
27/10/2014	15:00:00	97.45	0.78
27/10/2014	16:00:00	97.45	0.76
27/10/2014	17:00:00	97.45	0.75
27/10/2014	18:00:00	97.45	0.74
27/10/2014	19:00:00	97.44	0.72
27/10/2014	20:00:00	97.44	0.72
27/10/2014	21:00:00	97.44	0.72
27/10/2014	22:00:00	97.45	0.74
27/10/2014	23:00:00	97.45	0.74
28/10/2014	0:00:00	97.45	0.76
28/10/2014	1:00:00	97.46	0.80
28/10/2014	2:00:00	97.46	0.80
28/10/2014	3:00:00	97.46	0.83
28/10/2014	4:00:00	97.46	0.83
28/10/2014	5:00:00	97.46	0.83
28/10/2014	6:00:00	97.46	0.81
28/10/2014	7:00:00	97.46	0.83
28/10/2014	8:00:00	97.46	0.83
28/10/2014	9:00:00	97.46	0.83
28/10/2014	10:00:00	97.46	0.82
28/10/2014	11:00:00	97.46	0.83
28/10/2014	12:00:00	97.46	0.84
28/10/2014	13:00:00	97.46	0.83
28/10/2014	14:00:00	97.46	0.83
28/10/2014	15:00:00	97.46	0.83

Date	Time	Stage Elevation	Calculated Q (cms)
28/10/2014	16:00:00	97.46	0.83
28/10/2014	17:00:00	97.46	0.83
28/10/2014	18:00:00	97.46	0.81
28/10/2014	19:00:00	97.46	0.81
28/10/2014	20:00:00	97.46	0.82
28/10/2014	21:00:00	97.46	0.80
28/10/2014	22:00:00	97.45	0.79
28/10/2014	23:00:00	97.46	0.83
29/10/2014	0:00:00	97.47	0.86
29/10/2014	1:00:00	97.47	0.89
29/10/2014	2:00:00	97.47	0.92
29/10/2014	3:00:00	97.48	0.94
29/10/2014	4:00:00	97.48	0.95
29/10/2014	5:00:00	97.49	1.01
29/10/2014	6:00:00	97.50	1.09
29/10/2014	7:00:00	97.52	1.19
29/10/2014	8:00:00	97.53	1.27
29/10/2014	9:00:00	97.53	1.29
29/10/2014	10:00:00	97.53	1.26
29/10/2014	11:00:00	97.52	1.24
29/10/2014	12:00:00	97.52	1.24
29/10/2014	13:00:00	97.52	1.21
29/10/2014	14:00:00	97.51	1.18
29/10/2014	15:00:00	97.53	1.27
29/10/2014	16:00:00	97.60	1.70
29/10/2014	17:00:00	97.63	1.91
29/10/2014	18:00:00	97.64	2.00
29/10/2014	19:00:00	97.64	1.99
29/10/2014	20:00:00	97.63	1.93
29/10/2014	21:00:00	97.64	1.96
29/10/2014	22:00:00	97.63	1.90
29/10/2014	23:00:00	97.61	1.80
30/10/2014	0:00:00	97.59	1.65
30/10/2014	1:00:00	97.57	1.53
30/10/2014	2:00:00	97.56	1.44
30/10/2014	3:00:00	97.55	1.40
30/10/2014	4:00:00	97.54	1.37
30/10/2014	5:00:00	97.54	1.32
30/10/2014	6:00:00	97.53	1.27
30/10/2014	7:00:00	97.52	1.24
30/10/2014	8:00:00	97.52	1.20
30/10/2014	9:00:00	97.51	1.16
30/10/2014	10:00:00	97.51	1.15
30/10/2014	11:00:00	97.51	1.15
30/10/2014	12:00:00	97.51	1.14

Date	Time	Stage Elevation	Calculated Q (cms)
30/10/2014	13:00:00	97.51	1.13
30/10/2014	14:00:00	97.51	1.13
30/10/2014	15:00:00	97.51	1.12
30/10/2014	16:00:00	97.50	1.11
30/10/2014	17:00:00	97.51	1.12
30/10/2014	18:00:00	97.51	1.12
30/10/2014	19:00:00	97.50	1.11
30/10/2014	20:00:00	97.50	1.11
30/10/2014	21:00:00	97.50	1.11
30/10/2014	22:00:00	97.51	1.13
30/10/2014	23:00:00	97.51	1.18
31/10/2014	0:00:00	97.53	1.29
31/10/2014	1:00:00	97.54	1.37
31/10/2014	2:00:00	97.55	1.40
31/10/2014	3:00:00	97.55	1.39
31/10/2014	4:00:00	97.54	1.37
31/10/2014	5:00:00	97.54	1.36
31/10/2014	6:00:00	97.54	1.33
31/10/2014	7:00:00	97.53	1.30
31/10/2014	8:00:00	97.53	1.30
31/10/2014	9:00:00	97.53	1.28
31/10/2014	10:00:00	97.53	1.29
31/10/2014	11:00:00	97.53	1.29
31/10/2014	12:00:00	97.53	1.28
31/10/2014	13:00:00	97.53	1.29
31/10/2014	14:00:00	97.53	1.28
31/10/2014	15:00:00	97.53	1.27
31/10/2014	16:00:00	97.53	1.27
31/10/2014	17:00:00	97.53	1.27
31/10/2014	18:00:00	97.53	1.27
31/10/2014	19:00:00	97.53	1.26
31/10/2014	20:00:00	97.53	1.27
31/10/2014	21:00:00	97.53	1.26
31/10/2014	22:00:00	97.54	1.32
31/10/2014	23:00:00	97.55	1.42
01/11/2014	0:00:00	97.56	1.47
01/11/2014	1:00:00	97.57	1.51
01/11/2014	2:00:00	97.56	1.48
01/11/2014	3:00:00	97.56	1.49
01/11/2014	4:00:00	97.56	1.48
01/11/2014	5:00:00	97.56	1.44
01/11/2014	6:00:00	97.55	1.42
01/11/2014	7:00:00	97.55	1.42
01/11/2014	8:00:00	97.55	1.42
01/11/2014	9:00:00	97.55	1.41

Date	Time	Stage Elevation	Calculated Q (cms)
01/11/2014	10:00:00	97.55	1.40
01/11/2014	11:00:00	97.55	1.40
01/11/2014	12:00:00	97.55	1.40
01/11/2014	13:00:00	97.55	1.43
01/11/2014	14:00:00	97.55	1.39
01/11/2014	15:00:00	97.55	1.38
01/11/2014	16:00:00	97.54	1.36
01/11/2014	17:00:00	97.57	1.52
01/11/2014	18:00:00	97.58	1.58
01/11/2014	19:00:00	97.56	1.46
01/11/2014	20:00:00	97.54	1.36
01/11/2014	21:00:00	97.53	1.30
01/11/2014	22:00:00	97.53	1.27
01/11/2014	23:00:00	97.53	1.26
02/11/2014	0:00:00	97.52	1.21
02/11/2014	1:00:00	97.52	1.22
02/11/2014	2:00:00	97.52	1.22
02/11/2014	3:00:00	97.53	1.26
02/11/2014	4:00:00	97.53	1.30
02/11/2014	5:00:00	97.54	1.33
02/11/2014	6:00:00	97.54	1.34
02/11/2014	7:00:00	97.54	1.35
02/11/2014	8:00:00	97.54	1.36
02/11/2014	9:00:00	97.54	1.35
02/11/2014	10:00:00	97.54	1.35
02/11/2014	11:00:00	97.54	1.34
02/11/2014	12:00:00	97.54	1.35
02/11/2014	13:00:00	97.55	1.39
02/11/2014	14:00:00	97.55	1.38
02/11/2014	15:00:00	97.55	1.38
02/11/2014	16:00:00	97.55	1.39
02/11/2014	17:00:00	97.55	1.39
02/11/2014	18:00:00	97.54	1.37
02/11/2014	19:00:00	97.54	1.36
02/11/2014	20:00:00	97.54	1.36
02/11/2014	21:00:00	97.54	1.33
02/11/2014	22:00:00	97.54	1.34
02/11/2014	23:00:00	97.54	1.34
03/11/2014	0:00:00	97.54	1.35
03/11/2014	1:00:00	97.54	1.35
03/11/2014	2:00:00	97.54	1.33
03/11/2014	3:00:00	97.54	1.32
03/11/2014	4:00:00	97.54	1.33
03/11/2014	5:00:00	97.53	1.31
03/11/2014	6:00:00	97.54	1.31

Date	Time	Stage Elevation	Calculated Q (cms)
03/11/2014	7:00:00	97.53	1.31
03/11/2014	8:00:00	97.54	1.31
03/11/2014	9:00:00	97.54	1.33
03/11/2014	10:00:00	97.54	1.34
03/11/2014	11:00:00	97.54	1.35
03/11/2014	12:00:00	97.54	1.35
03/11/2014	13:00:00	97.54	1.37
03/11/2014	14:00:00	97.55	1.38
03/11/2014	15:00:00	97.54	1.36
03/11/2014	16:00:00	97.54	1.36
03/11/2014	17:00:00	97.54	1.35
03/11/2014	18:00:00	97.54	1.35
03/11/2014	19:00:00	97.54	1.35
03/11/2014	20:00:00	97.54	1.35
03/11/2014	21:00:00	97.54	1.35
03/11/2014	22:00:00	97.54	1.35
03/11/2014	23:00:00	97.54	1.35
04/11/2014	0:00:00	97.54	1.35
04/11/2014	1:00:00	97.54	1.34
04/11/2014	2:00:00	97.54	1.33
04/11/2014	3:00:00	97.54	1.33
04/11/2014	4:00:00	97.54	1.33
04/11/2014	5:00:00	97.54	1.32
04/11/2014	6:00:00	97.54	1.32
04/11/2014	7:00:00	97.54	1.31
04/11/2014	8:00:00	97.54	1.33
04/11/2014	9:00:00	97.54	1.31
04/11/2014	10:00:00	97.53	1.31
04/11/2014	11:00:00	97.53	1.31
04/11/2014	12:00:00	97.53	1.30
04/11/2014	13:00:00	97.53	1.29
04/11/2014	14:00:00	97.54	1.32
04/11/2014	15:00:00	97.53	1.30
04/11/2014	16:00:00	97.53	1.31
04/11/2014	17:00:00	97.53	1.31
04/11/2014	18:00:00	97.53	1.31
04/11/2014	19:00:00	97.53	1.30
04/11/2014	20:00:00	97.53	1.31
04/11/2014	21:00:00	97.53	1.30
04/11/2014	22:00:00	97.53	1.30
04/11/2014	23:00:00	97.53	1.31
05/11/2014	0:00:00	97.53	1.29
05/11/2014	1:00:00	97.53	1.27
05/11/2014	2:00:00	97.53	1.27
05/11/2014	3:00:00	97.53	1.29

Date	Time	Stage Elevation	Calculated Q (cms)
05/11/2014	4:00:00	97.53	1.29
05/11/2014	5:00:00	97.53	1.30
05/11/2014	6:00:00	97.53	1.31
05/11/2014	7:00:00	97.53	1.29
05/11/2014	8:00:00	97.53	1.29
05/11/2014	9:00:00	97.53	1.29
05/11/2014	10:00:00	97.53	1.28
05/11/2014	11:00:00	97.53	1.29
05/11/2014	12:00:00	97.53	1.28
05/11/2014	13:00:00	97.53	1.29
05/11/2014	14:00:00	97.53	1.30
09/04/2015	16:00:00	98.69	69.21
09/04/2015	17:00:00	98.68	69.18
09/04/2015	18:00:00	98.69	69.21
09/04/2015	19:00:00	98.67	69.13
09/04/2015	20:00:00	98.68	69.15
09/04/2015	21:00:00	98.68	69.17
09/04/2015	22:00:00	98.68	69.15
09/04/2015	23:00:00	98.68	69.18
10/04/2015	0:00:00	98.68	69.15
10/04/2015	1:00:00	98.67	69.11
10/04/2015	2:00:00	98.67	69.13
10/04/2015	3:00:00	98.67	69.13
10/04/2015	4:00:00	98.67	69.08
10/04/2015	5:00:00	98.66	69.05
10/04/2015	6:00:00	98.66	69.05
10/04/2015	7:00:00	98.65	68.98
10/04/2015	8:00:00	98.65	68.94
10/04/2015	9:00:00	98.63	68.87
10/04/2015	10:00:00	98.62	68.80
10/04/2015	11:00:00	98.61	68.69
10/04/2015	12:00:00	98.60	68.65
10/04/2015	13:00:00	98.59	68.57
10/04/2015	14:00:00	98.56	68.41
10/04/2015	15:00:00	98.56	68.40
10/04/2015	16:00:00	98.55	68.33
10/04/2015	17:00:00	98.54	68.27
10/04/2015	18:00:00	98.54	68.29
10/04/2015	19:00:00	98.53	68.23
10/04/2015	20:00:00	98.53	68.21
10/04/2015	21:00:00	98.53	68.21
10/04/2015	22:00:00	98.53	68.23
10/04/2015	23:00:00	98.53	68.21
11/04/2015	0:00:00	98.52	68.17
11/04/2015	1:00:00	98.52	68.14

Date	Time	Stage Elevation	Calculated Q (cms)
11/04/2015	2:00:00	98.52	68.12
11/04/2015	3:00:00	98.51	68.09
11/04/2015	4:00:00	98.51	68.05
11/04/2015	5:00:00	98.50	68.03
11/04/2015	6:00:00	98.51	68.05
11/04/2015	7:00:00	98.50	67.99
11/04/2015	8:00:00	98.51	68.06
11/04/2015	9:00:00	98.52	68.11
11/04/2015	10:00:00	98.52	68.17
11/04/2015	11:00:00	98.52	68.17
11/04/2015	12:00:00	98.52	68.17
11/04/2015	13:00:00	98.52	68.11
11/04/2015	14:00:00	98.52	68.14
11/04/2015	15:00:00	98.52	68.14
11/04/2015	16:00:00	98.52	68.17
11/04/2015	17:00:00	98.52	68.17
11/04/2015	18:00:00	98.53	68.17
11/04/2015	19:00:00	98.53	68.23
11/04/2015	20:00:00	98.54	68.26
11/04/2015	21:00:00	98.54	68.24
11/04/2015	22:00:00	98.54	68.26
11/04/2015	23:00:00	98.54	68.26
12/04/2015	0:00:00	98.54	68.26
12/04/2015	1:00:00	98.53	68.21
12/04/2015	2:00:00	98.54	68.26
12/04/2015	3:00:00	98.55	68.30
12/04/2015	4:00:00	98.54	68.28
12/04/2015	5:00:00	98.55	68.32
12/04/2015	6:00:00	98.55	68.35
12/04/2015	7:00:00	98.55	68.36
12/04/2015	8:00:00	98.56	68.39
12/04/2015	9:00:00	98.56	68.42
12/04/2015	10:00:00	98.56	68.40
12/04/2015	11:00:00	98.56	68.39
12/04/2015	12:00:00	98.56	68.37
12/04/2015	13:00:00	98.56	68.40
12/04/2015	14:00:00	98.56	68.42
12/04/2015	15:00:00	98.57	68.44
12/04/2015	16:00:00	98.57	68.44
12/04/2015	17:00:00	98.57	68.47
12/04/2015	18:00:00	98.57	68.48
12/04/2015	19:00:00	98.58	68.49
12/04/2015	20:00:00	98.58	68.49
12/04/2015	21:00:00	98.58	68.52
12/04/2015	22:00:00	98.59	68.60

Date	Time	Stage Elevation	Calculated Q (cms)
12/04/2015	23:00:00	98.60	68.62
13/04/2015	0:00:00	98.60	68.63
13/04/2015	1:00:00	98.60	68.67
13/04/2015	2:00:00	98.60	68.63
13/04/2015	3:00:00	98.60	68.67
13/04/2015	4:00:00	98.60	68.67
13/04/2015	5:00:00	98.61	68.73
13/04/2015	6:00:00	98.60	68.67
13/04/2015	7:00:00	98.61	68.69
13/04/2015	8:00:00	98.60	68.67
13/04/2015	9:00:00	98.59	68.61
13/04/2015	10:00:00	98.59	68.58
13/04/2015	11:00:00	98.58	68.55
13/04/2015	12:00:00	98.56	68.40
13/04/2015	13:00:00	98.56	68.39
13/04/2015	14:00:00	98.54	68.29
13/04/2015	15:00:00	98.52	68.17
13/04/2015	16:00:00	98.51	68.09
13/04/2015	17:00:00	98.50	68.01
13/04/2015	18:00:00	98.50	68.01
13/04/2015	19:00:00	98.52	68.12
13/04/2015	20:00:00	98.53	68.19
13/04/2015	21:00:00	98.51	68.09
13/04/2015	22:00:00	98.51	68.05
13/04/2015	23:00:00	98.50	67.99
14/04/2015	0:00:00	98.49	67.94
14/04/2015	1:00:00	98.49	67.92
14/04/2015	2:00:00	98.49	67.94
14/04/2015	3:00:00	98.49	67.98
14/04/2015	4:00:00	98.50	68.00
14/04/2015	5:00:00	98.50	68.01
14/04/2015	6:00:00	98.50	68.03
14/04/2015	7:00:00	98.51	68.08
14/04/2015	8:00:00	98.52	68.12
14/04/2015	9:00:00	98.52	68.11
14/04/2015	10:00:00	98.52	68.12
14/04/2015	11:00:00	98.53	68.19
14/04/2015	12:00:00	98.53	68.20
14/04/2015	13:00:00	98.52	68.17
14/04/2015	14:00:00	98.53	68.17
14/04/2015	15:00:00	98.52	68.15
14/04/2015	16:00:00	98.53	68.21
14/04/2015	17:00:00	98.54	68.24
14/04/2015	18:00:00	98.55	68.30
14/04/2015	19:00:00	98.55	68.34

Date	Time	Stage Elevation	Calculated Q (cms)
14/04/2015	20:00:00	98.56	68.37
14/04/2015	21:00:00	98.57	68.44
14/04/2015	22:00:00	98.58	68.50
14/04/2015	23:00:00	98.58	68.55
15/04/2015	0:00:00	98.59	68.61
15/04/2015	1:00:00	98.60	68.65
15/04/2015	2:00:00	98.61	68.69
15/04/2015	3:00:00	98.61	68.71
15/04/2015	4:00:00	98.61	68.69
15/04/2015	5:00:00	98.61	68.73
15/04/2015	6:00:00	98.62	68.78
15/04/2015	7:00:00	98.62	68.78
15/04/2015	8:00:00	98.62	68.77
15/04/2015	9:00:00	98.61	68.74
15/04/2015	10:00:00	98.62	68.76
15/04/2015	11:00:00	98.61	68.71
15/04/2015	12:00:00	98.60	68.65
15/04/2015	13:00:00	98.60	68.64
15/04/2015	14:00:00	98.59	68.61
15/04/2015	15:00:00	98.59	68.58
15/04/2015	16:00:00	98.59	68.57
15/04/2015	17:00:00	98.58	68.53
15/04/2015	18:00:00	98.58	68.52
15/04/2015	19:00:00	98.58	68.55
15/04/2015	20:00:00	98.58	68.53
15/04/2015	21:00:00	98.58	68.55
15/04/2015	22:00:00	98.59	68.60
15/04/2015	23:00:00	98.60	68.65
16/04/2015	0:00:00	98.60	68.63
16/04/2015	1:00:00	98.60	68.65
16/04/2015	2:00:00	98.59	68.61
16/04/2015	3:00:00	98.59	68.58
16/04/2015	4:00:00	98.59	68.56
16/04/2015	5:00:00	98.59	68.60
16/04/2015	6:00:00	98.59	68.60
16/04/2015	7:00:00	98.59	68.59
16/04/2015	8:00:00	98.59	68.56
16/04/2015	9:00:00	98.59	68.56
16/04/2015	10:00:00	98.58	68.49
16/04/2015	11:00:00	98.57	68.48
16/04/2015	12:00:00	98.57	68.46
16/04/2015	13:00:00	98.57	68.48
16/04/2015	14:00:00	98.57	68.44
16/04/2015	15:00:00	98.56	68.38
16/04/2015	16:00:00	98.57	68.48

Date	Time	Stage Elevation	Calculated Q (cms)
16/04/2015	17:00:00	98.58	68.52
16/04/2015	18:00:00	98.59	68.56
16/04/2015	19:00:00	98.59	68.56
16/04/2015	20:00:00	98.59	68.57
16/04/2015	21:00:00	98.59	68.61
16/04/2015	22:00:00	98.60	68.62
16/04/2015	23:00:00	98.60	68.62
17/04/2015	0:00:00	98.59	68.59
17/04/2015	1:00:00	98.59	68.56
17/04/2015	2:00:00	98.59	68.56
17/04/2015	3:00:00	98.58	68.55
17/04/2015	4:00:00	98.58	68.50
17/04/2015	5:00:00	98.57	68.48
17/04/2015	6:00:00	98.57	68.46
17/04/2015	7:00:00	98.57	68.44
17/04/2015	8:00:00	98.57	68.46
17/04/2015	9:00:00	98.57	68.44
17/04/2015	10:00:00	98.60	68.62
17/04/2015	11:00:00	98.60	68.64
17/04/2015	12:00:00	98.59	68.58
17/04/2015	13:00:00	98.57	68.44
17/04/2015	14:00:00	98.55	68.32
17/04/2015	15:00:00	98.53	68.23
17/04/2015	16:00:00	98.54	68.27
17/04/2015	17:00:00	98.54	68.26
17/04/2015	18:00:00	98.54	68.29
17/04/2015	19:00:00	98.56	68.42
17/04/2015	20:00:00	98.57	68.46
17/04/2015	21:00:00	98.60	68.62
17/04/2015	22:00:00	98.61	68.73
17/04/2015	23:00:00	98.63	68.83
18/04/2015	0:00:00	98.68	69.17
18/04/2015	1:00:00	98.77	69.72
18/04/2015	2:00:00	98.80	69.96
18/04/2015	3:00:00	98.78	69.81
18/04/2015	4:00:00	98.75	69.63
18/04/2015	5:00:00	98.72	69.40
18/04/2015	6:00:00	98.70	69.30
18/04/2015	7:00:00	98.69	69.26
18/04/2015	8:00:00	98.69	69.23
18/04/2015	9:00:00	98.68	69.14
18/04/2015	10:00:00	98.66	69.03
18/04/2015	11:00:00	98.65	68.97
18/04/2015	12:00:00	98.64	68.92
18/04/2015	13:00:00	98.64	68.90

Date	Time	Stage Elevation	Calculated Q (cms)
18/04/2015	14:00:00	98.63	68.86
18/04/2015	15:00:00	98.62	68.80
18/04/2015	16:00:00	98.62	68.76
18/04/2015	17:00:00	98.60	68.65
18/04/2015	18:00:00	98.61	68.69
18/04/2015	19:00:00	98.60	68.64
18/04/2015	20:00:00	98.59	68.61
18/04/2015	21:00:00	98.59	68.60
18/04/2015	22:00:00	98.60	68.65
18/04/2015	23:00:00	98.60	68.65
19/04/2015	0:00:00	98.60	68.67
19/04/2015	1:00:00	98.60	68.65
19/04/2015	2:00:00	98.60	68.62
19/04/2015	3:00:00	98.60	68.63
19/04/2015	4:00:00	98.59	68.60
19/04/2015	5:00:00	98.60	68.63
19/04/2015	6:00:00	98.60	68.62
19/04/2015	7:00:00	98.59	68.59
19/04/2015	8:00:00	98.59	68.57
19/04/2015	9:00:00	98.59	68.57
19/04/2015	10:00:00	98.58	68.55
19/04/2015	11:00:00	98.57	68.48
19/04/2015	12:00:00	98.57	68.46
19/04/2015	13:00:00	98.57	68.44
19/04/2015	14:00:00	98.56	68.40
19/04/2015	15:00:00	98.55	68.31
19/04/2015	16:00:00	98.54	68.24
19/04/2015	17:00:00	98.53	68.21
19/04/2015	18:00:00	98.53	68.17
19/04/2015	19:00:00	98.52	68.12
19/04/2015	20:00:00	98.52	68.13
19/04/2015	21:00:00	98.51	68.10
19/04/2015	22:00:00	98.52	68.11
19/04/2015	23:00:00	98.51	68.09
20/04/2015	0:00:00	98.51	68.09
20/04/2015	1:00:00	98.51	68.06
20/04/2015	2:00:00	98.51	68.05
20/04/2015	3:00:00	98.51	68.05
20/04/2015	4:00:00	98.50	67.99
20/04/2015	5:00:00	98.50	68.00
20/04/2015	6:00:00	98.50	67.99
20/04/2015	7:00:00	98.50	67.99
20/04/2015	8:00:00	98.49	67.98
20/04/2015	9:00:00	98.50	67.99
20/04/2015	10:00:00	98.49	67.96

Date	Time	Stage Elevation	Calculated Q (cms)
20/04/2015	11:00:00	98.48	67.87
20/04/2015	12:00:00	98.47	67.84
20/04/2015	13:00:00	98.47	67.85
20/04/2015	14:00:00	98.46	67.78
20/04/2015	15:00:00	98.48	67.88
20/04/2015	16:00:00	98.47	67.84
20/04/2015	17:00:00	98.47	67.79
20/04/2015	18:00:00	98.46	67.78
20/04/2015	19:00:00	98.46	67.75
20/04/2015	20:00:00	98.46	67.73
20/04/2015	21:00:00	98.45	67.71
20/04/2015	22:00:00	98.45	67.71
20/04/2015	23:00:00	98.46	67.75
21/04/2015	0:00:00	98.46	67.76
21/04/2015	1:00:00	98.45	67.71
21/04/2015	2:00:00	98.45	67.71
21/04/2015	3:00:00	98.45	67.70
21/04/2015	4:00:00	98.46	67.73
21/04/2015	5:00:00	98.45	67.69
21/04/2015	6:00:00	98.45	67.71
21/04/2015	7:00:00	98.45	67.69
21/04/2015	8:00:00	98.45	67.70
21/04/2015	9:00:00	98.45	67.69
21/04/2015	10:00:00	98.44	67.65
21/04/2015	11:00:00	98.44	67.64
21/04/2015	12:00:00	98.44	67.62
21/04/2015	13:00:00	98.43	67.58
21/04/2015	14:00:00	98.42	67.52
21/04/2015	15:00:00	98.42	67.50
21/04/2015	16:00:00	98.42	67.48
21/04/2015	17:00:00	98.41	67.42
21/04/2015	18:00:00	98.41	67.41
21/04/2015	19:00:00	98.40	67.38
21/04/2015	20:00:00	98.40	67.34
21/04/2015	21:00:00	98.39	67.31
21/04/2015	22:00:00	98.39	67.31
21/04/2015	23:00:00	98.39	67.29
22/04/2015	0:00:00	98.38	67.26
22/04/2015	1:00:00	98.39	67.33
22/04/2015	2:00:00	98.40	67.36
22/04/2015	3:00:00	98.40	67.36
22/04/2015	4:00:00	98.40	67.39
22/04/2015	5:00:00	98.41	67.41
22/04/2015	6:00:00	98.40	67.37
22/04/2015	7:00:00	98.40	67.40

Date	Time	Stage Elevation	Calculated Q (cms)
22/04/2015	8:00:00	98.41	67.42
22/04/2015	9:00:00	98.40	67.34
22/04/2015	10:00:00	98.40	67.38
22/04/2015	11:00:00	98.39	67.30
22/04/2015	12:00:00	98.40	67.37
22/04/2015	13:00:00	98.40	67.38
22/04/2015	14:00:00	98.41	67.46
22/04/2015	15:00:00	98.47	67.79
22/04/2015	16:00:00	98.52	68.15
22/04/2015	17:00:00	98.67	69.10
22/04/2015	18:00:00	98.79	69.88
22/04/2015	19:00:00	98.82	70.05
22/04/2015	20:00:00	98.82	70.09
22/04/2015	21:00:00	98.79	69.88
22/04/2015	22:00:00	98.77	69.71
22/04/2015	23:00:00	98.72	69.42
23/04/2015	0:00:00	98.68	69.19
23/04/2015	1:00:00	98.65	68.97
23/04/2015	2:00:00	98.62	68.81
23/04/2015	3:00:00	98.61	68.69
23/04/2015	4:00:00	98.59	68.57
23/04/2015	5:00:00	98.57	68.44
23/04/2015	6:00:00	98.56	68.39
23/04/2015	7:00:00	98.55	68.35
23/04/2015	8:00:00	98.55	68.33
23/04/2015	9:00:00	98.54	68.29
23/04/2015	10:00:00	98.54	68.28
23/04/2015	11:00:00	98.53	68.23
23/04/2015	12:00:00	98.53	68.23
23/04/2015	13:00:00	98.53	68.21
23/04/2015	14:00:00	98.56	68.42
23/04/2015	15:00:00	98.57	68.44
23/04/2015	16:00:00	98.52	68.16
23/04/2015	17:00:00	98.51	68.06
23/04/2015	18:00:00	98.50	67.99
23/04/2015	19:00:00	98.50	67.99
23/04/2015	20:00:00	98.49	67.98
23/04/2015	21:00:00	98.49	67.98
23/04/2015	22:00:00	98.50	68.01
23/04/2015	23:00:00	98.50	67.99
24/04/2015	0:00:00	98.51	68.05
24/04/2015	1:00:00	98.50	68.00
24/04/2015	2:00:00	98.50	67.99
24/04/2015	3:00:00	98.50	67.99
24/04/2015	4:00:00	98.50	68.00

Date	Time	Stage Elevation	Calculated Q (cms)
24/04/2015	5:00:00	98.50	67.99
24/04/2015	6:00:00	98.49	67.96
24/04/2015	7:00:00	98.49	67.96
24/04/2015	8:00:00	98.49	67.98
24/04/2015	9:00:00	98.49	67.96
24/04/2015	10:00:00	98.49	67.98
24/04/2015	11:00:00	98.51	68.06
24/04/2015	12:00:00	98.53	68.19
24/04/2015	13:00:00	98.55	68.30
24/04/2015	14:00:00	98.56	68.38
24/04/2015	15:00:00	98.57	68.44
24/04/2015	16:00:00	98.57	68.46
24/04/2015	17:00:00	98.55	68.35
24/04/2015	18:00:00	98.54	68.28
24/04/2015	19:00:00	98.54	68.24
24/04/2015	20:00:00	98.54	68.24
24/04/2015	21:00:00	98.53	68.23
24/04/2015	22:00:00	98.54	68.26
24/04/2015	23:00:00	98.53	68.21
25/04/2015	0:00:00	98.53	68.23
25/04/2015	1:00:00	98.53	68.23
25/04/2015	2:00:00	98.53	68.23
25/04/2015	3:00:00	98.54	68.26
25/04/2015	4:00:00	98.54	68.24
25/04/2015	5:00:00	98.54	68.26
25/04/2015	6:00:00	98.54	68.27
25/04/2015	7:00:00	98.54	68.26
25/04/2015	8:00:00	98.55	68.30
25/04/2015	9:00:00	98.55	68.33
25/04/2015	10:00:00	98.55	68.34
25/04/2015	11:00:00	98.56	68.37
25/04/2015	12:00:00	98.55	68.35
25/04/2015	13:00:00	98.55	68.36
25/04/2015	14:00:00	98.55	68.34
25/04/2015	15:00:00	98.55	68.34
25/04/2015	16:00:00	98.55	68.33
25/04/2015	17:00:00	98.55	68.34
25/04/2015	18:00:00	98.55	68.35
25/04/2015	19:00:00	98.55	68.36
25/04/2015	20:00:00	98.55	68.33
25/04/2015	21:00:00	98.55	68.32
25/04/2015	22:00:00	98.55	68.36
25/04/2015	23:00:00	98.55	68.36
26/04/2015	0:00:00	98.55	68.34
26/04/2015	1:00:00	98.55	68.32

Date	Time	Stage Elevation	Calculated Q (cms)
26/04/2015	2:00:00	98.55	68.32
26/04/2015	3:00:00	98.55	68.31
26/04/2015	4:00:00	98.54	68.28
26/04/2015	5:00:00	98.54	68.26
26/04/2015	6:00:00	98.54	68.28
26/04/2015	7:00:00	98.54	68.27
26/04/2015	8:00:00	98.53	68.23
26/04/2015	9:00:00	98.54	68.26
26/04/2015	10:00:00	98.54	68.24
26/04/2015	11:00:00	98.53	68.23
26/04/2015	12:00:00	98.53	68.23
26/04/2015	13:00:00	98.53	68.23
26/04/2015	14:00:00	98.53	68.19
26/04/2015	15:00:00	98.52	68.17
26/04/2015	16:00:00	98.52	68.15
26/04/2015	17:00:00	98.51	68.07
26/04/2015	18:00:00	98.51	68.05
26/04/2015	19:00:00	98.50	67.99
26/04/2015	20:00:00	98.49	67.94
26/04/2015	21:00:00	98.48	67.91
26/04/2015	22:00:00	98.49	67.94
26/04/2015	23:00:00	98.49	67.94
27/04/2015	0:00:00	98.48	67.90
27/04/2015	1:00:00	98.48	67.87
27/04/2015	2:00:00	98.47	67.85
27/04/2015	3:00:00	98.48	67.90
27/04/2015	4:00:00	98.49	67.92
27/04/2015	5:00:00	98.49	67.96
27/04/2015	6:00:00	98.49	67.96
27/04/2015	7:00:00	98.50	67.99
27/04/2015	8:00:00	98.50	67.99
27/04/2015	9:00:00	98.50	67.99
27/04/2015	10:00:00	98.50	67.99
27/04/2015	11:00:00	98.50	67.99
27/04/2015	12:00:00	98.50	68.00
27/04/2015	13:00:00	98.49	67.92
27/04/2015	14:00:00	98.48	67.89
27/04/2015	15:00:00	98.48	67.86
27/04/2015	16:00:00	98.47	67.82
27/04/2015	17:00:00	98.47	67.83
27/04/2015	18:00:00	98.47	67.79
27/04/2015	19:00:00	98.46	67.78
27/04/2015	20:00:00	98.46	67.78
27/04/2015	21:00:00	98.46	67.75
27/04/2015	22:00:00	98.46	67.73

Date	Time	Stage Elevation	Calculated Q (cms)
27/04/2015	23:00:00	98.46	67.75
28/04/2015	0:00:00	98.45	67.71
28/04/2015	1:00:00	98.44	67.64
28/04/2015	2:00:00	98.44	67.60
28/04/2015	3:00:00	98.43	67.57
28/04/2015	4:00:00	98.42	67.52
28/04/2015	5:00:00	98.41	67.46
28/04/2015	6:00:00	98.40	67.39
28/04/2015	7:00:00	98.39	67.33
28/04/2015	8:00:00	98.38	67.25
28/04/2015	9:00:00	98.37	67.21
28/04/2015	10:00:00	98.36	67.14
28/04/2015	11:00:00	98.35	67.08
28/04/2015	12:00:00	98.35	67.02
28/04/2015	13:00:00	98.34	66.96
28/04/2015	14:00:00	98.32	66.86
28/04/2015	15:00:00	98.33	66.94
28/04/2015	16:00:00	98.37	67.17
28/04/2015	17:00:00	98.38	67.25
28/04/2015	18:00:00	98.39	67.32
28/04/2015	19:00:00	98.40	67.37
28/04/2015	20:00:00	98.39	67.28
28/04/2015	21:00:00	98.39	67.28
28/04/2015	22:00:00	98.39	67.29
28/04/2015	23:00:00	98.39	67.31
29/04/2015	0:00:00	98.40	67.36
29/04/2015	1:00:00	98.39	67.30
29/04/2015	2:00:00	98.39	67.31
29/04/2015	3:00:00	98.40	67.37
29/04/2015	4:00:00	98.40	67.39
29/04/2015	5:00:00	98.40	67.40
29/04/2015	6:00:00	98.41	67.44
29/04/2015	7:00:00	98.41	67.44
29/04/2015	8:00:00	98.41	67.44
29/04/2015	9:00:00	98.41	67.41
29/04/2015	10:00:00	98.40	67.37
29/04/2015	11:00:00	98.40	67.35
29/04/2015	12:00:00	98.40	67.35
29/04/2015	13:00:00	98.40	67.36
29/04/2015	14:00:00	98.39	67.28
29/04/2015	15:00:00	98.38	67.23
29/04/2015	16:00:00	98.38	67.25
29/04/2015	17:00:00	98.39	67.28
29/04/2015	18:00:00	98.37	67.17
29/04/2015	19:00:00	98.37	67.19

Date	Time	Stage Elevation	Calculated Q (cms)
29/04/2015	20:00:00	98.37	67.17
29/04/2015	21:00:00	98.37	67.16
29/04/2015	22:00:00	98.37	67.21
29/04/2015	23:00:00	98.37	67.20
30/04/2015	0:00:00	98.37	67.20
30/04/2015	1:00:00	98.37	67.19
30/04/2015	2:00:00	98.38	67.21
30/04/2015	3:00:00	98.38	67.25
30/04/2015	4:00:00	98.38	67.25
30/04/2015	5:00:00	98.38	67.25
30/04/2015	6:00:00	98.38	67.21
30/04/2015	7:00:00	98.38	67.25
30/04/2015	8:00:00	98.37	67.21
30/04/2015	9:00:00	98.37	67.20
30/04/2015	10:00:00	98.37	67.21
30/04/2015	11:00:00	98.37	67.16
30/04/2015	12:00:00	98.36	67.14
30/04/2015	13:00:00	98.36	67.10
30/04/2015	14:00:00	98.36	67.09
30/04/2015	15:00:00	98.36	67.14
30/04/2015	16:00:00	98.37	67.21
30/04/2015	17:00:00	98.38	67.23
30/04/2015	18:00:00	98.38	67.26
30/04/2015	19:00:00	98.38	67.25
30/04/2015	20:00:00	98.39	67.28
30/04/2015	21:00:00	98.39	67.28
30/04/2015	22:00:00	98.39	67.29
30/04/2015	23:00:00	98.39	67.28
01/05/2015	0:00:00	98.39	67.28
01/05/2015	1:00:00	98.38	67.23
01/05/2015	2:00:00	98.37	67.17
01/05/2015	3:00:00	98.37	67.19
01/05/2015	4:00:00	98.37	67.20
01/05/2015	5:00:00	98.37	67.16
01/05/2015	6:00:00	98.37	67.19
01/05/2015	7:00:00	98.37	67.16
01/05/2015	8:00:00	98.37	67.15
01/05/2015	9:00:00	98.36	67.12
01/05/2015	10:00:00	98.35	67.08
01/05/2015	11:00:00	98.35	67.02
01/05/2015	12:00:00	98.35	67.05
01/05/2015	13:00:00	98.33	66.94
01/05/2015	14:00:00	98.34	66.96
01/05/2015	15:00:00	98.34	66.96
01/05/2015	16:00:00	98.33	66.92

Date	Time	Stage Elevation	Calculated Q (cms)
01/05/2015	17:00:00	98.33	66.93
01/05/2015	18:00:00	98.34	66.98
01/05/2015	19:00:00	98.33	66.94
01/05/2015	20:00:00	98.34	66.98
01/05/2015	21:00:00	98.34	67.00
01/05/2015	22:00:00	98.34	66.99
01/05/2015	23:00:00	98.35	67.08
02/05/2015	0:00:00	98.36	67.14
02/05/2015	1:00:00	98.36	67.12
02/05/2015	2:00:00	98.36	67.11
02/05/2015	3:00:00	98.36	67.10
02/05/2015	4:00:00	98.36	67.13
02/05/2015	5:00:00	98.36	67.14
02/05/2015	6:00:00	98.37	67.19
02/05/2015	7:00:00	98.37	67.20
02/05/2015	8:00:00	98.38	67.23
02/05/2015	9:00:00	98.38	67.23
02/05/2015	10:00:00	98.39	67.32
02/05/2015	11:00:00	98.39	67.32
02/05/2015	12:00:00	98.41	67.41
02/05/2015	13:00:00	98.40	67.39
02/05/2015	14:00:00	98.40	67.35
02/05/2015	15:00:00	98.39	67.30
02/05/2015	16:00:00	98.40	67.36
02/05/2015	17:00:00	98.40	67.35
02/05/2015	18:00:00	98.40	67.35
02/05/2015	19:00:00	98.40	67.39
02/05/2015	20:00:00	98.40	67.34
02/05/2015	21:00:00	98.40	67.40
02/05/2015	22:00:00	98.41	67.42
02/05/2015	23:00:00	98.42	67.48
03/05/2015	0:00:00	98.42	67.48
03/05/2015	1:00:00	98.41	67.44
03/05/2015	2:00:00	98.41	67.44
03/05/2015	3:00:00	98.40	67.40
03/05/2015	4:00:00	98.41	67.41
03/05/2015	5:00:00	98.40	67.40
03/05/2015	6:00:00	98.41	67.41
03/05/2015	7:00:00	98.40	67.40
03/05/2015	8:00:00	98.41	67.44
03/05/2015	9:00:00	98.42	67.48
03/05/2015	10:00:00	98.40	67.38
03/05/2015	11:00:00	98.40	67.39
03/05/2015	12:00:00	98.40	67.38
03/05/2015	13:00:00	98.40	67.36

Date	Time	Stage Elevation	Calculated Q (cms)
03/05/2015	14:00:00	98.39	67.28
03/05/2015	15:00:00	98.40	67.35
03/05/2015	16:00:00	98.39	67.29
03/05/2015	17:00:00	98.39	67.29
03/05/2015	18:00:00	98.38	67.25
03/05/2015	19:00:00	98.37	67.21
03/05/2015	20:00:00	98.38	67.25
03/05/2015	21:00:00	98.38	67.23
03/05/2015	22:00:00	98.38	67.26
03/05/2015	23:00:00	98.38	67.26
04/05/2015	0:00:00	98.39	67.28
04/05/2015	1:00:00	98.38	67.25
04/05/2015	2:00:00	98.38	67.25
04/05/2015	3:00:00	98.38	67.25
04/05/2015	4:00:00	98.38	67.25
04/05/2015	5:00:00	98.37	67.21
04/05/2015	6:00:00	98.37	67.19
04/05/2015	7:00:00	98.37	67.17
04/05/2015	8:00:00	98.37	67.20
04/05/2015	9:00:00	98.37	67.20
04/05/2015	10:00:00	98.37	67.17
04/05/2015	11:00:00	98.36	67.12
04/05/2015	12:00:00	98.35	67.07
04/05/2015	13:00:00	98.35	67.03
04/05/2015	14:00:00	98.33	66.94
04/05/2015	15:00:00	98.33	66.94
04/05/2015	16:00:00	98.33	66.91
04/05/2015	17:00:00	98.32	66.89
04/05/2015	18:00:00	98.31	66.82
04/05/2015	19:00:00	98.31	66.80
04/05/2015	20:00:00	98.30	66.71
04/05/2015	21:00:00	98.29	66.69
04/05/2015	22:00:00	98.30	66.71
04/05/2015	23:00:00	98.29	66.67
05/05/2015	0:00:00	98.29	66.64
05/05/2015	1:00:00	98.28	66.62
05/05/2015	2:00:00	98.28	66.62
05/05/2015	3:00:00	98.28	66.58
05/05/2015	4:00:00	98.27	66.57
05/05/2015	5:00:00	98.28	66.59
05/05/2015	6:00:00	98.28	66.60
05/05/2015	7:00:00	98.28	66.61
05/05/2015	8:00:00	98.28	66.60
05/05/2015	9:00:00	98.29	66.67
05/05/2015	10:00:00	98.29	66.69

Date	Time	Stage Elevation	Calculated Q (cms)
05/05/2015	11:00:00	98.30	66.75
05/05/2015	12:00:00	98.31	66.78
05/05/2015	13:00:00	98.31	66.81
05/05/2015	14:00:00	98.32	66.87
05/05/2015	15:00:00	98.33	66.94
05/05/2015	16:00:00	98.35	67.05
05/05/2015	17:00:00	98.36	67.14
05/05/2015	18:00:00	98.38	67.25
05/05/2015	19:00:00	98.39	67.33
05/05/2015	20:00:00	98.41	67.46
05/05/2015	21:00:00	98.42	67.48
05/05/2015	22:00:00	98.42	67.48
05/05/2015	23:00:00	98.41	67.46
06/05/2015	0:00:00	98.42	67.49
06/05/2015	1:00:00	98.42	67.50
06/05/2015	2:00:00	98.42	67.50
06/05/2015	3:00:00	98.42	67.49
06/05/2015	4:00:00	98.41	67.46
06/05/2015	5:00:00	98.42	67.51
06/05/2015	6:00:00	98.42	67.50
06/05/2015	7:00:00	98.42	67.51
06/05/2015	8:00:00	98.42	67.50
06/05/2015	9:00:00	98.42	67.50
06/05/2015	10:00:00	98.42	67.50
06/05/2015	11:00:00	98.42	67.52
06/05/2015	12:00:00	98.42	67.50
06/05/2015	13:00:00	98.42	67.48
06/05/2015	14:00:00	98.41	67.44
06/05/2015	15:00:00	98.41	67.42
06/05/2015	16:00:00	98.40	67.39
06/05/2015	17:00:00	98.39	67.32
06/05/2015	18:00:00	98.39	67.28
06/05/2015	19:00:00	98.39	67.29
06/05/2015	20:00:00	98.39	67.28
06/05/2015	21:00:00	98.38	67.25
06/05/2015	22:00:00	98.38	67.25
06/05/2015	23:00:00	98.38	67.25
07/05/2015	0:00:00	98.38	67.25
07/05/2015	1:00:00	98.38	67.25
07/05/2015	2:00:00	98.37	67.21
07/05/2015	3:00:00	98.37	67.19
07/05/2015	4:00:00	98.36	67.13
07/05/2015	5:00:00	98.37	67.15
07/05/2015	6:00:00	98.36	67.14
07/05/2015	7:00:00	98.37	67.17

Date	Time	Stage Elevation	Calculated Q (cms)
07/05/2015	8:00:00	98.37	67.16
07/05/2015	9:00:00	98.37	67.16
07/05/2015	10:00:00	98.37	67.19
07/05/2015	11:00:00	98.37	67.19
07/05/2015	12:00:00	98.37	67.15
07/05/2015	13:00:00	98.37	67.17
07/05/2015	14:00:00	98.38	67.23
07/05/2015	15:00:00	98.38	67.25
07/05/2015	16:00:00	98.39	67.28
07/05/2015	17:00:00	98.40	67.35
07/05/2015	18:00:00	98.40	67.34
07/05/2015	19:00:00	98.39	67.32
07/05/2015	20:00:00	98.39	67.33
07/05/2015	21:00:00	98.39	67.33
07/05/2015	22:00:00	98.40	67.39
07/05/2015	23:00:00	98.40	67.40
08/05/2015	0:00:00	98.40	67.40
08/05/2015	1:00:00	98.40	67.40
08/05/2015	2:00:00	98.40	67.36
08/05/2015	3:00:00	98.40	67.39
08/05/2015	4:00:00	98.40	67.36
08/05/2015	5:00:00	98.40	67.37
08/05/2015	6:00:00	98.40	67.39
08/05/2015	7:00:00	98.40	67.39
08/05/2015	8:00:00	98.40	67.36
08/05/2015	9:00:00	98.39	67.29
08/05/2015	10:00:00	98.39	67.31
08/05/2015	11:00:00	98.39	67.28
08/05/2015	12:00:00	98.38	67.23
08/05/2015	13:00:00	98.37	67.19
08/05/2015	14:00:00	98.37	67.16
08/05/2015	15:00:00	98.36	67.10
08/05/2015	16:00:00	98.36	67.11
08/05/2015	17:00:00	98.35	67.05
08/05/2015	18:00:00	98.36	67.09
08/05/2015	19:00:00	98.35	67.07
08/05/2015	20:00:00	98.35	67.04
08/05/2015	21:00:00	98.36	67.09
08/05/2015	22:00:00	98.37	67.16
08/05/2015	23:00:00	98.36	67.12
09/05/2015	0:00:00	98.36	67.13
09/05/2015	1:00:00	98.37	67.15
09/05/2015	2:00:00	98.37	67.15
09/05/2015	3:00:00	98.37	67.20
09/05/2015	4:00:00	98.38	67.21

Date	Time	Stage Elevation	Calculated Q (cms)
09/05/2015	5:00:00	98.38	67.23
09/05/2015	6:00:00	98.38	67.25
09/05/2015	7:00:00	98.38	67.25
09/05/2015	8:00:00	98.39	67.29
09/05/2015	9:00:00	98.39	67.28
09/05/2015	10:00:00	98.39	67.28
09/05/2015	11:00:00	98.38	67.26
09/05/2015	12:00:00	98.38	67.26
09/05/2015	13:00:00	98.38	67.21
09/05/2015	14:00:00	98.37	67.21
09/05/2015	15:00:00	98.37	67.19
09/05/2015	16:00:00	98.37	67.17
09/05/2015	17:00:00	98.36	67.14
09/05/2015	18:00:00	98.36	67.12
09/05/2015	19:00:00	98.36	67.10
09/05/2015	20:00:00	98.35	67.07
09/05/2015	21:00:00	98.35	67.07
09/05/2015	22:00:00	98.36	67.11
09/05/2015	23:00:00	98.36	67.12
10/05/2015	0:00:00	98.37	67.15
10/05/2015	1:00:00	98.37	67.17
10/05/2015	2:00:00	98.37	67.15
10/05/2015	3:00:00	98.36	67.13
10/05/2015	4:00:00	98.37	67.15
10/05/2015	5:00:00	98.37	67.17
10/05/2015	6:00:00	98.37	67.21
10/05/2015	7:00:00	98.37	67.17
10/05/2015	8:00:00	98.37	67.21
10/05/2015	9:00:00	98.38	67.21
10/05/2015	10:00:00	98.37	67.20
10/05/2015	11:00:00	98.37	67.17
10/05/2015	12:00:00	98.36	67.13
10/05/2015	13:00:00	98.36	67.13
10/05/2015	14:00:00	98.36	67.10
10/05/2015	15:00:00	98.35	67.04
10/05/2015	16:00:00	98.35	67.02
10/05/2015	17:00:00	98.34	67.01
10/05/2015	18:00:00	98.35	67.03
10/05/2015	19:00:00	98.34	66.96
10/05/2015	20:00:00	98.34	66.98
10/05/2015	21:00:00	98.34	66.99
10/05/2015	22:00:00	98.34	67.00
10/05/2015	23:00:00	98.34	66.98
11/05/2015	0:00:00	98.34	66.99
11/05/2015	1:00:00	98.34	67.00

Date	Time	Stage Elevation	Calculated Q (cms)
11/05/2015	2:00:00	98.34	67.00
11/05/2015	3:00:00	98.34	66.96
11/05/2015	4:00:00	98.34	66.98
11/05/2015	5:00:00	98.34	66.98
11/05/2015	6:00:00	98.34	66.98
11/05/2015	7:00:00	98.34	66.98
11/05/2015	8:00:00	98.34	67.00
11/05/2015	9:00:00	98.34	66.96
11/05/2015	10:00:00	98.34	66.96
11/05/2015	11:00:00	98.33	66.94
11/05/2015	12:00:00	98.32	66.89
11/05/2015	13:00:00	98.32	66.87
11/05/2015	14:00:00	98.32	66.83
11/05/2015	15:00:00	98.31	66.81
11/05/2015	16:00:00	98.31	66.78
11/05/2015	17:00:00	98.30	66.73
11/05/2015	18:00:00	98.29	66.68
11/05/2015	19:00:00	98.29	66.69
11/05/2015	20:00:00	98.29	66.66
11/05/2015	21:00:00	98.29	66.66
11/05/2015	22:00:00	98.28	66.63
11/05/2015	23:00:00	98.29	66.64
12/05/2015	0:00:00	98.28	66.61
12/05/2015	1:00:00	98.28	66.62
12/05/2015	2:00:00	98.29	66.65
12/05/2015	3:00:00	98.28	66.63
12/05/2015	4:00:00	98.28	66.62
12/05/2015	5:00:00	98.29	66.64
12/05/2015	6:00:00	98.29	66.64
12/05/2015	7:00:00	98.28	66.63
12/05/2015	8:00:00	98.28	66.63
12/05/2015	9:00:00	98.28	66.61
12/05/2015	10:00:00	98.28	66.57
12/05/2015	11:00:00	98.28	66.61
12/05/2015	12:00:00	98.28	66.58
12/05/2015	13:00:00	98.27	66.53
12/05/2015	14:00:00	98.27	66.52
12/05/2015	15:00:00	98.26	66.44
12/05/2015	16:00:00	98.25	66.41
12/05/2015	17:00:00	98.25	66.39
12/05/2015	18:00:00	98.24	66.35
12/05/2015	19:00:00	98.23	66.31
12/05/2015	20:00:00	98.24	66.33
12/05/2015	21:00:00	98.23	66.31
12/05/2015	22:00:00	98.24	66.35

Date	Time	Stage Elevation	Calculated Q (cms)
12/05/2015	23:00:00	98.24	66.36
13/05/2015	0:00:00	98.24	66.37
13/05/2015	1:00:00	98.24	66.36
13/05/2015	2:00:00	98.23	66.30
13/05/2015	3:00:00	98.24	66.32
13/05/2015	4:00:00	98.24	66.33
13/05/2015	5:00:00	98.24	66.36
13/05/2015	6:00:00	98.24	66.34
13/05/2015	7:00:00	98.24	66.35
13/05/2015	8:00:00	98.24	66.32
13/05/2015	9:00:00	98.23	66.30
13/05/2015	10:00:00	98.24	66.33
13/05/2015	11:00:00	98.24	66.35
13/05/2015	12:00:00	98.24	66.36
13/05/2015	13:00:00	98.23	66.31
13/05/2015	14:00:00	98.23	66.30
13/05/2015	15:00:00	98.23	66.25
13/05/2015	16:00:00	98.23	66.27
13/05/2015	17:00:00	98.22	66.25
13/05/2015	18:00:00	98.23	66.25
13/05/2015	19:00:00	98.22	66.22
13/05/2015	20:00:00	98.22	66.21
13/05/2015	21:00:00	98.22	66.23
13/05/2015	22:00:00	98.23	66.27
13/05/2015	23:00:00	98.24	66.32
14/05/2015	0:00:00	98.23	66.28
14/05/2015	1:00:00	98.23	66.30
14/05/2015	2:00:00	98.23	66.30
14/05/2015	3:00:00	98.23	66.29
14/05/2015	4:00:00	98.23	66.29
14/05/2015	5:00:00	98.23	66.31
14/05/2015	6:00:00	98.24	66.33
14/05/2015	7:00:00	98.24	66.32
14/05/2015	8:00:00	98.24	66.33
14/05/2015	9:00:00	98.24	66.35
14/05/2015	10:00:00	98.24	66.37
14/05/2015	11:00:00	98.23	66.31
14/05/2015	12:00:00	98.23	66.27
14/05/2015	13:00:00	98.22	66.22
14/05/2015	14:00:00	98.21	66.16
14/05/2015	15:00:00	98.20	66.12
14/05/2015	16:00:00	98.20	66.11
14/05/2015	17:00:00	98.19	66.03
14/05/2015	18:00:00	98.19	66.04
14/05/2015	19:00:00	98.19	66.02

Date	Time	Stage Elevation	Calculated Q (cms)
14/05/2015	20:00:00	98.18	65.98
14/05/2015	21:00:00	98.18	65.93
14/05/2015	22:00:00	98.17	65.92
14/05/2015	23:00:00	98.18	65.96
15/05/2015	0:00:00	98.18	65.96
15/05/2015	1:00:00	98.18	65.96
15/05/2015	2:00:00	98.18	65.96
15/05/2015	3:00:00	98.18	65.93
15/05/2015	4:00:00	98.17	65.90
15/05/2015	5:00:00	98.17	65.90
15/05/2015	6:00:00	98.17	65.92
15/05/2015	7:00:00	98.18	65.93
15/05/2015	8:00:00	98.17	65.90
15/05/2015	9:00:00	98.17	65.92
15/05/2015	10:00:00	98.17	65.88
15/05/2015	11:00:00	98.17	65.92
15/05/2015	12:00:00	98.17	65.90
15/05/2015	13:00:00	98.17	65.91
15/05/2015	14:00:00	98.17	65.87
15/05/2015	15:00:00	98.16	65.86
15/05/2015	16:00:00	98.16	65.84
15/05/2015	17:00:00	98.16	65.84
15/05/2015	18:00:00	98.16	65.81
15/05/2015	19:00:00	98.17	65.87
15/05/2015	20:00:00	98.17	65.88
15/05/2015	21:00:00	98.17	65.87
15/05/2015	22:00:00	98.19	66.00
15/05/2015	23:00:00	98.20	66.09
16/05/2015	0:00:00	98.20	66.08
16/05/2015	1:00:00	98.21	66.16
16/05/2015	2:00:00	98.23	66.25
16/05/2015	3:00:00	98.23	66.28
16/05/2015	4:00:00	98.24	66.36
16/05/2015	5:00:00	98.25	66.41
16/05/2015	6:00:00	98.26	66.48
16/05/2015	7:00:00	98.27	66.57
16/05/2015	8:00:00	98.29	66.64
16/05/2015	9:00:00	98.30	66.73
16/05/2015	10:00:00	98.31	66.80
16/05/2015	11:00:00	98.32	66.85
16/05/2015	12:00:00	98.32	66.84
16/05/2015	13:00:00	98.32	66.85
16/05/2015	14:00:00	98.32	66.85
16/05/2015	15:00:00	98.32	66.83
16/05/2015	16:00:00	98.32	66.85

Date	Time	Stage Elevation	Calculated Q (cms)
16/05/2015	17:00:00	98.32	66.83
16/05/2015	18:00:00	98.31	66.81
16/05/2015	19:00:00	98.31	66.78
16/05/2015	20:00:00	98.31	66.78
16/05/2015	21:00:00	98.31	66.81
16/05/2015	22:00:00	98.32	66.85
16/05/2015	23:00:00	98.32	66.83
17/05/2015	0:00:00	98.32	66.84
17/05/2015	1:00:00	98.32	66.85
17/05/2015	2:00:00	98.32	66.85
17/05/2015	3:00:00	98.31	66.82
17/05/2015	4:00:00	98.31	66.79
17/05/2015	5:00:00	98.31	66.82
17/05/2015	6:00:00	98.32	66.86
17/05/2015	7:00:00	98.32	66.86
17/05/2015	8:00:00	98.32	66.84
17/05/2015	9:00:00	98.32	66.83
17/05/2015	10:00:00	98.32	66.86
17/05/2015	11:00:00	98.32	66.83
17/05/2015	12:00:00	98.31	66.82
17/05/2015	13:00:00	98.31	66.79
17/05/2015	14:00:00	98.30	66.75
17/05/2015	15:00:00	98.30	66.71
17/05/2015	16:00:00	98.29	66.68
17/05/2015	17:00:00	98.29	66.65
17/05/2015	18:00:00	98.28	66.61
17/05/2015	19:00:00	98.29	66.65
17/05/2015	20:00:00	98.28	66.63
17/05/2015	21:00:00	98.28	66.58
17/05/2015	22:00:00	98.28	66.62
17/05/2015	23:00:00	98.28	66.60
18/05/2015	0:00:00	98.28	66.62
18/05/2015	1:00:00	98.28	66.60
18/05/2015	2:00:00	98.28	66.58
18/05/2015	3:00:00	98.28	66.57
18/05/2015	4:00:00	98.28	66.59
18/05/2015	5:00:00	98.28	66.59
18/05/2015	6:00:00	98.28	66.59
18/05/2015	7:00:00	98.28	66.58
18/05/2015	8:00:00	98.28	66.60
18/05/2015	9:00:00	98.28	66.61
18/05/2015	10:00:00	98.28	66.57
18/05/2015	11:00:00	98.27	66.55
18/05/2015	12:00:00	98.27	66.52
18/05/2015	13:00:00	98.27	66.52

Date	Time	Stage Elevation	Calculated Q (cms)
18/05/2015	14:00:00	98.26	66.48
18/05/2015	15:00:00	98.26	66.46
18/05/2015	16:00:00	98.25	66.43
18/05/2015	17:00:00	98.25	66.40
18/05/2015	18:00:00	98.24	66.37
18/05/2015	19:00:00	98.24	66.34
18/05/2015	20:00:00	98.23	66.31
18/05/2015	21:00:00	98.24	66.32
18/05/2015	22:00:00	98.24	66.35
18/05/2015	23:00:00	98.24	66.36
19/05/2015	0:00:00	98.24	66.37
19/05/2015	1:00:00	98.24	66.37
19/05/2015	2:00:00	98.24	66.37
19/05/2015	3:00:00	98.25	66.38
19/05/2015	4:00:00	98.24	66.35
19/05/2015	5:00:00	98.24	66.35
19/05/2015	6:00:00	98.25	66.38
19/05/2015	7:00:00	98.25	66.38
19/05/2015	8:00:00	98.25	66.41
19/05/2015	9:00:00	98.25	66.38
19/05/2015	10:00:00	98.24	66.36
19/05/2015	11:00:00	98.24	66.37
19/05/2015	12:00:00	98.24	66.35
19/05/2015	13:00:00	98.23	66.31
19/05/2015	14:00:00	98.23	66.25
19/05/2015	15:00:00	98.22	66.25
19/05/2015	16:00:00	98.22	66.21
19/05/2015	17:00:00	98.21	66.15
19/05/2015	18:00:00	98.20	66.12
19/05/2015	19:00:00	98.20	66.09
19/05/2015	20:00:00	98.19	66.05
19/05/2015	21:00:00	98.20	66.07
19/05/2015	22:00:00	98.20	66.07
19/05/2015	23:00:00	98.20	66.07
20/05/2015	0:00:00	98.19	66.03
20/05/2015	1:00:00	98.19	66.05
20/05/2015	2:00:00	98.20	66.07
20/05/2015	3:00:00	98.20	66.07
20/05/2015	4:00:00	98.20	66.07
20/05/2015	5:00:00	98.20	66.07
20/05/2015	6:00:00	98.20	66.07
20/05/2015	7:00:00	98.20	66.08
20/05/2015	8:00:00	98.20	66.07
20/05/2015	9:00:00	98.19	66.02
20/05/2015	10:00:00	98.19	66.02

Date	Time	Stage Elevation	Calculated Q (cms)
20/05/2015	11:00:00	98.19	66.02
20/05/2015	12:00:00	98.19	66.02
20/05/2015	13:00:00	98.18	65.98
20/05/2015	14:00:00	98.18	65.94
20/05/2015	15:00:00	98.17	65.90
20/05/2015	16:00:00	98.17	65.89
20/05/2015	17:00:00	98.16	65.83
20/05/2015	18:00:00	98.15	65.80
20/05/2015	19:00:00	98.15	65.77
20/05/2015	20:00:00	98.15	65.75
20/05/2015	21:00:00	98.15	65.75
20/05/2015	22:00:00	98.14	65.73
20/05/2015	23:00:00	98.15	65.77
21/05/2015	0:00:00	98.15	65.77
21/05/2015	1:00:00	98.14	65.73
21/05/2015	2:00:00	98.14	65.73
21/05/2015	3:00:00	98.15	65.75
21/05/2015	4:00:00	98.15	65.78
21/05/2015	5:00:00	98.15	65.77
21/05/2015	6:00:00	98.15	65.80
21/05/2015	7:00:00	98.15	65.77
21/05/2015	8:00:00	98.15	65.77
21/05/2015	9:00:00	98.15	65.75
21/05/2015	10:00:00	98.15	65.77
21/05/2015	11:00:00	98.15	65.77
21/05/2015	12:00:00	98.15	65.75
21/05/2015	13:00:00	98.15	65.75
21/05/2015	14:00:00	98.14	65.72
21/05/2015	15:00:00	98.14	65.69
21/05/2015	16:00:00	98.13	65.65
21/05/2015	17:00:00	98.13	65.63
21/05/2015	18:00:00	98.13	65.61
21/05/2015	19:00:00	98.12	65.59
21/05/2015	20:00:00	98.12	65.60
21/05/2015	21:00:00	98.13	65.61
21/05/2015	22:00:00	98.13	65.62
21/05/2015	23:00:00	98.13	65.66
22/05/2015	0:00:00	98.13	65.64
22/05/2015	1:00:00	98.13	65.65
22/05/2015	2:00:00	98.13	65.65
22/05/2015	3:00:00	98.14	65.68
22/05/2015	4:00:00	98.14	65.68
22/05/2015	5:00:00	98.14	65.70
22/05/2015	6:00:00	98.14	65.72
22/05/2015	7:00:00	98.14	65.72

Date	Time	Stage Elevation	Calculated Q (cms)
22/05/2015	8:00:00	98.15	65.75
22/05/2015	9:00:00	98.15	65.75
22/05/2015	10:00:00	98.15	65.78
22/05/2015	11:00:00	98.15	65.78
22/05/2015	12:00:00	98.15	65.77
22/05/2015	13:00:00	98.15	65.80
22/05/2015	14:00:00	98.15	65.77
22/05/2015	15:00:00	98.15	65.77
22/05/2015	16:00:00	98.14	65.73
22/05/2015	17:00:00	98.14	65.71
22/05/2015	18:00:00	98.14	65.73
22/05/2015	19:00:00	98.14	65.71
22/05/2015	20:00:00	98.14	65.71
22/05/2015	21:00:00	98.14	65.71
22/05/2015	22:00:00	98.15	65.75
22/05/2015	23:00:00	98.15	65.77
23/05/2015	0:00:00	98.15	65.78
23/05/2015	1:00:00	98.16	65.83
23/05/2015	2:00:00	98.16	65.82
23/05/2015	3:00:00	98.16	65.86
23/05/2015	4:00:00	98.17	65.88
23/05/2015	5:00:00	98.17	65.90
23/05/2015	6:00:00	98.17	65.91
23/05/2015	7:00:00	98.18	65.93
23/05/2015	8:00:00	98.18	65.94
23/05/2015	9:00:00	98.18	65.96
23/05/2015	10:00:00	98.18	65.94
23/05/2015	11:00:00	98.18	65.96
23/05/2015	12:00:00	98.17	65.92
23/05/2015	13:00:00	98.17	65.91
23/05/2015	14:00:00	98.16	65.86
23/05/2015	15:00:00	98.16	65.81
23/05/2015	16:00:00	98.16	65.80
23/05/2015	17:00:00	98.15	65.77
23/05/2015	18:00:00	98.14	65.72
23/05/2015	19:00:00	98.14	65.71
23/05/2015	20:00:00	98.13	65.65
23/05/2015	21:00:00	98.14	65.68
23/05/2015	22:00:00	98.13	65.65
23/05/2015	23:00:00	98.13	65.67
24/05/2015	0:00:00	98.14	65.69
24/05/2015	1:00:00	98.13	65.65
24/05/2015	2:00:00	98.13	65.67
24/05/2015	3:00:00	98.13	65.62
24/05/2015	4:00:00	98.13	65.63

Date	Time	Stage Elevation	Calculated Q (cms)
24/05/2015	5:00:00	98.13	65.64
24/05/2015	6:00:00	98.13	65.64
24/05/2015	7:00:00	98.13	65.64
24/05/2015	8:00:00	98.13	65.63
24/05/2015	9:00:00	98.13	65.62
24/05/2015	10:00:00	98.12	65.60
24/05/2015	11:00:00	98.12	65.59
24/05/2015	12:00:00	98.12	65.55
24/05/2015	13:00:00	98.11	65.51
24/05/2015	14:00:00	98.10	65.48
24/05/2015	15:00:00	98.10	65.42
24/05/2015	16:00:00	98.09	65.40
24/05/2015	17:00:00	98.09	65.39
24/05/2015	18:00:00	98.08	65.35
24/05/2015	19:00:00	98.08	65.33
24/05/2015	20:00:00	98.08	65.32
24/05/2015	21:00:00	98.09	65.39
24/05/2015	22:00:00	98.09	65.39
24/05/2015	23:00:00	98.09	65.37
25/05/2015	0:00:00	98.08	65.32
25/05/2015	1:00:00	98.08	65.30
25/05/2015	2:00:00	98.08	65.34
25/05/2015	3:00:00	98.08	65.32
25/05/2015	4:00:00	98.08	65.34
25/05/2015	5:00:00	98.08	65.32
25/05/2015	6:00:00	98.08	65.30
25/05/2015	7:00:00	98.08	65.31
25/05/2015	8:00:00	98.08	65.31
25/05/2015	9:00:00	98.08	65.31
25/05/2015	10:00:00	98.08	65.32
25/05/2015	11:00:00	98.08	65.32
25/05/2015	12:00:00	98.08	65.30
25/05/2015	13:00:00	98.08	65.33
25/05/2015	14:00:00	98.08	65.30
25/05/2015	15:00:00	98.06	65.22
25/05/2015	16:00:00	98.07	65.23
25/05/2015	17:00:00	98.08	65.30
25/05/2015	18:00:00	98.08	65.30
25/05/2015	19:00:00	98.08	65.31
25/05/2015	20:00:00	98.08	65.34
25/05/2015	21:00:00	98.09	65.37
25/05/2015	22:00:00	98.09	65.37
25/05/2015	23:00:00	98.09	65.40
26/05/2015	0:00:00	98.10	65.44
26/05/2015	1:00:00	98.10	65.44

Date	Time	Stage Elevation	Calculated Q (cms)
26/05/2015	2:00:00	98.10	65.48
26/05/2015	3:00:00	98.11	65.48
26/05/2015	4:00:00	98.11	65.51
26/05/2015	5:00:00	98.11	65.52
26/05/2015	6:00:00	98.12	65.55
26/05/2015	7:00:00	98.12	65.55
26/05/2015	8:00:00	98.12	65.59
26/05/2015	9:00:00	98.12	65.59
26/05/2015	10:00:00	98.13	65.61
26/05/2015	11:00:00	98.13	65.61
26/05/2015	12:00:00	98.12	65.60
26/05/2015	13:00:00	98.12	65.56
26/05/2015	14:00:00	98.11	65.54
26/05/2015	15:00:00	98.10	65.46
26/05/2015	16:00:00	98.10	65.45
26/05/2015	17:00:00	98.10	65.43
26/05/2015	18:00:00	98.10	65.43
26/05/2015	19:00:00	98.09	65.36
26/05/2015	20:00:00	98.10	65.44
26/05/2015	21:00:00	98.10	65.42
26/05/2015	22:00:00	98.09	65.38
26/05/2015	23:00:00	98.09	65.41
27/05/2015	0:00:00	98.09	65.40
27/05/2015	1:00:00	98.09	65.40
27/05/2015	2:00:00	98.09	65.38
27/05/2015	3:00:00	98.09	65.36
27/05/2015	4:00:00	98.09	65.38
27/05/2015	5:00:00	98.08	65.33
27/05/2015	6:00:00	98.09	65.36
27/05/2015	7:00:00	98.09	65.37
27/05/2015	8:00:00	98.08	65.32
27/05/2015	9:00:00	98.08	65.32
27/05/2015	10:00:00	98.08	65.32
27/05/2015	11:00:00	98.08	65.31
27/05/2015	12:00:00	98.08	65.30
27/05/2015	13:00:00	98.07	65.29
27/05/2015	14:00:00	98.07	65.23
27/05/2015	15:00:00	98.07	65.25
27/05/2015	16:00:00	98.09	65.39
27/05/2015	17:00:00	98.12	65.60
27/05/2015	18:00:00	98.17	65.89
27/05/2015	19:00:00	98.23	66.31
27/05/2015	20:00:00	98.24	66.33
27/05/2015	21:00:00	98.23	66.28
27/05/2015	22:00:00	98.23	66.25

Date	Time	Stage Elevation	Calculated Q (cms)
27/05/2015	23:00:00	98.20	66.11
28/05/2015	0:00:00	98.19	66.00
28/05/2015	1:00:00	98.18	65.94
28/05/2015	2:00:00	98.18	65.94
28/05/2015	3:00:00	98.19	66.00
28/05/2015	4:00:00	98.19	66.03
28/05/2015	5:00:00	98.19	66.05
28/05/2015	6:00:00	98.19	66.05
28/05/2015	7:00:00	98.20	66.07
28/05/2015	8:00:00	98.20	66.10
28/05/2015	9:00:00	98.20	66.11
28/05/2015	10:00:00	98.20	66.12
28/05/2015	11:00:00	98.20	66.09
28/05/2015	12:00:00	98.20	66.09
28/05/2015	13:00:00	98.20	66.07
28/05/2015	14:00:00	98.19	66.04
28/05/2015	15:00:00	98.20	66.11
28/05/2015	16:00:00	98.19	66.04
28/05/2015	17:00:00	98.19	66.01
28/05/2015	18:00:00	98.18	65.96
28/05/2015	19:00:00	98.18	65.94
28/05/2015	20:00:00	98.18	65.96
28/05/2015	21:00:00	98.17	65.91
28/05/2015	22:00:00	98.18	65.93
28/05/2015	23:00:00	98.18	65.93
29/05/2015	0:00:00	98.18	65.94
29/05/2015	1:00:00	98.18	65.93
29/05/2015	2:00:00	98.17	65.88
29/05/2015	3:00:00	98.16	65.86
29/05/2015	4:00:00	98.16	65.82
29/05/2015	5:00:00	98.16	65.81
29/05/2015	6:00:00	98.16	65.82
29/05/2015	7:00:00	98.16	65.80
29/05/2015	8:00:00	98.15	65.80
29/05/2015	9:00:00	98.15	65.80
29/05/2015	10:00:00	98.15	65.78
29/05/2015	11:00:00	98.15	65.77
29/05/2015	12:00:00	98.15	65.77
29/05/2015	13:00:00	98.14	65.73
29/05/2015	14:00:00	98.13	65.65
29/05/2015	15:00:00	98.13	65.65
29/05/2015	16:00:00	98.13	65.63
29/05/2015	17:00:00	98.13	65.65
29/05/2015	18:00:00	98.12	65.59
29/05/2015	19:00:00	98.12	65.59

Date	Time	Stage Elevation	Calculated Q (cms)
29/05/2015	20:00:00	98.12	65.55
29/05/2015	21:00:00	98.12	65.55
29/05/2015	22:00:00	98.12	65.56
29/05/2015	23:00:00	98.11	65.52
30/05/2015	0:00:00	98.11	65.50
30/05/2015	1:00:00	98.10	65.44
30/05/2015	2:00:00	98.10	65.42
30/05/2015	3:00:00	98.08	65.35
30/05/2015	4:00:00	98.08	65.32
30/05/2015	5:00:00	98.07	65.27
30/05/2015	6:00:00	98.07	65.25
30/05/2015	7:00:00	98.06	65.21
30/05/2015	8:00:00	98.07	65.23
30/05/2015	9:00:00	98.07	65.23
30/05/2015	10:00:00	98.06	65.22
30/05/2015	11:00:00	98.06	65.22
30/05/2015	12:00:00	98.06	65.22
30/05/2015	13:00:00	98.06	65.22
30/05/2015	14:00:00	98.07	65.23
30/05/2015	15:00:00	98.06	65.20
30/05/2015	16:00:00	98.06	65.16
30/05/2015	17:00:00	98.05	65.11
30/05/2015	18:00:00	98.05	65.10
30/05/2015	19:00:00	98.05	65.13
30/05/2015	20:00:00	98.07	65.23
30/05/2015	21:00:00	98.07	65.27
30/05/2015	22:00:00	98.12	65.57
30/05/2015	23:00:00	98.16	65.86
31/05/2015	0:00:00	98.13	65.63
31/05/2015	1:00:00	98.09	65.41
31/05/2015	2:00:00	98.07	65.25
31/05/2015	3:00:00	98.06	65.17
31/05/2015	4:00:00	98.04	65.06
31/05/2015	5:00:00	98.04	65.04
31/05/2015	6:00:00	98.03	65.01
31/05/2015	7:00:00	98.03	64.98
31/05/2015	8:00:00	98.02	64.96
31/05/2015	9:00:00	98.02	64.94
31/05/2015	10:00:00	98.01	64.90
31/05/2015	11:00:00	98.01	64.88
31/05/2015	12:00:00	98.01	64.85
31/05/2015	13:00:00	98.01	64.86
31/05/2015	14:00:00	98.01	64.84
31/05/2015	15:00:00	98.01	64.86
31/05/2015	16:00:00	98.01	64.88

Date	Time	Stage Elevation	Calculated Q (cms)
31/05/2015	17:00:00	98.01	64.85
31/05/2015	18:00:00	98.01	64.86
31/05/2015	19:00:00	98.01	64.84
31/05/2015	20:00:00	98.01	64.88
31/05/2015	21:00:00	98.01	64.90
31/05/2015	22:00:00	98.02	64.93
31/05/2015	23:00:00	98.02	64.92
01/06/2015	0:00:00	98.02	64.93
01/06/2015	1:00:00	98.02	64.92
01/06/2015	2:00:00	98.02	64.96
01/06/2015	3:00:00	98.03	65.00
01/06/2015	4:00:00	98.05	65.10
01/06/2015	5:00:00	98.06	65.18
01/06/2015	6:00:00	98.07	65.27
01/06/2015	7:00:00	98.09	65.40
01/06/2015	8:00:00	98.12	65.56
01/06/2015	9:00:00	98.12	65.56
01/06/2015	10:00:00	98.12	65.56
01/06/2015	11:00:00	98.11	65.54
01/06/2015	12:00:00	98.12	65.56
01/06/2015	13:00:00	98.14	65.73
01/06/2015	14:00:00	98.14	65.71
01/06/2015	15:00:00	98.12	65.59
01/06/2015	16:00:00	98.11	65.52
01/06/2015	17:00:00	98.10	65.46
01/06/2015	18:00:00	98.09	65.39
01/06/2015	19:00:00	98.09	65.38
01/06/2015	20:00:00	98.09	65.37
01/06/2015	21:00:00	98.09	65.36
01/06/2015	22:00:00	98.08	65.30
01/06/2015	23:00:00	98.08	65.30
02/06/2015	0:00:00	98.07	65.29
02/06/2015	1:00:00	98.07	65.29
02/06/2015	2:00:00	98.06	65.22
02/06/2015	3:00:00	98.06	65.20
02/06/2015	4:00:00	98.06	65.17
02/06/2015	5:00:00	98.05	65.10
02/06/2015	6:00:00	98.04	65.05
02/06/2015	7:00:00	98.03	65.02
02/06/2015	8:00:00	98.03	65.02
02/06/2015	9:00:00	98.02	64.96
02/06/2015	10:00:00	98.02	64.94
02/06/2015	11:00:00	98.02	64.92
02/06/2015	12:00:00	98.02	64.91
02/06/2015	13:00:00	98.01	64.86

Date	Time	Stage Elevation	Calculated Q (cms)
02/06/2015	14:00:00	98.00	64.81
02/06/2015	15:00:00	97.99	64.77
02/06/2015	16:00:00	97.99	64.75
02/06/2015	17:00:00	97.98	64.70
02/06/2015	18:00:00	97.98	64.68
02/06/2015	19:00:00	97.98	64.67
02/06/2015	20:00:00	97.98	64.67
02/06/2015	21:00:00	97.98	64.69
02/06/2015	22:00:00	97.98	64.67
02/06/2015	23:00:00	97.98	64.70
03/06/2015	0:00:00	97.99	64.71
03/06/2015	1:00:00	97.98	64.70
03/06/2015	2:00:00	97.98	64.71
03/06/2015	3:00:00	97.98	64.70
03/06/2015	4:00:00	97.99	64.71
03/06/2015	5:00:00	97.99	64.71
03/06/2015	6:00:00	97.99	64.73
03/06/2015	7:00:00	97.99	64.77
03/06/2015	8:00:00	97.99	64.77
03/06/2015	9:00:00	98.00	64.79
03/06/2015	10:00:00	98.00	64.80
03/06/2015	11:00:00	98.00	64.80
03/06/2015	12:00:00	98.00	64.80
03/06/2015	13:00:00	97.99	64.77
03/06/2015	14:00:00	97.99	64.75
03/06/2015	15:00:00	97.99	64.73
03/06/2015	16:00:00	97.98	64.70
03/06/2015	17:00:00	97.98	64.70
03/06/2015	18:00:00	97.99	64.71
03/06/2015	19:00:00	97.98	64.71
03/06/2015	20:00:00	98.00	64.80
03/06/2015	21:00:00	98.02	64.92
03/06/2015	22:00:00	98.07	65.25
03/06/2015	23:00:00	98.18	65.93
04/06/2015	0:00:00	98.21	66.14
04/06/2015	1:00:00	98.19	66.03
04/06/2015	2:00:00	98.17	65.92
04/06/2015	3:00:00	98.15	65.75
04/06/2015	4:00:00	98.14	65.72
04/06/2015	5:00:00	98.12	65.60
04/06/2015	6:00:00	98.11	65.51
04/06/2015	7:00:00	98.11	65.50
04/06/2015	8:00:00	98.09	65.40
04/06/2015	9:00:00	98.07	65.25
04/06/2015	10:00:00	98.06	65.20

Date	Time	Stage Elevation	Calculated Q (cms)
04/06/2015	11:00:00	98.06	65.21
04/06/2015	12:00:00	98.06	65.18
04/06/2015	13:00:00	98.05	65.15
04/06/2015	14:00:00	98.04	65.09
04/06/2015	15:00:00	98.04	65.09
04/06/2015	16:00:00	98.04	65.04
04/06/2015	17:00:00	98.03	65.02
04/06/2015	18:00:00	98.04	65.04
04/06/2015	19:00:00	98.04	65.04
04/06/2015	20:00:00	98.04	65.06
04/06/2015	21:00:00	98.04	65.05
04/06/2015	22:00:00	98.04	65.05
04/06/2015	23:00:00	98.04	65.06
05/06/2015	0:00:00	98.04	65.09
05/06/2015	1:00:00	98.04	65.04
05/06/2015	2:00:00	98.04	65.09
05/06/2015	3:00:00	98.04	65.04
05/06/2015	4:00:00	98.04	65.06
05/06/2015	5:00:00	98.04	65.09
05/06/2015	6:00:00	98.04	65.09
05/06/2015	7:00:00	98.04	65.09
05/06/2015	8:00:00	98.05	65.12
05/06/2015	9:00:00	98.05	65.10
05/06/2015	10:00:00	98.04	65.06
05/06/2015	11:00:00	98.04	65.04
05/06/2015	12:00:00	98.03	64.98
05/06/2015	13:00:00	98.02	64.96
05/06/2015	14:00:00	98.02	64.91
05/06/2015	15:00:00	98.02	64.93
05/06/2015	16:00:00	98.01	64.88
05/06/2015	17:00:00	98.01	64.89
05/06/2015	18:00:00	98.01	64.89
05/06/2015	19:00:00	98.01	64.89
05/06/2015	20:00:00	98.01	64.90
05/06/2015	21:00:00	98.01	64.85
05/06/2015	22:00:00	98.01	64.86
05/06/2015	23:00:00	98.01	64.85
06/06/2015	0:00:00	98.00	64.83
06/06/2015	1:00:00	98.01	64.86
06/06/2015	2:00:00	98.01	64.85
06/06/2015	3:00:00	98.01	64.88
06/06/2015	4:00:00	98.01	64.90
06/06/2015	5:00:00	98.02	64.91
06/06/2015	6:00:00	98.02	64.95
06/06/2015	7:00:00	98.02	64.96

Date	Time	Stage Elevation	Calculated Q (cms)
06/06/2015	8:00:00	98.02	64.96
06/06/2015	9:00:00	98.02	64.96
06/06/2015	10:00:00	98.02	64.93
06/06/2015	11:00:00	98.02	64.92
06/06/2015	12:00:00	98.02	64.94
06/06/2015	13:00:00	98.01	64.90
06/06/2015	14:00:00	98.01	64.85
06/06/2015	15:00:00	98.01	64.85
06/06/2015	16:00:00	98.00	64.82
06/06/2015	17:00:00	98.00	64.81
06/06/2015	18:00:00	98.00	64.79
06/06/2015	19:00:00	98.00	64.80
06/06/2015	20:00:00	97.99	64.77
06/06/2015	21:00:00	98.00	64.80
06/06/2015	22:00:00	98.00	64.80
06/06/2015	23:00:00	98.00	64.82
07/06/2015	0:00:00	98.01	64.84
07/06/2015	1:00:00	98.01	64.85
07/06/2015	2:00:00	98.00	64.83
07/06/2015	3:00:00	98.01	64.84
07/06/2015	4:00:00	98.01	64.88
07/06/2015	5:00:00	98.01	64.88
07/06/2015	6:00:00	98.01	64.86
07/06/2015	7:00:00	98.01	64.89
07/06/2015	8:00:00	98.02	64.91
07/06/2015	9:00:00	98.01	64.89
07/06/2015	10:00:00	98.01	64.86
07/06/2015	11:00:00	98.00	64.82
07/06/2015	12:00:00	98.00	64.79
07/06/2015	13:00:00	97.99	64.75
07/06/2015	14:00:00	97.99	64.77
07/06/2015	15:00:00	97.99	64.73
07/06/2015	16:00:00	97.99	64.77
07/06/2015	17:00:00	97.99	64.73
07/06/2015	18:00:00	97.98	64.71
07/06/2015	19:00:00	97.98	64.68
07/06/2015	20:00:00	97.97	64.61
07/06/2015	21:00:00	97.96	64.55
07/06/2015	22:00:00	97.96	64.54
07/06/2015	23:00:00	97.95	64.50
08/06/2015	0:00:00	97.95	64.52
08/06/2015	1:00:00	97.96	64.54
08/06/2015	2:00:00	97.96	64.54
08/06/2015	3:00:00	97.97	64.59
08/06/2015	4:00:00	97.97	64.62

Date	Time	Stage Elevation	Calculated Q (cms)
08/06/2015	5:00:00	97.98	64.66
08/06/2015	6:00:00	97.98	64.69
08/06/2015	7:00:00	97.98	64.69
08/06/2015	8:00:00	97.98	64.66
08/06/2015	9:00:00	97.98	64.66
08/06/2015	10:00:00	97.97	64.62
08/06/2015	11:00:00	97.98	64.65
08/06/2015	12:00:00	97.97	64.64
08/06/2015	13:00:00	97.98	64.65
08/06/2015	14:00:00	97.98	64.66
08/06/2015	15:00:00	97.98	64.70
08/06/2015	16:00:00	97.98	64.69
08/06/2015	17:00:00	97.98	64.70
08/06/2015	18:00:00	97.98	64.70
08/06/2015	19:00:00	97.98	64.67
08/06/2015	20:00:00	97.98	64.65
08/06/2015	21:00:00	97.98	64.68
08/06/2015	22:00:00	97.98	64.69
08/06/2015	23:00:00	97.98	64.71
09/06/2015	0:00:00	97.99	64.71
09/06/2015	1:00:00	97.99	64.71
09/06/2015	2:00:00	97.99	64.74
09/06/2015	3:00:00	97.99	64.74
09/06/2015	4:00:00	97.99	64.77
09/06/2015	5:00:00	97.99	64.75
09/06/2015	6:00:00	98.00	64.80
09/06/2015	7:00:00	98.00	64.80
09/06/2015	8:00:00	98.00	64.80
09/06/2015	9:00:00	98.00	64.79
09/06/2015	10:00:00	98.00	64.80
09/06/2015	11:00:00	98.00	64.81
09/06/2015	12:00:00	98.00	64.80
09/06/2015	13:00:00	97.99	64.77
09/06/2015	14:00:00	97.99	64.74
09/06/2015	15:00:00	97.99	64.71
09/06/2015	16:00:00	97.99	64.71
09/06/2015	17:00:00	97.98	64.67
09/06/2015	18:00:00	97.97	64.64
09/06/2015	19:00:00	97.98	64.65
09/06/2015	20:00:00	97.97	64.64
09/06/2015	21:00:00	97.97	64.64
09/06/2015	22:00:00	97.98	64.66
09/06/2015	23:00:00	97.98	64.66
10/06/2015	0:00:00	97.98	64.66
10/06/2015	1:00:00	97.97	64.64

Date	Time	Stage Elevation	Calculated Q (cms)
10/06/2015	2:00:00	97.97	64.64
10/06/2015	3:00:00	97.98	64.65
10/06/2015	4:00:00	97.97	64.63
10/06/2015	5:00:00	97.97	64.60
10/06/2015	6:00:00	97.97	64.59
10/06/2015	7:00:00	97.96	64.57
10/06/2015	8:00:00	97.96	64.54
10/06/2015	9:00:00	97.96	64.55
10/06/2015	10:00:00	97.95	64.50
10/06/2015	11:00:00	97.95	64.48
10/06/2015	12:00:00	97.95	64.48
10/06/2015	13:00:00	97.94	64.43
10/06/2015	14:00:00	97.93	64.38
10/06/2015	15:00:00	97.93	64.34
10/06/2015	16:00:00	97.92	64.29
10/06/2015	17:00:00	97.91	64.25
10/06/2015	18:00:00	97.91	64.25
10/06/2015	19:00:00	97.91	64.24
10/06/2015	20:00:00	97.91	64.23
10/06/2015	21:00:00	97.91	64.21
10/06/2015	22:00:00	97.91	64.21
10/06/2015	23:00:00	97.90	64.19
11/06/2015	0:00:00	97.90	64.20
11/06/2015	1:00:00	97.91	64.22
11/06/2015	2:00:00	97.90	64.18
11/06/2015	3:00:00	97.91	64.22
11/06/2015	4:00:00	97.91	64.21
11/06/2015	5:00:00	97.91	64.22
11/06/2015	6:00:00	97.91	64.24
11/06/2015	7:00:00	97.91	64.25
11/06/2015	8:00:00	97.91	64.24
11/06/2015	9:00:00	97.91	64.23
11/06/2015	10:00:00	97.91	64.23
11/06/2015	11:00:00	97.91	64.23
11/06/2015	12:00:00	97.91	64.22
11/06/2015	13:00:00	97.91	64.21
11/06/2015	14:00:00	97.90	64.20
11/06/2015	15:00:00	97.91	64.22
11/06/2015	16:00:00	97.90	64.18
11/06/2015	17:00:00	97.90	64.17
11/06/2015	18:00:00	97.90	64.19
11/06/2015	19:00:00	97.91	64.23
11/06/2015	20:00:00	97.91	64.24
11/06/2015	21:00:00	97.92	64.27
11/06/2015	22:00:00	97.92	64.29

Date	Time	Stage Elevation	Calculated Q (cms)
11/06/2015	23:00:00	97.92	64.31
12/06/2015	0:00:00	97.93	64.33
12/06/2015	1:00:00	97.92	64.29
12/06/2015	2:00:00	97.92	64.27
12/06/2015	3:00:00	97.92	64.31
12/06/2015	4:00:00	97.92	64.30
12/06/2015	5:00:00	97.93	64.33
12/06/2015	6:00:00	97.93	64.35
12/06/2015	7:00:00	97.93	64.34
12/06/2015	8:00:00	97.93	64.35
12/06/2015	9:00:00	97.93	64.38
12/06/2015	10:00:00	97.94	64.40
12/06/2015	11:00:00	97.94	64.44
12/06/2015	12:00:00	97.95	64.48
12/06/2015	13:00:00	97.98	64.66
12/06/2015	14:00:00	98.04	65.04
12/06/2015	15:00:00	98.07	65.27
12/06/2015	16:00:00	98.06	65.17
12/06/2015	17:00:00	98.05	65.11
12/06/2015	18:00:00	98.07	65.23
12/06/2015	19:00:00	98.20	66.09
12/06/2015	20:00:00	98.24	66.34
12/06/2015	21:00:00	98.18	65.94
12/06/2015	22:00:00	98.12	65.59
12/06/2015	23:00:00	98.09	65.36
13/06/2015	0:00:00	98.06	65.20
13/06/2015	1:00:00	98.06	65.22
13/06/2015	2:00:00	98.08	65.30
13/06/2015	3:00:00	98.06	65.18
13/06/2015	4:00:00	98.04	65.09
13/06/2015	5:00:00	98.06	65.19
13/06/2015	6:00:00	98.08	65.30
13/06/2015	7:00:00	98.12	65.55
13/06/2015	8:00:00	98.15	65.80
13/06/2015	9:00:00	98.14	65.68
13/06/2015	10:00:00	98.11	65.51
13/06/2015	11:00:00	98.10	65.44
13/06/2015	12:00:00	98.09	65.41
13/06/2015	13:00:00	98.10	65.46
13/06/2015	14:00:00	98.10	65.43
13/06/2015	15:00:00	98.12	65.60
13/06/2015	16:00:00	98.14	65.73
13/06/2015	17:00:00	98.12	65.57
13/06/2015	18:00:00	98.10	65.46
13/06/2015	19:00:00	98.09	65.37

Date	Time	Stage Elevation	Calculated Q (cms)
13/06/2015	20:00:00	98.07	65.29
13/06/2015	21:00:00	98.06	65.18
13/06/2015	22:00:00	98.06	65.16
13/06/2015	23:00:00	98.09	65.40
14/06/2015	0:00:00	98.08	65.30
14/06/2015	1:00:00	98.13	65.62
14/06/2015	2:00:00	98.13	65.65
14/06/2015	3:00:00	98.10	65.44
14/06/2015	4:00:00	98.08	65.34
14/06/2015	5:00:00	98.08	65.30
14/06/2015	6:00:00	98.08	65.30
14/06/2015	7:00:00	98.07	65.27
14/06/2015	8:00:00	98.08	65.30
14/06/2015	9:00:00	98.08	65.33
14/06/2015	10:00:00	98.08	65.35
14/06/2015	11:00:00	98.09	65.37
14/06/2015	12:00:00	98.09	65.36
14/06/2015	13:00:00	98.08	65.30
14/06/2015	14:00:00	98.08	65.30
14/06/2015	15:00:00	98.07	65.29
14/06/2015	16:00:00	98.07	65.27
14/06/2015	17:00:00	98.07	65.25
14/06/2015	18:00:00	98.07	65.25
14/06/2015	19:00:00	98.13	65.61
14/06/2015	20:00:00	98.12	65.60
14/06/2015	21:00:00	98.10	65.46
14/06/2015	22:00:00	98.09	65.37
14/06/2015	23:00:00	98.08	65.30
15/06/2015	0:00:00	98.08	65.30
15/06/2015	1:00:00	98.07	65.29
15/06/2015	2:00:00	98.07	65.25
15/06/2015	3:00:00	98.07	65.27
15/06/2015	4:00:00	98.07	65.25
15/06/2015	5:00:00	98.06	65.22
15/06/2015	6:00:00	98.06	65.19
15/06/2015	7:00:00	98.05	65.15
15/06/2015	8:00:00	98.05	65.12
15/06/2015	9:00:00	98.04	65.09
15/06/2015	10:00:00	98.04	65.07
15/06/2015	11:00:00	98.04	65.04
15/06/2015	12:00:00	98.03	64.98
15/06/2015	13:00:00	98.02	64.94
15/06/2015	14:00:00	98.01	64.88
15/06/2015	15:00:00	98.00	64.81
15/06/2015	16:00:00	97.99	64.77

Date	Time	Stage Elevation	Calculated Q (cms)
15/06/2015	17:00:00	97.99	64.71
15/06/2015	18:00:00	97.98	64.67
15/06/2015	19:00:00	97.97	64.61
15/06/2015	20:00:00	97.96	64.56
15/06/2015	21:00:00	97.96	64.54
15/06/2015	22:00:00	97.96	64.54
15/06/2015	23:00:00	97.96	64.52
16/06/2015	0:00:00	97.95	64.52
16/06/2015	1:00:00	97.95	64.50
16/06/2015	2:00:00	97.95	64.48
16/06/2015	3:00:00	97.94	64.45
16/06/2015	4:00:00	97.95	64.46
16/06/2015	5:00:00	97.94	64.45
16/06/2015	6:00:00	97.95	64.48
16/06/2015	7:00:00	97.95	64.48
16/06/2015	8:00:00	97.95	64.48
16/06/2015	9:00:00	97.96	64.52
16/06/2015	10:00:00	97.96	64.55
16/06/2015	11:00:00	97.96	64.57
16/06/2015	12:00:00	97.96	64.57
16/06/2015	13:00:00	97.97	64.59
16/06/2015	14:00:00	97.97	64.59
16/06/2015	15:00:00	97.97	64.59
16/06/2015	16:00:00	97.97	64.64
16/06/2015	17:00:00	97.97	64.64
16/06/2015	18:00:00	97.98	64.65
16/06/2015	19:00:00	97.98	64.65
16/06/2015	20:00:00	97.98	64.70
16/06/2015	21:00:00	97.98	64.70
16/06/2015	22:00:00	97.99	64.73
16/06/2015	23:00:00	97.99	64.77
17/06/2015	0:00:00	97.99	64.77
17/06/2015	1:00:00	97.99	64.77
17/06/2015	2:00:00	98.00	64.80
17/06/2015	3:00:00	98.00	64.80
17/06/2015	4:00:00	98.00	64.79
17/06/2015	5:00:00	98.00	64.80
17/06/2015	6:00:00	98.00	64.82
17/06/2015	7:00:00	98.00	64.83
17/06/2015	8:00:00	98.00	64.82
17/06/2015	9:00:00	98.01	64.84
17/06/2015	10:00:00	98.00	64.81
17/06/2015	11:00:00	98.00	64.82
17/06/2015	12:00:00	97.99	64.77
17/06/2015	13:00:00	97.99	64.75

Date	Time	Stage Elevation	Calculated Q (cms)
17/06/2015	14:00:00	97.99	64.75
17/06/2015	15:00:00	97.98	64.67
17/06/2015	16:00:00	97.97	64.64
17/06/2015	17:00:00	97.97	64.60
17/06/2015	18:00:00	97.96	64.55
17/06/2015	19:00:00	97.96	64.52
17/06/2015	20:00:00	97.95	64.48
17/06/2015	21:00:00	97.95	64.46
17/06/2015	22:00:00	97.94	64.43
17/06/2015	23:00:00	97.94	64.42
18/06/2015	0:00:00	97.93	64.38
18/06/2015	1:00:00	97.93	64.35
18/06/2015	2:00:00	97.93	64.33
18/06/2015	3:00:00	97.92	64.29
18/06/2015	4:00:00	97.92	64.27
18/06/2015	5:00:00	97.91	64.25
18/06/2015	6:00:00	97.91	64.25
18/06/2015	7:00:00	97.91	64.25
18/06/2015	8:00:00	97.91	64.25
18/06/2015	9:00:00	97.91	64.25
18/06/2015	10:00:00	97.91	64.25
18/06/2015	11:00:00	97.92	64.27
18/06/2015	12:00:00	97.91	64.22
18/06/2015	13:00:00	97.90	64.19
18/06/2015	14:00:00	97.90	64.16
18/06/2015	15:00:00	97.89	64.12
18/06/2015	16:00:00	97.89	64.10
18/06/2015	17:00:00	97.89	64.09
18/06/2015	18:00:00	97.89	64.07
18/06/2015	19:00:00	97.89	64.07
18/06/2015	20:00:00	97.89	64.07
18/06/2015	21:00:00	97.88	64.06
18/06/2015	22:00:00	97.88	64.06
18/06/2015	23:00:00	97.89	64.07
19/06/2015	0:00:00	97.89	64.07
19/06/2015	1:00:00	97.89	64.08
19/06/2015	2:00:00	97.88	64.04
19/06/2015	3:00:00	97.89	64.08
19/06/2015	4:00:00	97.88	64.06
19/06/2015	5:00:00	97.88	64.06
19/06/2015	6:00:00	97.88	64.04
19/06/2015	7:00:00	97.88	64.06
19/06/2015	8:00:00	97.89	64.07
19/06/2015	9:00:00	97.88	64.04
19/06/2015	10:00:00	97.88	64.04

Date	Time	Stage Elevation	Calculated Q (cms)
19/06/2015	11:00:00	97.88	64.02
19/06/2015	12:00:00	97.87	64.00
19/06/2015	13:00:00	97.91	64.25
19/06/2015	14:00:00	97.91	64.21
19/06/2015	15:00:00	98.05	65.11
19/06/2015	16:00:00	98.18	65.96
19/06/2015	17:00:00	98.50	67.99
19/06/2015	18:00:00	98.83	70.15
19/06/2015	19:00:00	99.03	71.43
19/06/2015	20:00:00	99.07	71.67
19/06/2015	21:00:00	99.07	71.67
19/06/2015	22:00:00	99.04	71.45
19/06/2015	23:00:00	99.06	71.57
20/06/2015	0:00:00	99.08	71.74
20/06/2015	1:00:00	99.11	71.92
20/06/2015	2:00:00	99.12	72.01
20/06/2015	3:00:00	99.13	72.03
20/06/2015	4:00:00	99.11	71.90
20/06/2015	5:00:00	99.04	71.47
20/06/2015	6:00:00	98.90	70.60
20/06/2015	7:00:00	98.73	69.47
20/06/2015	8:00:00	98.58	68.55
20/06/2015	9:00:00	98.49	67.92
20/06/2015	10:00:00	98.42	67.50
20/06/2015	11:00:00	98.37	67.16
20/06/2015	12:00:00	98.34	66.96
20/06/2015	13:00:00	98.32	66.88
20/06/2015	14:00:00	98.32	66.86
20/06/2015	15:00:00	98.32	66.84
20/06/2015	16:00:00	98.31	66.81
20/06/2015	17:00:00	98.31	66.80
20/06/2015	18:00:00	98.32	66.85
20/06/2015	19:00:00	98.32	66.85
20/06/2015	20:00:00	98.31	66.82
20/06/2015	21:00:00	98.31	66.80
20/06/2015	22:00:00	98.30	66.73
20/06/2015	23:00:00	98.27	66.57
21/06/2015	0:00:00	98.26	66.50
21/06/2015	1:00:00	98.25	66.44
21/06/2015	2:00:00	98.25	66.39
21/06/2015	3:00:00	98.25	66.38
21/06/2015	4:00:00	98.23	66.31
21/06/2015	5:00:00	98.22	66.23
21/06/2015	6:00:00	98.21	66.16
21/06/2015	7:00:00	98.20	66.07

Date	Time	Stage Elevation	Calculated Q (cms)
21/06/2015	8:00:00	98.19	66.01
21/06/2015	9:00:00	98.18	65.94
21/06/2015	10:00:00	98.16	65.86
21/06/2015	11:00:00	98.16	65.86
21/06/2015	12:00:00	98.15	65.80
21/06/2015	13:00:00	98.14	65.70
21/06/2015	14:00:00	98.12	65.59
21/06/2015	15:00:00	98.11	65.52
21/06/2015	16:00:00	98.10	65.44
21/06/2015	17:00:00	98.09	65.41
21/06/2015	18:00:00	98.08	65.35
21/06/2015	19:00:00	98.09	65.40
21/06/2015	20:00:00	98.08	65.30
21/06/2015	21:00:00	98.07	65.25
21/06/2015	22:00:00	98.07	65.25
21/06/2015	23:00:00	98.06	65.21
22/06/2015	0:00:00	98.06	65.21
22/06/2015	1:00:00	98.05	65.14
22/06/2015	2:00:00	98.05	65.14
22/06/2015	3:00:00	98.05	65.12
22/06/2015	4:00:00	98.05	65.11
22/06/2015	5:00:00	98.05	65.10
22/06/2015	6:00:00	98.04	65.09
22/06/2015	7:00:00	98.04	65.09
22/06/2015	8:00:00	98.04	65.09
22/06/2015	9:00:00	98.04	65.09
22/06/2015	10:00:00	98.05	65.10
22/06/2015	11:00:00	98.04	65.09
22/06/2015	12:00:00	98.04	65.05
22/06/2015	13:00:00	98.04	65.04
22/06/2015	14:00:00	98.03	64.98
22/06/2015	15:00:00	98.02	64.96
22/06/2015	16:00:00	98.02	64.95
22/06/2015	17:00:00	98.04	65.04
22/06/2015	18:00:00	98.06	65.19
22/06/2015	19:00:00	98.16	65.84
22/06/2015	20:00:00	98.56	68.41
22/06/2015	21:00:00	98.62	68.80
22/06/2015	22:00:00	98.56	68.42
22/06/2015	23:00:00	98.47	67.84
23/06/2015	0:00:00	98.38	67.21
23/06/2015	1:00:00	98.30	66.75
23/06/2015	2:00:00	98.25	66.42
23/06/2015	3:00:00	98.22	66.25
23/06/2015	4:00:00	98.21	66.14

Date	Time	Stage Elevation	Calculated Q (cms)
23/06/2015	5:00:00	98.19	66.04
23/06/2015	6:00:00	98.18	65.96
23/06/2015	7:00:00	98.18	65.93
23/06/2015	8:00:00	98.17	65.87
23/06/2015	9:00:00	98.16	65.83
23/06/2015	10:00:00	98.15	65.77
23/06/2015	11:00:00	98.14	65.73
23/06/2015	12:00:00	98.13	65.66
23/06/2015	13:00:00	98.12	65.57
23/06/2015	14:00:00	98.08	65.34
23/06/2015	15:00:00	98.07	65.27
23/06/2015	16:00:00	98.07	65.23
23/06/2015	17:00:00	98.06	65.19
23/06/2015	18:00:00	98.06	65.19
23/06/2015	19:00:00	98.06	65.17
23/06/2015	20:00:00	98.05	65.12
23/06/2015	21:00:00	98.05	65.12
23/06/2015	22:00:00	98.04	65.07
23/06/2015	23:00:00	98.04	65.06
24/06/2015	0:00:00	98.04	65.04
24/06/2015	1:00:00	98.03	65.01
24/06/2015	2:00:00	98.02	64.96
24/06/2015	3:00:00	98.02	64.95
24/06/2015	4:00:00	98.02	64.91
24/06/2015	5:00:00	98.02	64.94
24/06/2015	6:00:00	98.01	64.89
24/06/2015	7:00:00	98.01	64.88
24/06/2015	8:00:00	98.01	64.88
24/06/2015	9:00:00	98.01	64.88
24/06/2015	10:00:00	98.00	64.83
24/06/2015	11:00:00	98.00	64.83
24/06/2015	12:00:00	98.00	64.80
24/06/2015	13:00:00	98.00	64.79
24/06/2015	14:00:00	97.98	64.71
24/06/2015	15:00:00	97.98	64.68
24/06/2015	16:00:00	97.98	64.67
24/06/2015	17:00:00	97.98	64.67
24/06/2015	18:00:00	97.98	64.65
24/06/2015	19:00:00	97.97	64.62
24/06/2015	20:00:00	97.97	64.63
24/06/2015	21:00:00	97.99	64.71
24/06/2015	22:00:00	97.99	64.73
24/06/2015	23:00:00	97.99	64.71
25/06/2015	0:00:00	97.99	64.75
25/06/2015	1:00:00	97.99	64.75

Date	Time	Stage Elevation	Calculated Q (cms)
25/06/2015	2:00:00	97.99	64.71
25/06/2015	3:00:00	97.99	64.71
25/06/2015	4:00:00	97.99	64.74
25/06/2015	5:00:00	97.99	64.74
25/06/2015	6:00:00	97.99	64.74
25/06/2015	7:00:00	97.99	64.73
25/06/2015	8:00:00	97.99	64.75
25/06/2015	9:00:00	97.99	64.75
25/06/2015	10:00:00	97.99	64.75
25/06/2015	11:00:00	98.00	64.79
25/06/2015	12:00:00	97.99	64.77
25/06/2015	13:00:00	97.99	64.75
25/06/2015	14:00:00	97.98	64.71
25/06/2015	15:00:00	97.98	64.66
25/06/2015	16:00:00	97.98	64.66
25/06/2015	17:00:00	97.98	64.65
25/06/2015	18:00:00	97.97	64.60
25/06/2015	19:00:00	97.97	64.64
25/06/2015	20:00:00	97.97	64.63
25/06/2015	21:00:00	97.97	64.61
25/06/2015	22:00:00	97.97	64.62
25/06/2015	23:00:00	97.97	64.61
26/06/2015	0:00:00	97.97	64.63
26/06/2015	1:00:00	97.97	64.63
26/06/2015	2:00:00	97.98	64.65
26/06/2015	3:00:00	97.98	64.66
26/06/2015	4:00:00	97.98	64.67
26/06/2015	5:00:00	97.98	64.68
26/06/2015	6:00:00	97.99	64.71
26/06/2015	7:00:00	97.99	64.75
26/06/2015	8:00:00	97.99	64.77
26/06/2015	9:00:00	97.99	64.75
26/06/2015	10:00:00	97.99	64.77
26/06/2015	11:00:00	98.00	64.80
26/06/2015	12:00:00	98.00	64.80
26/06/2015	13:00:00	97.99	64.77
26/06/2015	14:00:00	97.99	64.75
26/06/2015	15:00:00	97.99	64.73
26/06/2015	16:00:00	97.99	64.73
26/06/2015	17:00:00	97.98	64.68
26/06/2015	18:00:00	97.98	64.65
26/06/2015	19:00:00	97.98	64.65
26/06/2015	20:00:00	97.98	64.65
26/06/2015	21:00:00	97.97	64.64
26/06/2015	22:00:00	97.97	64.64

Date	Time	Stage Elevation	Calculated Q (cms)
26/06/2015	23:00:00	97.98	64.69
27/06/2015	0:00:00	97.98	64.68
27/06/2015	1:00:00	97.98	64.69
27/06/2015	2:00:00	97.98	64.70
27/06/2015	3:00:00	97.99	64.71
27/06/2015	4:00:00	97.99	64.71
27/06/2015	5:00:00	97.98	64.71
27/06/2015	6:00:00	97.99	64.73
27/06/2015	7:00:00	97.98	64.71
27/06/2015	8:00:00	97.98	64.71
27/06/2015	9:00:00	97.98	64.68
27/06/2015	10:00:00	97.97	64.62
27/06/2015	11:00:00	97.97	64.59
27/06/2015	12:00:00	97.96	64.56
27/06/2015	13:00:00	97.95	64.50
27/06/2015	14:00:00	97.95	64.48
27/06/2015	15:00:00	97.94	64.43
27/06/2015	16:00:00	97.93	64.39
27/06/2015	17:00:00	97.93	64.38
27/06/2015	18:00:00	97.93	64.33
27/06/2015	19:00:00	97.93	64.34
27/06/2015	20:00:00	97.92	64.31
27/06/2015	21:00:00	97.93	64.34
27/06/2015	22:00:00	97.93	64.35
27/06/2015	23:00:00	97.94	64.40
28/06/2015	0:00:00	97.94	64.43
28/06/2015	1:00:00	97.95	64.46
28/06/2015	2:00:00	97.95	64.47
28/06/2015	3:00:00	97.95	64.48
28/06/2015	4:00:00	97.95	64.52
28/06/2015	5:00:00	97.96	64.54
28/06/2015	6:00:00	97.96	64.56
28/06/2015	7:00:00	97.96	64.57
28/06/2015	8:00:00	97.97	64.62
28/06/2015	9:00:00	97.97	64.61
28/06/2015	10:00:00	97.97	64.62
28/06/2015	11:00:00	97.97	64.63
28/06/2015	12:00:00	97.97	64.62
28/06/2015	13:00:00	97.97	64.63
28/06/2015	14:00:00	97.96	64.57
28/06/2015	15:00:00	97.96	64.56
28/06/2015	16:00:00	97.96	64.54
28/06/2015	17:00:00	97.96	64.52
28/06/2015	18:00:00	97.95	64.48
28/06/2015	19:00:00	97.95	64.48

Date	Time	Stage Elevation	Calculated Q (cms)
28/06/2015	20:00:00	97.94	64.45
28/06/2015	21:00:00	97.95	64.47
28/06/2015	22:00:00	97.95	64.48
28/06/2015	23:00:00	97.95	64.48
29/06/2015	0:00:00	97.95	64.50
29/06/2015	1:00:00	97.95	64.52
29/06/2015	2:00:00	97.95	64.50
29/06/2015	3:00:00	97.95	64.50
29/06/2015	4:00:00	97.95	64.50
29/06/2015	5:00:00	97.95	64.52
29/06/2015	6:00:00	97.95	64.50
29/06/2015	7:00:00	97.95	64.46
29/06/2015	8:00:00	97.94	64.45
29/06/2015	9:00:00	97.94	64.44
29/06/2015	10:00:00	97.94	64.40
29/06/2015	11:00:00	97.93	64.38
29/06/2015	12:00:00	97.93	64.33
29/06/2015	13:00:00	97.92	64.29
29/06/2015	14:00:00	97.91	64.24
29/06/2015	15:00:00	97.91	64.24
29/06/2015	16:00:00	97.91	64.22
29/06/2015	17:00:00	97.90	64.18
29/06/2015	18:00:00	97.89	64.12
29/06/2015	19:00:00	97.89	64.13
29/06/2015	20:00:00	97.89	64.09
29/06/2015	21:00:00	97.89	64.12
29/06/2015	22:00:00	97.90	64.14
29/06/2015	23:00:00	97.89	64.12
30/06/2015	0:00:00	97.89	64.10
30/06/2015	1:00:00	97.89	64.13
30/06/2015	2:00:00	97.89	64.12
30/06/2015	3:00:00	97.89	64.13
30/06/2015	4:00:00	97.89	64.12
30/06/2015	5:00:00	97.90	64.15
30/06/2015	6:00:00	97.90	64.16
30/06/2015	7:00:00	97.90	64.16
30/06/2015	8:00:00	97.90	64.18
30/06/2015	9:00:00	97.90	64.20
30/06/2015	10:00:00	97.90	64.19
30/06/2015	11:00:00	97.91	64.22
30/06/2015	12:00:00	97.91	64.23
30/06/2015	13:00:00	97.92	64.30
30/06/2015	14:00:00	97.92	64.29
30/06/2015	15:00:00	97.92	64.27
30/06/2015	16:00:00	97.92	64.27

Date	Time	Stage Elevation	Calculated Q (cms)
30/06/2015	17:00:00	97.91	64.25
30/06/2015	18:00:00	97.91	64.21
30/06/2015	19:00:00	97.91	64.21
30/06/2015	20:00:00	97.92	64.27
30/06/2015	21:00:00	97.92	64.30
30/06/2015	22:00:00	97.92	64.27
30/06/2015	23:00:00	97.92	64.32
01/07/2015	0:00:00	97.93	64.35
01/07/2015	1:00:00	97.93	64.36
01/07/2015	2:00:00	97.93	64.36
01/07/2015	3:00:00	97.93	64.38
01/07/2015	4:00:00	97.93	64.38
01/07/2015	5:00:00	97.93	64.38
01/07/2015	6:00:00	97.93	64.38
01/07/2015	7:00:00	97.93	64.38
01/07/2015	8:00:00	97.94	64.41
01/07/2015	9:00:00	97.94	64.45
01/07/2015	10:00:00	97.95	64.48
01/07/2015	11:00:00	97.95	64.48
01/07/2015	12:00:00	97.95	64.52
01/07/2015	13:00:00	97.96	64.54
01/07/2015	14:00:00	97.95	64.50
01/07/2015	15:00:00	97.95	64.50
01/07/2015	16:00:00	97.95	64.47
01/07/2015	17:00:00	97.95	64.46
01/07/2015	18:00:00	97.94	64.44
01/07/2015	19:00:00	97.94	64.40
01/07/2015	20:00:00	97.93	64.38
01/07/2015	21:00:00	97.93	64.39
01/07/2015	22:00:00	97.93	64.39
01/07/2015	23:00:00	97.93	64.39
02/07/2015	0:00:00	97.93	64.39
02/07/2015	1:00:00	97.93	64.38
02/07/2015	2:00:00	97.93	64.33
02/07/2015	3:00:00	97.93	64.34
02/07/2015	4:00:00	97.93	64.34
02/07/2015	5:00:00	97.92	64.32
02/07/2015	6:00:00	97.92	64.30
02/07/2015	7:00:00	97.92	64.29
02/07/2015	8:00:00	97.92	64.29
02/07/2015	9:00:00	97.92	64.27
02/07/2015	10:00:00	97.92	64.27
02/07/2015	11:00:00	97.92	64.27
02/07/2015	12:00:00	97.91	64.21
02/07/2015	13:00:00	97.90	64.18

Date	Time	Stage Elevation	Calculated Q (cms)
02/07/2015	14:00:00	97.90	64.14
02/07/2015	15:00:00	97.88	64.06
02/07/2015	16:00:00	97.88	64.03
02/07/2015	17:00:00	97.87	63.96
02/07/2015	18:00:00	97.86	63.91
02/07/2015	19:00:00	97.86	63.89
02/07/2015	20:00:00	97.85	63.86
02/07/2015	21:00:00	97.85	63.87
02/07/2015	22:00:00	97.85	63.86
02/07/2015	23:00:00	97.86	63.89
03/07/2015	0:00:00	97.85	63.84
03/07/2015	1:00:00	97.85	63.85
03/07/2015	2:00:00	97.85	63.85
03/07/2015	3:00:00	97.85	63.83
03/07/2015	4:00:00	97.85	63.85
03/07/2015	5:00:00	97.86	63.88
03/07/2015	6:00:00	97.86	63.94
03/07/2015	7:00:00	97.87	63.96
03/07/2015	8:00:00	97.87	63.98
03/07/2015	9:00:00	97.88	64.02
03/07/2015	10:00:00	97.87	63.98
03/07/2015	11:00:00	97.87	63.98
03/07/2015	12:00:00	97.87	63.97
03/07/2015	13:00:00	97.86	63.92
03/07/2015	14:00:00	97.86	63.89
03/07/2015	15:00:00	97.85	63.83
03/07/2015	16:00:00	97.85	63.82
03/07/2015	17:00:00	97.85	63.82
03/07/2015	18:00:00	97.85	63.82
03/07/2015	19:00:00	97.85	63.82
03/07/2015	20:00:00	97.85	63.82
03/07/2015	21:00:00	97.85	63.84
03/07/2015	22:00:00	97.85	63.86
03/07/2015	23:00:00	97.86	63.90
04/07/2015	0:00:00	97.87	63.96
04/07/2015	1:00:00	97.86	63.93
04/07/2015	2:00:00	97.87	63.95
04/07/2015	3:00:00	97.86	63.93
04/07/2015	4:00:00	97.87	63.98
04/07/2015	5:00:00	97.88	64.03
04/07/2015	6:00:00	97.88	64.04
04/07/2015	7:00:00	97.88	64.04
04/07/2015	8:00:00	97.89	64.09
04/07/2015	9:00:00	97.89	64.13
04/07/2015	10:00:00	97.90	64.16

Date	Time	Stage Elevation	Calculated Q (cms)
04/07/2015	11:00:00	97.91	64.22
04/07/2015	12:00:00	97.91	64.21
04/07/2015	13:00:00	97.91	64.22
04/07/2015	14:00:00	97.91	64.22
04/07/2015	15:00:00	97.91	64.25
04/07/2015	16:00:00	97.92	64.27
04/07/2015	17:00:00	97.92	64.32
04/07/2015	18:00:00	97.93	64.38
04/07/2015	19:00:00	97.94	64.42
04/07/2015	20:00:00	97.94	64.41
04/07/2015	21:00:00	97.94	64.42
04/07/2015	22:00:00	97.94	64.45
04/07/2015	23:00:00	97.95	64.48
05/07/2015	0:00:00	97.95	64.50
05/07/2015	1:00:00	97.97	64.59
05/07/2015	2:00:00	97.99	64.77
05/07/2015	3:00:00	98.00	64.83
05/07/2015	4:00:00	97.98	64.69
05/07/2015	5:00:00	97.97	64.61
05/07/2015	6:00:00	97.97	64.59
05/07/2015	7:00:00	97.96	64.57
05/07/2015	8:00:00	97.96	64.57
05/07/2015	9:00:00	97.96	64.54
05/07/2015	10:00:00	97.96	64.52
05/07/2015	11:00:00	97.95	64.50
05/07/2015	12:00:00	97.95	64.47
05/07/2015	13:00:00	97.94	64.44
05/07/2015	14:00:00	97.94	64.40
05/07/2015	15:00:00	97.93	64.38
05/07/2015	16:00:00	97.93	64.34
05/07/2015	17:00:00	97.92	64.30
05/07/2015	18:00:00	97.92	64.27
05/07/2015	19:00:00	97.92	64.27
05/07/2015	20:00:00	97.90	64.19
05/07/2015	21:00:00	97.91	64.21
05/07/2015	22:00:00	97.90	64.19
05/07/2015	23:00:00	97.90	64.20
06/07/2015	0:00:00	97.90	64.20
06/07/2015	1:00:00	97.90	64.17
06/07/2015	2:00:00	97.90	64.17
06/07/2015	3:00:00	97.90	64.17
06/07/2015	4:00:00	97.90	64.15
06/07/2015	5:00:00	97.89	64.12
06/07/2015	6:00:00	97.90	64.14
06/07/2015	7:00:00	97.89	64.12

Date	Time	Stage Elevation	Calculated Q (cms)
06/07/2015	8:00:00	97.89	64.10
06/07/2015	9:00:00	97.89	64.11
06/07/2015	10:00:00	97.89	64.10
06/07/2015	11:00:00	97.89	64.11
06/07/2015	12:00:00	97.89	64.10
06/07/2015	13:00:00	97.89	64.09
06/07/2015	14:00:00	97.89	64.07
06/07/2015	15:00:00	97.88	64.06
06/07/2015	16:00:00	97.88	64.06
06/07/2015	17:00:00	97.89	64.07
06/07/2015	18:00:00	97.88	64.06
06/07/2015	19:00:00	97.89	64.13
06/07/2015	20:00:00	97.90	64.19
06/07/2015	21:00:00	97.91	64.21
06/07/2015	22:00:00	97.91	64.25
06/07/2015	23:00:00	97.92	64.29
07/07/2015	0:00:00	97.93	64.34
07/07/2015	1:00:00	97.93	64.36
07/07/2015	2:00:00	97.93	64.34
07/07/2015	3:00:00	97.93	64.35
07/07/2015	4:00:00	97.93	64.35
07/07/2015	5:00:00	97.92	64.31
07/07/2015	6:00:00	97.92	64.30
07/07/2015	7:00:00	97.92	64.27
07/07/2015	8:00:00	97.91	64.25
07/07/2015	9:00:00	97.91	64.23
07/07/2015	10:00:00	97.90	64.18
07/07/2015	11:00:00	97.89	64.12
07/07/2015	12:00:00	97.89	64.09
07/07/2015	13:00:00	97.87	64.00
07/07/2015	14:00:00	97.87	63.98
07/07/2015	15:00:00	97.86	63.92
07/07/2015	16:00:00	97.85	63.87
07/07/2015	17:00:00	97.84	63.79
07/07/2015	18:00:00	97.83	63.74
07/07/2015	19:00:00	97.83	63.69
07/07/2015	20:00:00	97.82	63.66
07/07/2015	21:00:00	97.82	63.64
07/07/2015	22:00:00	97.81	63.61
07/07/2015	23:00:00	97.81	63.58
08/07/2015	0:00:00	97.80	63.56
08/07/2015	1:00:00	97.79	63.48
08/07/2015	2:00:00	97.79	63.47
08/07/2015	3:00:00	97.79	63.45
08/07/2015	4:00:00	97.78	63.42

Date	Time	Stage Elevation	Calculated Q (cms)
08/07/2015	5:00:00	97.78	63.40
08/07/2015	6:00:00	97.78	63.38
08/07/2015	7:00:00	97.77	63.35
08/07/2015	8:00:00	97.77	63.32
08/07/2015	9:00:00	97.76	63.29
08/07/2015	10:00:00	97.75	63.23
08/07/2015	11:00:00	97.75	63.18
08/07/2015	12:00:00	97.74	63.14
08/07/2015	13:00:00	97.74	63.13
08/07/2015	14:00:00	97.73	63.08
08/07/2015	15:00:00	97.73	63.06
08/07/2015	16:00:00	97.73	63.06
08/07/2015	17:00:00	97.72	63.04
08/07/2015	18:00:00	97.72	63.04
08/07/2015	19:00:00	97.72	63.03
08/07/2015	20:00:00	97.73	63.06
08/07/2015	21:00:00	97.73	63.06
08/07/2015	22:00:00	97.73	63.07
08/07/2015	23:00:00	97.73	63.11
09/07/2015	0:00:00	97.74	63.11
09/07/2015	1:00:00	97.73	63.11
09/07/2015	2:00:00	97.74	63.11
09/07/2015	3:00:00	97.74	63.11
09/07/2015	4:00:00	97.74	63.14
09/07/2015	5:00:00	97.74	63.13
09/07/2015	6:00:00	97.74	63.14
09/07/2015	7:00:00	97.74	63.11
09/07/2015	8:00:00	97.73	63.09
09/07/2015	9:00:00	97.73	63.07
09/07/2015	10:00:00	97.73	63.06
09/07/2015	11:00:00	97.72	63.04
09/07/2015	12:00:00	97.72	63.03
09/07/2015	13:00:00	97.72	63.00
09/07/2015	14:00:00	97.72	63.00
09/07/2015	15:00:00	97.71	62.98
09/07/2015	16:00:00	97.71	62.98
09/07/2015	17:00:00	97.71	62.98
09/07/2015	18:00:00	97.71	62.98
09/07/2015	19:00:00	97.71	62.98
09/07/2015	20:00:00	97.72	63.00
09/07/2015	21:00:00	97.72	63.00
09/07/2015	22:00:00	97.73	63.06
09/07/2015	23:00:00	97.74	63.14
10/07/2015	0:00:00	97.75	63.19
10/07/2015	1:00:00	97.75	63.22

Date	Time	Stage Elevation	Calculated Q (cms)
10/07/2015	2:00:00	97.76	63.27
10/07/2015	3:00:00	97.77	63.32
10/07/2015	4:00:00	97.76	63.29
10/07/2015	5:00:00	97.77	63.31
10/07/2015	6:00:00	97.76	63.29
10/07/2015	7:00:00	97.77	63.31
10/07/2015	8:00:00	97.77	63.32
10/07/2015	9:00:00	97.76	63.29
10/07/2015	10:00:00	97.76	63.25
10/07/2015	11:00:00	97.76	63.25
10/07/2015	12:00:00	97.75	63.23
10/07/2015	13:00:00	97.75	63.20
10/07/2015	14:00:00	97.74	63.15
10/07/2015	15:00:00	97.74	63.11
10/07/2015	16:00:00	97.72	63.03
10/07/2015	17:00:00	97.71	62.97
10/07/2015	18:00:00	97.71	62.97
10/07/2015	19:00:00	97.72	63.00
10/07/2015	20:00:00	97.72	63.04
10/07/2015	21:00:00	97.72	63.04
10/07/2015	22:00:00	97.73	63.06
10/07/2015	23:00:00	97.72	63.04
11/07/2015	0:00:00	97.72	63.00
11/07/2015	1:00:00	97.72	63.00
11/07/2015	2:00:00	97.72	63.00
11/07/2015	3:00:00	97.72	62.99
11/07/2015	4:00:00	97.71	62.98
11/07/2015	5:00:00	97.72	63.00
11/07/2015	6:00:00	97.72	63.00
11/07/2015	7:00:00	97.72	63.00
11/07/2015	8:00:00	97.72	63.03
11/07/2015	9:00:00	97.72	63.02
11/07/2015	10:00:00	97.72	63.04
11/07/2015	11:00:00	97.72	63.04
11/07/2015	12:00:00	97.73	63.06
11/07/2015	13:00:00	97.73	63.06
11/07/2015	14:00:00	97.72	63.04
11/07/2015	15:00:00	97.72	63.03
11/07/2015	16:00:00	97.72	63.03
11/07/2015	17:00:00	97.72	63.02
11/07/2015	18:00:00	97.71	62.96
11/07/2015	19:00:00	97.71	62.95
11/07/2015	20:00:00	97.71	62.93
11/07/2015	21:00:00	97.71	62.94
11/07/2015	22:00:00	97.72	63.00

Date	Time	Stage Elevation	Calculated Q (cms)
11/07/2015	23:00:00	97.72	63.04
12/07/2015	0:00:00	97.73	63.07
12/07/2015	1:00:00	97.75	63.18
12/07/2015	2:00:00	97.79	63.48
12/07/2015	3:00:00	97.90	64.17
12/07/2015	4:00:00	98.07	65.25
12/07/2015	5:00:00	98.10	65.46
12/07/2015	6:00:00	98.02	64.94
12/07/2015	7:00:00	97.96	64.52
12/07/2015	8:00:00	97.90	64.18
12/07/2015	9:00:00	97.86	63.88
12/07/2015	10:00:00	97.83	63.73
12/07/2015	11:00:00	97.81	63.59
12/07/2015	12:00:00	97.81	63.59
12/07/2015	13:00:00	97.80	63.53
12/07/2015	14:00:00	97.79	63.48
12/07/2015	15:00:00	97.79	63.45
12/07/2015	16:00:00	97.78	63.40
12/07/2015	17:00:00	97.78	63.38
12/07/2015	18:00:00	97.77	63.36
12/07/2015	19:00:00	97.77	63.36
12/07/2015	20:00:00	97.77	63.35
12/07/2015	21:00:00	97.77	63.34
12/07/2015	22:00:00	97.77	63.32
12/07/2015	23:00:00	97.77	63.32
13/07/2015	0:00:00	97.77	63.34
13/07/2015	1:00:00	97.77	63.35
13/07/2015	2:00:00	97.78	63.40
13/07/2015	3:00:00	97.78	63.38
13/07/2015	4:00:00	97.78	63.40
13/07/2015	5:00:00	97.78	63.41
13/07/2015	6:00:00	97.79	63.44
13/07/2015	7:00:00	97.79	63.45
13/07/2015	8:00:00	97.78	63.43
13/07/2015	9:00:00	97.79	63.46
13/07/2015	10:00:00	97.79	63.44
13/07/2015	11:00:00	97.78	63.42
13/07/2015	12:00:00	97.78	63.40
13/07/2015	13:00:00	97.77	63.35
13/07/2015	14:00:00	97.77	63.32
13/07/2015	15:00:00	97.76	63.27
13/07/2015	16:00:00	97.78	63.40
13/07/2015	17:00:00	97.78	63.41
13/07/2015	18:00:00	97.79	63.44
13/07/2015	19:00:00	97.79	63.47

Date	Time	Stage Elevation	Calculated Q (cms)
13/07/2015	20:00:00	97.80	63.56
13/07/2015	21:00:00	97.81	63.56
13/07/2015	22:00:00	97.78	63.41
13/07/2015	23:00:00	97.78	63.37
14/07/2015	0:00:00	97.77	63.36
14/07/2015	1:00:00	97.77	63.36
14/07/2015	2:00:00	97.77	63.35
14/07/2015	3:00:00	97.78	63.38
14/07/2015	4:00:00	97.78	63.38
14/07/2015	5:00:00	97.78	63.38
14/07/2015	6:00:00	97.78	63.40
14/07/2015	7:00:00	97.78	63.40
14/07/2015	8:00:00	97.78	63.40
14/07/2015	9:00:00	97.78	63.37
14/07/2015	10:00:00	97.78	63.38
14/07/2015	11:00:00	97.78	63.38
14/07/2015	12:00:00	97.77	63.32
14/07/2015	13:00:00	97.76	63.29
14/07/2015	14:00:00	97.76	63.29
14/07/2015	15:00:00	97.76	63.24
14/07/2015	16:00:00	97.75	63.23
14/07/2015	17:00:00	97.75	63.21
14/07/2015	18:00:00	97.75	63.20
14/07/2015	19:00:00	97.75	63.20
14/07/2015	20:00:00	97.75	63.19
14/07/2015	21:00:00	97.75	63.21
14/07/2015	22:00:00	97.75	63.20
14/07/2015	23:00:00	97.75	63.22
15/07/2015	0:00:00	97.76	63.24
15/07/2015	1:00:00	97.75	63.22
15/07/2015	2:00:00	97.75	63.23
15/07/2015	3:00:00	97.76	63.25
15/07/2015	4:00:00	97.75	63.21
15/07/2015	5:00:00	97.75	63.21
15/07/2015	6:00:00	97.75	63.21
15/07/2015	7:00:00	97.75	63.19
15/07/2015	8:00:00	97.74	63.16
15/07/2015	9:00:00	97.74	63.17
15/07/2015	10:00:00	97.74	63.13
15/07/2015	11:00:00	97.73	63.11
15/07/2015	12:00:00	97.73	63.07
15/07/2015	13:00:00	97.72	63.04
15/07/2015	14:00:00	97.71	62.98
15/07/2015	15:00:00	97.71	62.95
15/07/2015	16:00:00	97.71	62.92

Date	Time	Stage Elevation	Calculated Q (cms)
15/07/2015	17:00:00	97.70	62.90
15/07/2015	18:00:00	97.66	62.63
15/07/2015	19:00:00	97.64	62.47
15/07/2015	20:00:00	97.65	62.55
15/07/2015	21:00:00	97.65	62.59
15/07/2015	22:00:00	97.67	62.67
15/07/2015	23:00:00	97.68	62.75
16/07/2015	0:00:00	97.68	62.77
16/07/2015	1:00:00	97.69	62.79
16/07/2015	2:00:00	97.69	62.83
16/07/2015	3:00:00	97.70	62.86
16/07/2015	4:00:00	97.70	62.90
16/07/2015	5:00:00	97.71	62.93
16/07/2015	6:00:00	97.71	62.97
16/07/2015	7:00:00	97.72	63.00
16/07/2015	8:00:00	97.72	63.04
16/07/2015	9:00:00	97.73	63.07
16/07/2015	10:00:00	97.73	63.11
16/07/2015	11:00:00	97.74	63.12
16/07/2015	12:00:00	97.74	63.11
16/07/2015	13:00:00	97.74	63.14
16/07/2015	14:00:00	97.75	63.18
16/07/2015	15:00:00	97.75	63.20
16/07/2015	16:00:00	97.75	63.19
16/07/2015	17:00:00	97.74	63.17
16/07/2015	18:00:00	97.75	63.18
16/07/2015	19:00:00	97.75	63.20
16/07/2015	20:00:00	97.75	63.23
16/07/2015	21:00:00	97.75	63.23
16/07/2015	22:00:00	97.76	63.27
16/07/2015	23:00:00	97.77	63.31
17/07/2015	0:00:00	97.77	63.33
17/07/2015	1:00:00	97.78	63.38
17/07/2015	2:00:00	97.78	63.42
17/07/2015	3:00:00	97.80	63.50
17/07/2015	4:00:00	97.81	63.57
17/07/2015	5:00:00	97.81	63.59
17/07/2015	6:00:00	97.82	63.66
17/07/2015	7:00:00	97.82	63.68
17/07/2015	8:00:00	97.83	63.69
17/07/2015	9:00:00	97.83	63.70
17/07/2015	10:00:00	97.82	63.68
17/07/2015	11:00:00	97.82	63.68
17/07/2015	12:00:00	97.82	63.63
17/07/2015	13:00:00	97.81	63.61

Date	Time	Stage Elevation	Calculated Q (cms)
17/07/2015	14:00:00	97.80	63.54
17/07/2015	15:00:00	97.80	63.50
17/07/2015	16:00:00	97.79	63.44
17/07/2015	17:00:00	97.79	63.44
17/07/2015	18:00:00	97.83	63.72
17/07/2015	19:00:00	97.82	63.67
17/07/2015	20:00:00	97.81	63.58
17/07/2015	21:00:00	97.80	63.52
17/07/2015	22:00:00	97.79	63.47
17/07/2015	23:00:00	97.79	63.45
18/07/2015	0:00:00	97.78	63.43
18/07/2015	1:00:00	97.78	63.37
18/07/2015	2:00:00	97.77	63.33
18/07/2015	3:00:00	97.76	63.29
18/07/2015	4:00:00	97.76	63.25
18/07/2015	5:00:00	97.75	63.20
18/07/2015	6:00:00	97.75	63.19
18/07/2015	7:00:00	97.74	63.15
18/07/2015	8:00:00	97.73	63.11
18/07/2015	9:00:00	97.73	63.07
18/07/2015	10:00:00	97.72	63.04
18/07/2015	11:00:00	97.72	62.99
18/07/2015	12:00:00	97.71	62.95
18/07/2015	13:00:00	97.70	62.91
18/07/2015	14:00:00	97.70	62.86
18/07/2015	15:00:00	97.69	62.79
18/07/2015	16:00:00	97.68	62.74
18/07/2015	17:00:00	97.68	62.74
18/07/2015	18:00:00	97.68	62.73
18/07/2015	19:00:00	97.67	62.72
18/07/2015	20:00:00	97.67	62.69
18/07/2015	21:00:00	97.70	62.86
18/07/2015	22:00:00	97.71	62.93
18/07/2015	23:00:00	97.72	62.99
19/07/2015	0:00:00	97.72	63.02
19/07/2015	1:00:00	97.73	63.08
19/07/2015	2:00:00	97.74	63.15
19/07/2015	3:00:00	97.75	63.19
19/07/2015	4:00:00	97.76	63.25
19/07/2015	5:00:00	97.77	63.35
19/07/2015	6:00:00	97.79	63.45
19/07/2015	7:00:00	97.79	63.44
19/07/2015	8:00:00	97.78	63.41
19/07/2015	9:00:00	97.78	63.37
19/07/2015	10:00:00	97.77	63.36

Date	Time	Stage Elevation	Calculated Q (cms)
19/07/2015	11:00:00	97.77	63.36
19/07/2015	12:00:00	97.77	63.33
19/07/2015	13:00:00	97.77	63.32
19/07/2015	14:00:00	97.76	63.29
19/07/2015	15:00:00	97.76	63.27
19/07/2015	16:00:00	97.75	63.23
19/07/2015	17:00:00	97.75	63.22
19/07/2015	18:00:00	97.75	63.18
19/07/2015	19:00:00	97.75	63.19
19/07/2015	20:00:00	97.74	63.16
19/07/2015	21:00:00	97.75	63.18
19/07/2015	22:00:00	97.75	63.18
19/07/2015	23:00:00	97.75	63.18
20/07/2015	0:00:00	97.75	63.18
20/07/2015	1:00:00	97.74	63.17
20/07/2015	2:00:00	97.74	63.17
20/07/2015	3:00:00	97.74	63.14
20/07/2015	4:00:00	97.74	63.13
20/07/2015	5:00:00	97.73	63.09
20/07/2015	6:00:00	97.73	63.11
20/07/2015	7:00:00	97.72	63.04
20/07/2015	8:00:00	97.72	63.02
20/07/2015	9:00:00	97.71	62.95
20/07/2015	10:00:00	97.70	62.90
20/07/2015	11:00:00	97.71	62.97
20/07/2015	12:00:00	97.70	62.90
20/07/2015	13:00:00	97.69	62.82
20/07/2015	14:00:00	97.69	62.79
20/07/2015	15:00:00	97.68	62.74
20/07/2015	16:00:00	97.66	62.66
20/07/2015	17:00:00	97.66	62.61
20/07/2015	18:00:00	97.66	62.62
20/07/2015	19:00:00	97.65	62.58
20/07/2015	20:00:00	97.66	62.65
20/07/2015	21:00:00	97.66	62.61
20/07/2015	22:00:00	97.66	62.65
20/07/2015	23:00:00	97.68	62.77
21/07/2015	0:00:00	97.68	62.74
21/07/2015	1:00:00	97.68	62.74
21/07/2015	2:00:00	97.67	62.70
21/07/2015	3:00:00	97.68	62.74
21/07/2015	4:00:00	97.67	62.68
21/07/2015	5:00:00	97.66	62.65
21/07/2015	6:00:00	97.66	62.65
21/07/2015	7:00:00	97.66	62.65

Date	Time	Stage Elevation	Calculated Q (cms)
21/07/2015	8:00:00	97.66	62.64
21/07/2015	9:00:00	97.66	62.62
21/07/2015	10:00:00	97.65	62.59
21/07/2015	11:00:00	97.66	62.61
21/07/2015	12:00:00	97.66	62.61
21/07/2015	13:00:00	97.65	62.58
21/07/2015	14:00:00	97.65	62.55
21/07/2015	15:00:00	97.65	62.55
21/07/2015	16:00:00	97.64	62.52
21/07/2015	17:00:00	97.64	62.50
21/07/2015	18:00:00	97.64	62.50
21/07/2015	19:00:00	97.64	62.50
21/07/2015	20:00:00	97.64	62.50
21/07/2015	21:00:00	97.64	62.50
21/07/2015	22:00:00	97.64	62.49
21/07/2015	23:00:00	97.64	62.50
22/07/2015	0:00:00	97.64	62.50
22/07/2015	1:00:00	97.64	62.50
22/07/2015	2:00:00	97.64	62.49
22/07/2015	3:00:00	97.63	62.46
22/07/2015	4:00:00	97.63	62.46
22/07/2015	5:00:00	97.63	62.45
22/07/2015	6:00:00	97.63	62.45
22/07/2015	7:00:00	97.63	62.45
22/07/2015	8:00:00	97.64	62.47
22/07/2015	9:00:00	97.64	62.48
22/07/2015	10:00:00	97.64	62.48
22/07/2015	11:00:00	97.64	62.50
22/07/2015	12:00:00	97.64	62.50
22/07/2015	13:00:00	97.64	62.52
22/07/2015	14:00:00	97.64	62.50
22/07/2015	15:00:00	97.64	62.50
22/07/2015	16:00:00	97.64	62.52
22/07/2015	17:00:00	97.64	62.50
22/07/2015	18:00:00	97.65	62.55
22/07/2015	19:00:00	97.64	62.52
22/07/2015	20:00:00	97.65	62.56
22/07/2015	21:00:00	97.67	62.70
22/07/2015	22:00:00	97.69	62.79
22/07/2015	23:00:00	97.69	62.79
23/07/2015	0:00:00	97.68	62.79
23/07/2015	1:00:00	97.70	62.87
23/07/2015	2:00:00	97.70	62.87
23/07/2015	3:00:00	97.69	62.85
23/07/2015	4:00:00	97.69	62.83

Date	Time	Stage Elevation	Calculated Q (cms)
23/07/2015	5:00:00	97.69	62.83
23/07/2015	6:00:00	97.69	62.82
23/07/2015	7:00:00	97.69	62.79
23/07/2015	8:00:00	97.68	62.76
23/07/2015	9:00:00	97.68	62.77
23/07/2015	10:00:00	97.68	62.76
23/07/2015	11:00:00	97.68	62.77
23/07/2015	12:00:00	97.67	62.72
23/07/2015	13:00:00	97.67	62.68
23/07/2015	14:00:00	97.66	62.63
23/07/2015	15:00:00	97.66	62.63
23/07/2015	16:00:00	97.66	62.61
23/07/2015	17:00:00	97.65	62.59
23/07/2015	18:00:00	97.65	62.58
23/07/2015	19:00:00	97.65	62.56
23/07/2015	20:00:00	97.65	62.58
23/07/2015	21:00:00	97.65	62.56
23/07/2015	22:00:00	97.65	62.59
23/07/2015	23:00:00	97.65	62.59
24/07/2015	0:00:00	97.65	62.59
24/07/2015	1:00:00	97.65	62.59
24/07/2015	2:00:00	97.65	62.58
24/07/2015	3:00:00	97.65	62.58
24/07/2015	4:00:00	97.65	62.56
24/07/2015	5:00:00	97.65	62.56
24/07/2015	6:00:00	97.66	62.61
24/07/2015	7:00:00	97.65	62.59
24/07/2015	8:00:00	97.66	62.61
24/07/2015	9:00:00	97.66	62.62
24/07/2015	10:00:00	97.66	62.63
24/07/2015	11:00:00	97.66	62.62
24/07/2015	12:00:00	97.65	62.58
24/07/2015	13:00:00	97.65	62.59
24/07/2015	14:00:00	97.65	62.56
24/07/2015	15:00:00	97.64	62.50
24/07/2015	16:00:00	97.64	62.52
24/07/2015	17:00:00	97.66	62.61
24/07/2015	18:00:00	97.68	62.74
24/07/2015	19:00:00	97.68	62.79
24/07/2015	20:00:00	97.76	63.25
24/07/2015	21:00:00	97.78	63.41
24/07/2015	22:00:00	97.73	63.08
24/07/2015	23:00:00	97.70	62.91
25/07/2015	0:00:00	97.69	62.81
25/07/2015	1:00:00	97.68	62.75

Date	Time	Stage Elevation	Calculated Q (cms)
25/07/2015	2:00:00	97.67	62.72
25/07/2015	3:00:00	97.67	62.68
25/07/2015	4:00:00	97.67	62.68
25/07/2015	5:00:00	97.67	62.69
25/07/2015	6:00:00	97.67	62.67
25/07/2015	7:00:00	97.66	62.66
25/07/2015	8:00:00	97.66	62.65
25/07/2015	9:00:00	97.66	62.65
25/07/2015	10:00:00	97.66	62.64
25/07/2015	11:00:00	97.66	62.64
25/07/2015	12:00:00	97.66	62.64
25/07/2015	13:00:00	97.66	62.61
25/07/2015	14:00:00	97.65	62.58
25/07/2015	15:00:00	97.65	62.54
25/07/2015	16:00:00	97.64	62.52
25/07/2015	17:00:00	97.64	62.50
25/07/2015	18:00:00	97.64	62.49
25/07/2015	19:00:00	97.64	62.48
25/07/2015	20:00:00	97.63	62.46
25/07/2015	21:00:00	97.64	62.49
25/07/2015	22:00:00	97.64	62.52
25/07/2015	23:00:00	97.65	62.56
26/07/2015	0:00:00	97.65	62.58
26/07/2015	1:00:00	97.65	62.58
26/07/2015	2:00:00	97.65	62.58
26/07/2015	3:00:00	97.65	62.59
26/07/2015	4:00:00	97.65	62.59
26/07/2015	5:00:00	97.66	62.61
26/07/2015	6:00:00	97.66	62.62
26/07/2015	7:00:00	97.66	62.63
26/07/2015	8:00:00	97.66	62.64
26/07/2015	9:00:00	97.66	62.66
26/07/2015	10:00:00	97.66	62.65
26/07/2015	11:00:00	97.66	62.66
26/07/2015	12:00:00	97.66	62.66
26/07/2015	13:00:00	97.66	62.65
26/07/2015	14:00:00	97.66	62.64
26/07/2015	15:00:00	97.66	62.62
26/07/2015	16:00:00	97.65	62.59
26/07/2015	17:00:00	97.65	62.58
26/07/2015	18:00:00	97.65	62.58
26/07/2015	19:00:00	97.65	62.58
26/07/2015	20:00:00	97.65	62.58
26/07/2015	21:00:00	97.66	62.62
26/07/2015	22:00:00	97.66	62.64

Date	Time	Stage Elevation	Calculated Q (cms)
26/07/2015	23:00:00	97.66	62.65
27/07/2015	0:00:00	97.66	62.66
27/07/2015	1:00:00	97.67	62.67
27/07/2015	2:00:00	97.67	62.67
27/07/2015	3:00:00	97.67	62.69
27/07/2015	4:00:00	97.67	62.70
27/07/2015	5:00:00	97.67	62.70
27/07/2015	6:00:00	97.67	62.71
27/07/2015	7:00:00	97.68	62.73
27/07/2015	8:00:00	97.68	62.74
27/07/2015	9:00:00	97.68	62.74
27/07/2015	10:00:00	97.68	62.73
27/07/2015	11:00:00	97.68	62.73
27/07/2015	12:00:00	97.67	62.72
27/07/2015	13:00:00	97.67	62.70
27/07/2015	14:00:00	97.67	62.69
27/07/2015	15:00:00	97.67	62.67
27/07/2015	16:00:00	97.66	62.66
27/07/2015	17:00:00	97.66	62.65
27/07/2015	18:00:00	97.66	62.66
27/07/2015	19:00:00	97.67	62.69
27/07/2015	20:00:00	97.67	62.71
27/07/2015	21:00:00	97.68	62.73
27/07/2015	22:00:00	97.68	62.76
27/07/2015	23:00:00	97.68	62.75
28/07/2015	0:00:00	97.68	62.74
28/07/2015	1:00:00	97.67	62.72
28/07/2015	2:00:00	97.67	62.71
28/07/2015	3:00:00	97.67	62.69
28/07/2015	4:00:00	97.67	62.71
28/07/2015	5:00:00	97.68	62.74
28/07/2015	6:00:00	97.68	62.76
28/07/2015	7:00:00	97.68	62.76
28/07/2015	8:00:00	97.69	62.79
28/07/2015	9:00:00	97.69	62.81
28/07/2015	10:00:00	97.69	62.79
28/07/2015	11:00:00	97.68	62.77
28/07/2015	12:00:00	97.68	62.79
28/07/2015	13:00:00	97.68	62.79
28/07/2015	14:00:00	97.68	62.77
28/07/2015	15:00:00	97.68	62.77
28/07/2015	16:00:00	97.68	62.76
28/07/2015	17:00:00	97.68	62.77
28/07/2015	18:00:00	97.68	62.76
28/07/2015	19:00:00	97.68	62.77

Date	Time	Stage Elevation	Calculated Q (cms)
28/07/2015	20:00:00	97.68	62.79
28/07/2015	21:00:00	97.69	62.81
28/07/2015	22:00:00	97.69	62.81
28/07/2015	23:00:00	97.69	62.79
29/07/2015	0:00:00	97.69	62.81
29/07/2015	1:00:00	97.68	62.79
29/07/2015	2:00:00	97.68	62.79
29/07/2015	3:00:00	97.69	62.79
29/07/2015	4:00:00	97.68	62.77
29/07/2015	5:00:00	97.69	62.79
29/07/2015	6:00:00	97.69	62.82
29/07/2015	7:00:00	97.69	62.84
29/07/2015	8:00:00	97.70	62.86
29/07/2015	9:00:00	97.70	62.87
29/07/2015	10:00:00	97.70	62.88
29/07/2015	11:00:00	97.70	62.88
29/07/2015	12:00:00	97.70	62.90
29/07/2015	13:00:00	97.70	62.88
29/07/2015	14:00:00	97.71	62.92
29/07/2015	15:00:00	97.71	62.93
29/07/2015	16:00:00	97.70	62.90
29/07/2015	17:00:00	97.70	62.91
29/07/2015	18:00:00	97.70	62.90
29/07/2015	19:00:00	97.70	62.90
29/07/2015	20:00:00	97.70	62.91
29/07/2015	21:00:00	97.71	62.92
29/07/2015	22:00:00	97.71	62.96
29/07/2015	23:00:00	97.72	62.99
30/07/2015	0:00:00	97.72	63.00
30/07/2015	1:00:00	97.72	63.02
30/07/2015	2:00:00	97.72	63.02
30/07/2015	3:00:00	97.72	63.04
30/07/2015	4:00:00	97.73	63.06
30/07/2015	5:00:00	97.73	63.07
30/07/2015	6:00:00	97.73	63.08
30/07/2015	7:00:00	97.73	63.09
30/07/2015	8:00:00	97.73	63.11
30/07/2015	9:00:00	97.73	63.11
30/07/2015	10:00:00	97.73	63.11
30/07/2015	11:00:00	97.73	63.09
30/07/2015	12:00:00	97.73	63.08
30/07/2015	13:00:00	97.73	63.06
30/07/2015	14:00:00	97.72	63.04
30/07/2015	15:00:00	97.72	63.02
30/07/2015	16:00:00	97.72	62.99

Date	Time	Stage Elevation	Calculated Q (cms)
30/07/2015	17:00:00	97.71	62.96
30/07/2015	18:00:00	97.70	62.91
30/07/2015	19:00:00	97.70	62.90
30/07/2015	20:00:00	97.70	62.90
30/07/2015	21:00:00	97.70	62.90
30/07/2015	22:00:00	97.70	62.91
30/07/2015	23:00:00	97.71	62.93
31/07/2015	0:00:00	97.71	62.92
31/07/2015	1:00:00	97.71	62.92
31/07/2015	2:00:00	97.70	62.90
31/07/2015	3:00:00	97.70	62.87
31/07/2015	4:00:00	97.69	62.85
31/07/2015	5:00:00	97.69	62.83
31/07/2015	6:00:00	97.69	62.82
31/07/2015	7:00:00	97.69	62.81
31/07/2015	8:00:00	97.69	62.81
31/07/2015	9:00:00	97.68	62.79
31/07/2015	10:00:00	97.68	62.77
31/07/2015	11:00:00	97.68	62.77
31/07/2015	12:00:00	97.68	62.76
31/07/2015	13:00:00	97.67	62.71
31/07/2015	14:00:00	97.67	62.69
31/07/2015	15:00:00	97.67	62.67
31/07/2015	16:00:00	97.67	62.67
31/07/2015	17:00:00	97.66	62.66
31/07/2015	18:00:00	97.66	62.65
31/07/2015	19:00:00	97.66	62.63
31/07/2015	20:00:00	97.66	62.62
31/07/2015	21:00:00	97.66	62.62
31/07/2015	22:00:00	97.66	62.61
31/07/2015	23:00:00	97.66	62.61
01/08/2015	0:00:00	97.66	62.63
01/08/2015	1:00:00	97.66	62.63
01/08/2015	2:00:00	97.66	62.65
01/08/2015	3:00:00	97.66	62.65
01/08/2015	4:00:00	97.66	62.66
01/08/2015	5:00:00	97.67	62.67
01/08/2015	6:00:00	97.67	62.68
01/08/2015	7:00:00	97.67	62.70
01/08/2015	8:00:00	97.68	62.73
01/08/2015	9:00:00	97.68	62.74
01/08/2015	10:00:00	97.68	62.74
01/08/2015	11:00:00	97.68	62.75
01/08/2015	12:00:00	97.68	62.75
01/08/2015	13:00:00	97.67	62.71

Date	Time	Stage Elevation	Calculated Q (cms)
01/08/2015	14:00:00	97.67	62.68
01/08/2015	15:00:00	97.66	62.65
01/08/2015	16:00:00	97.66	62.64
01/08/2015	17:00:00	97.66	62.62
01/08/2015	18:00:00	97.66	62.62
01/08/2015	19:00:00	97.66	62.61
01/08/2015	20:00:00	97.66	62.61
01/08/2015	21:00:00	97.66	62.61
01/08/2015	22:00:00	97.66	62.64
01/08/2015	23:00:00	97.66	62.65
02/08/2015	0:00:00	97.67	62.67
02/08/2015	1:00:00	97.67	62.67
02/08/2015	2:00:00	97.67	62.67
02/08/2015	3:00:00	97.67	62.67
02/08/2015	4:00:00	97.67	62.67
02/08/2015	5:00:00	97.67	62.68
02/08/2015	6:00:00	97.67	62.68
02/08/2015	7:00:00	97.67	62.68
02/08/2015	8:00:00	97.67	62.67
02/08/2015	9:00:00	97.67	62.67
02/08/2015	10:00:00	97.66	62.66
02/08/2015	11:00:00	97.66	62.66
02/08/2015	12:00:00	97.66	62.64
02/08/2015	13:00:00	97.66	62.61
02/08/2015	14:00:00	97.65	62.59
02/08/2015	15:00:00	97.65	62.56
02/08/2015	16:00:00	97.64	62.50
02/08/2015	17:00:00	97.64	62.48
02/08/2015	18:00:00	97.63	62.44
02/08/2015	19:00:00	97.63	62.42
02/08/2015	20:00:00	97.62	62.37
02/08/2015	21:00:00	97.60	62.27
02/08/2015	22:00:00	97.60	62.24
02/08/2015	23:00:00	97.60	62.23
03/08/2015	0:00:00	97.60	62.25
03/08/2015	1:00:00	97.59	62.18
03/08/2015	2:00:00	97.59	62.20
03/08/2015	3:00:00	97.60	62.23
03/08/2015	4:00:00	97.59	62.21
03/08/2015	5:00:00	97.60	62.22
03/08/2015	6:00:00	97.60	62.24
03/08/2015	7:00:00	97.60	62.24
03/08/2015	8:00:00	97.60	62.24
03/08/2015	9:00:00	97.60	62.24
03/08/2015	10:00:00	97.59	62.21

Date	Time	Stage Elevation	Calculated Q (cms)
03/08/2015	11:00:00	97.59	62.16
03/08/2015	12:00:00	97.58	62.13
03/08/2015	13:00:00	97.57	62.08
03/08/2015	14:00:00	97.57	62.04
03/08/2015	15:00:00	97.56	62.00
03/08/2015	16:00:00	97.56	61.96
03/08/2015	17:00:00	97.55	61.92
03/08/2015	18:00:00	97.55	61.91
03/08/2015	19:00:00	97.54	61.86
03/08/2015	20:00:00	97.54	61.87
03/08/2015	21:00:00	97.54	61.84
03/08/2015	22:00:00	97.57	62.04
03/08/2015	23:00:00	97.67	62.70
04/08/2015	0:00:00	97.66	62.63
04/08/2015	1:00:00	97.87	64.00
04/08/2015	2:00:00	98.09	65.36
04/08/2015	3:00:00	98.09	65.39
04/08/2015	4:00:00	98.02	64.92
04/08/2015	5:00:00	97.89	64.13
04/08/2015	6:00:00	97.82	63.65
04/08/2015	7:00:00	97.77	63.32
04/08/2015	8:00:00	97.73	63.08
04/08/2015	9:00:00	97.70	62.90
04/08/2015	10:00:00	97.69	62.83
04/08/2015	11:00:00	97.69	62.79
04/08/2015	12:00:00	97.69	62.81
04/08/2015	13:00:00	97.68	62.77
04/08/2015	14:00:00	97.68	62.76
04/08/2015	15:00:00	97.46	61.34