



38°59'39.2"N 76°57'09.8"W

A SYNOPTIC SURVEY OF CAMPUS CREEK

Spring, 2019

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TABLE OF CONTENTS:

ABSTRACT.....	Page 2
INTRODUCTION.....	Page 3
TABLE 1.....	Page 3
FIGURE 1.....	Page 4
HYPOTHESIS.....	Page 4
FIGURES 2, 3.....	Page 5
METHODS.....	Page 6
FIGURES 4, 5.....	Page 6
FIGURES 6, 7.....	Page 7
FIGURE 8.....	Page 8
TABLES 2, 3.....	Page 9
DATA AND UNCERTAINTY.....	Page 10
FIELD DATA.....	Page 10
DISCHARGE DATA.....	Page 13
SAMPLE DO DATA.....	Page 15
ICP-OES DATA.....	Page 16
TOC/L DATA.....	Page 18
DISCUSSION.....	Page 20
TABLE 4.....	Page 20
FIGURE 9.....	Page 21
FIGURE 10,11.....	Page 22
FIGURE 12.....	Page 23
FIGURES 13,14,15.....	Page 24
FIGURE 16.....	Page 25
APPENDIX A (RAW FIELD DATA).....	Page 26
APPENDIX B (RAW ICP-OES DATA).....	Page 31
APPENDIX C (SITE PICTURES).....	Page 68
BIBLIOGRAPHY.....	Page 78

ABSTRACT:

Interactions between flowing water, surrounding ecology, and the soil substrate of the stream, as well as chemical and physical inputs to the watershed all alter the stream's chemistry as it travels downstream. Here, I use salinity, pH, dissolved oxygen, metal content, and other proxies for water quality to compare an urban environment (the UMD campus) with a rural environment (the UMD golf course) in terms of the impact of human activities (salting and fertilizer application) as well as precipitation events on the water quality of Campus Creek. I have found that road salt application with subsequent precipitation washes Ca, Mg, K, and Na at different rates through the watershed, where Ca and Mg concentrations showed the largest increases. There is a Na signal produced during salting events, but unlike the Ca and Mg signals does not subside within two days, unlike Ca and Mg. The concentration of K does not appreciably change during salting, however. Additionally, salt levels at sites adjacent to impervious surfaces in campus creek display a heightened sensitivity to precipitation events, where salt accumulates on dry days and is washed downstream on wet days.

INTRODUCTION:

Aside from the more altruistic arguments for keeping our Campus Creek clean, there is the more utilitarian consideration: Campus Creek drains into the Anacostia which, while improving, has only received its first “pass” grade in water quality from the Anacostia Watershed Society in 2018! Anyone living or recreating in this river is exposed to whatever pollution is in it, as well as anyone or anything downstream in the Chesapeake and further downstream. To measure the water quality of the water that is draining from Campus Creek, I have quantified stream water quality by measuring stream pH, conductivity, and concentration of dissolved oxygen (DO) in the stream water, as most fluvial terrestrial organisms tolerate only specific ranges of these metrics. In addition, I have also quantified base cation composition as well as Total Dissolved Nitrogen (TDN), Total Inorganic Carbon (TOC) and Total Inorganic Carbon (TOC) composition across Campus Creek.

With regards to the ecological effects of pH, most organisms have a specific pH range they can tolerate, with the median minimum pH between 6.1 and 5.2 for most aquatic organisms (Eilers et al., 1984). However, three dominant groups of aquatic organisms, across multiple trophic levels and accounting for much of any stream ecosystem’s biomass (algae, planktonic crustaceans, and fish) have tighter minimum pH requirements: between 5.6 to 5.3. However much variance in minimum pH tolerance there is, a pH below 6 in terrestrial water extirpates fish of the genus Cyprinidae (Eilers et al., 1984) like minnows (Wiener et al., 1984), while a pH below 5 extirpates the other Teleostei: Percidae, Salmonidae, and Centrarchidae. At lower trophic levels (insects and algae) most organisms (Plecoptera, Coleoptera, Hemiptera, and Diptera insects as well as Chlorophyta algae) had median minimum pH values between 5.5 and 6 (Eilers et al., 1984).

With regards to water salinity and conductivity, species from the genera Trichoptera, Plecoptera, Ephemeroptera, and Diptera are particularly susceptible to increases in conductivity, with representatives of Ephemeroptera being totally extirpated when conductivity surpasses 1387 $\mu\text{S}/\text{cm}$ (Cormier et al. 2012). Meanwhile, increased concentrations of Mg, Ca, and K also have toxic effects on representatives from other trophic levels, such as mayflies, mussels, and amphipods (Kunz et al., 2013). Moreover, extreme shifts in salinity may kill freshwater organisms directly (as well as make the water non-potable for humans), or cause alkalinization by releasing salt anions (Kaushal et al., 2018) which can cause the water to be too basic to support local wildlife. With regards to the addition of Ca, Mg, and Na salts to a watershed leads to the mobilization of toxic metals (Cu, Cd, Pb, Zn), with Pb and Cd showing the most mobilization (Acosta et al., 2011). Specific to my project (as I found that salting events in Campus Creek acutely raise concentrations of Ca and Mg), Ca preferentially mobilizes Cd and Pb, while Cd and Cu were preferentially mobilized when exposed to Mg salt (Acosta et al., 2011). In general, an increase in salinity increases different heavy metal concentrations differently—Cd is mobilized more than Cu, which is mobilized more than Pb (Shou, et al., 2013). Cd and Pb are especially problematic as both are carcinogenic and cause DNA damage (Tchounwou et al., 2014).

Region	% Urban	% Forested	% Impervious
1 (Golf Course)	72.1	24	9.7
2 (Campus)	87.3	17.1	49.8
Overall	77.5	22.1	26.9

Table 1: Land-use metrics for the Campus Creek Watershed. Regions 1 and 2 refer to the labelled regions in figure 2, below. Note that since regions 1 and 2 are different sizes.

Finally, total impervious surface cover has a significant impact on the quality (pathogen levels, sediment levels, Zn, Cd, and Cu concentrations) of the water that runs off into the stream (Arnold and Gibbons, 1996), thus by extension the quality of the stream itself. Increased cover by impermeable surfaces in a Chesapeake Bay tributary has been associated with decreased DO levels in the lower level of the bay (Uphoff et al., 2011). Regarding the UMD campus, there is significantly more total impervious surface cover on campus vs on the golf course (table 1), where impermeable surface cover due to urbanization adjacent to Campus Creek increases in the downstream direction.

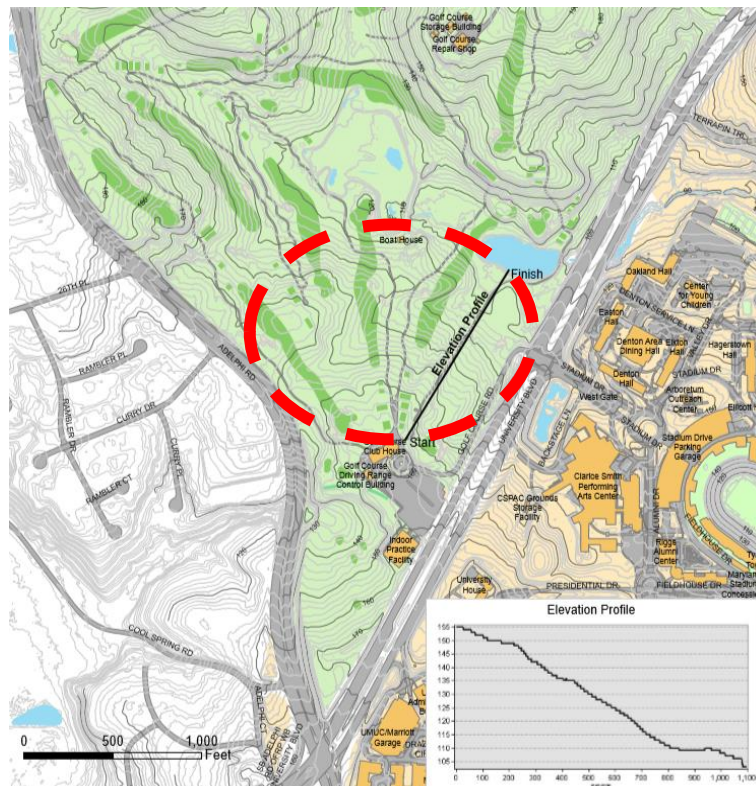


Figure 1: Topographic map of the UMD Golf Course (UMD Department of Facilities Planning). Red circled area indicates area where proposed land development would take place.

HYPOTHESIS:

I hypothesize that the application of salt to roads and walkways in the winter impacts the water quality (defined by the conductivity, DO content, and pH) of Campus Creek, with the null hypothesis being that salt application has no impact on the salinity, pH, and DO of the stream water. Furthermore, I hypothesize that the increased total impervious surface area of the UMD campus makes variations in water quality due to salt application and precipitation more extreme relative to water in the UMD golf course, where the null hypothesis is that there is no difference in water quality between the campus and the golf course after salt application and precipitation.

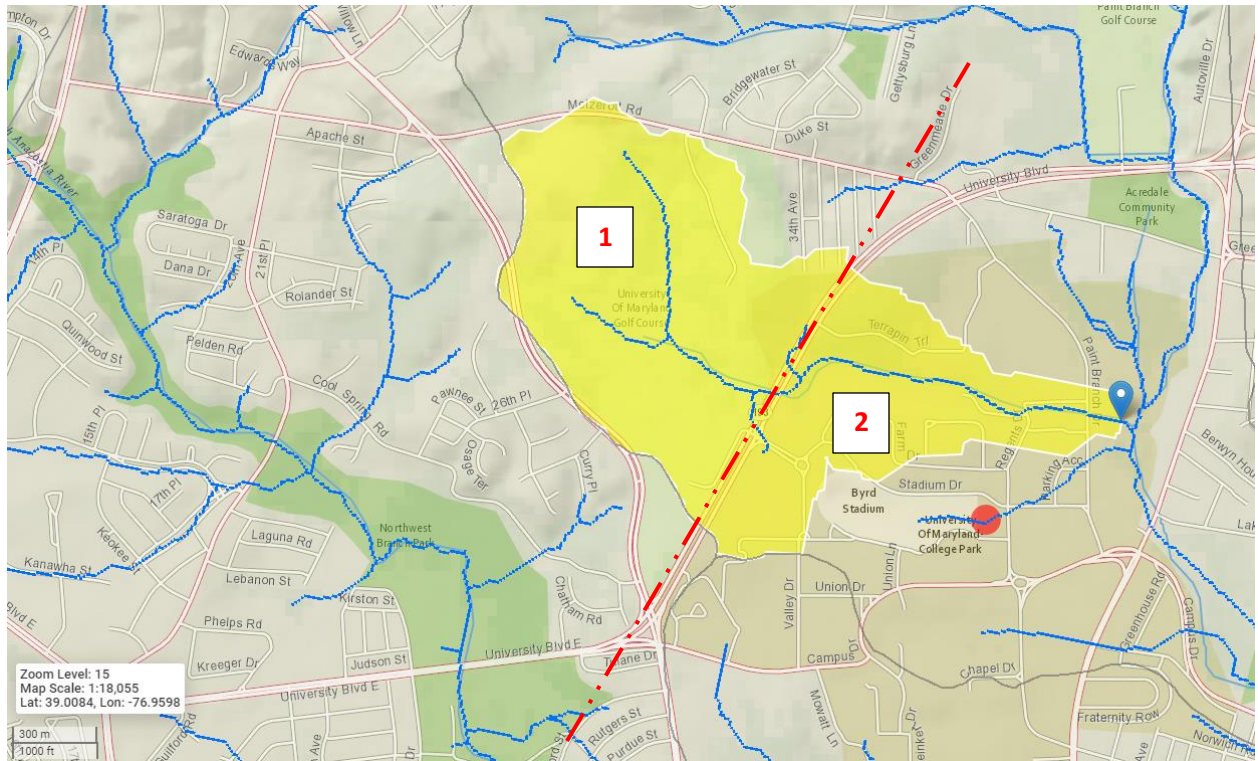


Figure 3: The Campus Creek watershed (yellow). Obtained using Streamstats, USGS.

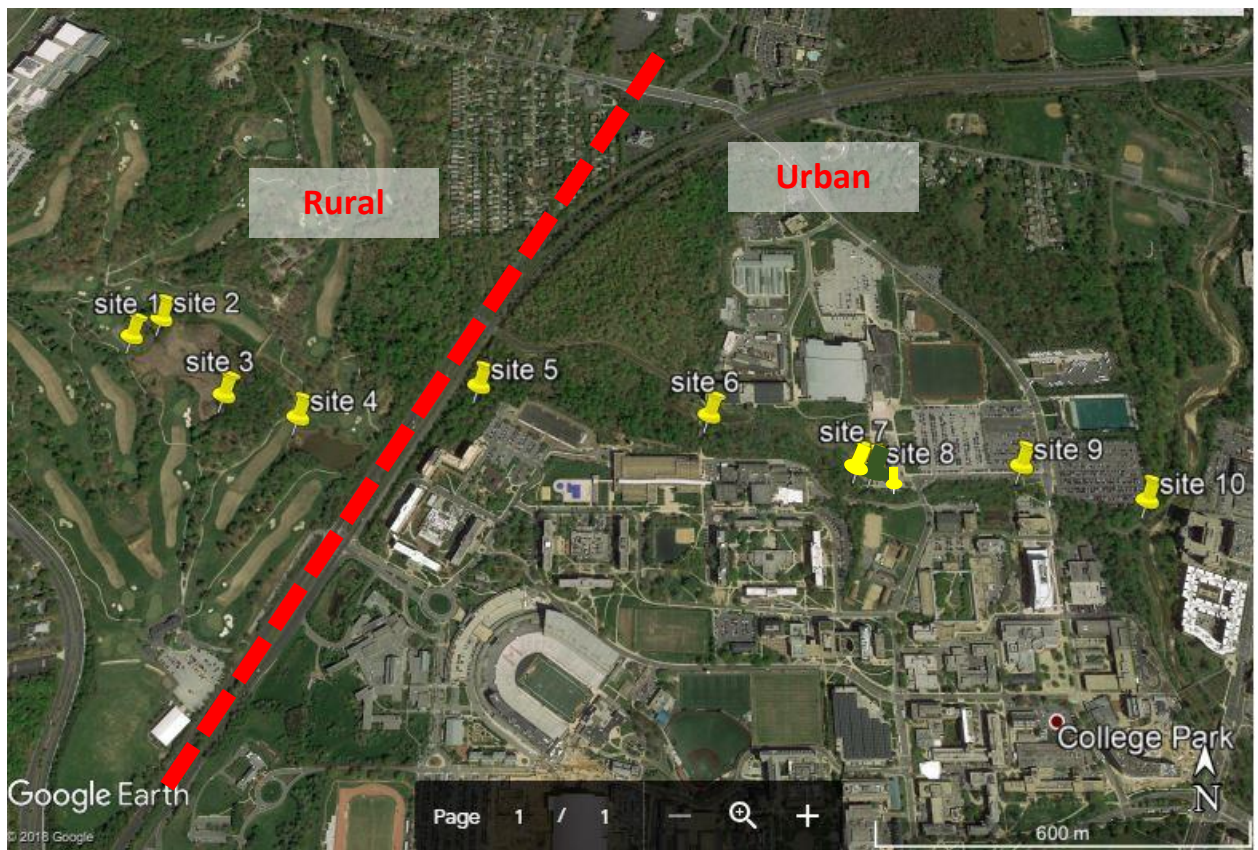


Figure 2: Map of sampling sites along Campus Creek. Sites 1-4 are on the golf course, and sites 5-10 are on campus.

METHODS:



Figure 4: Site 1 on the golf course. Taken on 1/14/19, two days after snowfall and salt application.

Total Organic Carbon (TOC), Total Dissolved Nitrogen (TDN), base cation (Na, K, Mg, Ca), and DO content. Base cation concentration will be obtained using Inductively Cooled Plasma-Optical Emission Spectrometry (ICP-OES), while TIC, TOC, and TDN data will be obtained using a Shimadzu TOC/L analyzer. The goal here is to characterize the water chemistry at different points along the stream, so as to draw inferences as to the effects that different precipitation and runoff events have

Using “StreamStats” (USGS, 2019), I was able to quantify the total proportion of surface area in both the “rural” and “urban” sections of my survey area (*figure 2*) as well as the basin area at each site. StreamStats is a web-based application that uses Geographic Information System (GIS) data as well as multiple related databases that either provide gauge data or land topography to allow for flow estimation at any user-defined site. It also provides the ability to delineate basin areas on a map, such as the one generated above (*figure 2*). I used the basin delineation function, as well as the land-use estimation function in my project. All that is required is to select a point on the stream, and the program returns a map of the basin that drains to that point, as well as the area (in square miles) that this basin covers.

A total of five sampling missions have been executed, each taking 4 hours on average to complete. Field measurements (pH, conductivity, Total Dissolved Solids (TDS), salinity, and temperature) have been collected in triplicate in the field (see map: *figure 3*), and samples of water will be bottled and brought to the lab for further analysis, including Total Inorganic Carbon (TIC),



Figure 5: Site 2 on the golf course. Taken on same day as figure 4, camera is pointed south in this photo.



Figure 6: Site 7, taken during dry, base-flow conditions on 3/4/19.

on water salinity, pH, and oxygen content, as well as track salts and fertilizers as they move through the watershed. Four samples are collected in the golf course environment (two at the headwaters and two downstream), and six samples collected in the campus (urban) environment, from University Blvd. E. all the way to the intersection with Paint Branch Creek. All data was collected in triplicate. Additionally, metadata such as the date, average air temperature, stream discharge and precipitation has been recorded alongside these data.

Before going out into the field to collect samples and data, the field probe, a Hanna Instruments HI98130 Combo Tester (a combination pH, conductivity, and temperature meter) must be calibrated prior to use, every time it is taken out. The procedure is relatively straightforward and involves calibrating the conductivity meter against a set of standards, in this case Hanna Instruments standards that were purchased alongside the probe. To enter calibration mode, the button labelled “cal.” is pressed and held until the display shows the letters “CAL”. First, the pH=7.0 standard is tested by putting the sensor bulb into the solution, swirling the solution briefly, and waiting for the screen to display the value of the standard being tested. Once it does, the “SET/HOLD” button is pressed. Once calibrated, the sensor bulb must be thoroughly rinsed with milli-Q water, to avoid cross-contaminating the standards. This same process is repeated for the pH=4.0 and pH=10.0 standards, as well as the conductivity standard, which has a value of 1214 μS (micro Siemen, SI unit of electrical conductivity), with thorough rinsing of the sensor between each calibration. The sensor must be stored in a solution of 3.0M KCl solution, to avoid desiccation of the sensor bulb. To this end, the plastic cap that goes over the bulb must be filled to the fill line with KCl solution, which may be prepared by dissolving 0.075 grams of laboratory-grade KCl (Sigma Aldrich) per 1 mL of water. With regard to the sample bottles used to collect river water, 250 mL wide-necked sample HDPE plastic sample bottles (manufactured by VWR) were acid washed for at least 20 minutes in 1M HCl, then rinsed with one rinse of deionized water on the outside and 2x40 mL of milli-Q water on the inside.

To sample data from the stream, the probe is uncapped, and the sensor bulb fully submerged in the water. Where possible, try to stick the probe in water



Figure 7: A Hanna Instruments HI98130 probe. Photo from the Hanna Instruments website.

moving at roughly the same speed, and deep enough to submerge the entire sample bottle. First, for every setting on the probe, data are recorded in triplicate (in the field) and averaged (later, in the lab) to obtain a datum for that site. Care must be taken to minimize the disturbance of sediment at the bottom of the channel. Next, to collect a sample of water for further analysis, rinse the bottle and cap three times in the stream before dumping out the water downstream of the user. Once again, care must be taken to only collect suspended material, and to avoid disturbing channel sediment and collecting that in the bottle. Attempt to fill the bottle as full as possible, to minimize the bottle's headspace and gas exchange between the collected water and the atmosphere. The bottles were stored in the field in an insulated bag with ice then transferred to a refrigerator upon returning to the lab, to minimize the degradation of whatever is in the sample as well as to avoid any reactions that take place after sampling.



Figure 8: Hach #146900 (DO test kit).

Winkler DO titration was used to quantify sample DO to the nearest mg/L. It was performed as soon as possible, and no more than 24 hours after sample collection. DO titration was executed before filtration, to avoid gas exchange between the sample and the atmosphere. I used a DO measurement kit from Hach (Hach product #146900), and followed the enclosed instructions, *always* using proper PPE including goggles, as reagents 2 and 3 are contact irritants and can cause blindness if allowed to enter the eyes. My procedure was as follows. First, all glassware was rinsed with deionized water at least twice. First, I decanted 15-20 mL sample water into the stopper bottle and swirled it around, autocontaminating the entire inside surface as well as the glass stopper with the sample. After

discarding this aliquot, I filled the stopper bottle with sample and stoppered it, discarding any excess. Next, I cut open one of each packet of Reagent 1 (manganous sulfate) and Reagent 2 (alkaline iodide-azide), and emptied the entire contents (in either order, it does not matter) into the bottle. Once again, I stoppered the bottle with one swift smooth motion, ensuring no air bubbles were trapped in the bottle. Then, I swirled the bottle allowing floc to form, then allowed it to sit for 4:00 minutes before swirling once more. After waiting another 4:00 minutes and swirling again, I added the contents of a packet of Reagent 3 (sulfamic acid), and swirled, letting the bottle sit and the fluid to homogenize. Once the solid settled and the fluid appeared homogenous, I took a disposable plastic pipette and pipetted aliquots of fluid into each of 3 measurement tubes (provided in the kit), equally filling the tubes to the top, then poured the contents of a tube into each of three titration flasks (from the kit). The titration itself was performed by adding 0.0109 N sodium thiosulfate solution (from the kit) dropwise into the titration flask, swirling the flask after each drop was added. I found it helpful to verbally count each drop to make it harder to lose track of how many drops were added. Using a blank sheet of white paper, I compared the color titration flask to a flask of clear water, stopping when the titration fluid turned completely clear and recording the number of drops. The quantity of DO (in mg/L) is equal to the number of drops

Reagent	Trial 1	Trial 2	Trial 3	Avg. (mg/L)
New	14	12	13	13.0
Expired	13	13	12	12.7

Table 2: Comparison between expired and fresh sodium thiosulfate reagents.

added. I found it efficient to use 3 titration flasks per stopper bottle, so I could easily take sets of measurements in triplicate. I had been using expired (as of February 2017) sodium thiosulfate and Reagent 2 until I obtained fresh reagents for dataset #5. The table below contains a comparison between the expired and new reagents, showing a minimal difference between reagents.

Sample filtration required a filtration apparatus, including plastic hose and filter paper. Once the apparatus was assembled, 15mL of sample was used to rinse the inside surface of the top of the apparatus. The sample water was then suctioned through to the bottom of the apparatus and the apparatus was swirled to rinse its inside surface, then poured out and discarded as waste. Then, the rest of the sample was measured and suctioned through the filter. The filtered sample was then decanted back into the original bottle after the bottle has been thoroughly rinsed with milli-Q water. The filter from the filtration apparatus was removed and sealed into a sheet of aluminum foil which was folded in half, then crimped at the edges so that the filter remained secure inside the foil wrapper. The total volume of water filtered (volume used to rinse the apparatus, plus the rest of the sample) was then recorded on the foil.

The ICP-OES performs a series of steps in order to take measurements. First, an acidified sample is drawn into the machine from the autosampler. The sample is aerosolized and sprayed into a chamber where an argon plasma excites the sample. The excited sample releases characteristic wavelengths for each different element present. These different wavelengths of light are passed through a disperser that segregates light based on wavelength, then a light detector that quantifies the intensity of the light signal. The position the light lands on in the detector corresponds to the wavelength (and therefore the identity of the element), while the intensity of the signal corresponds to the abundance of the element being measured. Preparation of samples for ICP-OES analysis was performed after filtration, with sample runs performed on 2/12/2019 and 3/1/2019. Using an automatic pipettor, a 30mL aliquot of sample was pipetted into a 60mL acid-washed bottle along with 150 μ L of trace-metal grade 6M nitric acid, to keep the metal ions in solution. Once all samples had been acidified, I filled a glass ICP-OES sample tube with approximately 13-15 mL of acidified sample, and loaded every sample into the autosampler, along with 3 blanks and one full set of stock-standards per sample run. There are two (set A and set B) sets of stock solutions. Set A is composed of 2.5, 5, 10, 25, 50, 100, 250, and 500 ppb solutions of Ag, Al, As, B, Ba, Be, Ca, Cd, Ce, Co, Cr, Cs, Cu, Dy, Er, Eu, Fe, Ga, Gd, Ho, K, La, Lu, Mg, Mn, Na, Nd, N, P, Pb, Pr, Rb, S, Se, Sm, Sr, Th, Tl, Tm, U, V, Yb, and Zn in 3% HNO₃. Set B is composed of 1000, 5000, 10,000, 25,000, 50,000, 100,000, and 250,000 ppb solutions of Al, Ca, Cr, Mg, Ni, K, Na, and Zn in 2% HNO₃. Set B is made from a stock solution bought from High-Purity Standards, and their measured uncertainties are tabulated in *table 3*, previous page.

Element	Concentration (μ g/ml)
Al	1000 $\pm$ 6
Ca	1000 $\pm$ 6
Cr	500 $\pm$ 3
Mg	1000 $\pm$ 6
Ni	500 $\pm$ 3
K	1000 $\pm$ 10
Na	1000 $\pm$ 6
Zn	500 $\pm$ 3

Table 3: Manufacturer's uncertainties for stock solution composition

TIC, TOC, and TDN sample preparation is performed by filling a sample vial with filtered sample water and loading it into the autosampler, along with 3 tubes of Total Inorganic Carbon (TIC) standard and 3 tubes of Total Organic Carbon/Total Dissolved Nitrogen (TOC/TDN) standard per sample run. The instrument used was a Shimadzu TOC/L analyzer, which works by a series of steps. First, sample is drawn up into a syringe and diluted with ultrapure water (processed within the instrument) until it reaches a specific volume. Then, a set volume of acid is added, which reacts with the inorganic carbon in the sample, volatilizing it. The contents of the syringe are sparged, which mixes the contents and degasses the evolved inorganic carbon, which passes through the detector and is measured (in mg/L). The rest of

the sample is injected into a combustion chamber where the rest of the carbon (TOC) and nitrogen (TDN) is combusted (at 680°C) and passed through the non-dispersive infrared detector.

DATA AND UNCERTAINTY:

All standard deviations are calculated to 1σ .

Field data. Data points are an average of the data collected in triplicate and are reported here for convenience. The raw data are located in appendix A. The format of the data here is: the first table is the averaged data for a sample trip, the second table is the standard deviation for each measurement made.

11/30/2018		(μS)	(ppm)	(ppt)	(celsius)
site	pH	conductivity	TDS	salinity	temp
1	7.34	413	232	0.21	4.1
2	6.91	330	235	0.17	7.5
3	7.59	323	229	0.16	4.2
4	7.64	320	228	0.16	3.7
5	7.45	384	275	0.19	4.4
6	7.41	382	271	0.19	5.2
7	7.30	437	309	0.22	5.4
8	7.32	442	315	0.22	4.7
9	7.46	463	330	0.23	4.7
10	7.54	498	356	0.25	4.6

Note that for field data set 1 only, these values are the raw data. Data were not collected in triplicate until the second survey trip

12/20/2018		(μS)	(ppm)	(ppt)	(celsius)
site	pH	conductivity	TDS	salinity	temp
1	7.51	327	243	0.17	5.5
2	7.00	274	195	0.14	6.3
3	7.58	265	187	0.13	4.5
4	7.59	259	186	0.13	4.5
5	7.34	289	207	0.15	5.0
6	7.48	286	205	0.14	5.9
7	7.29	337	242	0.17	5.7
8	7.37	342	247	0.18	6.1
9	7.60	291	207	0.15	5.9
10	7.47	280	202	0.15	5.7

site	stdev	stdev	stdev	stdev	stdev
site	pH	conductivity	TDS	salinity	temp
1	0.05	14.05	0.58	0.00	0.00
2	0.10	1.00	0.58	0.01	0.10

3	0.06	5.77	0.58	0.00	0.06
4	0.02	4.36	0.58	0.00	0.06
5	0.06	5.69	0.58	0.00	0.06
6	0.02	2.52	0.58	0.00	0.12
7	0.01	1.53	0.58	0.00	0.00
8	0.01	1.00	1.00	0.01	0.06
9	0.01	1.15	0.58	0.00	0.00
10	0.03	0.58	1.00	0.00	0.06

1/6/2019		(μ S)	(ppm)	(ppt)	(celsius)
site	pH	conductivity	TDS	salinity	temp
1	7.63	336	242	0.17	8.7
2	7.00	292	205	0.15	9.1
3	7.47	268	191	0.13	8.7
4	7.48	267	188	0.13	8.2
5	7.42	296	214	0.15	8.4
6	7.64	304	214	0.15	8.1
7	7.43	350	246	0.15	7.5
8	7.38	361	256	0.18	7.4
9	7.52	394	276	0.20	7.4
10	7.58	423	298	0.21	7.0

	stdev	stdev	stdev	stdev	stdev
site	pH	conductivity	TDS	salinity	temp
1	0.02	0.58	1.53	0.00	0.17
2	0.06	1.53	2.00	0.00	0.06
3	0.05	1.15	1.53	0.01	0.00
4	0.01	1.15	2.08	0.01	0.06
5	0.02	3.79	0.58	0.00	0.21
6	0.06	5.57	3.46	0.01	0.25
7	0.01	1.73	3.51	0.03	0.06
8	0.02	1.00	1.00	0.01	0.10
9	0.02	5.20	1.00	0.01	0.06
10	0.02	5.20	1.53	0.00	0.06

1/14/2019		(μ S)	(ppm)	(ppt)	(celsius)
site	pH	conductivity	TDS	salinity	temp
1	7.37	1874	1357	1.96	2.8
2	6.90	713	465	0.33	3.8
3	7.06	901	661	0.47	1.8

4	7.16	830	577	0.42	2.1
5	7.36	4227	2990	2.09	2.6
6	7.44	3373	2457	1.74	2.3
7	7.41	4320	3147	2.19	2.3
8	7.35	4660	3227	2.26	2.5
9	7.29	5667	3960	2.63	3.0
10	7.42	6153	3877	2.95	2.5

site	stdev pH	stdev conductivity	stdev TDS	stdev salinity	stdev temp
1	0.02	3.21	11.55	0.01	0.51
2	0.03	111.50	2.00	0.00	0.06
3	0.01	3.79	1.53	0.01	0.06
4	0.01	5.00	17.93	0.02	0.06
5	0.01	70.24	20.00	0.02	0.12
6	0.01	49.33	11.55	0.02	0.20
7	0.04	78.10	50.33	0.04	0.29
8	0.01	105.83	40.41	0.01	0.06
9	0.09	83.27	10.00	0.31	0.15
10	0.00	136.50	811.56	0.01	0.10

1/29/2019		(μS)	(ppm)	(ppt)	(celsius)
site	pH	conductivity	TDS	salinity	temp
1	7.56	419	300	0.21	3.5
2	7.28	318	225	0.16	3.9
3	7.58	340	242	0.17	2.5
4	7.61	332	236	0.17	2.4
5	7.42	468	337	0.24	4.3
6	7.55	454	325	0.23	3.4
7	7.56	583	422	0.30	3.7
8	7.41	950	710	0.54	3.8
9	7.44	800	561	0.39	3.5
10	7.49	785	556	0.40	3.4

site	stdev pH	stdev conductivity	stdev TDS	stdev salinity	stdev temp
1	0.03	3.21	1.53	0.00	0.00
2	0.10	0.58	1.00	0.00	0.17
3	0.03	1.00	0.58	0.00	0.00
4	0.02	1.53	0.58	0.00	0.06
5	0.02	1.53	1.15	0.01	0.00
6	0.01	1.00	3.21	0.01	0.12

7	0.03	0.58	1.53	0.01	0.06
8	0.03	17.62	3.06	0.00	0.29
9	0.01	1.53	1.00	0.00	0.06
10	0.01	1.15	0.58	0.01	0.06

USGS gauge discharge data. The site is located at Lat 39°01'59.3", long 76°57'51.4", Montgomery County, Hydrologic Unit 02070010, on left bank of stream, upstream of Floral Drive bridge, 1.9 mi northwest of College Park and 3.4 mi northeast of Takoma Park.

11/30/2018		Basin Area (km^2):	
	Time:	L/s:	
1	12:00 EST	532	0.21
2	12:30 EST	532	0.41
3	13:00 EST	532	0.78
4	13:30 EST	518	0.83
5	14:00 EST	518	1.35
6	14:30 EST	532	1.58
7	15:00 EST	532	1.68
8	15:30 EST	532	1.68
9	16:00 EST	518	1.76
10	16:30 EST	518	1.79

12/20/2018		Basin Area:	
Site:	Time:	L/s	
1	11:30 EST	558	0.21
2	12:00 EST	575	0.41
3	12:30 EST	558	0.78
4	13:00 EST	558	0.83
5	14:30 EST	558	1.35
6	15:00 EST	558	1.58
7	15:30 EST	558	1.68

8	16:00 EST	575	1.68
9	16:30 EST	575	1.76
10	17:00 EST	589	1.79

1/6/2019

Site:	Time:	L/s	Basin Area:
1	12:00 EST	530	0.21
2	12:30 EST	530	0.41
3	13:00 EST	530	0.78
4	13:30 EST	515	0.83
5	14:00 EST	515	1.35
6	14:30 EST	515	1.58
7	15:00 EST	515	1.68
8	15:30 EST	515	1.68
9	16:00 EST	515	1.76
10	16:30 EST	515	1.79

1/14/2019

Site:	Time:	L/s	Basin Area:
1	12:30 EST	589	0.21
2	13:00 EST	589	0.41
3	13:30 EST	606	0.78
4	14:00 EST	606	0.83
5	14:30 EST	606	1.35
6	15:00 EST	623	1.58
7	15:30 EST	623	1.68
8	16:00 EST	623	1.68
9	16:30 EST	623	1.76

10	17:00 EST	623	1.79
1/29/2019			
Site:	Time:	L/s	Basin Area:
1	12:30 EST	589	0.21
2	13:00 EST	589	0.41
3	13:30 EST	589	0.78
4	14:00 EST	589	0.83
5	14:30 EST	606	1.35
6	15:00 EST	606	1.58
7	15:30 EST	623	1.68
8	16:00 EST	637	1.68
9	16:25 EST	702	1.76
10	16:50 EST	736	1.79

DO data. These data were obtained by performing a Winkler's titration (in triplicate) on each sample collected in the field. DO measurements for sample sets 1 and 2 are unavailable, as the titration was not performed for set 1, and performed improperly for set 2. These data were averaged in column 5, then the standard deviation for each sample was calculated and tabulated in column 6. Rows with a "**SAMPLE LOST**" entry are missing as the sample was accidentally destroyed or otherwise lost.

DO:	site	Trial 1 (mg/L)	Trial 2 (mg/L)	Trial 3 (mg/L)	Avg. (mg/L)	Stdev (1σ)
1/6/2019	1	13	13	12	12.7	0.6
	2	12	12	11	11.7	0.6
	3	11	11	12	11.3	0.6
	4	11	11	11	11.0	0.0
	5	12	11	11	11.3	0.6
	6	12	11	11	11.3	0.6
	7	12	12	12	12.0	0.0
	8	12	12	12	12.0	0.0

		9	12	11	11	11.3	0.6
		10	12	12	12	12.0	0.0
*DO:	site	trial 1 (mg/L)	trial 2 (mg/L)	trial 3 (mg/L)	avg. (mg/L)	Stdev (1σ)	
1/14/2019	1	13	14	13	13.3	0.6	
	2	14	15	15	14.7	0.6	
	3	10	12	12	11.3	1.2	
	4	14	13	13	13.3	0.6	
	5	14	13	13	13.3	0.6	
	6	12	13	13	12.7	0.6	
	7	12	12	12	12.0	0.0	
	8		SAMPLE LOST				
	9	11	10	11	10.7	0.6	
	10	10	11	10	10.3	0.6	

DO:	site	trial 1 (mg/L)	trial 2 (mg/L)	trial 3 (mg/L)	avg. (mg/L)	Stdev (1σ)	
1/30/2019	1	14	14	13	13.7	0.6	
	2	12	12	11	11.7	0.6	
	3	13	12	13	12.7	0.6	
	4	13	13	13	13.0	0.0	
	5	13	12	12	12.3	0.6	
	6	13	14	13	13.3	0.6	
	7	12	12	11	11.7	0.6	
	8	11	11	12	11.3	0.6	
	9	11	12	12	11.7	0.6	
	10	11	12	13	12.0	1.0	

ICP-OES data. These data were collected in triplicate, then averaged. The standard deviation (1σ) for each set of three data points was calculated in excel and tabulated. The raw data is available in appendix

B. Rows with a “**SAMPLE LOST**” entry are missing as the sample was accidentally destroyed or misplaced.

		downstream distance from site 1					Ca	K	Mg	Na	
		site	(m)	Ca	K	Mg	Na	Ca stdev	K stdev	Mg stdev	Na stdev
11/30/2018	1	0	58.7	4.41	9.91	35.9	0.40	0.05	0.25	0.59	
	2	40	21.7	3.68	8.49	36.3	0.06	0.14	0.09	0.26	
	3	230	27.7	3.6	7.78	25.7	0.10	0.12	0.11	2.07	
	4	370	28.2	3.51	7.91	23.8	0.26	0.14	0.12	0.31	
	5	760	37.3	4.11	7.93	32.3	0.15	0.12	0.15	0.64	
	6	1205	36	4.07	7.74	34	0.10	0.11	0.12	0.67	
	7	1510	30.6	4.49	8.11	44.1	0.15	0.25	0.15	0.76	

12/20/2018	8	1565	SAMPLE LOST				SAMPLE LOST			
	9	1800	32.1	4.57	8.86	46.3	0.06	0.10	0.14	0.85
	10	2015	35.5	5.08	9.41	49.2	0.10	0.20	0.12	0.38
	1	0	46.2	3.85	7.48	26.6	0.21	0.17	0.09	0.47
	2	40	21.3	3.38	7.08	18.8	0.00	0.05	0.09	0.44
	3	230	25	3.26	6.34	17.1	0.06	0.02	0.09	0.31
	4	370	24.7	3.19	6.25	16.1	0.12	0.02	0.07	0.21
	5	760	25.2	3.77	14.5	27.5	0.12	0.14	0.06	0.26
	6	1205	24.6	3.8	8.64	26.7	0.21	0.09	0.03	0.64
	7	1510	27.6	3.71	6.18	29.2	0.10	0.14	0.13	0.29
1/6/2019	8	1565	30.9	3.41	5.78	37.1	0.59	0.06	0.08	0.65
	9	1800	24.5	3.11	5.29	24.9	0.15	0.05	0.11	0.42
	10	2015	24.3	3.01	5.13	30.2	0.10	0.08	0.07	0.64
	1	0	45.1	3.41	7.64	25.2	0.42	0.06	0.12	0.26
	2	40	22.7	3.42	7.43	20.1	0.15	0.09	0.14	0.46
	3	230	26.1	3.03	6.4	17.2	0.06	0.12	0.13	0.38
	4	370	24.8	3.56	16.5	21.6	0.06	0.07	0.10	0.15
	5	760	27.4	3.64	9.94	27	0.12	0.14	0.02	0.61
	6	1205	27.1	3.39	6.06	29	0.15	0.04	0.08	0.40
	7	1510	26.5	3.85	10.3	35.8	0.12	0.40	0.00	0.47
1/14/2019	8	1565	26.7	3.84	10.6	36	0.15	0.10	0.06	0.50
	9	1800	30.1	3.77	7.3	33.5	0.12	0.13	0.15	0.58
	10	2015	32.9	4.17	7.74	37.1	0.12	0.11	0.17	0.59
	1	0	77	6.07	10.6	209	0.15	0.04	0.10	0.58
	2	40	26.4	3.81	7.94	70.5	0.17	0.09	0.12	1.04
	3	230	44.8	4.51	8.44	113	0.29	0.20	0.11	1.15
	4	370	41.7	4.56	8.25	98.3	0.23	0.10	0.13	1.22
	5	760	69.3	9.06	23.4	560	0.30	0.24	0.46	1.53
	6	1205	69.9	8.69	15.7	516	0.06	0.09	0.32	0.00
	7	1510	75.4	9.84	24.1	576	0.26	0.19	0.26	2.00
1/29/2019	8	1565	SAMPLE LOST				SAMPLE LOST			
	9	1800	78.1	11.7	27.1	717	0.06	0.32	0.40	1.00
	10	2015	87.7	11.7	25.2	861	0.06	0.23	0.40	3.46
	1	0	18721	15.87	49809	1639	0.15	0.22	0.29	1.80
	2	40	9220	15.54	47138	1285	0.10	0.05	0.12	0.93
	3	230	58279	16.31	42293	1461	0.15	0.07	0.06	0.64
	4	370	10668	13.76	23486	1368	0.15	0.36	0.00	1.31
	5	760	14119	16.35	26821	2152	0.00	0.19	0.00	0.84
	6	1205	12752	18.01	44308	2108	0.26	0.19	0.00	0.64
	7	1510	89154	20.59	41451	1742	0.21	0.11	0.00	0.58
	8	1565	98875	24.11	80364	1877	0.12	0.14	0.15	1.53
	9	1800	15515	37.21	42509	1530	0.06	0.45	0.17	0.58

10	2015	14552	32.29	69798	1377	0.15	0.19	0.12	0.31
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TOC/L data. These data were not collected in triplicate, and the data below are the raw data. Rows with a “**SAMPLE LOST**” entry are missing as the sample was accidentally destroyed or otherwise lost.

Sample Name	site	downstream distance (m)	Result(NPOC)	Result(TN)	Result(IC)	Unit
12/07_1	1	0	6.343	1.363	20.91	mg/L
12/07_2	2	40	0.101	0.252	8.03	mg/L
12/07_3	3	230	3.535	1.286	11.23	mg/L
12/07_4	4	370	3.869	1.204	10.98	mg/L
12/07_5	5	760	3.585	1.144	10.85	mg/L
12/07_6	6	1205	3.309	1.063	9.49	mg/L
12/07_7	7	1510	3.116	1.205	9.93	mg/L
NO SAMPLE	8	SAMPLE LOST				
12/07_9	9	1800	3.148	1.095	10.78	mg/L
12/07_10	10	2015	3.719	1.111	12.51	mg/L
12/20_1	1	0	6.335	1.622	16.90	mg/L
12/20_2	2	40	3.184	1.806	7.01	mg/L
12/20_3	3	230	3.900	1.227	9.51	mg/L
12/20_4	4	370	4.100	1.214	9.41	mg/L
12/20_5	5	760	4.393	1.413	10.15	mg/L
12/20_6	6	1205	4.022	1.341	8.67	mg/L
12/20_7	7	1510	3.604	1.307	10.28	mg/L
12/20_8	8	1565	3.543	1.334	10.35	mg/L
12/20_9	9	1800	3.181	1.088	9.60	mg/L
12/20_10	10	2015	3.112	1.105	9.42	mg/L
1/6_1	1	0	5.137	1.525	19.09	mg/L
1/6_2	2	40	2.791	1.896	7.34	mg/L
1/6_3	3	230	3.800	1.280	9.99	mg/L
1/6_4	4	370	4.170	1.255	10.50	mg/L
1/6_5	5	760	5.437	1.229	10.43	mg/L
1/6_6	6	1205	3.871	1.238	9.92	mg/L
1/6_7	7	1510	3.773	1.431	10.30	mg/L
1/6_8	8	1565	3.442	1.151	9.22	mg/L
1/6_9	9	1800	3.487	1.155	11.05	mg/L
1/6_10	10	2015	3.327	1.134	11.30	mg/L
1/14_1	1	0	4.360	1.331	15.70	mg/L
1/14_2	2	40	3.765	1.615	8.45	mg/L
1/14_3	3	230	3.643	1.151	9.22	mg/L
1/14_4	4	370	3.340	1.057	8.97	mg/L
1/14_5	5	760	3.565	1.070	11.56	mg/L
1/14_6	6	1205	3.513	1.074	11.35	mg/L
1/14_7	7	1510	3.259	1.086	11.15	mg/L

NO SAMPLE	8			SAMPLE LOST		
1/14_9	9	1800	3.334	1.007	11.78	mg/L
1/14_10	10	2015	3.381	1.084	12.15	mg/L
1/29_1	1	0	4.203	1.597	16.75	mg/L
1/29_2	2	40	2.344	1.842	6.96	mg/L
1/29_3	3	230	3.243	1.217	8.10	mg/L
1/29_4	4	370	3.215	1.317	8.11	mg/L
1/29_5	5	760	3.676	1.340	9.12	mg/L
1/29_6	6	1205	3.345	1.265	8.18	mg/L
1/29_7	7	1510	2.801	1.396	9.65	mg/L
1/29_8	8	1565	3.381	1.416	9.89	mg/L
1/29_9	9	1800	2.773	1.216	9.11	mg/L
1/29_10	10	2015	2.700	1.228	9.35	mg/L

DISCUSSION:

To be able to compare salinity, ionic, and nutrient data across different sampling trips, all the data collected must be normalized to discharge. Discharge data for Campus Creek could not be obtained. Instead, discharges from the nearby USGS Paint Branch Creek gauge station were obtained at the same days and time range that samples were collected. Now, the problem is that as the sites move downstream, there is a corresponding increase in discharge due to the basin area at that site increasing relative to any point upstream, while the gauge station does not move and has a fixed basin area. To solve this problem, the approximate discharge for each of the ten sites along Campus Creek was calculated by using the following equation:

$$Q_{Campus\ Creek} = \frac{Q_{Paint\ Branch}}{BA_{Paint\ Branch}} * BA_{Campus\ Creek}$$

Once the discharge (in liters/second) for each site during each sampling was calculated, the concentration in mg/L to be normalized (concentration of Ca, concentration of TOC, etc.) was multiplied by the estimated discharge at that site to obtain the flux (in mg/second) of the datum of interest. The same method was applied to conductivity measurements, as conductivity is directly related to concentration of ions in sample water. It bears mentioning that this method fails during storm events, as since the Paint Branch station is in the middle of a forest, stormwater discharge events are more delayed, have lower volume, and less intense than those same events on campus (Du et al., 2015), where most of the nearby basin is impervious asphalt. In those cases, the estimated flux would be *lower* than the actual value, as the actual discharge at the campus creek sites would be higher than the Paint Branch station during precipitation. This method still works for base flow conditions and is better than no adjustment at all.

Survey #	Date	Weather	Air temp (°F)	Salt?
Set 1	11/30/2018	Dry	45	No
Set 2	12/20/2018	0.36" Rain	39	No
Set 3	1/6/2019	Dry	52	No
Set 4	1/14/2019	Dry, approx. 14" of snow on ground	33	1/12/2019 (same day)
Set 5	1/29/2019	Rain (13:00), Sleet (14:00), Snow (14:30)—0.2" total	35	1/29/2019 (2 days prior)

Table 4: Summary of weather conditions during sampling events.

Table 4 summarizes all relevant metadata for each sampling trip, including temperature, precipitation, and salt conditions. Note that sets 1-3 took place before any salt was applied, and at (or near) base flow conditions. Conversely, sets 4 and 5 took place after salting (set 4 took place 2 days after salt, set 5 took place as salting was being applied). This gives a view of standard conditions, and conditions during and after salt is applied, which allows us to see how long it takes various salts to pass through the watershed.

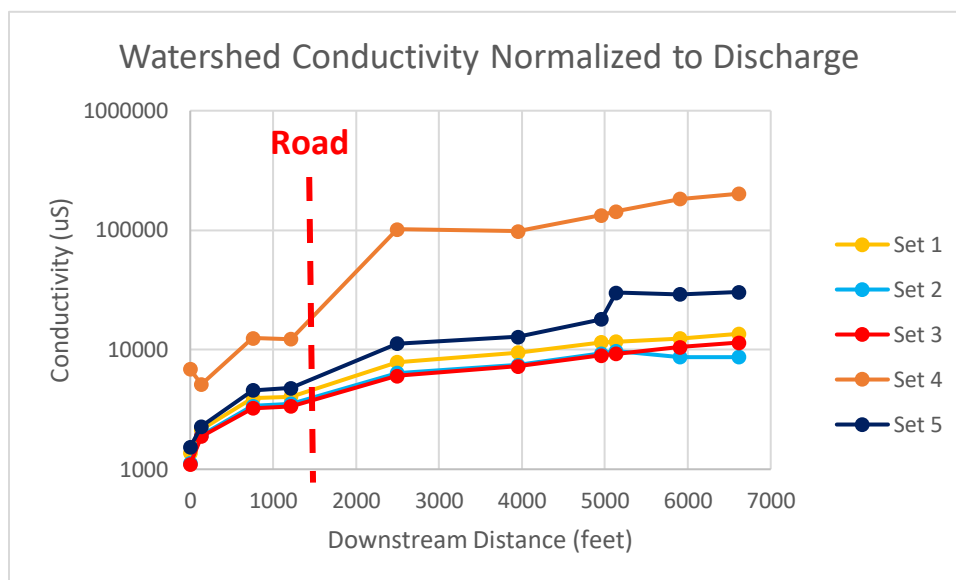


Figure 9: Stream water conductivity across the watershed normalized to discharge, for all data sets. Note the logarithmic y-axis, and that the blue lines indicate precipitation, while the red, orange, and yellow lines indicate no precipitation. Note also that sites 1 and 2 are connected on this graph, but are in fact separate, and independently drain into site 3.

Curiously, even though salt was being applied during set 5, the stream is more conductive during set 4 (two days after salting) than set 5. This is odd because ion concentrations are higher in set 4 than set 5. This may be explained by the fact that the average water temperature in set 4 is 2.6°C, while the average temperature in set 5 is 3.5°C, thus, the relatively warm water of set 5 would allow more ions to be dissolved in stream water and contribute to the higher conductivity readings. In any case, this implies that road salt application increases the salinity of the stream water.

Next, let us examine the relationship between impervious surfaces and conductivity. With regard to the effect that the road (University Blvd. E.) has on the water quality: the road seems to have a minimal effect when salt has not been applied. However, when salt is applied, there is a spike in conductivity between sites 4 and 5, which corresponds to the location of the road. This effect is more pronounced when salt has been applied recently and precipitation is occurring (*figure 9, set 4*), as opposed to when two days have passed since salt application, and there is no precipitation (*figure 9, set 5*). Although it is important to note that the effect is still present, as sites 5 and 6 are positively offset by the same amount relative to the unsalted baseflow states (sets 1, 2, and 3). This is consistent with my hypotheses, as it shows that the application of road salts leads to an increased conductivity (and therefore salinity) signal in the stream water.

The impervious surfaces downstream (the parking lots at the east end of campus) also have a visible impact on water quality. Observe how on wet days (*figure 9, sets 2 and 5, sites 8, 9, and 10*) water salinity decreases downstream. This happens when salts are input into the stream and abated as they drain out. This happens regardless of whether salt has been applied or not and indicates that increased runoff into Campus Creek from parking lots will dilute salts present in the water, even if salt has been applied, which is consistent with my second hypothesis as these conductivity data show a sensitivity to weather conditions. Compare sites 8-10 with the area between sites 5 and 6 in all data sets, where the lack of large swathes of impervious material that drain *directly* into the creek allow for the conductivity of the water to either stay constant or accumulate. Contrast this with the data from dry days (*figure 9, sets 1, 3, and 4*) where, given that relatively salty water is running off the lots and directly into the creek, conductivity continues to increase downstream as ions accumulate. This effect begins at site 6, but is most obvious past site 8, if one compares the dry datasets vs the wet ones. Finally, note how there is a

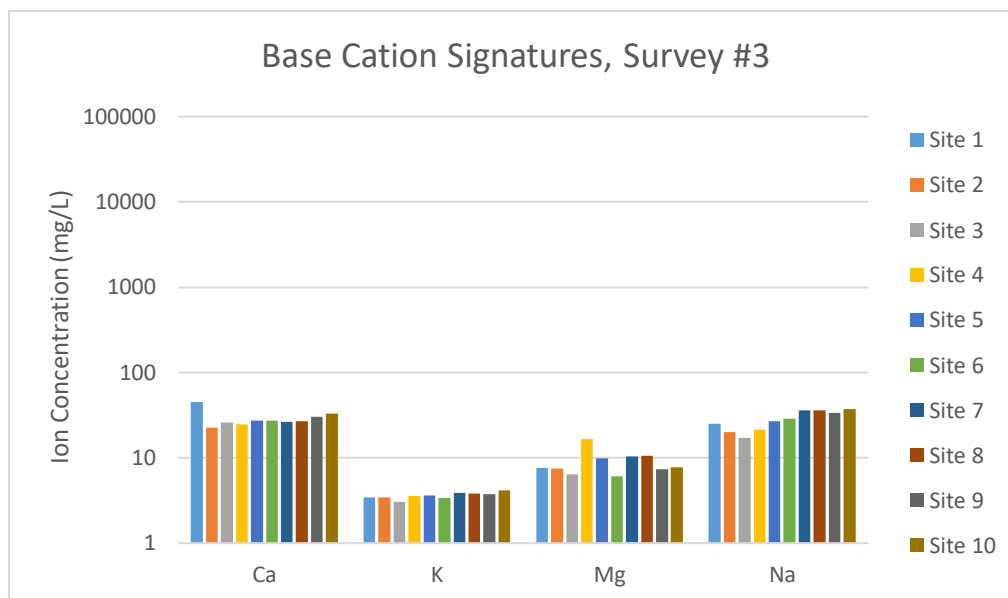


Figure 10: Base cation abundances during a dry base flow day, no salt applied.

sharp increase in salinity between sites 7 and 8 (figure 10, set 5). This accentuates the significant effect that proximity of impervious surfaces has on water quality. Note on the map (figure 3) that between sites 7 and 8, there is drainage of the parking lots to the north *directly into the creek*. As

snow is melting and draining into the parking lot while set 5 was collected, it entrains salt left in the lots, concentrates it, and dumps it into the creek. In all cases, the proximity of impervious surfaces to the creek has a disproportionate impact on water quality—sites 8-10 are sensitive to weather conditions due to their being directly adjacent to the lots, while sites 5-7 are not, as they are close to the lots but have some foliage and porous substrate between the impervious surface and the creek, to act as a buffer. This is consistent with my second hypothesis, as it shows that sites with relatively high nearby impervious surface cover are more sensitive to runoff inputs, as these sites (sites 8-10) dilute salt in the stream while sites upstream with relatively less adjacent impervious surface cover do not display similar sensitivity.

Next, let us compare the base cation abundances during unsalted dry base flow conditions (figure 10) to the abundances of the same cations as salt is being applied to the roads and walkways on UMD property (figure 11).

Note that the samples were collected on 1/29/2019 between 12:00 and 17:00, while salt was applied beginning at 15:00. This means that only the

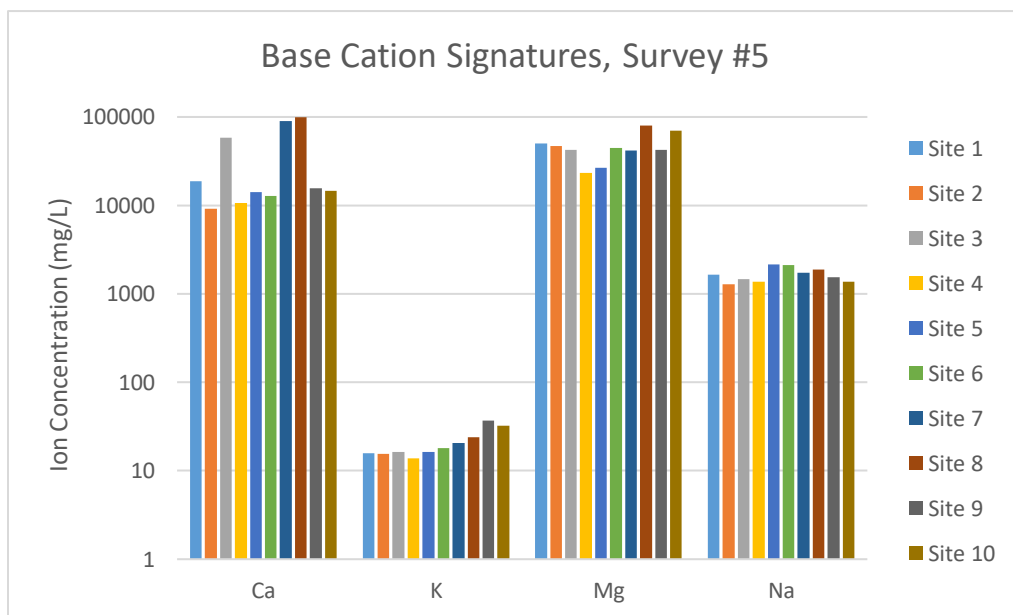


Figure 11: Base cation abundances during a salting and precipitation event.

first two hours of the salt signal were captured. During base flow conditions, base cation concentrations don't exceed 50 mg/L, and Ca and Na are the major components of the cation signature. Compare this with the base cation signatures (*figure 11*) as salt is being applied—Na levels increase by two orders of magnitude, compared with concentrations of Ca and Mg, which increase by three orders of magnitude. This supports my first hypothesis, as it shows that after salt was applied, stream water cation concentrations increased by 2-3 orders of magnitude.

Consider the base cation signatures of the stream two days after a salting event (*figure 12*). As time has passed and salt has been allowed to drain out, and discharge has returned to base flow levels, concentrations of base cations decrease by two

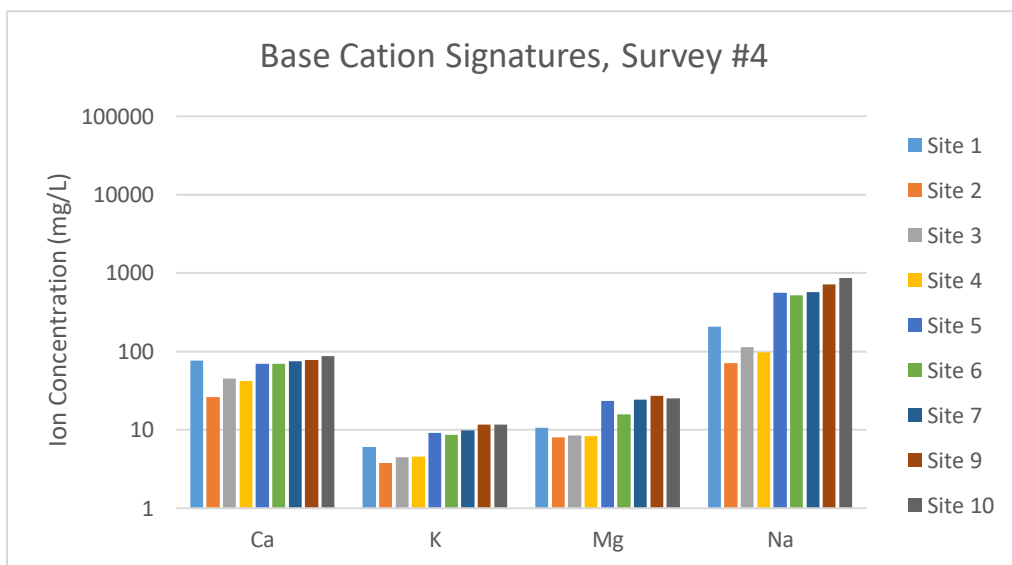


Figure 12: Base cation abundances two days after salting and precipitation events.

orders of magnitude, but are still noticeably higher than baseflow levels. Specifically, while Ca levels have dropped and are no longer the dominant component of the sample, they are still ~2.5x higher than base flow levels. Meanwhile, Na levels have subsided to one order of magnitude higher than base flow conditions on the golf course, but remain at two orders of magnitude above base flow conditions on campus. This disparity is consistent with my second hypothesis, and is further supported by the fact that this trend is also visible in Ca, Mg, and K abundances. To summarize, as salt is applied, Ca and Mg levels rise within minutes to hours of application, with the increase in Mg and Ca being more intense and short-lived. Meanwhile, the Na signal does not subside within two days (unlike the Ca and Mg signals), and is one order of magnitude than the Ca or Mg signal. As time passes, the salt signals subside faster in the golf course environment than the campus environment. Unlike the other cations, the K signal displays a minimal increase in concentration which returns to base flow conditions within two days.

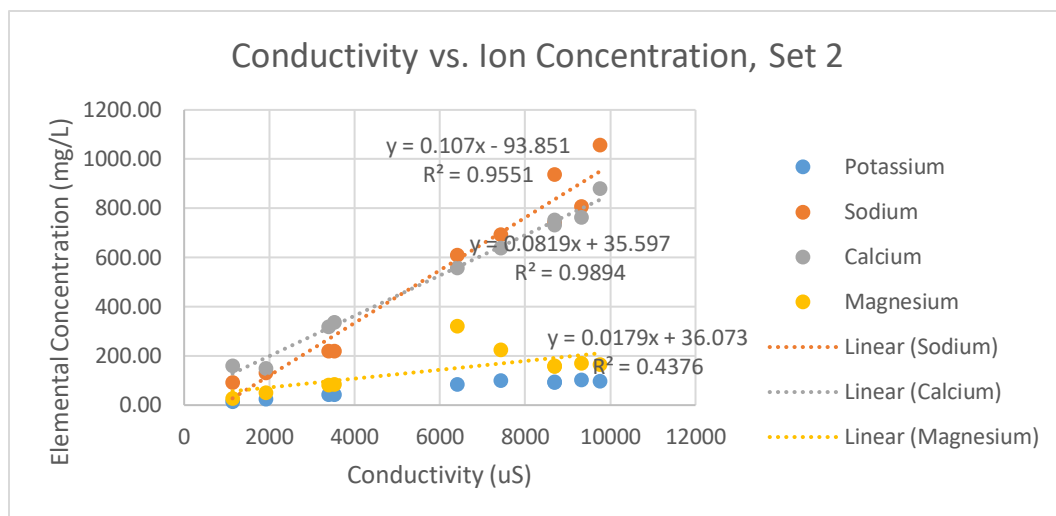


Figure 13: Conductivity vs ion flux for baseflow conditions. Note axes.

at each site, measured in the field. I have normalized the elemental abundances to discharge data obtained from the USGS gauge at Paint Branch Creek.

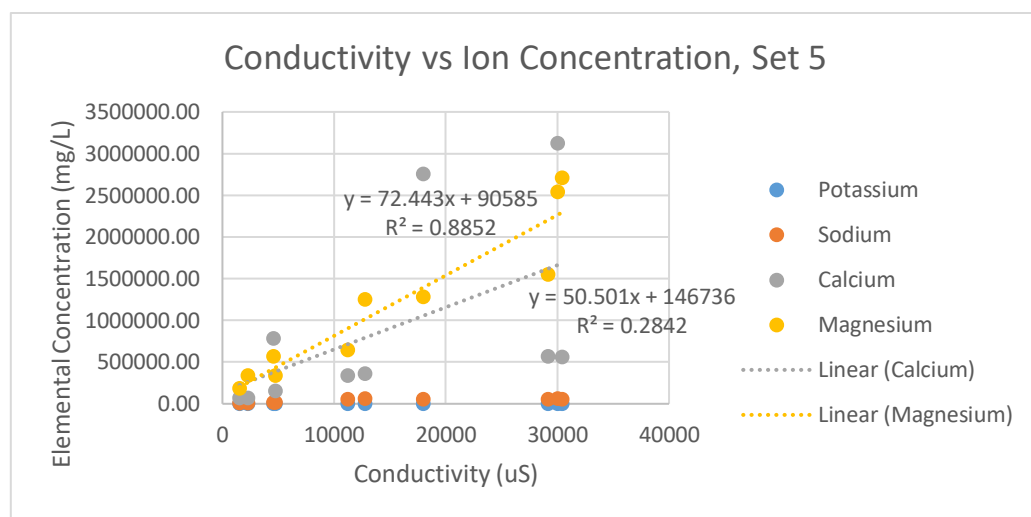


Figure 14: Conductivity vs ion flux during precipitation and salt application. Note the different axes.

Examining the relationship between ion flux and conductivity under base flow conditions (figure 13), we can see that Na and Ca have ~5.5x the effect on conductivity relative to [Mg]. Moving on to data collected as salt was applied (figure 14), we see that [Mg] and [Ca] are the dominant controls on the set 5 conductivity signal, which is consistent with ion abundance data discussed in previous pages.

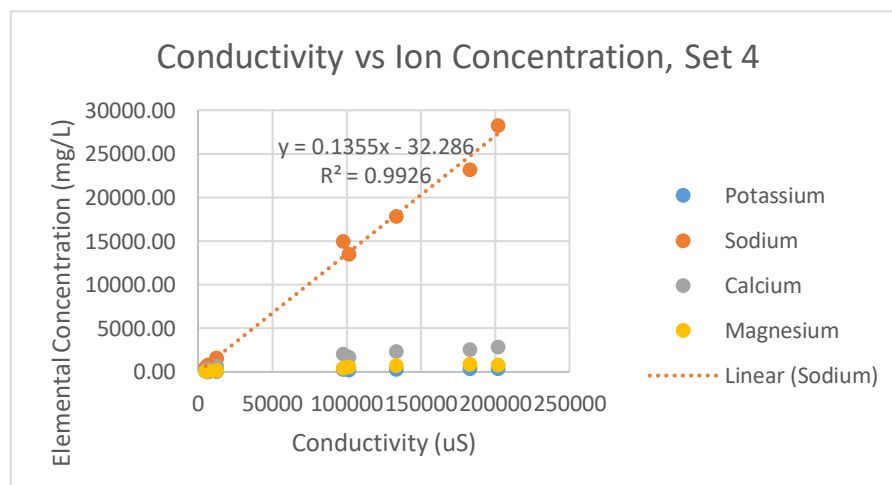


Figure 15: Conductivity vs ion flux on a dry day, two days after snowfall and salt application. Note the different axes.

Next, us examine the effects of each ion (Na, K, Ca, Mg) in more detail. The following plots detail the relationship between each ion and conductivity of the water

However in the data collected two days after salting (*figure 15*), the relationships between Ca, Mg, and K flux have returned to within the same order of magnitude as pre-salting conditions. Like base flow conditions, [Na] is now the dominant control on water conductivity but unlike base flow conditions [Ca] is not a significant control on conductivity. It is interesting to note that during base flow conditions, there is an inverse relationship (*figure 13*) between Mg flux and conductivity, which is not present in *figure 15*. These trends are consistent with my hypothesis, as there are 2-3 orders of magnitude of difference between salinity levels in stream water during unsalted base flow conditions and stream water during, and two days after, salt application to roads and walkways.

Briefly examining the relationship between conductivity and DO (*figure 16*), there only appears to be a relationship between the two in set 4, as the average water temperature was 2.6°C, sleet was falling, and salt was being applied. If indeed salt application negatively impacts stream DO levels, the effect does not produce a long-lasting signal and does not occur if conductivity is 2000 μS .

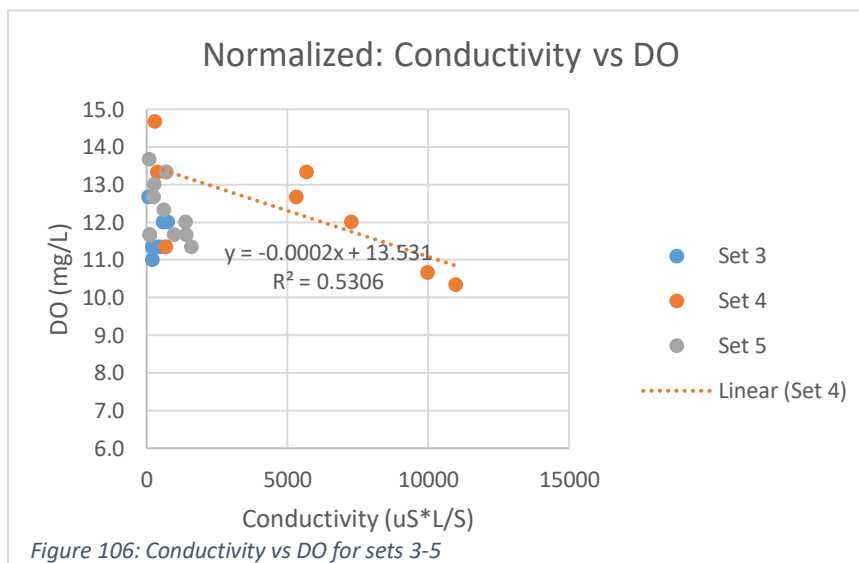


Figure 106: Conductivity vs DO for sets 3-5

SUMMARY:

Using a graph of conductivity down the watershed (*figure 9*), the creek between sites 7 and 10 is susceptible to larger variations in salinity during and after precipitation and runoff input, due to its proximity to large, salted impervious surfaces. road salt application with subsequent precipitation washes Ca, Mg, K, and Na at different rates through the watershed, where Ca and Mg concentrations showed the largest increases. There is a Na signal produced during salting events, but unlike the Ca and Mg signals does not subside within two days, unlike Ca and Mg. The concentration of K does not appreciably change during salting, however. There also appears to be an extremely short-lived negative spike in DO immediately after salt is applied, which disappears in no longer than two days.

APPENDIX A:

In sets 2-5, the first number in the site data is the average of the next three numbers under it

11/30/2018		(uS)	(ppm)	(ppt)	(celsius)
site	pH	conductivity	TDS	salinity	temp
1	7.34	413	232	0.21	4.1
2	6.91	330	235	0.17	7.5
3	7.59	323	229	0.16	4.2
4	7.64	320	228	0.16	3.7
5	7.45	384	275	0.19	4.4
6	7.41	382	271	0.19	5.2
7	7.30	437	309	0.22	5.4
8	7.32	442	315	0.22	4.7
9	7.46	463	330	0.23	4.7
10	7.54	498	356	0.25	4.6
12/20/2018			TDS	salinity	
	pH	cond. (uS)	(ppm)	(ppt)	temp ©
1	7.51	327	243	0.17	5.5
	7.56	312	243	0.17	5.5
	7.48	328	244	0.17	5.5
	7.48	340	243	0.17	5.5
2	7.00	274	195	0.14	6.3
	7.12	273	195	0.13	6.4
	6.97	274	195	0.14	6.3
	6.92	275	196	0.14	6.2
3	7.58	265	187	0.13	4.5
	7.63	272	187	0.13	4.5
	7.60	262	186	0.13	4.5
	7.52	262	187	0.13	4.4
4	7.59	259	186	0.13	4.5
	7.61	261	185	0.13	4.5
	7.58	262	186	0.13	4.5
	7.58	254	186	0.13	4.4
5	7.34	289	207	0.15	5.0
	7.40	283	207	0.15	5.0
	7.31	291	207	0.15	5.1
	7.30	294	208	0.15	5.0
6	7.48	286	205	0.14	5.9
	7.50	284	205	0.14	6.0
	7.47	286	205	0.14	5.8
	7.46	289	206	0.14	5.8
7	7.29	337	242	0.17	5.7
	7.30	335	242	0.17	5.7

	7.28	337	242	0.17	5.7
	7.28	338	243	0.17	5.7
8	7.37	342	247	0.18	6.1
	7.38	342	247	0.18	6.0
	7.37	343	246	0.18	6.1
	7.37	341	248	0.17	6.1
9	7.60	291	207	0.15	5.9
	7.60	290	208	0.15	5.9
	7.60	292	207	0.15	5.9
	7.59	292	207	0.15	5.9
10	7.47	280	202	0.15	5.7
	7.50	281	201	0.15	5.6
	7.46	280	202	0.15	5.7
	7.45	280	203	0.15	5.7
			TDS	salinity	
1/6/2019	pH	cond. (uS)	(ppm)	(ppt)	temp ©
1	7.63	336	242	0.17	8.7
	7.64	335	240	0.17	8.9
	7.61	336	242	0.17	8.6
	7.64	336	243	0.17	8.6
2	7.00	292	205	0.15	9.1
	7.04	294	203	0.15	9.1
	7.03	291	205	0.15	9.2
	6.94	292	207	0.15	9.1
3	7.47	268	191	0.13	8.7
	7.53	267	193	0.14	8.7
	7.45	267	191	0.13	8.7
	7.43	269	190	0.13	8.7
4	7.48	267	188	0.13	8.2
	7.48	266	190	0.13	8.2
	7.49	266	186	0.13	8.2
	7.47	268	187	0.12	8.1
5	7.42	296	214	0.15	8.4
	7.43	292	214	0.15	8.6
	7.40	298	215	0.15	8.3
	7.42	299	214	0.15	8.2
6	7.64	304	214	0.15	8.1
	7.67	298	218	0.16	8.4
	7.67	305	212	0.15	8.1
	7.57	309	212	0.15	7.9
7	7.43	350	246	0.15	7.5
	7.43	352	246	0.18	7.6
	7.44	349	243	0.13	7.5
	7.42	349	250	0.14	7.5

	8	7.38	361	256	0.18	7.4
		7.40	361	257	0.19	7.4
		7.38	362	256	0.18	7.5
		7.36	360	255	0.18	7.3
	9	7.52	394	276	0.20	7.4
		7.53	400	275	0.20	7.4
		7.52	391	276	0.19	7.4
		7.50	391	277	0.20	7.5
	10	7.58	423	298	0.21	7.0
		7.60	420	300	0.21	7.0
		7.58	429	298	0.21	6.9
		7.56	420	297	0.21	7.0
				TDS	salinity	
1/14/2019		pH	cond. (uS)	(ppm)	(ppt)	temp ©
	1	7.37	1874	1357	1.96	2.8
		7.35	1870	1370	1.96	2.9
		7.37	1875	1350	1.95	3.2
		7.38	1876	1350	1.96	2.2
	2	6.90	713	465	0.33	3.8
		6.93	670	467	0.33	3.7
		6.88	630	463	0.33	3.8
		6.89	840	465	0.33	3.8
	3	7.06	901	661	0.47	1.8
		7.06	897	663	0.48	1.8
		7.05	903	660	0.47	1.8
		7.06	904	661	0.47	1.9
	4	7.16	830	577	0.42	2.1
		7.15	825	598	0.40	2.1
		7.15	830	568	0.43	2.1
		7.17	835	566	0.43	2.0
	5	7.36	4227	2990	2.09	2.6
		7.35	4300	3010	2.11	2.5
		7.37	4220	2990	2.09	2.5
		7.37	4160	2970	2.08	2.7
	6	7.44	3373	2457	1.74	2.3
		7.45	3350	2470	1.76	2.3
		7.43	3340	2450	1.74	2.5
		7.44	3430	2450	1.73	2.1
	7	7.41	4320	3147	2.19	2.3
		7.40	4230	3200	2.24	2.0
		7.46	4370	3140	2.16	2.5
		7.38	4360	3100	2.17	2.5
	8	7.35	4660	3227	2.26	2.5
		7.35	4780	3270	2.27	2.5

	7.34	4580	3220	2.26	2.6
	7.35	4620	3190	2.25	2.5
9	7.29	5667	3960	2.63	3.0
	7.38	5760	3970	2.84	2.8
	7.28	5640	3950	2.28	3.0
	7.21	5600	3960	2.78	3.1
10	7.42	6153	3877	2.95	2.5
	7.42	6300	4370	2.96	2.4
	7.42	6130	4320	2.95	2.5
	7.42	6030	2940	2.94	2.6
			TDS	salinity	
	pH	cond. (uS)	(ppm)	(ppt)	temp ©
1	7.56	419	300	0.21	3.5
	7.58	420	299	0.21	3.5
	7.57	415	300	0.21	3.5
	7.53	421	302	0.21	3.5
2	7.28	318	225	0.16	3.9
	7.40	317	224	0.16	3.7
	7.25	318	226	0.16	4.0
	7.20	318	225	0.16	4.0
3	7.58	340	242	0.17	2.5
	7.60	339	241	0.17	2.5
	7.58	340	242	0.17	2.5
	7.55	341	242	0.17	2.5
4	7.61	332	236	0.17	2.4
	7.63	330	236	0.17	2.4
	7.60	332	236	0.17	2.4
	7.60	333	237	0.17	2.3
5	7.42	468	337	0.24	4.3
	7.42	467	336	0.24	4.3
	7.43	468	338	0.23	4.3
	7.40	470	338	0.24	4.3
6	7.55	454	325	0.23	3.4
	7.56	455	321	0.23	3.3
	7.55	453	327	0.23	3.5
	7.54	454	326	0.22	3.5
7	7.56	583	422	0.30	3.7
	7.60	584	422	0.31	3.7
	7.55	583	420	0.30	3.7
	7.54	583	423	0.30	3.8
8	7.41	950	710	0.54	3.8
	7.45	940	707	0.54	3.5
	7.40	939	713	0.54	4.0
	7.39	970	709	0.54	4.0

9	7.44	800	561	0.39	3.5
	7.45	802	562	0.39	3.5
	7.43	800	561	0.39	3.5
	7.43	799	560	0.39	3.6
10	7.49	785	556	0.40	3.4
	7.50	784	557	0.40	3.4
	7.50	784	556	0.39	3.4
	7.48	786	556	0.40	3.5

APPENDIX B:

Sample Name	Element	Unit	Conc[1]]	Conc[2]]	Conc[3]]	Conc[Ave]]	Conc[SD]]	Conc[RSD]]
DS20181207_1	Ag	mg/L	0.0059	0.0027	0.002	0.0035	0.0021	58.84
DS20181207_1	Al	mg/L	-5.33	-5.33	-5.29	-5.31	0.0215	0.4
DS20181207_1	As	mg/L	0.0674	0.0579	0.0478	0.0577	0.0098	17.04
DS20181207_1	B	mg/L	0.167	0.173	0.174	0.171	0.0035	2.06
DS20181207_1	Ba	mg/L	0.0689	0.0718	0.072	0.0709	0.0018	2.48
DS20181207_1	Be	mg/L	0.0023	0.0022	0.0022	0.0022	0	2.24
DS20181207_1	Ca	mg/L	58.2	58.7	59	58.7	0.397	0.68
DS20181207_1	Cd	mg/L	0.0093	0.0067	0.0026	0.0062	0.0034	54.88
DS20181207_1	Ce	mg/L	0.119	0.0952	0.0946	0.103	0.014	13.63
DS20181207_1	Co	mg/L	0.0062	0.0049	0.0053	0.0055	0.0007	12.23
DS20181207_1	Cr	mg/L	-0.556	-0.566	-0.568	-0.564	0.0067	1.18
DS20181207_1	Cs	mg/L	0.21	0.0845	0.0027	0.0992	0.105	105.48
DS20181207_1	Cu	mg/L	0.0094	0.0078	0.0079	0.0084	0.0009	10.29
DS20181207_1	Dy	mg/L	0.0171	0.0156	0.0127	0.0151	0.0022	14.79
DS20181207_1	Er	mg/L	0.0085	0.0072	0.0075	0.0077	0.0007	8.78
DS20181207_1	Eu	mg/L	0.0059	0.0055	0.0057	0.0057	0.0002	3.54
DS20181207_1	Fe	mg/L	0.0524	0.0528	0.052	0.0524	0.0004	0.74
DS20181207_1	Ga	mg/L	0.0541	0.0296	0.0205	0.0347	0.0174	50.04
DS20181207_1	Gd	mg/L	0.0115	0.007	0.0051	0.0079	0.0033	41.85
DS20181207_1	Ho	mg/L	0.0076	0.0057	0.0053	0.0062	0.0012	19.77
DS20181207_1	K	mg/L	4.36	4.45	4.41	4.41	0.0441	1
DS20181207_1	La	mg/L	0.0302	0.0269	0.0274	0.0282	0.0018	6.25
DS20181207_1	Lu	mg/L	0.0035	0.0033	0.0032	0.0033	0.0002	5.2
DS20181207_1	Mg	mg/L	9.62	10	10.1	9.91	0.247	2.5
DS20181207_1	Mn	mg/L	0.0476	0.0489	0.0486	0.0484	0.0006	1.33
DS20181207_1	Na	mg/L	35.2	36.3	36.1	35.9	0.6	1.67
DS20181207_1	Nd	mg/L	0.0944	0.0899	0.08	0.0881	0.0074	8.38
DS20181207_1	Ni	mg/L	-0.645	-0.65	-0.653	-0.65	0.0041	0.63
DS20181207_1	P	mg/L	0.0913	0.0687	0.0553	0.0718	0.0182	25.37
DS20181207_1	Pb	mg/L	0.03	0.0227	0.018	0.0236	0.006	25.58
DS20181207_1	Pr	mg/L	0.0462	0.0295	0.0338	0.0365	0.0087	23.72
DS20181207_1	Rb	mg/L	0.328	0.194	0.202	0.241	0.0752	31.14
DS20181207_1	S	mg/L	1.62	1.68	1.65	1.65	0.0288	1.75
DS20181207_1	Se	mg/L	0.0713	0.0878	0.0485	0.0692	0.0197	28.52
DS20181207_1	Sm	mg/L	0.0273	0.0225	0.0227	0.0242	0.0027	11.28
DS20181207_1	Sr	mg/L	0.102	0.107	0.107	0.105	0.0026	2.43
DS20181207_1	Th	mg/L	0.0905	0.0884	0.0763	0.0851	0.0077	9.04
DS20181207_1	Tl	mg/L	0.095	0.107	0.0708	0.0909	0.0184	20.27
DS20181207_1	Tm	mg/L	0.0058	0.0042	0.0025	0.0042	0.0016	39.31
DS20181207_1	U	mg/L	0.223	0.188	0.198	0.203	0.0182	8.93

DS20181207_1	V	mg/L	0.0059	0.0049	0.0046	0.0051	0.0007	13.08
DS20181207_1	Yb	mg/L	0.003	0.0027	0.0027	0.0028	0.0002	7.13
DS20181207_1	Zn	mg/L	-1.1	-1.1	-1.1	-1.1	0.0026	0.24
DS20181207_2	Ag	mg/L	0.0001	0.0011	0.0028	0.0006	0.002	327.05
DS20181207_2	Al	mg/L	-7.01	-7.3	-7.17	-7.16	0.148	2.07
DS20181207_2	As	mg/L	0.0318	0.0338	0.0699	0.0452	0.0214	47.48
DS20181207_2	B	mg/L	0.0084	0.0084	0.0091	0.0086	0.0004	4.46
DS20181207_2	Ba	mg/L	0.238	0.242	0.24	0.24	0.0018	0.76
DS20181207_2	Be	mg/L	0.0021	0.0021	0.0024	0.0022	0.0002	7.79
DS20181207_2	Ca	mg/L	21.7	21.8	21.8	21.7	0.0402	0.19
DS20181207_2	Cd	mg/L	0.0012	0.0018	0.013	0.0041	0.0078	188.82
DS20181207_2	Ce	mg/L	0.0454	0.0426	0.0777	0.0552	0.0195	35.4
DS20181207_2	Co	mg/L	0.0335	0.0338	0.0354	0.0343	0.001	3.05
DS20181207_2	Cr	mg/L	-0.721	-0.736	-0.719	-0.726	0.0092	1.27
DS20181207_2	Cs	mg/L	0.0778	0.0383	0.174	0.0193	0.135	700.9
DS20181207_2	Cu	mg/L	0.0054	0.005	0.007	0.0058	0.0011	18.3
DS20181207_2	Dy	mg/L	0.007	0.0064	0.0195	0.011	0.0074	67.16
DS20181207_2	Er	mg/L	0.0047	0.0052	0.0081	0.006	0.0018	30.62
DS20181207_2	Eu	mg/L	0.0037	0.0037	0.0039	0.0038	0.0002	4.06
DS20181207_2	Fe	mg/L	0.496	0.505	0.507	0.502	0.0055	1.1
DS20181207_2	Ga	mg/L	0.0102	0.0228	0.0184	-0.0103	0.0179	173.48
DS20181207_2	Gd	mg/L	0.0014	0.0025	0.0131	0.003	0.0087	285.59
DS20181207_2	Ho	mg/L	0.0014	0.0006	0.004	0.002	0.0018	89.91
DS20181207_2	K	mg/L	3.58	3.61	3.83	3.68	0.138	3.74
DS20181207_2	La	mg/L	0.01	0.0063	0.0258	0.014	0.0103	73.54
DS20181207_2	Lu	mg/L	0.003	0.0027	0.0033	0.003	0.0003	10.66
DS20181207_2	Mg	mg/L	8.39	8.57	8.52	8.49	0.0916	1.08
DS20181207_2	Mn	mg/L	0.7	0.714	0.713	0.709	0.0079	1.11
DS20181207_2	Na	mg/L	36.1	36.6	36.2	36.3	0.293	0.81
DS20181207_2	Nd	mg/L	0.0397	0.0428	0.0479	0.0435	0.0041	9.52
DS20181207_2	Ni	mg/L	-0.624	-0.63	-0.615	-0.623	0.0073	1.17
DS20181207_2	P	mg/L	0.0292	0.0077	0.0862	0.041	0.0405	98.85
DS20181207_2	Pb	mg/L	0.0093	0.0076	0.0295	0.0155	0.0122	78.92
DS20181207_2	Pr	mg/L	0.0057	0.0098	0.0093	0.0082	0.0022	27.03
DS20181207_2	Rb	mg/L	0.0779	0.015	0.15	0.0808	0.0673	83.27
DS20181207_2	S	mg/L	1.18	1.2	1.21	1.2	0.0152	1.27
DS20181207_2	Se	mg/L	0.0403	0.0388	0.127	0.0685	0.0502	73.24
DS20181207_2	Sm	mg/L	0.005	0.0061	0.0158	0.0089	0.006	66.55
DS20181207_2	Sr	mg/L	0.067	0.0686	0.0681	0.0679	0.0008	1.18

DS20181207_2	Th	mg/L	0.0732	0.0701	0.0907	0.078	0.0111	14.27
DS20181207_2	Tl	mg/L	0.0453	0.0087	0.095	0.0439	0.0519	118.27
DS20181207_2	Tm	mg/L	0.0016	0.0011	0.0057	0.0028	0.0025	90.58
DS20181207_2	U	mg/L	0.0814	0.0775	0.109	0.0893	0.0171	19.12
DS20181207_2	V	mg/L	0.002	0.0014	0.0046	0.0027	0.0017	63
DS20181207_2	Yb	mg/L	0.0025	0.0024	0.0026	0.0025	0.0001	3.7
DS20181207_2	Zn	mg/L	-0.732	-0.734	-0.728	-0.732	0.0032	0.43
DS20181207_3	Ag	mg/L	0.0017	0.0001	0.0009	0.0002	0.0013	563.44
DS20181207_3	Al	mg/L	-7.01	-6.77	-6.71	-6.83	0.156	2.29
DS20181207_3	As	mg/L	0.043	0.0048	0.0115	0.0166	0.0243	146.59
DS20181207_3	B	mg/L	0.0095	0.0093	0.0091	0.0093	0.0002	2.01
DS20181207_3	Ba	mg/L	0.0777	0.0795	0.0791	0.0788	0.001	1.25
DS20181207_3	Be	mg/L	0.0021	0.002	0.002	0.002	0.0001	3.93
DS20181207_3	Ca	mg/L	27.8	27.6	27.7	27.7	0.104	0.37
DS20181207_3	Cd	mg/L	0.0016	0.0008	0.0021	0.0001	0.0019	2267.97
DS20181207_3	Ce	mg/L	0.0386	0.0293	0.0139	0.0273	0.0125	45.74
DS20181207_3	Co	mg/L	0.0054	0.0044	0.004	0.0046	0.0007	15.84
DS20181207_3	Cr	mg/L	-0.72	-0.731	-0.735	-0.729	0.0077	1.06
DS20181207_3	Cs	mg/L	0.0122	0.0446	-0.101	-0.0148	0.0766	517.51
DS20181207_3	Cu	mg/L	0.0047	0.0036	0.0034	0.0039	0.0007	17.66
DS20181207_3	Dy	mg/L	0.0079	0.0036	0.0022	0.0046	0.003	64.87
DS20181207_3	Er	mg/L	0.0036	0.0019	-0.001	0.0015	0.0023	152.74
DS20181207_3	Eu	mg/L	0.004	0.0039	0.0035	0.0038	0.0002	6.26
DS20181207_3	Fe	mg/L	0.62	0.629	0.626	0.625	0.0047	0.75
DS20181207_3	Ga	mg/L	0.0061	0.0242	0.011	0.0097	0.0152	156.03
DS20181207_3	Gd	mg/L	0.0046	-0.001	-0.002	0.0005	0.0036	677.38
DS20181207_3	Ho	mg/L	0.0033	0.0026	0.0025	0.0028	0.0005	16.45
DS20181207_3	K	mg/L	3.53	3.53	3.74	3.6	0.12	3.34
DS20181207_3	La	mg/L	0.0161	0.0107	0.0072	0.0113	0.0045	39.8
DS20181207_3	Lu	mg/L	0.0031	0.0029	0.0028	0.0029	0.0002	5.15
DS20181207_3	Mg	mg/L	7.65	7.85	7.84	7.78	0.112	1.44
DS20181207_3	Mn	mg/L	0.151	0.154	0.154	0.153	0.0016	1.07
DS20181207_3	Na	mg/L	24	25.1	28	25.7	2.05	7.97
DS20181207_3	Nd	mg/L	0.0493	0.0456	0.0455	0.0468	0.0022	4.71
DS20181207_3	Ni	mg/L	-0.651	-0.655	-0.659	-0.655	0.0043	0.66
DS20181207_3	P	mg/L	0.0514	0.0345	0.0189	0.0349	0.0162	46.54
DS20181207_3	Pb	mg/L	0.0104	0.0032	0.0064	0.0067	0.0036	54.22
DS20181207_3	Pr	mg/L	0.0172	0.0204	0.0067	0.0147	0.0072	48.59
DS20181207_3	Rb	mg/L	0.239	0.0858	0.167	0.164	0.0768	46.75

DS20181207_3	S	mg/L	1.17	1.18	1.17	1.17	0.0071	0.61
DS20181207_3	Se	mg/L	0.04	0.0108	0.0056	0.0188	0.0186	98.69
DS20181207_3	Sm	mg/L	0.0118	0.0089	0.0069	0.0092	0.0025	26.85
DS20181207_3	Sr	mg/L	0.0681	0.0692	0.0692	0.0688	0.0007	0.95
DS20181207_3	Th	mg/L	0.0783	0.0632	0.0673	0.0696	0.0078	11.22
DS20181207_3	Tl	mg/L	0.0676	0.0227	0.0218	0.0373	0.0262	70.09
DS20181207_3	Tm	mg/L	0.0022	0.0019	0.001	0.0017	0.0006	35.66
DS20181207_3	U	mg/L	0.0989	0.0847	0.0784	0.0873	0.0105	11.99
DS20181207_3	V	mg/L	0.0031	0.0019	0.0012	0.002	0.0009	45.71
DS20181207_3	Yb	mg/L	0.0026	0.0025	0.0024	0.0025	0.0001	3.65
DS20181207_3	Zn	mg/L	-1.1	-1.1	-1.11	-1.11	0.0018	0.16
DS20181207_4	Ag	mg/L	0.0004	0.0012	0.0004	0.0001	0.0009	846.61
DS20181207_4	Al	mg/L	-6.93	-6.77	-7.27	-6.99	0.256	3.66
DS20181207_4	As	mg/L	0.0438	0.0378	0.0247	0.0355	0.0098	27.56
DS20181207_4	B	mg/L	0.0097	0.0098	0.0099	0.0098	0.0001	0.92
DS20181207_4	Ba	mg/L	0.0709	0.0729	0.0725	0.0721	0.0011	1.5
DS20181207_4	Be	mg/L	0.002	0.002	0.002	0.002	0	1.61
DS20181207_4	Ca	mg/L	28.3	27.9	28.4	28.2	0.221	0.78
DS20181207_4	Cd	mg/L	0.0014	0.0013	0	-0.0001	0.0013	2190.3
DS20181207_4	Ce	mg/L	0.0282	0.0655	0.0327	0.0422	0.0204	48.35
DS20181207_4	Co	mg/L	0.0044	0.0058	0.0052	0.0051	0.0007	14.03
DS20181207_4	Cr	mg/L	-0.622	-0.628	-0.626	-0.625	0.0031	0.5
DS20181207_4	Cs	mg/L	-0.066	0.0401	-0.059	-0.0283	0.0593	209.45
DS20181207_4	Cu	mg/L	0.0045	0.0053	0.0056	0.0051	0.0006	10.81
DS20181207_4	Dy	mg/L	0.0033	0.0054	0.0056	0.0048	0.0013	26.47
DS20181207_4	Er	mg/L	0.0012	0.0014	0.0009	-0.0002	0.0014	595.74
DS20181207_4	Eu	mg/L	0.0038	0.0041	0.0042	0.004	0.0002	5.32
DS20181207_4	Fe	mg/L	0.755	0.767	0.765	0.762	0.0061	0.79
DS20181207_4	Ga	mg/L	0.0173	0.0027	0.0246	0.0034	0.0209	622.09
DS20181207_4	Gd	mg/L	0.0005	0.0004	0.002	0.0007	0.0013	187.66
DS20181207_4	Ho	mg/L	0.0019	0.0027	0.002	0.0022	0.0004	19.84
DS20181207_4	K	mg/L	3.35	3.62	3.55	3.51	0.14	3.99
DS20181207_4	La	mg/L	0.008	0.0125	0.0113	0.0106	0.0023	22.17
DS20181207_4	Lu	mg/L	0.0027	0.0028	0.0028	0.0028	0.0001	2.5
DS20181207_4	Mg	mg/L	7.77	7.99	7.96	7.91	0.118	1.49
DS20181207_4	Mn	mg/L	0.0232	0.0236	0.0235	0.0234	0.0002	0.95
DS20181207_4	Na	mg/L	23.4	24	23.8	23.8	0.319	1.34
DS20181207_4	Nd	mg/L	0.0416	0.05	0.0514	0.0477	0.0053	11.11
DS20181207_4	Ni	mg/L	-0.658	-0.657	-0.66	-0.658	0.0013	0.19

DS20181207_4	P	mg/L	0.0243	0.0345	0.0368	0.0319	0.0067	20.9
DS20181207_4	Pb	mg/L	0.002	0.0037	0.0063	0.004	0.0021	53.38
DS20181207_4	Pr	mg/L	0.0094	0.0156	0.0174	0.0141	0.0042	29.75
DS20181207_4	Rb	mg/L	0.145	0.145	0.0963	0.129	0.0279	21.73
DS20181207_4	S	mg/L	7.56	7.79	7.72	7.69	0.118	1.53
DS20181207_4	Se	mg/L	0.0004	0.0456	0.033	0.0263	0.0233	88.44
DS20181207_4	Sm	mg/L	0.0143	0.0076	0.0087	0.0102	0.0036	35.18
DS20181207_4	Sr	mg/L	0.0672	0.0683	0.068	0.0678	0.0005	0.81
DS20181207_4	Th	mg/L	0.0717	0.0733	0.0775	0.0742	0.003	4.04
DS20181207_4	Tl	mg/L	0.0359	0.014	0.0276	0.0258	0.0111	42.88
DS20181207_4	Tm	mg/L	0.0017	0.0013	0.0009	0.0013	0.0004	30.25
DS20181207_4	U	mg/L	0.099	0.0963	0.0999	0.0984	0.0018	1.88
DS20181207_4	V	mg/L	0.0016	0.0021	0.0019	0.0019	0.0003	13.47
DS20181207_4	Yb	mg/L	0.0024	0.0024	0.0024	0.0024	0	0.18
DS20181207_4	Zn	mg/L	-1.25	-1.25	-1.25	-1.25	0.0004	0.03
DS20181207_5	Ag	mg/L	0.0016	0	0.0005	-0.0007	0.0008	119.06
DS20181207_5	Al	mg/L	-6.79	-6.55	-6.82	-6.72	0.147	2.18
DS20181207_5	As	mg/L	0.0961	0.107	0.0629	0.0886	0.0229	25.84
DS20181207_5	B	mg/L	0.0087	0.009	0.0086	0.0088	0.0002	2.59
DS20181207_5	Ba	mg/L	0.204	0.21	0.209	0.208	0.0032	1.54
DS20181207_5	Be	mg/L	0.0021	0.0021	0.002	0.0021	0.0001	3.9
DS20181207_5	Ca	mg/L	37.2	37.5	37.3	37.3	0.147	0.39
DS20181207_5	Cd	mg/L	0.0048	0.0005	0.0024	0.0006	0.0038	609.2
DS20181207_5	Ce	mg/L	0.0654	0.0697	0.0709	0.0687	0.0029	4.25
DS20181207_5	Co	mg/L	0.014	0.014	0.0127	0.0136	0.0007	5.27
DS20181207_5	Cr	mg/L	-0.723	-0.733	-0.733	-0.729	0.0059	0.81
DS20181207_5	Cs	mg/L	0.0398	-0.001	0.0419	-0.0276	0.023	83.47
DS20181207_5	Cu	mg/L	0.0059	0.007	0.0062	0.0064	0.0005	8.56
DS20181207_5	Dy	mg/L	0.0094	0.0101	0.006	0.0085	0.0022	25.68
DS20181207_5	Er	mg/L	0.0021	0.0052	0.0037	0.0036	0.0016	43.02
DS20181207_5	Eu	mg/L	0.0047	0.0043	0.004	0.0043	0.0003	7.4
DS20181207_5	Fe	mg/L	0.256	0.258	0.256	0.257	0.0008	0.32
DS20181207_5	Ga	mg/L	0.0115	-0.023	0.0008	-0.0036	0.0177	494.1
DS20181207_5	Gd	mg/L	0.0016	0.0018	0.0017	0.0006	0.0019	352.07
DS20181207_5	Ho	mg/L	0.0029	0.0031	0.0016	0.0025	0.0008	33.05
DS20181207_5	K	mg/L	3.97	4.15	4.2	4.11	0.118	2.87
DS20181207_5	La	mg/L	0.0135	0.0131	0.0093	0.012	0.0023	19.06
DS20181207_5	Lu	mg/L	0.0027	0.003	0.0029	0.0029	0.0001	4.46
DS20181207_5	Mg	mg/L	7.76	8.02	8.02	7.93	0.146	1.84
DS20181207_5	Mn	mg/L	0.372	0.381	0.38	0.378	0.0051	1.34

DS20181207_5	Na	mg/L	31.6	32.8	32.6	32.3	0.64	1.98
DS20181207_5	Nd	mg/L	0.049	0.0553	0.0464	0.0503	0.0046	9.15
DS20181207_5	Ni	mg/L	-0.65	-0.652	-0.656	-0.653	0.003	0.47
DS20181207_5	P	mg/L	0.0444	0.0234	0.0113	0.0264	0.0167	63.51
DS20181207_5	Pb	mg/L	0.0123	0.0039	0.0045	0.0069	0.0047	67.44
DS20181207_5	Pr	mg/L	0.007	0.0149	0.0067	0.0095	0.0047	49.07
DS20181207_5	Rb	mg/L	0.163	0.154	0.142	0.153	0.0108	7.08
DS20181207_5	S	mg/L	1.2	1.23	1.24	1.23	0.0244	1.99
DS20181207_5	Se	mg/L	0.0686	0.0534	0.0145	0.0455	0.0279	61.32
DS20181207_5	Sm	mg/L	0.0124	0.0158	0.0116	0.0133	0.0022	16.69
DS20181207_5	Sr	mg/L	0.0888	0.0913	0.0906	0.0902	0.0013	1.48
DS20181207_5	Th	mg/L	0.0505	0.0521	0.0541	0.0523	0.0018	3.46
DS20181207_5	Tl	mg/L	0.0853	0.0895	0.0556	0.0768	0.0185	24.03
DS20181207_5	Tm	mg/L	0.0017	0.0033	0.0021	0.0024	0.0008	35
DS20181207_5	U	mg/L	0.111	0.152	0.0931	0.119	0.0299	25.23
DS20181207_5	V	mg/L	0.0019	0.0024	0.0014	0.0019	0.0005	27.26
DS20181207_5	Yb	mg/L	0.0025	0.0026	0.0025	0.0025	0.0001	2.25
DS20181207_5	Zn	mg/L	-1.09	-1.09	-1.09	-1.09	0.0014	0.13
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DS20181207_6	Ag	mg/L	0.0006	0.0012	0	-0.0006	0.0006	101.06
DS20181207_6	Al	mg/L	-5.86	-5.84	-5.36	-5.69	0.286	5.02
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DS20181207_6	As	mg/L	0.0248	0.0088	0.0077	0.0086	0.0162	188.42
DS20181207_6	B	mg/L	0.158	0.163	0.162	0.161	0.0027	1.71
DS20181207_6	Ba	mg/L	0.207	0.212	0.21	0.21	0.0023	1.09
DS20181207_6	Be	mg/L	0.002	0.002	0.002	0.002	0	1.32
DS20181207_6	Ca	mg/L	35.9	36.1	36	36	0.125	0.35
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DS20181207_6	Cd	mg/L	0.0001	0.0008	0.0023	0.0005	0.0016	312.43
DS20181207_6	Ce	mg/L	0.0303	0.017	0.0319	0.0264	0.0082	30.96
DS20181207_6	Co	mg/L	0.0183	0.0176	0.0188	0.0182	0.0006	3.37
DS20181207_6	Cr	mg/L	-0.729	-0.732	-0.732	-0.731	0.0018	0.24
DS20181207_6	Cs	mg/L	0.0214	0.0211	0.0872	0.0432	0.0381	88.07
DS20181207_6	Cu	mg/L	0.0055	0.0049	0.0056	0.0053	0.0003	6.51
DS20181207_6	Dy	mg/L	0.0063	0.0039	0.0066	0.0056	0.0015	27.19
DS20181207_6	Er	mg/L	0.0036	0.001	0.0017	0.0021	0.0014	65.25
DS20181207_6	Eu	mg/L	0.0035	0.0041	0.0039	0.0038	0.0003	6.76
DS20181207_6	Fe	mg/L	0.427	0.437	0.435	0.433	0.0055	1.28
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DS20181207_6	Ga	mg/L	0.0035	0.0108	0.0203	-0.0092	0.012	129.98
			-	-	-			
DS20181207_6	Gd	mg/L	0.0019	0.0015	0.0006	-0.0013	0.0006	49.22
DS20181207_6	Ho	mg/L	0.0021	0.0025	0.0031	0.0026	0.0005	20.88
DS20181207_6	K	mg/L	3.94	4.13	4.12	4.07	0.108	2.66

DS20181207_6	La	mg/L	0.0131	0.0109	0.0118	0.012	0.0011	9.12
DS20181207_6	Lu	mg/L	0.0029	0.0029	0.003	0.0029	0.0001	1.91
DS20181207_6	Mg	mg/L	7.6	7.81	7.81	7.74	0.125	1.61
DS20181207_6	Mn	mg/L	0.459	0.47	0.467	0.466	0.0055	1.18
DS20181207_6	Na	mg/L	33.3	34.6	34.2	34	0.65	1.91
DS20181207_6	Nd	mg/L	0.0472	0.0474	0.0458	0.0468	0.0009	1.84
DS20181207_6	Ni	mg/L	-0.648	-0.65	-0.649	-0.649	0.001	0.16
DS20181207_6	P	mg/L	0.0079	0.001	0.0212	0.01	0.0103	102.56
DS20181207_6	Pb	mg/L	0.0146	0.0104	0.0053	0.0101	0.0047	46.27
DS20181207_6	Pr	mg/L	0.0125	0.0179	0.0123	0.0142	0.0032	22.27
DS20181207_6	Rb	mg/L	0.119	0.11	0.103	0.11	0.008	7.22
DS20181207_6	S	mg/L	8.16	8.44	8.36	8.32	0.141	1.7
DS20181207_6	Se	mg/L	0.0376	0.0195	0.0341	0.0304	0.0096	31.61
DS20181207_6	Sm	mg/L	0.0158	0.0173	0.0147	0.0159	0.0013	8.16
DS20181207_6	Sr	mg/L	0.0871	0.0894	0.0889	0.0885	0.0012	1.36
DS20181207_6	Th	mg/L	0.0525	0.0539	0.0534	0.0532	0.0007	1.35
DS20181207_6	Tl	mg/L	0.0385	0.0369	0.0482	0.0412	0.0061	14.81
DS20181207_6	Tm	mg/L	0.0033	0.0027	0.0021	0.0027	0.0006	23.05
DS20181207_6	U	mg/L	0.091	0.111	0.103	0.102	0.0101	9.97
DS20181207_6	V	mg/L	0.001	0.0012	0.0012	0.0012	0.0001	10.13
DS20181207_6	Yb	mg/L	0.0024	0.0025	0.0024	0.0024	0	1.4
DS20181207_6	Zn	mg/L	-1.22	-1.23	-1.22	-1.22	0.001	0.08
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DS20181207_7	Ag	mg/L	0.0031	0.0011	0.0018	-0.0008	0.0024	301.08
DS20181207_7	Al	mg/L	-5.96	-5.66	-5.74	-5.79	0.155	2.67
DS20181207_7	As	mg/L	0.0181	0.0471	0.0688	0.0447	0.0254	56.93
DS20181207_7	B	mg/L	0.169	0.173	0.174	0.172	0.0027	1.57
DS20181207_7	Ba	mg/L	0.114	0.117	0.118	0.116	0.0016	1.41
DS20181207_7	Be	mg/L	0.002	0.0021	0.0023	0.0021	0.0002	8.44
DS20181207_7	Ca	mg/L	30.6	30.7	30.4	30.6	0.156	0.51
			-	-				
DS20181207_7	Cd	mg/L	0.0032	0.0002	0.003	-0.0001	0.0031	2069.9
DS20181207_7	Ce	mg/L	0.0469	0.0641	0.0801	0.0637	0.0166	26.06
DS20181207_7	Co	mg/L	0.0131	0.0127	0.0148	0.0135	0.0011	8.01
DS20181207_7	Cr	mg/L	-0.73	-0.732	-0.725	-0.729	0.0039	0.53
DS20181207_7	Cs	mg/L	0.031	0.0281	0.0426	0.0339	0.0077	22.6
DS20181207_7	Cu	mg/L	0.0065	0.0062	0.0078	0.0068	0.0008	12.12
DS20181207_7	Dy	mg/L	0.0022	0.0034	0.0146	0.0067	0.0069	101.97
DS20181207_7	Er	mg/L	0.001	0.0034	0.0095	0.0046	0.0044	94.73
DS20181207_7	Eu	mg/L	0.0035	0.0037	0.0043	0.0038	0.0004	10.93
DS20181207_7	Fe	mg/L	0.376	0.384	0.384	0.381	0.0041	1.08
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DS20181207_7	Ga	mg/L	0.0105	0.0053	0.0129	-0.001	0.0123	1286.65

DS20181207_7	Gd	mg/L	0.0035	0.0024	0.0062	0.0001	0.0053	4143.81
DS20181207_7	Ho	mg/L	0.0014	0.0014	0.0038	0.0022	0.0014	64.64
DS20181207_7	K	mg/L	4.22	4.54	4.71	4.49	0.246	5.47
DS20181207_7	La	mg/L	0.0086	0.0108	0.0295	0.0163	0.0115	70.61
DS20181207_7	Lu	mg/L	0.0029	0.0029	0.0031	0.0029	0.0001	3.65
DS20181207_7	Mg	mg/L	7.94	8.17	8.22	8.11	0.145	1.79
DS20181207_7	Mn	mg/L	0.424	0.434	0.437	0.431	0.0067	1.55
DS20181207_7	Na	mg/L	43.2	44.6	44.4	44.1	0.78	1.77
DS20181207_7	Nd	mg/L	0.0488	0.0543	0.0618	0.055	0.0066	11.93
DS20181207_7	Ni	mg/L	-0.65	-0.649	-0.643	-0.648	0.004	0.62
DS20181207_7	P	mg/L	0.0193	0.0195	0.0554	0.0314	0.0208	66.19
DS20181207_7	Pb	mg/L	0.0005	0.0067	0.0191	0.0084	0.0099	117.05
DS20181207_7	Pr	mg/L	0.0021	0.0049	0.013	0.0067	0.0057	85.63
DS20181207_7	Rb	mg/L	0.0446	0.0261	0.222	0.0977	0.108	110.9
DS20181207_7	S	mg/L	8.02	8.28	8.32	8.21	0.16	1.96
DS20181207_7	Se	mg/L	0.0388	0.0548	0.0854	0.0597	0.0237	39.76
DS20181207_7	Sm	mg/L	0.0039	0.0109	0.0245	0.0131	0.0105	79.89
DS20181207_7	Sr	mg/L	0.0888	0.0898	0.0901	0.0896	0.0007	0.78
DS20181207_7	Th	mg/L	0.048	0.0581	0.0627	0.0563	0.0075	13.39
DS20181207_7	Tl	mg/L	-0.002	0.0136	0.0582	0.0142	0.0386	271.32
DS20181207_7	Tm	mg/L	0.0008	0.0005	0.0053	0.0022	0.0027	123.29
DS20181207_7	U	mg/L	0.0908	0.0946	0.154	0.113	0.0353	31.2
DS20181207_7	V	mg/L	0.0013	0.0018	0.0044	0.0025	0.0017	68.32
DS20181207_7	Yb	mg/L	0.0024	0.0024	0.0026	0.0025	0.0002	6.27
DS20181207_7	Zn	mg/L	-1.06	-1.06	-1.06	-1.06	0.0035	0.33
DS20181207_9	Ag	mg/L	0.0029	0.0008	0.0012	0.0009	0.0021	235.22
DS20181207_9	Al	mg/L	-5.95	-5.71	-6.05	-5.9	0.174	2.95
DS20181207_9	As	mg/L	0.0565	0.0285	0.0084	0.0311	0.0242	77.71
DS20181207_9	B	mg/L	0.168	0.173	0.172	0.171	0.0028	1.62
DS20181207_9	Ba	mg/L	0.0994	0.102	0.103	0.102	0.0019	1.91
DS20181207_9	Be	mg/L	0.0023	0.0022	0.002	0.0021	0.0001	5.69
DS20181207_9	Ca	mg/L	32.2	32.1	32.1	32.1	0.084	0.26
DS20181207_9	Cd	mg/L	0.0099	0.0046	0.0033	0.0037	0.0067	177.47
DS20181207_9	Ce	mg/L	0.0607	0.0525	0.0311	0.0481	0.0153	31.72
DS20181207_9	Co	mg/L	0.0185	0.0179	0.0167	0.0177	0.0009	4.97
DS20181207_9	Cr	mg/L	-0.716	-0.727	-0.736	-0.726	0.0098	1.36
DS20181207_9	Cs	mg/L	0.195	0.0536	0.0151	0.0778	0.107	137.59
DS20181207_9	Cu	mg/L	0.0071	0.0072	0.0063	0.0069	0.0005	7.63
DS20181207_9	Dy	mg/L	0.0103	0.0087	0.0032	0.0074	0.0038	50.52

DS20181207_9	Er	mg/L	0.0067	0.0036	0.0022	0.0041	0.0023	55.87
DS20181207_9	Eu	mg/L	0.0044	0.0044	0.004	0.0043	0.0002	5.71
DS20181207_9	Fe	mg/L	0.459	0.466	0.463	0.463	0.0035	0.76
DS20181207_9	Ga	mg/L	0.0133	0.0112	0.0052	0.0064	0.0101	157.72
DS20181207_9	Gd	mg/L	0.0098	0.0054	0.0008	0.0048	0.0053	111.3
DS20181207_9	Ho	mg/L	0.0037	0.0026	0.0013	0.0026	0.0012	46.22
DS20181207_9	K	mg/L	4.46	4.6	4.65	4.57	0.0989	2.17
DS20181207_9	La	mg/L	0.023	0.0161	0.0097	0.0163	0.0067	40.86
DS20181207_9	Lu	mg/L	0.0035	0.0032	0.0029	0.0032	0.0003	8.27
DS20181207_9	Mg	mg/L	8.7	8.92	8.95	8.86	0.141	1.6
DS20181207_9	Mn	mg/L	0.522	0.534	0.532	0.529	0.0061	1.16
DS20181207_9	Na	mg/L	45.3	46.6	46.9	46.3	0.853	1.84
DS20181207_9	Nd	mg/L	0.0641	0.0607	0.0519	0.0589	0.0063	10.71
DS20181207_9	Ni	mg/L	-0.637	-0.644	-0.65	-0.643	0.0065	1.01
DS20181207_9	P	mg/L	0.0696	0.0508	0.0074	0.0426	0.0319	74.9
DS20181207_9	Pb	mg/L	0.0219	0.0136	0.0024	0.0126	0.0098	77.66
DS20181207_9	Pr	mg/L	0.0359	0.0215	0.0274	0.0283	0.0072	25.59
DS20181207_9	Rb	mg/L	0.204	0.156	0.0949	0.152	0.0547	36.03
DS20181207_9	S	mg/L	8.32	8.52	8.51	8.45	0.111	1.31
DS20181207_9	Se	mg/L	0.116	0.0756	0.0137	0.0684	0.0515	75.33
DS20181207_9	Sm	mg/L	0.0206	0.0148	0.0146	0.0167	0.0034	20.42
DS20181207_9	Sr	mg/L	0.0928	0.0947	0.0948	0.0941	0.0011	1.16
DS20181207_9	Th	mg/L	0.0867	0.087	0.0766	0.0834	0.0059	7.07
DS20181207_9	Tl	mg/L	0.114	0.0808	0.023	0.0727	0.0462	63.56
DS20181207_9	Tm	mg/L	0.0056	0.0053	0.0043	0.0051	0.0007	13.55
DS20181207_9	U	mg/L	0.121	0.113	0.0939	0.109	0.014	12.83
DS20181207_9	V	mg/L	0.0047	0.003	0.0018	0.0031	0.0014	45.45
DS20181207_9	Yb	mg/L	0.0026	0.0024	0.0024	0.0025	0.0001	4.88
DS20181207_9	Zn	mg/L	-1.08	-1.08	-1.09	-1.08	0.004	0.37
DS20181207_10	Ag	mg/L	0.0051	0.007	0.0002	0.0041	0.0035	85.69
DS20181207_10	Al	mg/L	-5.79	-5.12	-5.46	-5.46	0.333	6.1
DS20181207_10	As	mg/L	0.0206	0.0531	-0.002	0.0102	0.0383	376.02
DS20181207_10	B	mg/L	0.167	0.172	0.171	0.17	0.0026	1.53
DS20181207_10	Ba	mg/L	0.0894	0.0912	0.0906	0.0904	0.0009	0.98
DS20181207_10	Be	mg/L	0.0023	0.0026	0.0021	0.0023	0.0002	10.5
DS20181207_10	Ca	mg/L	35.6	35.4	35.5	35.5	0.0826	0.23
DS20181207_10	Cd	mg/L	0.0014	0.0125	0.0014	0.0051	0.0064	125.72
DS20181207_10	Ce	mg/L	0.0842	0.0927	0.0669	0.0813	0.0131	16.14
DS20181207_10	Co	mg/L	0.0161	0.0184	0.0149	0.0164	0.0018	10.69
DS20181207_10	Cr	mg/L	-0.723	-0.717	-0.73	-0.723	0.007	0.96
DS20181207_10	Cs	mg/L	0.0161	0.237	0.0051	0.0862	0.131	152.04

DS20181207_10	Cu	mg/L	0.0082	0.01	0.0076	0.0086	0.0013	14.64
DS20181207_10	Dy	mg/L	0.0157	0.0236	0.0075	0.0156	0.0081	51.72
DS20181207_10	Er	mg/L	0.0085	0.0155	0.0027	0.0089	0.0064	72.15
DS20181207_10	Eu	mg/L	0.0041	0.0047	0.004	0.0043	0.0004	9.77
DS20181207_10	Fe	mg/L	0.393	0.4	0.398	0.397	0.0038	0.95
DS20181207_10	Ga	mg/L	0.026	0.0624	0.0201	0.0362	0.0229	63.28
DS20181207_10	Gd	mg/L	0.006	0.0144	0.0006	0.007	0.007	99.19
DS20181207_10	Ho	mg/L	0.0049	0.0064	0.0029	0.0047	0.0017	36.83
DS20181207_10	K	mg/L	4.98	5.31	4.94	5.08	0.204	4.02
DS20181207_10	La	mg/L	0.0285	0.0452	0.0133	0.029	0.016	54.95
DS20181207_10	Lu	mg/L	0.0034	0.0038	0.0032	0.0035	0.0003	7.98
DS20181207_10	Mg	mg/L	9.27	9.45	9.51	9.41	0.123	1.31
DS20181207_10	Mn	mg/L	0.479	0.489	0.489	0.485	0.0056	1.15
DS20181207_10	Na	mg/L	48.7	49.4	49.3	49.2	0.388	0.79
DS20181207_10	Nd	mg/L	0.0626	0.0675	0.0585	0.0629	0.0045	7.18
DS20181207_10	Ni	mg/L	-0.644	-0.633	-0.647	-0.642	0.0074	1.15
DS20181207_10	P	mg/L	0.0567	0.105	0.0368	0.0662	0.0351	53
DS20181207_10	Pb	mg/L	0.0186	0.0362	0.0203	0.025	0.0097	38.81
DS20181207_10	Pr	mg/L	0.0205	0.0295	0.0037	0.0179	0.0131	73.09
DS20181207_10	Rb	mg/L	0.224	0.308	0.089	0.207	0.11	53.36
DS20181207_10	S	mg/L	8.58	8.86	8.81	8.75	0.149	1.71
DS20181207_10	Se	mg/L	0.0557	0.143	0.0555	0.0847	0.0504	59.46
DS20181207_10	Sm	mg/L	0.0123	0.0239	0.0082	0.0148	0.0082	55.13
DS20181207_10	Sr	mg/L	0.102	0.104	0.104	0.103	0.001	0.99
DS20181207_10	Th	mg/L	0.0863	0.0975	0.0836	0.0891	0.0073	8.23
DS20181207_10	Tl	mg/L	0.0401	0.109	0.025	0.0581	0.0449	77.35
DS20181207_10	Tm	mg/L	0.0052	0.0133	0.0016	0.0056	0.0074	131.73
DS20181207_10	U	mg/L	0.167	0.195	0.132	0.164	0.0314	19.12
DS20181207_10	V	mg/L	0.0047	0.0068	0.0024	0.0047	0.0022	46.94
DS20181207_10	Yb	mg/L	0.0027	0.0028	0.0025	0.0027	0.0002	6.77
DS20181207_10	Zn	mg/L	-1.23	-1.23	-1.23	-1.23	0.0023	0.19
DS20181220_1	Ag	mg/L	0.0066	0.002	0.0019	0.0035	0.0027	76.69
DS20181220_1	Al	mg/L	-5.23	-5.17	-5.25	-5.22	0.0449	0.86
DS20181220_1	As	mg/L	0.158	0.105	0.0938	0.119	0.0344	28.84
DS20181220_1	B	mg/L	0.17	0.176	0.175	0.174	0.0032	1.83
DS20181220_1	Ba	mg/L	0.0288	0.029	0.0289	0.0289	0.0001	0.27
DS20181220_1	Be	mg/L	0.0025	0.0022	0.0022	0.0023	0.0002	8.83
DS20181220_1	Ca	mg/L	46.4	46.3	46	46.2	0.205	0.44
DS20181220_1	Cd	mg/L	0.0075	0.0067	0.0018	0.0053	0.0031	58.41
DS20181220_1	Ce	mg/L	0.0964	0.0744	0.0649	0.0785	0.0162	20.59
DS20181220_1	Co	mg/L	0.0067	0.0044	0.0036	0.0049	0.0016	32.49
DS20181220_1	Cr	mg/L	-0.564	-0.569	-0.571	-0.568	0.0035	0.62
DS20181220_1	Cs	mg/L	0.224	0.156	0.0974	0.159	0.0636	39.9

DS20181220_1	Cu	mg/L	0.0073	0.0056	0.0048	0.0059	0.0013	22.39
DS20181220_1	Dy	mg/L	0.0261	0.0112	0.0124	0.0166	0.0083	49.9
DS20181220_1	Er	mg/L	0.0217	0.0095	0.012	0.0144	0.0064	44.74
DS20181220_1	Eu	mg/L	0.005	0.0041	0.0047	0.0046	0.0005	9.94
DS20181220_1	Fe	mg/L	0.242	0.242	0.242	0.242	0.0003	0.12
DS20181220_1	Ga	mg/L	0.0508	0.0191	0.0276	0.0325	0.0164	50.42
DS20181220_1	Gd	mg/L	0.0161	0.0078	0.006	0.01	0.0054	53.97
DS20181220_1	Ho	mg/L	0.0059	0.0037	0.0035	0.0044	0.0013	29.98
DS20181220_1	K	mg/L	4.03	3.69	3.83	3.85	0.171	4.43
DS20181220_1	La	mg/L	0.0303	0.0245	0.0225	0.0258	0.004	15.71
DS20181220_1	Lu	mg/L	0.0034	0.003	0.0029	0.0031	0.0003	9.46
DS20181220_1	Mg	mg/L	7.38	7.55	7.53	7.48	0.0929	1.24
DS20181220_1	Mn	mg/L	0.0533	0.054	0.0538	0.0537	0.0004	0.71
DS20181220_1	Na	mg/L	26.1	27	26.8	26.6	0.49	1.84
DS20181220_1	Nd	mg/L	0.0741	0.0632	0.0644	0.0673	0.006	8.9
DS20181220_1	Ni	mg/L	-0.647	-0.652	-0.657	-0.652	0.0051	0.78
DS20181220_1	P	mg/L	0.0788	0.0536	0.0408	0.0577	0.0193	33.46
DS20181220_1	Pb	mg/L	0.0239	0.0224	0.0152	0.0205	0.0046	22.67
DS20181220_1	Pr	mg/L	0.0285	0.0085	0.014	0.017	0.0103	60.77
DS20181220_1	Rb	mg/L	0.468	0.234	0.181	0.294	0.153	51.84
DS20181220_1	S	mg/L	8.1	8.33	8.32	8.25	0.133	1.61
DS20181220_1	Se	mg/L	0.102	0.082	0.0719	0.0852	0.0152	17.79
DS20181220_1	Sm	mg/L	0.022	0.0184	0.0138	0.0181	0.0041	22.76
DS20181220_1	Sr	mg/L	0.0814	0.0836	0.0838	0.0829	0.0013	1.61
DS20181220_1	Th	mg/L	0.0707	0.0615	0.0549	0.0624	0.008	12.76
DS20181220_1	Tl	mg/L	0.0637	0.0893	0.036	0.063	0.0266	42.31
DS20181220_1	Tm	mg/L	0.0135	0.0037	0.0043	0.0072	0.0055	77.04
DS20181220_1	U	mg/L	0.168	0.122	0.118	0.136	0.0276	20.31
DS20181220_1	V	mg/L	0.0058	0.0035	0.0031	0.0041	0.0015	35.93
DS20181220_1	Yb	mg/L	0.0028	0.0025	0.0024	0.0026	0.0002	6.88
DS20181220_1	Zn	mg/L	-1.29	-1.29	-1.3	-1.29	0.0014	0.11
DS20181220_2	Ag	mg/L	0.0027	0.0039	-0.004	-0.0035	0.0008	21.36
DS20181220_2	Al	mg/L	-4.84	-5.03	-5.02	-4.96	0.11	2.22
DS20181220_2	As	mg/L	0.0314	0.0166	0.0481	0.032	0.0158	49.33
DS20181220_2	B	mg/L	0.148	0.152	0.152	0.151	0.0024	1.59
DS20181220_2	Ba	mg/L	0.0816	0.0833	0.083	0.0826	0.0009	1.13
DS20181220_2	Be	mg/L	0.0022	0.0021	0.0022	0.0022	0	0.92
DS20181220_2	Ca	mg/L	21.3	21.3	21.3	21.3	0.0398	0.19
DS20181220_2	Cd	mg/L	0.0015	0.002	0.0031	0.0022	0.0008	37.27
DS20181220_2	Ce	mg/L	0.0245	0.0118	0.0199	0.0187	0.0064	34.33
DS20181220_2	Co	mg/L	0.0257	0.0269	0.0258	0.0262	0.0006	2.44
DS20181220_2	Cr	mg/L	-0.727	-0.73	-0.731	-0.729	0.0021	0.29

DS20181220_2	Cs	mg/L	-	-	-	-	-	-
DS20181220_2	Cu	mg/L	0.0882	-0.159	0.0209	-0.0894	0.0691	77.31
DS20181220_2			0.0041	0.004	0.0039	0.004	0.0001	2.81
DS20181220_2	Dy	mg/L	-	-	-	-	-	-
DS20181220_2			0.0028	-0.001	0.0015	-0.0018	0.0009	53.24
DS20181220_2	Er	mg/L	-	-	-	-	-	-
DS20181220_2			0.0026	0	0.0001	-0.0009	0.0014	158.82
DS20181220_2	Eu	mg/L	0.0028	0.0028	0.003	0.0029	0.0001	4.79
DS20181220_2	Fe	mg/L	0.789	0.807	0.807	0.801	0.0105	1.31
DS20181220_2	Ga	mg/L	-	-	-	-	-	-
DS20181220_2			0.0049	0.0065	0.0156	-0.0057	0.0103	178.39
DS20181220_2	Gd	mg/L	-	-	-	-	-	-
DS20181220_2			0.0035	0.0012	0.0046	-0.0031	0.0017	56.34
DS20181220_2	Ho	mg/L	0.0012	0.001	0.0007	0.001	0.0003	26.98
DS20181220_2	K	mg/L	3.33	3.43	3.37	3.38	0.0485	1.44
DS20181220_2	La	mg/L	0.0051	0.0083	0.0068	0.0067	0.0016	24.26
DS20181220_2	Lu	mg/L	0.0029	0.0028	0.0029	0.0029	0	1.49
DS20181220_2	Mg	mg/L	6.98	7.11	7.15	7.08	0.0853	1.2
DS20181220_2	Mn	mg/L	0.435	0.445	0.445	0.442	0.0056	1.28
DS20181220_2	Na	mg/L	18.3	19	19.1	18.8	0.43	2.29
DS20181220_2	Nd	mg/L	0.0369	0.0355	0.039	0.0371	0.0018	4.77
DS20181220_2	Ni	mg/L	-0.632	-0.633	-0.634	-0.633	0.0011	0.17
DS20181220_2	P	mg/L	0.0165	0.0105	0.017	0.0147	0.0036	24.51
DS20181220_2	Pb	mg/L	0.01	0.0114	0.0042	0.0085	0.0038	44.36
DS20181220_2	Pr	mg/L	-	-	-	-	-	-
DS20181220_2			0.0096	0.0099	0.0124	-0.0106	0.0015	14.5
DS20181220_2	Rb	mg/L	-	-	-	-	-	-
DS20181220_2			-0.014	0.0851	0.0529	-0.0507	0.0356	70.34
DS20181220_2	S	mg/L	7.32	7.68	7.68	7.56	0.209	2.77
DS20181220_2	Se	mg/L	0.0281	0.0202	0.0539	0.034	0.0176	51.75
DS20181220_2	Sm	mg/L	-	-	-	-	-	-
DS20181220_2			0.004	0.0006	0.0031	0.0022	0.0024	112.43
DS20181220_2	Sr	mg/L	0.0561	0.0574	0.0571	0.0568	0.0007	1.22
DS20181220_2	Th	mg/L	0.0574	0.0612	0.0568	0.0585	0.0024	4.07
DS20181220_2	Tl	mg/L	0.0014	0.0363	0.0225	0.0201	0.0176	87.46
DS20181220_2	Tm	mg/L	-	-	-	-	-	-
DS20181220_2			0.0001	0.0008	-0.001	-0.0006	0.0006	101.54
DS20181220_2	U	mg/L	0.0289	0.0278	0.0169	0.0245	0.0066	26.97
DS20181220_2	V	mg/L	0.0038	0.004	0.004	0.0039	0.0001	3.16
DS20181220_2	Yb	mg/L	0.0025	0.0026	0.0024	0.0025	0.0001	3.77
DS20181220_2	Zn	mg/L	-1.03	-1.03	-1.03	-1.03	0.0019	0.18
DS20181220_3	Ag	mg/L	-	-	-	-	-	-
DS20181220_3			0.0034	0.0036	0.0044	-0.0038	0.0005	14.08
DS20181220_3	Al	mg/L	-5.73	-5.62	-5.67	-5.68	0.0555	0.98
DS20181220_3	As	mg/L	-0.073	0.0396	0.0308	-0.0009	0.0626	7252.1

DS20181220_3	B	mg/L	0.166	0.171	0.17	0.169	0.0026	1.54
DS20181220_3	Ba	mg/L	0.108	0.11	0.109	0.109	0.0011	1.05
DS20181220_3	Be	mg/L	0.0018	0.0019	0.0019	0.0019	0	2.56
DS20181220_3	Ca	mg/L	25	24.9	25	25	0.0502	0.2
			-		-			
DS20181220_3	Cd	mg/L	0.0019	0.0003	0.0001	-0.0006	0.0012	199.87
DS20181220_3	Ce	mg/L	0.0075	0.0078	0.0093	0.0082	0.001	11.73
DS20181220_3	Co	mg/L	0.0084	0.0092	0.0088	0.0088	0.0004	5.03
DS20181220_3	Cr	mg/L	-0.734	-0.732	-0.732	-0.732	0.001	0.14
			-		-			
DS20181220_3	Cs	mg/L	0.0011	0.004	0.0103	-0.0017	0.0075	433.94
DS20181220_3	Cu	mg/L	0.0015	0.002	0.0019	0.0018	0.0003	14.69
			-	-	-			
DS20181220_3	Dy	mg/L	0.0023	0.0011	0.0006	-0.0014	0.0009	64.08
			-	-	-			
DS20181220_3	Er	mg/L	-0.002	0.0033	0.0042	-0.0032	0.0011	34.58
DS20181220_3	Eu	mg/L	0.0025	0.0026	0.0025	0.0025	0.0001	2.95
DS20181220_3	Fe	mg/L	0.469	0.474	0.472	0.472	0.0029	0.61
			-	-	-			
DS20181220_3	Ga	mg/L	0.0101	0.0085	0.0032	-0.0073	0.0036	49.45
			-	-	-			
DS20181220_3	Gd	mg/L	0.0046	0.0048	0.0017	-0.0037	0.0017	47.19
			-	-	-			
DS20181220_3	Ho	mg/L	0.0002	0.0003	0.0001	-0.0002	0.0001	49.53
DS20181220_3	K	mg/L	3.25	3.24	3.27	3.26	0.0145	0.44
DS20181220_3	La	mg/L	0.0017	0.0049	0.0051	0.0039	0.0019	48.35
DS20181220_3	Lu	mg/L	0.0025	0.0026	0.0025	0.0025	0.0001	2.3
DS20181220_3	Mg	mg/L	6.24	6.39	6.4	6.34	0.0879	1.39
DS20181220_3	Mn	mg/L	0.227	0.231	0.23	0.229	0.0024	1.03
DS20181220_3	Na	mg/L	16.7	17.3	17.1	17.1	0.322	1.89
DS20181220_3	Nd	mg/L	0.0206	0.0267	0.0263	0.0246	0.0034	13.99
DS20181220_3	Ni	mg/L	-0.657	-0.656	-0.657	-0.657	0.0008	0.12
			-		-			
DS20181220_3	P	mg/L	0.0078	0.0254	0.04	0.0192	0.0245	127.42
			-	-	-			
DS20181220_3	Pb	mg/L	0.0018	0.0025	0.0008	-0.0012	0.0017	147.53
			-	-	-			
DS20181220_3	Pr	mg/L	0.0178	0.0072	0.0272	-0.0174	0.01	57.3
			-		-			
DS20181220_3	Rb	mg/L	0.0724	-0.1	0.0121	-0.0616	0.0452	73.25
DS20181220_3	S	mg/L	7.3	7.49	7.53	7.44	0.122	1.64
DS20181220_3	Se	mg/L	0.0357	0.0285	0.0144	0.0262	0.0109	41.44
DS20181220_3	Sm	mg/L	0.0033	0.0017	0.0002	0.0017	0.0016	90.09
DS20181220_3	Sr	mg/L	0.0555	0.0566	0.056	0.0561	0.0005	0.95
DS20181220_3	Th	mg/L	0.048	0.0447	0.0469	0.0465	0.0017	3.65

DS20181220_3	Tl	mg/L	0.0156	0.0067	0.0065	-0.0008	0.0128	1561.03
DS20181220_3	Tm	mg/L	0.0026	0.0027	0.0014	-0.0023	0.0007	32.49
DS20181220_3	U	mg/L	0.0195	0.0289	0.0006	0.016	0.0151	94.78
DS20181220_3	V	mg/L	0.0023	0.0026	0.0026	0.0025	0.0002	6.94
DS20181220_3	Yb	mg/L	0.0021	0.0021	0.0021	0.0021	0	1.5
DS20181220_3	Zn	mg/L	-1.06	-1.05	-1.05	-1.05	0.0021	0.2
DS20181220_4	Ag	mg/L	-0.004	0.0033	0.0044	-0.0039	0.0006	15.31
DS20181220_4	Al	mg/L	-5.51	-5.21	-5.61	-5.44	0.208	3.82
DS20181220_4	As	mg/L	0.0333	0.0399	0.0426	0.0386	0.0048	12.4
DS20181220_4	B	mg/L	0.167	0.171	0.172	0.17	0.0027	1.58
DS20181220_4	Ba	mg/L	0.12	0.123	0.123	0.122	0.0015	1.23
DS20181220_4	Be	mg/L	0.0019	0.0019	0.0019	0.0019	0	1.66
DS20181220_4	Ca	mg/L	24.8	24.8	24.6	24.7	0.0871	0.35
DS20181220_4	Cd	mg/L	0.0022	0.0009	0.0016	-0.0015	0.0007	43.04
DS20181220_4	Ce	mg/L	0.0149	0.0171	0.009	0.0137	0.0042	30.64
DS20181220_4	Co	mg/L	0.0049	0.0056	0.0054	0.0053	0.0004	6.81
DS20181220_4	Cr	mg/L	-0.573	-0.574	-0.573	-0.573	0.0006	0.1
DS20181220_4	Cs	mg/L	-0.194	-0.215	-0.202	-0.204	0.0107	5.25
DS20181220_4	Cu	mg/L	0.0013	0.001	0.0016	0.0013	0.0003	21.58
DS20181220_4	Dy	mg/L	0.0011	0.0005	0.0009	-0.0003	0.001	412.28
DS20181220_4	Er	mg/L	0.0049	0.0037	0.0059	-0.0048	0.0011	21.95
DS20181220_4	Eu	mg/L	0.0023	0.0027	0.0024	0.0025	0.0002	9.54
DS20181220_4	Fe	mg/L	0.921	0.939	0.941	0.934	0.0107	1.15
DS20181220_4	Ga	mg/L	0.0021	0.0098	-0.016	-0.0093	0.007	74.8
DS20181220_4	Gd	mg/L	0.0046	0.0028	0.0032	-0.0035	0.001	27.71
DS20181220_4	Ho	mg/L	0.0005	0.0005	0.0009	-0.0006	0.0002	31.4
DS20181220_4	K	mg/L	3.19	3.18	3.21	3.19	0.0137	0.43
DS20181220_4	La	mg/L	0.0035	0.004	0.0057	0.0044	0.0011	25.71
DS20181220_4	Lu	mg/L	0.0026	0.0027	0.0027	0.0027	0	1.73
DS20181220_4	Mg	mg/L	6.18	6.32	6.25	6.25	0.0717	1.15
DS20181220_4	Mn	mg/L	0.206	0.21	0.21	0.209	0.0024	1.15
DS20181220_4	Na	mg/L	15.9	16.3	16.2	16.1	0.187	1.16
DS20181220_4	Nd	mg/L	0.0307	0.0287	0.0175	0.0256	0.0071	27.89
DS20181220_4	Ni	mg/L	-0.658	-0.657	-0.658	-0.658	0.0007	0.11
DS20181220_4	P	mg/L	0.0147	0.0233	0.0187	0.0189	0.0043	22.74

DS20181220_4	Pb	mg/L	-	-	-	-	-	-
DS20181220_4	Pr	mg/L	0.0022	0.0038	-0.005	-0.0037	0.0014	38.07
DS20181220_4	Rb	mg/L	-	-	-	-	-	-
DS20181220_4	S	mg/L	0.0169	0.0122	0.0111	-0.0134	0.0031	22.81
DS20181220_4	Se	mg/L	-	-	-	-	-	-
DS20181220_4	Sm	mg/L	0.0448	0.0399	-0.113	-0.066	0.041	62.12
DS20181220_4	Sr	mg/L	7.05	7.28	7.29	7.21	0.14	1.94
DS20181220_4	Th	mg/L	0.0279	0.0198	0.0665	0.0381	0.025	65.5
DS20181220_4	Tl	mg/L	-0.003	0.001	0.0026	0.0002	0.0029	1506.25
DS20181220_4	Tm	mg/L	0.0546	0.0555	0.0552	0.0551	0.0005	0.86
DS20181220_4	U	mg/L	0.059	0.0574	0.0664	0.061	0.0048	7.89
DS20181220_4	V	mg/L	-	-	-	-	-	-
DS20181220_4	Yb	mg/L	0.0117	0.0058	0.0213	-0.0129	0.0078	60.53
DS20181220_4	Zn	mg/L	-	-	-	-	-	-
DS20181220_4	Ag	mg/L	0.0016	0.0014	0.0021	-0.0017	0.0004	21.61
DS20181220_4	Al	mg/L	0.033	0.0383	0.0244	0.0319	0.007	21.99
DS20181220_4	As	mg/L	0.0022	0.0022	0.0023	0.0023	0.0001	2.63
DS20181220_4	Ba	mg/L	0.0021	0.002	0.0021	0.0021	0.0001	2.6
DS20181220_4	Be	mg/L	-1.1	-1.1	-1.1	-1.1	0.0006	0.06
DS20181220_7	Ca	mg/L	-	-	-	-	-	-
DS20181220_7	Cd	mg/L	-0.004	0.0032	0.0022	-0.0031	0.0009	28.97
DS20181220_7	Ce	mg/L	0.238	0.232	0.256	0.242	0.0122	5.05
DS20181220_7	Co	mg/L	-	-	-	-	-	-
DS20181220_7	Cr	mg/L	0.0086	0.0391	0.0093	0.0133	0.0241	182.11
DS20181220_7	Cs	mg/L	0.169	0.174	0.175	0.173	0.003	1.72
DS20181220_7	Dy	mg/L	0.0818	0.0831	0.0823	0.0824	0.0007	0.8
DS20181220_7	Er	mg/L	0.0019	0.0021	0.0021	0.002	0.0001	7.15
DS20181220_7	Ea	mg/L	27.6	27.5	27.7	27.6	0.117	0.43
DS20181220_7	Eu	mg/L	-	-	-	-	-	-
DS20181220_7	Ga	mg/L	0.0013	0.011	0.0034	0.0044	0.0062	141.83
DS20181220_7	Gd	mg/L	-0.004	0.0091	0.0221	0.009	0.0131	144.34
DS20181220_7	Ho	mg/L	0.0077	0.0101	0.0098	0.0092	0.0013	14.58
DS20181220_7	Ir	mg/L	-0.573	-0.568	-0.571	-0.571	0.0024	0.42
DS20181220_7	K	mg/L	0.0286	0.0218	0.0391	0.0298	0.0087	29.21
DS20181220_7	La	mg/L	0.0019	0.0032	0.0046	0.0032	0.0013	41.61
DS20181220_7	Li	mg/L	0.0021	0.0023	0.0078	0.004	0.0033	80.45
DS20181220_7	Mg	mg/L	-	-	-	-	-	-
DS20181220_7	Mn	mg/L	0.0066	0.0044	0.0009	-0.004	0.0029	72.22
DS20181220_7	Ni	mg/L	0.0031	0.0032	0.0028	0.003	0.0002	7.89
DS20181220_7	Na	mg/L	0.289	0.29	0.289	0.289	0.0006	0.22
DS20181220_7	Nb	mg/L	-	-	-	-	-	-
DS20181220_7	Os	mg/L	0.0145	0.0067	0.0081	-0.0098	0.0042	42.53
DS20181220_7	P	mg/L	-	-	-	-	-	-
DS20181220_7	Pb	mg/L	0.0045	0.0026	0.0034	-0.0012	0.0041	337.8
DS20181220_7	Re	mg/L	-	-	-	-	-	-
DS20181220_7	Rh	mg/L	0.0013	0.0001	0.0012	-0.0001	0.0012	1708.88

DS20181220_7	K	mg/L	3.55	3.76	3.82	3.71	0.143	3.85
DS20181220_7	La	mg/L	0.0028	0.0114	0.0183	0.0108	0.0077	71.39
DS20181220_7	Lu	mg/L	0.0025	0.0028	0.0029	0.0028	0.0002	7.65
DS20181220_7	Mg	mg/L	6.04	6.27	6.24	6.18	0.123	1.99
DS20181220_7	Mn	mg/L	0.276	0.285	0.283	0.281	0.0048	1.69
DS20181220_7	Na	mg/L	28.9	29.4	29.4	29.2	0.283	0.97
DS20181220_7	Nd	mg/L	0.0226	0.0311	0.0367	0.0301	0.0071	23.49
DS20181220_7	Ni	mg/L	-0.655	-0.645	-0.65	-0.65	0.0047	0.72
DS20181220_7	P	mg/L	0.0188	0.0606	0.0555	0.0449	0.0228	50.72
DS20181220_7	Pb	mg/L	0.0006	0.0116	0.0113	0.0078	0.0063	80.06
DS20181220_7	Pr	mg/L	0.0015	0.0069	0.0038	0.0031	0.0043	139.9
DS20181220_7	Rb	mg/L	0.0721	0.0527	0.166	0.0971	0.0609	62.7
DS20181220_7	S	mg/L	7.08	7.29	7.28	7.22	0.12	1.66
DS20181220_7	Se	mg/L	0.0089	0.0757	0.0377	0.0408	0.0335	82.19
DS20181220_7	Sm	mg/L	0.0025	0.0121	0.0161	0.0102	0.007	68.58
DS20181220_7	Sr	mg/L	0.0703	0.0711	0.0715	0.071	0.0006	0.9
DS20181220_7	Th	mg/L	0.036	0.0494	0.0561	0.0472	0.0102	21.71
DS20181220_7	Tl	mg/L	0.0008	0.0448	0.032	0.0259	0.0226	87.53
DS20181220_7	Tm	mg/L	0.0041	0.0028	0.0008	-0.002	0.0025	124.05
DS20181220_7	U	mg/L	0.031	0.0628	0.0836	0.0591	0.0265	44.84
DS20181220_7	V	mg/L	0.0036	0.0042	0.0046	0.0042	0.0005	11.7
DS20181220_7	Yb	mg/L	0.0019	0.0021	0.0021	0.002	0.0001	5.32
DS20181220_7	Zn	mg/L	-1.06	-1.05	-1.05	-1.05	0.0048	0.45
DS20181220_8	Ag	mg/L	0.0006	0.0042	0.0037	-0.0024	0.0026	107.86
DS20181220_8	Al	mg/L	-6.16	-6.11	-6.13	-6.14	0.0264	0.43
DS20181220_8	As	mg/L	0.111	0.108	0.0644	0.0944	0.026	27.57
DS20181220_8	B	mg/L	0.153	0.156	0.157	0.155	0.0022	1.41
DS20181220_8	Ba	mg/L	0.0703	0.072	0.0722	0.0715	0.0011	1.52
DS20181220_8	Be	mg/L	0.0022	0.0018	0.0019	0.0019	0.0002	11.6
DS20181220_8	Ca	mg/L	30.2	31.3	31.1	30.9	0.573	1.86
DS20181220_8	Cd	mg/L	0.0047	0.0049	-0.002	-0.0007	0.005	686.23
DS20181220_8	Ce	mg/L	0.0447	0.0344	0.0322	0.0371	0.0067	18.08
DS20181220_8	Co	mg/L	0.0067	0.0046	0.0051	0.0055	0.0011	19.71
DS20181220_8	Cr	mg/L	-0.723	-0.736	-0.735	-0.731	0.0068	0.93
DS20181220_8	Cs	mg/L	0.0881	-0.198	0.0897	-0.125	0.0627	50.14
DS20181220_8	Cu	mg/L	0.0063	0.0043	0.0046	0.0051	0.0011	21.57
DS20181220_8	Dy	mg/L	0.0115	0.0006	0.0002	0.0036	0.0068	192.2
DS20181220_8	Er	mg/L	0.0018	0.0075	0.0067	-0.0053	0.0031	58.28

DS20181220_8	Eu	mg/L	0.0033	0.0027	0.0033	0.0031	0.0004	11.76
DS20181220_8	Fe	mg/L	0.229	0.229	0.229	0.229	0.0005	0.2
				-				
DS20181220_8	Ga	mg/L	0.0001	-0.043	0.0123	-0.0184	0.0222	120.78
				-				
DS20181220_8	Gd	mg/L	0.0043	0.0063	0.0029	-0.0016	0.0054	331.94
				-				
DS20181220_8	Ho	mg/L	0.0012	0.0011	0.0001	0	0.0012	4318.22
DS20181220_8	K	mg/L	3.46	3.34	3.43	3.41	0.0596	1.75
				-				
DS20181220_8	La	mg/L	0.0208	0.0018	0.0018	0.0069	0.0122	175.65
DS20181220_8	Lu	mg/L	0.0028	0.0024	0.0024	0.0025	0.0003	10.31
DS20181220_8	Mg	mg/L	5.69	5.81	5.83	5.78	0.0764	1.32
DS20181220_8	Mn	mg/L	0.178	0.181	0.182	0.181	0.002	1.1
DS20181220_8	Na	mg/L	36.5	37.8	37.2	37.1	0.658	1.77
DS20181220_8	Nd	mg/L	0.0426	0.028	0.0377	0.0361	0.0075	20.65
DS20181220_8	Ni	mg/L	-0.649	-0.662	-0.657	-0.656	0.0064	0.97
				-				
DS20181220_8	P	mg/L	0.0506	0.0008	0.0128	0.0209	0.0266	127.54
				-				
DS20181220_8	Pb	mg/L	0.0116	0.0049	0.0026	0.0031	0.0083	263.43
				-				
DS20181220_8	Pr	mg/L	0.0032	-0.019	-0.011	-0.0111	0.0079	71.46
				-				
DS20181220_8	Rb	mg/L	0.0493	0.0582	0.0123	0.0011	0.0546	4799.65
DS20181220_8	S	mg/L	6.44	6.6	6.62	6.55	0.0983	1.5
				-				
DS20181220_8	Se	mg/L	0.0373	0.0038	0.0165	0.0166	0.0205	123.4
DS20181220_8	Sm	mg/L	0.0201	0.0004	0.0026	0.0077	0.0108	140.57
DS20181220_8	Sr	mg/L	0.0693	0.0713	0.0717	0.0708	0.0013	1.84
DS20181220_8	Th	mg/L	0.0416	0.0298	0.0308	0.0341	0.0065	19.1
DS20181220_8	Tl	mg/L	0.0528	0.0201	0.0303	0.0344	0.0167	48.66
				-				
DS20181220_8	Tm	mg/L	0.0008	0.0033	0.0021	-0.0015	0.0021	140.14
DS20181220_8	U	mg/L	0.0883	0.0462	0.0521	0.0622	0.0228	36.63
DS20181220_8	V	mg/L	0.0046	0.0019	0.0036	0.0034	0.0014	40.42
DS20181220_8	Yb	mg/L	0.0024	0.0021	0.002	0.0022	0.0002	8.75
DS20181220_8	Zn	mg/L	-1.04	-1.04	-1.04	-1.04	0.0014	0.13
				-				
DS20181220_9	Ag	mg/L	0.0057	0.0052	0.0052	-0.0054	0.0003	5.32
DS20181220_9	Al	mg/L	-5.72	-5.66	-5.49	-5.62	0.115	2.04
DS20181220_9	As	mg/L	0.0542	0.0747	0.0579	0.0623	0.0109	17.57
DS20181220_9	B	mg/L	0.16	0.164	0.164	0.162	0.0025	1.52
DS20181220_9	Ba	mg/L	0.0645	0.0658	0.0659	0.0654	0.0008	1.18
DS20181220_9	Be	mg/L	0.0018	0.0019	0.0018	0.0018	0.0001	3.23
DS20181220_9	Ca	mg/L	24.6	24.5	24.3	24.5	0.128	0.52

DS20181220_9	Cd	mg/L	0.0302	0.0387	0.0308	0.0332	0.0047	14.28
DS20181220_9	Ce	mg/L	0.0182	0.04	0.0321	0.0301	0.011	36.72
DS20181220_9	Co	mg/L	0.006	0.0081	0.0067	0.0069	0.001	15.13
DS20181220_9	Cr	mg/L	-0.735	-0.731	-0.736	-0.734	0.0026	0.35
DS20181220_9	Cs	mg/L	-0.173	-0.203	-0.155	-0.177	0.0241	13.61
DS20181220_9	Cu	mg/L	0.0019	0.0025	0.0015	0.002	0.0005	24.52
			-	-	-			
DS20181220_9	Dy	mg/L	0.0025	0.0002	0.0028	-0.0018	0.0014	77.4
			-	-				
DS20181220_9	Er	mg/L	0.0076	0.0072	-0.006	-0.0069	0.0008	12.21
DS20181220_9	Eu	mg/L	0.0025	0.0027	0.0026	0.0026	0.0001	3.68
DS20181220_9	Fe	mg/L	0.242	0.247	0.247	0.245	0.0028	1.16
			-	-	-			
DS20181220_9	Ga	mg/L	0.0344	0.0124	0.0184	-0.0217	0.0114	52.42
			-	-	-			
DS20181220_9	Gd	mg/L	0.0068	0.0026	0.0055	-0.005	0.0021	43.25
			-	-				
DS20181220_9	Ho	mg/L	0.0015	0.0005	-0.001	-0.001	0.0005	45.73
DS20181220_9	K	mg/L	3.06	3.16	3.12	3.11	0.0479	1.54
			-					
DS20181220_9	La	mg/L	0.0008	0.0055	0.0015	0.0021	0.0032	154.64
DS20181220_9	Lu	mg/L	0.0024	0.0026	0.0025	0.0025	0.0001	3.16
DS20181220_9	Mg	mg/L	5.19	5.4	5.29	5.29	0.105	1.98
DS20181220_9	Mn	mg/L	0.227	0.231	0.231	0.23	0.0027	1.16
DS20181220_9	Na	mg/L	24.4	25.2	25	24.9	0.441	1.77
DS20181220_9	Nd	mg/L	0.018	0.0162	0.0229	0.0191	0.0035	18.13
DS20181220_9	Ni	mg/L	-0.66	-0.656	-0.659	-0.658	0.002	0.31
			-		-			
DS20181220_9	P	mg/L	0.0082	0.0161	0.0084	-0.0002	0.0141	9344.7
			-					
DS20181220_9	Pb	mg/L	0.0034	0.0056	0.0018	0.0013	0.0045	344.67
			-	-	-			
DS20181220_9	Pr	mg/L	0.0278	0.0246	0.0193	-0.0239	0.0043	17.93
			-		-			
DS20181220_9	Rb	mg/L	0.0827	-0.098	0.0205	-0.0671	0.041	61.21
DS20181220_9	S	mg/L	5.81	6.07	6.01	5.97	0.136	2.28
			-					
DS20181220_9	Se	mg/L	0.0209	0.0134	0.0109	0.0012	0.0191	1649.5
				-	-			
DS20181220_9	Sm	mg/L	-0.009	0.0007	0.0054	-0.0051	0.0042	82.41
DS20181220_9	Sr	mg/L	0.0619	0.063	0.063	0.0626	0.0006	0.99
DS20181220_9	Th	mg/L	0.0267	0.0344	0.0272	0.0294	0.0043	14.65
DS20181220_9	Tl	mg/L	0.0082	0.0535	0.0243	0.0287	0.0229	79.99
			-	-	-			
DS20181220_9	Tm	mg/L	0.0031	0.0017	0.0025	-0.0024	0.0007	28.03

DS20181220_9	U	mg/L	0.0218	0.0159	0.0237	0.006	0.0243	407.94
DS20181220_9	V	mg/L	0.0018	0.0018	0.0018	0.0018	0	2.19
DS20181220_9	Yb	mg/L	0.002	0.0021	0.0021	0.0021	0	1.31
DS20181220_9	Zn	mg/L	-1.05	-1.04	-1.05	-1.05	0.0026	0.25
DS20181220_10	Ag	mg/L	0.0043	0.0039	0.0022	-0.0034	0.0011	31.57
DS20181220_10	Al	mg/L	-6.12	-5.86	-5.77	-5.92	0.182	3.08
DS20181220_10	As	mg/L	0.0231	0.0311	0.0495	0.0138	0.0411	296.79
DS20181220_10	B	mg/L	0.166	0.171	0.171	0.169	0.0029	1.71
DS20181220_10	Ba	mg/L	0.0625	0.0629	0.064	0.0631	0.0008	1.19
DS20181220_10	Be	mg/L	0.0019	0.0018	0.002	0.0019	0.0001	4.54
DS20181220_10	Ca	mg/L	24.4	24.3	24.2	24.3	0.0934	0.38
DS20181220_10	Cd	mg/L	0.0044	0.0007	0.0063	0.0038	0.0028	74.06
DS20181220_10	Ce	mg/L	0.0121	0.017	0.0333	0.0208	0.0111	53.53
DS20181220_10	Co	mg/L	0.0047	0.004	0.0055	0.0048	0.0007	15.63
DS20181220_10	Cr	mg/L	-0.573	-0.575	-0.573	-0.574	0.0012	0.22
DS20181220_10	Cs	mg/L	0.0114	0.0865	0.0287	-0.023	0.0585	253.79
DS20181220_10	Cu	mg/L	0.0022	0.0012	0.0019	0.0018	0.0005	28.51
DS20181220_10	Dy	mg/L	0.0007	0.0023	0.0043	0.0025	0.0018	72.84
DS20181220_10	Er	mg/L	0.0056	0.0048	0.0019	-0.0041	0.0019	46.58
DS20181220_10	Eu	mg/L	0.0033	0.0034	0.0033	0.0033	0.0001	2.61
DS20181220_10	Fe	mg/L	0.257	0.26	0.262	0.259	0.0024	0.92
DS20181220_10	Ga	mg/L	0.0236	-0.015	0.0208	-0.0198	0.0044	22.13
DS20181220_10	Gd	mg/L	0.0049	0.0062	0.0025	-0.0029	0.0047	163.65
DS20181220_10	Ho	mg/L	0.0008	0.0015	0.0002	-0.0007	0.0008	118.44
DS20181220_10	K	mg/L	2.91	3.06	3.04	3.01	0.0828	2.75
DS20181220_10	La	mg/L	0.0039	0.0044	0.0105	0.0062	0.0037	59.13
DS20181220_10	Lu	mg/L	0.0027	0.0027	0.0028	0.0027	0.0001	2.97
DS20181220_10	Mg	mg/L	5.05	5.18	5.16	5.13	0.069	1.34
DS20181220_10	Mn	mg/L	0.136	0.139	0.139	0.138	0.0018	1.32
DS20181220_10	Na	mg/L	29.4	30.5	30.5	30.2	0.617	2.04
DS20181220_10	Nd	mg/L	0.0313	0.031	0.0316	0.0313	0.0003	0.93
DS20181220_10	Ni	mg/L	-0.656	-0.662	-0.655	-0.657	0.0038	0.58
DS20181220_10	P	mg/L	0.0166	0.0241	0.0033	0.0147	0.0106	71.95
DS20181220_10	Pb	mg/L	0.0006	0.0057	0.009	0.0047	0.0049	104.58
DS20181220_10	Pr	mg/L	0.0252	0.0227	0.0276	0.0252	0.0025	9.88

DS20181220_10	Rb	mg/L	-0.032	0.012	0.0241	-0.0147	0.0235	159.77
DS20181220_10	S	mg/L	5.49	5.66	5.7	5.62	0.108	1.92
DS20181220_10	Se	mg/L	0.0742	0.0761	0.0727	0.0743	0.0017	2.3
DS20181220_10	Sm	mg/L	-0.003	0.0087	0.0054	-0.0021	0.0071	335.74
DS20181220_10	Sr	mg/L	0.063	0.064	0.0639	0.0636	0.0005	0.82
DS20181220_10	Th	mg/L	0.0258	0.0306	0.0372	0.0312	0.0057	18.22
DS20181220_10	Tl	mg/L	0.0205	0.0151	0.0489	0.0181	0.032	177.06
DS20181220_10	Tm	mg/L	0.0026	0.0029	0.0016	-0.0024	0.0007	29.86
DS20181220_10	U	mg/L	0.0168	0.0143	0.0386	0.0232	0.0134	57.54
DS20181220_10	V	mg/L	0.0019	0.0016	0.002	0.0018	0.0002	8.71
DS20181220_10	Yb	mg/L	0.0019	0.002	0.002	0.002	0.0001	3.51
DS20181220_10	Zn	mg/L	-1.23	-1.22	-1.22	-1.22	0.0017	0.14
DS20180106_1	Ag	mg/L	0.0029	0.0017	0.0035	-0.0027	0.0009	32.83
DS20180106_1	Al	mg/L	-5.39	-5	-5.08	-5.16	0.206	3.99
DS20180106_1	As	mg/L	0.123	0.056	0.0697	0.083	0.0356	42.84
DS20180106_1	B	mg/L	0.16	0.165	0.165	0.164	0.0028	1.71
DS20180106_1	Ba	mg/L	0.0254	0.0265	0.0264	0.0261	0.0006	2.17
DS20180106_1	Be	mg/L	0.0019	0.0019	0.0018	0.0019	0.0001	3.69
DS20180106_1	Ca	mg/L	45.6	45	44.8	45.1	0.404	0.89
DS20180106_1	Cd	mg/L	0.0024	0.0017	0.0017	0.0008	0.0022	279.33
DS20180106_1	Ce	mg/L	0.0578	0.0539	0.0534	0.055	0.0024	4.33
DS20180106_1	Co	mg/L	0.006	0.0058	0.0045	0.0054	0.0008	14.35
DS20180106_1	Cr	mg/L	-0.73	-0.731	-0.733	-0.731	0.0015	0.2
DS20180106_1	Cs	mg/L	0.0044	0.0024	0.0353	-0.0095	0.0224	235.13
DS20180106_1	Cu	mg/L	0.0017	0.0038	0.0021	0.0026	0.0011	42.15
DS20180106_1	Dy	mg/L	0.004	0.0034	0.002	0.0032	0.001	32.34
DS20180106_1	Er	mg/L	-0.005	0.0048	0.0064	-0.0054	0.0009	16.56
DS20180106_1	Eu	mg/L	0.0032	0.0035	0.0035	0.0034	0.0001	4.17
DS20180106_1	Fe	mg/L	0.34	0.346	0.343	0.343	0.0028	0.82
DS20180106_1	Ga	mg/L	0.0349	0.0115	0.0304	-0.0256	0.0124	48.59
DS20180106_1	Gd	mg/L	0.0007	0.0019	0.0014	-0.0013	0.0006	45.09
DS20180106_1	Ho	mg/L	0.0002	0.0005	0.0002	0.0003	0.0002	51.01
DS20180106_1	K	mg/L	3.37	3.47	3.38	3.41	0.0538	1.58
DS20180106_1	La	mg/L	0.0142	0.0142	0.011	0.0131	0.0018	14.1
DS20180106_1	Lu	mg/L	0.0028	0.0027	0.0027	0.0027	0	1.21

DS20180106_1	Mg	mg/L	7.51	7.73	7.69	7.64	0.115	1.5
DS20180106_1	Mn	mg/L	0.0817	0.0837	0.0831	0.0829	0.001	1.23
DS20180106_1	Na	mg/L	24.9	25.4	25.3	25.2	0.268	1.06
DS20180106_1	Nd	mg/L	0.0466	0.0481	0.0491	0.0479	0.0012	2.54
DS20180106_1	Ni	mg/L	-0.659	-0.659	-0.663	-0.661	0.002	0.31
DS20180106_1	P	mg/L	0.0332	0.0321	0.0262	0.0305	0.0038	12.35
DS20180106_1	Pb	mg/L	0.0093	0.0127	0.008	0.01	0.0024	24.2
DS20180106_1	Pr	mg/L	0.0001	0.0002	0.0003	0	0.0003	6446.32
DS20180106_1	Rb	mg/L	0.0454	0.0421	0.0015	0.0297	0.0244	82.35
DS20180106_1	S	mg/L	8.92	9.2	9.14	9.09	0.145	1.6
DS20180106_1	Se	mg/L	0.0405	0.0335	0.0151	0.0297	0.0131	44.13
DS20180106_1	Sm	mg/L	0.0101	0.0124	0.0065	0.0097	0.0029	30.32
DS20180106_1	Sr	mg/L	0.08	0.0823	0.0816	0.0813	0.0012	1.46
DS20180106_1	Th	mg/L	0.0582	0.0555	0.0539	0.0559	0.0022	3.89
DS20180106_1	Tl	mg/L	0.0378	0.0012	0.0113	0.0085	0.0259	306.91
DS20180106_1	Tm	mg/L	0.0004	0.0008	0.0013	-0.0008	0.0004	55.28
DS20180106_1	U	mg/L	0.0892	0.094	0.0787	0.0873	0.0078	8.99
DS20180106_1	V	mg/L	0.004	0.0059	0.0045	0.0048	0.001	21.03
DS20180106_1	Yb	mg/L	0.0023	0.0024	0.0024	0.0023	0	1.5
DS20180106_1	Zn	mg/L	-1.31	-1.31	-1.31	-1.31	0.0006	0.04
DS20190106_2	Ag	mg/L	0.0042	0.0046	0.0053	-0.0047	0.0006	11.86
DS20190106_2	Al	mg/L	-5.2	-5.64	-5.51	-5.45	0.223	4.08
DS20190106_2	As	mg/L	0.027	0.0426	0.0428	0.0375	0.009	24.11
DS20190106_2	B	mg/L	0.175	0.18	0.18	0.178	0.0031	1.74
DS20190106_2	Ba	mg/L	0.134	0.137	0.137	0.136	0.0016	1.2
DS20190106_2	Be	mg/L	0.0019	0.0019	0.0019	0.0019	0	0.82
DS20190106_2	Ca	mg/L	22.8	22.7	22.5	22.7	0.114	0.5
DS20190106_2	Cd	mg/L	0.001	0.0005	0.0006	0.0004	0.0008	210.04
DS20190106_2	Ce	mg/L	0.0198	0.0225	0.0195	0.0206	0.0017	8.03
DS20190106_2	Co	mg/L	0.0294	0.0308	0.0298	0.03	0.0007	2.32
DS20190106_2	Cr	mg/L	-0.733	-0.731	-0.734	-0.732	0.0015	0.2
DS20190106_2	Cs	mg/L	-0.2	0.0942	-0.155	-0.15	0.0532	35.51
DS20190106_2	Cu	mg/L	0.0013	0.0021	0.0011	0.0015	0.0005	35.48
DS20190106_2	Dy	mg/L	0.0011	0.0001	0.0004	0.0003	0.0008	289.38
DS20190106_2	Er	mg/L	0.0031	0.0026	0.0025	-0.0027	0.0003	11.8
DS20190106_2	Eu	mg/L	0.0023	0.0027	0.0027	0.0025	0.0002	8.22
DS20190106_2	Fe	mg/L	0.201	0.204	0.204	0.203	0.0014	0.7

DS20190106_2	Ga	mg/L	-	-	-	-0.0424	0.0097	22.88
DS20190106_2	Gd	mg/L	-	-	-	-0.0055	0.0015	27.73
DS20190106_2	Ho	mg/L	0.0016	0.0021	0.0014	-0.0017	0.0004	21.17
DS20190106_2	K	mg/L	3.36	3.39	3.52	3.42	0.0852	2.49
DS20190106_2	La	mg/L	0.0024	0.0051	0.0034	0.0036	0.0014	37.39
DS20190106_2	Lu	mg/L	0.0026	0.0026	0.0025	0.0026	0.0001	3.22
DS20190106_2	Mg	mg/L	7.27	7.5	7.51	7.43	0.138	1.86
DS20190106_2	Mn	mg/L	0.515	0.527	0.526	0.523	0.0066	1.27
DS20190106_2	Na	mg/L	19.6	20.2	20.5	20.1	0.429	2.13
DS20190106_2	Nd	mg/L	0.018	0.0194	0.0208	0.0194	0.0014	7.12
DS20190106_2	Ni	mg/L	-0.636	-0.636	-0.637	-0.636	0.0009	0.14
DS20190106_2	P	mg/L	-	-	-	-	-	-
DS20190106_2	Pb	mg/L	0.0088	0.001	0.0384	0.0102	0.0249	244.44
DS20190106_2	Pb	mg/L	0.008	0.0095	0.0018	0.0064	0.0041	63.55
DS20190106_2	Pr	mg/L	0.0109	0.0058	0.0062	0.0076	0.0029	37.51
DS20190106_2	Rb	mg/L	-	-	-	-	-	-
DS20190106_2	Rb	mg/L	0.0926	0.0924	-0.055	-0.08	0.0216	27.04
DS20190106_2	S	mg/L	8.25	8.54	8.49	8.42	0.157	1.86
DS20190106_2	Se	mg/L	0.0091	0.0006	0.0188	0.0095	0.0091	95.68
DS20190106_2	Sm	mg/L	-	-	-	-	-	-
DS20190106_2	Sm	mg/L	0.0073	0.0063	0.0087	-0.0074	0.0012	15.77
DS20190106_2	Sr	mg/L	0.0573	0.0583	0.0583	0.058	0.0006	1.04
DS20190106_2	Th	mg/L	0.047	0.0578	0.0492	0.0514	0.0057	11.13
DS20190106_2	Tl	mg/L	0.0257	0.0288	0.0443	0.0329	0.01	30.23
DS20190106_2	Tm	mg/L	0.0074	0.0045	0.0042	0.0054	0.0018	33.48
DS20190106_2	U	mg/L	-	-	-	-	-	-
DS20190106_2	U	mg/L	0.0146	0.0154	-0.002	-0.0107	0.0075	70.47
DS20190106_2	V	mg/L	0.0032	0.0018	0.0026	0.0025	0.0007	26.08
DS20190106_2	Yb	mg/L	0.0021	0.0021	0.0021	0.0021	0	1.29
DS20190106_2	Zn	mg/L	-0.707	-0.7	-0.701	-0.703	0.0036	0.51
DS20190106_3	Ag	mg/L	-	-	-	-	-	-
DS20190106_3	Ag	mg/L	0.0059	0.0046	-0.005	-0.0052	0.0006	12.51
DS20190106_3	Al	mg/L	0.152	0.165	0.147	0.155	0.0092	5.95
DS20190106_3	As	mg/L	-	-	-	-	-	-
DS20190106_3	As	mg/L	0.0175	0.0042	0.0012	-0.0048	0.0113	233.49
DS20190106_3	B	mg/L	0.145	0.15	0.149	0.148	0.0024	1.64
DS20190106_3	Ba	mg/L	0.0986	0.101	0.1	0.0998	0.0011	1.07
DS20190106_3	Be	mg/L	0.0018	0.0018	0.0019	0.0018	0	0.9
DS20190106_3	Ca	mg/L	26.2	26.1	26.1	26.1	0.055	0.21
DS20190106_3	Cd	mg/L	-	-	-	-	-	-
DS20190106_3	Cd	mg/L	0	0.0023	0.0016	-0.0013	0.0012	89.94
DS20190106_3	Ce	mg/L	0.0093	0.0156	0.0013	0.0088	0.0072	81.77

DS20190106_3	Co	mg/L	0.0092	0.0086	0.0087	0.0089	0.0003	3.76
DS20190106_3	Cr	mg/L	-0.575	-0.576	-0.574	-0.575	0.0009	0.15
DS20190106_3	Cs	mg/L	-0.127	-0.251	-0.211	-0.196	0.0633	32.25
DS20190106_3	Cu	mg/L	0.0022	0.003	0.0022	0.0025	0.0005	18.39
			-	-				
DS20190106_3	Dy	mg/L	0.0014	0.0006	0.001	-0.0003	0.0012	404.19
				-	-			
DS20190106_3	Er	mg/L	-0.006	0.0066	0.0057	-0.0061	0.0005	7.78
DS20190106_3	Eu	mg/L	0.0025	0.0026	0.0026	0.0026	0.0001	2.77
DS20190106_3	Fe	mg/L	0.651	0.664	0.662	0.659	0.007	1.06
			-	-	-			
DS20190106_3	Ga	mg/L	0.0312	0.0474	0.0416	-0.04	0.0082	20.53
			-	-	-			
DS20190106_3	Gd	mg/L	0.0052	0.0059	0.0057	-0.0056	0.0004	6.29
			-	-				
DS20190106_3	Ho	mg/L	0.0018	0.0015	-0.002	-0.0017	0.0002	13.26
DS20190106_3	K	mg/L	2.91	3.14	3.05	3.03	0.114	3.75
DS20190106_3	La	mg/L	0.0023	0.004	0.0052	0.0038	0.0015	38.33
DS20190106_3	Lu	mg/L	0.0026	0.0025	0.0027	0.0026	0.0001	3.64
DS20190106_3	Mg	mg/L	6.25	6.49	6.46	6.4	0.127	1.99
DS20190106_3	Mn	mg/L	0.313	0.319	0.318	0.317	0.0033	1.04
DS20190106_3	Na	mg/L	16.7	17.4	17.3	17.2	0.404	2.35
DS20190106_3	Nd	mg/L	0.019	0.0196	0.0176	0.0188	0.001	5.59
DS20190106_3	Ni	mg/L	-0.656	-0.659	-0.657	-0.657	0.0016	0.24
DS20190106_3	P	mg/L	0.0178	0.0127	0.0212	0.0172	0.0043	24.83
DS20190106_3	Pb	mg/L	0.0025	0.0045	0.0049	0.004	0.0013	33.22
			-	-	-			
DS20190106_3	Pr	mg/L	0.0106	0.0119	0.0213	-0.0146	0.0058	39.93
			-	-				
DS20190106_3	Rb	mg/L	0.0207	0.0863	-0.148	-0.085	0.0637	74.98
DS20190106_3	S	mg/L	7.49	7.74	7.69	7.64	0.133	1.74
DS20190106_3	Se	mg/L	0.0188	0.0326	0.0284	0.0266	0.0071	26.69
			-	-	-			
DS20190106_3	Sm	mg/L	0.0027	0.0025	0.0003	-0.0018	0.0013	72.54
DS20190106_3	Sr	mg/L	0.0549	0.0562	0.0557	0.0556	0.0006	1.15
DS20190106_3	Th	mg/L	0.0547	0.0529	0.059	0.0556	0.0031	5.61
DS20190106_3	Tl	mg/L	0.0152	0.0159	0.0029	0.0114	0.0073	64.26
			-	-	-			
DS20190106_3	Tm	mg/L	0.0043	0.0015	0.0036	-0.0032	0.0015	46.36
DS20190106_3	U	mg/L	0.028	0.0133	0.0369	0.026	0.0119	45.81
DS20190106_3	V	mg/L	0.0021	0.0026	0.0028	0.0025	0.0004	14.67
DS20190106_3	Yb	mg/L	0.0021	0.0021	0.0021	0.0021	0	1.67
DS20190106_3	Zn	mg/L	-1.17	-1.16	-1.16	-1.16	0.0017	0.15
			-	-				
DS20190106_6	Ag	mg/L	0.0043	0.0052	-0.005	-0.0049	0.0005	10.08

DS20190106_6	Al	mg/L	-6.28	-6.51	-6.46	-6.42	0.117	1.82
DS20190106_6	As	mg/L	0.0273	0.0323	0.0431	0.0342	0.008	23.51
DS20190106_6	B	mg/L	0.0086	0.0085	0.0087	0.0086	0.0001	1.2
DS20190106_6	Ba	mg/L	0.0933	0.0952	0.0947	0.0944	0.001	1.06
DS20190106_6	Be	mg/L	0.0019	0.0019	0.0019	0.0019	0	2.17
DS20190106_6	Ca	mg/L	26.9	27.1	27.2	27.1	0.151	0.56
			-	-	-	-	-	-
DS20190106_6	Cd	mg/L	0.0032	0.0007	0.0011	0.0005	0.0024	511.28
DS20190106_6	Ce	mg/L	0.0217	0.0418	0.0349	0.0328	0.0102	31.12
DS20190106_6	Co	mg/L	0.0175	0.017	0.017	0.0172	0.0003	1.67
DS20190106_6	Cr	mg/L	-0.572	-0.575	-0.576	-0.574	0.0018	0.32
DS20190106_6	Cs	mg/L	-0.193	-0.173	-0.165	-0.177	0.0143	8.09
DS20190106_6	Cu	mg/L	0.0018	0.0013	0.0016	0.0016	0.0003	16.86
DS20190106_6	Dy	mg/L	0.0039	0.0004	0.0018	0.002	0.0018	87.64
			-	-	-	-	-	-
DS20190106_6	Er	mg/L	-0.005	0.0057	0.0045	-0.0051	0.0006	12.15
DS20190106_6	Eu	mg/L	0.0023	0.0022	0.0021	0.0022	0.0001	5.17
DS20190106_6	Fe	mg/L	0.489	0.493	0.493	0.492	0.0022	0.44
			-	-	-	-	-	-
DS20190106_6	Ga	mg/L	0.0146	0.0146	0.0316	-0.0203	0.0098	48.45
			-	-	-	-	-	-
DS20190106_6	Gd	mg/L	0.0048	0.0048	-0.006	-0.0052	0.0007	13.95
			-	-	-	-	-	-
DS20190106_6	Ho	mg/L	0.0017	0.0011	0.0013	-0.0014	0.0003	22.64
DS20190106_6	K	mg/L	3.41	3.35	3.42	3.39	0.0389	1.15
DS20190106_6	La	mg/L	0.0079	0.0064	0.0029	0.0057	0.0026	44.5
DS20190106_6	Lu	mg/L	0.0027	0.0026	0.0025	0.0026	0.0001	3.92
DS20190106_6	Mg	mg/L	5.97	6.11	6.11	6.06	0.0791	1.31
DS20190106_6	Mn	mg/L	0.447	0.453	0.452	0.451	0.0035	0.79
DS20190106_6	Na	mg/L	28.5	29.2	29.2	29	0.373	1.29
DS20190106_6	Nd	mg/L	0.0238	0.0209	0.0174	0.0207	0.0032	15.48
DS20190106_6	Ni	mg/L	-0.65	-0.653	-0.653	-0.652	0.0019	0.3
DS20190106_6	P	mg/L	0.0374	0.0186	0.0246	0.0269	0.0096	35.85
DS20190106_6	Pb	mg/L	0.0055	0.0057	0.0061	0.0058	0.0003	4.8
			-	-	-	-	-	-
DS20190106_6	Pr	mg/L	0.0196	-0.033	-0.024	-0.0255	0.0069	26.94
			-	-	-	-	-	-
DS20190106_6	Rb	mg/L	0.0955	0.0955	0.0899	-0.0936	0.0032	3.47
DS20190106_6	S	mg/L	7.31	7.54	7.54	7.46	0.135	1.81
DS20190106_6	Se	mg/L	0.0527	0.0345	0.0322	0.0398	0.0112	28.15
			-	-	-	-	-	-
DS20190106_6	Sm	mg/L	0.0028	0.0023	0.0003	0.0003	0.0025	929.99
DS20190106_6	Sr	mg/L	0.0687	0.0698	0.0698	0.0694	0.0007	0.95
DS20190106_6	Th	mg/L	0.0362	0.0483	0.0465	0.0437	0.0065	14.95
DS20190106_6	Tl	mg/L	0.0177	0.015	0.0033	0.012	0.0076	63.45

DS20190106_6	Tm	mg/L	0.0062	0.0047	0.0079	0.0063	0.0016	25.57
DS20190106_6	U	mg/L	0.0007	0.0032	0.0208	0.0061	0.0129	210.71
DS20190106_6	V	mg/L	0.003	0.0025	0.0034	0.003	0.0004	14.52
DS20190106_6	Yb	mg/L	0.002	0.002	0.0019	0.002	0	2.51
DS20190106_6	Zn	mg/L	-1.02	-1.02	-1.02	-1.02	0.0009	0.08
DS20190106_9	Ag	mg/L	0.0044	0.0028	0.0049	-0.004	0.0011	27.1
DS20190106_9	Al	mg/L	-6.57	-6.7	-6.9	-6.72	0.166	2.47
DS20190106_9	As	mg/L	0.0685	0.0535	0.0797	0.0673	0.0131	19.51
DS20190106_9	B	mg/L	0.0081	0.0088	0.0081	0.0083	0.0004	4.45
DS20190106_9	Ba	mg/L	0.103	0.106	0.106	0.105	0.0014	1.38
DS20190106_9	Be	mg/L	0.002	0.002	0.0019	0.002	0.0001	3.52
DS20190106_9	Ca	mg/L	30.2	30	30	30.1	0.143	0.47
DS20190106_9	Cd	mg/L	0.0031	0.0032	0.0025	0.0013	0.0033	259.52
DS20190106_9	Ce	mg/L	0.0374	0.0385	0.0324	0.0361	0.0033	9.08
DS20190106_9	Co	mg/L	0.0175	0.0187	0.017	0.0178	0.0009	4.92
DS20190106_9	Cr	mg/L	-0.728	-0.727	-0.735	-0.73	0.0042	0.58
DS20190106_9	Cs	mg/L	-0.147	-0.177	-0.199	-0.174	0.0261	14.99
DS20190106_9	Cu	mg/L	0.0028	0.004	0.0024	0.0031	0.0008	27.29
DS20190106_9	Dy	mg/L	0.004	0.0084	0.0013	0.0046	0.0036	78.55
DS20190106_9	Er	mg/L	0.0036	0.0011	0.0047	-0.0031	0.0019	59.86
DS20190106_9	Eu	mg/L	0.0024	0.0031	0.0027	0.0028	0.0004	12.69
DS20190106_9	Fe	mg/L	0.495	0.505	0.503	0.501	0.0053	1.07
DS20190106_9	Ga	mg/L	-0.013	0.0166	0.0456	-0.0251	0.0179	71.15
DS20190106_9	Gd	mg/L	0.0011	0.0011	0.0047	-0.0016	0.003	188
DS20190106_9	Ho	mg/L	0.0016	0	0.0019	-0.0012	0.001	89.54
DS20190106_9	K	mg/L	3.64	3.89	3.77	3.77	0.126	3.33
DS20190106_9	La	mg/L	0.0078	0.0172	0.003	0.0094	0.0072	77.25
DS20190106_9	Lu	mg/L	0.0025	0.0028	0.0026	0.0026	0.0002	5.83
DS20190106_9	Mg	mg/L	7.14	7.35	7.42	7.3	0.144	1.97
DS20190106_9	Mn	mg/L	0.476	0.488	0.488	0.484	0.007	1.46
DS20190106_9	Na	mg/L	32.9	33.9	33.9	33.5	0.591	1.76
DS20190106_9	Nd	mg/L	0.034	0.0401	0.0349	0.0363	0.0033	9.13
DS20190106_9	Ni	mg/L	-0.651	-0.648	-0.656	-0.652	0.004	0.62
DS20190106_9	P	mg/L	0.0385	0.0458	0.0165	0.0336	0.0152	45.31
DS20190106_9	Pb	mg/L	0.0078	0.0144	0.0061	0.0094	0.0044	46.5
DS20190106_9	Pr	mg/L	0.0077	0.0006	0.0045	0.0043	0.0036	83.53
DS20190106_9	Rb	mg/L	0.0907	0.0031	0.0797	-0.0558	0.0513	91.94

DS20190106_9	S	mg/L	7.74	8.04	8.08	7.95	0.187	2.35
DS20190106_9	Se	mg/L	0.0451	0.0591	0.0213	0.0418	0.0191	45.66
DS20190106_9	Sm	mg/L	0.0057	0.0142	0.0015	0.0071	0.0065	90.78
DS20190106_9	Sr	mg/L	0.0762	0.078	0.0784	0.0775	0.0012	1.53
DS20190106_9	Th	mg/L	0.0595	0.0627	0.0533	0.0585	0.0048	8.12
DS20190106_9	Tl	mg/L	0.0532	0.0333	0.0272	0.0379	0.0136	35.83
			-	-	-			
DS20190106_9	Tm	mg/L	0.0006	0.0003	0.0021	-0.001	0.0009	95.07
					-			
DS20190106_9	U	mg/L	0.0293	0.0361	0.0045	0.0203	0.0218	107.18
DS20190106_9	V	mg/L	0.0033	0.004	0.0025	0.0032	0.0008	23.34
DS20190106_9	Yb	mg/L	0.0022	0.0022	0.0022	0.0022	0	1.16
DS20190106_9	Zn	mg/L	-1.05	-1.05	-1.06	-1.05	0.0018	0.17
			-	-	-			
DS20190106_10	Ag	mg/L	0.0042	0.0046	0.0042	-0.0044	0.0002	5.49
DS20190106_10	Al	mg/L	-5.53	-5.79	-5.91	-5.74	0.194	3.38
DS20190106_10	As	mg/L	0.0413	0.0365	0.0481	0.042	0.0058	13.9
DS20190106_10	B	mg/L	0.162	0.168	0.168	0.166	0.0035	2.12
DS20190106_10	Ba	mg/L	0.107	0.109	0.109	0.108	0.0014	1.32
DS20190106_10	Be	mg/L	0.0018	0.0018	0.0018	0.0018	0	1.35
DS20190106_10	Ca	mg/L	33	32.8	32.8	32.9	0.117	0.36
			-	-	-			
DS20190106_10	Cd	mg/L	0.0009	0.0027	0.0001	-0.0011	0.0014	123.44
DS20190106_10	Ce	mg/L	0.044	0.042	0.0461	0.044	0.002	4.59
DS20190106_10	Co	mg/L	0.0136	0.0141	0.0144	0.014	0.0004	2.68
DS20190106_10	Cr	mg/L	-0.735	-0.738	-0.732	-0.735	0.0031	0.43
					-			
DS20190106_10	Cs	mg/L	-0.178	-0.132	0.0723	-0.127	0.053	41.56
DS20190106_10	Cu	mg/L	0.0033	0.0029	0.0061	0.0041	0.0018	43.02
DS20190106_10	Dy	mg/L	0.0025	0.0002	0.0002	0.001	0.0013	134.97
			-	-	-			
DS20190106_10	Er	mg/L	0.0066	0.0078	0.0065	-0.007	0.0007	10.34
DS20190106_10	Eu	mg/L	0.0021	0.0027	0.0027	0.0025	0.0003	12.62
DS20190106_10	Fe	mg/L	0.51	0.52	0.521	0.517	0.0059	1.15
			-		-			
DS20190106_10	Ga	mg/L	0.0556	-0.043	0.0522	-0.0503	0.0065	13
			-	-	-			
DS20190106_10	Gd	mg/L	0.0073	0.0099	0.0061	-0.0077	0.0019	24.92
			-		-			
DS20190106_10	Ho	mg/L	0.0009	-0.001	0.0011	-0.001	0.0001	8.54
DS20190106_10	K	mg/L	4.04	4.22	4.25	4.17	0.111	2.66
DS20190106_10	La	mg/L	0.006	0.0062	0.0069	0.0064	0.0005	7.81
DS20190106_10	Lu	mg/L	0.0026	0.0026	0.0026	0.0026	0	0.31
DS20190106_10	Mg	mg/L	7.55	7.85	7.82	7.74	0.164	2.12
DS20190106_10	Mn	mg/L	0.448	0.458	0.461	0.456	0.0068	1.49

DS20190106_10	Na	mg/L	36.4	37.5	37.3	37.1	0.596	1.61
DS20190106_10	Nd	mg/L	0.0284	0.0266	0.0284	0.0278	0.001	3.68
DS20190106_10	Ni	mg/L	-0.655	-0.656	-0.654	-0.655	0.0009	0.13
DS20190106_10	P	mg/L	0.0417	0.0266	0.0459	0.0381	0.0102	26.67
DS20190106_10	Pb	mg/L	0.003	0.0042	0.0032	0.0035	0.0006	18.04
			-	-	-			
DS20190106_10	Pr	mg/L	0.0179	0.0278	0.0327	-0.0261	0.0076	28.88
DS20190106_10	Rb	mg/L	-0.104	-0.105	-0.12	-0.11	0.0089	8.1
DS20190106_10	S	mg/L	7.33	7.65	7.66	7.55	0.19	2.52
DS20190106_10	Se	mg/L	0.037	0.022	0.0478	0.0356	0.013	36.5
				-				
DS20190106_10	Sm	mg/L	0.003	0.0005	0.006	0.0028	0.0032	113.11
DS20190106_10	Sr	mg/L	0.082	0.0843	0.0841	0.0835	0.0013	1.51
DS20190106_10	Th	mg/L	0.0539	0.0504	0.0559	0.0534	0.0028	5.24
			-	-				
DS20190106_10	Tl	mg/L	0.0212	0.0092	0.0299	-0.0002	0.0267	16012.09
DS20190106_10	Tm	mg/L	0.0098	0.0058	0.006	0.0072	0.0022	30.97
DS20190106_10	U	mg/L	0.0101	0.0248	0.0098	0.0149	0.0086	57.55
DS20190106_10	V	mg/L	0.0027	0.0029	0.0029	0.0029	0.0001	4.62
DS20190106_10	Yb	mg/L	0.0022	0.0021	0.0021	0.0021	0	2.16
DS20190106_10	Zn	mg/L	-1.04	-1.04	-1.04	-1.04	0.0027	0.26
				-	-			
DS20190114_1	Ag	mg/L	0	0.0027	0.0027	-0.0018	0.0016	85.59
DS20190114_1	Al	mg/L	-5.86	-5.88	-5.73	-5.82	0.0827	1.42
DS20190114_1	As	mg/L	0.0759	0.0582	0.057	0.0637	0.0106	16.6
DS20190114_1	B	mg/L	0.151	0.154	0.154	0.153	0.0018	1.17
DS20190114_1	Ba	mg/L	0.1	0.102	0.101	0.101	0.0007	0.7
DS20190114_1	Be	mg/L	0.0019	0.0019	0.0019	0.0019	0	2.13
DS20190114_1	Ca	mg/L	77.1	76.8	77	77	0.155	0.2
				-	-			
DS20190114_1	Cd	mg/L	0.0015	0.0029	0.0016	-0.001	0.0023	223.79
DS20190114_1	Ce	mg/L	0.0528	0.048	0.0377	0.0461	0.0077	16.69
DS20190114_1	Co	mg/L	0.0065	0.0061	0.0066	0.0064	0.0002	3.77
DS20190114_1	Cr	mg/L	-0.729	-0.729	-0.729	-0.729	0.0002	0.03
			-	-	-			
DS20190114_1	Cs	mg/L	0.0467	0.0942	0.0546	-0.0652	0.0255	39.07
DS20190114_1	Cu	mg/L	0.0201	0.019	0.0198	0.0196	0.0006	3.12
DS20190114_1	Dy	mg/L	0.0069	0.0041	0.0057	0.0056	0.0014	25.11
			-	-	-			
DS20190114_1	Er	mg/L	0.0017	0.0028	0.0031	-0.0025	0.0007	29.25
DS20190114_1	Eu	mg/L	0.0041	0.0042	0.0044	0.0042	0.0001	3.44
DS20190114_1	Fe	mg/L	0.119	0.117	0.117	0.117	0.0012	1
				-				
DS20190114_1	Ga	mg/L	0.0062	0.0225	0	-0.0054	0.0151	277.54
DS20190114_1	Gd	mg/L	0.003	0.0027	0.0024	0.0027	0.0003	10.88

DS20190114_1	Ho	mg/L	0.0014	0.0012	0.0013	0.0013	0.0001	9.56
DS20190114_1	K	mg/L	6.02	6.1	6.09	6.07	0.0403	0.66
DS20190114_1	La	mg/L	0.0196	0.0168	0.0165	0.0177	0.0017	9.65
DS20190114_1	Lu	mg/L	0.0032	0.0029	0.003	0.003	0.0002	5.16
DS20190114_1	Mg	mg/L	10.5	10.7	10.6	10.6	0.0971	0.92
DS20190114_1	Mn	mg/L	0.156	0.157	0.157	0.157	0.001	0.64
DS20190114_1	Na	mg/L	210	209	209	209	0.546	0.26
DS20190114_1	Nd	mg/L	0.074	0.0629	0.0736	0.0702	0.0063	8.92
DS20190114_1	Ni	mg/L	-0.661	-0.662	-0.664	-0.662	0.0019	0.29
DS20190114_1	P	mg/L	0.0448	0.039	0.0395	0.0411	0.0032	7.77
DS20190114_1	Pb	mg/L	0.0157	0.0136	0.0173	0.0155	0.0019	11.93
DS20190114_1	Pr	mg/L	0.0165	0.0188	0.0169	0.0174	0.0012	7.02
DS20190114_1	Rb	mg/L	0.253	0.155	0.225	0.211	0.0504	23.91
DS20190114_1	S	mg/L	8.59	8.78	8.78	8.72	0.106	1.22
DS20190114_1	Se	mg/L	0.0555	0.0205	0.029	0.035	0.0183	52.16
DS20190114_1	Sm	mg/L	0.0131	0.0094	0.0145	0.0123	0.0026	21.11
DS20190114_1	Sr	mg/L	0.149	0.15	0.15	0.15	0.0005	0.32
DS20190114_1	Th	mg/L	0.0818	0.0746	0.0749	0.0771	0.0041	5.32
DS20190114_1	Tl	mg/L	0.0275	0.0346	0.0401	0.0341	0.0064	18.65
			-					
DS20190114_1	Tm	mg/L	0.0013	0.0005	0.0004	0.0004	0.0009	196.89
DS20190114_1	U	mg/L	0.182	0.144	0.153	0.159	0.0199	12.48
DS20190114_1	V	mg/L	0.0024	0.0009	0.0013	0.0015	0.0008	51.67
DS20190114_1	Yb	mg/L	0.0026	0.0025	0.0025	0.0025	0	1.41
DS20190114_1	Zn	mg/L	-1.11	-1.11	-1.11	-1.11	0.0006	0.05
			-		-			
DS20190114_2	Ag	mg/L	0.0055	-0.007	0.0053	-0.006	0.0009	15.66
DS20190114_2	Al	mg/L	-6.82	-7.12	-7.06	-7	0.158	2.26
DS20190114_2	As	mg/L	0.0519	0.0065	0.0635	0.0406	0.0301	74.12
DS20190114_2	B	mg/L	0.0069	0.0069	0.007	0.0069	0	0.53
DS20190114_2	Ba	mg/L	0.145	0.148	0.149	0.148	0.002	1.38
DS20190114_2	Be	mg/L	0.0018	0.0018	0.0018	0.0018	0	1.74
DS20190114_2	Ca	mg/L	26.3	26.3	26.6	26.4	0.15	0.57
			-		-			
DS20190114_2	Cd	mg/L	0.0019	0.0016	0.0016	-0.0004	0.002	493.44
			-		-			
DS20190114_2	Ce	mg/L	0.0155	0.0155	0.0009	0.01	0.0095	94.77
DS20190114_2	Co	mg/L	0.0286	0.0277	0.0289	0.0284	0.0006	2.17
DS20190114_2	Cr	mg/L	-0.573	-0.574	-0.575	-0.574	0.001	0.17
			-		-			
DS20190114_2	Cs	mg/L	-0.214	-0.185	0.0883	-0.162	0.0658	40.53
DS20190114_2	Cu	mg/L	0.0051	0.0049	0.0056	0.0052	0.0003	6.63
DS20190114_2	Dy	mg/L	0.0013	0.0019	0.0001	0.0011	0.0009	79.66
			-		-			
DS20190114_2	Er	mg/L	0.0057	0.0061	0.0082	-0.0067	0.0014	20.6

DS20190114_2	Eu	mg/L	0.0019	0.0017	0.0019	0.0019	0.0001	6.39
DS20190114_2	Fe	mg/L	0.192	0.195	0.195	0.194	0.0017	0.85
			-	-	-			
DS20190114_2	Ga	mg/L	0.0357	0.0327	0.0438	-0.0374	0.0058	15.4
			-	-	-			
DS20190114_2	Gd	mg/L	0.0067	0.0093	0.0088	-0.0083	0.0014	16.84
			-	-	-			
DS20190114_2	Ho	mg/L	0.0021	0.0018	0.0017	-0.0019	0.0002	11.77
DS20190114_2	K	mg/L	3.71	3.87	3.86	3.81	0.0917	2.4
DS20190114_2	La	mg/L	0.0028	0.0014	0.0023	0.0022	0.0007	32.05
DS20190114_2	Lu	mg/L	0.0028	0.0028	0.0027	0.0027	0.0001	2.59
DS20190114_2	Mg	mg/L	7.81	8.02	8	7.94	0.113	1.43
DS20190114_2	Mn	mg/L	0.514	0.524	0.525	0.521	0.006	1.15
DS20190114_2	Na	mg/L	69.3	71.1	71.1	70.5	1.02	1.45
DS20190114_2	Nd	mg/L	0.0102	0.0067	0.0082	0.0084	0.0017	20.52
DS20190114_2	Ni	mg/L	-0.623	-0.624	-0.624	-0.624	0.0007	0.11
DS20190114_2	P	mg/L	0.027	0.0176	0.0206	0.0217	0.0048	22.19
			-					
DS20190114_2	Pb	mg/L	0.0013	0.0031	0.0043	0.0008	0.0037	449.23
DS20190114_2	Pr	mg/L	0.0139	0.0033	0.004	0.0071	0.0059	83.74
			-	-	-			
DS20190114_2	Rb	mg/L	0.0371	0.0938	0.0969	-0.0759	0.0336	44.32
DS20190114_2	S	mg/L	1.19	1.21	1.19	1.2	0.014	1.17
DS20190114_2	Se	mg/L	0.0266	0.0385	0.059	0.0414	0.0163	39.54
			-	-				
DS20190114_2	Sm	mg/L	0.0076	0.0087	-0.009	-0.0084	0.0007	8.73
DS20190114_2	Sr	mg/L	0.0605	0.0618	0.0617	0.0613	0.0007	1.2
DS20190114_2	Th	mg/L	0.0567	0.0517	0.0478	0.0521	0.0045	8.57
			-					
DS20190114_2	Tl	mg/L	0.0131	0.0067	0.0114	0.0028	0.0127	454.14
DS20190114_2	Tm	mg/L	0.0025	0.0046	0.0019	0.003	0.0014	46.4
			-	-				
DS20190114_2	U	mg/L	0.0047	0.0146	-0.013	-0.0108	0.0053	49.32
DS20190114_2	V	mg/L	0.0028	0.002	0.0019	0.0022	0.0005	21.89
DS20190114_2	Yb	mg/L	0.002	0.002	0.002	0.002	0	0.14
DS20190114_2	Zn	mg/L	-0.977	-0.974	-0.974	-0.975	0.0019	0.2
			-	-	-			
DS20190114_3	Ag	mg/L	0.0048	0.0031	0.0048	-0.0042	0.001	23.07
DS20190114_3	Al	mg/L	-5.48	-5.59	-5.77	-5.61	0.145	2.58
DS20190114_3	As	mg/L	0.04	0.0687	0.0394	0.0494	0.0168	33.97
DS20190114_3	B	mg/L	0.15	0.155	0.154	0.153	0.0028	1.86
DS20190114_3	Ba	mg/L	0.0966	0.0992	0.0987	0.0982	0.0014	1.38
DS20190114_3	Be	mg/L	0.0018	0.002	0.0018	0.0018	0.0001	5.59
DS20190114_3	Ca	mg/L	44.9	44.9	44.4	44.8	0.282	0.63
DS20190114_3	Cd	mg/L	0.0026	0.0108	0.0022	0.0052	0.0048	93.43

DS20190114_3	Ce	mg/L	0.0503	0.0451	0.0359	0.0438	0.0073	16.69
DS20190114_3	Co	mg/L	0.0108	0.0123	0.0102	0.0111	0.0011	9.71
DS20190114_3	Cr	mg/L	-0.571	-0.566	-0.572	-0.57	0.0032	0.56
			-	-				
DS20190114_3	Cs	mg/L	0.0404	0.0256	-0.106	-0.0573	0.0428	74.62
DS20190114_3	Cu	mg/L	0.0072	0.0087	0.0077	0.0079	0.0008	9.99
DS20190114_3	Dy	mg/L	0.0025	0.0036	0.0026	0.0029	0.0006	20.78
			-	-	-			
DS20190114_3	Er	mg/L	0.0064	0.0055	0.0061	-0.006	0.0005	7.6
DS20190114_3	Eu	mg/L	0.0023	0.0026	0.0025	0.0025	0.0001	5.69
DS20190114_3	Fe	mg/L	0.304	0.31	0.308	0.307	0.0033	1.06
			-	-	-			
DS20190114_3	Ga	mg/L	0.0435	0.0023	0.0213	-0.0224	0.0206	92.07
			-	-	-			
DS20190114_3	Gd	mg/L	0.0046	0.0006	0.0057	-0.0036	0.0027	73.34
			-	-	-			
DS20190114_3	Ho	mg/L	0.0012	0.0001	0.0008	-0.0007	0.0006	86.8
DS20190114_3	K	mg/L	4.31	4.71	4.51	4.51	0.2	4.44
DS20190114_3	La	mg/L	0.0096	0.0157	0.0119	0.0124	0.0031	24.94
DS20190114_3	Lu	mg/L	0.0027	0.0029	0.0027	0.0028	0.0001	4.35
DS20190114_3	Mg	mg/L	8.32	8.53	8.49	8.44	0.109	1.29
DS20190114_3	Mn	mg/L	0.319	0.326	0.325	0.323	0.0037	1.15
DS20190114_3	Na	mg/L	112	114	112	113	0.791	0.7
DS20190114_3	Nd	mg/L	0.0446	0.035	0.0341	0.0379	0.0058	15.34
DS20190114_3	Ni	mg/L	-0.654	-0.646	-0.654	-0.652	0.0046	0.71
DS20190114_3	P	mg/L	0.0287	0.0628	0.0303	0.0406	0.0192	47.36
DS20190114_3	Pb	mg/L	0.0034	0.0244	0.0122	0.0134	0.0105	78.9
			-	-	-			
DS20190114_3	Pr	mg/L	0.0145	0.0075	0.0241	-0.0154	0.0083	54.26
				-				
DS20190114_3	Rb	mg/L	-0.138	0.0736	-0.106	-0.106	0.0324	30.58
DS20190114_3	S	mg/L	6.99	7.19	7.2	7.13	0.117	1.65
DS20190114_3	Se	mg/L	0.0932	0.116	0.0719	0.0938	0.0222	23.67
			-	-	-			
DS20190114_3	Sm	mg/L	0.0055	0.0011	0.0063	-0.0043	0.0028	64.23
DS20190114_3	Sr	mg/L	0.0815	0.0834	0.0832	0.0827	0.0011	1.29
DS20190114_3	Th	mg/L	0.0609	0.0745	0.0618	0.0657	0.0076	11.57
DS20190114_3	Tl	mg/L	0.0056	0.0338	0.0254	0.0216	0.0145	67.19
			-	-	-			
DS20190114_3	Tm	mg/L	0.0028	0.0024	0.0034	-0.0028	0.0005	17.58
DS20190114_3	U	mg/L	0.053	0.0697	0.0617	0.0615	0.0084	13.63
DS20190114_3	V	mg/L	0.0043	0.0062	0.0048	0.0051	0.001	18.93
DS20190114_3	Yb	mg/L	0.002	0.0021	0.002	0.002	0	1.65
DS20190114_3	Zn	mg/L	-1.24	-1.24	-1.24	-1.24	0.0013	0.1

DS20190114_4	Ag	mg/L	0.0036	0.0044	0.0052	-0.0044	0.0008	18.34
DS20190114_4	Al	mg/L	0.202	0.21	0.222	0.212	0.0101	4.76
DS20190114_4	As	mg/L	0.047	0.0114	0.0288	0.0291	0.0178	61.3
DS20190114_4	B	mg/L	0.156	0.161	0.161	0.159	0.0026	1.65
DS20190114_4	Ba	mg/L	0.0876	0.0895	0.089	0.0887	0.001	1.09
DS20190114_4	Be	mg/L	0.002	0.0019	0.0018	0.0019	0.0001	4.4
DS20190114_4	Ca	mg/L	41.8	41.8	41.4	41.7	0.224	0.54
DS20190114_4	Cd	mg/L	0.0089	0.0034	0.0056	0.006	0.0028	46.26
DS20190114_4	Ce	mg/L	0.0215	0.0011	0.0093	0.0107	0.0102	96.05
DS20190114_4	Co	mg/L	0.0123	0.0105	0.0097	0.0108	0.0013	12.48
DS20190114_4	Cr	mg/L	-0.721	-0.726	-0.727	-0.725	0.0031	0.42
DS20190114_4	Cs	mg/L	-0.19	-0.198	-0.211	-0.2	0.0106	5.31
DS20190114_4	Cu	mg/L	0.0086	0.0076	0.0081	0.0081	0.0005	5.72
DS20190114_4	Dy	mg/L	0.0084	0.0048	0.0035	0.0056	0.0025	45.39
DS20190114_4	Er	mg/L	-0.004	-0.006	0.0056	-0.0052	0.001	19.93
DS20190114_4	Eu	mg/L	0.0026	0.0022	0.0027	0.0025	0.0003	12.18
DS20190114_4	Fe	mg/L	0.521	0.533	0.529	0.528	0.0061	1.16
DS20190114_4	Ga	mg/L	0.0148	0.0255	0.0297	-0.0234	0.0077	32.89
DS20190114_4	Gd	mg/L	0.0017	0.0007	0.0031	-0.0007	0.0024	325.28
DS20190114_4	Ho	mg/L	0.0001	0.0003	0.0004	0.0002	0.0003	151.48
DS20190114_4	K	mg/L	4.49	4.51	4.67	4.56	0.0998	2.19
DS20190114_4	La	mg/L	0.0165	0.0113	0.0104	0.0127	0.0033	26.14
DS20190114_4	Lu	mg/L	0.0031	0.0027	0.0027	0.0028	0.0002	8.67
DS20190114_4	Mg	mg/L	8.1	8.32	8.32	8.25	0.124	1.5
DS20190114_4	Mn	mg/L	0.397	0.407	0.406	0.404	0.0055	1.37
DS20190114_4	Na	mg/L	96.9	99.1	98.9	98.3	1.23	1.25
DS20190114_4	Nd	mg/L	0.0262	0.0319	0.0339	0.0306	0.004	12.94
DS20190114_4	Ni	mg/L	-0.647	-0.654	-0.652	-0.651	0.0039	0.6
DS20190114_4	P	mg/L	0.0698	0.0444	0.0452	0.0531	0.0145	27.21
DS20190114_4	Pb	mg/L	0.0191	0.0128	0.0127	0.0149	0.0037	24.67
DS20190114_4	Pr	mg/L	0.0019	0.0116	-0.008	-0.0059	0.007	118.36
DS20190114_4	Rb	mg/L	0.0489	0.0144	0.0467	-0.0041	0.0486	1192.74
DS20190114_4	S	mg/L	1.23	1.23	1.22	1.23	0.0069	0.56
DS20190114_4	Se	mg/L	0.106	0.0597	0.0693	0.0785	0.0247	31.42
DS20190114_4	Sm	mg/L	0.0012	0.0019	-0.002	-0.0017	0.0004	24.05
DS20190114_4	Sr	mg/L	0.0764	0.0783	0.078	0.0776	0.001	1.29
DS20190114_4	Th	mg/L	0.0675	0.0633	0.0676	0.0661	0.0024	3.66

DS20190114_4	Tl	mg/L	0.106	0.0977	0.0822	0.0954	0.0122	12.78
			-	-	-			
DS20190114_4	Tm	mg/L	0.0008	0.0023	0.0023	-0.0018	0.0009	48.63
DS20190114_4	U	mg/L	0.0487	0.0505	0.06	0.0531	0.0061	11.48
DS20190114_4	V	mg/L	0.0021	0.0003	0.0011	0.0012	0.0009	79.16
DS20190114_4	Yb	mg/L	0.0024	0.0021	0.0021	0.0022	0.0001	6.58
DS20190114_4	Zn	mg/L	-1.23	-1.23	-1.23	-1.23	0.0001	0.01
					-			
DS20190114_5	Ag	mg/L	0.0002	0.0008	0.0004	0.0002	0.0006	290
DS20190114_5	Al	mg/L	0.357	0.368	0.358	0.361	0.0058	1.62
DS20190114_5	As	mg/L	0.124	0.0958	0.0759	0.0986	0.0243	24.66
DS20190114_5	B	mg/L	0.143	0.148	0.148	0.146	0.003	2.03
DS20190114_5	Ba	mg/L	0.114	0.117	0.117	0.116	0.0019	1.64
DS20190114_5	Be	mg/L	0.002	0.0021	0.002	0.002	0.0001	3.4
DS20190114_5	Ca	mg/L	69.3	69.6	69	69.3	0.329	0.47
DS20190114_5	Cd	mg/L	0.0065	0.0087	0.0033	0.0062	0.0027	44.2
DS20190114_5	Ce	mg/L	0.137	0.1	0.0819	0.106	0.0281	26.4
DS20190114_5	Co	mg/L	0.0136	0.0141	0.0133	0.0137	0.0004	3.26
DS20190114_5	Cr	mg/L	-0.711	-0.706	-0.713	-0.71	0.0035	0.49
			-		-			
DS20190114_5	Cs	mg/L	0.0183	0.0385	0.0774	-0.0191	0.0579	303.93
DS20190114_5	Cu	mg/L	0.0367	0.0377	0.0376	0.0374	0.0005	1.43
DS20190114_5	Dy	mg/L	0.0098	0.0143	0.0088	0.011	0.0029	26.83
DS20190114_5	Er	mg/L	0.0038	0.0046	0.0018	0.0034	0.0015	43.09
DS20190114_5	Eu	mg/L	0.0044	0.0043	0.0042	0.0043	0.0001	2.15
DS20190114_5	Fe	mg/L	0.16	0.161	0.159	0.16	0.001	0.62
			-					
DS20190114_5	Ga	mg/L	0.0014	0.023	0.0098	0.0105	0.0122	116.63
DS20190114_5	Gd	mg/L	0.0027	0.0075	0.0031	0.0045	0.0027	60.22
DS20190114_5	Ho	mg/L	0.0039	0.0035	0.003	0.0035	0.0004	12.19
DS20190114_5	K	mg/L	8.79	9.13	9.25	9.06	0.24	2.65
DS20190114_5	La	mg/L	0.0239	0.0289	0.0193	0.024	0.0048	20.11
DS20190114_5	Lu	mg/L	0.0035	0.0037	0.0035	0.0036	0.0001	2.84
DS20190114_5	Mg	mg/L	22.9	23.7	23.7	23.4	0.48	2.05
DS20190114_5	Mn	mg/L	0.275	0.282	0.282	0.28	0.0042	1.51
DS20190114_5	Na	mg/L	560	562	559	560	1.53	0.27
DS20190114_5	Nd	mg/L	0.0753	0.0834	0.081	0.0799	0.0042	5.25
DS20190114_5	Ni	mg/L	-0.646	-0.642	-0.648	-0.645	0.0029	0.45
DS20190114_5	P	mg/L	0.0912	0.109	0.0893	0.0966	0.0109	11.31
DS20190114_5	Pb	mg/L	0.0366	0.0457	0.0328	0.0384	0.0066	17.2
DS20190114_5	Pr	mg/L	0.0129	0.0058	0.0153	0.0114	0.0049	43.27
DS20190114_5	Rb	mg/L	0.192	0.167	0.169	0.176	0.0139	7.88
DS20190114_5	S	mg/L	8.89	9.26	9.23	9.13	0.205	2.25
DS20190114_5	Se	mg/L	0.106	0.146	0.0943	0.116	0.0272	23.54

DS20190114_5	Sm	mg/L	0.02	0.0181	0.0197	0.0193	0.0011	5.54
DS20190114_5	Sr	mg/L	0.249	0.256	0.256	0.253	0.0042	1.66
DS20190114_5	Th	mg/L	0.16	0.172	0.156	0.163	0.0086	5.26
DS20190114_5	Tl	mg/L	0.144	0.134	0.105	0.127	0.0203	15.96
			-					
DS20190114_5	Tm	mg/L	0.0007	0.0021	0.0011	0.0006	0.0016	283.69
DS20190114_5	U	mg/L	0.161	0.168	0.151	0.16	0.0087	5.43
DS20190114_5	V	mg/L	0.0057	0.0064	0.0047	0.0056	0.0008	14.77
DS20190114_5	Yb	mg/L	0.0029	0.0029	0.0027	0.0028	0.0001	4.4
DS20190114_5	Zn	mg/L	-1.07	-1.07	-1.07	-1.07	0.0016	0.15
			-	-	-			
DS20190114_6	Ag	mg/L	0.0018	0.0013	0.0016	-0.0016	0.0003	16.86
DS20190114_6	Al	mg/L	-5.23	-5.35	-5.25	-5.28	0.0669	1.27
DS20190114_6	As	mg/L	0.0629	0.0749	0.058	0.0653	0.0087	13.33
DS20190114_6	B	mg/L	0.154	0.159	0.158	0.157	0.0027	1.69
DS20190114_6	Ba	mg/L	0.139	0.144	0.143	0.142	0.0026	1.82
DS20190114_6	Be	mg/L	0.0019	0.0019	0.0019	0.0019	0	0.25
DS20190114_6	Ca	mg/L	70	69.9	69.9	69.9	0.0318	0.05
			-	-	-			
DS20190114_6	Cd	mg/L	0.0002	0.0019	0.0015	-0.0011	0.0011	101.86
DS20190114_6	Ce	mg/L	0.0517	0.0409	0.0447	0.0458	0.0055	11.95
DS20190114_6	Co	mg/L	0.015	0.0149	0.0147	0.0149	0.0002	1.13
DS20190114_6	Cr	mg/L	-0.72	-0.721	-0.723	-0.721	0.0015	0.2
			-	-	-			
DS20190114_6	Cs	mg/L	0.0905	0.0276	0.0242	-0.0474	0.0374	78.74
DS20190114_6	Cu	mg/L	0.0322	0.0333	0.0334	0.033	0.0006	1.95
DS20190114_6	Dy	mg/L	0.0076	0.0064	0.0082	0.0074	0.0009	12.68
			-	-	-			
DS20190114_6	Er	mg/L	0.0014	0.0012	0.0003	-0.0001	0.0013	896.74
DS20190114_6	Eu	mg/L	0.0044	0.0044	0.0042	0.0044	0.0001	2.78
DS20190114_6	Fe	mg/L	0.172	0.176	0.174	0.174	0.0021	1.2
			-	-	-			
DS20190114_6	Ga	mg/L	0.0022	0.0109	0.0203	-0.0024	0.0161	666.56
			-	-	-			
DS20190114_6	Gd	mg/L	0.0003	0.0011	0.0011	0.0001	0.0011	1058.2
DS20190114_6	Ho	mg/L	0.0016	0.0029	0.0023	0.0023	0.0007	30.17
DS20190114_6	K	mg/L	8.59	8.77	8.72	8.69	0.096	1.1
DS20190114_6	La	mg/L	0.0166	0.0148	0.015	0.0155	0.001	6.47
DS20190114_6	Lu	mg/L	0.0034	0.0034	0.0032	0.0033	0.0001	3.04
DS20190114_6	Mg	mg/L	15.4	15.9	16	15.7	0.311	1.98
DS20190114_6	Mn	mg/L	0.375	0.385	0.384	0.381	0.0051	1.34
DS20190114_6	Na	mg/L	516	516	516	516	0.304	0.06
DS20190114_6	Nd	mg/L	0.0654	0.0646	0.0604	0.0635	0.0027	4.2
DS20190114_6	Ni	mg/L	-0.652	-0.65	-0.653	-0.652	0.0011	0.17
DS20190114_6	P	mg/L	0.0566	0.0462	0.0509	0.0512	0.0052	10.16

DS20190114_6	Pb	mg/L	0.0188	0.0212	0.0165	0.0188	0.0024	12.63
DS20190114_6	Pr	mg/L	0.0021	0.0004	0.0025	-0.0014	0.0016	113.35
DS20190114_6	Rb	mg/L	0.181	0.223	0.207	0.204	0.0212	10.41
DS20190114_6	S	mg/L	8.83	9.08	9.09	9	0.145	1.61
DS20190114_6	Se	mg/L	0.0942	0.11	0.104	0.103	0.0078	7.64
DS20190114_6	Sm	mg/L	0.01	0.0084	0.0098	0.0094	0.0009	9.31
DS20190114_6	Sr	mg/L	0.343	0.353	0.352	0.349	0.0057	1.62
DS20190114_6	Th	mg/L	0.114	0.11	0.107	0.111	0.0037	3.34
DS20190114_6	Tl	mg/L	0.104	0.0885	0.113	0.102	0.0124	12.15
DS20190114_6	Tm	mg/L	0.001	0.0017	0.0001	0.0009	0.0008	81.96
DS20190114_6	U	mg/L	0.143	0.139	0.13	0.137	0.0069	5.02
DS20190114_6	V	mg/L	0.0041	0.0038	0.0035	0.0038	0.0003	7.8
DS20190114_6	Yb	mg/L	0.0026	0.0026	0.0025	0.0026	0	1.53
DS20190114_6	Zn	mg/L	-1.07	-1.07	-1.07	-1.07	0.0004	0.03
DS20190114_7	Ag	mg/L	0.0002	0.0022	0.0006	0.0008	0.0012	141.39
DS20190114_7	Al	mg/L	-5.8	-5.57	-5.55	-5.64	0.139	2.46
DS20190114_7	As	mg/L	0.0607	0.0841	0.0684	0.0711	0.0119	16.81
DS20190114_7	B	mg/L	0.139	0.143	0.143	0.141	0.0023	1.61
DS20190114_7	Ba	mg/L	0.136	0.138	0.138	0.137	0.0013	0.95
DS20190114_7	Be	mg/L	0.0019	0.002	0.0019	0.0019	0.0001	2.9
DS20190114_7	Ca	mg/L	75.5	75.6	75.1	75.4	0.264	0.35
DS20190114_7	Cd	mg/L	0.0019	0.0084	0.0002	0.0035	0.0043	122.62
DS20190114_7	Ce	mg/L	0.0481	0.0718	0.0497	0.0566	0.0132	23.37
DS20190114_7	Co	mg/L	0.0162	0.018	0.0168	0.017	0.0009	5.23
DS20190114_7	Cr	mg/L	-0.721	-0.716	-0.723	-0.72	0.0038	0.52
DS20190114_7	Cs	mg/L	0.0032	0.0887	0.046	0.0438	0.046	104.88
DS20190114_7	Cu	mg/L	0.037	0.0392	0.0381	0.0381	0.0011	2.89
DS20190114_7	Dy	mg/L	0.0069	0.0119	0.0071	0.0086	0.0029	33.25
DS20190114_7	Er	mg/L	0.0016	0.004	0.0018	0.0025	0.0013	52.39
DS20190114_7	Eu	mg/L	0.0052	0.0061	0.006	0.0058	0.0005	9.19
DS20190114_7	Fe	mg/L	0.139	0.143	0.143	0.142	0.0022	1.59
DS20190114_7	Ga	mg/L	0.0018	0.0196	0.0039	0.0084	0.0097	115.54
DS20190114_7	Gd	mg/L	0.0019	0.0058	0.0007	0.0015	0.0039	253.57
DS20190114_7	Ho	mg/L	0.0019	0.0028	0.0022	0.0023	0.0004	17.65
DS20190114_7	K	mg/L	9.63	10	9.87	9.84	0.194	1.97
DS20190114_7	La	mg/L	0.0169	0.0214	0.0149	0.0177	0.0033	18.82
DS20190114_7	Lu	mg/L	0.0039	0.004	0.0039	0.0039	0.0001	2.1
DS20190114_7	Mg	mg/L	23.8	24.2	24.3	24.1	0.293	1.21
DS20190114_7	Mn	mg/L	0.381	0.389	0.389	0.387	0.0046	1.2
DS20190114_7	Na	mg/L	574	576	578	576	1.92	0.33

DS20190114_7	Nd	mg/L	0.0781	0.0716	0.0683	0.0727	0.005	6.89
DS20190114_7	Ni	mg/L	-0.647	-0.642	-0.649	-0.646	0.0034	0.52
DS20190114_7	P	mg/L	0.0948	0.0841	0.107	0.0953	0.0115	12.05
DS20190114_7	Pb	mg/L	0.0292	0.0372	0.0276	0.0314	0.0052	16.43
DS20190114_7	Pr	mg/L	0.0283	0.0181	0.0137	0.02	0.0075	37.53
DS20190114_7	Rb	mg/L	0.235	0.257	0.211	0.234	0.0231	9.86
DS20190114_7	S	mg/L	8.78	9.11	9.04	8.98	0.178	1.99
DS20190114_7	Se	mg/L	0.101	0.124	0.103	0.109	0.0128	11.74
DS20190114_7	Sm	mg/L	0.0052	0.0099	0.0079	0.0077	0.0023	30.62
DS20190114_7	Sr	mg/L	0.295	0.301	0.3	0.299	0.0031	1.04
DS20190114_7	Th	mg/L	0.164	0.187	0.16	0.17	0.0145	8.48
DS20190114_7	Tl	mg/L	0.138	0.185	0.115	0.146	0.0356	24.43
DS20190114_7	Tm	mg/L	0.0016	0.0018	0.0013	0.0016	0.0003	15.9
DS20190114_7	U	mg/L	0.127	0.169	0.151	0.149	0.0209	14.05
DS20190114_7	V	mg/L	0.0047	0.0061	0.0053	0.0054	0.0007	12.8
DS20190114_7	Yb	mg/L	0.0029	0.0029	0.0029	0.0029	0	0.68
DS20190114_7	Zn	mg/L	-1.05	-1.05	-1.05	-1.05	0.0027	0.26
DS20190114_9	Ag	mg/L	0.0015	0.0023	0.001	0.0016	0.0006	40.26
DS20190114_9	Al	mg/L	-5.96	-5.73	-5.57	-5.75	0.195	3.38
DS20190114_9	As	mg/L	0.117	0.0987	0.103	0.106	0.0094	8.82
DS20190114_9	B	mg/L	0.155	0.16	0.16	0.158	0.0027	1.71
DS20190114_9	Ba	mg/L	0.135	0.139	0.138	0.137	0.0018	1.34
DS20190114_9	Be	mg/L	0.002	0.0019	0.0019	0.0019	0	1.75
DS20190114_9	Ca	mg/L	78.1	78.1	78	78.1	0.0715	0.09
DS20190114_9	Cd	mg/L	0.0017	0.0003	0.0014	0.0011	0.0007	66.58
DS20190114_9	Ce	mg/L	0.0564	0.0596	0.0532	0.0564	0.0032	5.69
DS20190114_9	Co	mg/L	0.0169	0.0177	0.0178	0.0175	0.0005	2.91
DS20190114_9	Cr	mg/L	-0.719	-0.72	-0.722	-0.72	0.0014	0.19
DS20190114_9	Cs	mg/L	0.0888	0.0985	0.0741	0.0871	0.0123	14.08
DS20190114_9	Cu	mg/L	0.0457	0.047	0.046	0.0462	0.0007	1.48
DS20190114_9	Dy	mg/L	0.0111	0.0105	0.0115	0.011	0.0005	4.56
DS20190114_9	Er	mg/L	0.0033	0.0028	0.0034	0.0032	0.0004	11.03
DS20190114_9	Eu	mg/L	0.0047	0.0049	0.0046	0.0047	0.0002	4.17
DS20190114_9	Fe	mg/L	0.0959	0.0971	0.0964	0.0965	0.0006	0.59
DS20190114_9	Ga	mg/L	0.0156	0.0211	0.0235	0.0044	0.0243	554.16
DS20190114_9	Gd	mg/L	0.0038	0.0038	0.0047	0.0041	0.0006	13.54
DS20190114_9	Ho	mg/L	0.0026	0.0026	0.0033	0.0028	0.0004	13.2
DS20190114_9	K	mg/L	11.4	11.9	12	11.7	0.317	2.7
DS20190114_9	La	mg/L	0.0189	0.0197	0.0204	0.0196	0.0007	3.79
DS20190114_9	Lu	mg/L	0.0039	0.0037	0.0037	0.0038	0.0001	2.61
DS20190114_9	Mg	mg/L	26.7	27.4	27.4	27.1	0.412	1.52
DS20190114_9	Mn	mg/L	0.385	0.394	0.393	0.391	0.0048	1.23
DS20190114_9	Na	mg/L	716	718	717	717	1.08	0.15

DS20190114_9	Nd	mg/L	0.0811	0.0909	0.0928	0.0883	0.0062	7.07
DS20190114_9	Ni	mg/L	-0.645	-0.646	-0.647	-0.646	0.0011	0.17
DS20190114_9	P	mg/L	0.0881	0.0826	0.0871	0.0859	0.0029	3.37
DS20190114_9	Pb	mg/L	0.0366	0.032	0.0348	0.0345	0.0023	6.73
DS20190114_9	Pr	mg/L	0.0118	0.0292	0.0177	0.0196	0.0088	44.99
DS20190114_9	Rb	mg/L	0.278	0.361	0.277	0.305	0.0484	15.86
DS20190114_9	S	mg/L	9.31	9.5	9.54	9.45	0.126	1.33
DS20190114_9	Se	mg/L	0.132	0.127	0.115	0.125	0.0085	6.79
DS20190114_9	Sm	mg/L	0.0276	0.0313	0.0286	0.0292	0.0019	6.54
DS20190114_9	Sr	mg/L	0.496	0.51	0.507	0.504	0.0076	1.5
DS20190114_9	Th	mg/L	0.184	0.19	0.186	0.186	0.0033	1.75
DS20190114_9	Tl	mg/L	0.135	0.106	0.119	0.12	0.0141	11.75
DS20190114_9	Tm	mg/L	0.0005	0.0017	0.0002	-0.0008	0.0008	96.66
DS20190114_9	U	mg/L	0.178	0.182	0.186	0.182	0.0043	2.37
DS20190114_9	V	mg/L	0.0059	0.0064	0.0071	0.0065	0.0006	9.51
DS20190114_9	Yb	mg/L	0.0029	0.0031	0.003	0.003	0.0001	2.64
DS20190114_9	Zn	mg/L	-1.07	-1.07	-1.07	-1.07	0.001	0.09
DS29190114_10	Ag	mg/L	0.0016	0.0019	0.0014	0.0016	0.0003	15.7
DS29190114_10	Al	mg/L	-5.7	-5.98	-5.67	-5.79	0.169	2.92
DS29190114_10	As	mg/L	0.054	0.0602	0.0512	0.0552	0.0046	8.36
DS29190114_10	B	mg/L	0.144	0.149	0.148	0.147	0.0024	1.66
DS29190114_10	Ba	mg/L	0.143	0.147	0.147	0.146	0.0021	1.47
DS29190114_10	Be	mg/L	0.0019	0.0019	0.0019	0.0019	0	0.54
DS29190114_10	Ca	mg/L	87.7	87.7	87.8	87.7	0.0947	0.11
DS29190114_10	Cd	mg/L	0.001	0.0012	0.0018	0.0013	0.0004	31.37
DS29190114_10	Ce	mg/L	0.0621	0.0719	0.0607	0.0649	0.0061	9.42
DS29190114_10	Co	mg/L	0.0159	0.0162	0.0149	0.0157	0.0006	4.12
DS29190114_10	Cr	mg/L	-0.72	-0.72	-0.718	-0.72	0.0011	0.15
DS29190114_10	Cs	mg/L	0.0737	0.185	0.0301	0.0962	0.0797	82.84
DS29190114_10	Cu	mg/L	0.0472	0.048	0.048	0.0477	0.0005	0.97
DS29190114_10	Dy	mg/L	0.0093	0.0114	0.0102	0.0103	0.0011	10.36
DS29190114_10	Er	mg/L	0.0044	0.0033	0.0035	0.0037	0.0006	15.7
DS29190114_10	Eu	mg/L	0.0046	0.0048	0.0049	0.0048	0.0002	3.74
DS29190114_10	Fe	mg/L	0.0933	0.0955	0.0956	0.0948	0.0013	1.34
DS29190114_10	Ga	mg/L	0.0009	0.0361	0.0113	0.0161	0.0181	112.38
DS29190114_10	Gd	mg/L	0.0018	0.0038	0.0004	0.002	0.0018	88.38
DS29190114_10	Ho	mg/L	0.0024	0.0039	0.0032	0.0032	0.0008	23.96
DS29190114_10	K	mg/L	11.5	11.9	11.9	11.7	0.215	1.83
DS29190114_10	La	mg/L	0.0185	0.0194	0.0171	0.0184	0.0012	6.49
DS29190114_10	Lu	mg/L	0.0039	0.0039	0.004	0.0039	0.0001	1.36
DS29190114_10	Mg	mg/L	24.8	25.5	25.5	25.2	0.424	1.68
DS29190114_10	Mn	mg/L	0.365	0.374	0.373	0.371	0.0045	1.22
DS29190114_10	Na	mg/L	857	863	863	861	3.2	0.37

DS29190114_10	Nd	mg/L	0.0816	0.0833	0.0802	0.0817	0.0015	1.88
DS29190114_10	Ni	mg/L	-0.647	-0.646	-0.647	-0.647	0.0008	0.12
DS29190114_10	P	mg/L	0.0639	0.0712	0.058	0.0644	0.0066	10.29
DS29190114_10	Pb	mg/L	0.0308	0.0279	0.0282	0.029	0.0016	5.55
DS29190114_10	Pr	mg/L	0.0158	0.0148	0.0177	0.0161	0.0015	9.08
DS29190114_10	Rb	mg/L	0.311	0.3	0.318	0.31	0.0091	2.95
DS29190114_10	S	mg/L	8.99	9.24	9.22	9.15	0.137	1.49
DS29190114_10	Se	mg/L	0.119	0.115	0.141	0.125	0.014	11.14
DS29190114_10	Sm	mg/L	0.0105	0.015	0.0082	0.0112	0.0035	30.88
DS29190114_10	Sr	mg/L	0.5	0.515	0.514	0.51	0.0085	1.66
DS29190114_10	Th	mg/L	0.176	0.18	0.177	0.178	0.0022	1.25
DS29190114_10	Tl	mg/L	0.106	0.082	0.0964	0.095	0.0123	12.91
DS29190114_10	Tm	mg/L	0.0029	0.0044	0.0039	0.0037	0.0008	20.81
DS29190114_10	U	mg/L	0.188	0.22	0.198	0.202	0.0161	7.96
DS29190114_10	V	mg/L	0.0062	0.0069	0.0066	0.0066	0.0004	5.62
DS29190114_10	Yb	mg/L	0.0029	0.003	0.003	0.003	0	1.62
DS29190114_10	Zn	mg/L	-1.05	-1.04	-1.04	-1.04	0.0011	0.1

APPENDIX C:



Site 1: 38°59'44.4"N 76°57'22.5"W. Creek under bridge, downstream of walkway, which gets salted. Surrounded by golf course Green, marsh 20ft downstream.



Site 2: 38°59'45.8"N 76°57'20.2"W. Rusty, goopy mud bottom. Water moves slowly SW, and has iridescent rust film on surface. At western end of marsh, and converges with site 1 creek 150ft downstream.



Site 3: 38°59'40.9"N 76°57'15.4"W. Outlet for water that flows through marsh. Water flows E-SE through woods to site 4.



Site 4: 38°59'39.2"N 76°57'09.8"W. Water from site 3 pouring out of a rusty metal culvert into a low-lying bowl. This depression floods during large precipitation events.



Site 5: 38°59'41.9"N 76°56'56.4"W. Water flows from site 4 past a pond, under and across the road coming out in another metal culvert. Flows N-NE parallel to the road for 350 ft through woods behind Oakland Hall.



Site 6: 38°59'39.5"N 76°56'39.6"W. Water flows from site 5 past bridge (which gets salted during icy conditions) and then continues East, past Eppley (and wastewater output), SPH, and parking lots.



Site 7: 38°59'35.9"N 76°56'23.6"W. Water exits woods after flowing past wastewater outlets and buried sewer lines. Sampling is done downstream of bridge pictured, but upstream of Xfinity Center parking lot runoff input.



Site 8: 38°59'36.0"N 76°56'25.8"W. Water from site 7 continues to flow parallel to road to the south, and past parking lot runoff input to the north.



Site 9: 38°59'36.5"N 76°56'17.2"W. Water flows E, adjacent to parking lots, and under Regents Drive. Site is 20ft upstream of bridge walkway.



Site 10: 38°59'34.9"N 76°56'08.0"W. Stream continues to flow E past more parking lots and under Paint Branch Dr.

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