Stantec

Field Report

Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Jake Alward, John Marshall, Cindi Pannone, Riley Bronga
File:	204700415	Date(s):	December 12, 2017 to December 13, 2017

Subsurface☒ Surface☒ Vegetation☐

Reference: December Water Sampling Event

1.1 BACKGROUND

December's sampling event included both surface and subsurface sampling. The site was much different than November's sampling event. Nearly all the snow was gone, ground was more frozen (Photo 4), and there was approximately an 1" of water lying on top of all the ice in the swamp. Depending on the location, the source of the water on the ice was either ground water or precipitation. The weather was cloudy and 41°F.

It was surprising to find that the ice thickness nearly doubled from November in many locations considering the weather leading up to the sampling event had been unusually warm. At most sampling locations the water and ground were frozen to about 18". There were random locations on site where the ice was thawed and ground water was showing. You could see where the water was flowing as it was warm and melted channels into the surrounding ice.

Water was only sampled at four surface water locations, two at the creek and two and existing ponds. Five of seven subsurface locations were sampled (Photo 1).

Detectable results summary table, data quality summary table, and photo log are attached.

1.2 SAMPLING EVENT HIGHLIGTS

SUBSURFACE SAMPLING

Subsurface water was not sampled at B11 and MW14. MW6 had an ice plug that almost prevented sampling, but it broke loose and floated to the top of the casing (Photo 3). B11 was frozen and MW14 is damaged. The protective casing at MW14 is bent at a 30° angle and the cap is pulled off (Photo 2). The water depth tape was not even able to navigate the bend in the well casing.

SURFACE SAMPLING

SW5 was sampled using a peristaltic pump through a 1" hole drilled through the ice (Photo 6). Ice thickness was determined by drilling a 1" hole through the ice at each sampling location with an 18" drill bit.

Reference: December Water Sampling Event

IMPROVEMENTS FOR FUTURE SAMPLING

- MW14 needs to be fixed
- B3 needs a new cap (Photo 5).

1.3 STREAM GAGING

WEIR 1 (SW17)

Width: 2.21 -ft
Water depth: 0.85 -ft
Velocity: 0.35-ft/sec
Calculated flow: 0.65 -CF/sec

WEIR 2 (SW18)

Width: 3.1875 -ft
Water depth: .85 -ft
Velocity: 0.38 -ft/sec
Calculated flow: 1.03 -CF/sec

1.4 SAMPLE RESULTS

The attached table summarizes detected analytes. All others were below detectable limits. Complete results can be found in the SGS reports. Note that the speciation between nitrate and nitrite is not reported.

1.5 DATA QUALITY

Two surface and one subsurface water samples were sampled. Although some samples have detectable results and the duplicate does not, it is due to detection limit differences between the tests. There are no alarming results. The attached table summarizes the relative percent differences between the samples and duplicates.

Attachment: Photo Log

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December Photo Log

Photo 1:
B4 sampled using a peristaltic pump

Photo 2:
MW14 pulled over at 30° angle

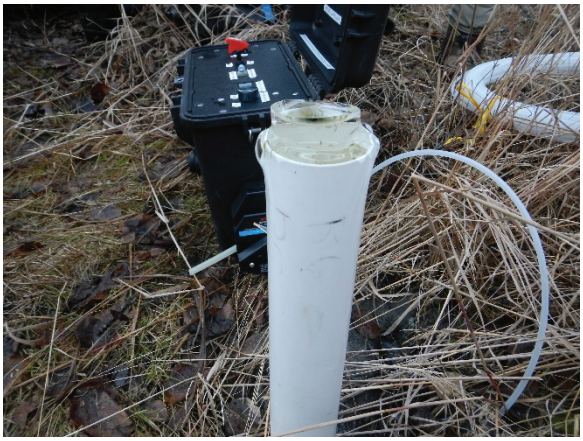

Photo 3:
MW6 with a floating ice plug

Photo 4:
Site is frozen

Photo 5:
B3 with a makeshift cap

Photo 6:
Hole drilled through ice for peristaltic pump

Attachment: Results Summary Table

Detectable Results Summary Table and
Data Quality Summary Table

December-2017

	B1	B3	B4	B11	B11.1	MW6	SW5	SW5.5	SW15	SW15.1	SW17	SW18
Date Collected	12/12/2017	12/12/2017	12/12/2017	12/12/2017	12/12/2017	12/12/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017	12/13/2017
Time	12:02	12:26	11:30	13:59	13:59	12:52	11:43	11:43	14:04	14:04	13:44	14:43
Sample Type	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temp (°C)	2.99	3.28	4.29	3.93	3.93	3.17	0.51	0.51	0.11	0.11	1.37	2.03
Conductivity	238	208	396	352	352	201	381	381	247	247	461	542
pH	6.01	6	5.54	5.51	5.51	5.77	5.5	5.5	5.21	5.21	5.46	5.64
DO	7.7	7.5	14.8	7.7	7.7	2.95	9.5	9.5	15.02	15.02	10.8	10.8
Total Nitrate/ Nitrite (mg/L)	0.0724	0.0542	1.93	0.031	0.0624	0.0318	0.0446	ND	0.0704	0.0994	3.19	5.02
TSS (mg/L)	-	-	-	-	-	-	7.86	7.55	5.25	1.44	0.928	14.4
TKN (mg/L)	ND	0.719	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	0.362	0.438	ND	ND	0.561	0.637
Ammonia (mg/L)	0.0383	0.0816	ND(0.0500)	0.122	0.131	0.0494	0.239	0.223	0.0577	0.0677	0.209	0.144
Total P (mg/L)	0	0	0	0	0	0	0.0245	0.0313	0.0158	0.0135	0.156	0.661
BOD (mg/L)	0	0	0	0	0	0	2.82	2.52	ND	ND	ND	2.17
FC (col/100mL)	ND	ND	ND	ND	ND	ND	ND	ND	24	18	1420	430
E. Coli (col/100mL)	-	-	-	-	-	-	ND	1	54	36	1414	579
TC (col/100mL)**	-	-	-	-	-	-	28	34	228	272	1733	1203
Arsenic (mg/L)	-	-	-	-	-	-	-	-	1.85	ND	-	-
Barium (mg/L)	-	-	-	-	-	-	-	-	12.5	11.6	-	-
Cadmium (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-
Chromium (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-
Copper (mg/L)	-	-	-	-	-	-	-	-	1.93	2.68	-	-
Lead (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-
Selenium (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-
Silver (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-
Mercury (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-
Zinc (mg/L)	-	-	-	-	-	-	-	-	ND	ND	-	-

	B11	Dup1	% Diff	SW5	Dup2	% Diff	SW15	Dup3	% Diff
Total Nitrate/ Nitrite(mg/L)	0.031	0.0624	**67.2%**	0.0446	ND	**NA**	0.0704	0.0994	**34.2%**
TSS (mg/L)	-	-	**-**	7.86	7.55	**4.0%**	5.25	1.44	**113.9%**
TKN (mg/L)	ND	ND	**0.0%**	0.362	0.438	**19.0%**	ND	ND	**0.0%**
Ammonia (mg/L)	0.122	0.131	**7.1%**	0.239	0.223	**6.9%**	0.0577	0.0677	**15.9%**
Total P (mg/L)	-	-	**-**	0.0245	0.0313	**24.4%**	0.0158	0.0135	**15.7%**
BOD (mg/L)	-	-	**-**	2.82	2.52	**11.2%**	ND	ND	**0.0%**
FC (col/100mL)	ND	ND	**0.0%**	ND	ND	**0.0%**	24	18	**28.6%**
E. Coli (col/100mL)	-	-	**-**	ND	1	**NA**	54	36	**40.0%**
TC (col/100mL)**	-	-	**-**	28	34	**19.4%**	228	272	**17.6%**
Arsenic (mg/L)	-	-	**-**	-	-	**-**	1.85	ND	**NA**
Barium (mg/L)	-	-	**-**	-	-	**-**	12.5	11.6	**7.5%**
Cadmium (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**
Chromium (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**
Copper (mg/L)	-	-	**-**	-	-	**-**	1.93	2.68	**32.5%**
Lead (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**
Selenium (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**
Silver (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**
Mercury (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**
Zinc (mg/L)	-	-	**-**	-	-	**-**	ND	ND	**0.0%**