Stantec

Field Report

Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Jake Alward, John Marshall, Riley Bronga
File:	204700415	Date:	December 18 &19, 2018

Subsurface☒ Surface☒ Vegetation Plot☐ Lagoon ☐

Reference: December Water Sampling Event

1.1 BACKGROUND

The December sampling event was for surface and subsurface water. The site was covered in approximately 6-inches of snow and was relatively frozen. All surface water locations were frozen except one (SW11) and about half the wells were frozen. There were open water and thin ice locations in multiple locations south of B11.

There were no major differences noticed from the November 30 earthquake. The slopes above MW10 and MW15 were still intact as well as the toe of slope of the percolation beds about SW17 and SW18.

Water samples were limited due to the frozen nature of the wetland.

1.2 SAMPLING EVENT HIGHLIGHTS

SURFACE
Water was only sampled at SW5, SW17, and SW18. All locations were visited and drilled to determine the thickness of ice. Ice thickness ranged from 0 inches to 18 inches depending on the locations. The northern section of the wetland appears to be more frozen than the southern section. The southern sections (south of B11) had many more upwellings and open water holes, although many were difficult to see since they were covered in 6-inches of snow. There were many times the team stepped into deep water without expecting it.

At all the sampling locations the surface water was completely frozen, except for SW11. SW11 had some snow and slush, but no thick ice. The other locations varied, but in general the soil under the surface water was also frozen to some degree. It is predicted that the soil will continue to freeze as cold conditions are maintained over the winter, although there was not a noticeable difference between November's sampling event and this sampling event. If anything, the southern section seemed to be more thawed.

Water was not sampled at other locations due to the ice; and when the drill bit reached a thawed section, it was mud.

Moving around the site was more difficult due to the snow especially since it covered up the open water and thin ice locations.

SUBSURFACE
9 of the 18 subsurface locations were sampled, the rest were frozen. The wells that were not frozen had either artesian pressure or had a water level below ground surface. MW14B was not sampled

because there was barely any water in the bottom of the well. The first bailer dropped down picked up 18-inches of water and 6-inches of silt. All sampled wells except for MW14 and MW20 were sampled using a peristaltic pump, which proved to be challenging due to the freezing conditions. The tubes already located in the wells were frozen and unusable and the tubes we brought to the wells would also freeze if water was not moving. MW14 and MW20 were sampled using bailers.

There was no vandalism on MW14 and MW20 proving that the at grade casing work better than the above grade casings.

IMPROVEMENTS FOR FUTURE SAMPLING:

The water level meter was not used for this sampling event. It needs to be used in March. The water flow meter needs to be recalibrated, the readings seemed to be larger than normal.

1.3 OTHER ACTIVITIES

WEIR 1 (SW17)

Width: 2.21 -ft
Water depth: 0.6 -ft
Velocity: 0.71-ft/sec
Calculated flow: 0.94 -CF/sec

WEIR 2 (SW18)

Width: 3.22 -ft
Water depth: 0.7 -ft
Velocity: 0.41 -ft/sec
Calculated flow: 0.92 -CF/sec

1.4 SAMPLE RESULTS

The attached table summaries detected analytes. All other were below detectable limits. Complete results can be found in the SGS reports.

1.5 DATA QUALITY

There was one duplicate taken during the December sampling event for surface. The duplicate and original sample all tested very similar with no alarming differences.

Site ID	Nitrate	Nitrite	Total Nitrate/ Nitrite	TSS	TKN	Ammonia	Total P	BOD	FC	E. Coli	TC
SW18	3.31	ND	3.34	1.89	ND	0.165	0.599	ND	2	1	219
SW18.1	3.29	ND	3.32	2.18	1.02	0.212	0.545	ND	ND	2	219
% Diff	**-0.6%**	**0.0%**	**-0.6%**	**14.3%**	**NA**	**24.9%**	**-9.4%**	**0.0%**	**NA**	**66.7%**	**0.0%**

Attachment: Photo Log

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December Photo Log

Photo 1:
SW-1

Photo 4:
SW-10

Photo 2:
SW-2

Photo 5:
SW-11

Photo 3:
MW-2b

Photo 6:
SW-18

Attachment: Results Summary Table

Detectable Results Summary Table

December-2018

Site ID	SW5	SW17	SW18	SW18.1
Date Collected	12/18/2019	12/19/2018	12/19/2018	12/19/2018
Time	14:00	12:20	12:54	12:54
Sample Type	Surface	Surface	Surface	Surface
Water Temperature (°C)	0.35	0.35	0.65	0.65
Conductivity	402	511	637	637
pH	5.6	5.78	5.94	5.94
DO	1.79	7.73	9.85	9.85
Nitrate	ND(0.100)	3.26	3.31	3.29
Total Nitrate/Nitrite	ND(0.100)	3.26	3.34	3.32
TSS	3.47	4.4	1.89	2.18
TKN	ND(0.500)	ND(0.500)	ND(0.500)	1.02
Ammonia	0.197	0.128	0.165	0.212
Total P	0.0202	0.125	0.599	0.545
BOD	4.05	ND(2.00)	ND(2.00)	ND(2.00)
FC	ND(1)	ND(1)	2	ND(1)
E. Coli	ND(1)	5	1	2
TC	31	66	219	219

Site ID	B3	B4	B11	MW6	MW10	MW13	MW14A	MW15	MW20
Date Collected	12/18/2019	12/18/19	12/19/18	12/18/19	12/18/19	12/19/18	12/19/18	12/18/19	12/19/18
Time	13:15	12:05	10:00	12:55	10:00	12:00	14:00	10:40	3:30
Sample Type	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface
Water Temperature (°C)	2.51	3.74	3.48	3.13	3.56	2.85	-	3.46	-
Conductivity	224	449	352	195	373	204	-	347	-
pH	6.59	6.43	5.95	7.23	6.74	7.12	-	5.85	-
DO	3.7	-	1.4	1.57	1.1	1.58	-	1.22	-
Nitrate	ND(0.100)	1.46	ND(0.100)	ND(0.100)	0.236	ND(0.100)	ND(0.100)	ND(0.100)	0.247
Total Nitrate/Nitrite	ND(0.100)	1.46	ND(0.100)	ND(0.100)	0.271	ND(0.100)	ND(0.100)	ND(0.100)	0.247
TSS	-	-	-	-	-	-	-	-	-
Ammonia	0.128	ND(0.0500)	0.185	0.119	ND(0.0500)	0.138	ND(0.0500)	0.242	ND(0.0500)
FC	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)	ND(1)