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Project: City of Wasilla WWTP Pilot Study      Field Crew: Jake Alward, John Marshall

File: 204700415      Date: November 19 to 20, 2019

Subsurface     Surface     Vegetation Plot

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**Reference: November Water Sampling Event**

## 1.1 BACKGROUND

The November sampling event was for surface water only. The weather was cold and wet. It was the first sampling event of the 2019 winter season with snow and ice on the ground. The ice was about 2 inches thick, which was just thin enough to "post hole" nearly every step. The ice created a dangerous environment to walk through and therefore not all sites were observed or sampled. Underneath the approximately 2 inches of ice was a lot of water. There were many locations that had completely open water.

In-situ samples were also taken along the berm to determine if effluent is moving towards to west. The results are summarized below.

## 1.2 SAMPLING EVENT HIGHLIGHTS

### SURFACE

Water was sampled at 14 locations including the effluent and Mr. Shaw's property. The effluent and SW18 were duplicated. Samples were collected either by dipping or peristaltic pump. Intrinsic data from the YSI was taken at all locations apart from the effluent sample.

The location immediately adjacent to discharge bed #1 was completely unfrozen and a small amount of green vegetation was still present. The water was backed up so that the discharge bed was flooded with effluent.

There were many locations throughout the wetland that still had open water, which may be due to the slow flow of effluent, although it is hard to verify especially since the wetland has always had open water locations throughout the winter. It was also not as easy to observe flow because of the ice.

The stream near SW17 appeared to be outside of its banks more than usual. The weir flow values below confirm this observation. The flow at SW18, which appeared to be within its banks, was nearly double the flow at SW17.

**Reference: November Water Sampling Event**
**WEIR FLOW**
**Weir 1 (SW17)**

Width: 2.21 -ft  
 Water Depth: 0.75 -ft  
 Velocity: 0.36 -ft/s  
 Flow: 0.60 -cf/s

**Weir 2 (SW18)**

Width: 3.22 -ft  
 Water Depth: 0.82 -ft  
 Velocity: 0.42 -ft/s  
 Flow: 1.13 -cf/s

**IMPROVEMENTS FOR FUTURE SAMPLING:**

November sampling went smoothly. Something to observe next month is whether the stream near SW17 is back within its normal banks.

**1.3 SAMPLE RESULT**

The attached tables summarize detected analytes. All other were below detectable limits. Complete results can be found in the SGS reports. Results below are from *in-situ* testing.

Sample Location	Date	Result (mg/l)
B3	11/19/2019	2.3
B6	11/19/2019	1.9
BW9	11/19/2019	6.8
B15	11/19/2019	1.0
A9	11/20/2019	2.0
AA2	11/20/2019	0.8
AA1	11/20/2019	1.4
A6	11/20/2019	0.7
A11	11/20/2019	2.0
A8	11/20/2019	1.9
A7	11/20/2019	1.6
A5.5	11/20/2019	2.4
A14	11/20/2019	1.7
A12	11/20/2019	1.5
A10	11/20/2019	0.0

Detectable Results Summary Table

November-2019

Site ID	SW1	SW2	SW3	SW4	SW5	SW6	SW8	SW9	SW14
Date Collected	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/19/2019	11/20/2019	11/20/2019	11/20/2019
Time	10:31	10:58	11:20	13:18	13:40	12:45	11:40	11:29	14:16
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temperature (°C)	0.93	0.02	0.09	0.57	0.04	0.01	0.88	1.34	0.34
Conductivity	397	909	1003	794	492	940	285	810	439
pH	3.54	4.12	5.01	5.4	5.47	4.7	5.36	5.66	7.04
DO	4.32	12	4.3	6.16	3.56	4.28	7.2	5.6	7.18
Nitrate	ND(0.100)	12.5	17.2	2.24	ND(0.100)	11.5	ND(0.100)	2.76	0.597
Nitrite	ND(0.100)	ND(0.200)	ND(0.200)	0.345	ND(0.100)	ND(0.200)	ND(0.100)	ND(0.100)	ND(0.100)
Total Nitrate/Nitrite	ND	12.5	17.2	2.585	ND	11.5	ND	2.76	0.597
TSS	1.9	ND(0.515)	8.63	1.08	1.82	ND(0.500)	ND(0.500)	1.37	3.88
TKN	ND(0.500)	ND(0.500)	2.27	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
Ammonia	ND(0.0500)	ND(0.0500)	0.325	ND(0.0500)	0.107	ND(0.0500)	ND(0.0500)	0.119	ND(0.0500)
Total P	ND(0.0100)	0.701	3.42	0.0376	ND(0.0100)	0.223	ND(0.0100)	ND(0.0100)	ND(0.0100)
BOD	ND(2.00)	ND(2.00)	7.3	ND(2.00)		ND(2.00)	ND(2.00)	ND(2.00)	ND(2.00)
FC	ND(2)	76	15	ND(2)	ND(2)	1.7	ND(2)	1.7	ND(2)
E. Coli	ND(1)	40	10	ND(1)	2	4	ND(1)	3	ND(1)
TC	72	280	3650	248	187	150	90	19	166

Site ID	SW15	SW17	SW18	SW18.1	Shaw	Eff	Eff.1
Date Collected	11/20/2019	11/20/2019	11/20/2019	11/20/2019	11/20/2019	11/19/2019	11/19/2019
Time	14:11	13:38	13:13	13:13	12:19	14:00	14:00
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temperature (°C)	1.44	1.26	1.7	1.7	0.14	10.7	10.9
Conductivity	388	617	697	697	256	0.439	0.444
pH	6.92	6.73	6.65	6.65	5.32		
DO	6.19	9.2	10.2	10.2	11	12.8	12
Nitrate	ND(0.100)	3.45	5.56	5.52	ND(0.100)	13.7	14.4
Nitrite	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	14.5	14.9
Total Nitrate/Nitrite	ND	3.45	5.56	5.52	ND	4.14	4.34
TSS	ND(0.510)	1.6	5.56	9.78	3.56	38.9	49.1
TKN	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	3300	3100
Ammonia	0.117	0.125	0.183	ND(0.0500)	ND(0.0500)	2910	3870
Total P	ND(0.0100)	0.0624	0.325	0.267	ND(0.0100)		
FC	10	3.3	ND(2)	6.7	6.7		
E. Coli	19	12	14	11	10		
TC	236	276	727	649	219		

## November Photo Log



Photo 1:  
Berm



Photo 4:  
Discharge Bed #1



Photo 2:  
SW1



Photo 5:  
SW17



Photo 3:  
SW2



Photo 6:  
SW9