Stantec

Field Report

Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Jake Alward
File:	204700415	Date:	November 21, 2017

Subsurface☐ Surface☒ Vegetation ☐

Reference: November Water Sampling Event

1.1 BACKGROUND

Water samples were taken at 10 surface water locations. The weather was clear and 10°F. All sampling locations were frozen except for SW17 and SW18 (Photo 3, 5 & 6).

Detectable results summary table and photo log are attached.

1.2 SAMPLING EVENT HIGHLIGHTS

A metal breaker bar was used to break through between 3 and 8-inches of ice (Photos 1, 2 & 4). When the ice broke, water flowed to the surface. It appeared the pressure of the ice was forcing water out of the hole. In many locations pools of water were still under the ice. In other locations, the weight of the ice was forcing water out of the saturated earth. This was obvious because the water had much more solids. There were ice chunks and slush in many of the sample bottles despite efforts to remove it. It was very cold for John to do with only nitrile gloves on.

A fecal coliform bottle was missing for the DUP1 set. Therefore, only ammonia, TP, TKN, TC, BOD, and TSS will have duplicated tests. As mentioned before in prior field reports, a checklist of bottles needs to be brought to the lab every time sample bottles are picked up that way no bottles are forgotten.

By the time the bottles got back to the vehicle and were put in the cooler, there was ice starting to form inside the bottle. When the bottles were dropped off at the lab they still had ice formations inside the bottle. If water is to be collected by breaking away ice, some sort of strainer or ladle needs to be carried to each location to remove as much ice and slush from the samples as possible. This will help the lab get more accurate results and help the field crew from freezing their hands.

IMPROVEMENTS FOR FUTURE SAMPLING

- Bring strainer if chipping away ice to access water
- Bottle counts need to be double checked before heading to field. Final bottle count list still needs to be verified with lab.
- In order to keep the water samples at an acceptable temperature in cold weather samplings, the coolers need to be used as heaters instead. The ice packs might work better for cold weather sampling if they are left unfrozen.

Reference: November Water Sampling Event

1.3 STREAM GAGING

Although there was open water in some location, there was also a thick layer of ice over the creek in many locations. To get a good flow reading, the ice was broke and pushed downstream of the gaging stations. The stations appeared to be in good shape even with the water froze around them.

WEIR 1 (SW17)

Width: 2.21' (from previous measurement)
Water elevation: Middle of stream .7 ft
Velocity: 0.30 ft/sec
Calculated flow: 0.46 CF/sec

WEIR 2 (SW18)

Width: 3.22' (from previous measurement)
Water elevations: Middle of stream: .825 ft
Velocity: 0.27 ft/sec
Calculated flow: 0.72 CF/sec

1.4 SAMPLE RESULTS

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

1.5 DATA QUALITY

SW18 was duplicated to verify lab data quality. Fecal coliform was not duplicated. There were no alarming results. The table below summarizes the relative percent difference between the sample and duplicate.

	Nitrite/Nitrite	TSS	TKN	Ammonia	TP	BOD	FC	E. Coli	TC
SW18	7.44	18.4	ND	0.247	1.08	ND	7	5	326
Duplicate	7.49	10.5	ND	0.247	1.08	ND	-	6	435
% Difference	**0.7%**	**54.7%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**NA**	**18.2%**	**28.6%**

Attachment: Photo Log

Attachment: Results Summary Table

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November Photo Log

Photo 1:
Ice chipped away to access water

Photo 2:
Ice being chipped away at SW9

Photo 3:
Pond at SW5 covered in snow

Photo 4:
Ice being chipped away to sample water

Photo 5:
Typical site covered in snow

Photo 6:
Stream is unfrozen at SW17

Detectable Results Summary Table

November-2017

	SW1	SW2	SW3	SW4	SW5	SW9	SW12	SW15	SW17	SW18	SW18.1*
Date Collected	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017	11/21/2017
Time	10:19	10:46	11:01	11:42	11:29	12:26	13:33	13:56	14:25	14:57	14:57
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temp (°C)	0.3	0.15	0.04	0.14	0.12	0.04	0.03	0.38	0.32	0.22	0.22
Conductivity	304	223	287	305	436	369	253	260	598	671	671
pH	5.71	4.3	5.19	5.72	5.03	5.28	4.78	5.05	5.88	5.78	5.78
DO	7	5	4	4.7	3	4	2.2	3.9	6.7	7.6	7.6
Total Nitrate/ Nitrite(mg/L)	ND	ND	ND	ND	ND	ND	ND	ND	4.79	7.44	7.49
TSS (mg/L)	1080	1000	767	513	367	802	1340	2.94	ND	18.4	10.5
TKN (mg/L)	ND	1.6	1.68	ND	ND	1.07	ND	ND	ND	ND	ND
Ammonia (mg/L)	ND	0.152	ND	ND	ND	0.515	0.748	ND	0.516	0.247	0.247
Total P (mg/L)	0.399	0.696	0.621	0.3	0.29	0.38	0.701	0.0428	0.258	1.08	1.08
BOD (mg/L)	8.28	33.2	22.6	7.59	6.15	11.1	9.45	ND	ND	ND	ND
FC (col/100mL)	ND	ND	ND	ND	ND	ND	217	9	5	7	-
E. Coli (col/100mL)	22	26	7	ND	6	3	308	11	3	5	6
TC (col/100mL)**	2421	2421	2421	2421	2421	2421	2421	205	73	326	435

* Denotes duplicate sample

** Value of "2421" means result was greater than 2420