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Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Cindi Pannone, Riley Bronga, John Marshall
File:	204700415	Date(s):	September 26, 2017 to September 27, 2017

Subsurface     Surface     Vegetation

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**Reference:    September Water Sampling Event**

## 1.1 BACKGROUND

All 18 surface water sites were sampled over the two days. Weather ranged from clear and sunny to cloudy, but there was no rain. The terrain was no drier resulting in typically rough terrain (Photo 1 & 4). SW4 and SW18 were duplicated and labeled D1 and D2 respectively. There was a lot of animal waste observed (Photo 2) which is to be expected.

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

## 1.2 SAMPLING EVENT HIGHLIGHTS

Ammonia tests were not performed this month as it was inadvertently left off the lab test request form.

A tape measure was found to be missing so the width of the existing two weirs was not collected. They will be assumed to be the same width as the installation date.

Two safety concerns were noted on this sampling event. The first item being that there are some locations that appear to be upland when they are really sink holes (Photo 3). This is especially deceiving when the ground is covered in leaves. The second item is access to SW18 requires descending a steep hill (Photo 2). There is a rope strung between trees; however, the rope is abrasive and can easily cut skin if gloves are not worn.

## IMPROVEMENTS FOR FUTURE SAMPLING

- Clarify with lab the bottle count for future sampling events
- Bring a tape measure to record width of weir (if there is concern it has changed)
- Extra caution must be taken when working on this job site. It may be helpful to use walking pole when maneuvering the site. Gloves should be used when descending the hill.

## 1.3 STREAM GAGING

Velocities and depth of water at weirs 1 and 2 were collected (Photo 4). Using the previous width of the weirs, stream flow was calculated.

**Reference: September Water Sampling Event**

**WEIR 1 (SW17)**

Width: 2.21' (from original installation)  
Water depth(s): Middle stream – 0.81'  
Velocity: 0.24 ft/sec  
Calculated flow: 0.43 CF/sec

**WEIR 2 (SW18)**

Width: 3.22' (from original installation)  
Water depth(s): Middle stream – 0.75'  
Velocity: 0.17 ft/sec  
Calculated flow: 0.41 CF/sec

## **1.4 RESULTS**

The attached table summarizes detected analytes. All other were below detectable limits. Note the maximum detectable limit for TC is 2420 col/100mL. Completed results can be found in SGS Reports.

## **1.5 DATA QUALITY**

Two surface water samples were duplicated. The relative percent difference of total coliform (TC) between the samples and duplicates are slightly high. Results for TC will be closely monitored for future sampling events.

Attachment: Photo Log

## September Photo Log



Photo 1:  
Pond at SW5



Photo 4:  
Evidence of animal presence



Photo 2:  
Steep hill access to SW18



Photo 4:  
Stream gage station SW17



Photo 3:  
Sink hole covered with leaves



Photo 4:  
Surface water present at SW13

**Attachment: Results Summary Table**

Detectable Results Summary Table and  
Data Quality Summary Table

September-2017

Site ID	SW1	SW2	SW3	SW4	SW4.1*	SW5	SW6	SW7	SW8	SW9
Date Collected	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017	9/26/2017
Time	9:33	10:00	10:47	12:05	12:05	11:41	12:24	12:40	13:49	14:02
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temp (°C)	4.07	4.13	5.84	6.94	6.94	5.61	7.41	7.34	7.01	7.73
Conductivity	160	162	218	278	278	220	282	1.62	179	282
pH	4.68	4.87	6.2	6.86	6.86	6.27	6.7	6.25	6.14	6.76
DO	2.53	2.3	3.01	5.76	5.76	1.57	7.09	3.43	2.64	4.26
Total Nitrate/ Nitrite (mg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TSS (mg/L)	51	281	188	22	17	35	82	99	183	48
TKN (mg/L)	ND	1.06	ND	ND	ND	ND	ND	ND	ND	ND
Total P (mg/L)	0.223	0.254	0.249	ND	ND	ND	0.204	ND	ND	ND
BOD (mg/L)	7.83	9.87	3.74	3.21	3.04	5.79	3.36	2.15	8.19	4.89
FC (col/100mL)	ND	ND	ND	ND	ND	ND	ND	3	ND	1
E. Coli	ND	1	3	ND	ND	ND	ND	3	ND	ND(1)
TC (col/100mL)**	2421	2421	2421	2421	548	2421	2421	2421	2421	2421

Site ID	SW10	SW11	SW12	SW13	SW14	SW15	SW16	SW17	SW18	SW18.1*
Date Collected	9/26/2017	9/26/2017	9/27/2017	9/27/2017	9/27/2017	9/27/2017	9/27/2017	9/27/2017	9/27/2017	9/27/2017
Time	14:17	15:08	9:19	9:36	10:27	10:11	9:50	11:45	11:13	11:13
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Temp (°C)	9.43	6.42	7.16	7.36	5.9	7.01	6.63	5.97	6.58	6.58
Conductivity	144	241	234	200	305	244	129	377	468	468
pH	6.71	6.57	5.38	6.19	6.45	6.62	6.16	6.82	6.91	6.91
DO	3.15	2.23	3.65	3	3.34	4.58	1.32	4.79	5.59	5.59
Total Nitrate/ Nitrite (mg/L)	ND	ND	ND	ND	ND	ND	ND	2.22	4.68	4.69
TSS (mg/L)	54	209	45.2	31.4	188	83.4	806	ND	1.94	1.25
TKN (mg/L)	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total P (mg/L)	0.296	ND	0.393	ND	0.674	0.0531	1.22	0.214	0.811	0.803
BOD (mg/L)	3.1	4.09	5.77	2.78	6.73	2.9	11.5	ND	ND	ND
FC (col/100mL)	14	ND	3	7	11	4	ND	18	2	7
E. Coli	8	ND	33	12	16	6	ND	47	9	12
TC (col/100mL)**	2421	2421	2421	613	2421	579	2421	980	2420	1553

Site ID	Nitrate	Nitrite	TSS	TKN	Total P	BOD	FC	E. Coli	TC**
SW4	ND	ND	22	ND	ND	3.21	ND	ND	2421
Dup1	ND	ND	17	ND	ND	3.04	ND	ND	548
% Difference	0.00%	0.00%	25.64%	0.00%	0.00%	5.44%	0.00%	0.00%	126.17%
SW18	4.68	ND	1.94	ND	0.811	ND	2	9	2420
Dup2	4.69	ND	1.25	ND	0.803	ND	7	12	1553
% Difference	0.21%	0.00%	43.26%	0.00%	0.99%	0.00%	111.11%	28.57%	43.64%

\*Denotes duplicate sample

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

**Attachment: Data Collection Forms**

**FIELD DATA**

Wasilla WWTP 204700415

Collected by/ Team Lead: <b>John Marshall</b>		Collection Date: <b>September 26, 2017</b>	
Field Team: Cindi Pannone, Riley Bronga		Weather: Sunny, Clear, Light Frost	
RSM01 reviewed and RSM02 Completed? Yes <input checked="" type="radio"/> No <input type="radio"/>	Temperature: <b>34°F</b>	Equipment Used: <b>YSI 556, GPS, Camera, Flow Meter</b>	Equipment Calibrated? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Site ID	Time	Sample Type	Water Temperature (all) MS/cm	Conductivity (subsurface)	pH (surface)	DO (surface) mg/L	Well Purged? (Yes or No)	Visible Surface Water? Depth? (Yes or No)	Depth to Groundwater (feet bgs)	Photo Taken? (Yes or No)	Lab Sample ID (complete COC)	Comments
SW1	9:33	Surface / Subsurface Duplicate	4.07°C	160	4.68	2.53	N/A	Y		Y		
SW2	10:00	Surface / Subsurface Duplicate	4.13°C	162	4.87	2.30	N/A	Y		Y		
SW3	10:47	Surface / Subsurface Duplicate	5.84°C	218	6.20	3.01	N/A	Y		Y		
SW5	11:41	Surface / Subsurface Duplicate	5.61°C	220	6.27	1.57	N/A	Y		Y		Pond
SW4	12:05	Surface / Subsurface Duplicate	6.94°C	278	6.86	5.76	N/A	Y		Y		
D1	12:05	Surface / Subsurface Duplicate	6.94°C	278	6.86	5.76	N/A	Y		Y		Duplicate 1 (SW4)
SW6	12:24	Surface / Subsurface Duplicate	7.41°C	282	6.70	7.09	N/A	Y		Y		
SW7	12:40	Surface / Subsurface Duplicate	7.34°C	1.62	6.25	3.43	N/A	Y		Y		
SW8	13:49	Surface / Subsurface Duplicate	7.01°C	179	6.14	2.64	N/A	Y		Y		



**FIELD DATA**

Wasilla WWTP 204700415

Collected by/ Team Lead: <b>John Marshall</b>		Collection Date: <b>September 26, 2017</b>	
Field Team: Cindi Pannone, Riley Bronga		Weather: Sunny, Clear, Light Frost	
RSM01 reviewed and RSM02 Completed? Yes <input checked="" type="radio"/> No <input type="radio"/>	Temperature: <b>34°F</b>	Equipment Used: <b>YSI 556, GPS, Camera, Flow Meter</b>	Equipment Calibrated? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Site ID	Time	Sample Type	Water Temperature (all) MS/cm	Conductivity (subsurface)	pH (surface)	DO (surface) mg/L	Well Purged? (Yes or No)	Visible Surface Water? Depth? (Yes or No)	Depth to Groundwater (feet bgs)	Photo Taken? (Yes or No)	Lab Sample ID (complete COC)	Comments
SW9	14:02	Surface / Subsurface Duplicate	7.73°C	282	6.76	4.26	N/A	Y		Y		
SW10	14:17	Surface / Subsurface Duplicate	9.43°C	144	6.71	3.15	N/A	Y		Y		
SW11	15:08	Surface / Subsurface Duplicate	6.42°C	241	6.57	2.23	N/A	Y		Y		
		Surface / Subsurface Duplicate										
		Surface / Subsurface Duplicate										
		Surface / Subsurface Duplicate										
		Surface / Subsurface Duplicate										
		Surface / Subsurface Duplicate										

**FIELD DATA**

Wasilla WWTP 204700415

Collected by/ Team Lead: <b>John Marshall</b>		Collection Date: <b>September 27, 2017</b>	
Field Team: Cindi Pannone, Riley Bronga		Weather: Mostly Cloudy	
RSM01 reviewed and RSM02 Completed? <input checked="" type="radio"/> Yes <input type="radio"/> No	Temperature: <b>53.1°F</b>	Equipment Used: <b>YSI 556, GPS, Camera, Flow Meter</b>	Equipment Calibrated? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Site ID	Time	Sample Type	Water Temperature (all) MS/cm	Conductivity (subsurface)	pH (surface)	DO (surface) mg/L	Well Purged? (Yes or No)	Visible Surface Water? Depth? (Yes or No)	Depth to Groundwater (feet bgs)	Photo Taken? (Yes or No)	Lab Sample ID (complete COC)	Comments
SW12	9:19	Surface / Subsurface Duplicate	7.16°C	234	5.38	3.65	N/A	Y		Y		
SW13	9:36	Surface / Subsurface Duplicate	7.36°C	200	6.19	3.00	N/A	Y		Y		
SW16	9:50	Surface / Subsurface Duplicate	6.63°C	129	6.16	1.32	N/A	Y		Y		
SW15	10:11	Surface / Subsurface Duplicate	7.01°C	244	6.62	4.58	N/A	Y		Y		
SW14	10:27	Surface / Subsurface Duplicate	5.90°C	305	6.45	3.34	N/A	Y		Y		
SW18	11:13	Surface / Subsurface Duplicate	6.58°C	468	6.91	5.59	N/A	Y		Y		
D2	11:13	Surface / Subsurface Duplicate	6.58°C	468	6.91	5.59	N/A	Y		Y		Duplicate 2 (SW18)
SW17	11:45	Surface / Subsurface Duplicate	5.97°C	377	6.82	4.79	N/A	Y		Y		
		Surface / Subsurface Duplicate										

FLOW METER READINGS:

Near SW 18 .17 ft/sec Uniform Depth .75 ft

Near SW 17 .24f t/sec Uniform Depth .81 ft