Stantec

Field Report

Project:	City of Wasilla WWTP Pilot Study	Field Crew:	Jake Alward, John Marshall, Ryan Cooper
File:	204700415	Date:	June 18-21, 26, 28, 2018

Subsurface☒ Surface☒ Vegetation Plot☐ Lagoon ☐

Reference: June Water Sampling Event

1.1 BACKGROUND

The June sampling event was the largest sampling event to date in 2018. All surface water and sub-surface water locations were sampled. Maneuvering around the site was particularly hard since all the ice had melted and the grass and brush was fully leafed out. The bugs were also incredibly awful.

This sampling event included developing the wells that were froze after being installed in the winter. The event in general took a long time because we had to visit many well sites twice; once to develop and once to sample. We also took our first surface water sample at Mr. Shaw's property.

Sampling and development occurred over a two-week period. We experienced all types of weather in the two weeks.

1.2 SAMPLING EVENT HIGHLIGHTS

SURFACE
All 18 surface water locations and Mr. Shaw's property were sampled with a peristaltic pump. SW5 and SW18 were duplicated. Overall, the site was very wet. It was once again difficult to move around the site without falling into holes up to your waist. The two ponds were full. At Mr. Shaw's property, we were driven down by a UTV to a location of flowing water, which is where we sampled.

SUB-SURFACE
All 16 sub-surface water locations were sampled. As described above, any well that had not yet been developed was developed. Wells were developed using a bailer. Approximately 3 well volumes were purged. MW20 and MW15 was purged with an electric pump. In general, the water bailed from undeveloped wells was very silty. MW14b did not get intrinsic data as there was not enough water to run through the flow-through cell to get proper readings.

IMPROVEMENTS FOR FUTURE SAMPLING:

Better mosquito repellent was needed for this sampling event. The bugs were the worst they have been since project start.

Reference: June Water Sampling Event

1.3 OTHER ACTIVITIES

WEIR 1 (SW17)

Width: 2.21 -ft
Water depth: 0.60 -ft
Velocity: 0.30-ft/sec
Calculated flow: 0.40 -CF/sec

WEIR 2 (SW18)

Width: 3.22 -ft
Water depth: 0.65 -ft
Velocity: 0.25 -ft/sec
Calculated flow: 0.52 -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

Surface water sampled on 6/20/18 does not have total phosphorous results as there was a mix up at the lab.

There were two duplicates taken during the June sampling event, SW5 and SW18. For SW5, the only major difference is the results for the E. Coli. Being that natural wetlands are being tested, there can be a lot of animal waste that can drastically affect these results. For SW18, there are no major differences.

	Nitrate	Nitrite	TSS	TKN	Ammonia	Total P	BOD	FC	E. Coli	TC
SW5	ND	ND	ND	4.95	ND	ND	-	ND	17	5
Duplicate 1	ND	ND	ND	3.83	ND	ND	-	2.39	151	4
% Difference	**0.0%**	**0.0%**	**0.0%**	**-25.5%**	**0.0%**	**0.0%**	**-**	**NA**	**159.5%**	**-22.2%**
SW18	8.25	0.106	8.356	11.3	ND	0.553	0.787	4.05	460	613
Duplicate 2	8.37	ND	8.37	14.1	ND	0.63	0.759	3.58	560	816
% Diff	**1.4%**	**NA**	**0.2%**	**22.0%**	**0.0%**	**13.0%**	**-3.6%**	**-12.3%**	**19.6%**	**28.4%**

Attachment: Photo Log

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June Photo Log

Photo 1:
Developing MW-15

Photo 4:
Bugs at SW-3

Photo 2:
SW-7

Photo 4:
Pond at SW15

Photo 3:
SW-11

Photo 4:
Green vegetation at SW17

Attachment: Results Summary Table

Detectable Results Summary Table

June-2018

Site ID	B1	B3	B4	B11	MW2b	MW6	MW8	MW10	MW12	MW13	MW14a	MW14b	MW15	MW16
Date Collected	6/20/2018	6/20/2018	6/20/2018	6/21/2018	6/20/2018	6/20/2018	6/26/2018	6/19/2018	6/26/2018	6/26/2018	6/19/2018	6/19/2018	6/19/2018	6/26/2018
Time	11:01	11:23	12:25	12:03	10:44	11:58	11:06	14:30	13:33	15:17	11:19	11:19	15:00	13:00
Sample Type	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface	Sub-surface
Water Temperature (°C)	3.4	6.54	4.31	-	5.13	3.11	3.8	3.1	5.12	5.84	4.66	-	3.5	6.6
Conductivity	336	-	466	-	206	217	225	394	204	213	262	-	364	225
pH	7.04	7.25	6.84	-	7.38	7.51	7.1	7.35	7.36	8.16	5.97	-	6.8	6.78
DO	1.39	-	12.6	-	-	1.5	1.64	1.4	1.7	1.74	3.65	-	3.06	1.78
Nitrate	ND(0.0500)	ND(0.0500)	1.42	0.477	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	ND(0.0500)	0.216	ND(0.0500)	ND(0.0500)
Total Nitrate/Nitrite	ND	ND	1.42	0.477	ND	ND	ND	ND	ND	ND	ND	0.216	ND	ND
TKN	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	1.34	ND(0.500)	ND(0.500)	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)	ND(0.0500)	0.538	0.108	ND(0.0500)	0.1	0.149	ND(0.0500)	0.192	ND(0.0500)	-	0.305	ND(0.0500)
FC	ND(2)	17	ND(2)	ND(2)	ND(6)	ND(2)	ND(1)	ND(2)	ND(1)	ND(1)	ND(2)	ND(100)	ND(2)	6
Arsenic	6	9.88	ND(2.50)	6.59	91	12.7	9.8	ND(2.50)	8.83	ND(2.50)	10.3	138	20.7	8.12
Barium	12.4	12.1	14.7	73.8	326	10.7	11.8	62.5	12.1	18.3	60.4	1680	129	23.7
Cadmium	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	ND(1.00)	2.38	ND(1.00)	ND(1.00)
Chromium	ND(2.00)	ND(2.00)	ND(2.00)	9.91	25.2	ND(2.00)	ND(2.00)	7.17	ND(2.00)	ND(2.00)	17.8	895	33.2	ND(2.00)
Copper	ND(3.00)	ND(3.00)	ND(3.00)	23.7	57	ND(3.00)	ND(3.00)	11.6	ND(3.00)	ND(3.00)	26.2	981	42.8	7.55
Lead	ND(0.500)	ND(0.500)	ND(0.500)	3.15	10.9	ND(0.500)	ND(0.500)	1.51	ND(0.500)	ND(0.500)	5.09	132	5.02	ND(0.500)
Mercury	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	ND(0.100)	2.11	ND(0.100)	ND(0.100)
Zinc	ND(12.5)	ND(12.5)	ND(12.5)	37.3	76.6	ND(12.5)	ND(12.5)	ND(12.5)	ND(12.5)	ND(12.5)	59.1	1530	50.5	ND(12.5)

Site ID	MW17	MW20
Date Collected	6/26/2018	6/19/2018
Time	10:16	10:35
Sample Type	Sub-surface	Sub-surface
Water Temperature (°C)	3.59	4.27
Conductivity	485	233
pH	6.26	6.61
DO	1.95	-
Nitrate	ND(0.0500)	0.185
Total Nitrate/Nitrite	ND	0.185
TKN	ND(0.500)	ND(0.500)
Ammonia	0.857	0.288
FC	ND(1)	ND(2)
Arsenic	ND(2.50)	17
Barium	38.2	162
Chromium	ND(2.00)	64.5
Copper	ND(3.00)	75.2
Lead	ND(0.500)	7.72
Mercury	ND(0.100)	0.254
Zinc	ND(12.5)	82.8

Site ID	SW1	SW2	SW3	SW4	SW5	SW5.1	SW6	SW7	SW8	SW9	SW10	SW11	SW12	SW13	SW14
Date Collecte	6/18/2018	6/18/2018	6/18/2018	6/20/2018	6/20/2018	6/20/2018	6/20/2018	6/20/2018	6/26/2018	6/26/2018	6/26/2018	6/21/2018	6/21/2018	6/21/2018	6/28/2018
Time	12:36	14:52	15:00	14:04	15:01	15:01	13:34	13:39	11:42	10:56	10:38	15:00	14:35	14:11	10:37
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface	Surface
Water Tempe	7.79	8.11	10.54	12.98	6.46	6.46	15.36	7.21	8.46	13.36	12.29	7.78	8.78	9.06	9.64
Conductivity	288	212	240	380	370	370	545	272	220	367	217	345	208	187	420
pH	-	5.11	6.05	6.57	6.42	6.42	6.51	5.56	5.95	6.37	5.96	6.28	5.98	5.93	6.31
DO	-	1.65	1.13	0.54	0.96	0.96	2.98	1.49	1.33	1.36	0.99	0.96	2.45	2.71	1.3
TSS	8.2	8.4	3.27	1.12	4.95	3.83	ND(0.505)	ND(0.510)	ND(0.520)	ND(0.495)	ND(0.495)	1.18	1.09	ND(0.500)	1.9
TKN	1.09	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)	ND(0.500)
Total P	0.219	0.0732	0.0225	-	-	-	-	-	0.0416	ND(0.0100)	0.0339	0.176	ND(0.0100)	ND(0.0100)	0.0682
BOD	6.3	3.22	ND(2.00)	ND(2.00)	ND(2.00)	2.39	ND(2.00)	ND(2.00)	ND(2.00)	ND(2.00)	2.21	ND(2.00)	ND(2.00)	ND(2.00)	10.1
FC	ND(100)	ND(2)	ND(2)	2	17	151	ND(2)	ND(2)	ND(1)	ND(1)	ND(1)	ND(2)	ND(2)	ND(2)	ND(1)
E. Coli	50	ND(1)	ND(1)	1	5	4	ND(1)	ND(1)	ND(1)	1	1	ND(1)	1	3	ND(1)
TC	236	2480	980	2420	2420	2140	1986	3080	579	1300	613	140	1080	62	19860

Site ID	SW15	SW16	SW17	SW18	SW18.1	Shaw1
Date Collecte	6/26/2018	6/26/2018	6/28/2018	6/28/2018	6/28/2018	6/19/2018
Time	15:03	14:33	11:08	11:43	11:43	13:04
Sample Type	Surface	Surface	Surface	Surface	Surface	Surface
Water Tempe	10.26	5.54	9.28	9.34	9.34	8.8
Conductivity	295	197	449	687	687	171
pH	6.26	6.31	6.58	6.49	6.49	6.22
DO	1.53	2.85	6.47	5.94	5.94	7.59
Nitrate	ND(0.0500)	ND(0.0500)	1.07	8.25	8.37	ND(0.0500)
Nitrite	ND(0.0500)	ND(0.0500)	ND(0.0500)	0.106	ND(0.100)	ND(0.0500)
Total Nitrate/	ND	ND	1.07	8.356	8.37	ND
TSS	11.4	21.6	7.88	11.3	14.1	ND(0.500)
TKN	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)	0.132	0.553	0.63	ND(0.0500)
Total P	0.0311	0.0564	0.241	0.787	0.759	ND(0.0100)
BOD	ND(2.00)	3.61	ND(2.00)	4.05	3.45	ND(2.00)
FC	8	7	109	460	560	3.3
E. Coli	4	4	130	613	816	12
TC	1553	8660	866	1553	1414	548
Arsenic	ND(2.50)	ND(2.50)	-	-	-	-
Barium	13.4	11.6	-	-	-	-
Cadmium	ND(1.00)	ND(1.00)	-	-	-	-
Chromium	ND(2.00)	ND(2.00)	-	-	-	-
Copper	ND(3.00)	ND(3.00)	-	-	-	-
Lead	ND(0.500)	ND(0.500)	-	-	-	-
Mercury	ND(0.100)	ND(0.100)	-	-	-	-
Zinc	ND(12.5)	ND(12.5)	-	-	-	-