

Pilot Study 2020 Annual Report Attachments

4-29-21v4

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Attachment A – DEQ Approvals and Water Transfer Agreements



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1445 North Orchard • Boise, ID 83706 • (208) 373-0550

Brad Little, Governor
Jess Byrne, Director

September 9, 2020

The Honorable Steven Rule
Mayor, City of Middleton
1103 West Main Street
Middleton ID 83644
srule@middletoncity.com

RE: City of Middleton - Natural Treatment System Pilot Study Work Plan
(Middleton, Canyon County) - Approval

Dear Mayor Rule:

On August 25, 2020, the Idaho Department of Environmental Quality (DEQ) received the final version of the City of Middleton's Natural Treatment Pilot Study Work Plan (Pilot Study). An associated Quality Assurance Project Plan (QAPP) was received by DEQ on August 28, 2020. This approval is based on the documents submitted on those dates, any modifications to the Pilot Study or monitoring will need to be approved by DEQ.

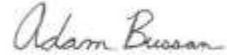
I. PROJECT SPECIFIC CONDITIONS:

- A. This approval is for the operation of the Pilot Study only. Five years after the date of this approval letter, the City of Middleton will need to request re-approval for the Pilot Study, or submit a reuse permit application if the project is to continue beyond that timeframe.
- B. An annual report discussing monitoring results collected according to the QAPP is required to be submitted to DEQ every year by April 30. A Plan of Operation for the reuse irrigation system used in the Pilot Study shall be submitted by April 30, 2021.
- C. In accordance with the "Idaho Wastewater Rules" (IDAPA 58.01.16), submit, for DEQ review and approval, a preliminary engineering report (PER) and Plans and Specifications for the wastewater facility modifications that may remain in use after the Pilot Study has ended.

Mayor Steve Rule
September 9, 2020
Page 2

Please call me with any questions at (208) 373-0282, or contact me via e-mail at adam.bussan@deq.idaho.gov.

Sincerely,



Adam Bussan, PE
Senior Water Quality Engineer

AB:dr

cc: Jack Harrison, PE, HyQual, PA
Mike Martin, PE, Civil Dynamics, PC
Valerie Greear, PE, Boise Regional Office
Larry Waters, PE, Wastewater Engineering Bureau Chief
2020AGH1253



STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 N Orchard Street, Boise, ID 83706
(208) 373-0550

Brad Little, Governor
Jess Byrne, Director

March 18, 2021

By email: srule@middletoncity.com

The Honorable Steven Rule
Mayor, City of Middleton
1103 West Main Street
Middleton ID 83644

RE: City of Middleton – Natural Treatment System Pilot Study (*Middleton, Canyon County*)
Preliminary Engineering Report and Plans and Specifications

Dear Mayor Rule:

The Idaho Department of Environmental Quality (DEQ) has completed its review of the Preliminary Engineering Report (PER) and record drawings (submitted in lieu of plans and specifications) for City of Middleton's Natural Treatment System Pilot Study. The PER and record drawings appear to meet State of Idaho standards and are approved based on the conditions listed below. The submitted documents meet the conditions of Item C in the September 9, 2020 Natural Treatment System Pilot Study Work Plan approval letter sent from DEQ to the City of Middleton for the items included in these approved submittals.

I. STANDARD CONDITIONS

- A. All conditions of this letter must be met. The standard conditions on the DEQ review stamp are part of this approval. Supporting reports or documents are considered to be part of the approved documents.
- B. This approval will be voided if: 1) the project is improperly constructed, operated, or maintained; or 2) the project fails to function as intended.
- D. No material deviations can be made from the approved plans without DEQ's prior written approval.

II. PROJECT SPECIFIC CONDITIONS:

- A. The City of Middleton will need to fill out and submit, to the Idaho Department of Water Resources, a Shallow Injection Well Inventory Form. This form is located at:
<https://idwr.idaho.gov/files/forms/shallow-well-inventory-form.pdf>

Mayor Steven Rule
City of Middleton
March 18, 2021
Page 2

Please call me with any questions at 208-373-0282, or contact me via email at adam.bussan@deq.idaho.gov.

Sincerely,



Adam Bussan, PE
Senior Water Quality Engineer

AB:dr
2021AGH318

Enclosure(s): One set of Approved and Stamped Plans and Specifications

c: Mike Martin, PE, Civil Dynamics, PC (w/ approved and stamped set of plans
Jack Harrison, PE HyQual, PA
Valerie Greear, PE, DEQ Boise Regional Office
Larry Waters, PE, Wastewater Engineering Bureau Chief

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CHRIS YAMAMOTO
CANYON COUNTY RECORDER
Pgs: 25 LBERG NO FEE
AGR
SAWTOOTH LAW OFFICES

LICENSE AGREEMENT

LICENSE AGREEMENT, made and entered into this 7 day of April, 2021, by and among DRAINAGE DISTRICT NO. 2, a drainage district organized and existing under and by virtue of the laws of the State of Idaho, hereinafter referred to as the "District", and

CITY OF MIDDLETON,
Attn: Bruce Bayne, Public Works Superintendent,
Whose address is: 1103 W. Main Street, Middleton, Idaho 83644,

hereinafter referred to as the "Licensee",

WITNESSETH:

WHEREAS, the District owns the drainage ditch or drain known as LAWRENCE KENNEDY DRAIN aka MILL SLOUGH (hereinafter referred to as "ditch or drain"), an integral part of the irrigation and drainage works and system of the District, together with the easement therefor to convey irrigation and drainage water, to operate, clean, maintain, and repair the ditch or drain, and to access the ditch or drain for those purposes; and,

WHEREAS, the District operates, cleans, maintains, repairs and protects the ditch or drain for the benefit of District landowners; and,

WHEREAS, the Licensee is the owner of real property that is servient to the District's ditch or drain and easement, and is particularly described in the "Legal Description" and/or deed attached hereto as **Exhibit A** and by this reference made a part hereof; and,

WHEREAS, the ditch or drain crosses and intersects the real property described in Exhibit A as shown on **Exhibit B**, attached hereto and by this reference made a part hereof; and,

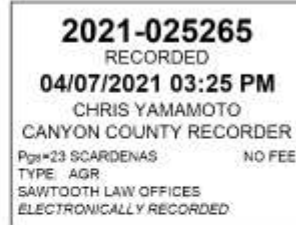
WHEREAS, the Licensee desires a license to cross, encroach upon or modify said ditch or drain and/or the District's easement under the terms and conditions of this License Agreement;

NOW, THEREFORE, for and in consideration of the premises and of the covenants, agreements and conditions hereinafter set forth, the parties agree as follows:

A. Acknowledgment of the District's Easement.

1. Licensee acknowledges that the District's easement for the drain includes a sufficient area of land to convey irrigation and drainage water, to operate, clean, maintain and repair the ditch or drain, and to access the ditch or drain for said purposes, and is a minimum of 100 feet, 50 feet to either side of the centerline for open sections and 50 feet, 25 feet to either side of the centerline of the drain for piped or closed sections.

LICENSE AGREEMENT - 1



LICENSE AGREEMENT

This LICENSE AGREEMENT, is made and entered into this 6 day of April, 2021, by and between CANYON COUNTY WATER COMPANY, duly organized and existing Idaho corporation and ditch company under and by virtue of the laws of the State of Idaho, hereinafter collectively referred to as the "Ditch Company", and

CITY OF MIDDLETON,
Attn: Bruce Bayne, Public Works Superintendent,
Whose address is: 1103 W. Main Street, Middleton, Idaho 83644,

hereinafter referred to as the "Licensee",

WITNESSETH:

WHEREAS, the Ditch Company owns the irrigation ditch or canal known as the WATKINS DITCH (hereinafter referred to as "ditch or canal"), an integral part of the irrigation works and system of the Ditch Company, together with the easement therefor to convey irrigation water, to operate, clean, maintain, and repair the ditch or canal, and to access the ditch or canal for those purposes; and,

WHEREAS, the Ditch Company operates, cleans, maintains, repairs and protects the ditch or canal for the benefit of Ditch Company shareholders; and,

WHEREAS, the Licensee is the owner of real property that is servient to the Ditch Company's ditch or canal and easement, and is particularly described in the "Legal Description" and/or deed attached hereto as **Exhibit A** and by this reference made a part hereof; and,

WHEREAS, the ditch or canal crosses and intersects the real property/right-of-way described in Exhibit A as shown on **Exhibit B**, attached hereto and by this reference made a part hereof; and,

WHEREAS, the Licensee desires a license approve of prior Licensee's crossing, encroachment upon or modification of said ditch or canal and/or the Ditch Company's easement under the terms and conditions of this License Agreement;

NOW, THEREFORE, for and in consideration of the premises and of the covenants, agreements and conditions hereinafter set forth, the parties agree as follows:

A. Acknowledgment of the Ditch Company's Easement.

1. Licensee acknowledges that the Ditch Company's easement for the ditch or canal includes a sufficient area of land to convey irrigation and water, to operate, clean, maintain and repair the ditch or

LICENSE AGREEMENT - 1

Attachment B – QA/QC Review

Overview

A draft QAPP was submitted to DEQ on August 28, 2020 draft, and subsequently QAPP approved by DEQ on September 9, 2020. To help establish background water quality conditions, data collection began in the spring of 2020, which was during the planning and construction phases of this pilot study. While data collection began before the QAPP were drafted and approved, the data were collected using procedures generally consistent with the procedures established in the QAPP. For example:

- All water quality data were collected under the approved sampling procedures and submitted to the laboratory within required timeframes and under chain of custody
- Laboratory QA/QC was followed, and no problems observed or reported
- All wastewater data were collected under the existing Wastewater QAPP
- Preliminary water quality data collected in the spring and summer were compiled, reviewed and analyzed
- After preliminary operations, temperature probes were pulled and calibration checked.
- However, there were a few procedures identified that were not implemented including:
 - Replicate water quality samples were not collected
 - Sampling oversight and review did not occur during all sampling events
 - Some data were not compiled and reviewed until this report was prepared
 - Collection of field notes during surface water sampling

Additionally, during the startup phase, the following data were not collected:

- Water quality data for the Boise River
- Temperature data for the Boise River
- Pump station temperature
- NO₃+NO₂ and TKN for SW
- Replicate samples

Consistent with quality assurance procedures established for annual review and reporting, these minor deficiencies were identified, will be addressed, and additional procedures will be established to facilitate full QAPP compliance. The following modifications to the QAPP and/or Monitoring Section of the Work Plan are proposed:

- A more secure location for Boise River temperature monitoring will be selected, and a probe installed
- Mill Slough water level upstream of Rubicon will be recorded monthly and when any changes to gate setting occur
- Quarterly data review meetings will be scheduled

The following are a few examples of some of the QC measured implemented for this project. Additional QC documentation include chain of custody forms, field logs, field probe calibration notes, and preliminary data review notes, are available upon request.

Temperature Probe Calibration Check

The temperature sensors, HOBO Pendant MX Water Temperature Data Logger, were verified according to the QAPP and the EPA Field Temperature Measurement Operating Procedure (Appendix D of the QAPP).

City staff removed each sensor from the monitoring location and returned all sensors to the WWTP laboratory. The sensors were placed in an ice bath beaker and mixed over a stir plate for 20 minutes for equilibration. Sensor temperatures were compared to the bench top Thermostat Scientific Orion Star A216 meter and a thermometer. City staff ensured that all sensors were away from the sides and bottom of the beaker. Results are shown in table below.

Bench Top Temperature Probe and Thermometer	Sensor Name	Temperature Measurement
		(°C)
(°C)		
1.5	W-4	1.50
	WQ-WC	1.50
	WQ- RUBDS	1.50
	WQ- RUBUS	1.46
	W-1	1.54
	W-2	1.46
	W-3	1.50

Notes:

HOBO Pendant MX Temperature Specs.

Range: -20 °C to 70 °C

Resolution: 0.04 °C

+/- 0.5

Accuracy: °C

*City staff performed temperature check in lab on
10/29

Laboratory notes are on file at the WWTP. Files include photos and temperatures measurements.

Temperature Data QC Log

During review and processing of the temperature data, ground water monitoring well data were removed due to influences by a sampling event, water level measurement event, or the removal of the HOBO sensor for temperature verification. Additional notes regarding the data are highlighted below.

At MW-2, There are data fluctuations in July that are likely due to ponding of surface water/runoff from the adjacent landowner (Fitzpatrick). Based on field notes, surface water ponding was resolved in early August.

At MW-3, temperature data in September and early October abruptly increase several degrees and do not follow the general trend of the other ground water monitoring wells. The weight on the sensor broke and this is likely the cause as the sensor floats. Unfortunately, there are no field notes on when the weight was reinstalled.

At MW-4, there is an increase in temperature on the 5th through 8th of September. Water level measurements were taken on August 4th and September 28th and water quality samples were taken on August 26th. So the increase in temperature is unknown at this time.

The MS-DS site data in August and September had significant variability. The variability is likely a result of the sensor and weight issue. The sensor maybe floating in the Mill Slough and caught in eddys below the Rubicon gate.

Water Level Sensor Verification

The well level sensor, well sounder, was checked after the completion of the 2020 season. All measured depth to water from measurement point were less than 10 feet. Thus the sensor was check occurred for the first 10 feet. The well sounder was verified by rolling out the first 10 feet on the floor of the office laboratory. A tape measure was used to compare/measure the length. Results are shown below.

QAPP Tolerance (ft per 10 ft)	Verification Length*	=>	Allowable Measured Length	
(ft)	(ft)		Min	Max
0.01	10		(ft)	(ft)
			9.99	10.01

*All measured depth to water are less than 10 feet.

Measured Length**
(ft)
10.001

**Measured length in office laboratory with tape measure.

Water Level Data and Sensor QC Check

The well level sensor, well sounder, was checked after the completion of the 2020 season and meets the annual verification per the QAPP and Appendix F.

All measured depths were measured and recorded within 0.01 feet as required in the QAPP and Appendix F.

Ground Water Quality QC Log

Ground water quality were based on the QAPP and Appendix G with the multiple volume purge approach. Full documentation of the purge volume and parameters stabilization (pH and temperature) prior to sampling occurred in the second quarter of 2020. The third and fourth quarter sampling did not include parameter stabilization in the field. These two parameters, pH and temperature, were measured in the office laboratory. No replicate samples were taken during the quarterly sampling event.

Surface Water Quality QC Log

Surface water quality samples were taken using the approach – Dipping Using Sample Container. This approach is outline in the QAPP and Appendix H. No replicate samples were taken during the quarterly sampling event. The NO₃+NO₂ and TKN parameters were not analyzed.

Soil Sampling QC Log

The City used a direct push soil core sampler from Western Laboratories, Inc. Sampling followed Appendix E of the QAPP. Ten random samples from each depth (0"-12", 12"-24", and 24"-36") were taken for OZ 1-3, OZ 4, OZ 5, and OZ 6. The ten samples were then composited and taken to the Western Laboratories for analysis. Soil samples in the fall of 2020 were not collected.

Attachment C – Site Soil Sampling Results

Soil samples were collected per the Pilot Study QAPP (Martin and Harrison 2020) before alfalfa planting in the spring of 2020 and after planting in spring of 2021. Selected results are given in the tables below. The soil sample laboratory reports and QC are available upon request.

Report date	05/28/20	OZ 4			OZ 5			OZ 6			OZ 1-3		
		0-12	12-24	24-36	0-12	12-24	24-36	0-12	12-24	24-36	0-12	12-24	24-36
pH	s.u.	7.1	7.2	7.2	6.6	6.7	7	7.3	8.3	8.2	6.7	7	7
% Organic Matter	Percent	1.22	1.17	0.59	1.17	1.2	2.1	1.6	1	1.55	1.99	1.24	1.21
Nitrate	ppm	39	19	14	8	12	20	14	7	5	5	24	27
Ammonium	ppm	6	5	3	3	4	4	4	3	2	2	3	3
Nitrogen	ppm	45	24	17	11	16	24	18	10	7	7	27	30
Phosphorus	ppm	22	7	7	26	7	6	17	6	8	23	15	10
Nitrogen	lbs/ac	135	72	51	33	48	72	54	30	21	21	81	90
Phosphorus	lbs/ac	66	21	21	78	21	18	51	18	24	69	45	30

Report date	04/07/21	OZ 4			OZ 5			OZ 6			OZ 1-3		
		0-12	12-24	24-36	0-12	12-24	24-36	0-12	12-24	24-36	0-12	12-24	24-36
pH	s.u.	7.1	7.8	7.3	6.2	7	7.3	8.1	9	9	7	7.8	7.8
% Organic Matter	Percent	2.57	0.74	0.86	2.67	0.97	0.82	3.47	1.89	1.79	2.79	2.8	2.83
Nitrate	ppm	3	3	2	5	9	6	2	2	2	10	22	13
Ammonium	ppm	7	2	7	3	8	2	3	2	1	2	2	7
Nitrogen	ppm	10	5	9	8	17	8	5	4	3	12	24	20
Phosphorus	ppm	16	13	10	31	15	2	12	8	13	15	9	11
Nitrogen	lbs/ac	30	15	27	24	51	24	15	12	9	36	72	60
Phosphorus	lbs/ac	48	39	30	93	45	6	36	24	39	45	27	33

Attachment D – Soil Phosphorus Storage

University of Idaho a 5-point P isotherm test results (UI 2019,).

Sample ID	Client ID	Sample Code	Conc. µg P/mL	Conc. Dm. µg	Solution µg P/mL	Soil Sorbed
S2002457	OZ4 - 0-12	A5	3.02	2.84	2.93	51.8
		A25	20.28	20.24	20.3	119
		A50	41.69	43.29	42.5	188
		A100	90.29	95.82	93.1	174
		A200	180.80	186.20	184	413
S2002458	OZ4 - 12-24	B5	2.53	2.37	2.4505	63.7
		B25	20.50	20.34	20.42	115
		B50	43.20	42.86	43.0	174
		B100	89.26	91.98	90.6	235
		B200	181.10	192.30	187	333
S2002459	OZ4 - 24-36	C5	2.63	2.60	2.615	60
		C25	19.66	19.75	19.71	132
		C50	41.98	42.19	42.1	198
		C100	87.89	89.55	88.7	282
		C200	183.50	181.10	182.3	443
S2002460	OZ5 - 0-12	D5	3.47	3.35	3.411	39.7
		D25	21.66	21.26	21.460	89
		D50	44.18	43.04	43.61	160
		D100	92.61	94.04	93.3	167
		D200	182.80	187.30	185.1	374
S2002461	OZ5 - 12-24	E5	2.44	2.49	2.465	63.4
		E25	20.14	19.93	20.035	124
		E50	41.66	41.41	41.54	212
		E100	86.95	89.36	88.2	296
		E200	179.60	180.70	180.2	496
S2002462	OZ5 - 24-36	F5	2.76	2.65	2.7040	57.5
		F25	20.07	20.35	20.21	120
		F50	41.54	41.81	41.7	208
		F100	88.64	89.40	89.0	275
		F200	182.00	179.90	181	477
S2002463	OZ6 - 0-12	G5	2.76	2.63	2.698	58
		G25	19.14	19.26	19.20	145
		G50	39.42	39.62	39.5	262
		G100	87.71	91.36	89.5	262
		G200	180.90	184.50	182.7	433
S2002464	OZ6 - 12-24	H5	1.85	1.90	1.876	78.2
		H25	16.21	15.91	16.060	224
		H50	34.93	34.24	34.59	386
		H100	79.18	77.44	78.3	543
		H200	147.00	147.50	147.3	1320
S2002465	OZ6 - 24-36	I5	2.14	2.26	2.201	70.1
		I25	17.37	17.51	17.440	189
		I50	35.65	36.99	36.32	342
		I100	80.64	82.98	81.8	455
		I200	172.40	177.20	174.8	631

Attachment E – Groundwater and Surface Water Quality Data

Sample Date	MW-1						
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	8:37	6.93	13.0	12.8	0.3	0.186	0.172
8/26/2020	14:55	6.96	15	11.1	< 0.10	0.164	0.164
11/9/2020	15:30	7.01	15	9.65	0.24	0.16	0.20
Sample Date	MW-2						
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	9:12	6.90	14.0	9.04	0.46	0.254	0.242
8/26/2020	15:28	6.94	21.6	1.04	0.23	0.292	0.239
11/9/2020	17:15	6.98	15.5	7.12	0.30	0.22	0.22
Sample Date	MW-3						
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	10:18	6.96	13.8	18.2	0.54	0.329	0.326
8/26/2020	16:02	7	16	17.2	0.2	0.293	0.308
11/9/2020	17:00	7.08	16	12.1	0.41	0.32	0.40
Sample Date	MW-4						
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	10:45	7.03	16.5	4.47	0.53	0.583	0.677
8/26/2020	16:39	6.82	18.4	0.57	0.17	0.341	0.351
11/9/2020	16:45	6.95	16.6	1.34	<0.10	0.36	0.37

Sample Date	Mill Slough Rubicon Downstream							
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P	TSS
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	14:10	7.64	19.0			0.129	0.145	13
8/26/2020	11:15	7.56	27.6			0.097	0.186	8
11/9/2020	12:25	8.06	8.2			0.17	0.18	2
Sample Date	Mill Slough Rubicon Upstream							
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P	TSS
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	13:50	7.51	18.5			0.116	0.13	14
8/26/2020	11:28	7.48	19.26			0.111	0.123	8
11/9/2020	12:44	8.02	8.3			0.17	0.19	5
Sample Date	Mill Slough Middleton Road							
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P	TSS
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	13:33	7.64	19.0			0.124	0.151	12
8/26/2020	12:30	7.38	18.75			0.07	0.098	4
11/9/2020	13:30	8.22	9			0.16	0.16	4
Sample Date	Mill Slough Hwy 44							
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P	TSS
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	13:22	7.41	17.8			0.127	0.141	11
8/26/2020	12:15	7.52	19.53			0.091	0.135	12
11/9/2020	13:44	7.94	8.4			0.17	0.18	5
Sample Date	Willow Creek							
	Time	ph	Temp	NO ₃ +NO ₂	TKN	Ortho-P	Total-P	TSS
		(S.U.)	(°C)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)
6/12/2020	14:20	7.60	19.1			0.05	0.089	22
8/26/2020	12:30	7.52	22.22			0.07	0.098	4
11/9/2020	13:59	8.22	8.7			0.13	0.17	4

Attachment F – Groundwater

To support this environmental study, the City installed 4 monitoring groundwater in the vicinity of NTS Pilot Study and planned future reuse activities. The location are described as follows:

- MW-1 – downstream of the Operational Zone (OZ) 5; near the end of the field and north of Mill Slough
- MW-2 – upstream of OZ 5; west of the piped supplemental irrigation water from the Canyon County Water Company canal and out of the future phases where the farmer will be farming at the moment
- MW-3 – upstream of the pilot study area; it is locations north of the power pole and from the double culverts where the future cemetery road will be connecting to Sawtooth Lake Drive.
- MW-4 – upstream of the pilot study area; east and off the quarter-quarter section line

Wells MW-1 and MW-2 are located to assess for changes in groundwater quality caused by Pilot Study operations.

Wells MW-3 and MW-4 are located to assess for changes in groundwater quality caused by City farming operations, and provide a broader context to help understand groundwater flow and quality.



Figure F1 - Groundwater Monitoring Well Locations

A standard well design was used that included 2-inch PVC 0.020-inch slotted screen with 10/20 silica sand filter pack Solid 2-inch PVC casing extended above the screen and a layer of bentonite chips were placed over the sand pack. With this standard design, an Application for Drilling Permit was prepared and submitted to IDWR for approval IDWR approved the application on November 26, 2019.

2020 water level collected by the City was used to prepare potentiometric surface contours (i.e., groundwater isopleths maps) (Figure GW-2, 3, and 4). The isopleths provide an indication of the local flow direction for the shallow water table groundwater.



Figure F2 Shallow groundwater isopleth for Jan, Jun, Sep, Oct and Nov 2020 (prepared by Civil Dynamics)



Figure F3 Shallow groundwater isopleth for Jul and Aug 2020 (prepared by Civil Dynamics)



Figure F4 Shallow groundwater isopleth for Dec 2020 (prepared by Civil Dynamics)

Attachment G – Reclaimed Water

The wastewater is collected from approximately 3357 service connection (i.e., about 9000 residents), mechanically treated to levels needed to exceed the requirements of the city's current NPDES permit. The treatment processes produce a reclaimed water that exceeds the requirements for Class C reuse per DEQ Reuse Guidance and Idaho regulations

Reclaimed water data (i.e., monthly wastewater data collected downstream of the UV treatment unit) were compiled and plotted to review data and assess trends.

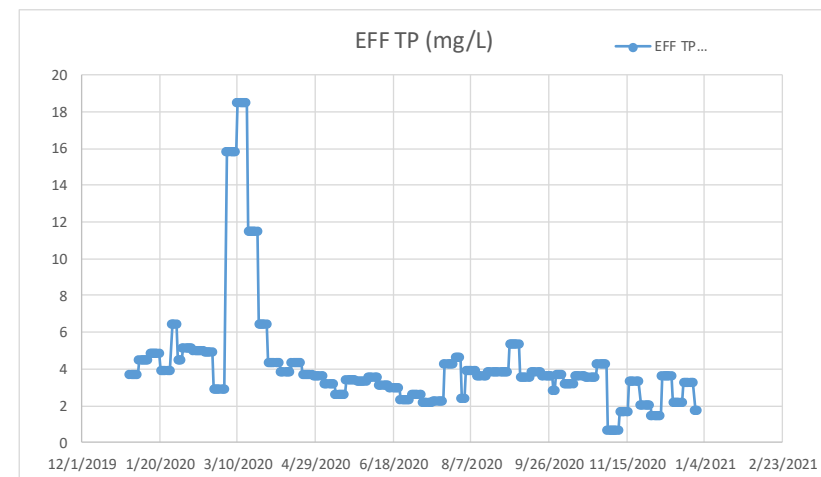
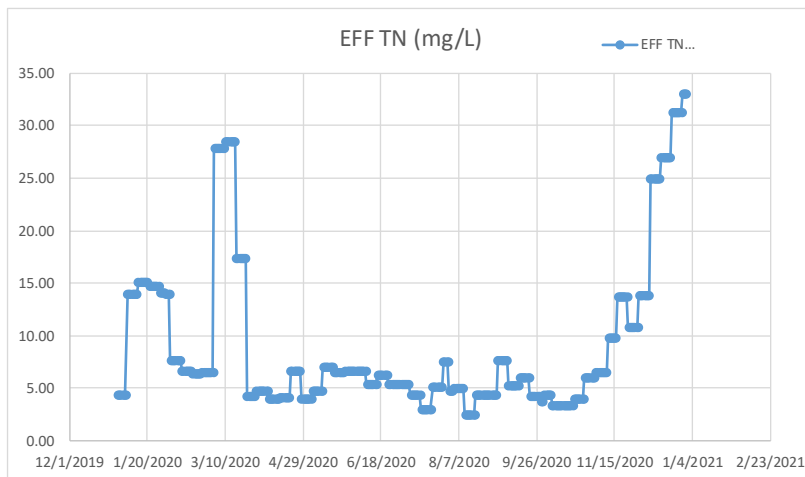
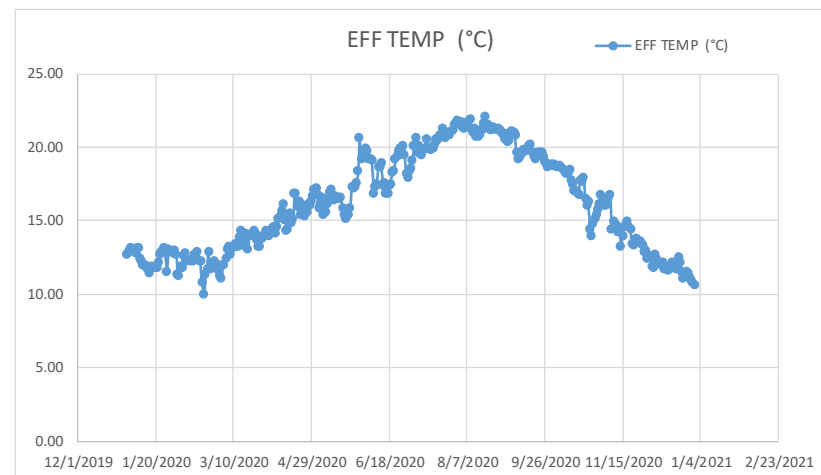
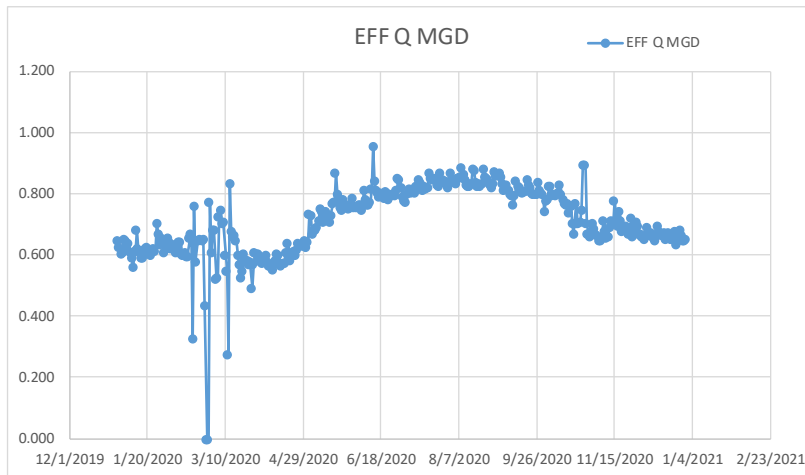


Figure G1 - RW QC data plots for general review

Daily wastewater treatment data were compiled and plotted to review data and assess trends. Notes:

- High nutrients spikes typically coincide with storm events or scum pumping cycles being extended.
- Higher than normally plant recycle flows from the waste activated sludge (WAS) basin.

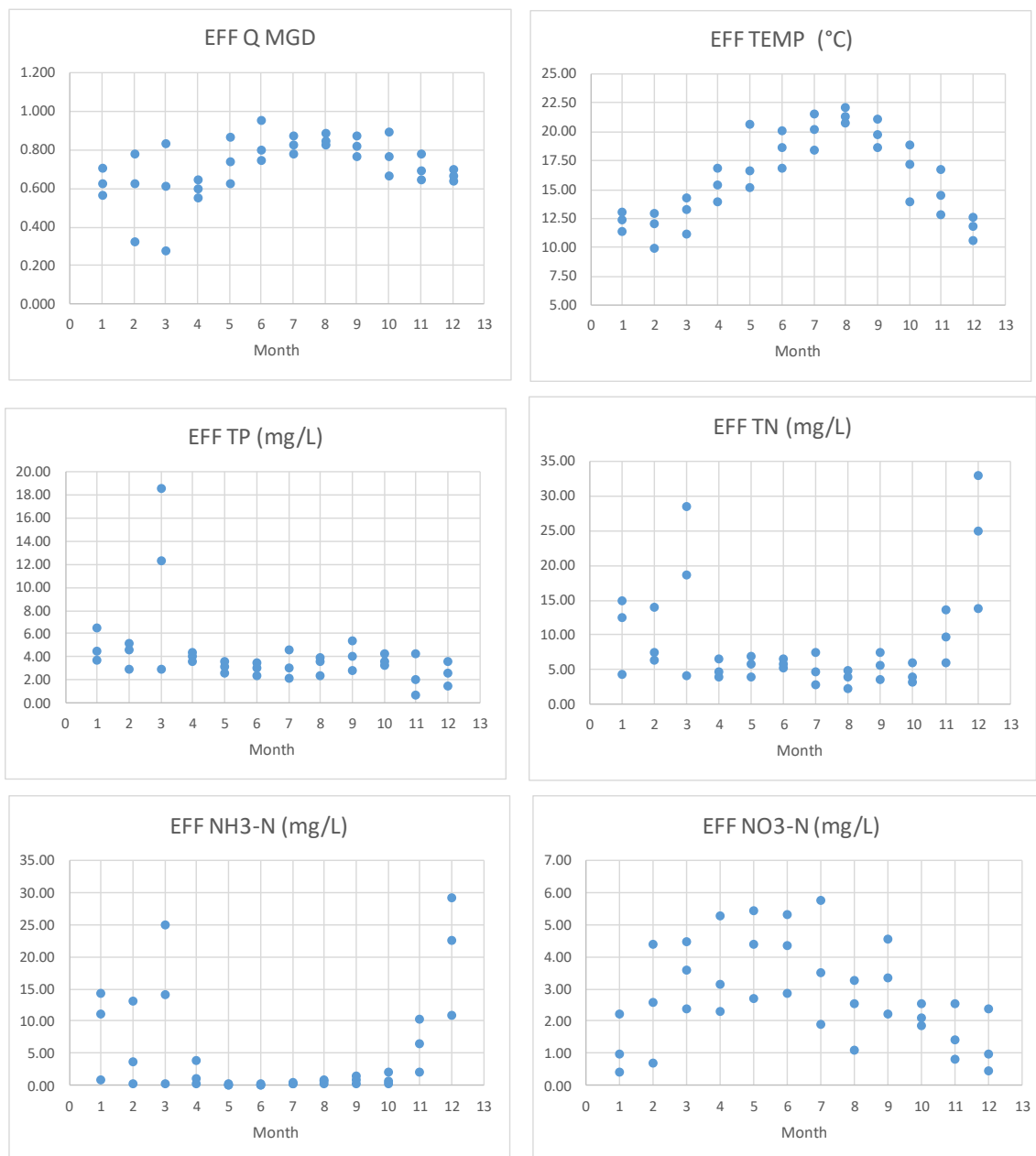


Figure G2– Monthly average RW data for selected constituents