MEMORANDUM

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FROM: Tyler Ayers, EI, Water Quality Engineer, Idaho Falls Regional Office

DATE: January 9, 2023

SUBJECT: **M-156-05 Stanley Sewer Association, Staff Analysis supporting reuse permit issuance.**

Executive Summary

The Stanley Sewer Association (SSA) currently operates a municipal Class I collection and Class I treatment system with three facultative lagoons. During the current permit cycle (M-156-04) SSA applied an average of 13.4 million gallons annually (MGA) to up to 103 permitted acres of native vegetation via slow-rate reuse. Reuse of recycled water is only permitted during the growing season and the facility has adequate capacity for winter storage.

Recent annual reports indicate compliance with permit hydraulic and constituent loading, except for periodic noncompliance of Class C disinfection requirements. Recent inspections have identified the need for lagoon site fencing maintenance.

The permit renewal is anticipated to address operational and maintenance issues at the site with some minor changes to permit limits and monitoring requirements. Proposed changes to draft permit M-156-05 from the previous permit include the following:

- Addition of a compliance activity requiring an influent flow meter improvement plan (Section 8).
- Addition of a compliance activity requiring Stanley Sewer Association to obtain the services of a licensed operator (Section 8).
- Addition of a compliance activity requiring maintenance and improvements to the lagoon perimeter fence and posting (Section 8).
- Reduction of hydraulic loading limit from 20 inches/acre to 15 inches/acre to incorporate climatic data (Section 4.6.2).
- Changes to ground water monitoring requirements and frequency (Section 6.3).
- Changes to recycled water monitoring requirements (Section 6.1)

It is recommended that the Stanley Sewer Association facility be re-permitted for a period of 10 years incorporating conditions discussed in this staff analysis and in the attached draft permit.

1 Introduction

This memorandum satisfies the requirements of the "Recycled Water Rules" (IDAPA 58.01.17.400) for issuing reuse permits. The principal facts and significant questions considered in preparing the draft permit and a summary of the basis for the draft permit conditions are provided.

Summary of permitting timeline:

- DEQ issued reuse permit M-156-04 on April 12, 2013. The current permit expires on October 31, 2022.
- DEQ issued Modification 1 to Reuse Permit M-156-04 on May 28, 2020 to update the responsible official to Mr. Tom Peterson, SSA Board President.
- A pre-application workshop was held on November 18, 2021 with SSA and Galena Engineering.
- A workshop summary letter identifying the application requirements was sent to SSA on November 18, 2021.
- A permit application was submitted on April 25, 2022 by Galena Engineering.
- DEQ issued a completeness determination letter to SSA on May 6, 2022, deeming the application complete. This date is the effective date of application.
- DEQ issued a preliminary decision to prepare a draft permit on May 6, 2022.

2 Site Location and Ownership

The Stanley Sewer Association wastewater treatment and reuse facility is located approximately 2.3 miles south of the city of Stanley, Idaho in Custer County.

The reuse site is located approximately one mile to the north and west of the treatment facility. The wastewater lagoon treatment facility and reuse site are owned by the United States Forest Service (USFS) and are operated by SSA under a special use permit (USFS 1999). Surrounding land is also owned by the USFS. There are no dwellings, canals/ditches, private water sources, or public water sources in the nearby vicinity. The Redfish to Stanley trail was recently constructed that runs alongside the lagoons to the east. Figure 1 shows the lagoon treatment site and reuse site.

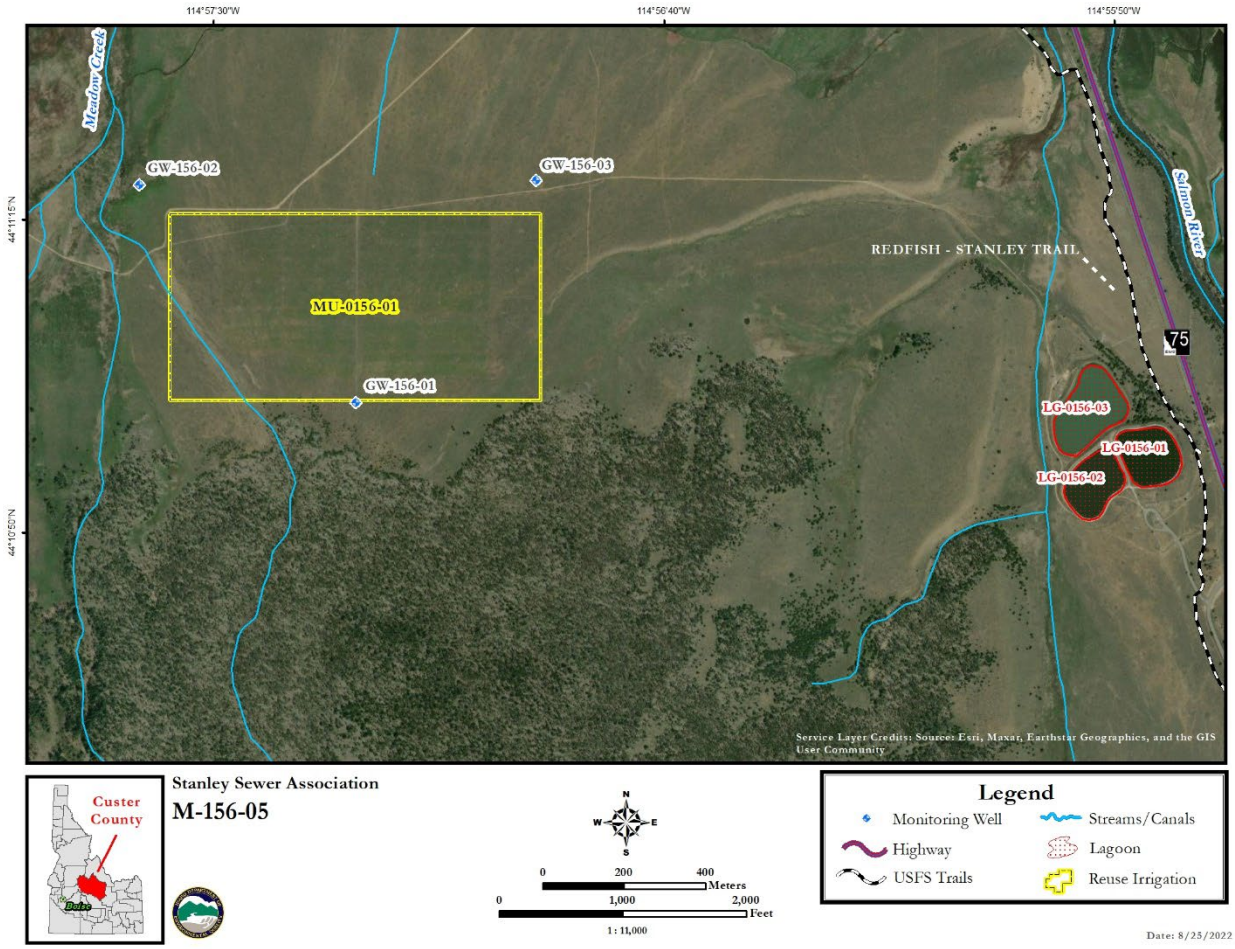

Figure 1. Stanley Sewer Association Site Map

3 Process Description

Domestic wastewater is collected from the SSA and the SNRA collection systems. Contributors to the SSA collection system are primarily homes, with a few commercial businesses including retail stores, hotels, bars, and restaurants. There are no industrial contributors. System population significantly increases during the summer months due to the tourism industry, resulting in higher volumes of wastewater. Wastewater strength also increases seasonally, due to impacts from RV dump stations connected to the SNRA collection system during periods of use. There are two lift stations in the SSA collection system – the main lift station which is located approximately ½ mile north of Stanley near the Valley Creek confluence, and a second lift station in lower Stanley, which pumps to the main lift station. Wastewater from the main lift station is pumped to the facultative lagoon site. (Opal 2022b).

Influent flow rates from the SSA and SNRA are measured independently. SSA influent is measured with an ultrasonic flowmeter on the SSA force main from the main lift station.

Historical issues with this meter have primarily occurred due to power outages. SSA has improved reliability of the meter by installing a backup battery power source, although prolonged outages may still result in the loss of flow data (Opal 2022a). The SNRA influent is measured with a Parshall flume. The SNRA meter has consistently failed to produce reliable readings, as noted in annual reports from SSA and subsequent DEQ reviews of said reports. The exact cause of incomplete and inaccurate meter readings is not known; however, potential causes include power outages and plugging of the flume with debris. To compensate for the lack of complete and accurate influent flowmeter data, SSA maintains meticulous records including estimated flows from lift station hour meters and monthly lagoon level measurement.

The facultative lagoon system consists of three cells with a total volume of 23.2 million gallons. Cells 1, 2, and 3 have operating volumes of 7 million gallons, 6.7 million gallons, and 9.5 million gallons, respectively. Wastewater from the SSA and SNRA collection systems is pumped to Cell 1, flows by gravity to Cell 2, and then to Cell 3. Lagoon system effluent (recycled water) from Cell 3 is disinfected to Class C recycled water standards using sodium hypochlorite (Opal 2022b).

Recycled water is pumped uphill to management unit MU-156-01, comprising 103 permitted acres. Recycled water flows are measured by an electromagnetic flowmeter on the discharge line from the irrigation pump. Recycled water is applied to native vegetation using two wheel lines, which are moved daily among 38 risers during periods of application. The wheel lines have a combined flow capacity of 240 to 260 gallons per minute (gpm) (assuming existing nozzles and 120 psi pressure at the pump). The system does not utilize supplemental irrigation or harvest a crop. (Opal 2022b).

4 Site Characteristics

4.1 Site Management History

SSA and SNRA operated separate wastewater facilities prior to the issuance of Permit LA-000156-02 in 2001. Due to inadequate lagoon storage capacity at both facilities, emergency land application permit modifications were issued by DEQ in 1989, 1995, 1996, and 1997. In May of 1996, SSA submitted a permit application for a long-term permit. It was determined by DEQ that the site in use was not suitable for the long-term treatment needs of the city of Stanley.

To alleviate lagoon storage capacity issues, SSA and SNRA decided that the best course of action would be to combine the two systems into one wastewater treatment facility. It was determined that SSA would assume managerial responsibilities for the treatment facility. The USFS issued SSA a special use permit for the land underlying the treatment facility and reuse site in 1999 (USFS 1999). On July 31, 2001 SSA was issued permit LA-000156-02 which replaced permits LA-000156-01 and LA-000157-01 for SSA and SNRA, respectively.

Application of recycled water to native grasses and sagebrush is done during the growing season only. Supplemental irrigation water is not used at the site.

4.2 Climatic Characteristics

Climate data is taken from the National Weather Service weather station located in Stanley, ID. The climate is relatively cool compared to the state in general. Snowfall is heavy with approximately 72 inches annually, and the growing season is from May through October. Prevailing winds vary with the seasons and daily, predominantly from the south in the morning and from the north in the afternoon.

The average annual precipitation is 19.8 inches per year. The annual average maximum temperature is 52.3°F and annual average minimum temperature is 18.4°F. Additional meteorological data can be found at: *http://www.wrcc.dri.edu/summary/climsmid.html.*

4.3 Soils

Soil types present are described in section III.C of the 2012 permit application technical report. According to the NRCS, Chamberlain gravelly loam is present at the application site. Additional soil information for the site can be found in the NRCS soil survey for Custer-Lemhi Area, Idaho (*https://www.nrcs.usda.gov/Internet/FSE_MANUSCRIPTS/idaho/ID752/0/Custer_Lemhi.pdf*.)

Permit M-156-04 requires SSA to collect composite soil samples at depths of 0-12”, 12-24”, and 24-36”. Samples are collected annually in May, prior to irrigation, and analyzed for pH, nitrate-N, ammonium-N, plant available phosphorus, and electrical conductivity. Figures 2 – 6 present soil monitoring data for the required constituents. Soil sampling shows that monitored constituents are typical of Idaho soils (Stukenholtz 2007).

Soil pH values are in the medium range (5.6-7.0 S.U.) for typical Southern Idaho soil chemistry values, with little variation over time. Figure 2 shows pH monitoring results over time.

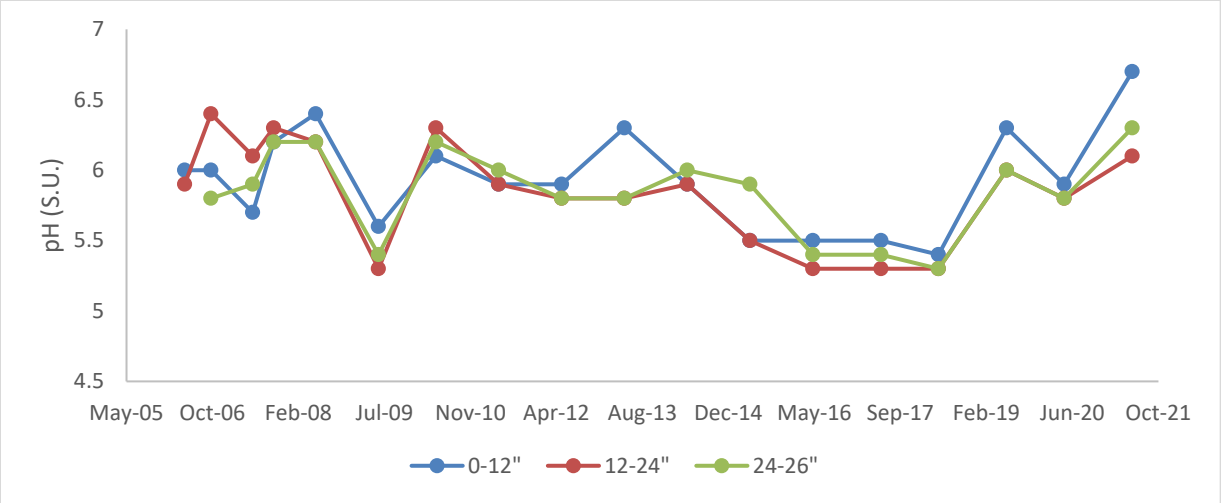

Figure 2. Historical pH levels (S.U.) in MU-156-01.

Soil nitrate-N levels have been in the low range (0-5 ppm) for typical Southern Idaho soil chemistry values (Stukenholtz 2007). It does not appear that nitrate is accumulating in the soils. Figure 3 shows nitrate-N monitoring results over time.

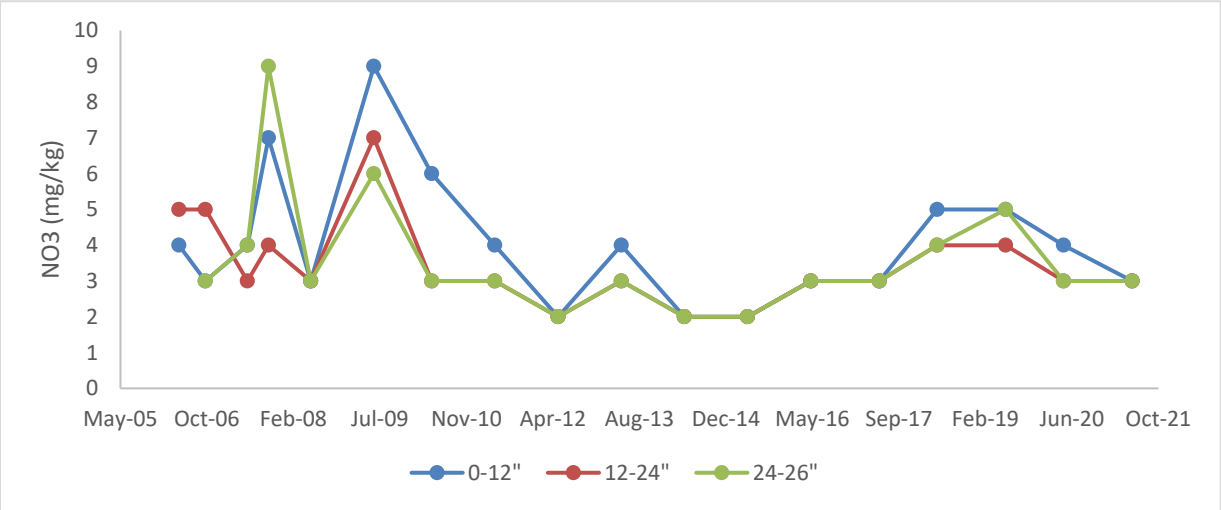

Figure 3. Historical nitrate-N levels (mg/kg) in MU-156-01.

Soil ammonium-N values are low and have remained consistent over the years. It does not appear that ammonium-N is accumulating in the soils. Figure 4 shows ammonium-N monitoring results over time.

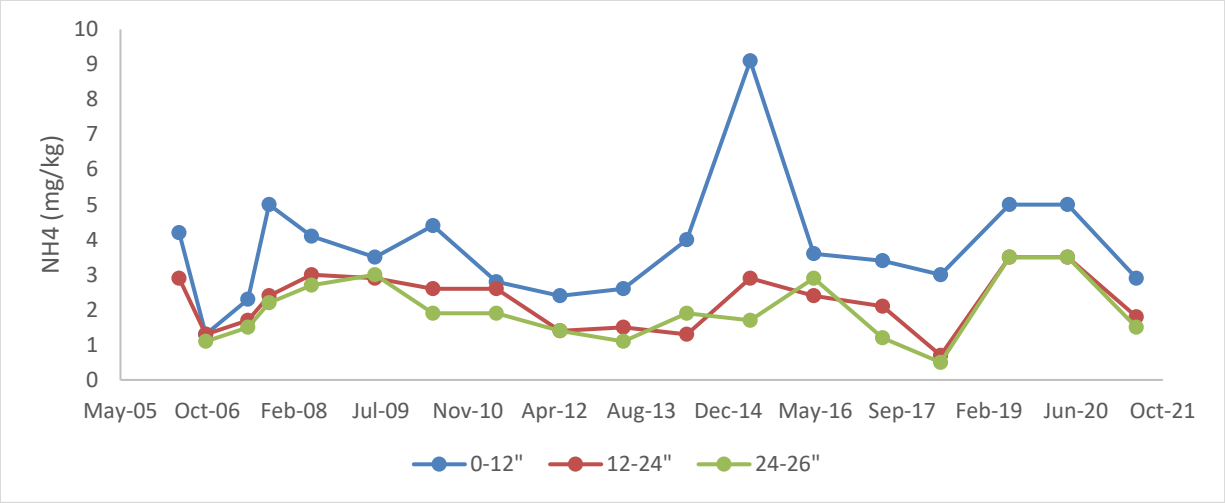

Figure 4. Historical ammonium-N levels (mg/kg) in MU-156-01.

Soil plant available phosphorus (Olsen Method) values are in the low-medium range for typical Southern Idaho soil chemistry values (Stukenholtz 2007). There may be slight accumulation of soil phosphorus in recent years, but the values are low and do not appear to be accumulating at a rapid rate. Figure 5 shows plant available phosphorus monitoring results over time.

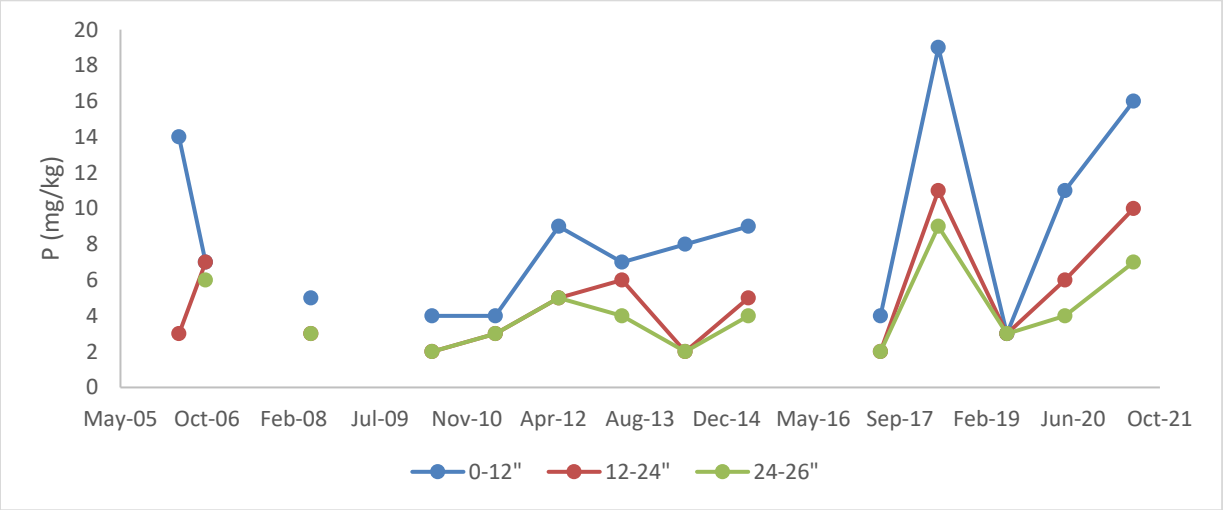

Figure 5. Historical plant available phosphorus (Olsen Method) levels (mg/kg) in MU-156-01.

Soil electrical conductivity values are in the low range for typical Southern Idaho soils (Stukenholtz 2007). Salts do not appear to be accumulating in the soils over time. Figure 6 shows electrical conductivity monitoring results over time.

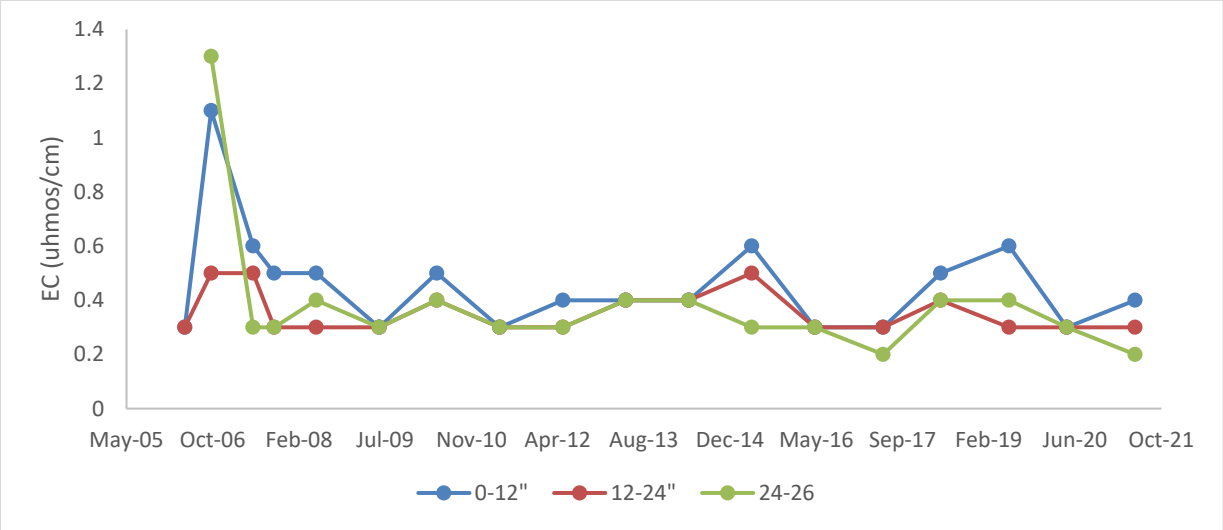

Figure 6. Historical electrical conductivity levels (uhmos/cm) in MU-156-01.

4.4 Surface Water

The Salmon River is located approximately 700 feet east of the treatment lagoons and 4,600 feet east south of the reuse site. The reuse site and treatment facility are both located outside of the 100-year floodplain. Beneficial uses include cold water biota, primary contact recreation, salmonid spawning, domestic water supply, special resource water, agricultural water supply, industrial water supply, wildlife habitats, and aesthetics.

Meadow Creek is located approximately 810 feet northwest of the site. The creek normally only flows during spring runoff and into early summer. Beneficial uses include agricultural water supply, industrial water supply, and aesthetics. Presumed use protections for cold water aquatic life and contact recreation apply.

4.5 Ground Water/Hydrogeology

The facility has a ground water monitoring well network consisting of three wells. Depth to groundwater ranges from 6’ to 76’ from monitoring well data. The aquifer is assumed to be unconfined and flows primarily north to northeast (Galena 2012).

GW-156-01 is the upgradient well located south of MU-156-01. GW-015602 is located northwest of MU-156-01. It has been identified as a downgradient well but appears to be cross-gradient based on groundwater contours provided in annual reports. Static water level is also significantly shallower than the other monitoring wells, with depth ranging from 3.62 feet to 6.83 feet below the ground (Opal 2022a). GW-015603 is a downgradient well located northeast of MU-156-01. The facility map (figure 1) in Section 2 shows the locations of the monitoring wells in relation to MU-156-01. The monitoring wells are commonly referred to as MW 1, MW 2, and MW 3.

Permit M-156-04 requires SSA to collect grab samples from each of the three monitoring wells. Samples are collected twice annually in May and September, and analyzed for water table depth, water table elevation, nitrate-N, total phosphorus, dissolved iron, dissolved manganese, chloride, and pH.

The Ground Water Quality Rule, IDAPA 58.01.11, establishes Primary and Secondary Constituent Standards. Primary Constituent Standards are based on protection of human health, while Secondary Constituent Standards are generally based on aesthetic qualities. Nitrate-N has a Primary Constituent Standard of 10 mg/L. Figure 7 shows historical ground water nitrate-N levels over time. There appears to be an increasing trend in ground water nitrate in the downgradient well, MW 3 above background levels in MW 1 and MW 2. Current nitrate-N values are well below the ground water standard but should continue to be monitored to evaluate trends and impacts over time.

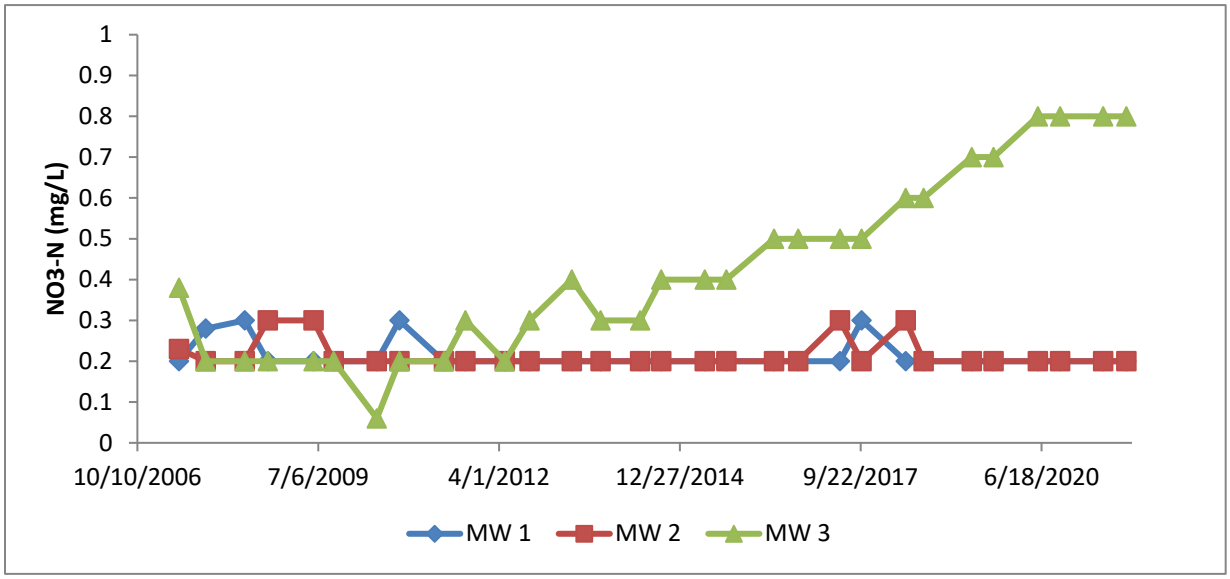

Figure 7. Historical ground water nitrate-N levels (mg/L).

Chloride has a secondary constituent standard of 250 mg/L. Figure 8 shows historical chloride monitoring results over time. Chloride levels in MW 3 appear to be increasing over time, but the values are significantly lower than the secondary constituent standard. It does appear that the trend has decelerated since 2018.

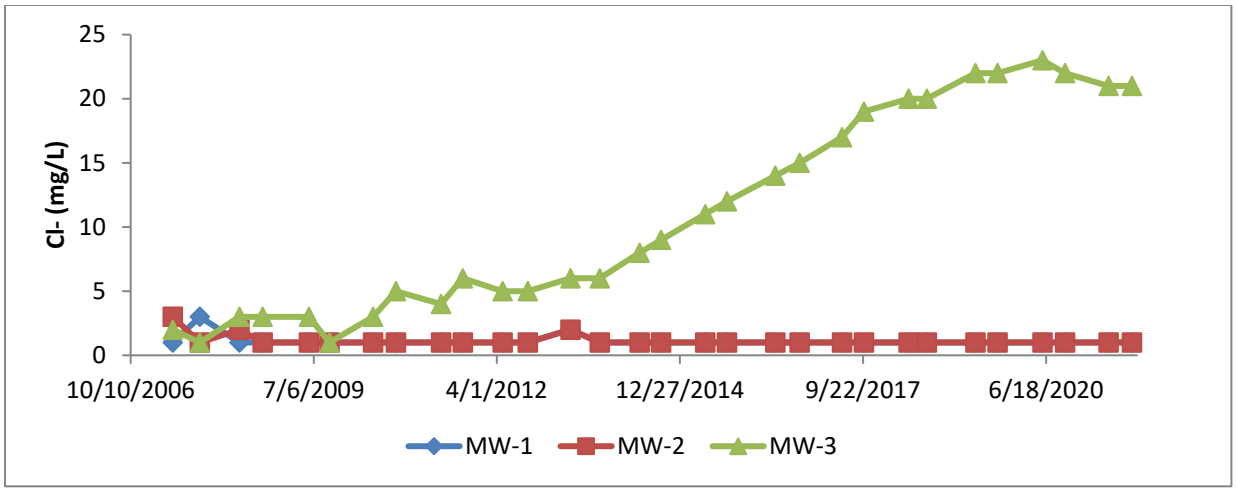

Figure 8. Historical ground water chloride levels (mg/L).

Phosphorus has no numeric ground water standard and is not generally mobile. Figure 9 shows historical ground water total phosphorus levels in the monitoring wells. There is a slight increasing trend in ground water total phosphorus monitoring in MW 2. As discussed in Section 4.3, soil phosphorus levels are in the low-medium range and breakthrough is not likely. Furthermore, MW 2 is more accurately described as a cross-gradient well and impacts from reuse would not likely be observed. MW 2 has static water ranging from approximately 3 to 6 feet below the ground, so it is possible that stormwater or other influences are causing the apparent increase. There is no increase in phosphorus levels in the downgradient well, MW 3 above background levels in MW 1.

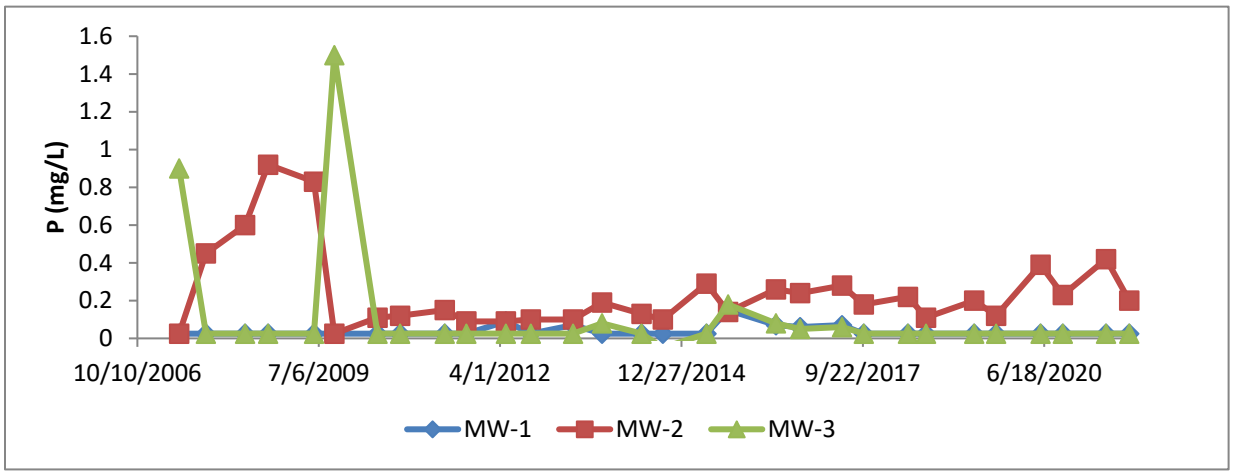

Figure 9. Historical ground water total phosphorus levels (mg/L).

Dissolved iron has a Secondary Constituent Standard of 0.3 mg/L. Apart from a few outliers in MW 2 and MW 3, monitoring results as shown in Figure 10 have been less than the standard. In September 2008, the result was 4.25 mg/L and was anomalously high. Figure 10 has been scaled to exclude that point and allow for increased resolution to evaluate trends. Dissolved iron in MW 2 and MW 3 appears to be slightly elevated compared to MW 1, but there does not appear to be an increasing trend.

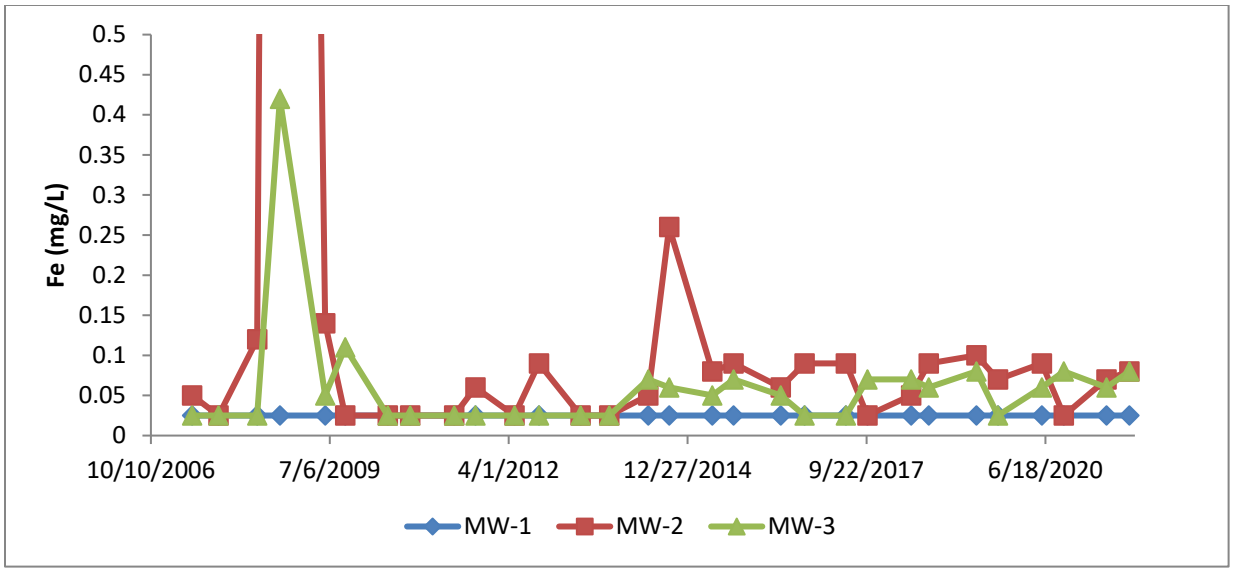

Figure 10. Historical ground water dissolved iron levels (mg/L).

Dissolved manganese has a Secondary Constituent Standard of 0.05 mg/L. Prior to 2020, the laboratory was using a minimum detection limit of 0.05 mg/L. Figure 11 shows historical ground water dissolved manganese monitoring results. Data points at the minimum detection limit were reported as <0.05 mg/L and were plotted at half of the detection limit, or 0.025 mg/L. Monitoring prior to 2020 has not been useful for identifying trends or differences in upgradient and downgradient wells. Since 2020, a minimum detection limit of 0.005 mg/L has been used, and the data appears to indicate an increase in dissolved manganese in MW 3 compared to MW 1 and MW 2. There have been two exceedances above the standard in MW 3 in September 2017 and May 2020. Elevated dissolved manganese levels in ground water are typically associated with high COD loading and reducing conditions (DEQ 2007). COD loading (discussed in Section 4.6.3) is low - it is unclear what is causing increased dissolved manganese levels in MW 3.

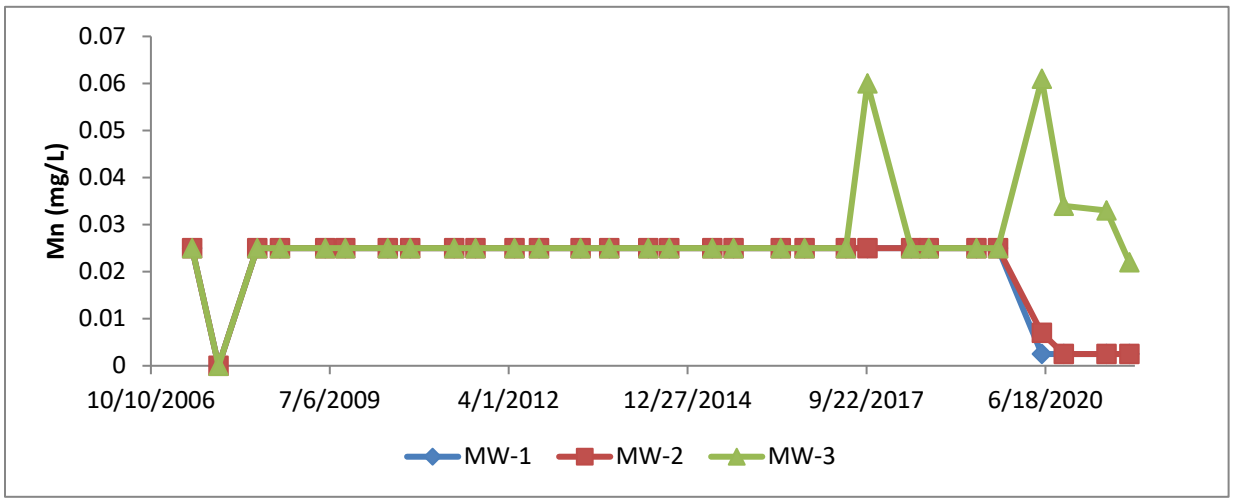

Figure 11. Historical ground water dissolved manganese levels (mg/L).

No public or private drinking water supply wells are located within ¼ mile of the reuse site. A well location acceptability analysis has not been conducted for the site and is not required in the draft permit.

4.6 Recycled Water Characterization and Loading Rates

4.6.1 Recycled Water Characterization

Average recycled water volumes for the annual reporting years 2011 to 2021 are shown in Table 1 below. The average annual recycled water volume is 15.7 MG.

Table 1. MU-156-01 hydraulic loading rates (HLR), 2011 to 2021

	HLR (MG)	Acreage Used	HLR (in/acre)
2011	23.2	68.87	12.41
2012	28.8	85.4	12.42
2013	5.1	46.8	4.01
2014	15.6	93.7	6.13
2015	11.9	93.66	4.68
2016	11.3	88.16	4.72
2017	18.6	99.9	6.86
2018	16.3	95.04	6.32
2019	15.6	60.76	9.46
2020	12.8	49	9.62
2021	13.4	53.21	9.27
Average	15.69	75.86	7.81
St Dev.	6.30	20.44	3.00

Figure 12 presents the annual hydraulic loading rate in graphical form to identify any potential trends. It should be noted that the annual recycled water may not be reflective of influent – the total capacity of the lagoon system is 23.2 MG, which exceeds the typical annual recycled water flow of 15.7 MG. Some of the variability in the recycled water flow may be influenced by operations. There are no apparent trends in the recycled water flow data.

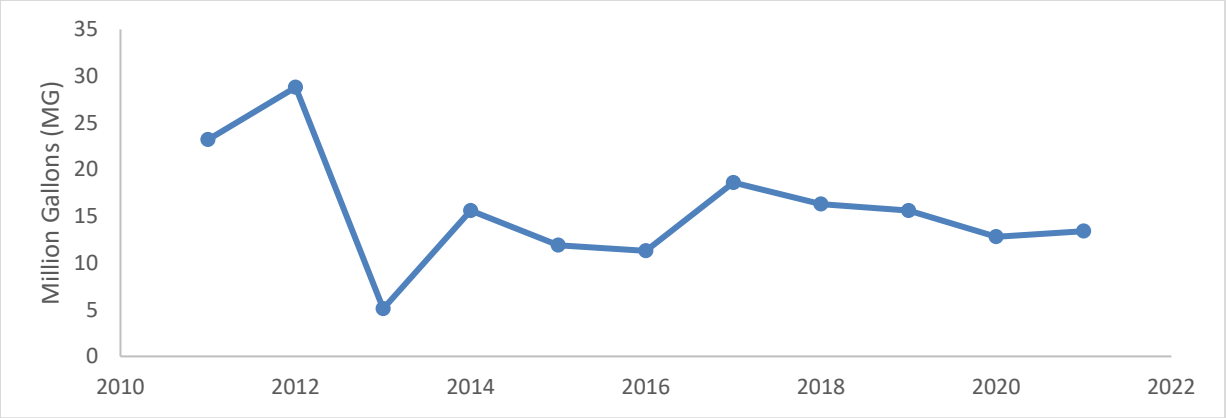

Figure 12. MU-156-01 hydraulic loading rates (HLR), 2011 to 2022

Although annual application rates do not show any strong trends, there appears to be a slight increasing trend for total Kjeldahl nitrogen (TKN), Total N, chemical oxygen demand (COD), and Total P concentrations in recycled water. Treatment efficiency of facultative lagoons is a factor of detention time (EPA 2011). DEQ recommends that SSA investigate potential causes of decreasing recycled water quality – including short-circuiting, sludge accumulation, and any changes to influent quality or quantity. Figures 13-16 below present monthly recycled water constituent monitoring. Nitrate + nitrite analytical results have been consistently low, and BOD does not appear to be trending - These data are not provided.

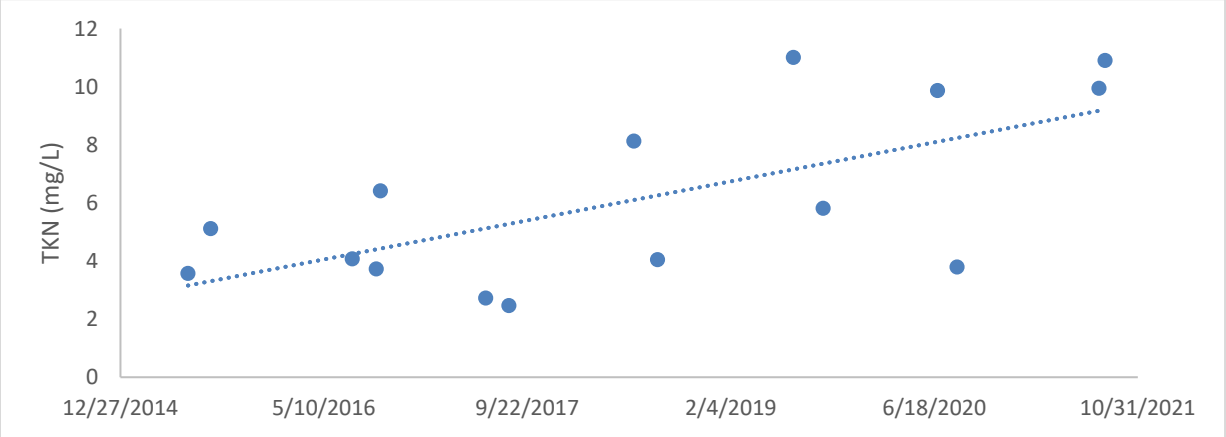

Figure 13. Recycled water TKN monitoring results, 2015 to 2021.

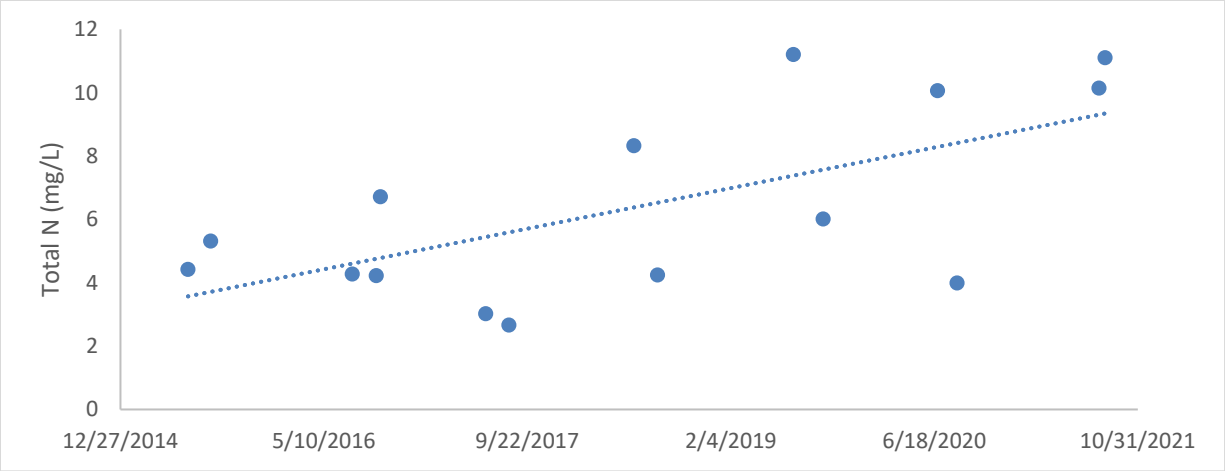

Figure 14. Recycled water total N monitoring results, 2015 to 2021.

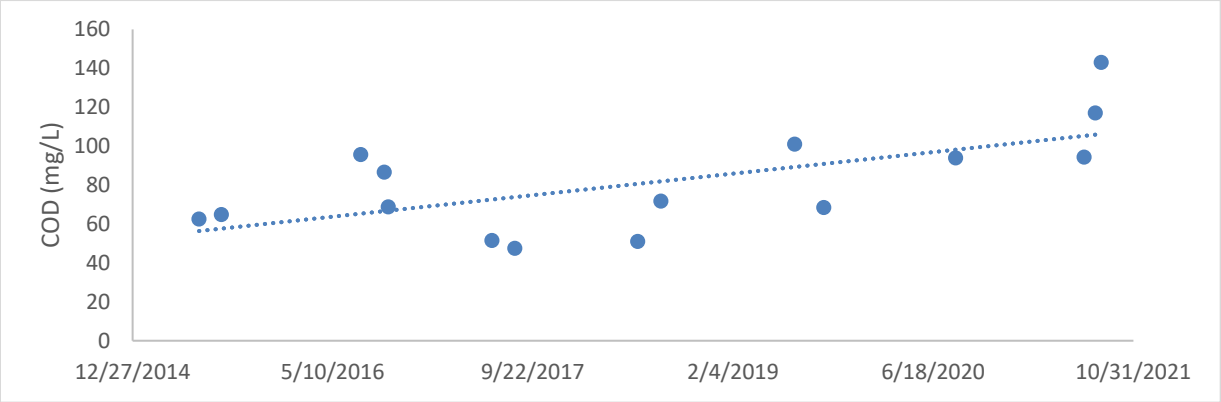

Figure 15. Recycled water COD monitoring results, 2015 to 2021.

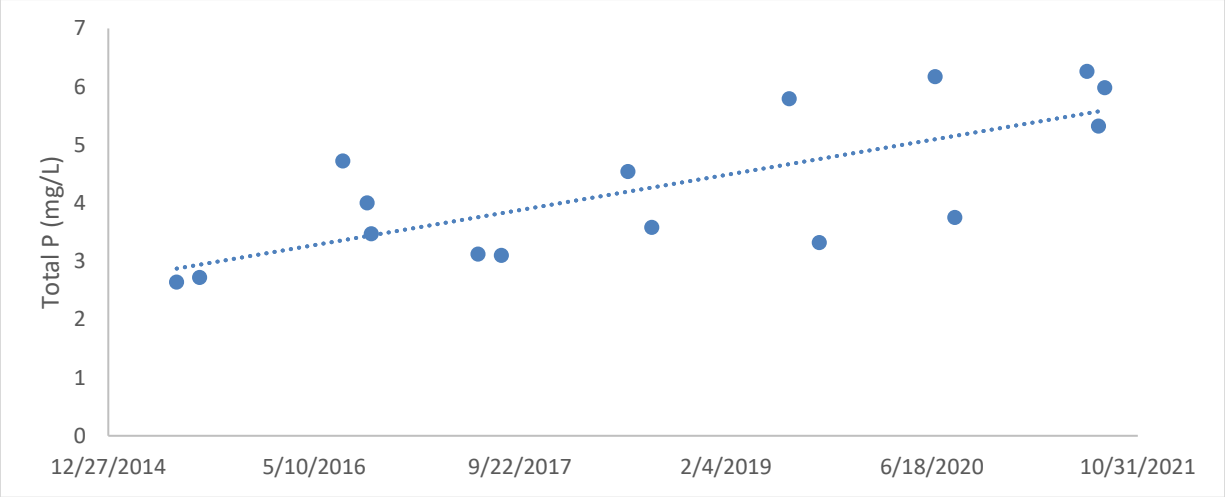

Figure 16. Recycled water total P monitoring results, 2015 to 2021.

The SSA reuse facility is permitted for Class C recycled water. The *Idaho Recycled Water Rules,* IDAPA 58.01.17 specify that for Class C recycled water, the median (from the last 5 analyses)

bacteriological result must be less than 23 CFU / 100 mL, with no single sample above 230 CFU / 100 mL.

There have been six total coliform exceedances since 2019, which are presented in Table 2. In the 2021 annual report, SSA claimed that the elevated total coliform results are the result of duckweed, which is present in the final lagoon cell, interfering with chlorine disinfection in the contact chamber. SSA plans to move the existing duckweed screen to the lower outlet feeding the contact chamber and adjust the recycled water application schedule to irrigate earlier in the growing season when duckweed tends to be less prevalent. (Opal 2022a).

Table 2. Recycled Water Total Coliform Exceedances, 2019 to 2021

Sample Collection Date	Total Coliform (CFU/100 mL)
7/8/2019	220
9/19/2019	77
9/26/2019	30
8/14/2020	>1600
8/20/2021	>1600
8/31/2021	240

4.6.2 Hydraulic Loading Rates

DEQ typically establishes the growing season hydraulic loading limits for the application of recycled water on MUs at the irrigation water requirement (IWR). Applying water to MUs at rates considerably greater than the IWR could lead to excess water and nutrients infiltrating past the root zone, potentially polluting the ground water and surface water. The IWR is defined by Equation 1 below. Where P_{def} is the precipitation deficit and E_i is the irrigation efficiency of the irrigation system.

$$\boldsymbol{Eq\ 1}: IWR = \frac{P_{def}}{E_i}$$

Precipitation deficit is defined as the amount of water the plant requires less than the amount in the root zone and less than the effective precipitation (PPT_e; Allen and Robison 2007 appendix 11, p. 205).

Recycled water is applied to native grasses and sagebrush at the management unit according to the USFS Special Use Permit (USFS 1999). Precipitation deficit and IWR values for grass pasture – low management and sage brush are presented in Table 3.

Table 3. Precipitation deficit (P_{def}) and irrigation water requirement (IWR) values for primary crops at the reuse facility, during the growing season.

Month	Grass Pasture – Low Management		Sage Brush	
	P_{def}[a] (inches)	IWR[b] (inches)	P_{def}[a] (inches)	IWR[b] (inches)
April	0.09	0.13	0	0
May	0.37	0.52	0.21	0.30
June	3.14	4.49	1.87	2.67
July	5.27	7.53	2.28	3.26
August	2.48	3.54	0.79	1.13
September	0	0	0	0
October	0	0	0	0

a. These data were obtained from the University of Idaho's ET_{Idaho}2017 website, using the Stanley NWS station, USC00108676 (Allen and Robison 2017).
b. IWR was calculated using Equation 1, assuming an E_i of 0.70 for the wheel line irrigation system (Opal 2022b).

Ground cover is estimated to be between 85-90% native grasses, with the remainder being sage brush. The average annual IWR accounting for the respective proportions of grasses and sage brush yields and average annual IWR of approximately 15 inches per acre.

Previous permits have established a hydraulic loading limit of 20 inches per acre for the growing season. This limit was calculated using ET data from obsolete DEQ guidance. DEQ recommends that the draft permit limit growing season hydraulic loading to 15 inches per acre to incorporate site-specific climatic data. Although this loading limit represents a 25% reduction compared to previous permits, historical data demonstrates that loading will be within the new limit. SSA also currently uses less than the permitted 103 acres and has the potential to utilize additional acreage through irrigation system improvements. Historical hydraulic loading rates for the management unit and actual acreage used are shown in Table 1 in Section 4.6.1.

The hydraulic loading limit in previous permits has been established as a fixed number for the entire growing season, rather than being broken down by the IWR for each month. DEQ recommends no change to this approach, although the overall limit has been reduced, as 16described above. Limitations of the irrigation system prevent significant hydraulic overloading in a given month. The maximum daily flow to the management unit is approximately 400,000 gallons to the lower risers. Maximum flow decreases as elevation increases on the upper risers, with an average of approximately 300,000 GPD. In 2021, SSA used 53.21 acres for land application, which corresponds to an annual limit of 21.51 MG at 15 inches/acre. In this instance, it would have taken SSA 14.4 weeks at 5 days/week to exceed the seasonal hydraulic loading limit. Actual application typically occurs less than 5 days in a given week, and actual hydraulic loading is typically well within permit limits (Opal 2022a). SSA's approved irrigation management plan prevents overloading each portion of the field. SSA irrigates in 24-hour sets and moves the wheel lines after each irrigation set. Irrigation does not occur if the ground is muddy or if ponding occurs (Opal 2022b).

Non-growing season hydraulic loading is not permitted, and the lagoon system has adequate capacity for winter storage.

4.6.3 Constituent Loading Rates

Permit M-156-04 establishes an annual nitrogen loading limit of 50 lbs/acre and a COD loading limit of 50 lbs/acre-day during the growing season. Annual average constituent loading rates for MU-156-01 for the years 2011 to 2021 are shown are Table 4.

Table 4. Average constituent loading rates on MU-156-01, 2011 to 2021[a]

Total nitrogen (lbs/acre)	12.8
Total phosphorus (lbs/acre)	7.3
COD (lbs/acre-day)	1.2

a. Data were obtained from the SSA 2021 annual site performance report (Opal 2022a)

Neither total nitrogen nor COD loading are approaching the permitted limits. DEQ recommends that the total nitrogen annual loading limit of 50 lbs/acre remain unchanged for permit M-156-05. Average COD loading represents 2.4% of the permitted limit, and COD is not a limiting constituent. The current permit, M-156-04, includes a COD loading limit, but recycled water COD monitoring is not required. SSA has been monitoring for COD to demonstrate compliance with the limit although not expressly required to do so by the permit. DEQ recommends that the COD loading limit be removed for permit M-156-05. Permit M-156-04 does not include a total phosphorus or NVDS loading limit. DEQ recommends that no limit for phosphorus or NVDS be included in permit M-156-05.

5 Site Management

5.1 Buffer Zones

Buffer zones for protection of surface water, ground water, drinking water supplies, and the public are required by IDAPA 58.01.17.604. A summary of buffer zones is shown in Table 5.

Table 5. Buffer Zones, feet.

	Existing Permit Buffer Requirements[a]	Guidance Buffer Zone Requirements[b]
Nearest Inhabited Residence	300	300
Nearest Public Water System	1,000	1,000
Nearest Private Water Supply	500	500
Areas Accessible to the Public	0	0
Nearest Surface Water	100	100

Nearest Irrigation Ditches/Canals	50	50
Fencing	Not required	Three-wire pasture fence
Posting	Every 500 feet and at each corner of the application area perimeter.	Every 500 feet and at each corner of the outer perimeter of the buffer zone(s) of the site.

a. Current Buffer Zone Requirements in Reuse Permit M-156-04.
b. The DEQ Reuse Guidance Manual provides recommended buffer distances for various reuse scenarios. For this permit, the following scenario was used for determining buffer distances: Municipal Class C, rural location, sprinkler application.

Fencing is recommended for this reuse scenario, but not specified in the current permit. Three-rail log fence is installed along the perimeter of MU-156-01 and appears to be in good condition. All existing buffer zones satisfy the DEQ Guidance buffer requirements. The guidance buffer zones requirements will be specified in the new permit.

5.2 Runoff

A runoff management plan was submitted as part of the overall plan of operation on March 19, 2009 and approved by DEQ on June 16, 2009. An updated plan of operation and runoff management plan were submitted on July 25, 2013. The runoff management plan briefly describes best management practices to prevent runoff by ensuring that application rates of recycled water do not cause ponding or overland flow. Submittal of an updated runoff management plan is not required by the draft permit.

5.3 Seepage Rate Testing

Lagoons LG-156-01, LG-156-02, and LG-156-03 were last seepage rate tested in 2016 and were found to be leaking below the maximum allowable seepage rate of 0.25 inches per day (EHM 2016). The Idaho Wastewater Rules require that lagoons be seepage tested every 10 years. DEQ recommends a compliance activity be added to the draft permit requiring seepage testing to be completed no later than 2026.

Test procedures for completing seepage tests are recommended to be submitted at least 45 days prior to the planned testing date.

Information on seepage testing procedures is located at:
https://www2.deq.idaho.gov/admin/LEIA/api/document/download/5943

5.4 Waste Solids, Biosolids, Sludge, and Solid Waste

Waste solids are settled and contained within the lagoon system. The majority of settling occurs in cell 1. Waste solids accumulation does not appear to be significant, and waste solids removal is not anticipated for many years. Submittal of a waste solids management plan is required prior to solids removal.

5.5 Nuisance Odors

A nuisance odor management plan was submitted as part of the overall plan of operation on March 19, 2009 and approved by DEQ on June 16, 2009. An updated plan of operation and nuisance odor management plan were submitted on July 25, 2013. Nuisance odors have not been a problem at the facility. Submittal of an updated nuisance odor management plan is not required by the draft permit.

5.6 Cropping Plan

The SSA operates the site under the USFS Special Use Permit and applies recycled water to native vegetation (native grasses and sagebrush). Submittal of a cropping plan is not required by the draft permit.

5.7 Grazing

Grazing has not been practiced historically on the site. DEQ recommends that the draft permit specify that a DEQ-approved grazing management plan is required prior to any grazing activities on the permitted reuse site.

5.8 Salts

Salts are not applied at a rate that would cause adverse salinity in soils or significant degradation of ground water or surface water. Submittal of an NVDS loading management plan is not required by the draft permit.

5.9 Irrigation Management

An irrigation management plan was submitted as part of the Plan of Operation on March 19, 2009 and approved by DEQ on June 16, 2009. An updated Plan of Operation and irrigation management plan were submitted on July 25, 2013.

The irrigation management plan describes the existing irrigation system, comprised of the irrigation main line in the center of the management unit with 38 risers spaced 40 feet apart. There are two 1,500-ft wheel lines that connect to the risers. Wheel lines are moved two risers at a time to avoid overlap on consecutive irrigation periods and operated for a 24-hour period to prevent ponding or runoff.

Submittal of an updated irrigation management plan is not required by the draft permit.

6 Monitoring

The proposed monitoring requirements for the draft permit are described in detail in the following subsections. All monitoring will be conducted in accordance with the facility's Quality Assurance Project Plan (QAPP). See section 7 for requirements regarding the QAPP.

6.1 Recycled Water Monitoring

6.1.1 Recycled Water Flow Monitoring

SSA is required to monitor flows at three locations – influent from the SNRA collection system, influent from the SSA collection system, and recycled water to MU-156-01. SSA is required to record daily meter readings and compile the data monthly.

As discussed in Section 3, the SSA and SNRA influent meters have been plagued by power outages and other maintenance issues. To compensate for the lack of complete and accurate influent flowmeter data, SSA maintains meticulous records including estimated flows from lift station hour meters and monthly lagoon level measurement.

DEQ recommends a compliance activity be added to the draft permit requiring SSA to submit an influent flow metering improvement plan to collect accurate and complete influent flow data within 18 months of permit issuance. Any improvements deemed necessary shall be completed within 6 months of improvement plan approval. DEQ does not recommend any other changes to flow metering in the draft permit.

6.1.2 Recycled Water Constituent Monitoring

The current reuse permit requires a monthly grab sample at the irrigation pump sample port inside the building to be analyzed for total Kjeldahl nitrogen (TKN), nitrite + nitrate-N (NNN), and total phosphorus. DEQ recommends the draft permit require total nitrogen as N instead of TKN and NNN to align with current permitting practices. DEQ does not recommend any other changes to the monthly constituent analyses.

Class C disinfection requirements typically include weekly total coliform monitoring. During the permitting process in 2007, SSA expressed concerns with the weekly coliform sampling and the distance and time to the nearest analytical laboratory in Boise. SSA was concerned that the operator would have to spend an entire day every week driving the sample to Boise since there is no courier service in Stanley. They expressed concerns with the expense of the weekly drive, as well as the operator being absent from the site so frequently to make the drive. DEQ and SSA resolved the issue by requiring coliform sampling twice per month instead of weekly, requiring at least 5 coliform samples per season to comply with the 5-sample median (DEQ 2013a). An unintended consequence of the twice monthly total coliform monitoring requirement is that SSA must collect and analyze two samples for total coliform if irrigation

with recycled water only occurs for one week in a month. To remedy this and to maintain the intention of the previous agreement, DEQ recommends that the draft permit include a requirement to monitor total coliform biweekly during periods of use, with a minimum of 5 samples to be collected in the growing season.

Weekly onsite free chlorine residual monitoring is required to provide assurance that the disinfection level is being maintained in between twice monthly total coliform sampling events. DEQ recommends no change to the free chlorine residual monitoring requirements in the draft permit.

6.2 Soil Monitoring

Soil monitoring objectives are discussed in section 7.4.1 of the guidance manual (DEQ 2007). Although reuse permits do not specify limits for soil parameters, the data provides information necessary to manage reuse operations.

The current permit requires annual soil sampling in May, prior to irrigation. Soils are to be composited from ten locations at depths of 0-12 inches, 12-24 inches, and 24-36 inches. Samples must be analyzed for electrical conductivity, nitrate-nitrogen as N, ammonium nitrogen, plant available phosphorus as P, and pH.

As discussed in Section 4.3, soils do not appear to be negatively impacted by recycled water application activities. DEQ does not recommend any changes to soil monitoring requirements in the draft permit.

6.3 Ground Water Monitoring

Section 7.2 of the DEQ Guidance describes the elements of a ground water monitoring plan for a reuse site. Ground water monitoring may be used to evaluate a facility's impact on ground water quality and serves to assess compliance with the reuse permit and the *Ground Water Quality Rule*, IDAPA 58.01.11.

A description of the ground water monitoring well network is present in Section 4.5 and the well locations can be seen on the map in Figure 1, Section 2. Consistent with the ground water gradients provided in annual reports and the discussion in Section 4.5, DEQ recommends that GW-0156-02 be designated as a mid-gradient well in the draft permit. It is also recommended that ground water monitoring well serial numbers be updated to reflect standard DEQ formats, as shown in Table 6 below.

Table 6. Ground Water Monitoring Point Descriptions

Current Monitoring Point Serial Number	Monitoring Point Serial Number	Common Designation	Well Type	Gradient Location
GW-015601	GW-156-01	MW 1	Monitoring well	Upgradient (South)
GW-015602	GW-156-02	MW 2	Monitoring well	Mid-gradient (NW)
GW-015603	GW-156-03	MW 3	Monitoring well	Downgradient (NE)

The current permit, M-156-04, requires grab samples in May and September annually from each monitoring well. Monitoring parameters include water table depth, water table elevation, nitrate-nitrogen, total phosphorus, dissolved iron, dissolved manganese, chloride, and pH. Additional discussion and graphs regarding each parameter can be found in Section 4.5.

During the permitting process, SSA has requested that dissolved iron, dissolved manganese, and chloride be removed from the required monitored constituents in the draft permit. Chloride has shown an increasing, although slight, trend in MW 3 and should continue to be monitored. Dissolved iron levels are slightly higher in MW 2 and MW 3 than in the upgradient well, MW 1. Monitoring results from both wells in September 2008 exceeded the Secondary Constituent Standard, but iron levels have been low for the past several years and do not appear to be increasing. DEQ recommends that the monitoring requirement for dissolved iron be removed from the draft permit. The historical dissolved manganese data are not useful for tracking trends because the minimum detection limit used for analysis was equal to the Secondary Constituent Standard. There have also been exceedances in the downgradient well, MW 3. DEQ recommends that the draft permit include a requirement to monitor for dissolved manganese.

There is no ground water quality standard for total phosphorus, and phosphorus levels in the monitoring wells remain low. DEQ recommends that the monitoring requirement for dissolved iron be removed from the draft permit.

There appears to be minimal impact on groundwater due to land application activities, as discussed in Section 4.5. DEQ recommends that monitoring frequency be reduced to annually in September of each year. Monitoring in September may more accurately represent potential impacts to groundwater that can be attributed to reuse activities, as irrigation typically occurs from June to August. Groundwater quality in the spring may be influenced by seasonal snow melt and runoff, particularly in the shallow MW 2.

DEQ recommends that all other existing ground water monitoring requirements remain as present in the current permit.

6.4 Supplemental Irrigation Water Monitoring

Supplemental irrigation is not used or proposed for use at the facility. Supplemental irrigation water monitoring is not required by the draft permit.

6.5 Crop Yield and Tissue Monitoring

Stanley Sewer Association irrigates native grasses and sagebrush and does not harvest a crop. Crop yields and tissue monitoring are not required by the draft permit.

6.6 Meteorological Monitoring

DEQ staff does not recommend that the draft permit require meteorological monitoring, as there are sufficient meteorological monitoring stations nearby that SSA can access.

6.7 Calculation Methodologies

Calculation methodologies for determining permit compliance with hydraulic loading limits and constituent loading limits must be approved by DEQ in the PO, which is covered in Compliance Activity CA-156-01 in the draft permit.

7 Quality Assurance Project Plan

The QAPP outlines the procedures used by the permittee to ensure the data collected and analyzed meets the requirements of the permit.

To support its mission, DEQ is dedicated to using and providing objective, correct, reliable, and understandable information. Decisions made by DEQ are subject to public review and may at times, be subject to rigorous scrutiny. Therefore, DEQ's goal is to ensure that all decisions are based on data of known and acceptable quality.

The QAPP is a permit requirement and must be submitted to DEQ as a stand-alone document for review and acceptance. The QAPP is used to assist the permittee in planning for the collection, analysis, and reporting of all monitoring data in support of the reuse permit and explaining data anomalies when they occur.

DEQ does not approve QAPPs but reviews them to determine if the minimum EPA guideline requirements are met and that the reuse permit requirements are satisfied. DEQ does not approve QAPPs because the responsibility for validating of the facility's sampling data lies with the permittee's quality assurance officer and not with DEQ.

The format of the QAPP should adhere to the recommendations and references in the Assurance and Data Processing sections of the guidance manual (DEQ 2007) and EPA QAPP

guidance documents *https://www.epa.gov/sites/production/files/2015-06/documents/g5-final.pdf*.

SSA developed and submitted a QAPP to DEQ for review in 2013 after the issuance of reuse permit M-156-04. Annual report reviews and site inspections since 2013 have revealed that SSA is currently using analytical methods which are not reflected in the QAPP. DEQ recommends that a compliance activity in the draft permit be included to require an updated QAPP to be submitted to incorporate current analytical methods and revised monitoring requirements.

8 Site Operation and Maintenance

The SSA board president serves as the Responsible Official for the permit and oversees site operations and management.

The SSA system must be operated by an operator who holds the following licenses: Wastewater Collections I, Wastewater Treatment I, and Wastewater Land Application. The current operator does not have the required licensure. DEQ staff recommend a compliance activity be added to the draft permit requiring SSA to contract, train, or hire a licensed operator by April 1, 2026.

The USFS special use permit expires on December 31, 2029, at midnight and must be renewed for continued operation of the wastewater treatment and land application facility. DEQ recommends a compliance activity be added to the permit requiring submittal of the new special use permit for reuse to continue past December 31, 2029.

The lagoon system and reuse area are enclosed by three-rail log fence, with some sections of 4-rail log fence. The newly constructed Redfish to Stanley trail passes within 100 feet of the treatment lagoons to the east, between the lagoons and Highway 75. The trail is a non-motorized trail, except for winter snowmachine use. Several sections of perimeter fence along the southern and eastern perimeter of the lagoon site near the trail are in poor condition. Snow accumulation in the region often exceeds several feet in depth, which may cover the existing fence. The potential for snowmachine users to ride over the fence and into the lagoons presents a serious risk to human health. SSA has installed 18” x 12” warning signs every 75 feet along the eastern fence. SSA personnel have indicated that these signs are too small to be easily seen. DEQ recommends a compliance activity be added to the draft permit requiring the installation of a more protective fence, along with improved warning signage no later than October 31, 2025. A map showing the trail location in relation to the SSA lagoons is shown in Figure 1 in Section 2.

An updated draft plan of operation was prepared to accompany the permit renewal application. DEQ recommends a compliance activity be added to the draft permit requiring a final version of the updated draft plan of operation to be submitted within 6 months of permit issuance, incorporating any terms/conditions of the draft permit.

9 Compliance Activities

The list of compliance activities included in the current permit and those that will be required by the new permit is provided below.

9.1 Status of Compliance Activities in Current Permit

Compliance Activity	Description	Due Date	Status
CA-156-01	Plan of Operation	June 1, 2013	Submitted: July 22, 2013
CA-156-02	Quality Assurance Project Plan	June 1, 2013	Submitted: September 30, 2013
CA-156-03	SNRA Flow Meter	June 1, 2013	The SNRA flow meter was replaced by the Forest Service in 2012. However, the SNRA has not been operated and maintained so that complete and accurate flow data is provided to SSA.
CA-156-04	Seepage Testing	October 31, 2016	Completed: 2016 – All three cells passed.

9.2 Compliance Activities Required in New Permit

The following compliance activities are specified in the draft permit:

1. Submit an updated Plan of Operation that incorporates the terms and conditions of the new permit within 6 months after permit issuance (Section 8).
2. Submit an updated Quality Assurance Project Plan, including verification that the plan has been implemented by the facility, within 6 months of permit issuance (Section 7).
3. Submit lagoon seepage rate test proposed schedule and procedures at least 45 days prior to the planned seepage test. Seepage testing must be completed no later than 2026. Submit the seepage test report within 90 days after completion of the seepage test (Section 5.3).
4. Complete lagoon site fencing and posting improvements before October 31, 2025 (Section 8)
5. Comply with operator licensure requirements before April 1, 2026 (Section 8)
6. Submit an updated Special Use Permit with the US Forest Service prior to its expiration on December 31, 2029 (Section 8)
7. Submit an influent flow meter improvement plan within 18 months of permit issuance and incorporate any improvements 6 months after approval (Section 6.1.1).
8. Schedule a Pre-Application Conference one year prior to permit expiration.
9. Submit a permit renewal application 180 days prior to expiration of the existing permit.

10 Recommendations

Staff recommends the draft reuse permit be issued incorporating conditions discussed in this staff analysis and specified in the attached draft permit. The permit specifies hydraulic and constituent loading limits and establishes monitoring and reporting requirements to evaluate system performance, environmental impacts, and permit compliance.

11 References

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Stukenholtz Laboratory, Inc. 2007. *Soil Test Levels – General Evaluation Table.* (Stukenholtz 2007).