



NPDES Permit No. IDS-028118

Final Monitoring Report

Assessment Years 2023-2025

For Permit Term from December 1, 2020 to September 30, 2025



Prepared by: Madison Kolda
City of Caldwell
Stormwater Division
621 Cleveland Blvd
Caldwell, ID 83605
208-455-4598
www.cityofcaldwell.org



Background of Sites:

The Lower Boise River originates at Lucky Peak Dam and travels through the Treasure Valley, ending at its confluence with the Snake River on the Oregon/Idaho state border. With many connecting tributaries to the Boise River, the City of Caldwell focused their stormwater monitoring efforts on the Boise River, Indian Creek, and Mason Creek, as they are representative of the MS4 discharges to the Waters of the United States. (WOTUS).

In the interest of assessing water quality within the Boise River tributaries, stormwater sampling sites were selected given their location and influence from the Municipal Separate Storm Sewer System (MS4) system. Staff selected each site with the intent to avoid extraneous influences, such as agricultural runoff/overflow, groundwater seepage,

artesian flow, or stormwater from other jurisdictions, such as Idaho Transportation Department's Interstate 84.

The following table shows the sampling sites that were selected for monitoring for the permit term 2020-2025. The Boise River site sampled in the previous permit term was also a stormwater drain manhole (SDMH) upstream of the Boise River. For the present permit term, sampling staff selected a SDMH in the (north) Golden Gate Addition neighborhood, which is a tributary to Outfall BOI-0007A, upstream of Interstate 84.

Table 1: Monitoring Location Information

Outfall ID	Site Name	Latitude, Longitude	Parameters	Receiving Water	Pipe Dia. (in)	Land Use
IND-0545D	12 th Ave at Indian Creek	43.663084, -116.683243	TP, N, TSS, Ec, T	Indian Creek	15"	1900's Historic Residential
NOB-0214B	Noble Drain at Tamsworth Way Storm Pond	43.661335, -116.617651	TP, N, TSS, Ec, T	Mason Creek	12"	1990's Modern Residential
SOL-0165A	Solomon Drain at Skyway Street Pond	43.655451, -116.629855	TP, N, TSS, Ec, T	Mason Creek	12"	2010's Modern Residential
BOI-0007A	SDMH Upstream of BOI-0007A	43.677605, -116.686306	TP, N, TSS, Ec, T	Boise River	18"	1950's Residential and Commercial

TP = Total Phosphorus, TSS = Total Suspended Solids, EC = E.coli, T = Temperature, TKN = Total Kjeldahl Nitrogen

Tributaries of Mason Creek, both Noble Drain and Solomon Drain are observed during each MS4 sampling event. These facilities primarily receive and deliver agricultural flows during the irrigation season. The Solomon Drain carries seepage year-round to prevent inconvenient rises in Caldwell's groundwater levels. The Mason Creek drainage system consists of control mechanisms designed to handle a minimum 25-year event capacity. Therefore, it is unlikely for these outfalls to discharge during typical storm events.

Total Maximum Daily Loads

In 2000, DEQ established a Total Maximum Daily Load (TMDL) on the Lower Boise River for bacteria (fecal coliform) and sediment. An addendum in 2008 to the Lower Boise River TMDLs, also for sediment and bacteria, expanded the segment inclusions upstream to Lucky Peak (4 total segments of Boise River). In 2015, an amendment to the TMDLs again included the tributaries in the Lower Boise Subbasin, modifying the original TMDLs to include suspended sediment and *E.coli* for tributary creeks such as Indian and Mason Creeks. In late 2015, an amendment occurred again to include the parameter total phosphorus (TP) adding to the original TMDLs, just for the Lower Boise River and on two segments: from Indian Creek to mouth and from Middleton to Indian Creek. This information is found on Idaho Department of Environmental Quality's (IDEQ) website.

Due to increasing temperatures in waterbodies, IDEQ and EPA have recognized it as a parameter that causes impairments to surface waters, their beneficial uses, and their aquatic ecosystems. The City of Caldwell Stormwater Division monitoring staff have measured field temperature of the samples collected during the permit cycle 2020-2025. To meet permit requirements, the Stormwater staff monitors Total Suspended Solids (TSS), *E. coli*, Total Phosphorus (TP), Total Nitrogen (TN), and Temperature (Temp) quarterly, or up to four times per year.

The following table, Table 2, lists the water quality TMDL targets established by the TMDL document and its amendments throughout the last 25 years, to reach goals based on the criteria for Idaho's water quality standards and those set by EPA.

Table 2: TMDL Water Quality Targets (IDEQ, 2005)

Source	TMDL Targets			Water Quality Standard	Turbidity
	TSS	TN	TP	<i>E coli</i>	
Indian Creek	20 mg/L	None	0.089 mg/L	126 cfu/100mL	50 NTU
Boise River	20 mg/L	None	0.089 mg/L	126 cfu/100mL	50 NTU

TP = Total Phosphorus, TSS = Total Suspended Solids, TN = Nitrate + Nitrite Nitrogen (as N)

Stormwater Data at a Glance

The City of Caldwell’s MS4 permit was issued in December of 2020, but sampling did not begin until 2022. The Monitoring and Assessment Plan, Quality Assurance Project Plan, and Pollutant Reduction Activity Proposal needed to be approved by the DEQ and EPA before stormwater sampling could take place. Since the City’s MS4 Monitoring and Assessment Plans took full effect in 2022, stormwater data was not collected and recorded until that year. To carry out a comprehensive analysis of the water flowing into the Boise River, samples were collected and tested for TSS, TN, TP, E. coli, and Turbidity. The information below represents the existing stormwater data collected by the Stormwater Division from March 2023 to October 2024 for the Boise River and Indian Creek. Collection of samples is conducted by any and/or all the following staff from the Stormwater Division.

Table 3: Stormwater Pollution Prevention Team

Stormwater Division Staff		
Staff Names	Role	Phone number
Ashley Newbry, PE	Deputy Public Works Director (Water)	Desk: 208-455-4672 Cell: 208-919-8327
Christina Beeson	Stormwater Superintendent	Desk: 208-455-4598 Cell: 208-484-7243
Jake Wells	Environmental Scientist	Desk: 208-455-4753 Cell: 208-504-9701
Madison Kolda	Environmental Stormwater Inspector	Desk: 208-455-4620 Cell: 208-504-8478
Bryan Dallolio	Construction Stormwater Inspector	Desk: 208-455-3006 Cell: 208-504-7130

While analyzing the stormwater sample data from this permit term, a few outliers were noticeable in the dataset. Table 4 shows all the data from all of the sampling events throughout the permit term.

Table 4: Water sample averages for all sampling events within the permit term

Averages for the TMDL Pollutants of Concern (March 2023 - October 2024)					
Outfall ID	SOURCE	Average E. COLI (MPN/100mL)	Average N (mg/L)	Average TP (mg/L)	Average TSS (mg/L)
IND-0545D	12th Avenue	3,903	0.41	1.04	36.17
BOI-0007A	1st Avenue	486	1.02	0.67	70
NOB-0214B	Noble Drain at Tamsworth Way Storm Pond	No Discharge	No Discharge	No Discharge	No Discharge
SOL-0165A	Solomon Drain at Skyway Street Ponod	No Discharge	No Discharge	No Discharge	No Discharge

MPN/100mL = Most Probable Number of Bacteria per 100mL, mg/L = milligrams per Liter

Table 5: Sample data from each sampling event during the permit term

Water Quality Data Summary (2023-2024)					
DATE COLLECTED	SOURCE	E. COLI (CFU/100mL)	N (mg/L)	TP (mg/L)	TSS (mg/L)
3/20/2023	12th Avenue	12	-	0.302	13
3/20/2023	1st Avenue	110	-	0.587	88
4/21/2023	12th Avenue	2,400	0.4	0.85	33
4/21/2023	1st Avenue	60	0.3	0.63	60
11/2/2023	12th Avenue	4,100	0.79	0.77	10
11/2/2023	1st Avenue	2,000	3.24	0.73	107
2/1/2024	12th Avenue	550	0.14	0.25	51
3/12/2024	12th Avenue	56	-	0.262	22
10/16/2024	12th Avenue	20,000	0.46	1.19	848
10/16/2024	1st Avenue	130	0.34	0.85	65
11/21/2024	12th Avenue	200	0.26	3.66	88
11/21/2024	1st Avenue	130	0.18	0.56	30
	AVERAGES	2,479	0.679	0.887	117.92

Note: Highlighted cell = outlier in the dataset

Both 12th Avenue and 1st Avenue had higher levels of nitrates/nitrites during the sampling event on 11/2/2023, while the rest of the results from the same event were around average. The concentrations were 0.79 mg/L and 3.24 mg/L, compared to the

average of 0.678 mg/L for both sites. Additionally, there were two outliers from the 12th Avenue sampling event on 10/16/2024, along with above-average numbers for the other two parameters. This stormwater sampling day resulted in an outlier of 848 mg/L for TSS, which is well above the average of 117.92 mg/L for both sites. *E. coli* was an extreme outlier of 20,000 CFU on 10/16/2024.

During the 11/2/2023 sampling event, the stormwater team observed an influx of rainwater while collecting samples. A catch basin was plugged and subsequently cleared of leaves and sediment, which caused our samples to be overloaded with extra material. We believe that external factors played a significant role in the sample results for that event.

Total Phosphorus

Figure 1 visualizes the sampling event results of the TP data collected at 12th Avenue and 1st Avenue throughout the permit term. The blue line indicates the TP TMDL target for water quality in this watershed, with a value of 0.10 mg/L.

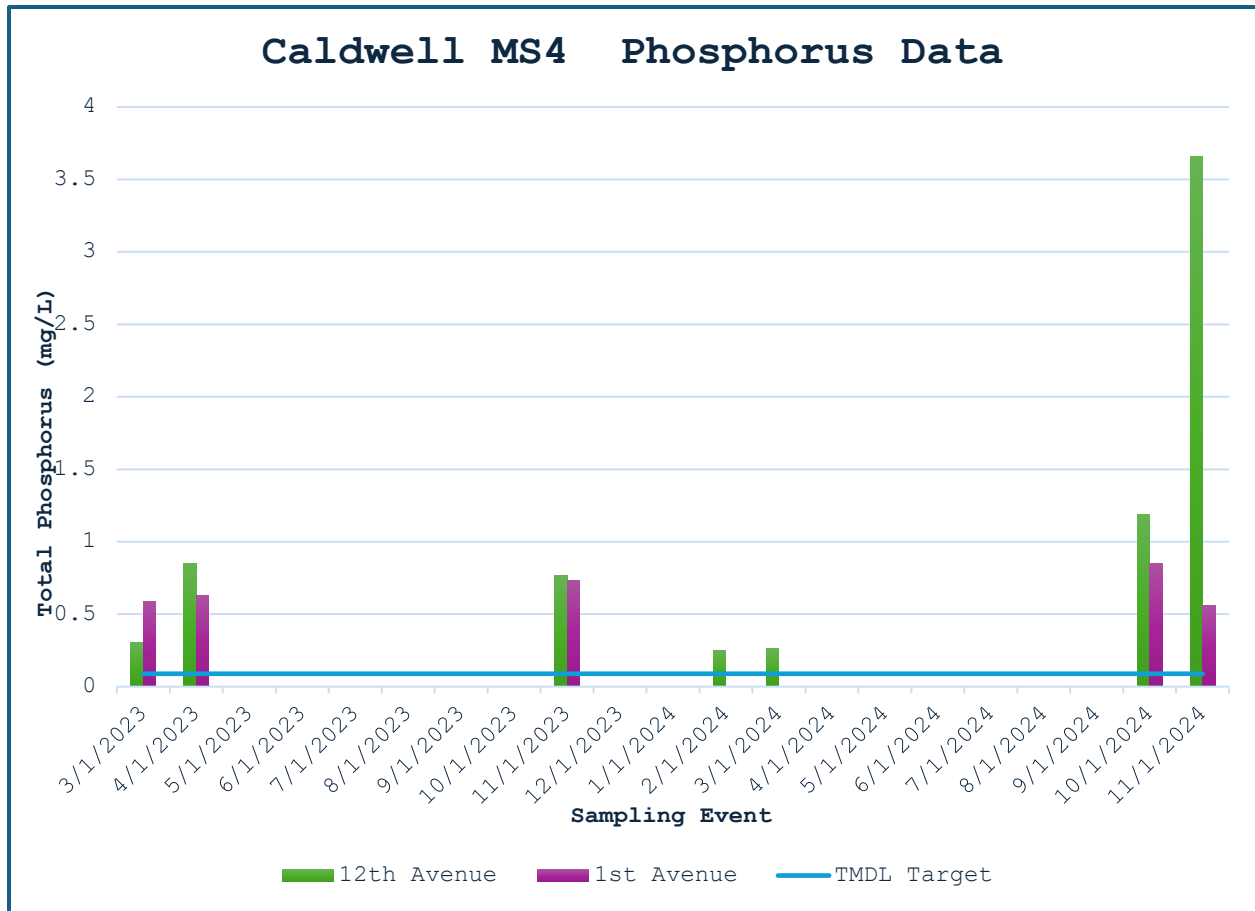


Figure 1. Total Phosphorus Data collected at 12th Avenue & 1st Avenue between permit term 2020-2025.

The TP sample results averages for both sampling locations exceeded the TMDL of 0.10 mg/L during the monitoring and permit term; they were found to be consistently below 1.0 mg/L however, except for the November sampling event, which the result was 3.66 mg/L, an extremely high result for this sampling site.

Nutrient load excess in stormwater samples may come from sources such as fertilizer, sediment, and transportation-related debris can lead to increased levels of phosphorus in the water matrix. Idaho Transportation Department (ITD) was involved with an overpass construction project from 2023-2024 that had potential to affect water samples from the 1st Avenue storm drain manhole. Before construction took place, City stormwater staff sampled upstream of I-84 to avoid interstate runoff influence. After construction was completed, the city storm drains and ITD storm drains became their

own systems under jurisdiction, therefore eliminating the potential for stormwater pollution from these construction events to the 1st Avenue site. The 1st Avenue sampling site is normally susceptible to runoff pollution from other sources. However, there were no external factors to explain the elevated phosphorus levels found during monitoring this permit term.

Total Suspended Solids

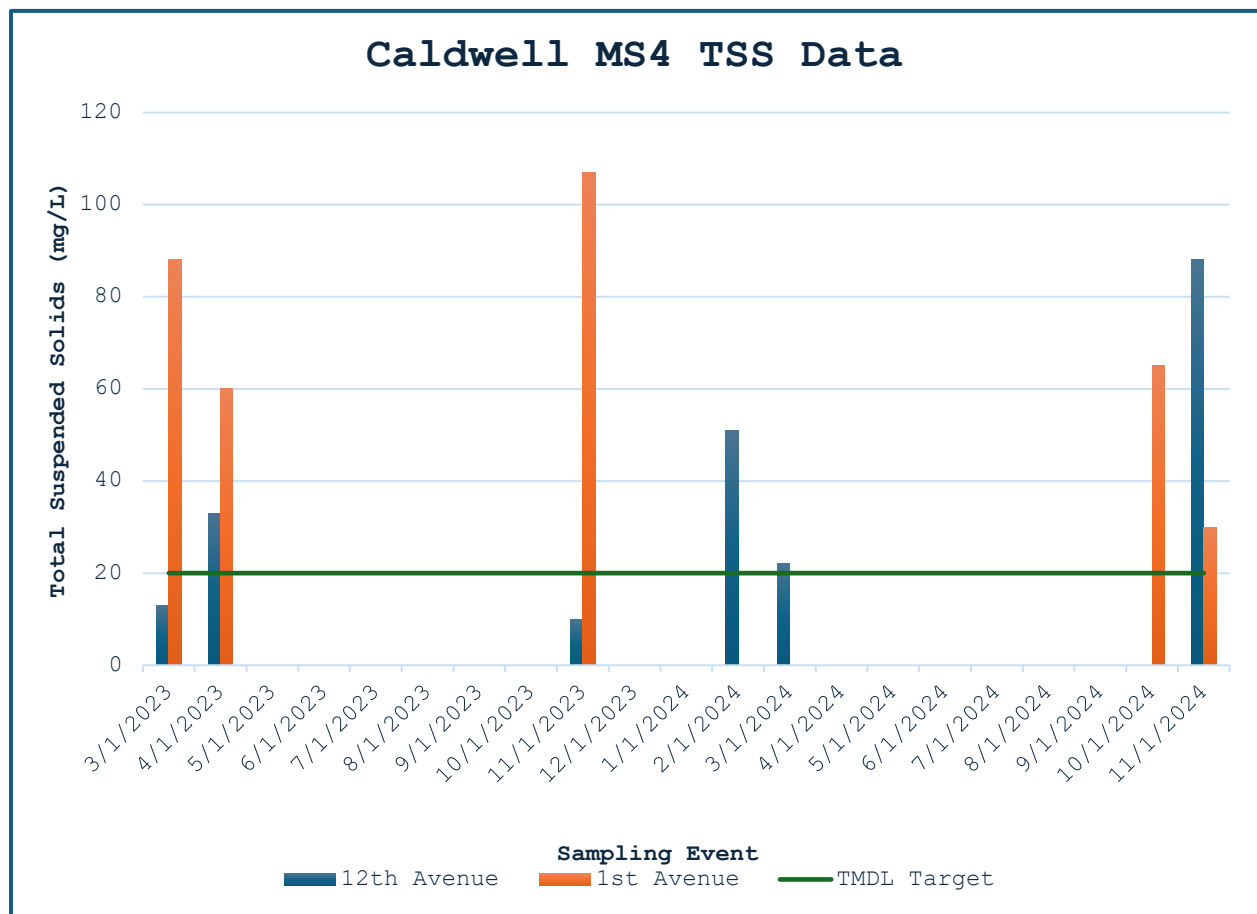


Figure 2. Total Suspended Solids (TSS) Data collected at 12th Avenue & 1st Avenue between permit term 2020-2025.

The following figure, Figure 2, summarizes the TSS data collected at 12th Avenue and 1st Avenue throughout the permit term. The green line represents the TSS target of 20 mg/L. Over half of the samples exceeded this target. The TSS average for 12th Avenue

was slightly above the TMDL Target at 36.17 mg/L, and for 1st Avenue each site was slightly above the target at 70 mg/L.

Notably, there was an extreme outlier in the dataset of 848 mg/L during the 10/16/2024 sampling event. We removed this sample result to obtain a more accurate understanding of our data. We suspect that this water sample was anthropogenically influenced during the time the sample was taken, as we have never recorded such a high TSS result at 12th Avenue.

Escherichia coli

The following figure, Figure 3, summarizes the *E. Coli* data collected at 12th Avenue and 1st Avenue throughout the permit term. *E. Coli* averages for both sample sites exceeded the target of 126 CFU/100mL, where CFU is colony forming units. Additionally, eight out of the thirteen samples were above the target as well.

As previously stated, the outlier of 20,000 CFU/100mL has been removed from the graph as we believe external factors may have influenced the October sampling event. Overall, 1st Avenue has lower counts of *E. coli* compared to 12th Avenue. 12th Avenue has been selected as part of the City's Pollutant Reduction Program due to its notably high amounts of *E. Coli*. A Microbial Source Tracking (MST) Assessment has been done to possibly identify the source of the increased *E. Coli* in the water samples. With each sampling event, the Levels of *E. Coli* are monitored.

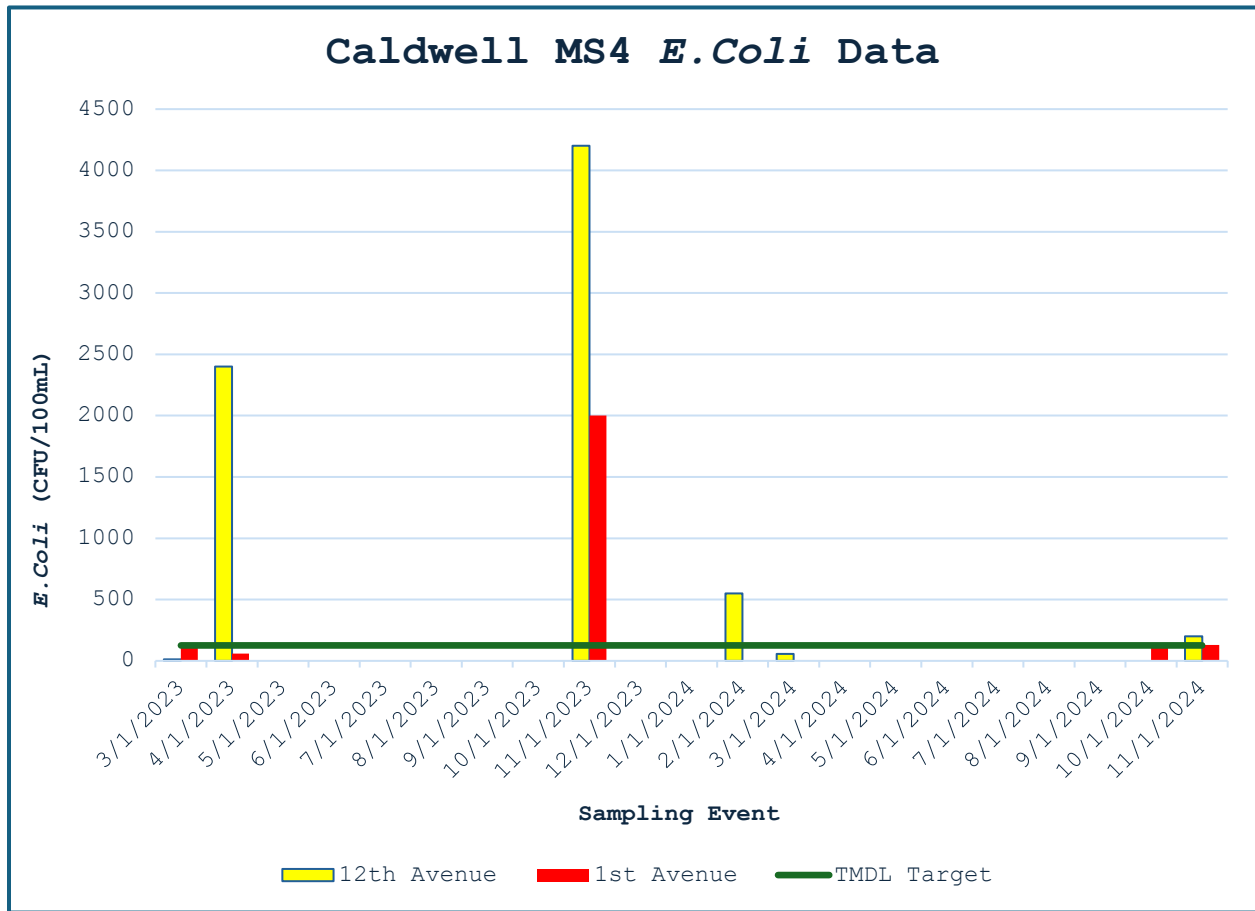


Figure 3. *Escherichia coli* (*E. Coli*) Data collected at 12th Avenue & 1st Avenue between permit term 2020-2025.

Nitrite/Nitrate as Nitrogen

Figure 4 summarizes the Nitrogen data collected at 12th Avenue and 1st Avenue throughout the permit term. There is not currently a set limit on Nitrate/Nitrite for the Boise River and Mason Creek. These samples were collected and processed in addition to the other required samples, but were not needed for this permit term.

All samples were below 0.50 mg/L for every sampling event except for 11/21/2024. The November samples yielded remarkably high values for both locations, with readings of 0.79 mg/L and 3.24 mg/L.

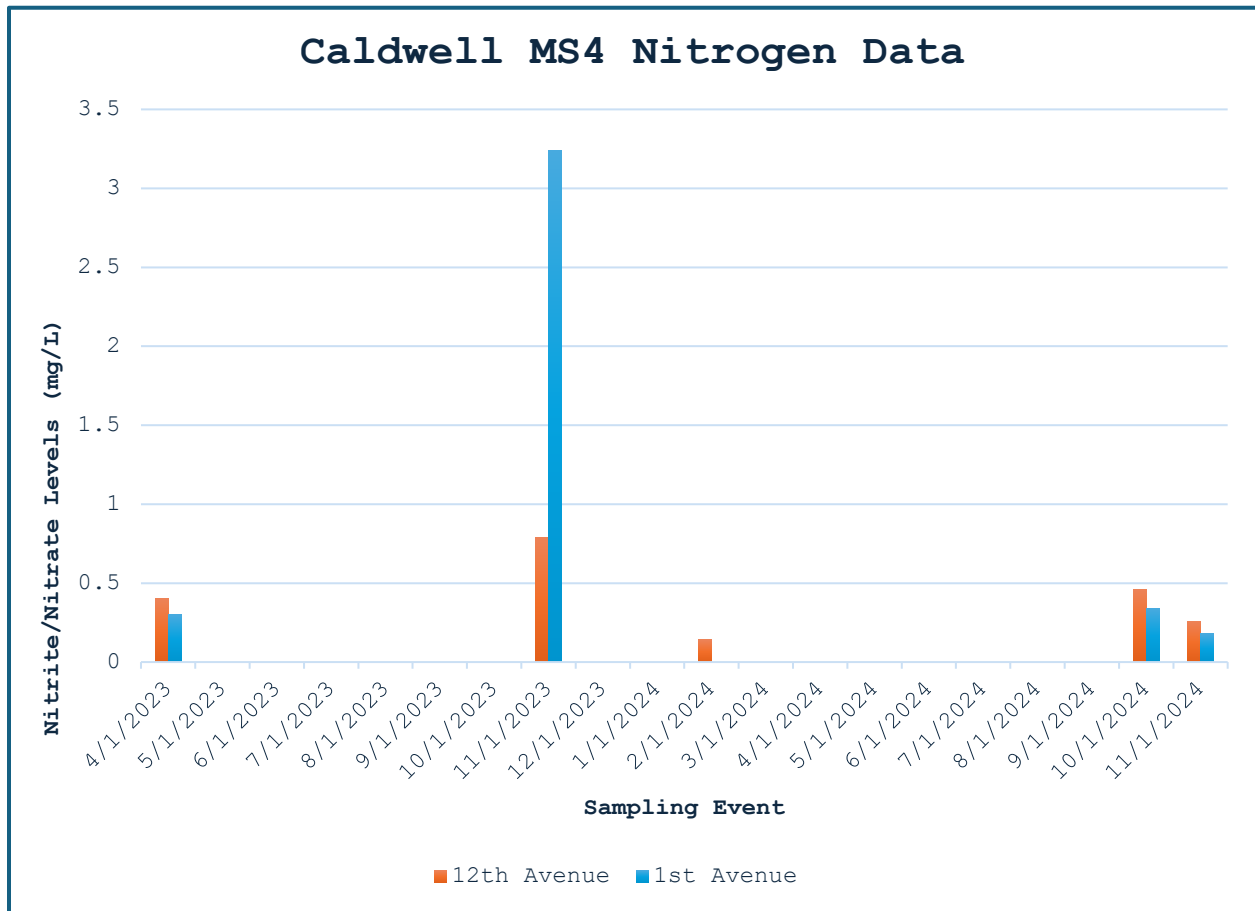


Figure 4. Nitrite/Nitrate as Nitrogen Data collected at 12th Avenue & 1st Avenue between permit term 2020-2025.

Summary

Currently, all laboratory reports and storm sampling photographs are stored electronically in house. Original paper chain of custody (COC) documents and lab reports are kept in paper format. These originals will be stored for the duration of the permit term. Once the permit term ends, the reports and COCs will be stored electronically in the City of Caldwell Laserfiche or another secure location on the City servers.

All records remain available to Idaho DEQ, EPA, or the public upon request, or in some cases, through a public record request. As per permit requirements, many planning documents will continue to be available on the Stormwater page of the City's website.

The City of Caldwell will continue to monitor and sample 12th Avenue (Indian Creek outfall) and 1st Avenue (Manhole near Boise River) to gain a quantitative and qualitative understanding of water quality in the City's proximity in the Lower Boise River Watershed and its effect on the system. The nutrient and sediment flux apparent in stormwater runoff is of major concern to the discharges reaching WOTUS from the City's MS4. With data collected from before this permit term to present day, we can gain a better understanding over time of how implementation of the City's stormwater BMPs helped to restore and remediate the natural riverine system, as best as possible for future nature enthusiasts or to provide areas in need of immediate improvements.

Along with quarterly stormwater monitoring, the Stormwater Division has effectively carried out other programs to help reduce environmental impacts from anthropogenic factors. A few programs include, but are not limited to, permanent BMP maintenance inspections, Illicit Discharge Detection and Elimination (IDDE), and Community Education and Outreach about stormwater, MS4, IPDES, and Erosion and Sediment Controls for construction sites. The City will continue to maintain sample results for as long as they can to complete time series analyses on pollutant reduction and recovery over the course of the City's Stormwater Management and effectiveness.