2024 Annual Water Quality Report
Coal Combustion Residue Monofill

Permit No. #58-SDP-03-92C

Grain Processing Corporation
Muscatine, IA

Final
October 2024

Stanley Consultants INC.
A Stanley Group Company
Engineering, Environmental and Construction Services - Worldwide

CERTIFICATION

2024 ANNUAL WATER QUALITY REPORT GPC

LANDFILL
Permit No. #58-SDP-03-92C

GRAIN PROCESSING CORPORATION MUSCATINE, IOWA

October 2024

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Trenton S Humphrey, P.E. Date: 10/9/24

License No. **P27585**

My renewal date is **December 31, 2025**

Pages or sheets covered by this seal: All pages.

Entire Document

Prepared By:

QUALIFIED GROUNDWATER SCIENTIST
Iowa Administrative Code Chapter 113.10(1)d

Name: Julie Oriano, P.G.
Iowa Certified Groundwater Professional

Signature:

Date: 10/9/2024

Stanley Consultants, Inc.
Crosspark Road, Suite 100
Coralville, IA 52241
Phone: (319) 259.6618

EXECUTIVE SUMMARY

Grain Processing Corporation (GPC) owns a private landfill regulated under [567] IAC Chapter 103 and closed under Permit #58-SDP-03-92C. The landfill previously operated as a disposal facility of Coal Combustion Residue (CCR) from GPC's Muscatine, Iowa, corn processing facility until July 2015 and spent diatomaceous earth until June 2016. The Iowa Department of Natural Resources (IDNR) approved a Closure/Post-Closure Plan for the site in September 2016 and closure/post-closure construction activities were completed in 2018. GPC is overseeing this site under a 10-year Closure Permit issued in January 2019.

This Annual Water Quality Report (AWQR) is submitted to comply with requirements of GPC's landfill permit and Iowa Administrative Code (IAC) 567, Chapter 103.1 (4) e. The report covers ground water quality monitoring activities that were completed in 2024.

In addition to groundwater quality monitoring, GPC conducts semiannual inspections to evaluate final landfill cover for differential settling, surface cracks, holes, erosion channels, or any interference with surface drainage. No changes are recommended to the semiannual inspection schedule.

A review of the monitoring well network and groundwater elevation level measurements identify (1) a steady groundwater flow gradient and pattern that persists both horizontally and vertically, and (2) "MW-5 has been observed to maintain minimal observed groundwater levels and no evident recharge during the Fall 2022 and Fall 2024 sampling events. Spring 2023 allowed for normal sampling conditions as observed prior to Fall 2022. MW-5 will be further assessed based on the groundwater observations in Spring 2025. No changes to the hydrologic monitoring system plan are recommended at this time.

Groundwater quality results identify similar findings to the 2023 results and include the following 2024 exceedances of an US Environmental Protection Agency (EPA) Maximum Contaminant Level (MCL):

- Arsenic at MW-18

All other water quality results do not exceed MCLs (see Table 2).

Iron and manganese continue to be detected at upgradient/background monitoring locations at levels that are above applicable non-MCL standards. Excluding iron and manganese, there were 13 detections observed above regulatory thresholds in 2024 in monitoring wells downgradient of the landfill. These 2024 detections were compared to 2023 detections where non-stable or non-declining trend results were observed in 2023. The results of this comparison found the 2024 concentrations were greater than or similar in value to what had been observed in 2023.

Background limits or control limits in 2024 were compared for MW-2 and MW-3. Results identified exceedances for the corresponding control limit and a regulatory standard for iron and manganese. A review of results shows that a majority of the parameters that had exceedances above regulatory thresholds are slightly increasing in concentrations from 2023 to 2024.

Stanley Consultants recommends that the current monitoring program be continued in 2025 with the groundwater sampling event to occur in the Spring of 2025.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF APPENDICES

GLOSSARY OF TERMS

AL – Action Level

AMSL – Above mean sea level

AWQR – Annual Water Quality Report

CCR – Coal Combustion Residual

CL - Control Limit (M+/-2SD)

DNR – Department of Natural Resources

GPC – Grain Processing Corporation

HAL – Health Advisory Level

HMSP – Hydrologic Monitoring System Plan

HR Green – HR Green, Inc.

IAC – Iowa Administrative Code

IDNR – Iowa Department of Natural Resources

IGS – Iowa Geological Survey

MCL – Maximum Contaminant Level

MW – Monitoring Well

NC – No Change

NPGW – Non-Protected Groundwater

PGW – Protected Groundwater

PL – Prediction Limit

RL – Reporting Limit

SDWR – Secondary Drinking Water Regulations

SWS – Statewide Standard

TSS- Total Suspended Solids

US EPA – United States Environmental Protection Agency

1. INTRODUCTION

1.1 BACKGROUND

Grain Processing Corporation (GPC) maintains a private landfill regulated under 567 Iowa Administrative Code (IAC) Chapter 103 and that has been closed under Permit #58-SDP-03-92C. The landfill previously operated as a disposal facility of Coal Combustion Residual (CCR) from GPC's Muscatine, Iowa, corn processing facility. The landfill is located in Louisa County, approximately 10 miles southwest of the City of Muscatine, Iowa.

In 2015 GPC modified its processing plant boilers to use natural gas as a fuel source rather than coal, thus eliminating the generation of CCR. CCR was last disposed of at the landfill on July 15, 2015. Disposal of spent diatomaceous earth (aka spent carbon) from GPC's filtering process continued until June 29, 2016.

Disposal of GPC's wastes ended prior to the landfill reaching full build-out conditions as designed under the 2011 permit. A Closure/Post-Closure Plan prepared by HR Green was approved by the Iowa Department of Natural Resources (IDNR) on September 28, 2016. The closure/post-closure construction activities were completed in 2018. GPC received a 10-year Closure Permit for this facility on January 3, 2019. Per this permit, no additional waste disposal or landfill-related activities are to be completed at the facility. Annual sample collection and liquid level (groundwater/leachate) measurements are to be completed per Special Provisions X.6.a-g and X.8 of the Closure Permit. This included monthly site inspections for at least the first year of post-closure (which has been completed) and semiannual inspections thereafter.

Semiannual inspections evaluate final landfill cover for differential settling, surface cracks, holes, erosion channels, or any interference with surface drainage. Semiannual inspections were completed by GPC and are attached to this report in Appendix C.

In accordance with [567] IAC Chapter 103.1(4)e and Special Provision X.6.h of the landfill closure permit, this annual water quality report summarizes the effect that the landfill is having on groundwater and surface water quality.

Under Permit Special Provisions X.6.e and the approved Hydrologic Monitoring System Plan (HMSP), routine sampling is conducted as a single annual event. The event addressed herein is referenced as September 9th and 10th, 2024.

1.2 HYDROLOGIC MONITORING SYSTEM PLAN

The approved HMSP consists of the following monitoring wells: MW-2 is the upgradient comparison point for MW-4. Well MW-3 is the upgradient comparison point for MW-5[1], MW-10, MW-15[1], MW-16, MW-17, and MW-181. Surface water monitoring is not required. The monitoring locations and units monitored by the HMSP wells are described in Table 1. The 2024 sample collection was completed on September 9th and 10th, 2024. Annual sampling was conducted on an IDNR-approved schedule that continues the seasonal variation with spring/summer month sample collection in 2024. Sample collection schedule information is included in Table 2.

Under the Closure Permit Special Provisions X.6.e, HMSP monitoring wells are tested for total arsenic, barium, beryllium, boron, calcium, cobalt, copper, iron, lead, lithium, magnesium, manganese, potassium, selenium, sodium, and zinc; pH, bicarbonate alkalinity, chloride, sulfate, and TSS as outlined in Table 2. Water samples are field screened for pH. For all remaining contaminants, groundwater samples are collected via a low-flow method, placed in laboratory provided containers, and preserved on ice prior to submitting samples to the laboratory. Samples are analyzed by Eurofins Environment Testing North Central located in Cedar Falls, Iowa.

[1] As referenced herein MW-5 and MW-15 are the same as replacement wells MW-5R and MW-15R constructed in 2011. For water quality background comparison, MW-5 is considered an upgradient monitoring location.

Groundwater level measurement points include each of the above-listed HMSP monitoring wells plus several other wells retained as measurement points including MW-1, MW-6, MW-7, MW-8, MW-9, and MW-11. The locations of the monitoring wells and water level measurement points are shown on the Water Table Contour Map (Figure 1).

1.3 GEOLOGIC SETTING

Prior to being a landfill the property was undeveloped land. The landfill is located on the boundary of the landform regions referred to as the Southern Iowa Drift Plain and the Mississippi Alluvial Plain. The Southern Iowa Drift Plain is characterized topographically by steeply rolling hills interspersed with areas of uniformly level upland divides and level alluvial lowlands. Topography of the Mississippi Alluvial Plain is characterized by gently undulating to nearly level relief located along rivers and major streams.

The site is defined by a topographic ridge to the west, Muscatine Slough to the east, and eroded bluff ravines to the north and south. The fill area consists of two east-west trending ravines. The ravines cut back into the west topographic ridge. An earthen embankment composed of glacial till was constructed across the downslope toe of the ravines to complete the waste containment area.

The topography ranges from approximately 735 feet above mean sea level (AMSL) along the upland divides to approximately 670 feet AMSL in the alluvial lowlands. The soils and sediments within the area are either glacial or alluvial in origin. The glacial sediments are comprised of loess, till, and glaciofluvial deposits.

Loess is defined as a deposit of wind-blown rock fragments composed of clay and silt sized particles. The fine particles were originally produced from the grinding effect of continental glaciers on pre-existing rock. The resulting particles were carried by wind and deposited in varying thicknesses throughout southeast Iowa. The loess deposits in the area of the landfill range from 9 to 25 feet thick.

Glacial till is characterized by a mixture of different sized particles deposited by glacial ice without evidence of particle sorting or stratification. The glaciofluvial (outwash) deposits, in contrast, are lenses of sand and gravel exhibiting some degree of particle sorting and stratification. These units were deposited either under the ice or along its margin by glacial melt waters. The thickness of the till varies greatly ranging from “not present” beneath the Mississippi River valley to nearly 350 feet beneath the upland areas west of Muscatine Island.

Present-day soils were derived from weathering of the loess and till parent materials. The predominate soil type is represented by the Fayette silt loam along the bluff tops, the Douds-Lindley loams along the ravine side slopes, and the Olmitz loam over the alluvial deposits of Muscatine Island.

The cumulative thickness of the surficial material overlying bedrock is primarily controlled by bedrock topography. The average elevation of the bedrock in the vicinity of the landfill is between 350 and 400 feet AMSL (ranging from 135 to 385 feet below surface). The uppermost bedrock beneath the landfill consists of the Devonian age Cedar Valley Limestone. This formation is a finely crystalline and clastic limestone in the upper part; a brown dolomitic limestone in the middle part; and gray argillaceous, fossiliferous limestone in the lower part. The Devonian beneath the landfill is approximately 150 feet thick. Silurian dolomite and Ordovician shale underlie the Devonian System strata.

Three distinct water tables exist with the upper two zones perched and discontinuous and the lower zone forming the uppermost continuous water table. The uppermost water table is perched on glacial till beneath the uplands on the southwestern portion of the site. The upland geologic units crop out along the face of the pre-landfill bluff creating an inferred water table seepage face within the CCR fill area. The lateral extent of this zone is limited to the southwest (upgradient) portion of the site, so downgradient groundwater quality monitoring of this upper water table is not possible because the seepage face is at a higher elevation on the bluff.

The second water table encountered beneath the upland area is observed within an intra-till sand unit. This water table surface is perched on an underlying clay-rich glacial till unit that also crops out along the face of the pre-landfill bluff, again creating an inferred water table seepage face within the CCR fill area. Monitoring wells MW-2 (upgradient) and MW-4 (downgradient) are used to monitor groundwater within this zone. Downgradient monitoring along the east perimeter is again not possible because the seepage face is at a higher elevation on the bluff.

The uppermost continuous water table across the entire site is observed in the lower intra-till sand unit that is located beneath the uplands and in the alluvium of Muscatine Island. This water table is separated from the overlying CCR fill area by several tens of feet of clay-rich till in the upland area and by 45 to 55 feet of unsaturated intra-till sand and alluvium along the eastern perimeter of the landfill. Upgradient monitoring well MW-3 and downgradient wells MW-10, MW-15, MW-16, MW-17, and MW-18 are used to monitor groundwater in this zone.

Another perched zone of limited aerial extent is observed near the northeast corner of the landfill at well cluster MW-5/MW-15. MW-5 is used to monitor groundwater within this zone that is perched on a floodplain clay deposit. The perched zone does not appear to be hydraulically connected to the uppermost continuous aquifer that is monitored by wells MW-3, MW-10, MW-15, MW-16, MW-17, and MW-18. The impact of the local confining clay layer is evidenced by the head differential observed between MW-5 and MW-15, which is consistently 5 to 10 feet (see Table 4). Provided the head differential exists, it appears the water quality monitored at MW-5 and MW-15 are representative of distinct hydrologic units. Because of the isolated nature of the perched zone, MW-5 does not have a corresponding upgradient counterpart.

Specifically, at well cluster MW-5/MW-15, a low permeability alluvial layer extends from 532-536 feet AMSL. The base of the filter pack for shallow well MW-5 extends down to 534.86 feet AMSL, while the top of the filter pack for deeper well MW-15 extends up to 533.00 feet AMSL. These elevations illustrate that the filter pack intervals for these two wells are separated by approximately 2 feet within the clay layer. The constructed condition of MW-5 and MW-15 does not create a hydrologic cross connection between the over- and under-lying aquifers. That is because (1) each well is known to intersect the same low permeability alluvial clay layer, but not fully crosscut it, and (2) the wells are offset horizontally by several feet meaning the wells do not create a physical conduit vertically through the clay. As such, the water level measurements and water quality at MW-5 reflect a perched condition above the clay layer; and the levels and quality at MW-15 reflect the underlying groundwater that is representative of the uppermost continuous aquifer beneath the site.

2. MONITORING WELL MAINTENANCE AND PERFORMANCE SUMMARY

Reviews of well performance are conducted to confirm that the HMSP-approved wells continue to function as viable monitoring points. A schedule of these reviews is included in Table 3. A summary of the well information is presented in Table 4. This table includes a record of high and low water levels at each monitoring well and reports the change in depth of well from initial installation and vertical gradient information for nested monitoring locations. One new record low water level was observed at MW-5 in 2024. No new record high water levels were observed during 2024. Vertical gradient conditions remain consistent with historic observations, the magnitude of the gradients are similar where a recharge (downward) vertical hydraulic gradient is observed in the upland area (MW-1/2/3) and a neutral vertical gradient in the alluvial lowland area (MW-9/10/11). The vertical gradient at MW-5/15 is downward but MW-5 is screened within a perched water table zone.

Additionally, under Closure Permit Special Provision X.8, the annual liquid levels are recorded at two piezometers (LPZ-12 and LPZ-14). Information collected at these locations is included in Table 4.

The current review indicates: (1) a steady groundwater flow gradient and pattern persists both horizontal and vertical (Figure 1 and Table 4), and (2) the wells remain viable sampling points as they are physically intact, void of excessive turbidity with stable well depth measurements, and provide the anticipated recharge during sampling. No changes to the hydrologic monitoring system plan are recommended.

3. ANNUAL MONITORING RESULTS

3.1 COMPARISON TO STANDARDS

Statistical methods, tabulations, and graphics have been compiled for this report using data collected from 2016-2024. With the exception of well MW-5, which was dry in 2022 and 2024, the minimum of eight samples for statistical analysis have been collected. Interwell control limits were also assessed taking the average at the background well and adding (or subtracting for pH) two standard deviations from that value. As control limits change each year based on results from previous years, only the results from this year are evaluated in this report.

Where the parameters have a MCL[2] established by the U.S. EPA, the water quality data are evaluated in relation to the established MCL's, or where an MCL does not exist, the result is compared to the HAL[3] or SDWR[4] (U.S. EPA edition of the Drinking Water Standards and Health Advisories, 2018). Where an MCL, HAL, or SDWR standard does not exist, the result is compared to the Iowa SWS[5] for a protected, or non-protected, groundwater source.

The analytical reporting limit (or method detection limit) is defined as the practical and routinely achievable detection level that provides a relatively good certainty that any reported value is reliable. As many results are observed in concentrations that are less than the reporting limit (i.e., the result is reported as "not detected"), an accurate calculation of the mean concentration and standard deviation values from the data set cannot be completed. For purposes of water quality comparison, the means, standard deviations, and control limits are computed by utilizing the reporting limit value in the computations. This procedure slightly overestimates the control limit.

When a parameter is not detected during analysis the result is plotted on the graph at the numeric value of the reporting limit. This data may appear to be an exception when viewed on the graph, if detection limits vary in results however, this occurrence is inconclusive as to whether the parameter has exceeded the control limit. The calculated control limits for both MW-2 and MW-3 and applicable standards are listed in Table 5.

---

[2] The highest level of contaminant allowed in drinking water. MCLs are enforceable standards.

[3] An estimate of acceptable drinking water levels for a chemical substance based on health effect information. This is not a legally enforceable Federal standard, but serves as technical guidance to assist Federal, State, and local officials.

[4] Non-enforceable Federal guidelines regarding cosmetic effects (such as tooth or skin discoloration) or aesthetic effects (such as taste, odor, or color) of drinking water.

[5] Chapter 137 of Iowa DNR voluntary cleanup rules prescribed SWSs for groundwater/ Two classes are distinguished by the hydraulic conductivity (K) of the aquifer and the naturally occurring total dissolved solids (TDS) content. Groundwater in a useable aquifer ($K \geq 0.44$ m/d and TDS < 2,500 mg/L) has a higher level of protection than groundwater that is not likely to be used.

3.2 OUTLIER AND TREND ANALYSIS

To determine the water quality trends and potential outliers from 2024 sampling trends, a statistical analysis was completed using ProUCL 5.2. ProUCL is a software program developed by the EPA for the statistical analysis of outliers and trends, among other analyses. Since the number of analysis for each well-constituent pair is below 25, the Rosner test is used by ProUCL to determine outliers at a 95% confidence interval. ProUCL denotes “upper tail” outliers as outliers that are above existing values while “lower tail” outliers are outliers that are below existing values. For values that below the detection limit, ½ the detection limit was used for statistical analysis.

As discussed in Section 3.1, statistical analysis was not determined for MW-5 since only seven samples have been collected at this location. Additionally, outlier analysis was not performed for beryllium, copper, selenium, and zinc since a majority of results for each well were below the detection limit. Statistical analysis was not also completed for other well-constituent pairs that had at least 50% of non-detects in the data set. The potential outliers for 2024 were identified by the ProUCL software program:

- Arsenic at MW-17 (0.00380 mg/L) – upper tail
- Lead at MW-17 (0.000954 mg/L) – upper tail
- Manganese at MW-17 (1.19 mg/L) – upper tail
- Potassium at MW-16 (6.77 mg/L) – upper tail

Since the outliers have not been determined to be due to a sampling and analysis error, the data points will not be removed from consideration of trends and future outliers. Trends were determined using the Mann-Kendall test in ProUCL. The Mann-Kendall test has three potential trends: 1) an increasing trend that signifies that the concentrations are increasing at a significance level was above 95%, 2) a decreasing trend that signifies that the concentrations are decreasing at a significance level of 95% and, 3) no trend if the Mann-Kendall statistic is 0 or the confidence level is below 95%. Similar to the outlier analysis, statistical analysis was not performed for MW-5 or for well-constituent pairs that had at least 50% non-detects in the data set. Table 3-1 summarizes the 2024 trends for applicable well-constituent pairs with an additional discussion for each parameter that trend analysis could be completed for.

Table 3-1
Summary of GPC Landfill Statistical Analysis
2016 Through 2024

Chemical Constituent	Upgradient of Landfill Trends		Downgradient of Landfill Trends					
	MW-2	MW-3	MW-4	MW-10	MW-15	MW-16	MW-17	MW-18
Arsenic	NA	NA	NT	NA	NA	NA	NT	NT
Barium	NT	NT	NT	NT	NT	NT	NT	NT
Bicarbonate Alkalinity	↑	NT	NT	NT	↓	↑	NT	NT
Boron	NA	NA	NT	NT	↓	NT	NT	NT
Calcium	NT	NT	NT	NT	NT	↑	NT	NT
Chloride	NT	NA	NT	NT	↓	↑	NT	NT
Cobalt	NT	NT	NT	NT	NT	NT	↑	↓
Iron	NT	NT	NT	NT	NT	NT	NT	NT
Lead	NA	NA	NA	NA	NA	NT	NT	NT
Lithium	NT	NT	NA	↓	NT	NT	↑	NT
Magnesium	NT	NT	NT	NT	↓	↑	NT	NT
Manganese	NT	NT	↓	NT	NT	NT	NT	↓
Potassium	↑	NT	NT	↑	NT	↑	NT	↓
Sodium	NT	NT	NT	↓	↓	↑	↓	↓
Sulfate	NT	NT	NT	NT	NT	NT	NT	NT
TSS	NT	NT	↓	NT	NT	NT	NT	NT

Notes:
NA – Not analyzed due to at least 50% non-detects in the data set from 2016-2024
NT – No trend from 2016-2024
↑ – An increasing trend at the 95% confidence interval from 2016-2024
↓ – A decreasing trend at the 95% confidence interval from 2016-2024
*MW-5 does not have enough data to run the Statistical Analysis and is excluded in the statements below describing all wells.

Arsenic –A statistical trend analysis was able to be completed in 2024 for wells MW-4, MW-17, and MW-18 and no trend was present at these three wells.

Barium – A statistical trend analysis was able to be completed in 2024 for all wells and no trend was present at these wells.

Bicarbonate Alkalinity –A statistical trend analysis was able to be completed in 2024 for all wells. Upgradient well MW-2 and downgradient MW-16 showed an increasing trend while downgradient well MW-15 showed a decreasing trend. The remaining wells showed no trend.

Boron – A statistical trend analysis was able to be completed in 2024 for all downgradient wells. Downgradient well MW-15 displayed a decreasing trend while the remaining downgradient wells did not display a trend.

Calcium – A statistical trend analysis was able to be completed in 2024 for all wells. Downgradient well MW-16 has an increasing trend and the remaining wells had no trend.

Chloride – A statistical trend analysis was able to be completed in 2024 for all wells except upgradient well MW-3. Downgradient well MW-16 had an increasing trend, downgradient well MW-15 had a decreasing trend, and the remaining wells had no trend.

Cobalt – A statistical trend analysis was able to be completed in 2024 for all wells. Downgradient well MW-17 had an increasing trend, downgradient well MW-18 had a decreasing trend, and the remaining wells did not exhibit a trend.

Iron – A statistical trend analysis was able to be completed in 2024 for all wells with no trend observed in each well.

Lead – A statistical trend analysis was able to be completed in 2024 for downgradient wells MW-16, MW-17, and MW-18. Each of these wells did not have a trend.

Lithium – A statistical trend analysis was able to be completed in 2024 for all wells except downgradient well MW-4. Downgradient well MW-17 showed an increasing trend, downgradient well MW-10 showed a decreasing trend, and the remaining wells did not have a trend.

Magnesium – A statistical trend analysis was able to be completed in 2024 for all wells. Downgradient wells MW-15 had a decreasing trend, downgradient well MW-16 had an increasing trend, and the remaining wells did not have a trend.

Manganese – A statistical trend analysis was able to be completed in 2024 for all wells. Downgradient wells MW-4 and MW-18 had a decreasing trend while the remaining wells did not have a trend.

Potassium – A statistical trend analysis was able to be completed in 2024 for all wells. An increasing trend was observed in upgradient well MW-2 and downgradient wells MW-10 and MW-15. Downgradient well MW-18 had a downward trend while the remaining wells did not have a trend.

Sodium – A statistical trend analysis was able to be completed in 2024 for all wells. A decreasing trend was observed at downgradient wells MW-10, MW-15, MW-17, and MW-18 and an increasing trend was observed at MW-16. Upgradient wells MW-2 and MW-3 and downgradient well MW-4 had no trend.

Sulfate – A statistical trend analysis was able to be completed in 2024 for all wells and no wells had an increasing or decreasing trend.

TSS- A statistical trend analysis was able to completed in 2024 for all wells. Downgradient well MW-4 exhibited a decreasing trend and the remaining wells did not have a trend.

3.3 2024 WATER QUALITY RESULTS

Sampling of the HMSP-approved monitoring points was conducted during the period of September 9th and 10th, 2024. Table 6 provides a summary of monitoring points and detected constituents from the recent sampling activity and the 2024 sampling event that did not exceed a control limit. Table 7 is a summary of ongoing or newly identified exceedances of control limits. Table 8 includes the historical sample results at this facility from 2016-2024. Table 9 summarizes findings from 2016-2024 where exceedances have occurred. In this table, results from 2016-2023 were compared to the 2024 calculated control limit (mean +/-2 standard deviations). A complete list of results is provided in the laboratory Analytical Report in Appendix A. Appendix D contains graphs showing water quality results from 2016 to 2024 and includes applicable regulatory standards and 2024 calculated control limits.

Some general observations about groundwater quality include:

MW-5 had only 300mL of recovery through low flow purging and expressed no recharge during the September 9-10, 2024 sampling event. No samples were collected during the event, therefore MW-5 data was entered as dry and an attempt to resample will occur during the Spring 2025 sampling event.

Arsenic at MW-18 was reported above the MCL. The arsenic concentration observed at this location slightly increased in 2024 compared to the decrease from the observed concentration reported in 2023, as shown in the arsenic plot included in Appendix D. All other compounds at all sample points were reported below the MCL.

Manganese and iron exceed regulatory limits in upgradient locations MW-2 and MW-3. These upgradient values reflect ambient (background) conditions of the monitored aquifers.

Excluding the iron and manganese detections above regulatory limits, there were 13 detections observed above regulatory thresholds in 2024 in monitoring wells downgradient of the landfill.

A review of non-stable or non-decreasing trend results for sample locations and contaminants where concentration exceeded regulatory standards from 2023 compared to the 2024 results identified the following:

- No detection of iron concentration at MW-2 in 2024, compared to a detection in 2023.
- Slight increase in iron concentration observed at MW-3 in 2024 as was observed in 2023.
- Increased observed arsenic and iron concentrations at MW-18 in 2024 compared to 2023.
- Increased concentrations of cobalt in MW-4 and MW-17 in 2024 compared to 2023.
- Slight decrease in cobalt concentration at MW-16 in 2024 compared to 2023.
- Additional sampling events will continue to inform the results

Thirteen (13) constituents were detected above the control limit (MW-2) at MW-4 with nine (9) constituents either being below their respective regulatory threshold or did not have an applicable threshold. Iron, manganese, cobalt, and sodium were reported above their respective regulatory threshold.

Several constituents were detected above control limits (MW-3) at downgradient monitoring well locations and below their respective regulatory threshold with the following exceptions:

- Arsenic at MW-18 above the MCL (0.01 mg/L);
- Boron at MW-16 above the HAL (6 mg/L);
- Cobalt at MW-16 and MW-17 above the PGW SWS (0.0021 mg/L);
- Iron at MW-10 *(Non-Detect but RL at 0.4mg/L due to dilution), MW-16, MW-17, and MW-18 above the SDWR (0.3 mg/L);
- Lithium at MW-10, MW-16, and MW-18 above the SWS (0.014 mg/L);
- Manganese at MW-15, MW-16, MW-17, and MW-18 above the HAL (0.3) / SDWR (0.05); MW-10 (SDWR only)
- Sodium at MW-10, MW-15, and MW-16 above the HAL (20 mg/L); and
- Sulfate at MW-10 above the SDWR (250 mg/L).

Overall, there appears to be localized impact on groundwater quality near the east perimeter of the fill area.

There are no changes recommended at this time related to the sample collection schedule and parameters to be sampled. The next sample event is planned for Spring 2025.

4. SUMMARY OF RECOMMENDATIONS

1) The next sampling event is tentatively scheduled for Spring 2025 with additional sampling events as detailed in Table 2.
2) Based on review of the horizontal and vertical hydraulic gradients and well conditions, no changes to the hydrologic monitoring system plan or well maintenance is recommended at this time.
3) No additional site groundwater quality assessment is recommended at this time.

4) Annually submit a report (AWQR) by November 30 which summarized the effects the facility is having on groundwater quality. If a sampling event is performed during the winter months (i.e., 4th quarter calendar year) GPC may request an alternative submittal date to accommodate sample analysis.

5) Inspections will be completed on a semiannual basis.

5. REFERENCES

EPA, 2015. ProUCL Version Guide, EPA/600/R-07/041, October 2015

Howard R. Green Company, 2009. Hydrologic Monitoring System Plan section of the Permit Renewal Application, May 2009, Grain Processing Corporation, Muscatine, Iowa.

Howard R. Green Company, 1995. Amended Hydrologic Monitoring System Plan Grain Processing Corporation, Muscatine, Iowa. Unpublished report, 12 pp. plus appendices.

Howard R. Green Company, March 1994. Hydrogeologic Investigation Report and Proposed Hydrologic Monitoring System Plan, Grain Processing Corporation, Muscatine, Iowa. Unpublished report, 45 pp. plus appendices.

HR Green, March 2017 (draft report). Construction Documentation & Final Closure Report, Grain Processing Corporation CCR Landfill.

HR Green, September 19, 2016. Closure / Post-closure Plan Grain Processing Corporation, Muscatine, Iowa.

HR Green, 2001-2020. Annual Water Quality Reports, Grain Processing Corporation, Muscatine, Iowa. Unpublished reports.

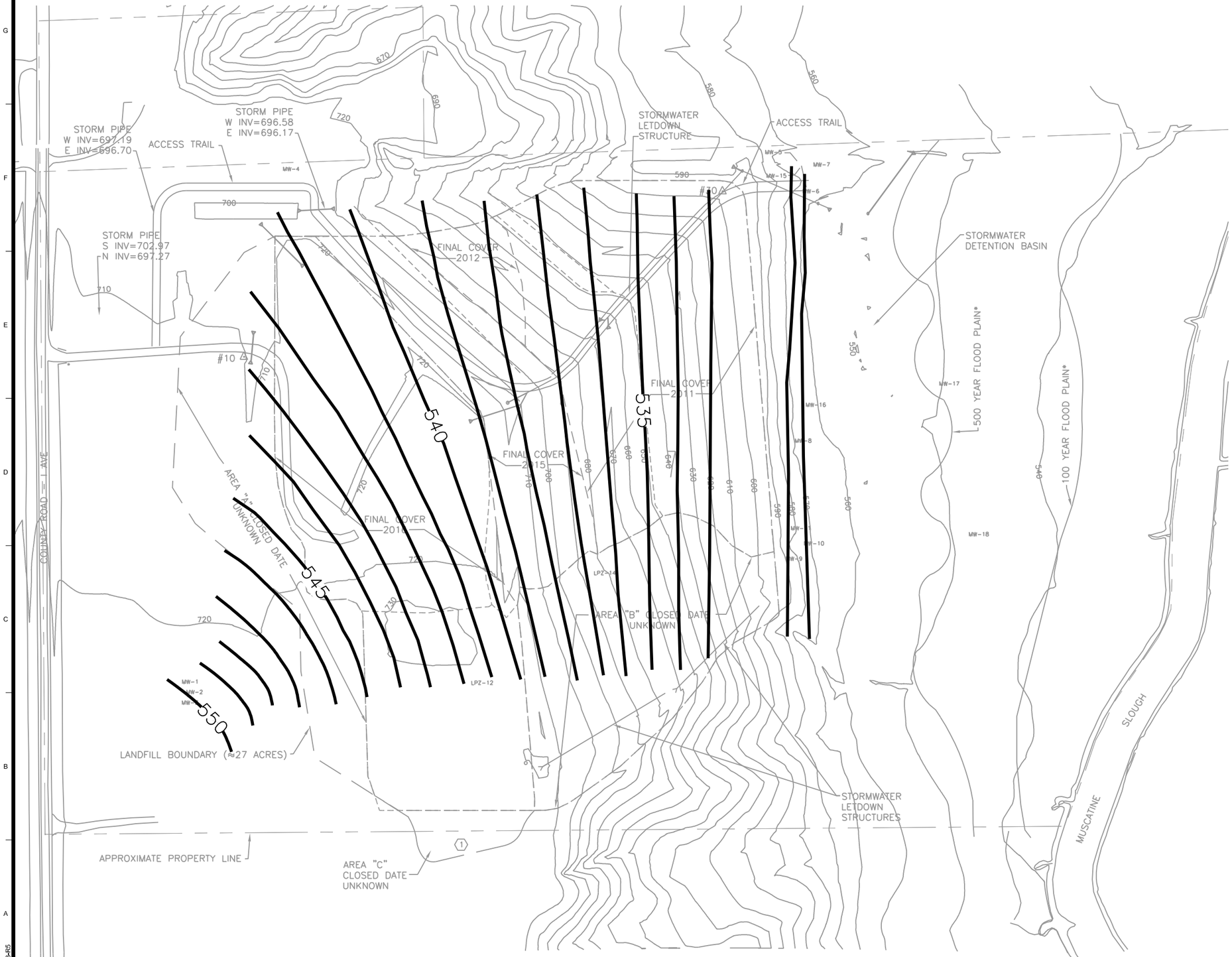
HR Green, 2012. Final Cover Construction Record Drawings Sheet 1, Grain Processing Corporation, Muscatine, Iowa.

U.S. Environmental Protection Agency (EPA), 2018. Drinking Water Standards and Health Advisories; EPA 822-F-18-001, March 2018.

U.S. Geological Survey (USGS), 1995. Hydrogeology and Water Quality of the Mississippi River Alluvium Near Muscatine, Iowa, WRIR-95-4049.

FIGURES

Water Table Contour Map



LEGEND

- 720 — INDEX CONTOUR
- INTERMEDIATE CONTOUR
- CONTROL POINTS
- PIEZOMETERS
- MONITORING WELL
- LANDFILL BOUNDARY
- FINAL COVER BOUNDARY
- 540 — WATER TABLE CONTOUR

WATER TABLE IS UPPERMOST AQUIFER MONITORED BY POINTS MW-3, MW-10, MW-15, MW-16, MW-17, AND MW-18.

KEYNOTES: ⬡

1. A RETRACEMENT SURVEY ADDRESSING THE OFFSITE ASH FILL WAS PREPARED BY MARTIN & WHITACRE SURVEYORS AND FILED WITH LOUISA COUNTY JUNE 5, 2017.

MONITORING POINTS

DESCRIPTION	NORTHING	EASTING	ELEV ••	POINT #
MW-1	480569.39	2283917.08	725.86	61017
MW-2 •	480562.10	2283918.18	725.68	61016
MW-3 •	480555.63	2283918.65	726.05	61015
MW-4 •	481599.36	2284110.31	707.93	61012
MW-5 •	481607.82	2285152.40	567.86	61002
MW-6	481608.74	2285159.64	568.06	61001
MW-7	481609.83	2285166.72	568.07	61000
MW-8	481043.88	2285138.65	572.76	61005
MW-9	480848.82	2285145.16	578.43	61006
MW-10 •	480854.95	2285144.88	577.90	61007
MW-11	480859.76	2285144.58	577.79	61008
LPZ-12	480588.05	2284558.37	725.65	61014
~~LPZ-13 •••~~	~~481294.49~~	~~2284289.61~~	~~707.29~~	~~61013~~
LPZ-14	480811.98	2284741.90	687.48	61011
MW-15 •	481603.58	2285156.26	568.00	61003
MW-16 •	481111.85	2285166.16	568.45	61004
MW-17 •	481159.89	2285415.19	554.67	61051
MW-18 •	480874.82	2285468.74	551.31	61052

• HMSP APPROVED MONITORING POINTS
•• ELEVATION FROM TOP OF CASING
••• ABANDONED

MAPPING DATUM 8

NAD83 (2011) IOWA STATE PLANE, SOUTH ZONE, U.S. SURVEY FEET
NAVD88 (GEOID 12A), U.S. SURVEY FEET

SURVEY NOTES:

TOPOGRAPHIC BASE MAP IS A COMPILATION OF AERIAL AND GROUND SURVEYS. PHOTOGRAMMETRIC METHODS BY SIDEWELL COMPANY. DATE OF PHOTOGRAPHY APRIL 25, 2006. GROUND CONTROL BY H.R.GREEN. TOPOGRAPHIC SURVEY OF RECENTLY COVERED AREAS UPDATED BY JB HOLLAND CONSTRUCTION, INC. AND HEROLD-REICKS SURVEYING 12/13/2016 AS PART OF 2016 CLOSURE CONSTRUCTION WORK.

NO.	REVISIONS	DSGN	CHKD	APVD	DATE

NORTH

0 100' 200'

Stanley Consultants INC.
225 Iowa Avenue, Muscatine, Iowa 52761-3764
www.stanleyconsultants.com

GRAIN PROCESSING CORPORATION
CCR LANDFILL
MUSCATINE, IOWA

WATER TABLE CONTOUR MAP

DESIGNED	TS HUMPHREY
DRAWN	SL ROENFELDT
CHECKED	
APPROVED	
APPROVED	
DATE	

SCALE: AS NOTED

NO. 31016.02 | REV. X01 | 2

CADD D3-R5

TABLES

Table 1
Monitoring Program Summary 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Monitoring Well	Formation	Current Monitoring Program	Change for next sampling event	2021 Control Limit Exceedances	No. of Samples in each monitoring program since September 1, 2016		
					Routine	Supplemental	Remedial Action
MW-01	Till	Water Level	NC	*N/A*	*N/A*	*N/A*	*N/A*
MW-02	Upper Intratill Sand	Routine	NC	None	9	0	0
MW-04	Upper Intratill Sand	Routine	NC	Ba, B, Co, Fe, Mn, K, Na, pH, SO_4	9	0	0
MW-03	Lower Intratill Sand	Routine	NC	None	9	0	0
MW-05	Perched Clay Deposit	Routine	NC	B, Ca, Co, Cu, Li, Mg, K, Na, CaCO3, Cl, SO_4	9	0	0
MW-06	Lower Intratill Sand	Water Level	NC	*N/A*	*N/A*	*N/A*	*N/A*
MW-07	Lower Intratill Sand	Water Level	NC	*N/A*	*N/A*	*N/A*	*N/A*
MW-08	Upper Intratill Sand	Water Level	NC	*N/A*	*N/A*	*N/A*	*N/A*
MW-09	Upper Intratill Sand	Water Level	NC	*N/A*	*N/A*	*N/A*	*N/A*
MW-10	Lower Intratill Sand	Routine	NC	B, Ca, Li, Mg, K, Na, Se, CaCO3, Cl, SO_4	9	0	0
MW-11	Lower Intratill Sand	Water Level	NC	*N/A*	*N/A*	*N/A*	*N/A*
MW-15	Lower Intratill Sand	Routine	NC	B, Li, Mg, K, NA, $CaCO_3$, Cl	9	0	0
				B, Ca, Co, Li, Mg, Mn, K, Na, pH, CaCO3, Cl,			
MW-16	Lower Intratill Sand	Routine	NC	SO_4, TSS	9	0	0
MW-17	Lower Intratill Sand	Routine	NC	As, B, Co, Li, Mg, Mn, K, Cl, SO_4	9	0	0
MW-18	Lower Intratill Sand	Routine	NC	As, Ba, B, Fe, Mn, Cl, TSS	9	0	0
Other monitoring points							
LPZ-12	Fly Ash Waste	Routine - Leachate	NC	*N/A*	*N/A*	*N/A*	*N/A*
LPZ-14	Fly Ash Waste	Routine - Leachate	NC	*N/A*	*N/A*	*N/A*	*N/A*

Table 2
Monitoring Program Implementation Schedule 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Monitoring Well	Recent Sampling Dates and Constituents						Upcoming Sampling Dates and Constituents
	6/25-26/2019	9/21-22/2020	4/29-30/2021	9/20-21/2022	4/4-6/2023	9/9-10/2024	Spring 2025
MW-01	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*
MW-02	List A	List A	List A	List A	List A	List A	List A
MW-03	List A	List A	List A	List A	List A	List A	List A
MW-04	List A	List A	List A	List A	List A	List A	List A
MW-05	List A	List A	List A	List A	List A	List A	List A
MW-06	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*
MW-07	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*
MW-08	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*
MW-09	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*
MW-10	List A	List A	List A	List A	List A	List A	List A
MW-11	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*	*NA - Water Level Only*
MW-15	List A	List A	List A	List A	List A	List A	List A
MW-16	List A	List A	List A	List A	List A	List A	List A
MW-17	List A	List A	List A	List A	List A	List A	List A
MW-18	List A	List A	List A	List A	List A	List A	List A
LPZ-12	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*
LPZ-14	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*	*NA - Leachate Level Only*

List A- Arsenic, barium, beryllium, bicarbonate alkalinity as $CaCO_3$, boron, calcium, chloride, cobalt, copper, iron, lead, lithium, magnesium, manganese, pH, potassium, selenium, sodium, sulfate, total suspended solids, and zinc.

Table 3
Monitoring Well Maintenance and Performance Revaluation Schedule 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Compliance with:	Monitoring Calendar Years					
	2019	2020	2021	2022	2023	2024
567 IAC 114.21(2)"a" high and low water levels	Completed	Completed	Completed	Completed	Completed	Completed
567 IAC 114.21(2)"b" changes in the hydrologic setting and flow paths	Completed	Completed	Completed	Completed	Completed	Completed
567 IAC 114.21(2)"c" well depths	Completed	Completed	Completed	Completed	Completed	Completed

Table 4
Monitoring Well Maintenance and Performance Summary 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Top of Casing (ft, amsl)	Top of Screen (ft, amsl)	Total Depth (ft)		Date of Measurements	Water Levels (ft amsl)**		Maximum Depth Discrepancy (ft)
					9/9/2024	Low	High	
MW-01	725.86	710	27.79	Groundwater Level (ft)	27.05	N/A	N/A	-
				Groundwater Elevation (Ft MSL)	698.81			
				Measured Well Depth (ft)	-			
				Submerged screen	N			
MW-02	725.68	670.6	67.35	Groundwater Level (ft)	57.02	667.23	673.56	2.55
				Groundwater Elevation (Ft MSL)	668.66			
				Measured Well Depth (ft)	64.80			
				Submerged screen	N			
MW-03	726.05	541.35	196.60	Groundwater Level (ft)	176.82	548.97	550.4	0.60
				Groundwater Elevation (Ft MSL)	549.23			
				Measured Well Depth (ft)	196.00			
				Submerged screen	Y			
MW-04	707.93	665.8	55.22	Groundwater Level (ft)	46.64	659.5	664.88	-0.28
				Groundwater Elevation (Ft MSL)	661.29			
				Measured Well Depth (ft)	55.5			
				Submerged screen	N			
MW-05	567.86	546.6	33.25	Groundwater Level (ft)	31.85	536.51	542.39	0.05
				Groundwater Elevation (Ft MSL)	536.51			
				Measured Well Depth (ft)	33.2			
				Submerged screen	N			
MW-15	568	532.5	47.24	Groundwater Level (ft)	36.94	530.34	534.11	1.89
				Groundwater Elevation (Ft MSL)	531.06			
				Measured Well Depth (ft)	45.35			
				Submerged screen	N			

Table 4
Monitoring Well Maintenance and Performance Summary 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Top of Casing (ft, amsl)	Top of Screen (ft, amsl)	Total Depth (ft)		Date of Measurements	Water Levels (ft amsl)**		Maximum Depth Discrepancy (ft)
					9/9/2024	Low	High	
MW-06	568.06	511	69.55	Groundwater Level (ft)	36.88	N/A	N/A	-
				Groundwater Elevation (Ft MSL)	531.18			
				Measured Well Depth (ft)	-			
				Submerged screen	Y			
MW-07	568.07	485.5	86.95	Groundwater Level (ft)	37.30	N/A	N/A	-
				Groundwater Elevation (Ft MSL)	530.77			
				Measured Well Depth (ft)	-			
				Submerged screen	Y			
MW-08	572.76	548	37.48	Groundwater Level (ft)	37.25	N/A	N/A	-
				Groundwater Elevation (Ft MSL)	535.51			
				Measured Well Depth (ft)	-			
				Submerged screen	Y			
MW-09	578.43	551.1	35.42	Groundwater Level (ft)	Dry @ 35.25	N/A	N/A	-
				Groundwater Elevation (Ft MSL)	-			
				Measured Well Depth (ft)	-			
				Submerged screen	N			
MW-10	577.9	532.3	57.59	Groundwater Level (ft)	46.88	530.37	533.74	-0.21
				Groundwater Elevation (Ft MSL)	531.02			
				Measured Well Depth (ft)	57.80			
				Submerged screen	Y			
MW-11	577.79	502.4	82.19	Groundwater Level (ft)	46.89	N/A	N/A	-
				Groundwater Elevation (Ft MSL)	530.90			
				Measured Well Depth (ft)	-			
				Submerged screen	Y			

Table 4
Monitoring Well Maintenance and Performance Summary 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Top of Casing (ft, amsl)	Top of Screen (ft, amsl)	Total Depth (ft)		Date of Measurements	Water Levels (ft amsl)**		Maximum Depth Discrepancy (ft)
					9/9/2024	Low	High	
MW-16	568.45	535.3	55.43	Groundwater Level (ft)	37.31	530.3	533.92	2.83
				Groundwater Elevation (Ft MSL)	531.14			
				Measured Well Depth (ft)	52.60			
				Submerged screen	N			
MW-17	554.67	508.52	59	Groundwater Level (ft)	24.10	530.09	533.08	-4.00
				Groundwater Elevation (Ft MSL)	530.57			
				Measured Well Depth (ft)	63.000			
				Submerged screen	Y			
MW-18	551.31	513.41	49	Groundwater Level (ft)	20.98	529.81	532.74	-4.20
				Groundwater Elevation (Ft MSL)	530.33			
				Measured Well Depth (ft)	53.20			
				Submerged screen	Y			
LPZ-12	725.65	690.5	47.68	Leachate Level (ft)	47.31	-	-	-
				Leachate Elevation (Ft MSL)	678.34			
				Measured Well Depth (ft)	-			
				Submerged screen	Y			
LPZ-14	687.48	636.6	59.85	Groundwater Level (ft)	59.03	-	-	-
				Groundwater Elevation (Ft MSL)	628.45			
				Measured Well Depth (ft)	-			
				Submerged screen	N			

Well information collected from 1994 HIR / *Gradient calculated on nest wells in the following groups: MW-01, MW-02, MW-03; MW-05, MW-15, MW-06, MW-07; MW-09, MW-10, MW-11; Negative value is a discharge gradient; positive value is a recharge gradient / ** Period of record: 2006-2024 (except for MW-17 and MW-18 which started in 2013)

Table 5
Background Summary
2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Interwell Background/Control Limits (MW-2)							
Constituent	**Units**	**Samples**	**Detections**	**Background level**	**Statistical Test**	**Action Level**	**Source**
Inorganics							
Arsenic (As)	mg/l	9	0	0.00075	M+/-2SD	0.01	MCL
Barium (Ba)	mg/l	9	9	0.03742	M+/-2SD	2	MCL
Beryllium (Be)	mg/l	9	0	0.00027	M+/-2SD	0.004	MCL
Boron (B)	mg/l	9	0	0.058	M+/-2SD	6	PGW SWS
Calcium (Ca)	mg/l	9	9	79.955	M+/-2SD	-	None
Cobalt (Co)	mg/l	9	6	0.00045	M+/-2SD	0.0021	PGW SWS
Copper (Cu)	mg/l	9	1	0.00239	M+/-2SD	1.3	AL
Iron (Fe)	mg/l	9	3	0.40156	M+/-2SD	0.3	SDWR
Lead (Pb)	mg/l	9	1	0.0006	M+/-2SD	0.015	AL
Lithium (Li)	mg/l	9	8	0.00809	M+/-2SD	0.014	PGW SWS
Magnesium (Mg)	mg/l	9	9	38.2317	M+/-2SD	-	None
Manganese (Mn)	mg/l	9	9	0.18502	M+/-2SD	0.3 / 0.05	HAL / SDWR
Potassium (K)	mg/l	9	7	0.56756	M+/-2SD	-	None
Selenium (Se)	mg/l	9	2	0.00146	M+/-2SD	0.05	MCL
Sodium (Na)	mg/l	9	9	13.3917	M+/-2SD	20	HAL*
Zinc (Zn)	mg/l	9	2	0.02279	M+/-2SD	2	HAL
General Chemistry							
Bicarbonate alkalinity as CaCO3	mg/l	9	9	276.162	M+/-2SD	-	None
Chloride	mg/l	9	9	14.3087	M+/-2SD	250	SDWR
Sulfate	mg/l	9	9	51.0485	M+/-2SD	250	SDWR
Total suspended solids	mg/l	9	9	27.3067	M+/-2SD	-	None
Field Parameters							
pH	SU	9	9	6.67-7.76	M+/-2SD	6.5-8.5	SDWR

Table 5
Background Summary
2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Interwell Background/Control Limits (MW-3)							
Constituent	**Units**	**Samples**	**Detections**	**Background level**	**Statistical Test**	**Action Level**	**Source**
Inorganics							
Arsenic (As)	mg/l	9	0	0.00075	M+/-2SD	0.01	MCL
Barium (Ba)	mg/l	9	9	0.23547	M+/-2SD	2	MCL
Beryllium (Be)	mg/l	9	0	0.000272	M+/-2SD	0.004	MCL
Boron (B)	mg/l	9	3	0.143	M+/-2SD	6	PGW SWS
Calcium (Ca)	mg/l	9	9	118.417	M+/-2SD	-	None
Cobalt (Co)	mg/l	9	9	0.00085	M+/-2SD	0.0021	PGW SWS
Copper (Cu)	mg/l	9	0	0.0014	M+/-2SD	1.3	AL
Iron (Fe)	mg/l	9	9	2.64513	M+/-2SD	0.3	SDWR
Lead (Pb)	mg/l	9	2	0.00042	M+/-2SD	0.015	AL
Lithium (Li)	mg/l	9	6	0.00688	M+/-2SD	0.014	PGW SWS
Magnesium (Mg)	mg/l	9	9	35.6816	M+/-2SD	-	None
Manganese (Mn)	mg/l	9	9	0.46619	M+/-2SD	0.3 / 0.05	HAL / SDWR
Potassium (K)	mg/l	9	9	1.50805	M+/-2SD	-	None
Selenium (Se)	mg/l	9	0	0.00096	M+/-2SD	0.05	MCL
Sodium (Na)	mg/l	9	9	18.8596	M+/-2SD	20	HAL*
Zinc (Zn)	mg/l	9	0	0.01	M+/-2SD	2	HAL
General Chemistry							
Bicarbonate alkalinity as CaCO3	mg/l	9	9	413.751	M+/-2SD	N/A	None
Chloride	mg/l	9	9	2.2779	M+/-2SD	250	SDWR
Sulfate	mg/l	9	9	46.522	M+/-2SD	250	SDWR
Total suspended solids	mg/l	9	9	13.8022	M+/-2SD	-	None
Field Parameters							
pH	SU	9	9	6.37-7.78	M+/-2SD	6.5-8.5	SDWR

Table 6
Summary of Well/Detected Constituent Pairs With No Immediately Preceding Control Limit Exceedances
2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Constituent	Units	Most recent result	Control Limit
MW-2	Calcium	mg/l	85.7	79.55
	Magnesium	mg/l	33.2	38.2317
	Manganese	mg/l	0.0966	0.18502
	Sodium	mg/l	11.5	13.3917
	pH	SU	7.37	6.67-7.76
	Bicarbonate Alkalinity	mg/l	269	276.162
	Chloride	mg/l	10.1	14.3087
	Sulfate	mg/l	39.8	51.0485
	TSS	mg/l	2.38	27.3067
MW-4	Calcium	mg/l	106	79.55
	Magnesium	mg/l	44.7	38.2317
	Sodium	mg/l	20.6	13.3917
	pH	SU	6.61	6.67-7.76
	Bicarbonate Alkalinity	mg/l	339	276.162
	Chloride	mg/l	13.5	14.3087
	TSS	mg/l	11.00	27.3067
MW-3	Barium	mg/l	0.223	0.23547
	Calcium	mg/l	118	118.417
	Cobalt	mg/l	0.000598	0.00085
	Iron	mg/l	2.2	2.64513
	Magnesium	mg/l	30.6	35.6816
	Manganese	mg/l	0.326	0.46619
	Potassium	mg/l	1.32	1.50805
	Sodium	mg/l	15.9	18.8596
	pH	SU	7.49	6.37-7.78
	Bicarbonate Alkalinity	mg/l	327	413.751
	Sulfate	mg/l	34.6	46.522
	TSS	mg/l	8.88	13.8022
MW-10	Barium	mg/l	0.035	0.23547
	Manganese	mg/l	0.0771	0.46619
	pH	SU	7.00	6.37-7.78
MW-15	Barium	mg/l	0.147	0.23547
	Calcium	mg/l	127	118.417
	Cobalt	mg/l	0.000981	0.00085
	Iron	mg/l	0.117	2.64513
	Magnesium	mg/l	38.7	35.6816
	Manganese	mg/l	0.301	0.46619
	Potassium	mg/l	1.93	1.50805
	pH	SU	7.37	6.37-7.78
	Chloride	mg/l	13.8	14.3087
	Sulfate	mg/l	62.7	46.522
	TSS	mg/l	11.80	13.8022
MW-16	Barium	mg/l	0.0639	0.23547
	Iron	mg/l	1.6	2.64513
	Lithium	mg/l	0.495	0.00688
	Magnesium	mg/l	95.0	35.6816
	Manganese	mg/l	0.817	0.46619
	Potassium	mg/l	6.77	1.50805
	Sodium	mg/l	169	18.8596
	pH	SU	6.64	6.37-7.78
	Bicarbonate Alkalinity	mg/l	872	413.751
	Chloride	mg/l	159	14.3087
	Sulfate	mg/l	224	46.522
	TSS	mg/l	24.6	13.8022

Table 6
Summary of Well/Detected Constituent Pairs With No Immediately Preceding Control Limit Exceedances
2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Constituent	Units	Most recent result	Control Limit
MW-17	Barium	mg/l	0.055	0.23547
	Lead	mg/l	0.000954	0.00042
	Lithium	mg/l	0.01	0.00688
	Sodium	mg/l	8.55	18.8596
	pH	SU	7.45	6.37-7.78
	Bicarbonate Alkalinity	mg/l	403	413.751
	Calcium	mg/l	122	118.417
	Cobalt	mg/l	0.0005	0.00085
	Lithium	mg/l		0.00688
MW-18	Magnesium	mg/l	28.7	35.6816
	Potassium	mg/l	0.727	1.50805
	Sodium	mg/l	12.3	18.8596
	Selenium	mg/l		0.00146
	pH	SU	7.10	6.37-7.78
	Bicarbonate Alkalinity	mg/l	310	413.751
	Chloride	mg/l	5.00	14.3087

Table 7
Summary of Ongoing and Newly Identified Control Limit Exceedances 2024 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Constituent	Units	Most recent result	Background Standard (MW-2 quals MW-4; MW-3 is remaining Well comparisons)	Action Level/ Statewide Standard
MW-2	Manganese	mg/l	0.0966	0.18502	0.05 / 0.3
MW-4	Iron	mg/l	11.0	0.40156	0.3
	Manganese	mg/l	0.635	0.18502	0.05 / 0.3
	Cobalt	mg/l	0.00772	0.00045	0.0021
	Sodium	mg/l	20.6	18.8596	20
MW-3	Iron	mg/l	2.20	2.64513	0.3
	Manganese	mg/l	0.326	0.18502	0.05 / 0.3
MW-5	Dry				
MW-10	Lithium	mg/l	0.250	0.00688	0.014
	Manganese	mg/l	0.0771	0.46619	0.05 / 0.3
	Sodium	mg/l	50.7	18.8596	20
	Sulfate	mg/l	876	46.522	250
MW-15	Manganese	mg/l	0.301	0.46619	0.05 / 0.3
	Sodium	mg/l	59.7	18.8596	20
MW-16	Boron	mg/l	9.9	0.143	6
	Cobalt	mg/l	0.00217	0.00085	0.0021
	Iron	mg/l	1.60	2.64513	0.3
	Lithium	mg/l	0.495	0.00688	0.014
	Manganese	mg/l	0.817	0.46619	0.3/0.05
	Sodium	mg/l	169	18.8596	20
MW-17	Cobalt	mg/l	0.00447	0.00085	0.0021
	Iron	mg/l	12.1	2.64513	0.3
	Manganese	mg/l	1.19	0.46619	0.3/0.05
MW-18	Arsenic	mg/l	0.0211	0.00075	0.01
	Iron	mg/l	24.4	2.64513	0.3
	Lithium	mg/l	0.0394	0.00688	0.014
	Manganese	mg/l	0.560	0.46619	0.3 / 0.05

Table 8
Analytical Data Summary (2016-2023) 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Constituent (CAS #)	Sample Date	Units	MW-2	MW-4	MW-3	MW-5	MW-10	MW-15	MW-16	MW-17	MW-18
			BG/UG	DG	BG/UG	DG	DG	DG	DG	DG	DG
Arsenic (Total) (7440-38-2); MCL = 0.01	9/27-29/2016	mg/l	< 0.000672	**0.00143**	< 0.000672	< 0.000672	< 0.000672	< 0.000672	< 0.000672	**0.00302**	**0.00328**
	5/22-23/2017	mg/l	< 0.000505	**0.000863**	< 0.000505	< 0.000505	< 0.000505	< 0.000505	**0.000662**	**0.00261**	**0.00306**
	8/29/2018 & 9/28/2018	mg/l	< 0.00057	**0.00106**	< 0.000570	< 0.000570	< 0.000570	**0.000708**	**0.00582**	**0.00305**	< 0.000570
	6/25-26/2019	mg/l	< 0.00075	**0.00116**	< 0.000750	< 0.000750	< 0.000750	< 0.000750	< 0.000750	**0.00287**	**0.0287**
	9/21-22/2020	mg/l	< 0.00088	< 0.000880	< 0.000880	**0.00389**	< 0.000880	< 0.000880	< 0.000880	**0.00285**	**0.0178**
	4/29-30/2021	mg/l	< 0.00075	< 0.000750	< 0.000750	< 0.000750	< 0.000750	< 0.000750	< 0.000750	**0.00196**	**0.0151**
	9/20-21/2022	mg/l	< 0.00075	**0.000841**	< 0.000750	Dry	< 0.000750	< 0.000750	**0.00111**	**0.00261**	**0.0238**
	4/3-5/2023	mg/l	< 0.00200	< 0.00200	< 0.00200	< 0.00200	< 0.00200	< 0.00200	**0.00428**	**0.00298**	**0.0198**
	9/9-10/2024	mg/l	< 0.00200	**0.00206**	< 0.00200	Dry	< 0.00800	< 0.00200	< 0.008	**0.0038**	**0.0211**
Barium (Total) (7440-39-3); MCL = 2	9/27-29/2016	mg/l	**0.0342**	**0.0844**	**0.195**	**0.262**	**0.0307**	**0.165**	**0.0677**	**0.0619**	**0.148**
	5/22-23/2017	mg/l	**0.0335**	**0.0712**	**0.204**	**0.254**	**0.0344**	**0.147**	**0.0581**	**0.0675**	**0.15**
	8/29/2018 & 9/28/2018	mg/l	**0.0366**	**0.0936**	**0.22**	**0.243**	**0.0355**	**0.165**	**0.174**	**0.0654**	**0.0715**
	6/25-26/2019	mg/l	**0.0363**	**0.125**	**0.227**	**0.221**	**0.0312**	**0.125**	**0.034**	**0.0643**	**1.67**
	9/21-22/2020	mg/l	**0.0341**	**0.078**	**0.202**	**0.267**	**0.0387**	**0.148**	**0.0375**	**0.0649**	**1.06**
	4/29-30/2021	mg/l	**0.0346**	**0.0693**	**0.217**	**0.231**	**0.0364**	**0.135**	**0.0422**	**0.0479**	**0.67**
	9/20-21/2022	mg/l	**0.0311**	**0.071**	**0.189**	Dry	**0.0341**	**0.134**	**0.0512**	**0.0484**	**0.489**
	4/3-5/2023	mg/l	**0.0392**	**0.0963**	**0.230**	**0.261**	**0.0391**	**0.116**	**0.0870**	**0.0607**	**0.543**
	9/9-10/2024	mg/l	**0.038**	**0.146**	**0.223**	Dry	**0.035**	**0.147**	**0.0639**	**0.055**	**1.03**
Beryllium (Total) (7440-41-7); MCL = 0.004	9/27-29/2016	mg/l	< 0.000221	< 0.000221	< 0.000221	< 0.000221	< 0.000221	< 0.000221	**0.000227**	< 0.000221	**0.000241**
	5/22-23/2017	mg/l	< 0.000125	< 0.000125	< 0.000125	< 0.000125	< 0.000125	< 0.000125	< 0.000125	< 0.000125	< 0.000125
	8/29/2018 & 9/28/2018	mg/l	< 0.00019	< 0.000190	< 0.000190	< 0.000190	< 0.000190	< 0.000190	< 0.000190	< 0.000190	< 0.000190
	6/25-26/2019	mg/l	< 0.00027	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270
	9/21-22/2020	mg/l	< 0.00027	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270
	4/29-30/2021	mg/l	< 0.00027	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270
	9/20-21/2022	mg/l	< 0.00027	< 0.000270	< 0.000270	Dry	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270
	4/3-5/2023	mg/l	< 0.00110	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100
	9/9-10/2024	mg/l	< 0.001	< 0.001000	< 0.001000	< Dry	< 0.004000	< 0.001000	< 0.004000	< 0.001000	< 0.001000
Boron (7440-42-8); HAL = 6	9/27-29/2016	mg/l	< 0.0434	**0.172**	**0.069**	**5.86**	**8.69**	**6.01**	**4.33**	**1.35**	**0.766**
	5/22-23/2017	mg/l	< 0.104	**0.116**	< 0.104	**4.8**	**7.21**	**4.9**	**7.81**	**1.24**	**1.09**
	8/29/2018 & 9/28/2018	mg/l	< 0.100	< 0.100	**0.125**	**4.6**	**7.81**	**4.57**	< 0.100	**0.492**	**3.4**
	6/25-26/2019	mg/l	< 0.110	**0.321**	< 0.110	**3.96**	**3.51**	**3.24**	**3.12**	**0.763**	**0.391**
	9/21-22/2020	mg/l	< 0.0800	**0.1**	< 0.0800	**4.33**	**6.05**	**4.15**	**4.54**	**0.947**	**1.27**
	4/29-30/2021	mg/l	< 0.0580	**0.0828**	< 0.0580	**4.57**	**4.61**	**3.39**	**4.41**	**0.285**	**0.202**
	9/20-21/2022	mg/l	< 0.0580	**0.0805**	**0.0816**	Dry	**5.44**	**4.12**	**7.35**	**0.877**	**0.92**
	4/3-5/2023	mg/l	< 0.100	< 0.100	< 0.100	**5.14**	**4.77**	**2.46**	**7.12**	**0.833**	**0.126**
	9/9-10/2024	mg/l	< 0.100	**0.154**	< 0.100	Dry	**5.56**	**3.3**	**9.9**	**0.611**	**0.625**

Table 8
Analytical Data Summary (2016-2023) 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Constituent (CAS #)	Sample Date	Units	MW-2	MW-4	MW-3	MW-5	MW-10	MW-15	MW-16	MW-17	MW-18
			BG/UG	DG	BG/UG	DG	DG	DG	DG	DG	DG
Calcium (7440-70-2) MCL = N/A	9/27-29/2016	mg/l	73.1	77.6	104	132	379	146	195	113	123
	5/22-23/2017	mg/l	71.1	65.9	97.5	131	354	122	241	116	109
	8/29/2018 & 9/28/2018	mg/l	74.7	88.8	102	135	459	115	69.7	103	200
	6/25-26/2019	mg/l	79.3	107	118	133	247	122	215	133	110
	9/21-22/2020	mg/l	70.5	56.5	99.2	127	378	125	204	122	97
	4/29-30/2021	mg/l	71.2	55.6	99.5	126	338	113	232	116	82.2
	9/20-21/2022	mg/l	72.7	59	106	Dry	338	122	245	119	102
	4/3-5/2023	mg/l	76.0	69.0	105	145	350	102	247	120	76.6
	9/9-10/2024	mg/l	85.7	106.0	118.0	Dry	409	127.0	264.0	133.0	122.0
Cobalt (Total) (7440-48-4); PGW SWS = 0.0021	9/27-29/2016	mg/l	0.000102	0.0152	0.000663	0.00369	0.000273	0.00174	0.00301	0.00181	0.00212
	5/22-23/2017	mg/l	0.0000740	0.00953	0.000757	0.00238	0.000249	0.00104	0.00272	0.00209	0.000663
	8/29/2018 & 9/28/2018	mg/l	0.000356	0.00902	0.000801	0.00156	0.000416	0.00154	0.000329	0.00259	0.000833
	6/25-26/2019	mg/l	< 0.000091	0.00885	0.00067	0.00143	< 0.0000910	0.00051	0.000954	0.00322	0.00108
	9/21-22/2020	mg/l	0.000348	0.00297	0.000584	0.00452	0.000364	0.00103	0.00122	0.00269	0.000523
	4/29-30/2021	mg/l	< 0.000091	0.00298	0.000594	0.00175	0.000119	0.000651	0.0011	0.00392	0.000451
	9/20-21/2022	mg/l	0.000257	0.00451	0.00552	Dry	0.000559	0.00116	0.00287	0.00294	0.000461
	4/3-5/2023	mg/l	0.00134	0.00553	0.000855	0.00167	0.000543	0.000620	0.00392	0.00237	< 0.000500
	9/9-10/2024	mg/l	< 0.000500	0.00772	0.000598	Dry	< 0.000500	0.000981	0.00217	0.00447	< 0.000500
Copper (Total) (7440-50-8); MCL AL = 1.3	9/27-29/2016	mg/l	< 0.00122	< 0.00122	< 0.00122	0.00402	< 0.00122	0.00159	0.00193	< 0.00122	0.00252
	5/22-23/2017	mg/l	< 0.00219	< 0.00219	< 0.00219	0.00303	< 0.00219	< 0.00219	< 0.00219	< 0.00219	< 0.00219
	8/29/2018 & 9/28/2018	mg/l	< 0.00160	< 0.00160	< 0.00160	0.00285	< 0.00160	< 0.00160	< 0.00160	< 0.00160	< 0.00160
	6/25-26/2019	mg/l	< 0.00200	< 0.00200	< 0.00200	0.00254	< 0.00200	< 0.00200	< 0.00200	< 0.00200	< 0.00200
	9/21-22/2020	mg/l	0.00153	< 0.00150	< 0.00150	< 0.00150	< 0.00150	< 0.00150	< 0.00150	< 0.00150	< 0.00150
	4/29-30/2021	mg/l	< 0.00140	< 0.00140	< 0.00140	0.00283	< 0.00140	< 0.00140	< 0.00140	< 0.00140	< 0.00140
	9/20-21/2022	mg/l	< 0.0018	< 0.00180	< 0.00180	Dry	< 0.00180	< 0.00180	< 0.00180	< 0.00180	< 0.00180
	4/3-5/2023	mg/l	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	< 0.00500	0.00590	< 0.00500	< 0.00500
	9/9-10/2024	mg/l	< 0.00500	< 0.00500	< 0.00500	Dry	< 0.02000	< 0.00500	< 0.02000	< 0.00500	< 0.00500
Iron (Total) (7439-89-6); SDWR = 0.3	9/27-29/2016	mg/l	0.0611	25.4	1.83	0.48	0.106	0.41	1.67	4.02	9.66
	5/22-23/2017	mg/l	0.0553	15.7	1.79	0.31	0.0712	0.295	3.03	6.74	5.18
	8/29/2018 & 9/28/2018	mg/l	0.138	9.9	2.15	0.16	< 0.0660	0.204	4.27	0.765	0.146
	6/25-26/2019	mg/l	< 0.0660	11.5	2.42	0.143	< 0.0660	0.2	0.661	1.76	44.7
	9/21-22/2020	mg/l	0.399	2.95	2.21	3.47	< 0.0500	0.0948	1.38	7.73	25.2
	4/29-30/2021	mg/l	0.0466	2.51	2.34	0.191	0.0442	0.0635	1.08	0.725	21.3
	9/20-21/2022	mg/l	0.0514	3.28	2.38	Dry	0.0602	0.155	2.92	4.37	25.2
	4/3-5/2023	mg/l	0.597	4.72	2.08	0.254	0.907	0.424	13.8	3.11	22.3
	9/9-10/2024	mg/l	< 0.100	11.00	2.20	Dry	< 0.400	0.117	1.60	12.10	24.40

Table 8
Analytical Data Summary (2016-2023) 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Constituent (CAS #)	Sample Date	Units	MW-2	MW-4	MW-3	MW-5	MW-10	MW-15	MW-16	MW-17	MW-18
			BG/UG	DG	BG/UG	DG	DG	DG	DG	DG	DG
Lead (Total) (7439-92-1); MCL AL =0.015	9/27-29/2016	mg/l	< 0.000211	< 0.000211	< 0.000211	0.000637	< 0.000211	0.000515	0.00232	0.000455	0.00247
	5/22-23/2017	mg/l	< 0.000324	< 0.000324	< 0.000324	< 0.000324	< 0.000324	< 0.000324	0.00138	0.000433	0.000595
	8/29/2018 & 9/28/2018	mg/l	< 0.000250	< 0.000250	0.000364	0.000256	< 0.000250	0.000264	< 0.000250	< 0.000250	< 0.000250
	6/25-26/2019	mg/l	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	< 0.000270	0.00033	< 0.000270	0.00155
	9/21-22/2020	mg/l	0.000595	< 0.000110	0.000136	0.000476	< 0.000110	0.000116	0.000422	0.000517	0.000343
	4/29-30/2021	mg/l	< 0.000210	< 0.000210	< 0.000210	0.000294	< 0.000210	< 0.000210	0.000314	< 0.000210	0.000259
	9/20-21/2022	mg/l	< 0.000240	< 0.000240	< 0.000240	Dry	< 0.000240	< 0.000240	0.000879	0.00038	< 0.000240
	4/3-5/2023	mg/l	< 0.000500	< 0.000500	< 0.000500	< 0.000500	< 0.000500	< 0.000500	0.00223	0.000500	< 0.000500
	9/9-10/2024	mg/l	< 0.000500	< 0.000500	< 0.000500	Dry	< 0.000500	< 0.000500	< 0.000500	0.000954	< 0.000500
Lithium (7439-93-2); PGW SWS = 0.014	9/27-29/2016	mg/l	< 0.00655	< 0.00655	< 0.00655	0.0769	0.385	0.0169	0.194	< 0.00655	0.048
	5/22-23/2017	mg/l	0.00452	0.00265	0.00441	0.0786	0.324	0.0125	0.292	0.00537	0.0392
	8/29/2018 & 9/28/2018	mg/l	0.00394	< 0.00280	0.00412	0.0744	0.29	0.0111	< 0.00280	0.00494	0.127
	6/25-26/2019	mg/l	0.00656	0.00384	0.00557	0.0631	0.159	0.016	0.141	0.00715	0.0111
	9/21-22/2020	mg/l	0.00691	< 0.00250	0.00424	0.0635	0.28	0.0122	0.184	0.00539	0.0339
	4/29-30/2021	mg/l	0.00532	0.00325	0.00507	0.0794	0.203	0.0143	0.181	0.0072	0.00525
	9/20-21/2022	mg/l	0.00495	0.00422	0.0057	Dry	0.251	0.0115	0.331	0.00642	0.0347
	4/3-5/2023	mg/l	< 0.0100	< 0.0100	< 0.0100	0.0697	0.160	0.0107	0.296	< 0.0100	< 0.0100
	9/9-10/2024	mg/l	< 0.0100	< 0.0100	< 0.0100	Dry	0.250	0.0129	0.495	< 0.0100	0.0394
Magnesium(Total) (7439-95-4); MCL = N/A	9/27-29/2016	mg/l	30.8	34.8	28.8	50.4	103	46	58.9	39.3	32.5
	5/22-23/2017	mg/l	31.4	31.8	30.3	55.3	104	42	81	42.2	31
	8/29/2018 & 9/28/2018	mg/l	31.2	40.5	29.9	49.9	123	44	16.2	36.3	64.3
	6/25-26/2019	mg/l	36.9	52.3	35.2	47.5	66.6	40.2	73.7	48.5	24.1
	9/21-22/2020	mg/l	27	25.2	28.3	48.2	105	38.1	66.5	41.3	22
	4/29-30/2021	mg/l	33.2	27.3	31.6	51.9	84.8	39.9	81.9	39	18.7
	9/20-21/2022	mg/l	30.2	26.5	30.5	Dry	111	39.7	85.4	41.4	25.2
	4/3-5/2023	mg/l	34.4	33.4	32.8	56.7	102	35.5	89.2	44.7	17.1
	9/9-10/2024	mg/l	33.2	44.7	30.6	Dry	99.4	38.7	95.0	44.9	28.7
Manganese(Total) (7439-96-5); HAL = 0.3; SDWR = 0.05	9/27-29/2016	mg/l	0.0263	1.13	0.333	1.62	0.146	0.467	0.878	0.695	0.886
	5/22-23/2017	mg/l	0.0559	0.846	0.417	0.662	0.125	0.15	0.839	0.799	0.529
	8/29/2018 & 9/28/2018	mg/l	0.147	0.533	0.353	0.224	0.202	0.527	0.72	0.775	0.709
	6/25-26/2019	mg/l	0.0205	0.714	0.387	0.316	0.0104	0.104	0.635	0.735	1.3
	9/21-22/2020	mg/l	0.138	0.386	0.365	2.1	0.144	0.116	0.608	0.922	0.67
	4/29-30/2021	mg/l	0.0668	0.277	0.444	0.247	0.0698	0.235	0.764	0.72	0.6
	9/20-21/2022	mg/l	0.182	0.335	0.343	Dry	0.0912	0.195	0.739	0.835	0.517
	4/3-5/2023	mg/l	0.179	0.365	0.376	0.128	0.120	0.291	0.855	0.721	0.496
	9/9-10/2024	mg/l	0.0966	0.635	0.326	Dry	0.0771	0.301	0.817	1.19	0.560

Table 8
Analytical Data Summary (2016-2023) 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Constituent (CAS #)	Sample Date	Units	MW-2	MW-4	MW-3	MW-5	MW-10	MW-15	MW-16	MW-17	MW-18
			BG/UG	DG	BG/UG	DG	DG	DG	DG	DG	DG
Potassium (7440-09-7); MCL = N/A	9/27-29/2016	mg/l	**0.373**	**1.49**	**1.36**	**17.9**	**4.92**	**1.92**	**4.45**	**1.76**	**0.893**
	5/22-23/2017	mg/l	**0.414**	**1.11**	**1.28**	**16.8**	**5.19**	**1.76**	**5.19**	**1.95**	**0.876**
	8/29/2018 & 9/28/2018	mg/l	**0.482**	**1.49**	**1.38**	**15.9**	**5.48**	**1.99**	**0.702**	**1.8**	**3.21**
	6/25-26/2019	mg/l	**0.488**	**1.69**	**1.49**	**11.1**	**4.38**	**1.38**	**4.67**	**1.84**	**0.711**
	9/21-22/2020	mg/l	**0.53**	**1.15**	**1.3**	**16.4**	**12.8**	**1.73**	**5.33**	**1.66**	**0.785**
	4/29-30/2021	mg/l	**0.425**	**1.16**	**1.35**	**14.1**	**8.5**	**1.6**	**5.38**	**1.66**	**0.659**
	9/20-21/2022	mg/l	**0.495**	**1.12**	**1.35**	Dry	**13.1**	**1.78**	**5.23**	**1.62**	**0.788**
	4/3-5/2023	mg/l	< 0.500	**1.17**	**1.40**	**16.5**	**7.59**	**1.42**	**5.46**	**1.90**	**0.609**
	9/9-10/2024	mg/l	< 0.500	**1.58**	**1.32**	Dry	**10.30**	**1.93**	**6.77**	**1.56**	**0.727**
Zinc (Total) (7440-66-6); HAL & SS PGW = 2	9/27-29/2016	mg/l	**0.00649**	< 0.00521	< 0.00521	< 0.00521	< 0.00521	< 0.00521	< 0.00521	< 0.00521	**0.00739**
	5/22-23/2017	mg/l	< 0.0115	< 0.0115	< 0.0115	< 0.0115	< 0.0115	< 0.0115	< 0.0115	**0.017**	< 0.0115
	8/29/2018 & 9/28/2018	mg/l	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
	6/25-26/2019	mg/l	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
	9/21-22/2020	mg/l	**0.0225**	< 0.0100	< 0.0100	**0.0138**	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
	4/29-30/2021	mg/l	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
	9/20-21/2022	mg/l	< 0.0100	< 0.0100	< 0.0100	Dry	< 0.0100	< 0.0100	< 0.0100	< 0.0100	< 0.0100
	4/3-5/2023	mg/l	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200	< 0.0200
	9/9-10/2024	mg/l	< 0.0200	< 0.0200	< 0.0200	Dry	< 0.0800	< 0.0200	0.0800	< 0.0200	< 0.0200
Sodium (7440-23-5); HAL (restricted diets) = 20	9/27-29/2016	mg/l	**12**	**17.8**	**17.4**	**85.5**	**78.2**	**87.1**	**46.1**	**21.3**	**18.6**
	5/22-23/2017	mg/l	**12.8**	**13.5**	**15.8**	**83.3**	**63.3**	**68.9**	**75.1**	**22.4**	**19.5**
	8/29/2018 & 9/28/2018	mg/l	**13.1**	**18.3**	**16.4**	**75.3**	**60.8**	**80.7**	**11.8**	**21**	**48.7**
	6/25-26/2019	mg/l	**11.8**	**25.7**	**18.5**	**76.2**	**26.7**	**52.1**	**34**	**17.8**	**12.7**
	9/21-22/2020	mg/l	**12.3**	**14**	**17.1**	**75.2**	**55**	**74.4**	**57.7**	**17**	**16.7**
	4/29-30/2021	mg/l	**12.5**	**14.1**	**16.2**	**73.6**	**47.8**	**51.6**	**64.5**	**9.16**	**10.4**
	9/20-21/2022	mg/l	**12.2**	**15**	**16.6**	Dry	**53.9**	**72.1**	**105**	**9.67**	**11.3**
	4/3-5/2023	mg/l	**12.8**	**14.4**	**17.2**	**73.8**	**45.3**	**38.3**	**112**	**11.1**	**8.86**
	9/9-10/2024	mg/l	**11.5**	**20.6**	**15.9**	Dry	**50.7**	**59.7**	**169.0**	**8.55**	**12.3**
Selenium (Total) (7782-49-2); MCL = 0.05	9/27-29/2016	mg/l	< 0.000630	< 0.000630	< 0.000630	< 0.000630	< 0.000630	< 0.000630	< 0.000630	< 0.00063	< 0.000630
	5/22-23/2017	mg/l	< 0.000928	< 0.000928	< 0.000928	< 0.000928	< 0.000928	< 0.000928	< 0.000928	< 0.000928	< 0.000928
	8/29/2018 & 9/28/2018	mg/l	< 0.000900	< 0.000900	< 0.000900	< 0.000900	< 0.000900	< 0.000900	< 0.000900	< 0.000900	< 0.000900
	6/25-26/2019	mg/l	**0.00139**	< 0.00100	< 0.00100	< 0.00100	**0.00245**	< 0.00100	< 0.00100	< 0.00100	< 0.00100
	9/21-22/2020	mg/l	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100	< 0.00100
	4/29-30/2021	mg/l	< 0.000960	< 0.000960	< 0.000960	< 0.000960	**0.000974**	< 0.000960	< 0.000960	< 0.000960	< 0.000960
	9/20-21/2022	mg/l	**0.00148**	**0.00189**	< 0.000960	Dry	**0.0015**	**0.0011**	**0.00106**	< 0.000960	**0.00989**
	4/3-5/2023	mg/l	< 0.005	< 0.005	< 0.005000	< 0.005000	< 0.005000	< 0.005000	< 0.005000	< 0.005000	< 0.005000
	9/9-10/2024	mg/l	< 0.00500	< 0.00500	< 0.00500	Dry	< 0.0200	< 0.00500	< 0.0200	< 0.00500	< 0.00500
pH (N/A); SDWR = 6.5-8.5	9/27-29/2016	SU	**7.23**	**6.88**	**7.36**	**6.96**	**6.62**	**7.05**	**6.81**	**6.97**	**7.11**
	5/22-23/2017	SU	**7.35**	**6.71**	**7.42**	**6.79**	**6.56**	**6.99**	**6.6**	**6.99**	**7.10**
	8/29/2018 & 9/28/2018	SU	**6.81**	**6.15**	**6.62**	**6.22**	**6.2**	**6.51**	**6.32**	**6.78**	**6.94**
	6/25-26/2019	SU	**7.62**	**6.9**	**7.39**	**7.15**	**7.01**	**7.18**	**7.05**	**7.36**	**7.56**
	9/21-22/2020	SU	**7.22**	**6.46**	**6.87**	**6.44**	**6.34**	**6.72**	**6.44**	**6.88**	**7.16**
	4/29-30/2021	SU	**7.06**	**6.64**	**6.81**	**6.56**	**6.38**	**6.73**	**6.36**	**7.05**	**7.14**
	9/20-21/2022	SU	**7.48**	**6.83**	**7.24**	Dry	**6.87**	**7.17**	**6.79**	**7.35**	**7.23**
	4/3-5/2023	mg/l	**7.49**	**6.74**	**7.23**	**6.90**	**6.89**	**7.17**	**6.89**	**7.36**	**7.60**
	9/9-10/2024	mg/l	**7.37**	**6.61**	**7.49**	Dry	**7.00**	**7.37**	**6.64**	**7.45**	**7.10**

Table 8
Analytical Data Summary (2016-2023) 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Constituent (CAS #)	Sample Date	Units	MW-2	MW-4	MW-3	MW-5	MW-10	MW-15	MW-16	MW-17	MW-18
			BG/UG	DG	BG/UG	DG	DG	DG	DG	DG	DG
Bicarbonate Alkalinity (STL00138); MCL = N/A	9/27-29/2016	mg/l	**257**	**296**	**385**	**587**	**602**	**597**	**528**	**405**	**370**
	5/22-23/2017	mg/l	**268**	**278**	**397**	**587**	**608**	**551**	**736**	**438**	**397**
	8/29/2018 & 9/28/2018	mg/l	**252**	**330**	**386**	**577**	**592**	**567**	**268**	**402**	**633**
	6/25-26/2019	mg/l	**260**	**383**	**359**	**545**	**535**	**475**	**594**	**416**	**307**
	9/21-22/2020	mg/l	**270**	**232**	**400**	**626**	**623**	**562**	**721**	**448**	**345**
	4/29-30/2021	mg/l	**266**	**217**	**380**	**592**	**582**	**464**	**760**	**395**	**257**
	9/20-21/2022	mg/l	**273**	**238**	**396**	Dry	**581**	**528**	**792**	**431**	**326**
	4/3-5/2023	mg/l	**300**	**275**	**442**	**722**	**660**	**482**	**986**	**472**	**301**
	9/9-10/2024	mg/l	**269**	**339**	**327**	Dry	**542**	**459**	**872**	**403**	**310**
Chloride (16887-00-6); SDWR = 250	9/27-29/2016	mg/l	**13.5**	**10.4**	< 1.91	**22.4**	**36**	**29.8**	**27**	**19.8**	**13**
	5/22-23/2017	mg/l	**12.9**	**12.8**	**1.89**	**17.2**	**32.4**	**19.7**	**84.3**	**18.4**	**12.7**
	8/29/2018 & 9/28/2018	mg/l	**10.6**	**10.9**	< 1.60	**14.4**	**27.9**	**18.1**	**4.34**	**11.8**	**40.3**
	6/25-26/2019	mg/l	**9.96**	**14.5**	**1.68**	**11.2**	**9.44**	**8.81**	**33.4**	**12.3**	**8.81**
	9/21-22/2020	mg/l	**11.4**	**7.65**	< 2.00	**20.5**	**21.7**	**17.5**	**68.3**	**13.3**	**4.2**
	4/29-30/2021	mg/l	**10.7**	**8.21**	< 2.15	**17.5**	**14.8**	**12**	**95.6**	**6.2**	**3.84**
	9/20-21/2022	mg/l	**21.7**	**10.8**	**2.42**	Dry	**24.3**	**16.7**	**96.2**	**9.65**	**9.9**
	4/3-5/2023	mg/l	**11.4**	**12.8**	< 5.00	**29.1**	**21.9**	**8.65**	**127**	**15.3**	< 5.00
	9/9-10/2024	mg/l	**10.1**	**13.50**	< 5.00	Dry	**23.0**	**13.8**	**159**	**9.40**	**10.80**
Sulfate (14808-79-8); SDWR = 250	9/27-29/2016	mg/l	**36.3**	**53.3**	**26.8**	**101**	**808**	**64.6**	**211**	**56.3**	**48.5**
	5/22-23/2017	mg/l	**45.3**	**62.4**	**34.5**	**106**	**1630**	**61.7**	**266**	**58**	**45.9**
	8/29/2018 & 9/28/2018	mg/l	**48.1**	**80.4**	**32.2**	**106**	**927**	**75.9**	**5.48**	**64.9**	**205**
	6/25-26/2019	mg/l	**38.8**	**90.7**	**40.8**	**101**	**328**	**42.5**	**184**	**83.2**	**28.7**
	9/21-22/2020	mg/l	**44.2**	**56.8**	**40**	**114**	**861**	**70.8**	**191**	**84.1**	**19.3**
	4/29-30/2021	mg/l	**39.8**	**60.5**	**39.2**	**101**	**684**	**43.6**	**182**	**57.5**	**7.41**
	9/20-21/2022	mg/l	**47.7**	**55.2**	**42.8**	Dry	**898**	**75.9**	**221**	**77.7**	**32.6**
	4/3-5/2023	mg/l	**41.5**	**80.1**	**31.4**	**101**	**795**	**34.0**	**207**	**70.9**	< 5.00
	9/9-10/2024	mg/l	**39.8**	**78.5**	**34.6**	Dry	**876**	**62.7**	**224**	**62.3**	**46.20**
Total Suspended Solids (TSS) (STL00161) MCL = N/A	9/27-29/2016	mg/l	**5.75**	**28.9**	**7**	**38**	**7.62**	**37.4**	**199**	**21.6**	**179**
	5/22-23/2017	mg/l	**4.13**	**27.3**	**10.4**	**20.4**	**4**	**14.1**	**164**	**58**	**65**
	8/29/2018 & 9/28/2018	mg/l	**4.62**	**18.1**	**11.3**	**14.4**	**2.63**	**17.8**	**10**	**3.13**	**12.1**
	6/25-26/2019	mg/l	**4.13**	**14**	**6.63**	**9.12**	**3.13**	**3.63**	**56.3**	**5.25**	**160**
	9/21-22/2020	mg/l	**27.5**	**5.75**	**9.5**	**17.5**	**3.38**	**8.13**	**38.7**	**95.1**	**317**
	4/29-30/2021	mg/l	**1.5**	**2.63**	**11.8**	**13.6**	**3.13**	**6.75**	**27.9**	**3**	**66**
	9/20-21/2022	mg/l	**4.75**	**2.25**	**7**	Dry	**12.8**	**6.38**	**104**	**43.5**	**104**
	4/3-5/2023	mg/l	**4.13**	**5.88**	**8.50**	**7.50**	**5.50**	**4.00**	**86.0**	**21.3**	**70.0**
	9/9-10/2024	mg/l	**2.38**	**11.00**	**8.88**	Dry	< 1.88	**11.80**	**24.6**	**85.0**	**77.0**

Key:

AL = Action Level
BG = Background
CL = Control Limit
DG = Downgradient
HAL = Health Advisory Level
MCL = Maximum Control Level
SDWR = Secondary Drinking Water Standards SS = Iowa Statewide Standards
UG = Upgradient

Bold = detected above laboratory reporting
Red Bold = detected above Action Level

Table 9
Historic Control Limit Action Level Exceedances 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Constituent	Sep-2016	May-2017	Aug-2018	Jun-2019	Sep-2020	Apr-2021	Sep-2022	Apr-2023	Sep-2024
MW-2	Arsenic									
	Barium									
	Beryllium									
	Boron									
	Cobalt									
	Copper									
	Iron					X			X	
	Lithium									
	Manganese		X	X		X	X	X	X	X
	Selenium									
	Bicarbonate Alkalinity									
	Chloride									
	Total Suspended Solids									
MW-4	Arsenic									
	Barium									
	Beryllium									
	Boron									
	Cobalt	X	X	X	X	X	X	X	X	X
	Copper									
	Iron	X	X	X	X	X	X	X	X	X
	Lithium									
	Manganese	X	X	X	X	X	X	X	X	X
	Potassium									
	Sodium				X					X
	pH			X		X				
	Sulfate									
MW-3	Arsenic									
	Beryllium									
	Iron	X	X	X	X	X	X	X	X	X
	Cobalt							X		
	Copper									
	Lead									
	Lithium									
	Manganese	X	X	X	X	X	X	X	X	X
	Selenium									
	Chloride									
	Bicarbonate Alkalinity									
	Zinc									

Table 9
Historic Control Limit Action Level Exceedances 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

MW-5	Arsenic									
	Barium									
	Beryllium									
	Boron									
	Calcium									
	Cobalt	X	X			X				
	Copper									
	Iron	X	X			X				
	Lead									
	Lithium	X	X	X	X	X	X		X	
	Magnesium									
	Manganese	X	X	X	X	X	X		X	
	Potassium									
	Zinc									
	pH			X		X				
	Selenium									
	Sodium	X	X	X	X	X	X		X	
	Bicarbonate Alkalinity									
	Chloride									
	Sulfate									
	Total Suspended Solids									

Table 9
Historic Control Limit Action Level Exceedances 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Constituent	Sep-2016	May-2017	Aug-2018	Jun-2019	Sep-2020	Apr-2021	Sep-2022	Apr-2023	Sep-2024
MW-10	Arsenic									
	Barium									
	Beryllium									
	Boron	X	X	X		X				
	Calcium									
	Copper									
	Iron								X	X
	Lead									
	Lithium	X	X	X	X	X	X	X	X	X
	Magnesium									
	Manganese	X	X	X		X	X	X	X	X
	Potassium									
	Zinc									
	Sodium	X	X	X	X	X	X	X	X	X
	Selenium									
	pH			X		X	X			
	Bicarbonate Alkalinity									
	Chloride									
	Sulfate	X	X	X	X	X	X	X	X	X
MW-15	Arsenic									
	Barium									
	Beryllium									
	Boron	X								
	Calcium									
	Cobalt									
	Copper									
	Iron	X							X	
	Lithium	X			X		X			
	Lead									
	Magnesium									
	Manganese	X	X	X	X	X	X	X	X	X
	Potassium									
	Sodium	X	X	X	X	X	X	X	X	X
	Selenium									
	Bicarbonate Alkalinity									
	Chloride									
	Sulfate									

Table 9
Historic Control Limit Action Level Exceedances 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

Well	Constituent	Sep-2016	May-2017	Aug-2018	Jun-2019	Sep-2020	Apr-2021	Sep-2022	Apr-2023	Sep-2024
MW-16	Arsenic									
	Beryllium									
	Boron		X					X	X	
	Calcium									
	Cobalt							X	X	X
	Copper									
	Iron	X	X	X	X	X	X	X	X	X
	Lead									
	Lithium	X	X		X	X	X	X	X	X
	Magnesium									
	Manganese	X	X	X	X	X	X	X	X	X
	Potassium									
	Zinc									
	Sodium	X	X		X	X	X	X	X	X
	Selenium									
	pH			X		X	X			
	Bicarbonate Alkalinity									
	Chloride									
	Sulfate		X							
	Total Suspended Solids									
MW-17	Arsenic									
	Boron									
	Beryllium									
	Calcium									
	Cobalt			X	X	X	X	X	X	X
	Copper									
	Iron	X	X	X	X	X	X	X	X	X
	Lead									
	Lithium									
	Magnesium									
	Manganese	X	X	X	X	X	X	X	X	X
	Potassium									
	Zinc									
	Sodium	X	X	X						
	Selenium									
	Bicarbonate Alkalinity									
	Chloride									
	Sulfate									
	Total Suspended Solids									

Table 9
Historic Control Limit Action Level Exceedances 2023 Annual Water Quality Report
Grain Processing Corporation Coal Combustion Residue Landfill Permit No. 58-SDP-03-92C

MW-18	Arsenic				X	X	X	X	X	X
	Barium									
	Beryllium									
	Boron									
	Cobalt	X								
	Copper									
	Iron	X	X		X	X	X	X	X	X
	Lead									
	Lithium	X	X	X		X		X		
	Manganese	X	X	X	X	X	X	X	X	X
	Zinc									
	Selenium									
	Sodium			X						
	Chloride									
	Total Suspended Solids									

	Exceeds MCL
	Exceeds Background (M+2SD) - Starting in 2020 and compared to 2023 CL
X	Exceeds a SDWR, HAL, or NPGW SWS when no MCL

APPENDIX A

LABORATORY ANALYTICAL

REPORTS

Laboratory Analytical Report 2024

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Melissa Tiedemann
Stanley Consultants Inc
U of I Oakdale Res.
2658 Crosspark Road, Suite 100
Coralville, Iowa 52241

Generated 9/26/2024 1:11:08 PM

JOB DESCRIPTION

GPC Landfill Sampling

JOB NUMBER

310-290280-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization

Generated
9/26/2024 1:11:08 PM

Authorized for release by
Zach Bindert, Senior Project Manager
Zach.Bindert@et.eurofinsus.com
(319)595-2016

Table of Contents

Job Narrative
310-290280-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers and/or narrative comments are included to explain any exceptions, if applicable.

- Matrix QC may not be reported if insufficient sample is provided or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
- Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 9/11/2024 4:30 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperatures of the 2 coolers at receipt time were 1.8°C and 2.4°C.

HPLC/IC
Method 9056A_ORGFM_28D: The following sample was diluted due to the nature of the sample matrix: MW-03 (310-290280-2). Elevated reporting limits (RLs) are provided.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Metals
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry
No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Sample Summary

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-290280-1	MW-02	Water	09/09/24 11:35	09/11/24 16:30
310-290280-2	MW-03	Water	09/09/24 10:45	09/11/24 16:30
310-290280-3	MW-04	Water	09/09/24 12:55	09/11/24 16:30
310-290280-4	MW-10	Water	09/10/24 11:50	09/11/24 16:30
310-290280-5	MW-15	Water	09/09/24 14:10	09/11/24 16:30
310-290280-6	MW-16	Water	09/10/24 10:40	09/11/24 16:30
310-290280-7	MW-17	Water	09/10/24 14:25	09/11/24 16:30
310-290280-8	MW-18	Water	09/10/24 13:25	09/11/24 16:30

Detection Summary

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-02 — Lab Sample ID: 310-290280-1

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	10.1		5.00		mg/L	5		9056A	Total/NA
Sulfate	39.8		5.00		mg/L	5		9056A	Total/NA
Barium	0.0380		0.00200		mg/L	1		6020B	Total/NA
Calcium	85.7		0.500		mg/L	1		6020B	Total/NA
Magnesium	33.2		0.500		mg/L	1		6020B	Total/NA
Manganese	0.0966		0.0100		mg/L	1		6020B	Total/NA
Sodium	11.5		1.00		mg/L	1		6020B	Total/NA
pH	7.37	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	2.38		1.88		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	269		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-03 — Lab Sample ID: 310-290280-2

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	34.6		5.00		mg/L	5		9056A	Total/NA
Barium	0.223		0.00200		mg/L	1		6020B	Total/NA
Calcium	118		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000598		0.000500		mg/L	1		6020B	Total/NA
Iron	2.20		0.100		mg/L	1		6020B	Total/NA
Magnesium	30.6		0.500		mg/L	1		6020B	Total/NA
Manganese	0.326		0.0100		mg/L	1		6020B	Total/NA
Potassium	1.32		0.500		mg/L	1		6020B	Total/NA
Sodium	15.9		1.00		mg/L	1		6020B	Total/NA
pH	7.49	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	8.88		1.88		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	327		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-04 — Lab Sample ID: 310-290280-3

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13.5		5.00		mg/L	5		9056A	Total/NA
Sulfate	78.5		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00206		0.00200		mg/L	1		6020B	Total/NA
Barium	0.146		0.00200		mg/L	1		6020B	Total/NA
Boron	0.154		0.100		mg/L	1		6020B	Total/NA
Calcium	106		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00772		0.000500		mg/L	1		6020B	Total/NA
Iron	11.0		0.100		mg/L	1		6020B	Total/NA
Magnesium	44.7		0.500		mg/L	1		6020B	Total/NA
Manganese	0.635		0.0100		mg/L	1		6020B	Total/NA
Potassium	1.58		0.500		mg/L	1		6020B	Total/NA
Sodium	20.6		1.00		mg/L	1		6020B	Total/NA
pH	6.61	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	11.0		3.00		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	339		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-10 — Lab Sample ID: 310-290280-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	23.0		5.00		mg/L	5		9056A	Total/NA
Sulfate	876		20.0		mg/L	20		9056A	Total/NA
Barium	0.0350		0.00200		mg/L	1		6020B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-10 (Continued) — Lab Sample ID: 310-290280-4

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Boron	5.56		0.400		mg/L	4		6020B	Total/NA
Calcium	409		0.500		mg/L	1		6020B	Total/NA
Lithium	0.250		0.0100		mg/L	1		6020B	Total/NA
Magnesium	99.4		2.00		mg/L	4		6020B	Total/NA
Manganese	0.0771		0.0400		mg/L	4		6020B	Total/NA
Potassium	10.3		2.00		mg/L	4		6020B	Total/NA
Sodium	50.7		4.00		mg/L	4		6020B	Total/NA
pH	7.00	HF	1.00		SU	1		9040C	Total/NA
Bicarbonate Alkalinity as CaCO3	542		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-15 — Lab Sample ID: 310-290280-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	13.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	62.7		5.00		mg/L	5		9056A	Total/NA
Barium	0.147		0.00200		mg/L	1		6020B	Total/NA
Boron	3.30		0.100		mg/L	1		6020B	Total/NA
Calcium	127		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.000981		0.000500		mg/L	1		6020B	Total/NA
Iron	0.117		0.100		mg/L	1		6020B	Total/NA
Lithium	0.0129		0.0100		mg/L	1		6020B	Total/NA
Magnesium	38.7		0.500		mg/L	1		6020B	Total/NA
Manganese	0.301		0.0100		mg/L	1		6020B	Total/NA
Potassium	1.93		0.500		mg/L	1		6020B	Total/NA
Sodium	59.7		1.00		mg/L	1		6020B	Total/NA
pH	7.37	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	11.8		3.00		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	459		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-16 — Lab Sample ID: 310-290280-6

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	159		5.00		mg/L	5		9056A	Total/NA
Sulfate	224		5.00		mg/L	5		9056A	Total/NA
Barium	0.0639		0.00200		mg/L	1		6020B	Total/NA
Boron	9.90		0.400		mg/L	4		6020B	Total/NA
Calcium	264		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00217		0.000500		mg/L	1		6020B	Total/NA
Iron	1.60		0.400		mg/L	4		6020B	Total/NA
Lithium	0.495		0.0100		mg/L	1		6020B	Total/NA
Magnesium	95.0		2.00		mg/L	4		6020B	Total/NA
Manganese	0.817		0.0400		mg/L	4		6020B	Total/NA
Potassium	6.77		2.00		mg/L	4		6020B	Total/NA
Sodium	169		4.00		mg/L	4		6020B	Total/NA
pH	6.64	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	24.6		3.00		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	872		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-17 — Lab Sample ID: 310-290280-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	9.40		5.00		mg/L	5		9056A	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample ID: MW-17 (Continued)

Lab Sample ID: 310-290280-7

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Sulfate	62.3		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.00380		0.00200		mg/L	1		6020B	Total/NA
Barium	0.0550		0.00200		mg/L	1		6020B	Total/NA
Boron	0.611		0.100		mg/L	1		6020B	Total/NA
Calcium	133		0.500		mg/L	1		6020B	Total/NA
Cobalt	0.00447		0.000500		mg/L	1		6020B	Total/NA
Iron	12.1		0.100		mg/L	1		6020B	Total/NA
Lead	0.000954		0.000500		mg/L	1		6020B	Total/NA
Magnesium	44.9		0.500		mg/L	1		6020B	Total/NA
Manganese	1.19		0.0100		mg/L	1		6020B	Total/NA
Potassium	1.56		0.500		mg/L	1		6020B	Total/NA
Sodium	8.55		1.00		mg/L	1		6020B	Total/NA
pH	7.45	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	85.0		3.00		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	403		5.00		mg/L	1		SM 2320B	Total/NA

Client Sample ID: MW-18

Lab Sample ID: 310-290280-8

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Chloride	10.8		5.00		mg/L	5		9056A	Total/NA
Sulfate	46.2		5.00		mg/L	5		9056A	Total/NA
Arsenic	0.0211		0.00200		mg/L	1		6020B	Total/NA
Barium	1.03		0.00200		mg/L	1		6020B	Total/NA
Boron	0.625		0.100		mg/L	1		6020B	Total/NA
Calcium	122		0.500		mg/L	1		6020B	Total/NA
Iron	24.4		0.100		mg/L	1		6020B	Total/NA
Lithium	0.0394		0.0100		mg/L	1		6020B	Total/NA
Magnesium	28.7		0.500		mg/L	1		6020B	Total/NA
Manganese	0.560		0.0100		mg/L	1		6020B	Total/NA
Potassium	0.727		0.500		mg/L	1		6020B	Total/NA
Sodium	12.3		1.00		mg/L	1		6020B	Total/NA
pH	7.10	HF	1.00		SU	1		9040C	Total/NA
Total Suspended Solids	77.0		15.0		mg/L	1		I-3765-85	Total/NA
Bicarbonate Alkalinity as CaCO3	310		5.00		mg/L	1		SM 2320B	Total/NA

This Detection Summary does not include radiochemical test results.

Client Sample Results

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-02

Date Collected: 09/09/24 11:35
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-1

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10.1**		5.00		mg/L			09/13/24 15:10	5
Sulfate	**39.8**		5.00		mg/L			09/13/24 15:10	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200		mg/L		09/13/24 09:30	09/25/24 22:46	1
Barium	**0.0380**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:07	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 22:46	1
Boron	<0.100		0.100		mg/L		09/13/24 09:30	09/25/24 22:46	1
Calcium	**85.7**		0.500		mg/L		09/13/24 09:30	09/19/24 17:07	1
Cobalt	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:07	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:46	1
Iron	<0.100		0.100		mg/L		09/13/24 09:30	09/25/24 22:46	1
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:07	1
Lithium	<0.0100		0.0100		mg/L		09/13/24 09:30	09/19/24 17:07	1
Magnesium	**33.2**		0.500		mg/L		09/13/24 09:30	09/25/24 22:46	1
Manganese	**0.0966**		0.0100		mg/L		09/13/24 09:30	09/25/24 22:46	1
Potassium	<0.500		0.500		mg/L		09/13/24 09:30	09/25/24 22:46	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:46	1
Sodium	**11.5**		1.00		mg/L		09/13/24 09:30	09/25/24 22:46	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 22:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**2.38**		1.88		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**269**		5.00		mg/L			09/20/24 21:03	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**7.37**	**HF**	1.00		SU			09/11/24 23:15	1

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-03

Date Collected: 09/09/24 10:45
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-2

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<5.00		5.00		mg/L			09/13/24 15:22	5
Sulfate	**34.6**		5.00		mg/L			09/13/24 15:22	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200		mg/L		09/13/24 09:30	09/25/24 22:50	1
Barium	**0.223**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:10	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 22:50	1
Boron	<0.100		0.100		mg/L		09/13/24 09:30	09/25/24 22:50	1
Calcium	**118**		0.500		mg/L		09/13/24 09:30	09/19/24 17:10	1
Cobalt	**0.000598**		0.000500		mg/L		09/13/24 09:30	09/19/24 17:10	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:50	1
Iron	**2.20**		0.100		mg/L		09/13/24 09:30	09/25/24 22:50	1
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:10	1
Lithium	<0.0100		0.0100		mg/L		09/13/24 09:30	09/19/24 17:10	1
Magnesium	**30.6**		0.500		mg/L		09/13/24 09:30	09/25/24 22:50	1
Manganese	**0.326**		0.0100		mg/L		09/13/24 09:30	09/25/24 22:50	1
Potassium	**1.32**		0.500		mg/L		09/13/24 09:30	09/25/24 22:50	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:50	1
Sodium	**15.9**		1.00		mg/L		09/13/24 09:30	09/25/24 22:50	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 22:50	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**8.88**		1.88		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**327**		5.00		mg/L			09/20/24 21:12	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**7.49**	**HF**	1.00		SU			09/11/24 22:59	1

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-04

Date Collected: 09/09/24 12:55
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-3

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**13.5**		5.00		mg/L			09/13/24 11:55	5
Sulfate	**78.5**		5.00		mg/L			09/13/24 11:55	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.00206**		0.00200		mg/L		09/13/24 09:30	09/25/24 22:53	1
Barium	**0.146**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:12	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 22:53	1
Boron	**0.154**		0.100		mg/L		09/13/24 09:30	09/25/24 22:53	1
Calcium	**106**		0.500		mg/L		09/13/24 09:30	09/19/24 17:12	1
Cobalt	**0.00772**		0.000500		mg/L		09/13/24 09:30	09/19/24 17:12	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:53	1
Iron	**11.0**		0.100		mg/L		09/13/24 09:30	09/25/24 22:53	1
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:12	1
Lithium	<0.0100		0.0100		mg/L		09/13/24 09:30	09/19/24 17:12	1
Magnesium	**44.7**		0.500		mg/L		09/13/24 09:30	09/25/24 22:53	1
Manganese	**0.635**		0.0100		mg/L		09/13/24 09:30	09/25/24 22:53	1
Potassium	**1.58**		0.500		mg/L		09/13/24 09:30	09/25/24 22:53	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:53	1
Sodium	**20.6**		1.00		mg/L		09/13/24 09:30	09/25/24 22:53	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 22:53	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**11.0**		3.00		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**339**		5.00		mg/L			09/20/24 21:22	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**6.61**	**HF**	1.00		SU			09/11/24 23:13	1

Client Sample Results

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-10

Date Collected: 09/10/24 11:50
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-4

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**23.0**		5.00		mg/L			09/13/24 12:06	5
Sulfate	**876**		20.0		mg/L			09/13/24 19:30	20

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00800		0.00800		mg/L		09/13/24 09:30	09/25/24 22:57	4
Barium	**0.0350**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:23	1
Beryllium	<0.00400		0.00400		mg/L		09/13/24 09:30	09/25/24 22:57	4
Boron	**5.56**		0.400		mg/L		09/13/24 09:30	09/25/24 22:57	4
Calcium	**409**		0.500		mg/L		09/13/24 09:30	09/19/24 17:23	1
Cobalt	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:23	1
Copper	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 22:57	4
Iron	<0.400		0.400		mg/L		09/13/24 09:30	09/25/24 22:57	4
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:23	1
Lithium	**0.250**		0.0100		mg/L		09/13/24 09:30	09/19/24 17:23	1
Magnesium	**99.4**		2.00		mg/L		09/13/24 09:30	09/25/24 22:57	4
Manganese	**0.0771**		0.0400		mg/L		09/13/24 09:30	09/25/24 22:57	4
Potassium	**10.3**		2.00		mg/L		09/13/24 09:30	09/25/24 22:57	4
Selenium	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 22:57	4
Sodium	**50.7**		4.00		mg/L		09/13/24 09:30	09/25/24 22:57	4
Zinc	<0.0800		0.0800		mg/L		09/13/24 09:30	09/25/24 22:57	4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	<1.88		1.88		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**542**		5.00		mg/L			09/20/24 21:31	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**7.00**	**HF**	1.00		SU			09/11/24 23:02	1

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-15

Date Collected: 09/09/24 14:10
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-5

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**13.8**		5.00		mg/L			09/13/24 12:18	5
Sulfate	**62.7**		5.00		mg/L			09/13/24 12:18	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200		mg/L		09/13/24 09:30	09/25/24 23:01	1
Barium	**0.147**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:25	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 23:01	1
Boron	**3.30**		0.100		mg/L		09/13/24 09:30	09/25/24 23:01	1
Calcium	**127**		0.500		mg/L		09/13/24 09:30	09/19/24 17:25	1
Cobalt	**0.000981**		0.000500		mg/L		09/13/24 09:30	09/19/24 17:25	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 23:01	1
Iron	**0.117**		0.100		mg/L		09/13/24 09:30	09/25/24 23:01	1
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:25	1
Lithium	**0.0129**		0.0100		mg/L		09/13/24 09:30	09/19/24 17:25	1
Magnesium	**38.7**		0.500		mg/L		09/13/24 09:30	09/25/24 23:01	1
Manganese	**0.301**		0.0100		mg/L		09/13/24 09:30	09/25/24 23:01	1
Potassium	**1.93**		0.500		mg/L		09/13/24 09:30	09/25/24 23:01	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 23:01	1
Sodium	**59.7**		1.00		mg/L		09/13/24 09:30	09/25/24 23:01	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 23:01	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**11.8**		3.00		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**459**		5.00		mg/L			09/20/24 21:43	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**7.37**	**HF**	1.00		SU			09/11/24 23:03	1

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-16

Date Collected: 09/10/24 10:40
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-6

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**159**		5.00		mg/L			09/13/24 12:29	5
Sulfate	**224**		5.00		mg/L			09/13/24 12:29	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00800		0.00800		mg/L		09/13/24 09:30	09/25/24 23:04	4
Barium	**0.0639**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:27	1
Beryllium	<0.00400		0.00400		mg/L		09/13/24 09:30	09/25/24 23:04	4
Boron	**9.90**		0.400		mg/L		09/13/24 09:30	09/25/24 23:04	4
Calcium	**264**		0.500		mg/L		09/13/24 09:30	09/19/24 17:27	1
Cobalt	**0.00217**		0.000500		mg/L		09/13/24 09:30	09/19/24 17:27	1
Copper	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 23:04	4
Iron	**1.60**		0.400		mg/L		09/13/24 09:30	09/25/24 23:04	4
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:27	1
Lithium	**0.495**		0.0100		mg/L		09/13/24 09:30	09/19/24 17:27	1
Magnesium	**95.0**		2.00		mg/L		09/13/24 09:30	09/25/24 23:04	4
Manganese	**0.817**		0.0400		mg/L		09/13/24 09:30	09/25/24 23:04	4
Potassium	**6.77**		2.00		mg/L		09/13/24 09:30	09/25/24 23:04	4
Selenium	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 23:04	4
Sodium	**169**		4.00		mg/L		09/13/24 09:30	09/25/24 23:04	4
Zinc	<0.0800		0.0800		mg/L		09/13/24 09:30	09/25/24 23:04	4

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**24.6**		3.00		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**872**		5.00		mg/L			09/20/24 21:54	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**6.64**	**HF**	1.00		SU			09/11/24 23:16	1

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-17

Date Collected: 09/10/24 14:25
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-7

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	9.40		5.00		mg/L			09/13/24 12:41	5
Sulfate	62.3		5.00		mg/L			09/13/24 12:41	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.00380		0.00200		mg/L		09/13/24 09:30	09/25/24 23:08	1
Barium	0.0550		0.00200		mg/L		09/13/24 09:30	09/19/24 17:30	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 23:08	1
Boron	0.611		0.100		mg/L		09/13/24 09:30	09/25/24 23:08	1
Calcium	133		0.500		mg/L		09/13/24 09:30	09/19/24 17:30	1
Cobalt	0.00447		0.000500		mg/L		09/13/24 09:30	09/19/24 17:30	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 23:08	1
Iron	12.1		0.100		mg/L		09/13/24 09:30	09/25/24 23:08	1
Lead	0.000954		0.000500		mg/L		09/13/24 09:30	09/19/24 17:30	1
Lithium	<0.0100		0.0100		mg/L		09/13/24 09:30	09/19/24 17:30	1
Magnesium	44.9		0.500		mg/L		09/13/24 09:30	09/25/24 23:08	1
Manganese	1.19		0.0100		mg/L		09/13/24 09:30	09/25/24 23:08	1
Potassium	1.56		0.500		mg/L		09/13/24 09:30	09/25/24 23:08	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 23:08	1
Sodium	8.55		1.00		mg/L		09/13/24 09:30	09/25/24 23:08	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 23:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	85.0		3.00		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	403		5.00		mg/L			09/20/24 22:15	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	7.45	HF	1.00		SU			09/11/24 23:01	1

Client Sample Results

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-18

Date Collected: 09/10/24 13:25
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-8

Matrix: Water

Method: SW846 9056A - Anions, Ion Chromatography

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	**10.8**		5.00		mg/L			09/13/24 12:53	5
Sulfate	**46.2**		5.00		mg/L			09/13/24 12:53	5

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	**0.0211**		0.00200		mg/L		09/13/24 09:30	09/25/24 23:15	1
Barium	**1.03**		0.00200		mg/L		09/13/24 09:30	09/19/24 17:34	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 23:15	1
Boron	**0.625**		0.100		mg/L		09/13/24 09:30	09/25/24 23:15	1
Calcium	**122**		0.500		mg/L		09/13/24 09:30	09/19/24 17:34	1
Cobalt	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:34	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 23:15	1
Iron	**24.4**		0.100		mg/L		09/13/24 09:30	09/25/24 23:15	1
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 17:34	1
Lithium	**0.0394**		0.0100		mg/L		09/13/24 09:30	09/19/24 17:34	1
Magnesium	**28.7**		0.500		mg/L		09/13/24 09:30	09/25/24 23:15	1
Manganese	**0.560**		0.0100		mg/L		09/13/24 09:30	09/25/24 23:15	1
Potassium	**0.727**		0.500		mg/L		09/13/24 09:30	09/25/24 23:15	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 23:15	1
Sodium	**12.3**		1.00		mg/L		09/13/24 09:30	09/25/24 23:15	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 23:15	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids (USGS I-3765-85)	**77.0**		15.0		mg/L			09/12/24 10:16	1
Bicarbonate Alkalinity as CaCO3 (SM 2320B)	**310**		5.00		mg/L			09/20/24 22:25	1

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9040C)	**7.10**	**HF**	1.00		SU			09/11/24 23:17	1

Definitions/Glossary

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Qualifiers

General Chemistry

Qualifier	Qualifier Description
HF	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-433211/3
Matrix: Water
Analysis Batch: 433211

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			09/13/24 09:35	1
Sulfate	<1.00		1.00		mg/L			09/13/24 09:35	1

Lab Sample ID: LCS 310-433211/4
Matrix: Water
Analysis Batch: 433211

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	9.976		mg/L		100	90 - 110
Sulfate	10.0	10.22		mg/L		102	90 - 110

Lab Sample ID: MB 310-433214/3
Matrix: Water
Analysis Batch: 433214

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloride	<1.00		1.00		mg/L			09/13/24 09:06	1
Sulfate	<1.00		1.00		mg/L			09/13/24 09:06	1

Lab Sample ID: LCS 310-433214/4
Matrix: Water
Analysis Batch: 433214

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloride	10.0	10.15		mg/L		102	90 - 110
Sulfate	10.0	10.28		mg/L		103	90 - 110

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-433030/1-A
Matrix: Water
Analysis Batch: 433771

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433030

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Barium	<0.00200		0.00200		mg/L		09/13/24 09:30	09/19/24 16:36	1
Calcium	<0.500		0.500		mg/L		09/13/24 09:30	09/19/24 16:36	1
Cobalt	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 16:36	1
Lead	<0.000500		0.000500		mg/L		09/13/24 09:30	09/19/24 16:36	1

Lab Sample ID: MB 310-433030/1-A
Matrix: Water
Analysis Batch: 434346

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433030

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00200		0.00200		mg/L		09/13/24 09:30	09/25/24 22:03	1
Beryllium	<0.00100		0.00100		mg/L		09/13/24 09:30	09/25/24 22:03	1
Boron	<0.100		0.100		mg/L		09/13/24 09:30	09/25/24 22:03	1
Copper	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:03	1
Iron	<0.100		0.100		mg/L		09/13/24 09:30	09/25/24 22:03	1
Lithium	<0.0100		0.0100		mg/L		09/13/24 09:30	09/25/24 22:03	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: MB 310-433030/1-A
Matrix: Water
Analysis Batch: 434346

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 433030

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Magnesium	<0.500		0.500		mg/L		09/13/24 09:30	09/25/24 22:03	1
Manganese	<0.0100		0.0100		mg/L		09/13/24 09:30	09/25/24 22:03	1
Potassium	<0.500		0.500		mg/L		09/13/24 09:30	09/25/24 22:03	1
Selenium	<0.00500		0.00500		mg/L		09/13/24 09:30	09/25/24 22:03	1
Sodium	<1.00		1.00		mg/L		09/13/24 09:30	09/25/24 22:03	1
Zinc	<0.0200		0.0200		mg/L		09/13/24 09:30	09/25/24 22:03	1

Lab Sample ID: LCS 310-433030/2-A
Matrix: Water
Analysis Batch: 433771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 433030

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	0.100	0.1094		mg/L		109	80 - 120
Calcium	2.00	2.092		mg/L		105	80 - 120
Cobalt	0.100	0.1065		mg/L		107	80 - 120
Lead	0.200	0.2274		mg/L		114	80 - 120

Lab Sample ID: LCS 310-433030/2-A
Matrix: Water
Analysis Batch: 434346

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 433030

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.200	0.2173		mg/L		109	80 - 120
Beryllium	0.100	0.09732		mg/L		97	80 - 120
Boron	0.200	0.2020		mg/L		101	80 - 120
Copper	0.200	0.2056		mg/L		103	80 - 120
Iron	0.200	0.2029		mg/L		101	80 - 120
Lithium	0.200	0.2052		mg/L		103	80 - 120
Magnesium	2.00	2.005		mg/L		100	80 - 120
Manganese	0.100	0.1030		mg/L		103	80 - 120
Potassium	2.00	2.026		mg/L		101	80 - 120
Selenium	0.400	0.3736		mg/L		93	80 - 120
Sodium	2.00	1.999		mg/L		100	80 - 120
Zinc	0.200	0.1873		mg/L		94	80 - 120

Lab Sample ID: 310-290280-7 DU
Matrix: Water
Analysis Batch: 433771

Client Sample ID: MW-17
Prep Type: Total/NA
Prep Batch: 433030

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Barium	0.0550		0.05590		mg/L		2	20
Calcium	133		132.6		mg/L		0.2	20
Cobalt	0.00447		0.004549		mg/L		2	20
Lead	0.000954		0.0009880		mg/L		4	20
Lithium	<0.0100		<0.0100		mg/L		NC	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-290280-7 DU
Matrix: Water
Analysis Batch: 434346

Client Sample ID: MW-17
Prep Type: Total/NA
Prep Batch: 433030

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
Arsenic	0.00380			0.003856		mg/L				2	20
Beryllium	<0.00100			<0.00100		mg/L				NC	20
Boron	0.611			0.5738		mg/L				6	20
Copper	<0.00500			<0.00500		mg/L				NC	20
Iron	12.1			12.38		mg/L				2	20
Magnesium	44.9			45.01		mg/L				0.2	20
Manganese	1.19			1.179		mg/L				1	20
Potassium	1.56			1.631		mg/L				4	20
Selenium	<0.00500			<0.00500		mg/L				NC	20
Sodium	8.55			8.556		mg/L				0	20
Zinc	<0.0200			<0.0200		mg/L				NC	20

Method: 9040C - pH

Lab Sample ID: LCS 310-432903/1
Matrix: Water
Analysis Batch: 432903

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	6.980		SU		100	98 - 102		

Lab Sample ID: 310-290280-3 DU
Matrix: Water
Analysis Batch: 432903

Client Sample ID: MW-04
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	6.61	HF		6.570		SU				0.6	20

Method: I-3765-85 - Residue, Non-filterable (TSS)

Lab Sample ID: MB 310-432962/1
Matrix: Water
Analysis Batch: 432962

Client Sample ID: Method Blank
Prep Type: Total/NA

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Suspended Solids	<5.00		5.00		mg/L			09/12/24 10:16	1

Lab Sample ID: LCS 310-432962/2
Matrix: Water
Analysis Batch: 432962

Client Sample ID: Lab Control Sample
Prep Type: Total/NA

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Total Suspended Solids			100	107.0		mg/L		107	81 - 116		

HPLC/IC

Analysis Batch: 433211

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	9056A	
310-290280-2	MW-03	Total/NA	Water	9056A	
MB 310-433211/3	Method Blank	Total/NA	Water	9056A	
LCS 310-433211/4	Lab Control Sample	Total/NA	Water	9056A	

Analysis Batch: 433214

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-3	MW-04	Total/NA	Water	9056A	
310-290280-4	MW-10	Total/NA	Water	9056A	
310-290280-4	MW-10	Total/NA	Water	9056A	
310-290280-5	MW-15	Total/NA	Water	9056A	
310-290280-6	MW-16	Total/NA	Water	9056A	
310-290280-7	MW-17	Total/NA	Water	9056A	
310-290280-8	MW-18	Total/NA	Water	9056A	
MB 310-433214/3	Method Blank	Total/NA	Water	9056A	
LCS 310-433214/4	Lab Control Sample	Total/NA	Water	9056A	

Metals

Prep Batch: 433030

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	3005A	
310-290280-2	MW-03	Total/NA	Water	3005A	
310-290280-3	MW-04	Total/NA	Water	3005A	
310-290280-4	MW-10	Total/NA	Water	3005A	
310-290280-5	MW-15	Total/NA	Water	3005A	
310-290280-6	MW-16	Total/NA	Water	3005A	
310-290280-7	MW-17	Total/NA	Water	3005A	
310-290280-8	MW-18	Total/NA	Water	3005A	
MB 310-433030/1-A	Method Blank	Total/NA	Water	3005A	
LCS 310-433030/2-A	Lab Control Sample	Total/NA	Water	3005A	
310-290280-7 DU	MW-17	Total/NA	Water	3005A	

Analysis Batch: 433771

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	6020B	433030
310-290280-2	MW-03	Total/NA	Water	6020B	433030
310-290280-3	MW-04	Total/NA	Water	6020B	433030
310-290280-4	MW-10	Total/NA	Water	6020B	433030
310-290280-5	MW-15	Total/NA	Water	6020B	433030
310-290280-6	MW-16	Total/NA	Water	6020B	433030
310-290280-7	MW-17	Total/NA	Water	6020B	433030
310-290280-8	MW-18	Total/NA	Water	6020B	433030
MB 310-433030/1-A	Method Blank	Total/NA	Water	6020B	433030
LCS 310-433030/2-A	Lab Control Sample	Total/NA	Water	6020B	433030
310-290280-7 DU	MW-17	Total/NA	Water	6020B	433030

Analysis Batch: 434346

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	6020B	433030
310-290280-2	MW-03	Total/NA	Water	6020B	433030

Metals (Continued)

Analysis Batch: 434346 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-3	MW-04	Total/NA	Water	6020B	433030
310-290280-4	MW-10	Total/NA	Water	6020B	433030
310-290280-5	MW-15	Total/NA	Water	6020B	433030
310-290280-6	MW-16	Total/NA	Water	6020B	433030
310-290280-7	MW-17	Total/NA	Water	6020B	433030
310-290280-8	MW-18	Total/NA	Water	6020B	433030
MB 310-433030/1-A	Method Blank	Total/NA	Water	6020B	433030
LCS 310-433030/2-A	Lab Control Sample	Total/NA	Water	6020B	433030
310-290280-7 DU	MW-17	Total/NA	Water	6020B	433030

General Chemistry

Analysis Batch: 432903

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	9040C	
310-290280-2	MW-03	Total/NA	Water	9040C	
310-290280-3	MW-04	Total/NA	Water	9040C	
310-290280-4	MW-10	Total/NA	Water	9040C	
310-290280-5	MW-15	Total/NA	Water	9040C	
310-290280-6	MW-16	Total/NA	Water	9040C	
310-290280-7	MW-17	Total/NA	Water	9040C	
310-290280-8	MW-18	Total/NA	Water	9040C	
LCS 310-432903/1	Lab Control Sample	Total/NA	Water	9040C	
310-290280-3 DU	MW-04	Total/NA	Water	9040C	

Analysis Batch: 432962

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	I-3765-85	
310-290280-2	MW-03	Total/NA	Water	I-3765-85	
310-290280-3	MW-04	Total/NA	Water	I-3765-85	
310-290280-4	MW-10	Total/NA	Water	I-3765-85	
310-290280-5	MW-15	Total/NA	Water	I-3765-85	
310-290280-6	MW-16	Total/NA	Water	I-3765-85	
310-290280-7	MW-17	Total/NA	Water	I-3765-85	
310-290280-8	MW-18	Total/NA	Water	I-3765-85	
MB 310-432962/1	Method Blank	Total/NA	Water	I-3765-85	
LCS 310-432962/2	Lab Control Sample	Total/NA	Water	I-3765-85	

Analysis Batch: 433931

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-290280-1	MW-02	Total/NA	Water	SM 2320B	
310-290280-2	MW-03	Total/NA	Water	SM 2320B	
310-290280-3	MW-04	Total/NA	Water	SM 2320B	
310-290280-4	MW-10	Total/NA	Water	SM 2320B	
310-290280-5	MW-15	Total/NA	Water	SM 2320B	
310-290280-6	MW-16	Total/NA	Water	SM 2320B	
310-290280-7	MW-17	Total/NA	Water	SM 2320B	
310-290280-8	MW-18	Total/NA	Water	SM 2320B	
LCS 310-433931/2	Lab Control Sample	Total/NA	Water	SM 2320B	

Client Sample ID: MW-02
Date Collected: 09/09/24 11:35
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-1
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433211	HE7K	EET CF	09/13/24 15:10
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	434346	NFT2	EET CF	09/25/24 22:46
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:07
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:15
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 21:03

Client Sample ID: MW-03
Date Collected: 09/09/24 10:45
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-2
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433211	HE7K	EET CF	09/13/24 15:22
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	434346	NFT2	EET CF	09/25/24 22:50
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:10
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 22:59
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 21:12

Client Sample ID: MW-04
Date Collected: 09/09/24 12:55
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-3
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433214	HE7K	EET CF	09/13/24 11:55
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	434346	NFT2	EET CF	09/25/24 22:53
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:12
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:13
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 21:22

Client Sample ID: MW-10
Date Collected: 09/10/24 11:50
Date Received: 09/11/24 16:30

Lab Sample ID: 310-290280-4
Matrix: Water

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433214	HE7K	EET CF	09/13/24 12:06
Total/NA	Analysis	9056A		20	433214	HE7K	EET CF	09/13/24 19:30

Lab Chronicle

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-10

Lab Sample ID: 310-290280-4

Date Collected: 09/10/24 11:50

Matrix: Water

Date Received: 09/11/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		4	434346	NFT2	EET CF	09/25/24 22:57
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:23
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:02
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 21:31

Client Sample ID: MW-15

Lab Sample ID: 310-290280-5

Date Collected: 09/09/24 14:10

Matrix: Water

Date Received: 09/11/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433214	HE7K	EET CF	09/13/24 12:18
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	434346	NFT2	EET CF	09/25/24 23:01
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:25
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:03
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 21:43

Client Sample ID: MW-16

Lab Sample ID: 310-290280-6

Date Collected: 09/10/24 10:40

Matrix: Water

Date Received: 09/11/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433214	HE7K	EET CF	09/13/24 12:29
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		4	434346	NFT2	EET CF	09/25/24 23:04
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:27
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:16
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 21:54

Client Sample ID: MW-17

Lab Sample ID: 310-290280-7

Date Collected: 09/10/24 14:25

Matrix: Water

Date Received: 09/11/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433214	HE7K	EET CF	09/13/24 12:41
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	434346	NFT2	EET CF	09/25/24 23:08

Lab Chronicle

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Client Sample ID: MW-17

Lab Sample ID: 310-290280-7

Date Collected: 09/10/24 14:25

Matrix: Water

Date Received: 09/11/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:30
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:01
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 22:15

Client Sample ID: MW-18

Lab Sample ID: 310-290280-8

Date Collected: 09/10/24 13:25

Matrix: Water

Date Received: 09/11/24 16:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	9056A		5	433214	HE7K	EET CF	09/13/24 12:53
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	434346	NFT2	EET CF	09/25/24 23:15
Total/NA	Prep	3005A			433030	F5MW	EET CF	09/13/24 09:30
Total/NA	Analysis	6020B		1	433771	NFT2	EET CF	09/19/24 17:34
Total/NA	Analysis	9040C		1	432903	ZJX4	EET CF	09/11/24 23:17
Total/NA	Analysis	I-3765-85		1	432962	HE7K	EET CF	09/12/24 10:16
Total/NA	Analysis	SM 2320B		1	433931	T5AC	EET CF	09/20/24 22:25

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

Accreditation/Certification Summary

Client: Stanley Consultants Inc
Job ID: 310-290280-1
Project/Site: GPC Landfill Sampling

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-25

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3005A	Water	Lithium

Method Summary

Client: Stanley Consultants Inc
Project/Site: GPC Landfill Sampling

Job ID: 310-290280-1

Method	Method Description	Protocol	Laboratory
9056A	Anions, Ion Chromatography	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
9040C	pH	SW846	EET CF
I-3765-85	Residue, Non-filterable (TSS)	USGS	EET CF
SM 2320B	Alkalinity	SM	EET CF
3005A	Preparation, Total Metals	SW846	EET CF

Protocol References:

SM = "Standard Methods For The Examination Of Water And Wastewater"

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

USGS = "Methods For Analysis Of Water And Fluvial Sediments", USGS, 1989

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-290280 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Stanley Consultants

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/11/24 | TIME 1630 | Received By: JJ

Delivery Type. ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler? ☒ Yes ☐ No *If yes:* Cooler ID:

Multiple Coolers? ☒ Yes ☐ No *If yes:* Cooler # ____ of 12

Cooler Custody Seals Present? ☒ Yes ☐ No *If yes:* Cooler custody seals intact? ☒ Yes ☐ No

Sample Custody Seals Present? ☐ Yes ☒ No *If yes:* Sample custody seals intact? ☐ Yes ☐ No

Trip Blank Present? ☐ Yes ☒ No *If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: P | Correction Factor (°C): 0

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.4 | Corrected Temp (°C): 2.4

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

eurofins | Environment Testing America

Place COC scanning label here

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Stanley Consultants

City/State: CITY | STATE | Project:

Receipt Information

Date/Time Received: DATE 9/11/24 | TIME 1630 | Received By: JJ

Delivery Type. ☐ UPS ☐ FedEx ☐ FedEx Ground ☐ US Mail ☐ Spee-Dee
☒ Lab Courier ☐ Lab Field Services ☐ Client Drop-off ☐ Other:_____

Condition of Cooler/Containers

Sample(s) received in Cooler?	☒ Yes	☐ No	*If yes:* Cooler ID:
Multiple Coolers?	☒ Yes	☐ No	*If yes:* Cooler # 2 of 2
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes:* Cooler custody seals intact? ☒ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes:* Sample custody seals intact? ☐ Yes ☐
Trip Blank Present?	☐ Yes	☒ No	*If yes:* Which VOA samples are in cooler? ↓

Temperature Record

Coolant: ☒ Wet ice ☐ Blue ice ☐ Dry ice ☐ Other:_____ ☐ NONE

Thermometer ID: P | Correction Factor (°C): TD

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 1.3 | Corrected Temp (°C): 1.0

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:		
Uncorrected Temp (°C):		
Corrected Temp (°C):		

Exceptions Noted

1) If temperature exceeds criteria, was sample(s) received same day of sampling? ☐ Yes ☐ No
   a) *If yes:* Is there evidence that the chilling process began? ☐ Yes ☐ No

2) If temperature is <0°C, are there obvious signs that the integrity of sample containers is compromised? (e.g., bulging septa, broken/cracked bottles, frozen solid?) ☐ Yes ☐ No

NOTE If yes, contact PM before proceeding. If no, proceed with login

Additional Comments

Chain of Custody Record

385375 eurofins | Environment Testing TestAmerica

Address _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TAL-8210

Client Contact	Project Manager: Trenton Humphrey	Site Contact: Chris Hare	Date: 9/11/24	COC No: —
Company Name: STANLEY Consultants	Tel/Email: Humphrey.Trenton@stanleygroup.com	Lab Contact: Z Bindert	Carrier: Eurofins	1 of 1 COCs
Address: 2658 Cross Park Rd, Ste 100	Analysis Turnaround Time			Sampler: T. Merritt / R Gaul
City/State/Zip: Coralville, IA 52241	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: 319-520-6659	TAT if different from Below _____			Walk-in Client:
Fax: 319-269-6659	☐ 2 weeks			Lab Sampling:
Project Name: GPC	☐ 1 week			
Site: Grandview, IA	☐ 2 days			Job / SDG No:
P O # —	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y/N)	Perform MS / MSD (Y/N)	Sample Specific Notes
MW-02	9/9/24	11:35	G	H_2O	4			SEE
MW-03	9/9	10:45			4			ATTACHED
MW-04 RTG	9/9	12:55			4			Parameter
MW-05 NO SAMPLE Submitted								Sheets
MW-10	9/10	11:50			4			
MW-15	9/9	14:10			4			
MW-16	9/10	10:40			4			
MW-17	9/10	14:25			4			
MW-18	9/10	13:25			4			

Preservation Used: 1= Ice, 2= HCl; 3= H_2SO_4; 4=HNO_3; 5=NaOH; 6= Other _____

Possible Hazard Identification.
Are any samples from a listed EPA Hazardous Waste? Please List any EPA Waste Codes for the sample in the Comments Section if the lab is to dispose of the sample

☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)

☐ Return to Client ☐ Disposal by Lab ☐ Archive for _____ Months

Special Instructions/QC Requirements & Comments

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No	Cooler Temp (°C) Obs'd _____ Corr'd _____	Therm ID No _____

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
[signature]	O.A.Test	9/11/24 8:00	[signature]		9/11/24 1630
Relinquished by:	Company:	Date/Time	Received by:	Company:	Date/Time
Relinquished by:	Company:	Date/Time	Received in Laboratory by:	Company:	Date/Time

Consultant Stanley Consultants Sampling Date 9 /9+10 /24 Project # - - -

Project Manager Trenton Humphrey Sampled By Randy Gavin / Tyler Merritt

WELL NO.	MW-02	MW-03	MW-04	MW-05	MW-10	MW-15	MW-16	MW-17	MW-18					
Arsenic, total	X	X	X	X	X	X	X	X	X					
barium, total	X	X	X	X	X	X	X	X	X					
copper, total	X	X	X	X	X	X	X	X	X					
lead, total	X	X	X	X	X	X	X	X	X					
magnesium, total	X	X	X	X	X	X	X	X	X					
zinc, total	X	X	X	X	X	X	X	X	X					
iron, total	X	X	X	X	X	X	X	X	X					
Beryllium, total	X	X	X	X	X	X	X	X	X					
cobalt, total	X	X	X	X	X	X	X	X	X					
manganese, total	X	X	X	X	X	X	X	X	X					
Selenium, total	X	X	X	X	X	X	X	X	X					
chloride	X	X	X	X	X	X	X	X	X					
sulfate	X	X	X	X	X	X	X	X	X					
TSS	X	X	X	X	X	X	X	X	X					
pH	X	X	X	X	X	X	X	X	X					

Note: MDL for As 0.001 mg/L, Lithium: ≤ 0.014 mg/L, Cobalt: ≤ 0.0028 mg/L

Sampler: Shipping Date: 09/ 11 /24

Page 1 of 2,

Consultant Stanley Consultants Sampling Date 9/9/2024 Project # ---

Project Manager Trenton Humphrey Sampled By Randy Gavin / Tyler Merritt

WELL NO.	MW-02	MW-03	MW-04	MW-05	MW-10	MW-15	MW-16	MW-17	MW-18					
Bicarbonate alkalinity	X	X	X	X	X	X	X	X	X					
boron	X	X	X	X	X	X	X	X	X					
calcium	X	X	X	X	X	X	X	X	X					
potassium	X	X	X	X	X	X	X	X	X					
lithium	X	X	X	X	X	X	X	X	X					
sodium	X	X	X	X	X	X	X	X	X					

Sampler: Shipping Date: 9/11/24

Page 2 of 2,

Login Sample Receipt Checklist

Client: Stanley Consultants Inc

Job Number: 310-290280-1

Login Number: 290280
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

APPENDIX B

DNR SAMPLING FORMS AND DOCUMENTATION

DNR Sampling Forms

Low Flow Sampling Forms

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-02

Upgradient X **Downgradient**

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 726.03 **Ground Elevation** 723.57

Depth of Well 64.80 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/9/2024 11:02	57.02	669.01
***After Purging**	9/9/2024 11:34	57.05	668.98
***Before Purging**	9/9/2024 11:34	57.05	668.98

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.84

No. of Well Volumes (based on current water level) 0.66

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 69^0, WSW winds 5-10 mph, 30.2"Hg

Field Measurements (after stabilization):

Temperature 17.17 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 7.37

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 609.78 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-03

Upgradient X **Downgradient**

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 726.26 **Ground Elevation** 723.89

Depth of Well 196.00 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/9/2024 10:16	176.82	549.44
***After Purging**	9/9/2024 10:40	176.91	549.35
***Before Purging**	9/9/2024 10:40	176.91	549.35

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.74

No. of Well Volumes (based on current water level) 0.56

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

*D. FIELD MEASUREMENT

Weather Conditions Clear, 64^0, SSW winds 5-10 mph, 30.2"Hg

Field Measurements (after stabilization):

Temperature 14.67 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 7.16

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 733.18 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-04

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 707.84 **Ground Elevation** 705.75

Depth of Well 55.50 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/9/2024 12:23	46.64	661.2
***After Purging**	9/9/2024 12:53	46.76	661.08
***Before Purging**	9/9/2024 12:53	46.76	661.08

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.63

No. of Well Volumes (based on current water level) 0.44

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 74^0, SW winds 5-10 mph, 30.2"Hg

Field Measurements (after stabilization):

Temperature 18.89 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 6.44

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 842.42 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-05

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) ☐ **Yes** ☒ **No**

If no, explain

Standing Water or Litter? (please check) ☐ **Yes** ☒ **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 567.86 **Ground Elevation** 565.86

Depth of Well 33.20 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/9/2024 14:37	31.35	536.51
***After Purging**			
***Before Purging**			

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) - - -

No. of Well Volumes (based on current water level) - - -

Was well pumped/bailed dry? - - -

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 78^0, SW winds 5-10 mph, 30.1"Hg

Field Measurements (after stabilization):

Temperature - - - **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH - - -

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance - - - **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Well purged dry after removing 300 ml.

NO SAMPLE SUBMITTED.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-10

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 557.79 **Ground Elevation** 575.30

Depth of Well 57.80 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/10/2024 11:19	46.88	510.91
***After Purging**	9/10/2024 11:47	46.90	510.89
***Before Purging**	9/10/2024 11:47	46.90	510.89

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.74

No. of Well Volumes (based on current water level) 0.42

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 72^0, S winds 5-10 mph, 30.1"Hg

Field Measurements (after stabilization):

Temperature 16.53 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 6.61

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 2,250.6 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-15

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 568.00 **Ground Elevation** 565.85

Depth of Well 45.35 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/9/2024 15:37	36.94	531.06
***After Purging**	9/9/2024 16:06	36.93	531.07
***Before Purging**	9/9/2024 16:06	36.93	531.07

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.77

No. of Well Volumes (based on current water level) 0.56

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 77^0, SW winds 5-10 mph, 30.1"Hg

Field Measurements (after stabilization):

Temperature 16.51 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 6.94

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 1,004.50 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-16

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 568.19 **Ground Elevation** 565.31

Depth of Well 52.60 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/10/2024 9:46	37.31	530.88
***After Purging**	9/10/2024 10:39	37.36	530.83
***Before Purging**	9/10/2024 10:39	37.36	530.83

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.40

No. of Well Volumes (based on current water level) 0.56

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 64^0, SW winds 5-10 mph, 30.1"Hg

Field Measurements (after stabilization):

Temperature 17.45 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 6.55

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 2,349.1 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-17

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 554.67 **Ground Elevation** 551.11

Depth of Well 63.00 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/10/2024 14:01	24.10	530.57
***After Purging**	9/10/2024 14:24	24.17	530.5
***Before Purging**	9/10/2024 14:24	24.17	530.5

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 0.61

No. of Well Volumes (based on current water level) 0.10

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 75^0, S winds 5-10 mph, 30.1"Hg

Field Measurements (after stabilization):

Temperature 17.71 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 6.97

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 829.58 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

GROUNDWATER SAMPLING AND/OR GROUNDWATER ELEVATION MEASUREMENT FORM

Site Name Grain Processing Corporation CCR Landfill **Permit No.** 58-SDP-03-92P-CCR

Monitoring Well/Piezometer No. MW-18

Upgradient **Downgradient** X

Name of person sampling Randy Gavin & Tyler Merritt

A. MONITORING WELL/PIEZOMETER CONDITIONS

Well/Piezometer Properly Capped? (please check) [X] **Yes** [ ] **No**

If no, explain

Standing Water or Litter? (please check) [ ] **Yes** [X] **No**

If yes, explain

B. GROUNDWATER ELEVATION MEASUREMENT (± 0.01 foot, MSL)

Elevation:

Top of inner well casing 551.31 **Ground Elevation** 548.54

Depth of Well 53.20 **Inside Casing Diameter** (in inches) 2.00

Equipment Used Solinst 101 P7 Water Level Meter

Groundwater Level (± 0.01 foot below top of inner casing, MSL):

	Date/Time	Depth to Groundwater	Groundwater Elevation
Before Purging	9/10/2024 12:30	20.98	530.33
***After Purging**	9/10/2024 13:22	21.02	530.29
***Before Purging**	9/10/2024 13:22	21.02	530.29

*C. WELL PURGING

Quantity of Water Removed from Well (gallons) 1.37

No. of Well Volumes (based on current water level) 0.26

Was well pumped/bailed dry? No

Equipment used:

Bailer type **Dedicated Bailer?**

Pump type QED Sample Pro Bladder Pump **Dedicated Pump?** No

If not dedicated, method of cleaning Liquinox detergent scrub, then a triple deionized water rinse

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

***D. FIELD MEASUREMENT**

Weather Conditions Clear, 75^0, S winds 5-10 mph, 30.1"Hg

Field Measurements (after stabilization):

Temperature 19.16 **Units** °C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

pH 7.08

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Specific Conductance 732.12 **Units** µmhos/cm @ 25°C

Equipment Used In-Situ AquaTroll 500 Multiparameter Water Quality Meter

Comments

Low flow protocol.

Certification

I certify under penalty of law I believe the information reported above is true, accurate and complete.

Signature Randy Gavin **Date** 9/26/2024

Telephone (563) 852-5105 **Fax** - - - - **Email** oatech@netins.net

NOTE: Attach Laboratory Report and 8 ½" x 11" site plan showing locations of all surface and groundwater monitoring points. One map per sampling round.

*Omit if only measuring groundwater elevations.

Please mail completed form to: Iowa Department of Natural Resources, Land Quality Bureau, 502 E 9th St, Des Moines IA 50319
Questions? Call or Email: Nina Booker Environmental Engineer Sr., 515-725-8309, nina.booker@dnr.iowa.gov

LOW FLOW SAMPLING FORM

DATE	9/9/2024	WELL ID	MW-02	SAMPLE DATE / TIME	9/9/2024 11:35
SITE	GPC Landfill	DTW	57.02	NOTE	
PROJECT #	- - -	WELL DEPTH	64.80		
WEATHER	Clear, 69^0, WSW winds 5-10 mph, 30.2"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	61'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
11:02										
11:04	100	200	57.02	20.70	7.33	-30.1	637.83	86.50	3.66	
11:09	100	700	57.01	18.17	7.30	-11.3	611.86	57.71	2.36	
11:14	100	1200	57.02	17.00	7.33	0.2	608.51	25.15	2.23	
11:19	100	1700	57.03	16.88	7.36	5.5	609.73	15.98	2.16	
11:24	100	2200	57.06	16.75	7.37	10.9	608.83	7.40	2.10	
11:29	100	2700	57.06	17.15	7.38	15.5	608.27	7.08	2.15	
11:34	100	3200	57.05	17.17	7.37	19.9	609.78	7.61	2.12	
12:09			57.01							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/9/2024	WELL ID	MW-03	SAMPLE DATE / TIME	9/9/2024 10:45
SITE	GPC Landfill	DTW	176.82	NOTE	
PROJECT #	- - -	WELL DEPTH	196.00		
WEATHER	Clear, 64^0, SSW winds 5-10 mph, 30.2"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	191'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
10:16										
10:22	200	1200	176.82	16.02	7.06	10.6	739.97	17.81	3.31	
10:25	200	1800	176.91	15.54	7.03	-12.3	742.44	13.17	4.35	
10:28	200	2400	176.86	14.97	7.06	-15.3	741.01	44.48	3.97	
10:31	200	3000	176.90	14.64	7.09	-15.2	738.85	56.66	3.04	
10:34	200	3600	176.87	14.79	7.12	-19.4	734.23	54.65	2.49	
10:37	200	4200	176.85	14.58	7.15	-21.3	733.19	52.31	2.40	
10:40	200	4800	176.91	14.67	7.16	-21.8	733.18	51.78	2.49	
10:56			176.85							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10%*	*Limits*
									or +/-0.2 mg	***100 PSI, 2 CPM, 56***

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/9/2024	WELL ID	MW-04	SAMPLE DATE / TIME	9/9/2024 12:55
SITE	GPC Landfill	DTW	46.64	NOTE	
PROJECT #	- - -	WELL DEPTH	55.50		
WEATHER	Clear, 74^0, SW winds 5-10 mph, 30.2"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	50'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
12:29										
12:33	100	400	46.68	24.32	6.59	-1.4	894.77	50.08	1.62	
12:38	100	900	46.73	19.82	6.49	6.0	867.49	42.15	0.57	
12:43	100	1400	46.71	18.67	6.45	8.4	854.59	15.06	0.35	
12:48	100	1900	46.77	18.77	6.44	9.3	846.11	13.88	0.38	
12:53	100	2400	46.76	18.89	6.44	10.3	842.42	14.40	0.42	
13:15			46.71							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/9/2024	WELL ID	MW-05	SAMPLE DATE / TIME	- - -
SITE	GPC Landfill	DTW	31.85	NOTE	No Sample Submitted
PROJECT #	- - -	WELL DEPTH	33.20		
WEATHER	Clear, 78^{0}, SW winds 5-10 mph, 30.1"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	32.20'(on bottom)

TIME	PURGE RATE(	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
14:37										
14:40	100	300	After 300 ml is removed the well will no longer pump - DRY							
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3		
NaOH		
None		

LOW FLOW SAMPLING FORM

DATE	9/10/2024	WELL ID	MW-10	SAMPLE DATE / TIME	9/10/2024 11:50
SITE	GPC Landfill	DTW	46.88	NOTE	
PROJECT #	- - -	WELL DEPTH	57.80		
WEATHER	Clear, 72^0, S winds 5-10 mph, 30.1"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	52'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
11:19										
11:22	100	300	46.90	17.67	6.66	100.5	1881.3	53.51	4.34	
11:27	100	800	46.90	16.50	6.59	116.1	2034.9	20.09	2.67	
11:32	100	1300	46.91	16.39	6.59	121.3	2198.7	14.91	1.84	
11:37	100	1800	46.91	16.39	6.59	123.9	2240.6	13.31	1.54	
11:42	100	2300	46.91	16.52	6.60	126.0	2251.9	13.53	1.45	
11:47	100	2800	46.90	16.53	6.61	128.4	2250.6	12.92	1.39	
12:20			46.90							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/9/2024	WELL ID	MW-15	SAMPLE DATE / TIME	9/9/2024 14:10
SITE	GPC Landfill	DTW	36.94	NOTE	
PROJECT #	- - -	WELL DEPTH	45.35		
WEATHER	Clear, 77^0, SW winds 5-10 mph, 30.1"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	41'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
13:37										
13:41	100	400	36.94	19.25	7.00	40.9	1049.2	196.46	0.97	
13:46	100	900	36.93	17.33	6.95	45.8	1046.2	116.10	0.75	
13:51	100	1400	36.93	16.57	6.95	48.7	1031.0	66.76	0.66	
13:56	100	1900	36.93	16.55	6.94	50.9	1022.2	42.10	0.63	
14:01	100	2400	36.93	16.55	6.94	52.9	1009.0	41.48	0.61	
14:06	100	2900	36.93	16.51	6.94	54.9	1004.5	41.37	0.64	
14:35			36.94							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/10/2024	WELL ID	MW-16	SAMPLE DATE / TIME	9/10/2024 10:40
SITE	GPC Landfill	DTW	37.31	NOTE	
PROJECT #	- - -	WELL DEPTH	52.60		
WEATHER	Clear, 64^0, SW winds 5-10 mph, 30.1"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	47'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
9:46										
9:49	100	300	37.38	17.86	6.64	197.7	1787.2	776.50	2.69	
9:54	100	800		17.72	6.57	210.3	2113.3	404.94	1.75	
9:59	100	1300	37.37	18.05	6.57	206.5	2185.0	413.00	1.34	
10:04	100	1800	37.38	16.85	6.56	185.4	2233.6	211.02	0.85	
10:09	100	2300	37.38	16.92	6.56	162.9	2253.9	203.30	0.82	
10:14	100	2800	37.37	17.08	6.56	130.6	2274.9	197.40	0.73	
10:19	100	3300	37.37	17.07	6.56	100.7	2386.6	182.60	0.72	
10:24	100	3800	37.38	17.24	6.56	84.4	2335.0	167.71	0.73	
10:29	100	4300	37.37	17.17	6.55	72.5	2347.7	174.64	0.71	
10:34	100	4800	37.37	17.28	6.56	67.9	2353.1	163.09	0.72	
10:39	100	5300	37.36	17.45	6.55	64.0	2349.1	160.24	0.69	
11:09			37.37							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/10/2024	WELL ID	MW-17	SAMPLE DATE / TIME	9/10/2024 14:25
SITE	GPC Landfill	DTW	24.10	NOTE	
PROJECT #	- - -	WELL DEPTH	63.00		
WEATHER	Clear, 75^0, S winds 5-10 mph, 30.1"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	55'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
14:01										
14:04	100	300	24.14	19.30	7.12	50.5	726.16	428.77	1.57	
14:09	100	800	24.15	18.20	7.01	47.0	760.30	249.41	0.87	
14:14	100	1300	24.15	17.97	6.96	41.4	805.71	133.78	0.68	
14:19	100	1800	24.15	17.77	6.96	38.1	819.68	132.61	0.64	
14:24	100	2300	24.17	17.70	6.97	34.6	829.58	136.14	0.57	
14:46			24.17							After Sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

LOW FLOW SAMPLING FORM

DATE	9/10/2024	WELL ID	MW-18	SAMPLE DATE / TIME	9/10/2024 13:25
SITE	GPC Landfill	DTW	20.98	NOTE	
PROJECT #	- - -	WELL DEPTH	53.20		
WEATHER	Clear, 75^0, S winds 5-10 mph, 30.1"Hg	PUMP TYPE	QED Bladder	DEPTH TO INTAKE	48'

TIME	PURGE RATE(r	VOL REMOVED(m	DTW	TEMP	Ph	ORP	SpecCond	Turbidity	DO	NOTES
12:30										
12:32	100	200	21.02	20.59	7.38	-11.7	483.87	893.1	1.61	
12:37	100	700	21.02	18.52	7.30	-49.2	482.82	1669.1	1.00	Rinsed flow cell
12:42	100	1200	21.02	18.55	7.39	-53.5	484.08	2189.3	0.96	
12:47	100	1700	21.02	18.40	7.36	-64.7	499.27	2244.0	0.77	
12:52	100	2200	21.02	18.27	7.26	-61.9	573.53	2282.7	0.74	
12:57	100	2700	21.02	18.45	7.17	-55.5	654.97	2718.5	0.73	Rinsed flow cell
13:02	100	3200	21.02	19.60	7.20	-37.9	668.60	2269.1	2.31	
13:07	100	3700	21.02	19.15	7.12	-43.6	700.28	2131.2	0.75	
13:12	100	4200	21.02	19.10	7.09	-43.1	724.89	1045.9	0.74	
13:17	100	4700	21.02	19.18	7.09	-42.5	726.39	1001.3	0.74	
13:22	100	5200	21.02	19.16	7.08	-41.2	732.12	1023.8	0.71	
13:51			21.02							After sampling
0.5-5.0 min	*200-500 ml*	*- - -*	*minimize*	*- - -*	*+/- 0.1*	*+/-10 mV*	*+/- 3%*	*+/- 10%*	*+/- 10% or +/-0.2 mg*	*Limits*

Preservative	# of Containers	
HCl		
HNO_3	1	
NaOH		
None	3	

APPENDIX C

FACILITY INSPECTIONS

Semiannual Inspection Reports

Semi-Annual CCR Landfill Site Evaluation

MEMO

Environmental

Guide Continuous Improvement
Prevent Pollution
Comply with Environmental Regulations

To: Record
From: Mackenzie Holladay
GPC Environmental
Date: 3/7/2024
Subject: Semi-Annual Visual Inspection at the CCR Landfill

Background:

- The CCR landfill is undergoing IDNR closure (see IDNR inspection by Field Office 6, Brian Lee, dated 10-13-17), and a sanitary disposal project closure permit (58-SDP-03-92C) was issued and became effective on 1-3-19. In this closure permit under section X. Special Provisions, 7. Details monthly inspections for the first year. Then a reduction in the frequency of inspections may be sought after with IDNR, so long as enough justification is provided with the criteria in 567 IAC 103.1(5)" f" (status of conformance or nonconformance).

Visual Inspection:

- On March 7, 2024, Mackenzie Holladay (Environmental Specialist) and Greg Beik (Facilities Coordinator) took a trip to the landfill at about 9:15am to complete a bi-annual visual inspection. The weather was mostly cloudy, 46 degrees F, and winds from the southeast at about 9 mph. During the visual inspection of the landfill area the following were observed:
    - No standing water in the retention ponds.
        - The North retention pond had two puddles, from the precipitation that had occurred that morning and earlier in the week.
    - No trees were visible on the cap of the landfill.
    - No signs of animals creating homes/burrows on the cap of the landfill.
    - No visible signs of stressed vegetation on the property.
    - No visible cracks, cave-ins, or punctures to the landfill cap.
        - Three small areas of erosion were found on the west side of the landfill, not on the cap.
    - Pictures were taken during this visit and are available at S:\production\environmental\enviroshare\CCR Landfill\Pictures\2024 Pics

Recommendation:

- Continue to do annual mowing maintenance. The landfill was last mowed on 8/15/2023.
- Pay particular attention to entrances and exiting to retention basins to ensure steady flow in and out, which may include weed whacking the areas and addition of riprap.
- Ensuring that monitoring wells and piezometers are clearly labeled and mowing/weed whacking and maintenance for easy identification and access to for testing.
- Fix the three small, eroded areas before they get worse, and affect the landfill cap. Greg Beik will call up Muscatine Bridge to fix the areas.

The visit to the landfill was concluded and gate locked around 9:50am.

Semi-Annual CCR Landfill Site Evaluation

MEMO

Environmental

Guide Continuous Improvement
Prevent Pollution
Comply with Environmental Regulations

To: Record
From: Mackenzie Holladay
GPC Environmental
Date: 9/4/2024
Subject: Semi-Annual Visual Inspection at the CCR Landfill

Background:

- The CCR landfill is undergoing IDNR closure (see IDNR inspection by Field Office 6, Brian Lee, dated 10-13-17), and a sanitary disposal project closure permit (58-SDP-03-92C) was issued and became effective on 1-3-19. In this closure permit under section X. Special Provisions, 7. Details monthly inspections for the first year. Then a reduction in the frequency of inspections may be sought after with IDNR, so long as enough justification is provided with the criteria in 567 IAC 103.1(5)" f" (status of conformance or nonconformance).

Visual Inspection:

- On September 4, 2024, Mackenzie Holladay (Environmental Specialist) took a trip to the landfill at about 1:40pm to complete a semi-annual visual inspection. The weather was sunny, 81 degrees F, and winds from the southeast at about 11 mph. During the visual inspection of the landfill the following were observed:
    - No standing water in the retention ponds.
    - No trees were visible on the cap of the landfill.
    - No signs of animals creating homes/burrows on the cap of the landfill.
    - No visible signs of stressed vegetation on the property.
    - No visible cracks, cave-ins, or punctures to the landfill cap.
        - One minor area of erosion found on the northwest side of the landfill on the hillside going up to the cap, but not on the cap.
    - Pictures were taken during this visit and are available at S:\production\environmental\enviroshare\CCR Landfill\Pictures\2024 Pics

Recommendations/Comments:

- Continue to do annual mowing maintenance. The landfill was last mowed on 7/29/2024.
- Pay particular attention to entrances and exits to retention basins to ensure steady flow in and out, which may include weed whacking the areas and addition of riprap.
- Greg did a great job flagging the wells and piezometers on the site. Continue the upkeep of these areas, including mowing/weed whacking and maintenance for easy identification and access for testing.
- Fix the one small, eroded area before it affects the landfill cap. Mackenzie will contact Greg Beik (Facilities Coordinator).
- Mackenzie found a deer shed, which indicates evidence of wildlife.
- Landfill Sampling will take place September 9th and 10th.

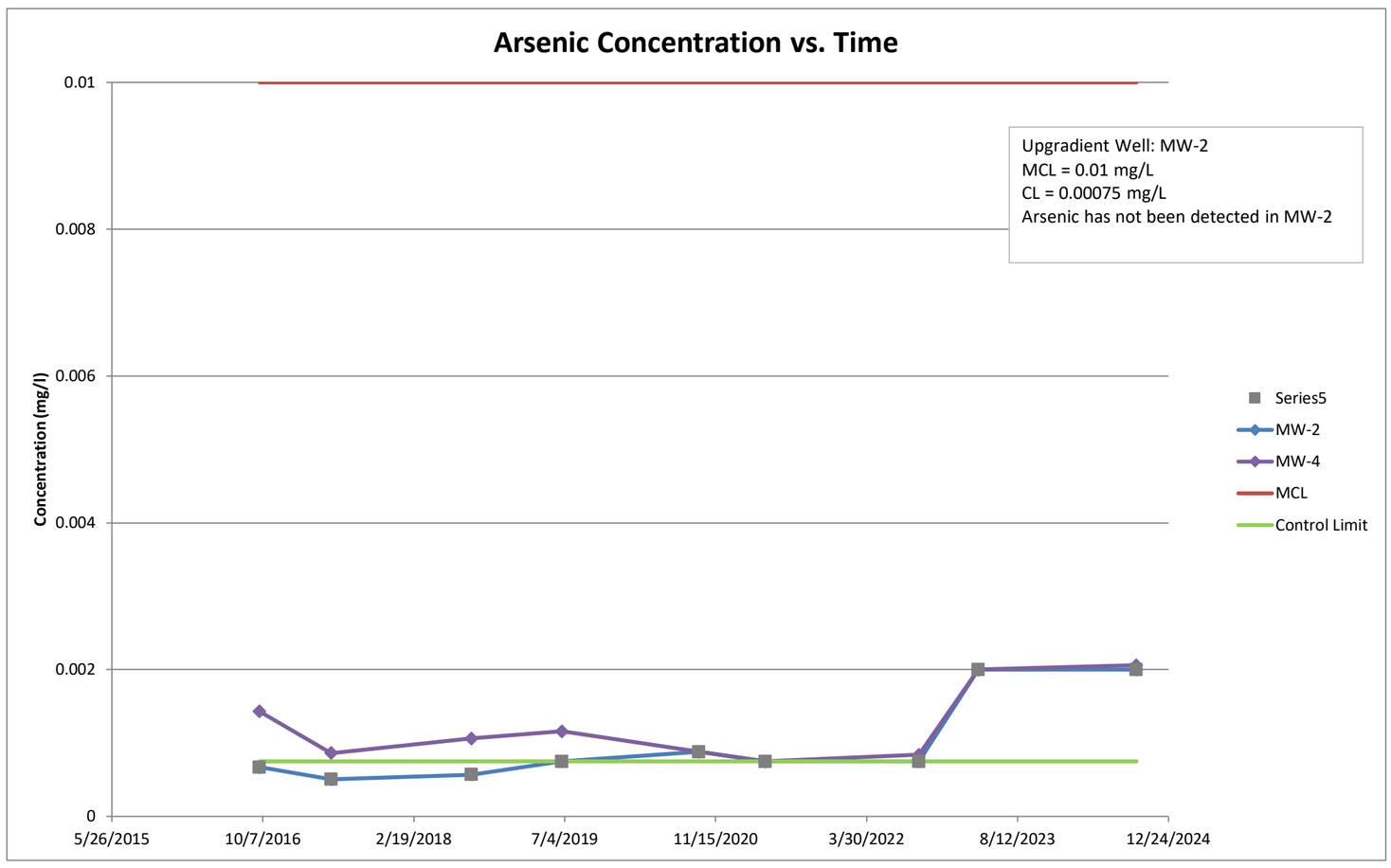
The visit to the landfill was concluded and gate locked around 2:20pm.

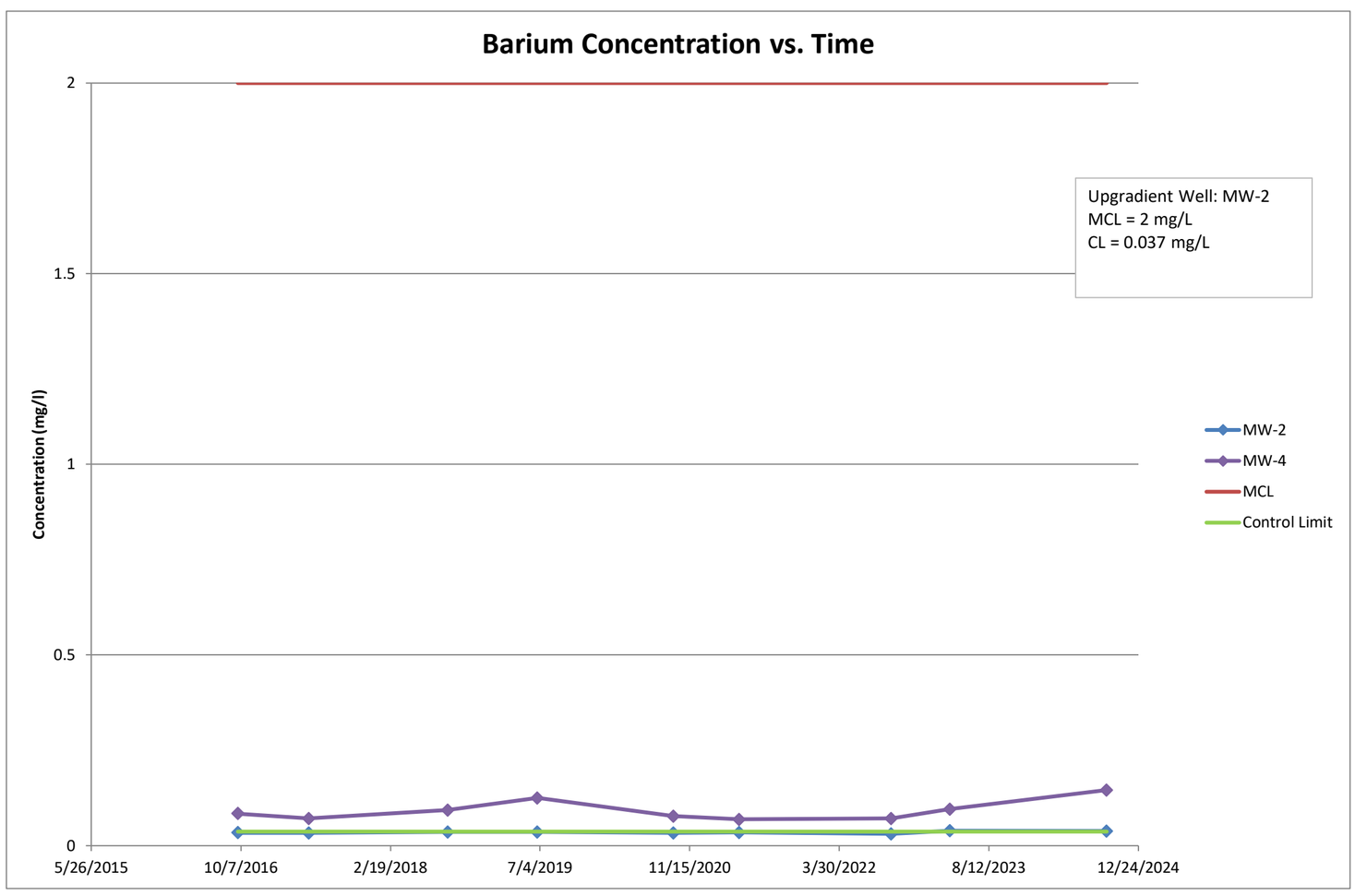
APPENDIX D

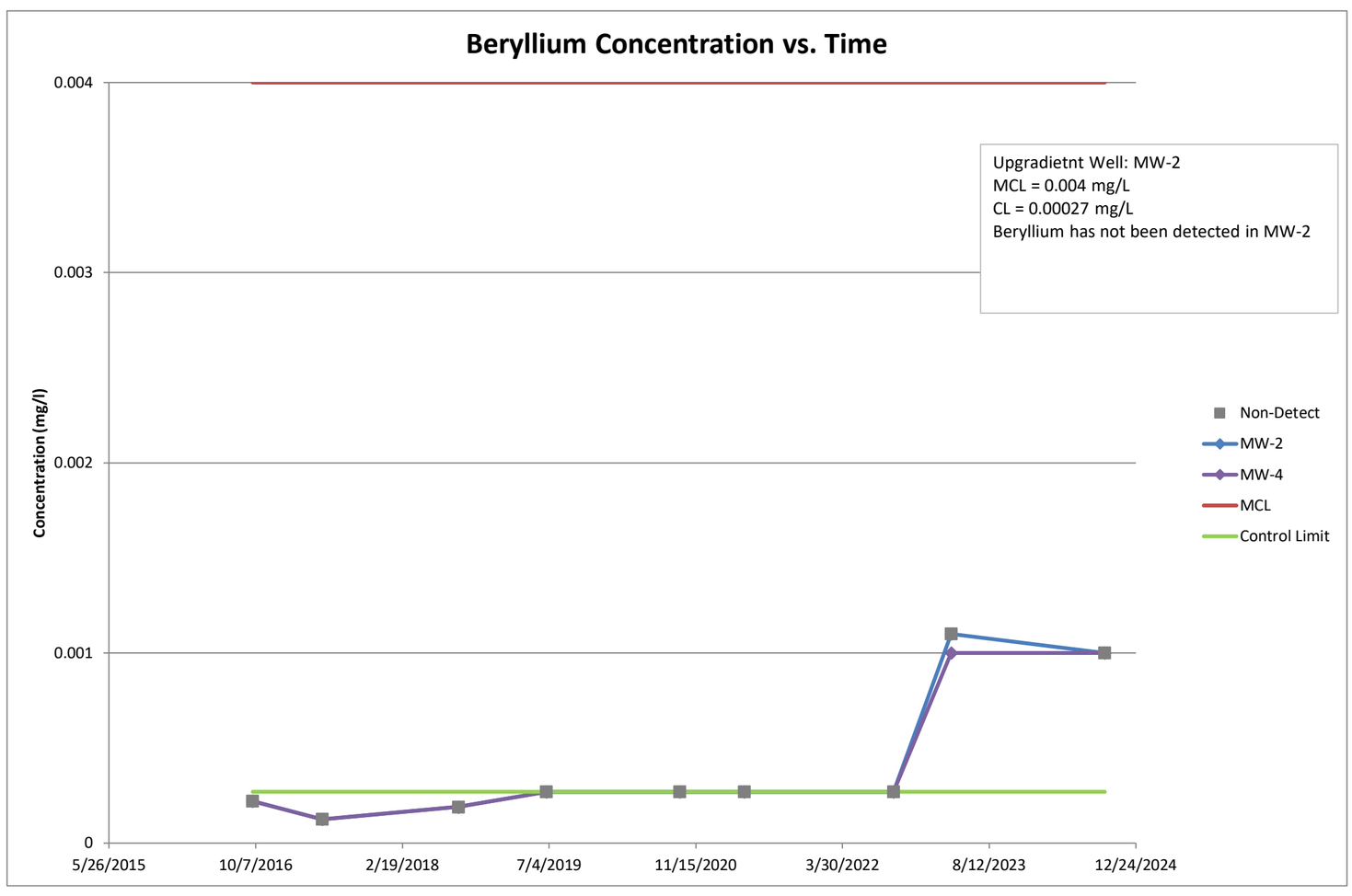
HISTORICAL GROUNDWATER QUALITY FIGURES

Groundwater Results Over Time (2016-2023)

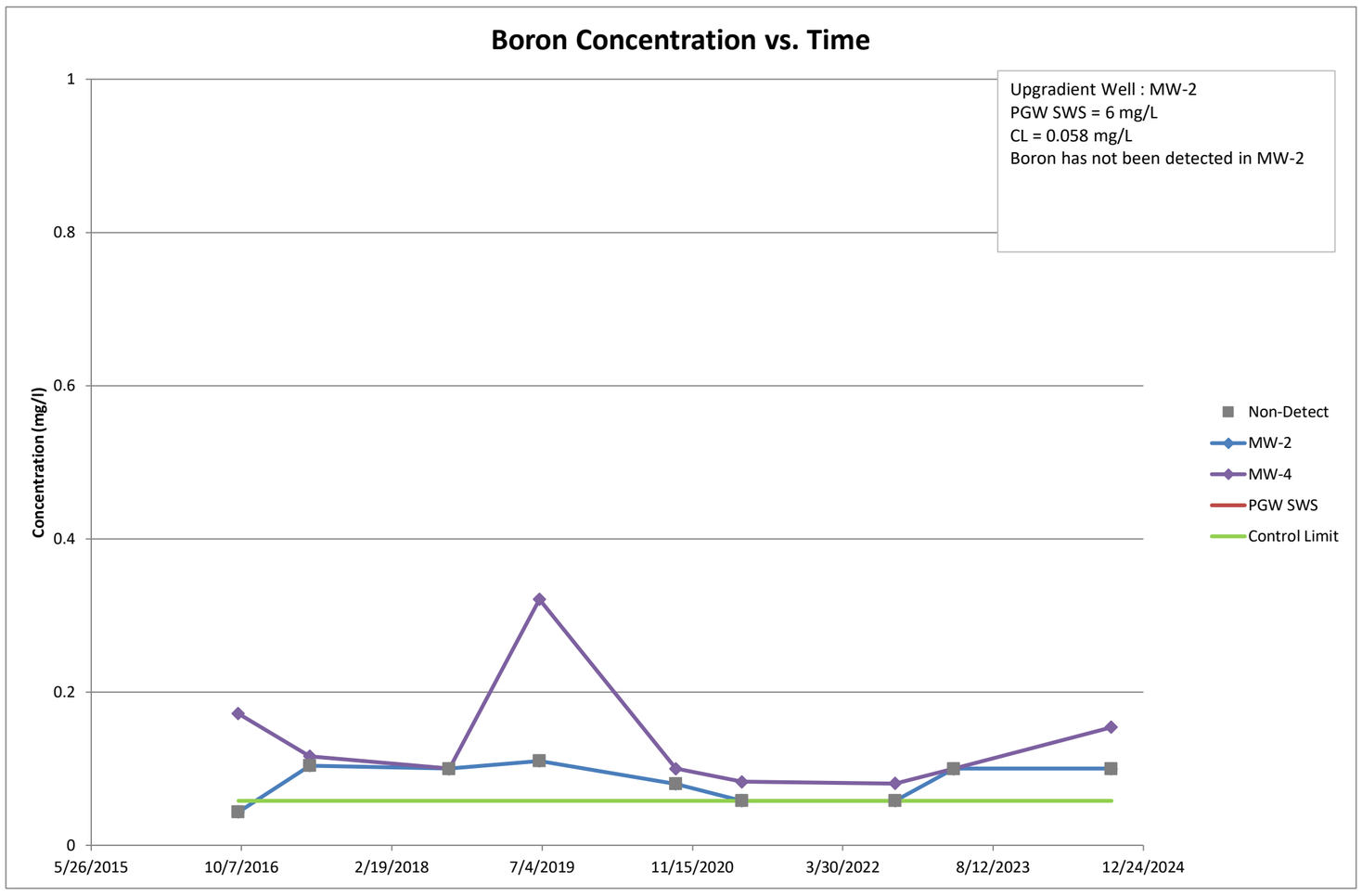
Appendix D
Background : MW-2

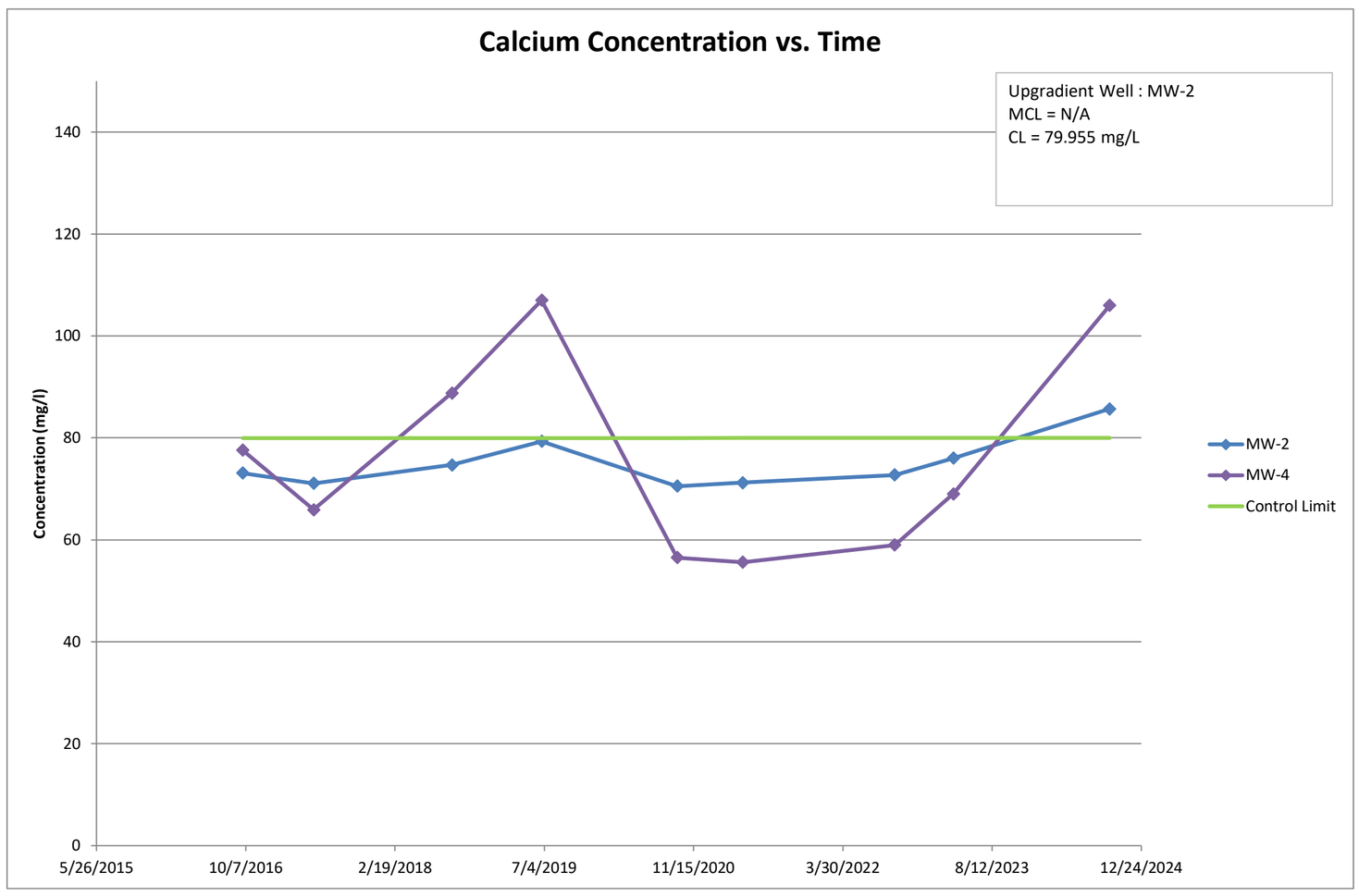


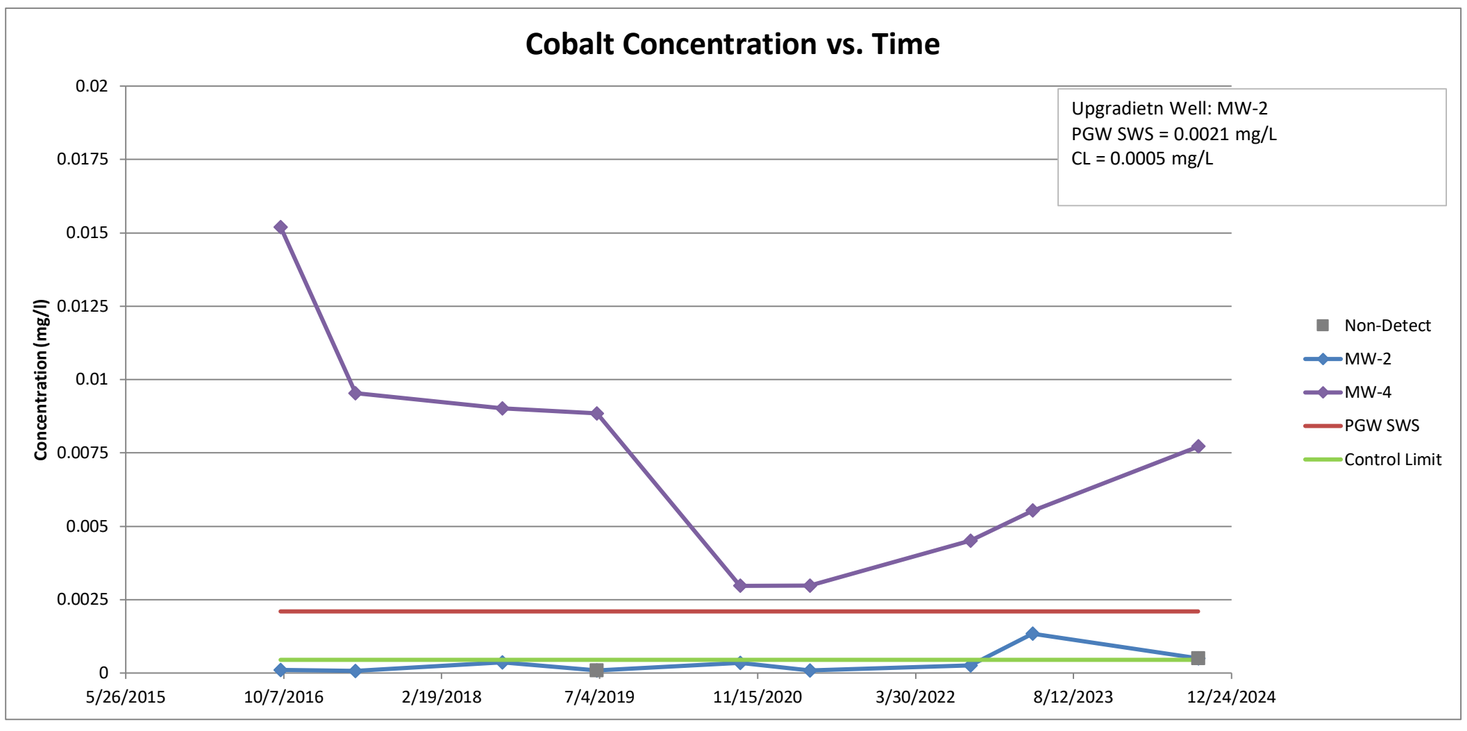




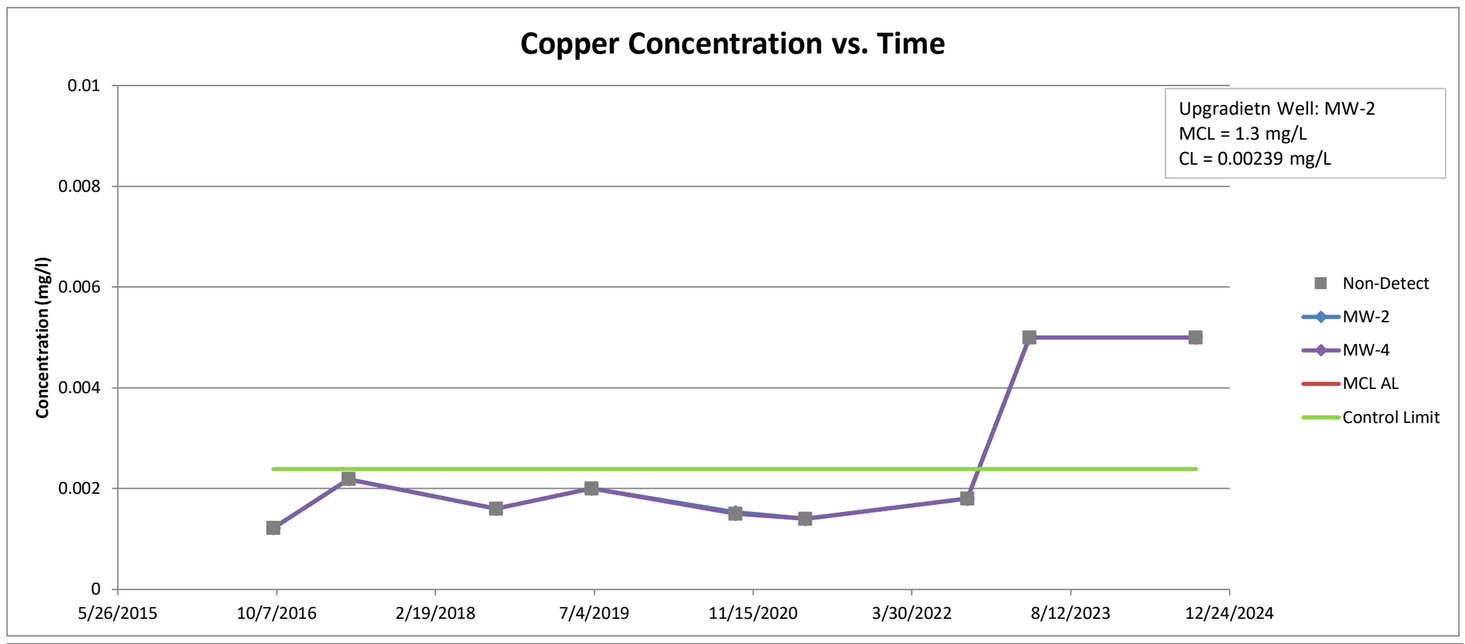
Appendix D
Background : MW-2

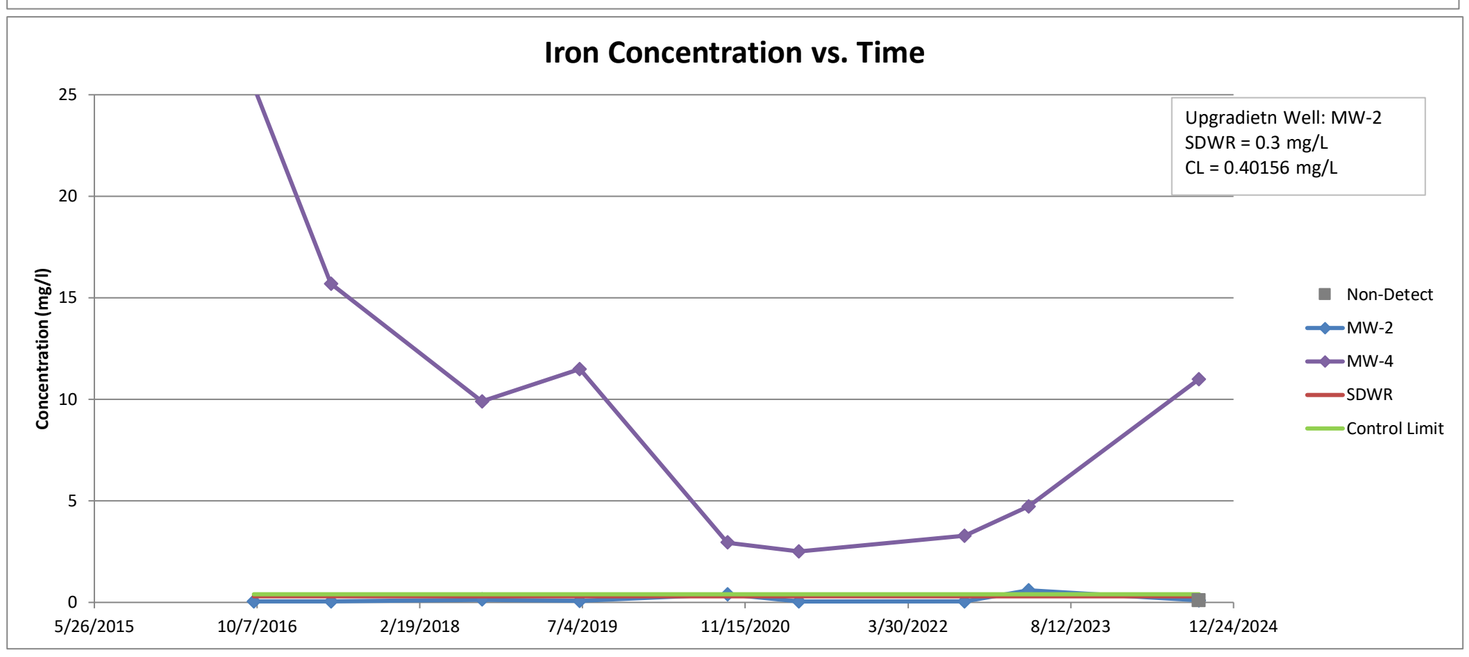


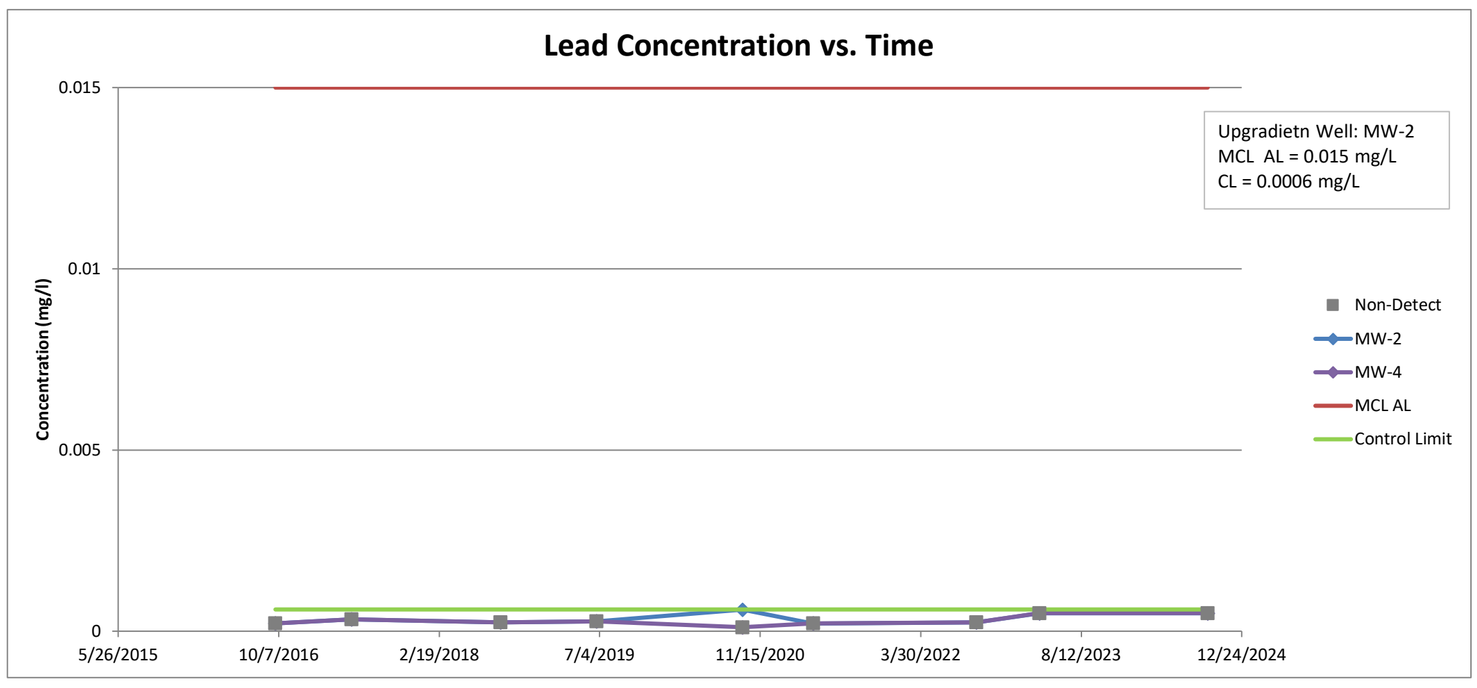




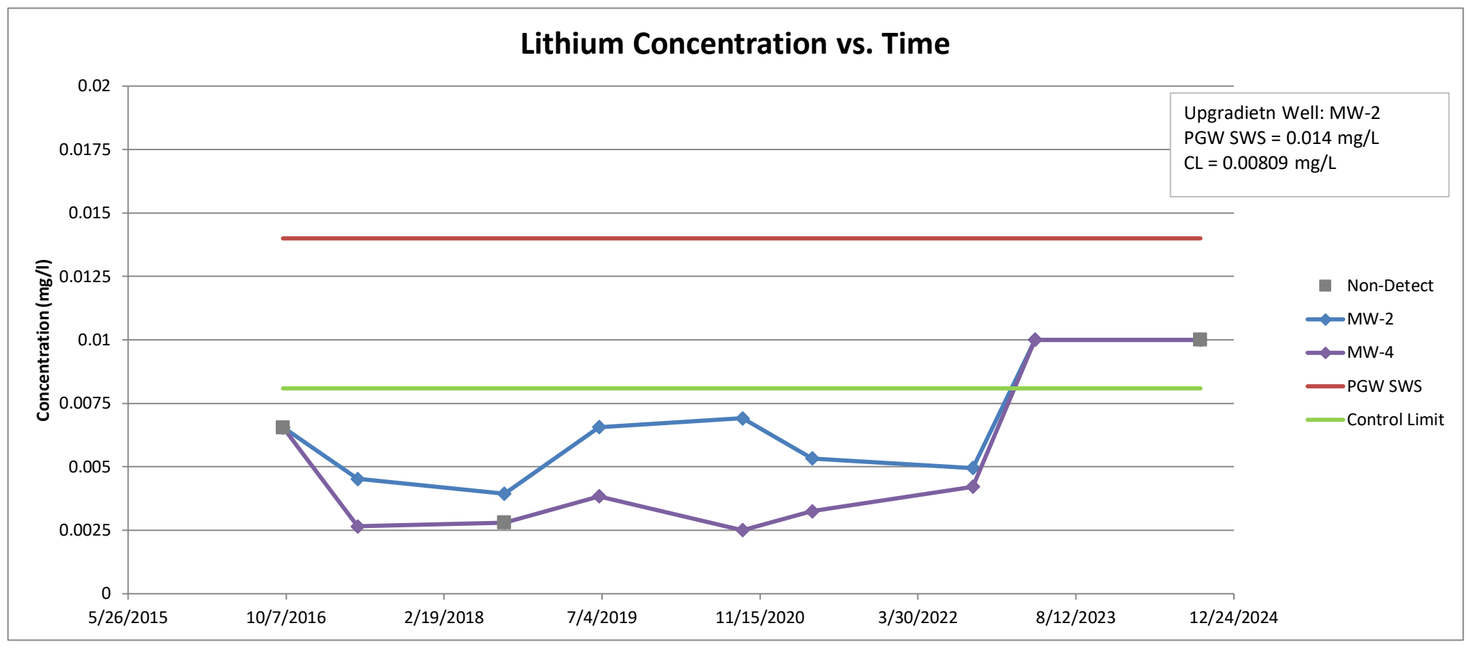
Appendix D
Background : MW-2

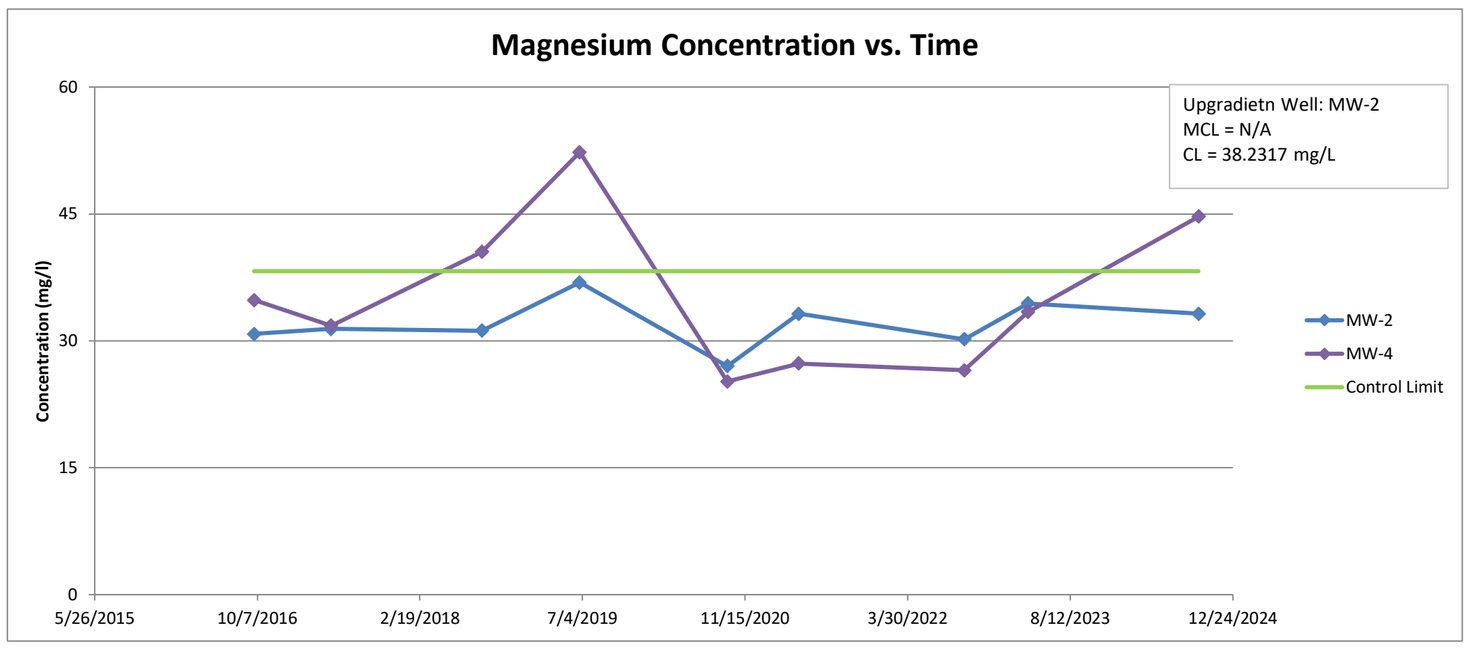


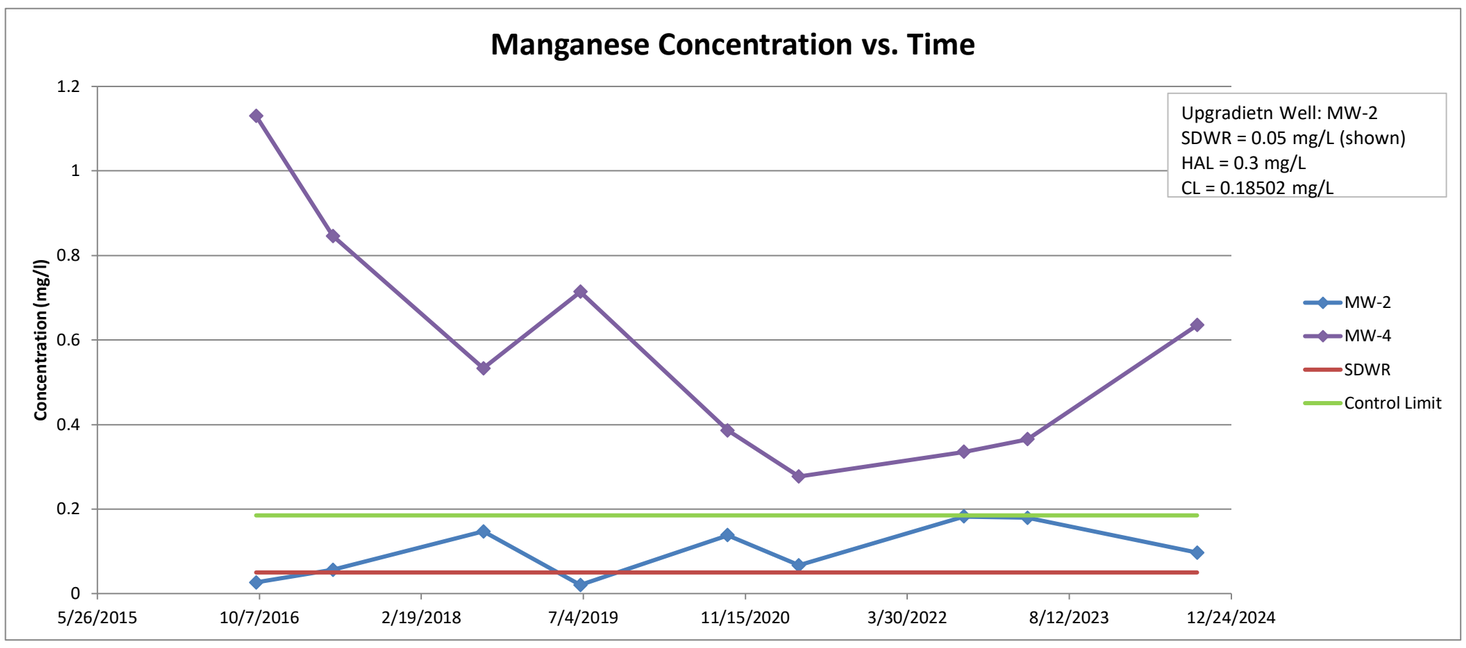




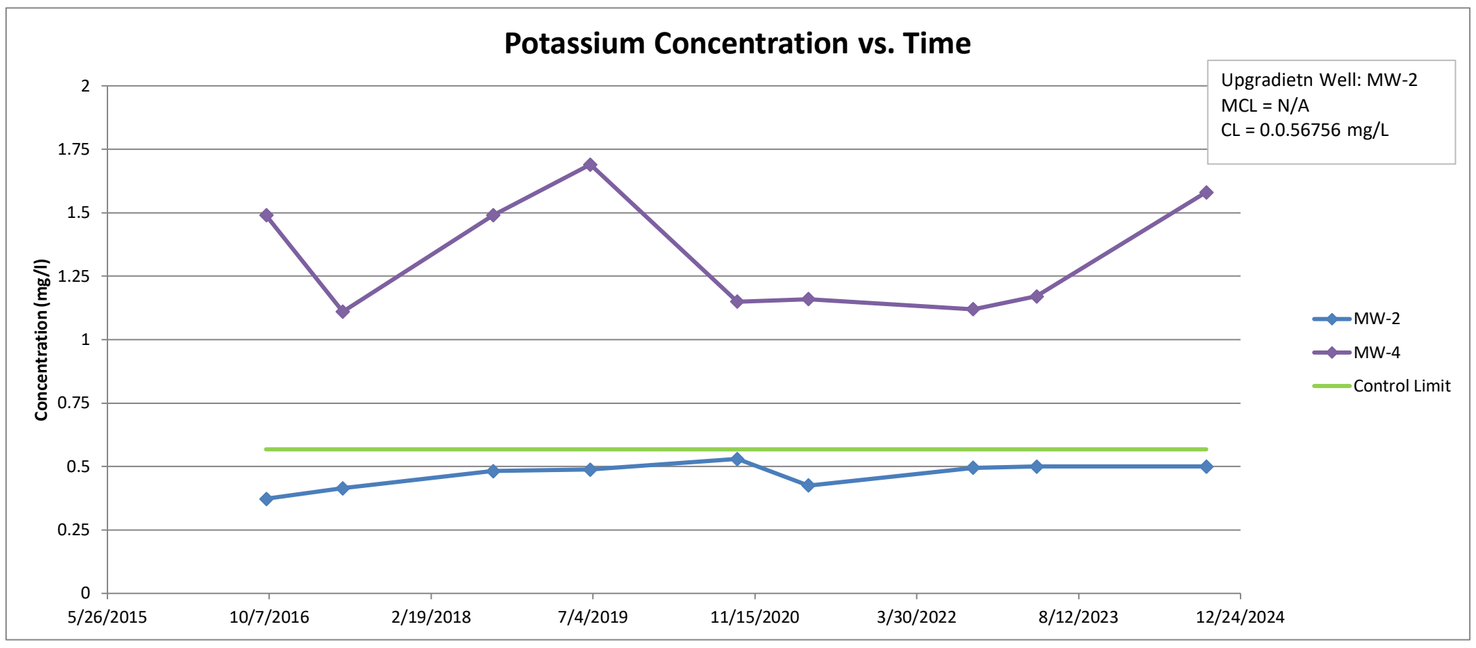
Appendix D
Background : MW-2

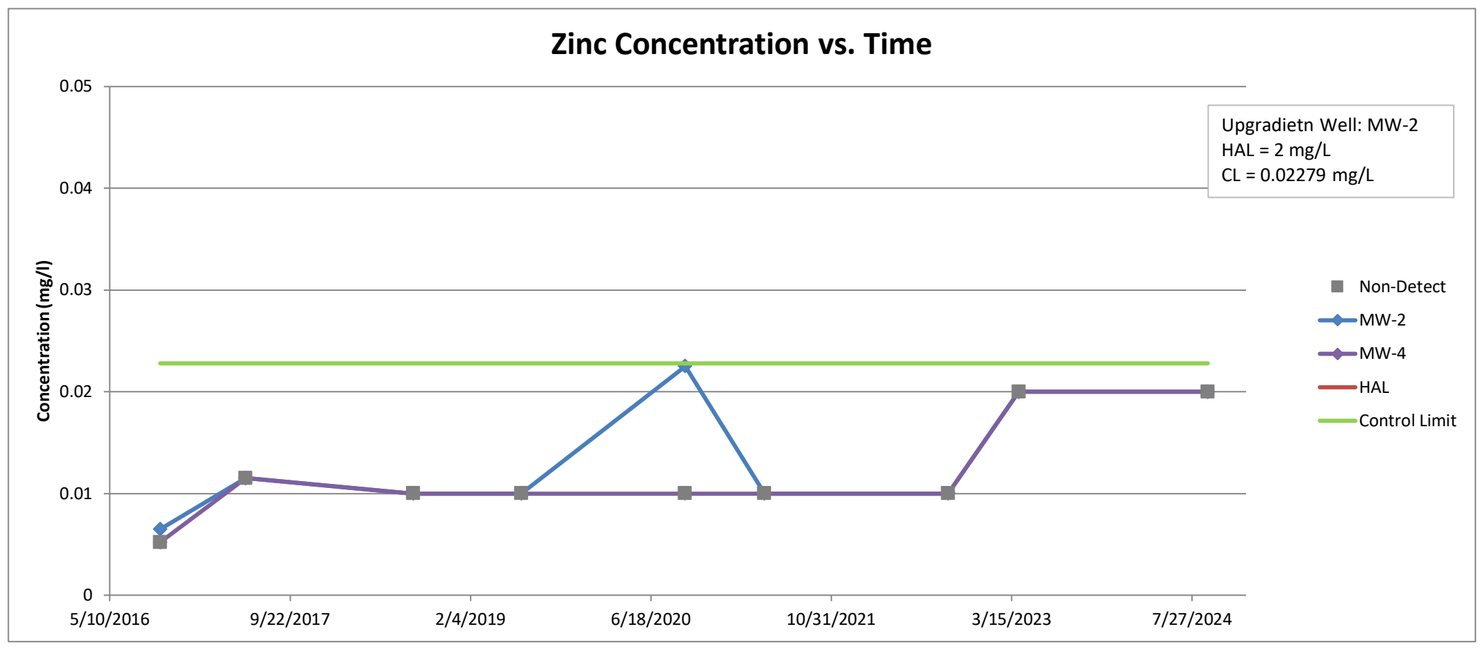


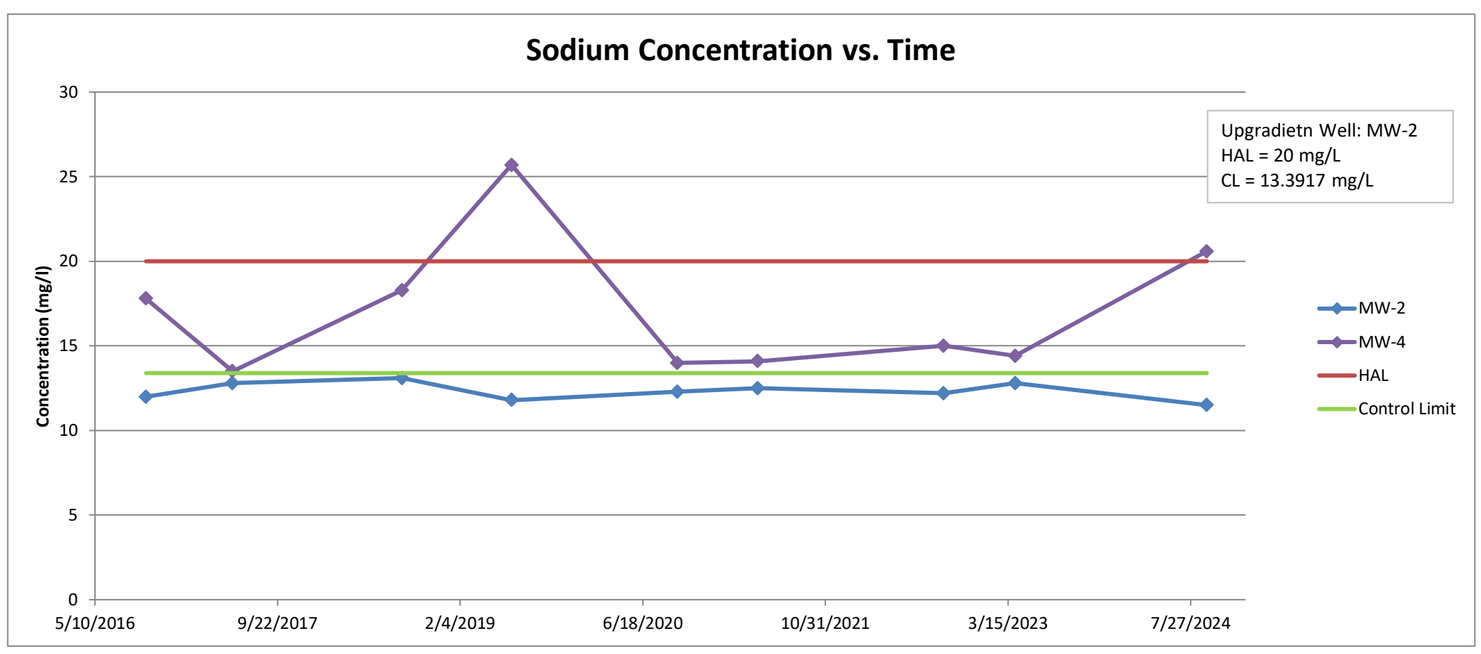




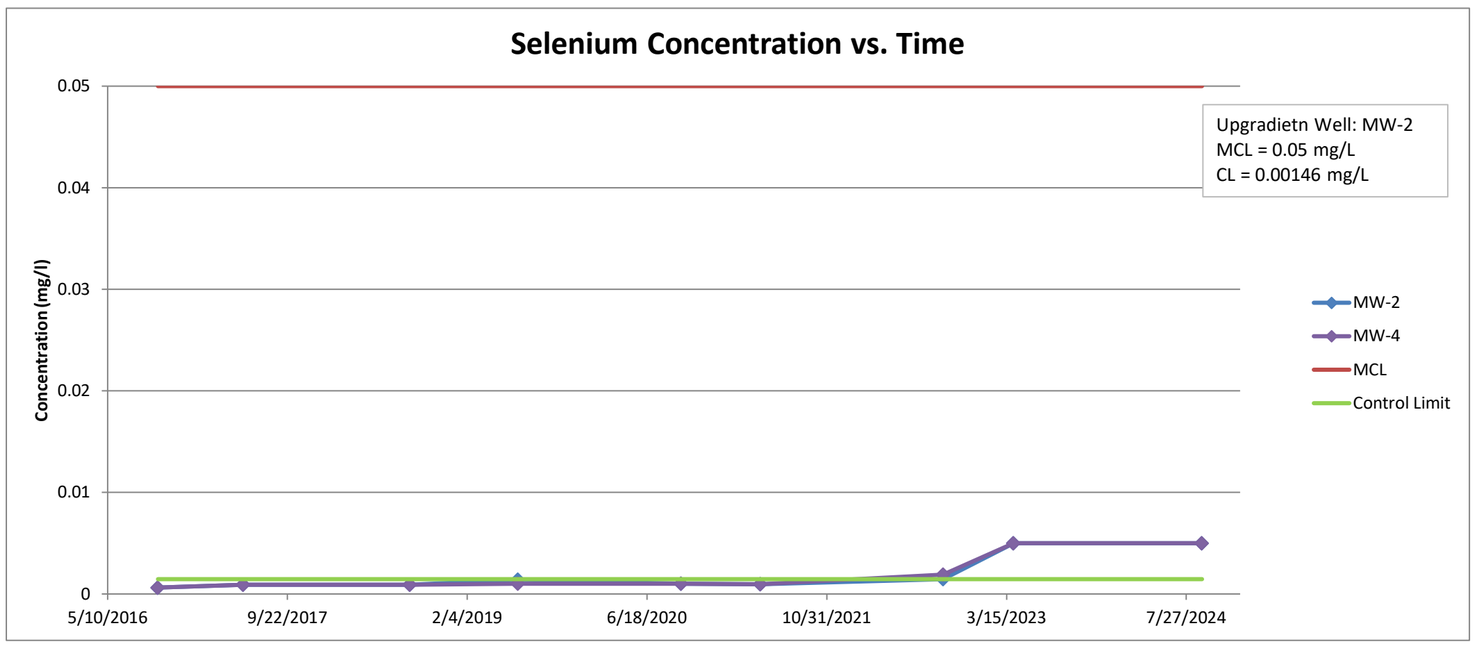
Appendix D
Background : MW-2

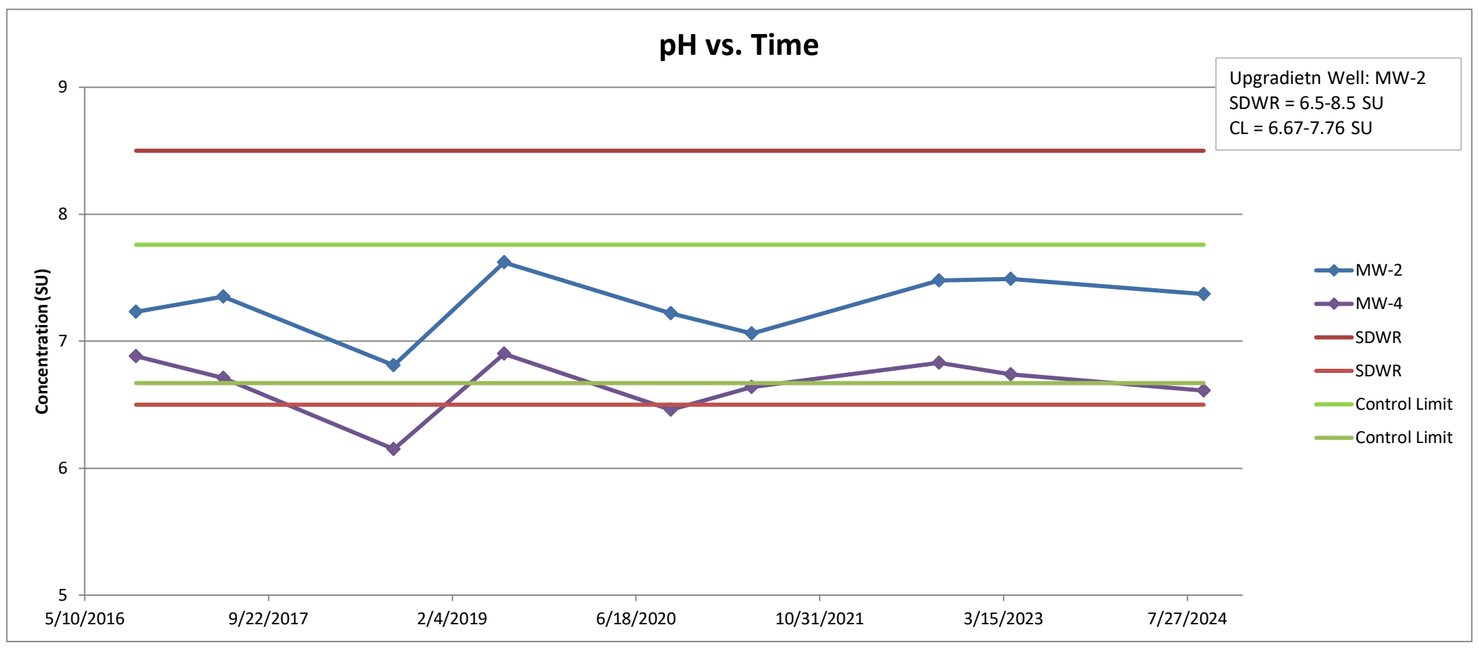


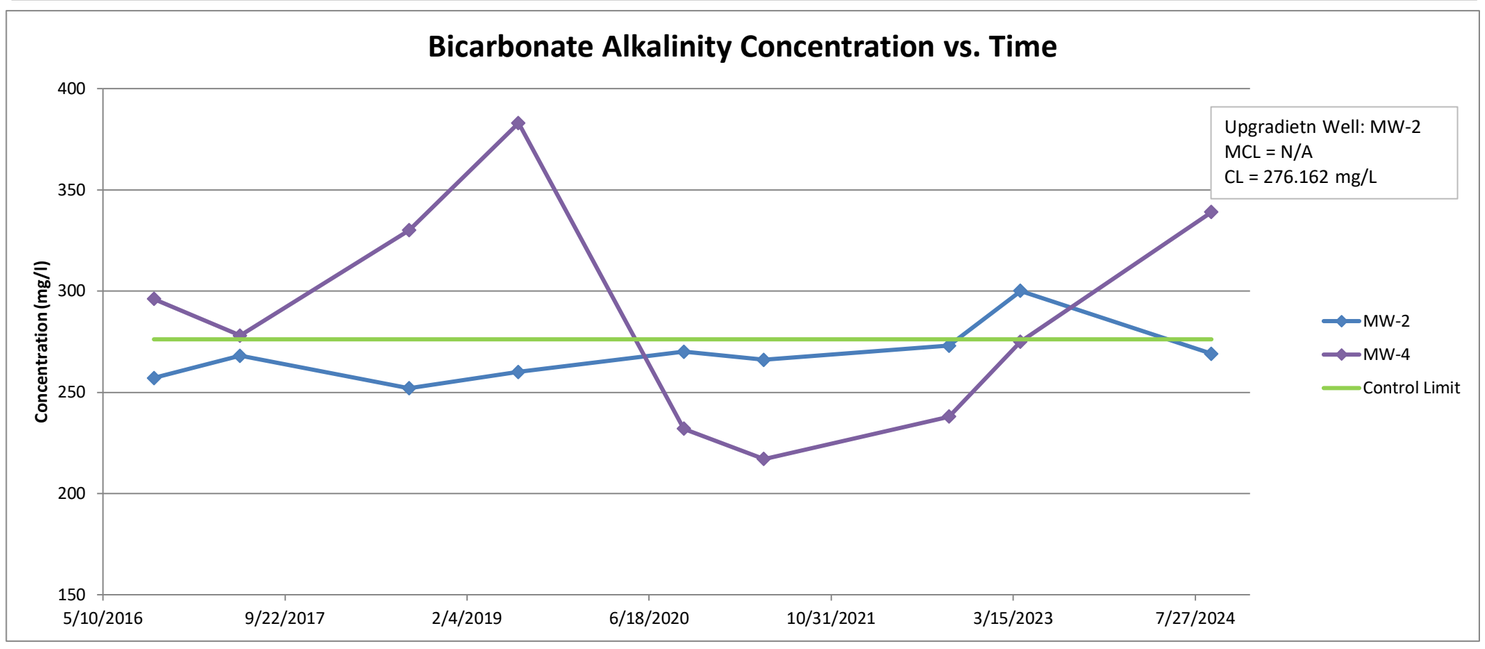




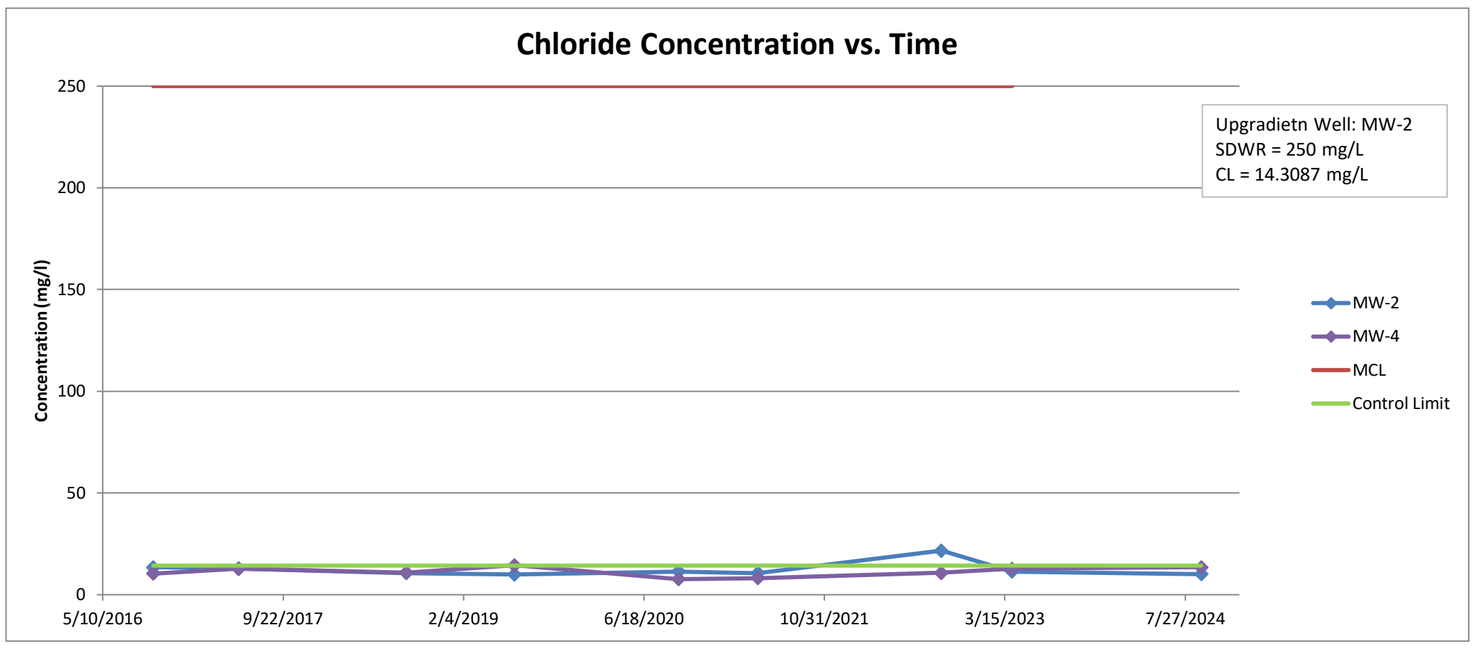
Appendix D
Background : MW-2

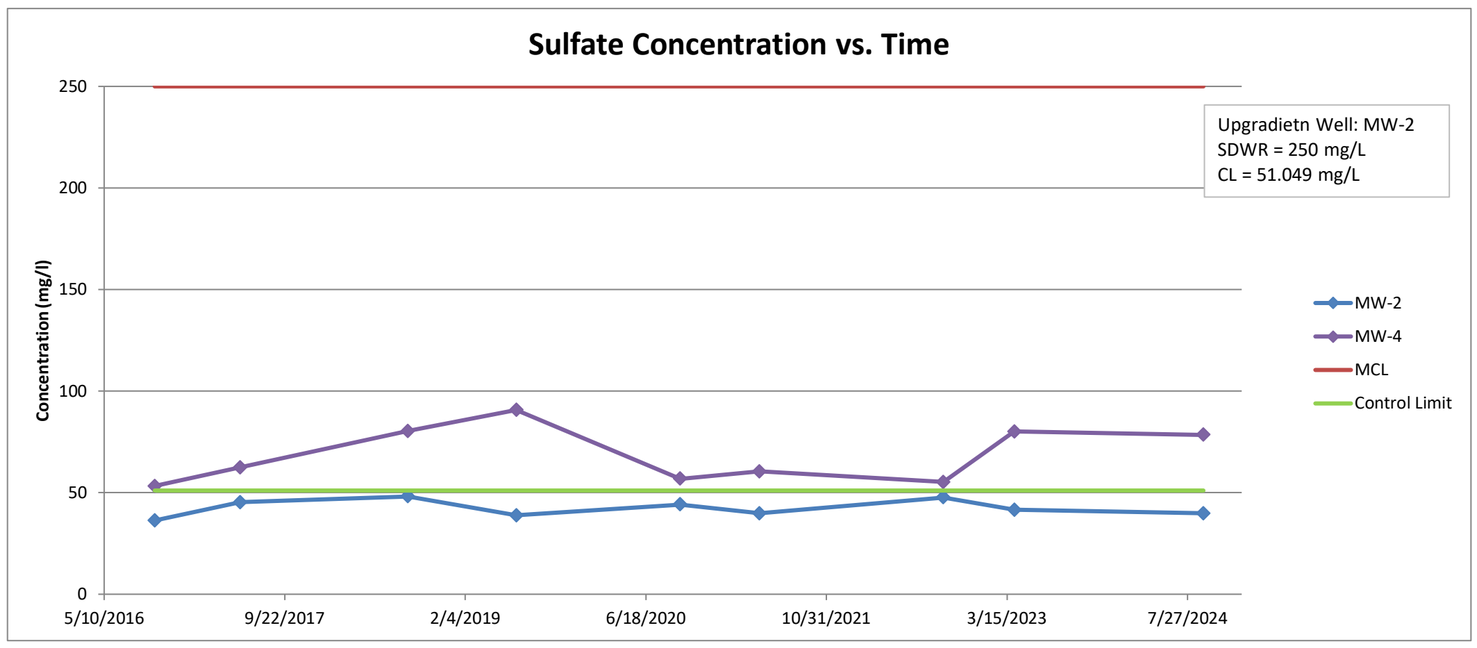


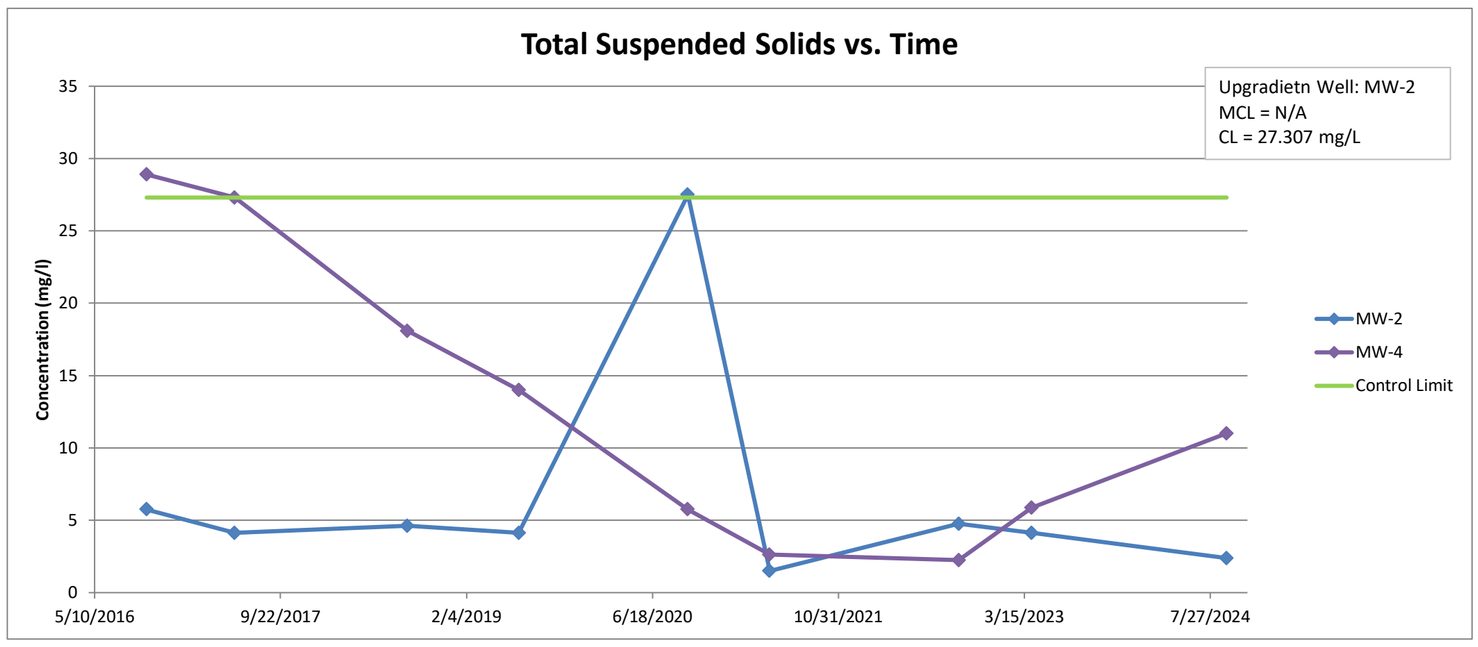




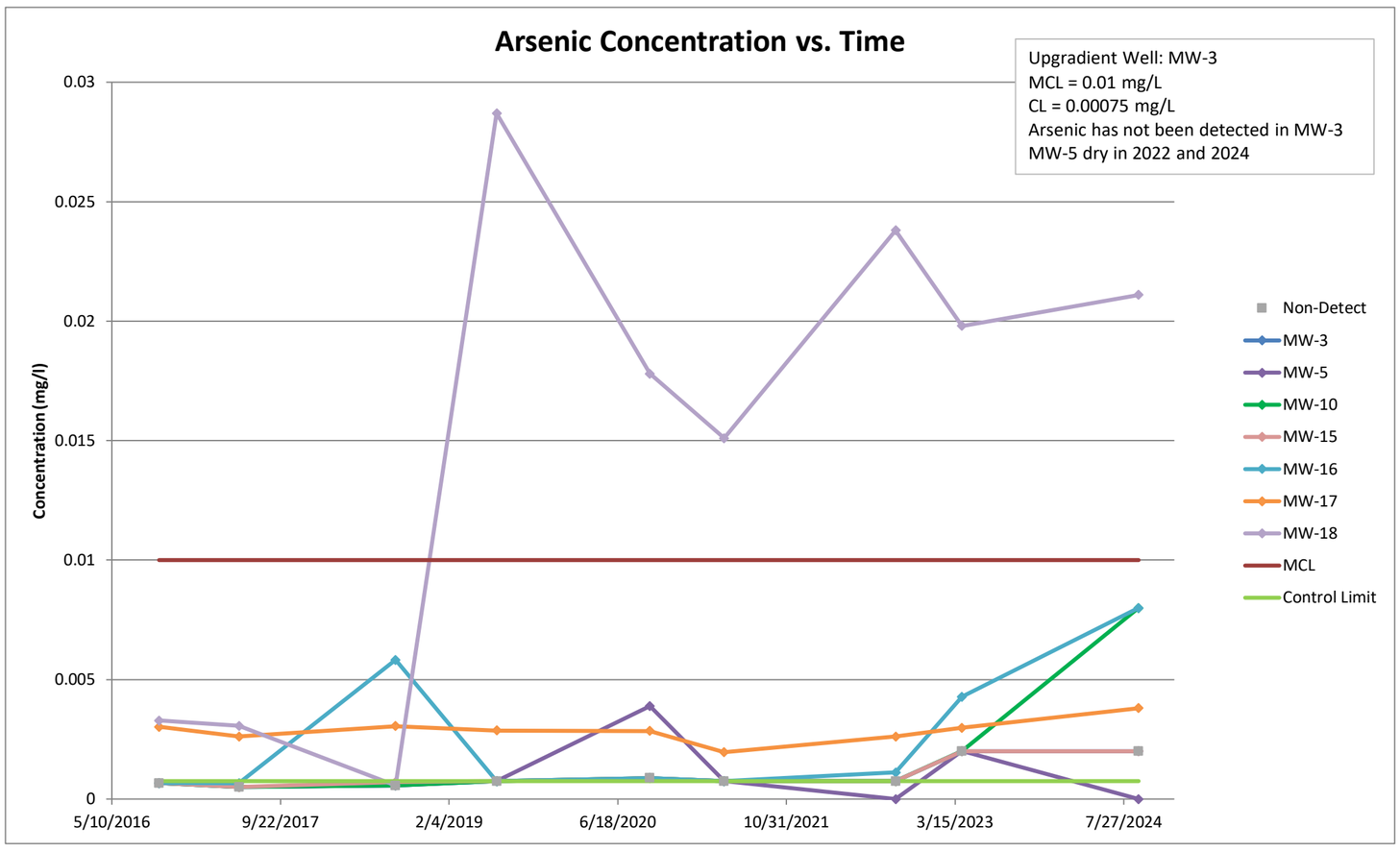
Appendix D
Background : MW-2

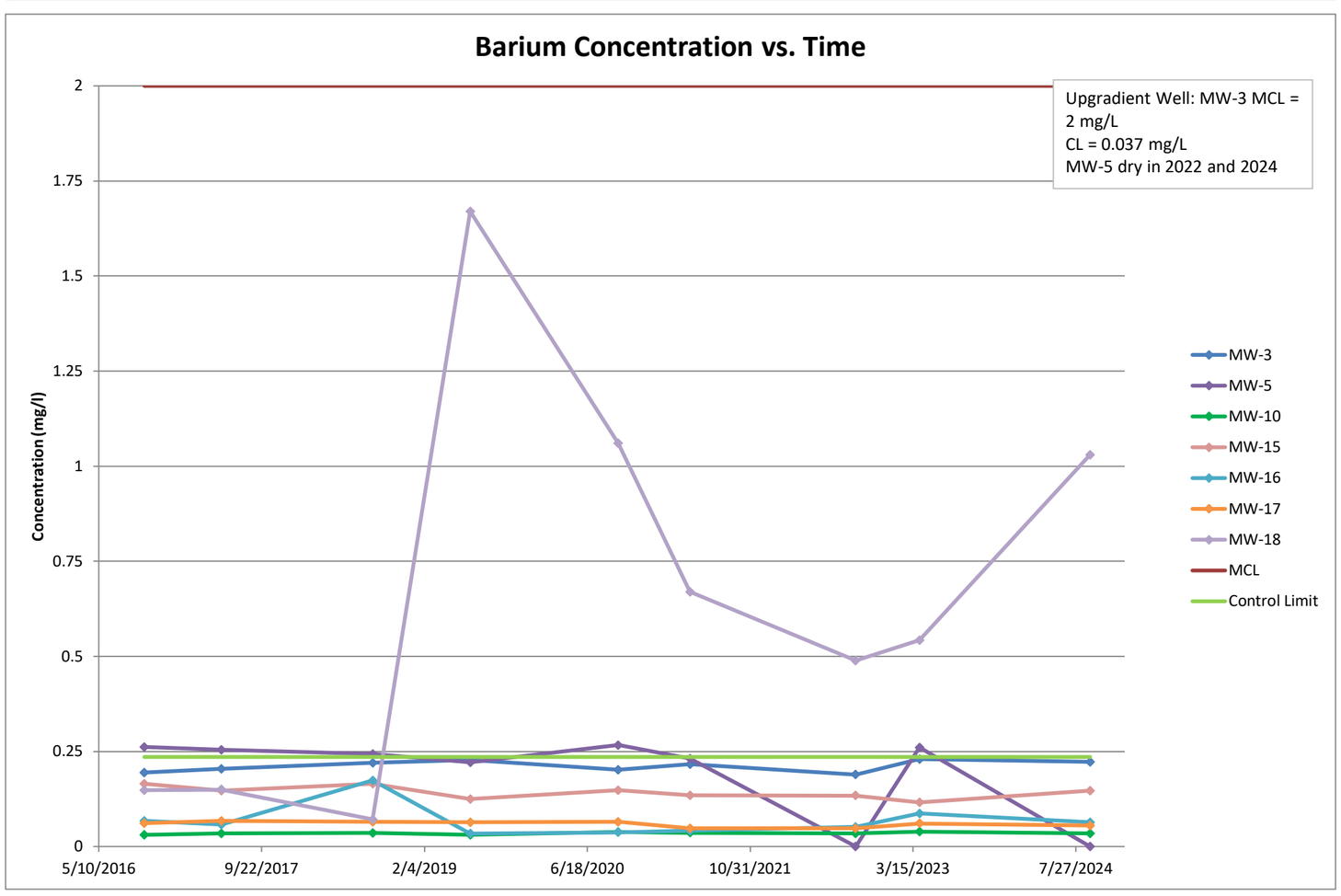


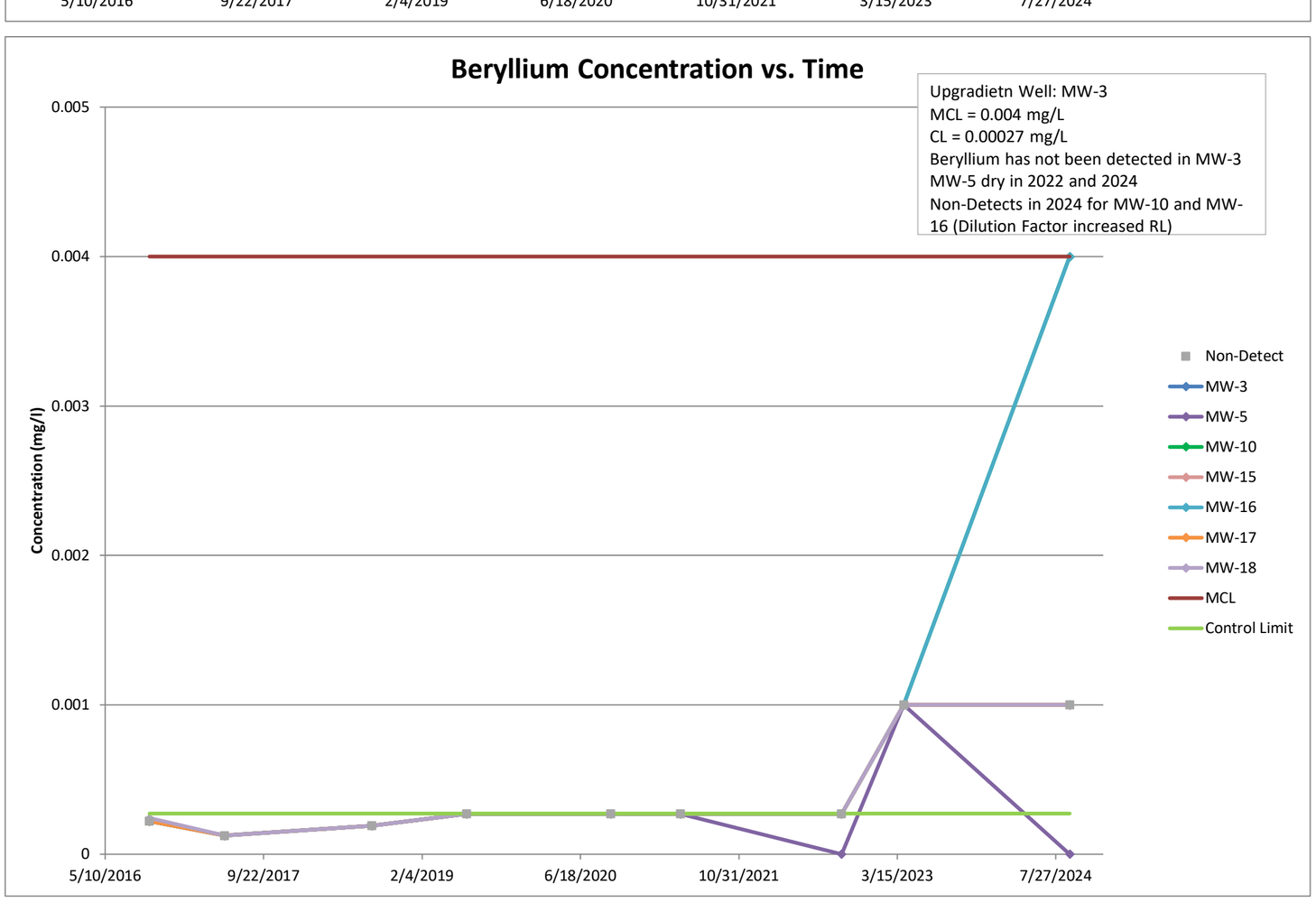




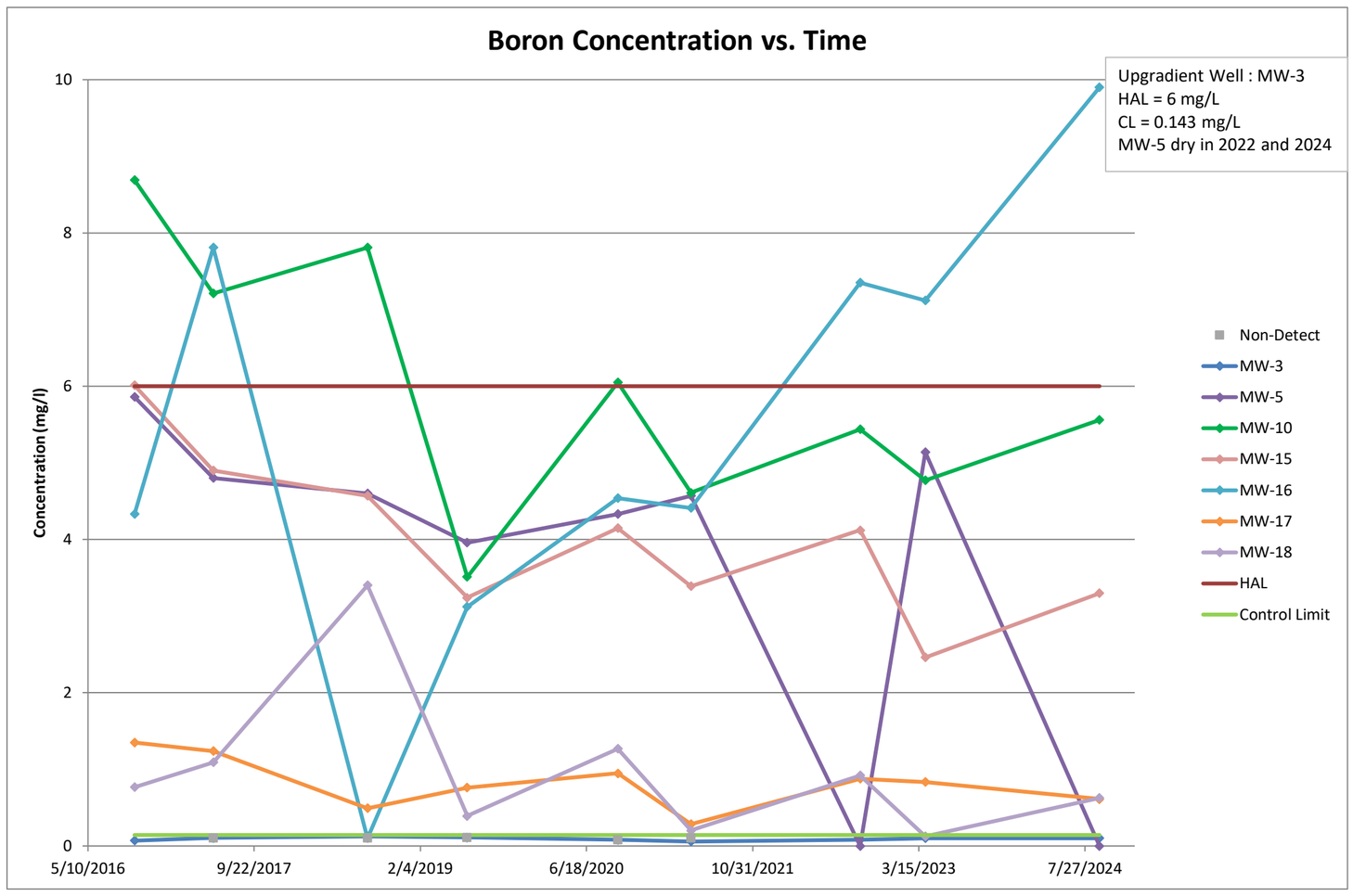
Appendix D
Background: MW-3

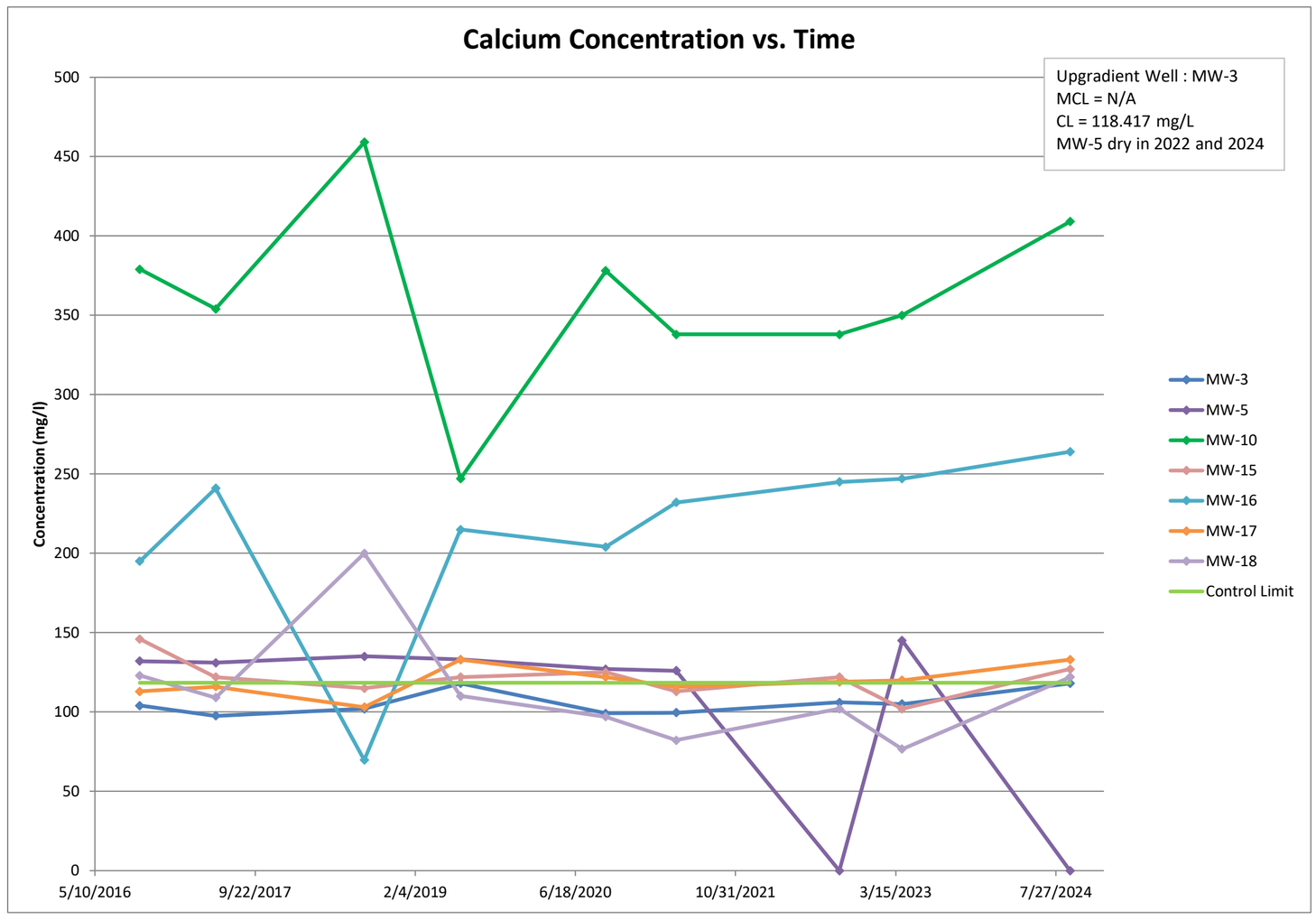


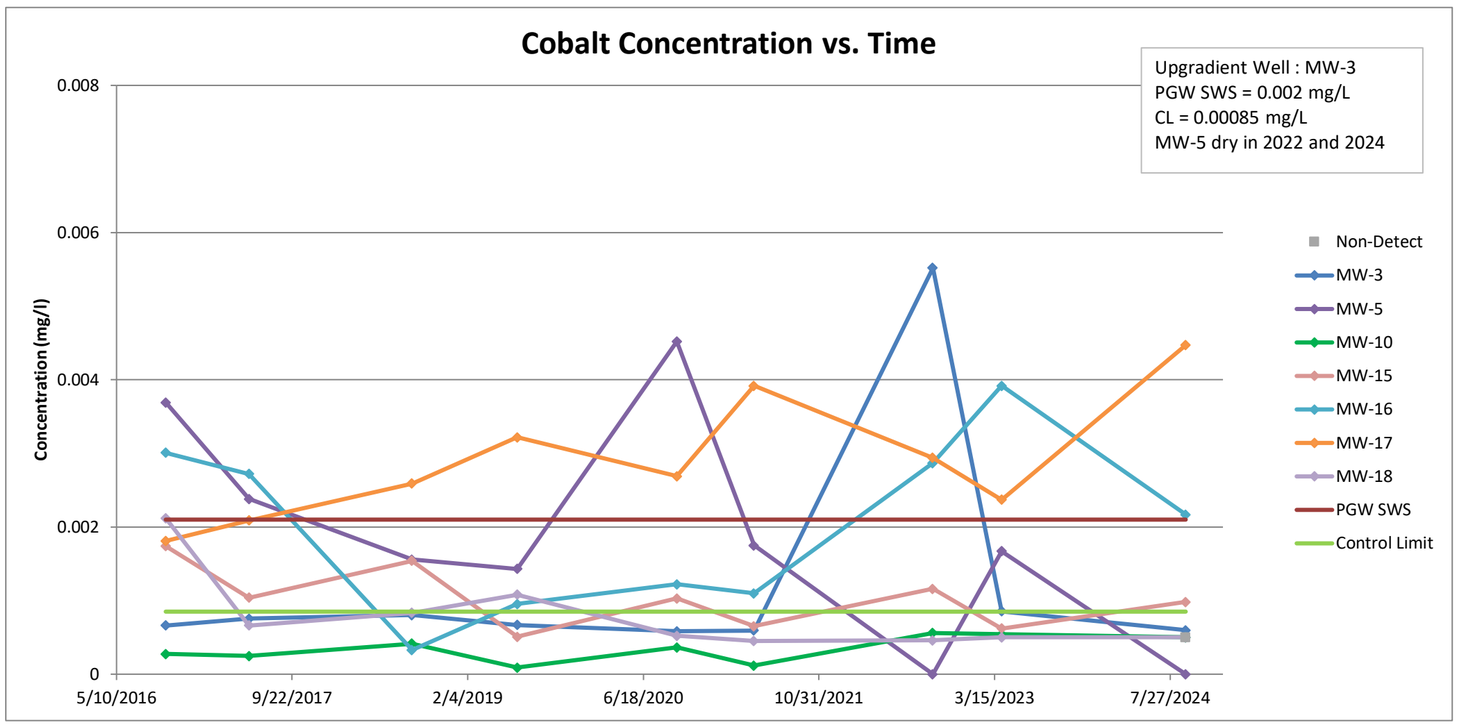




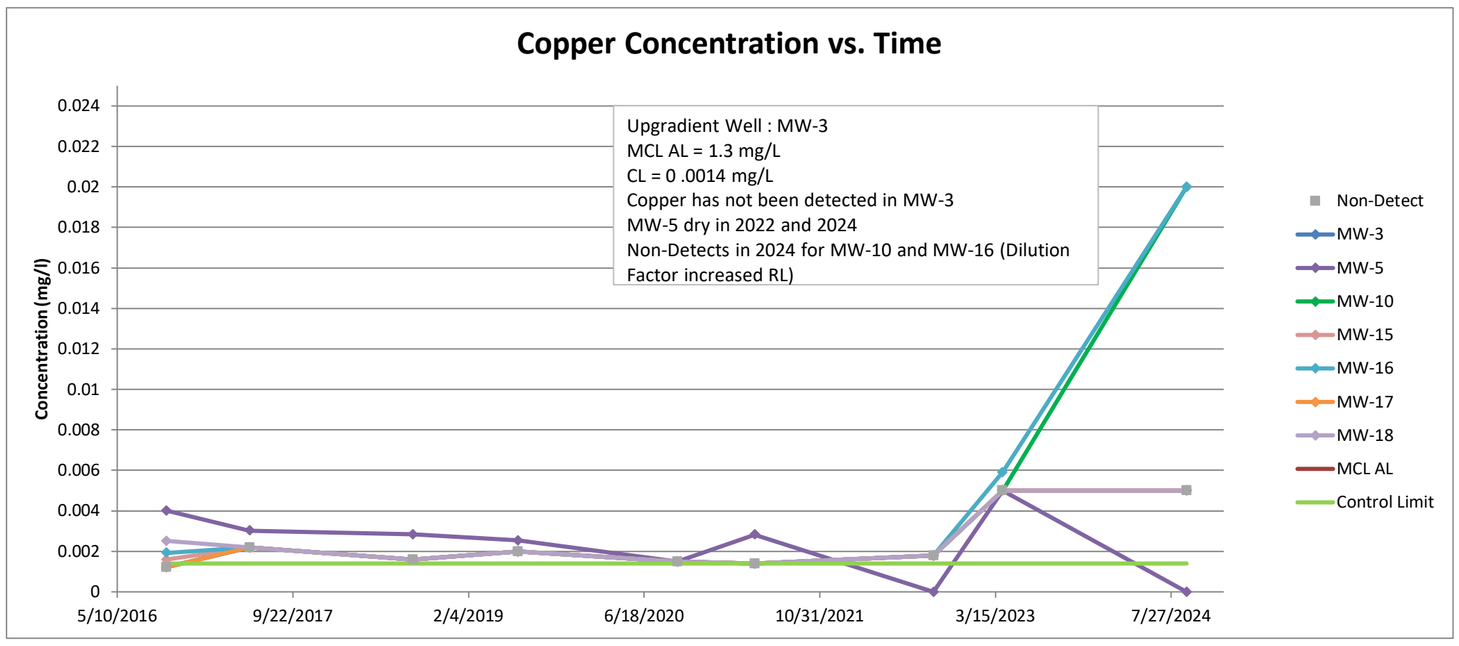
Appendix D
Background: MW-3

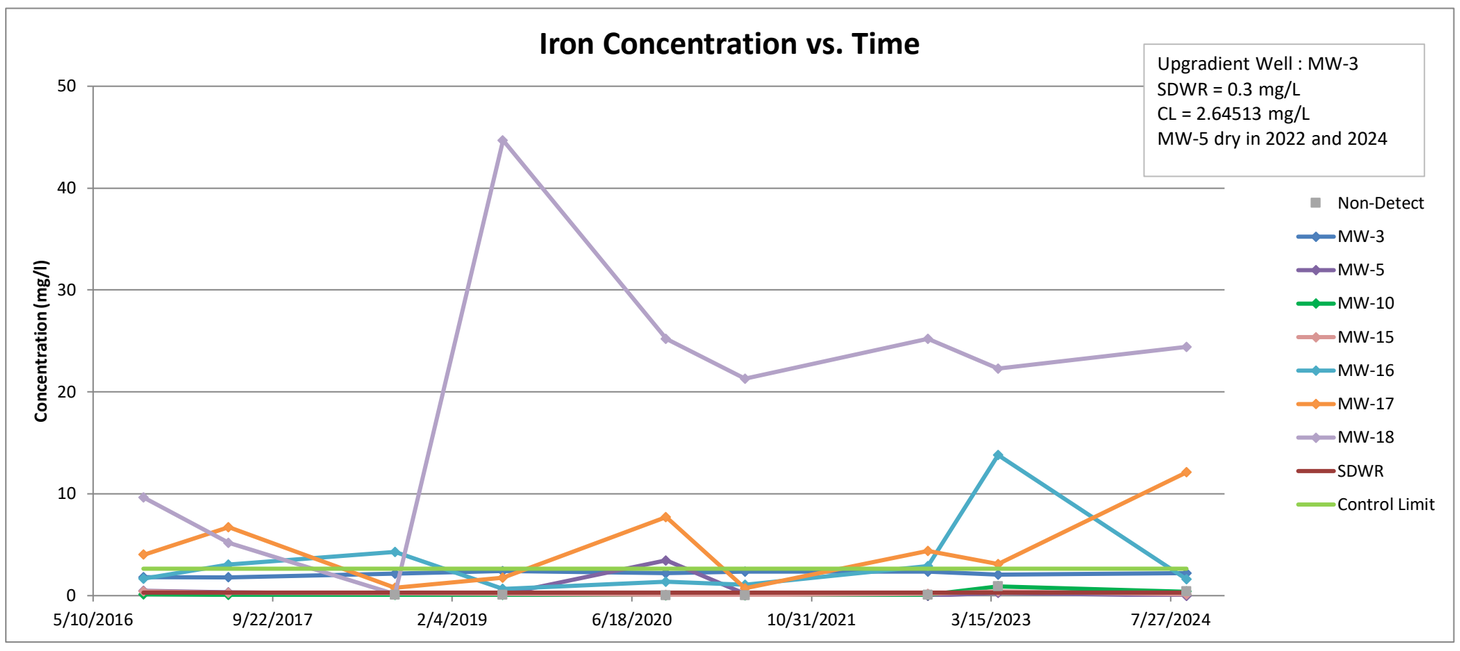


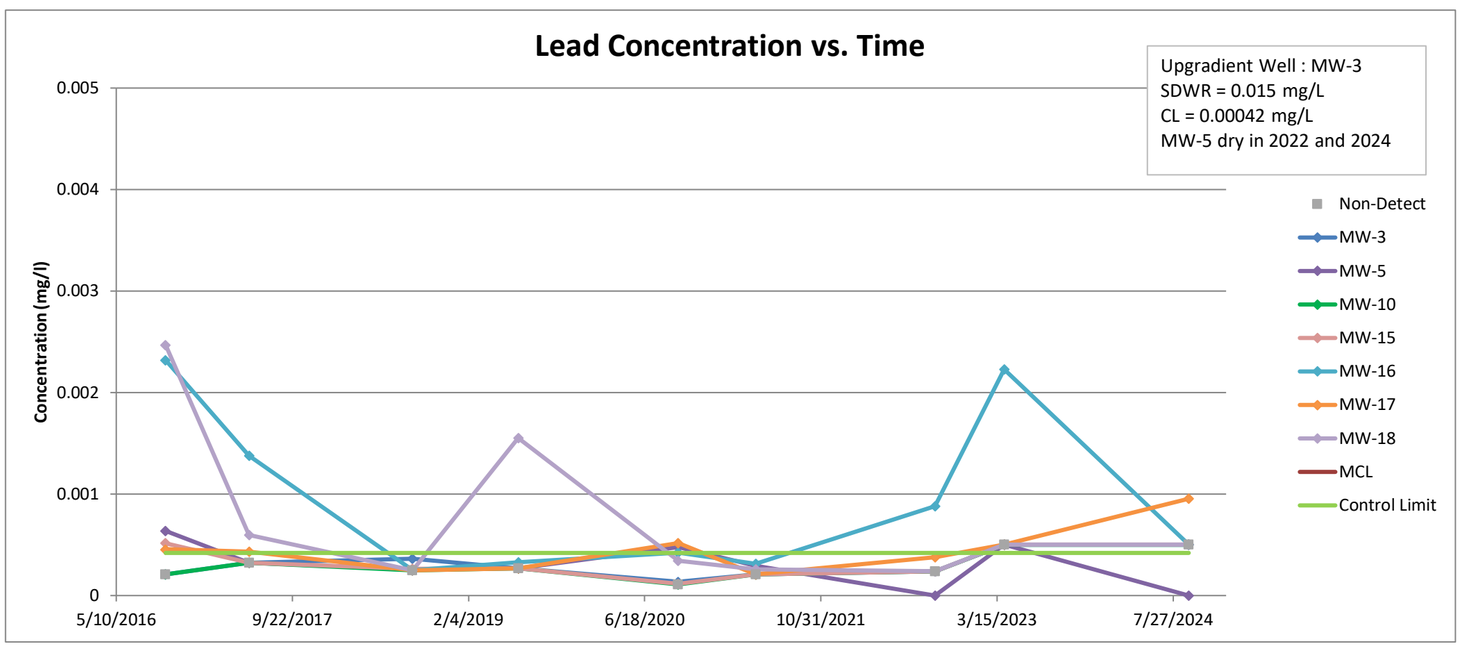




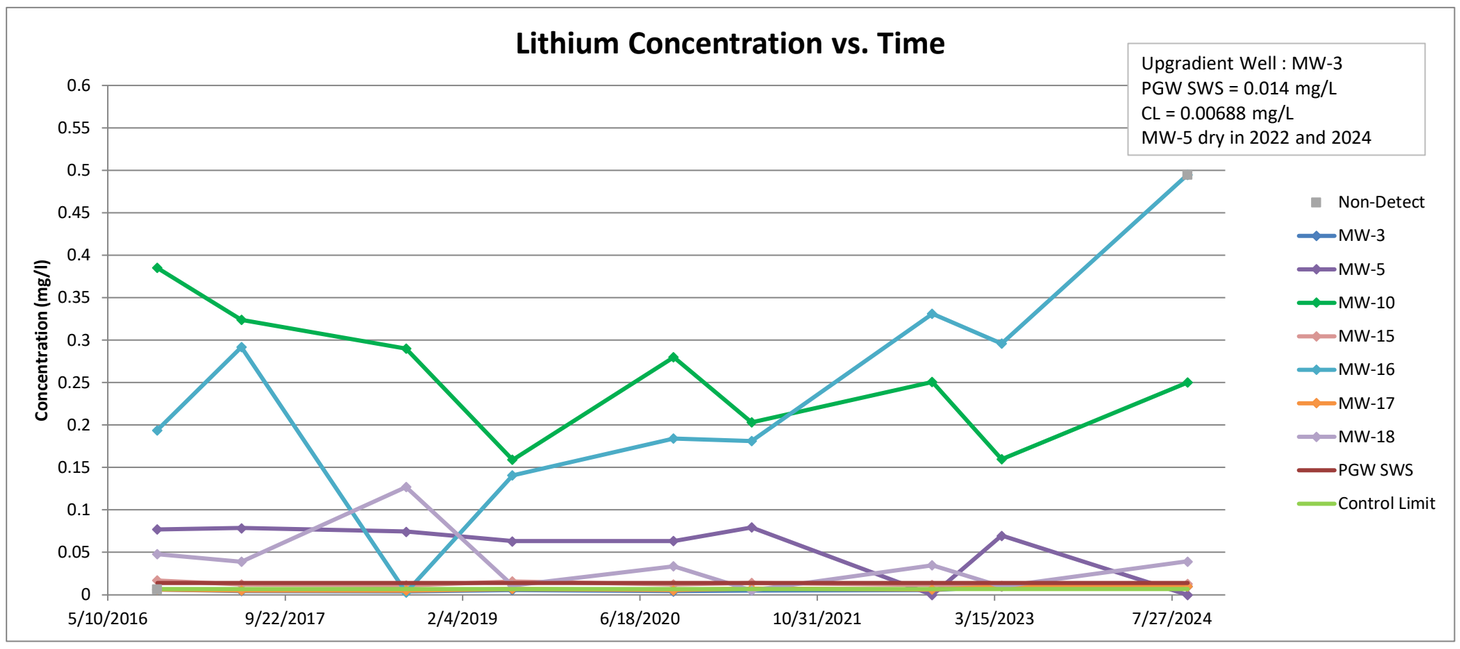
Appendix D
Background: MW-3

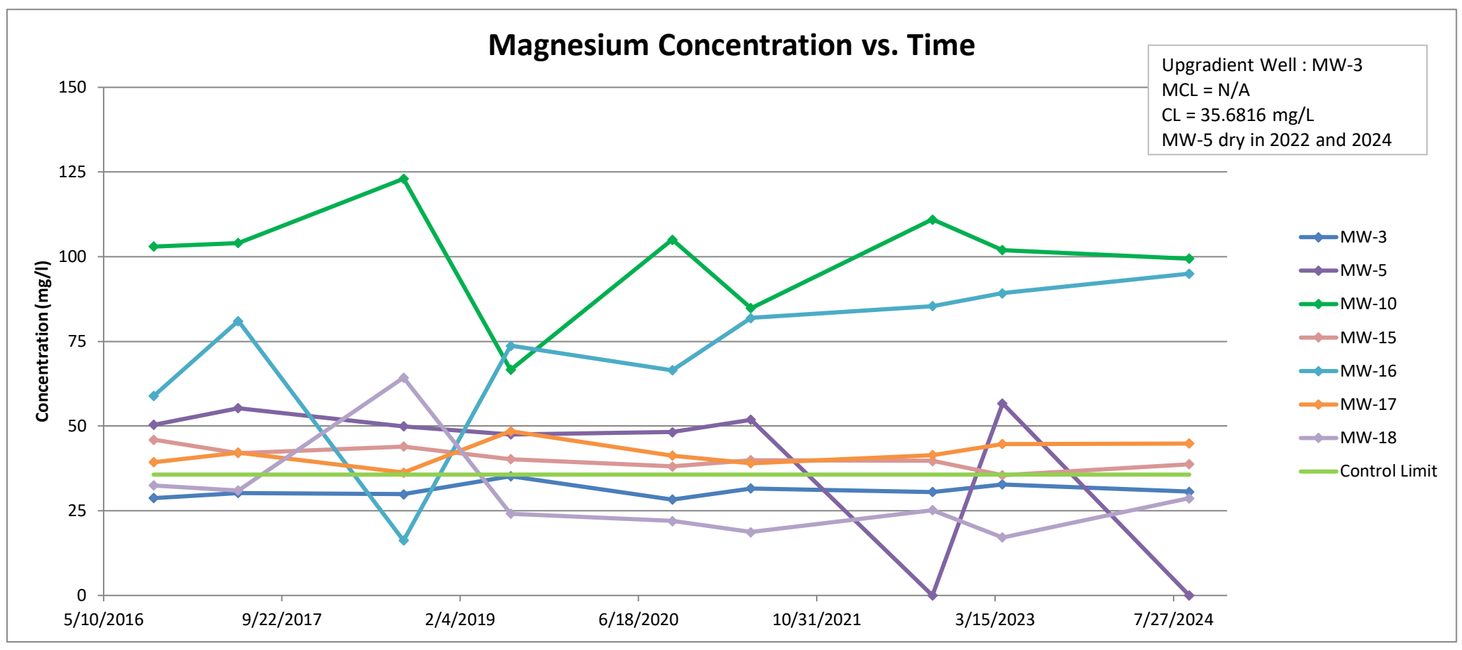


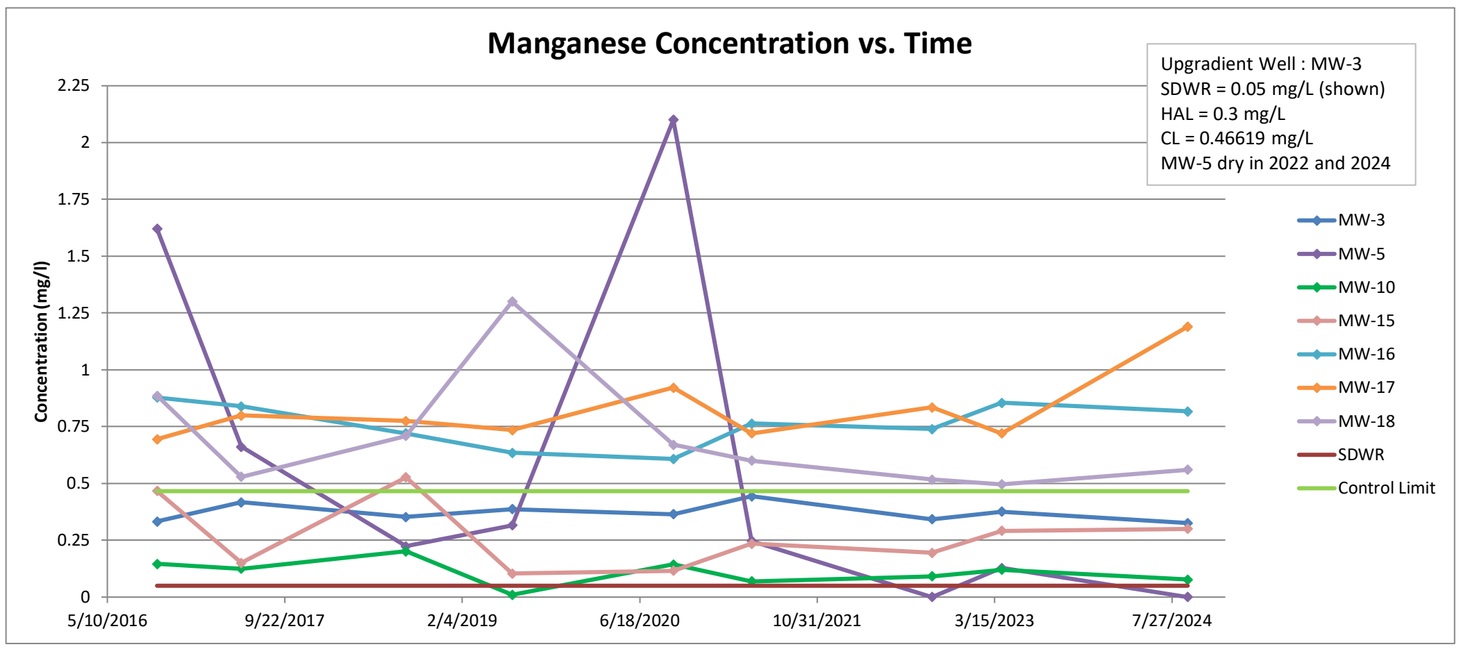




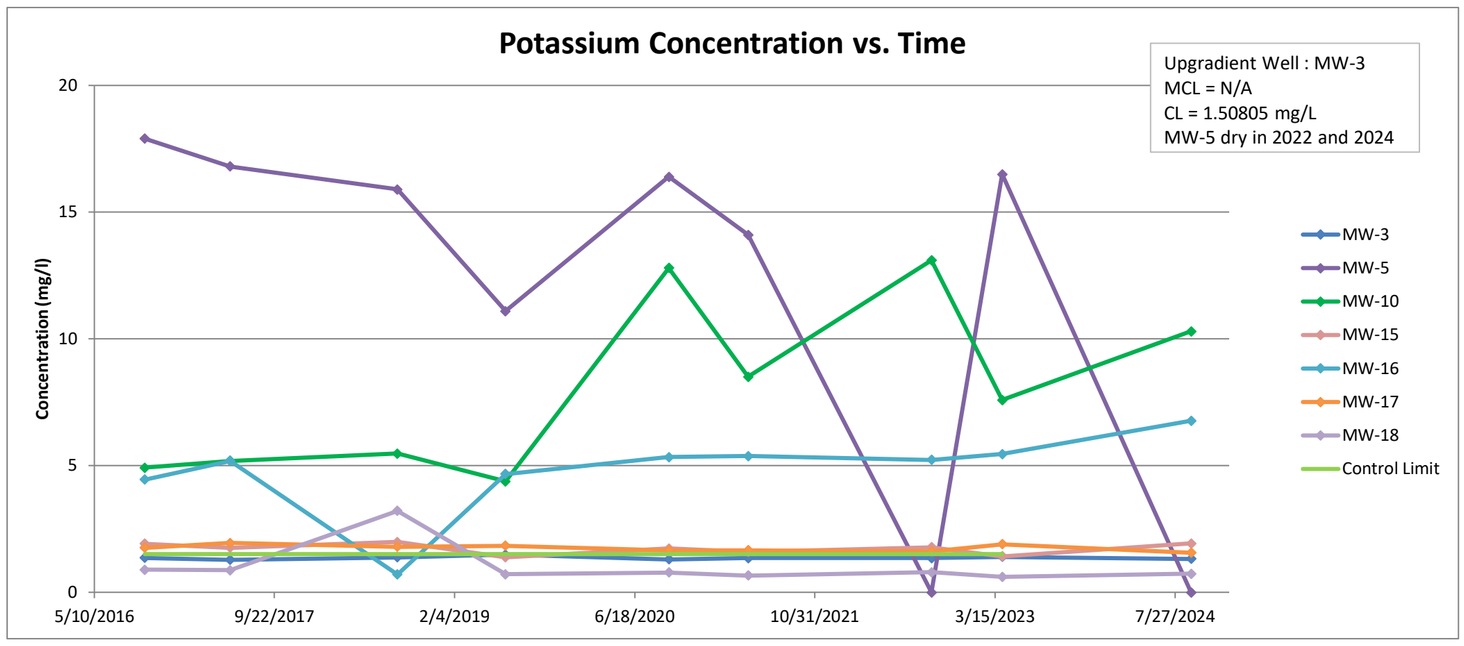
Appendix D
Background: MW-3

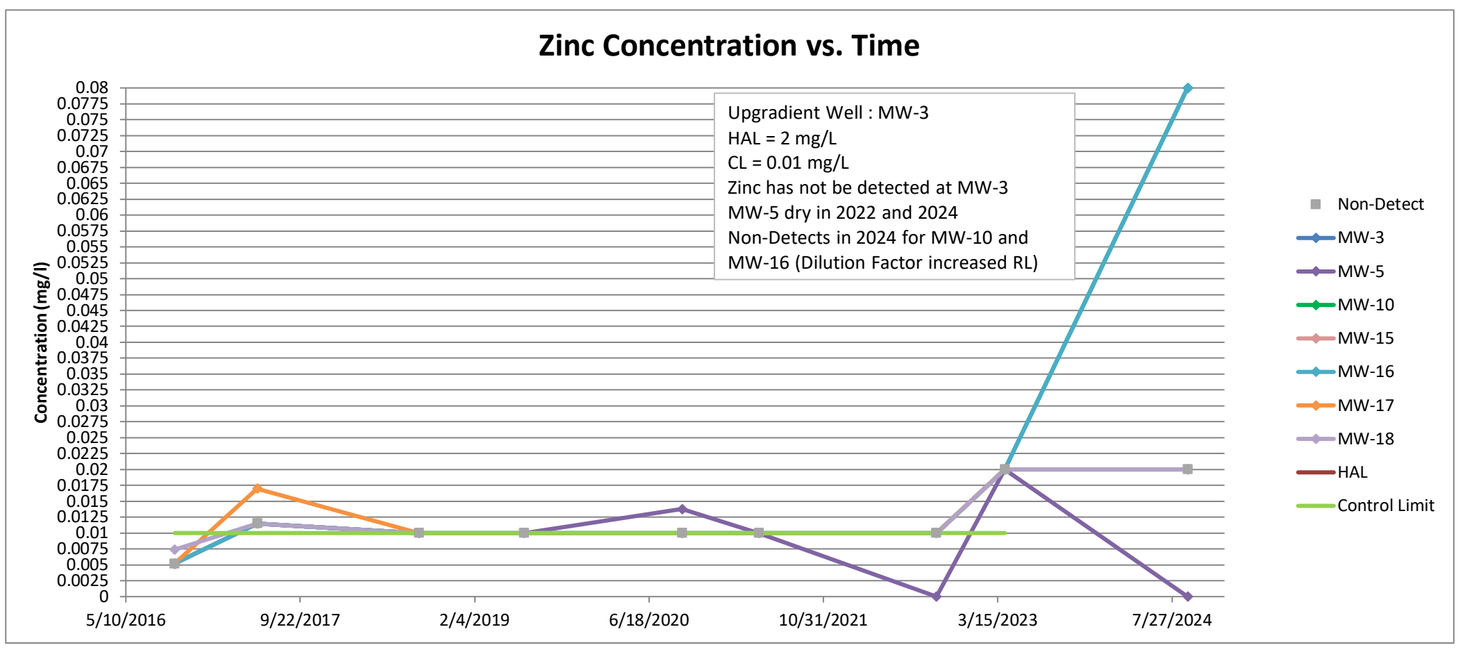


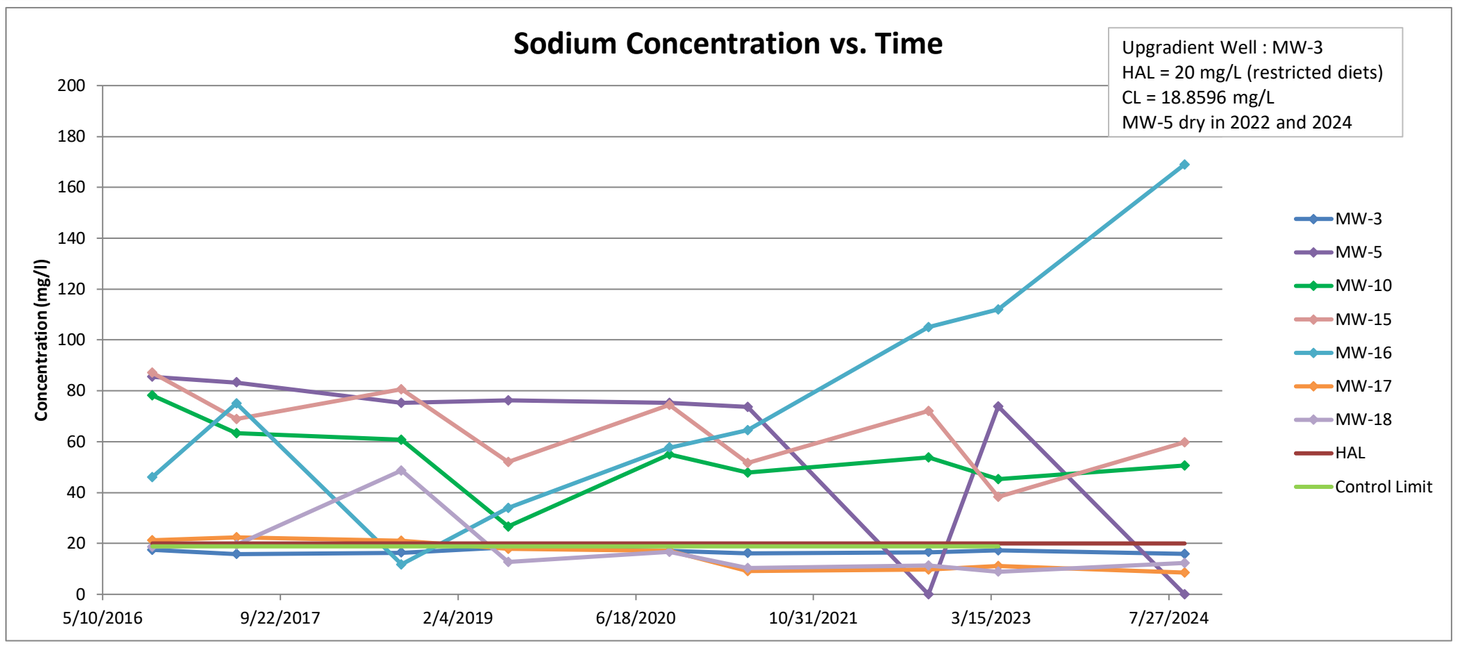




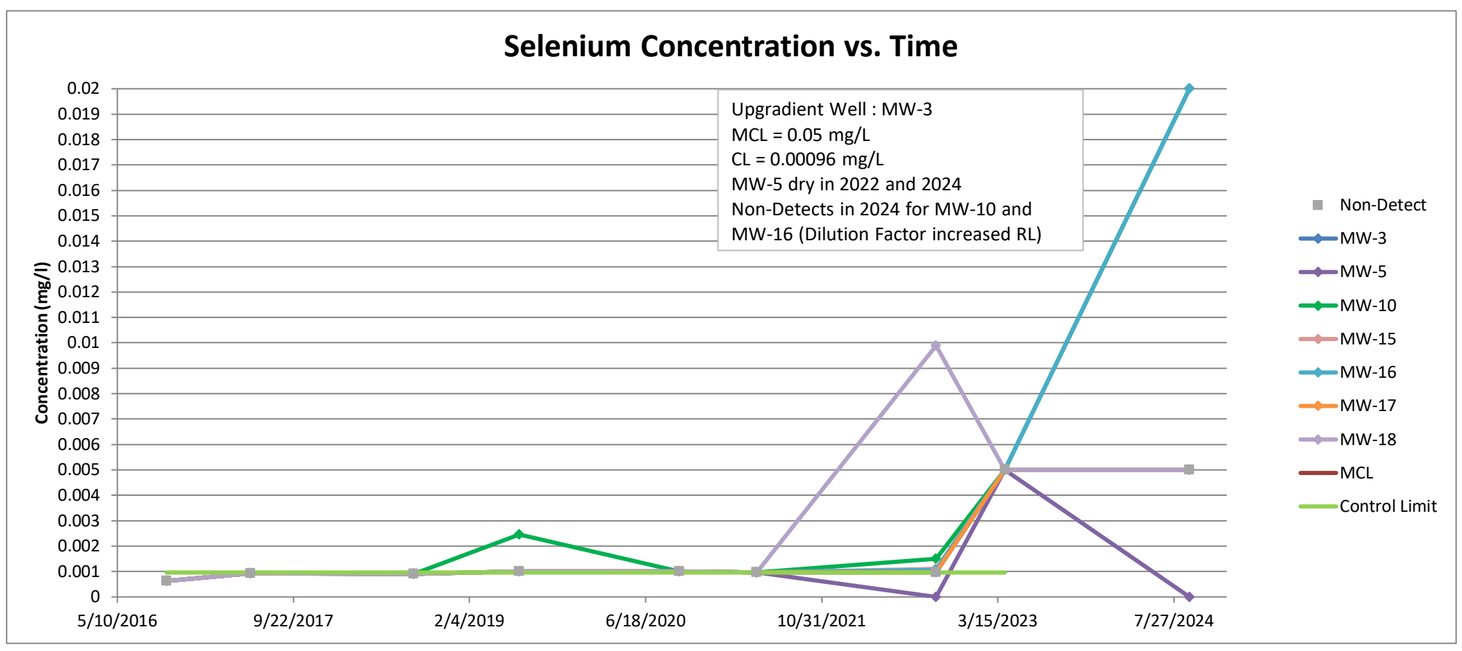
Appendix D
Background: MW-3

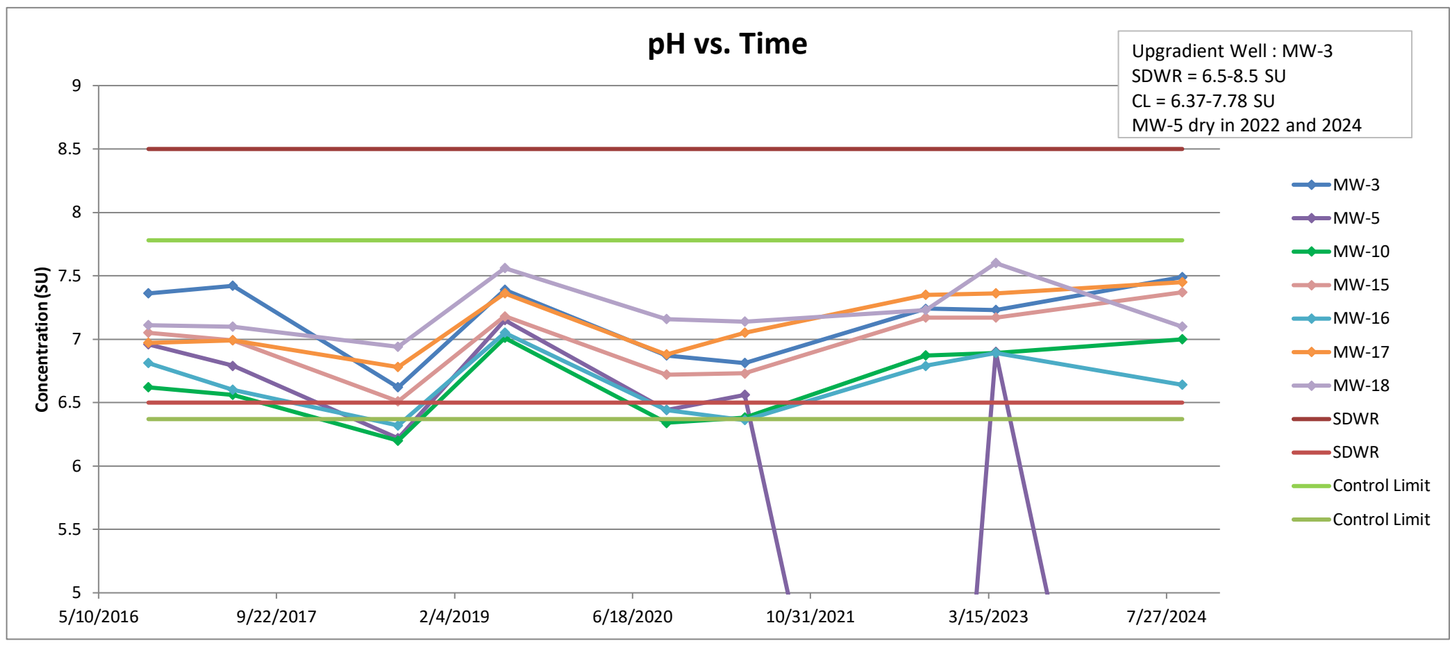


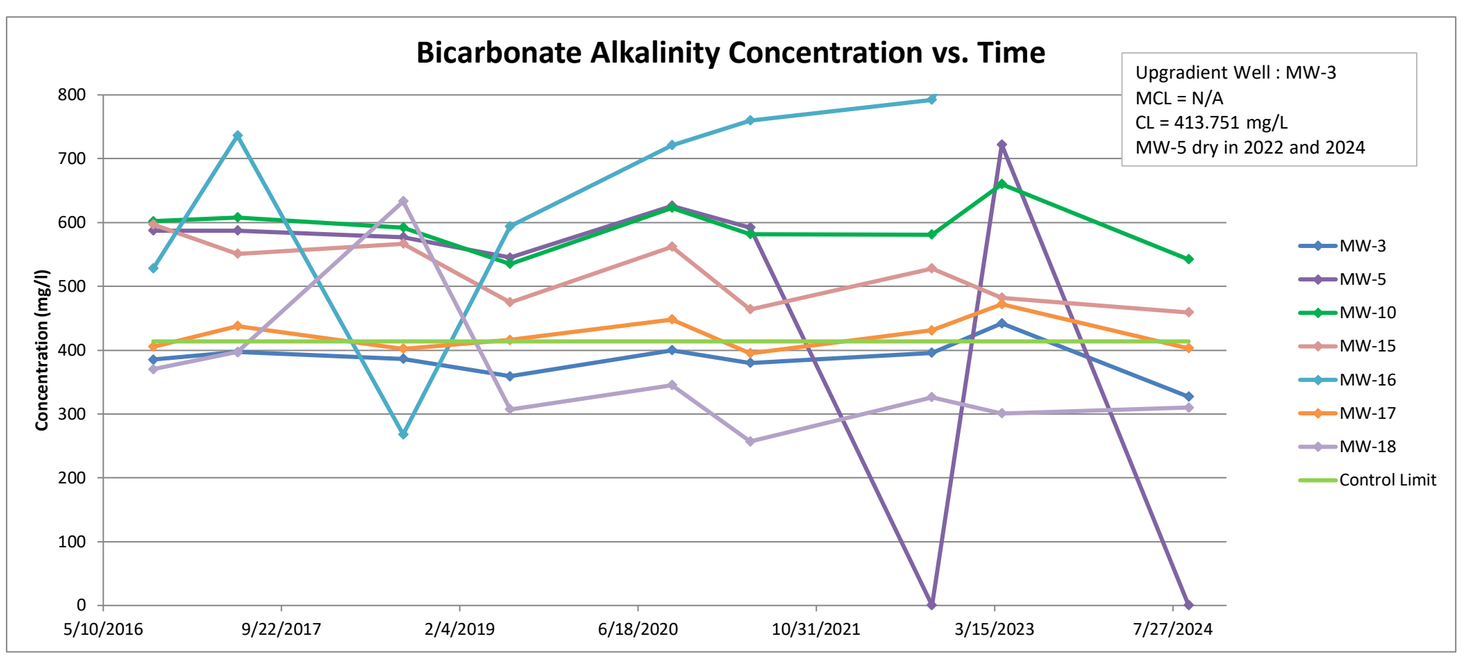


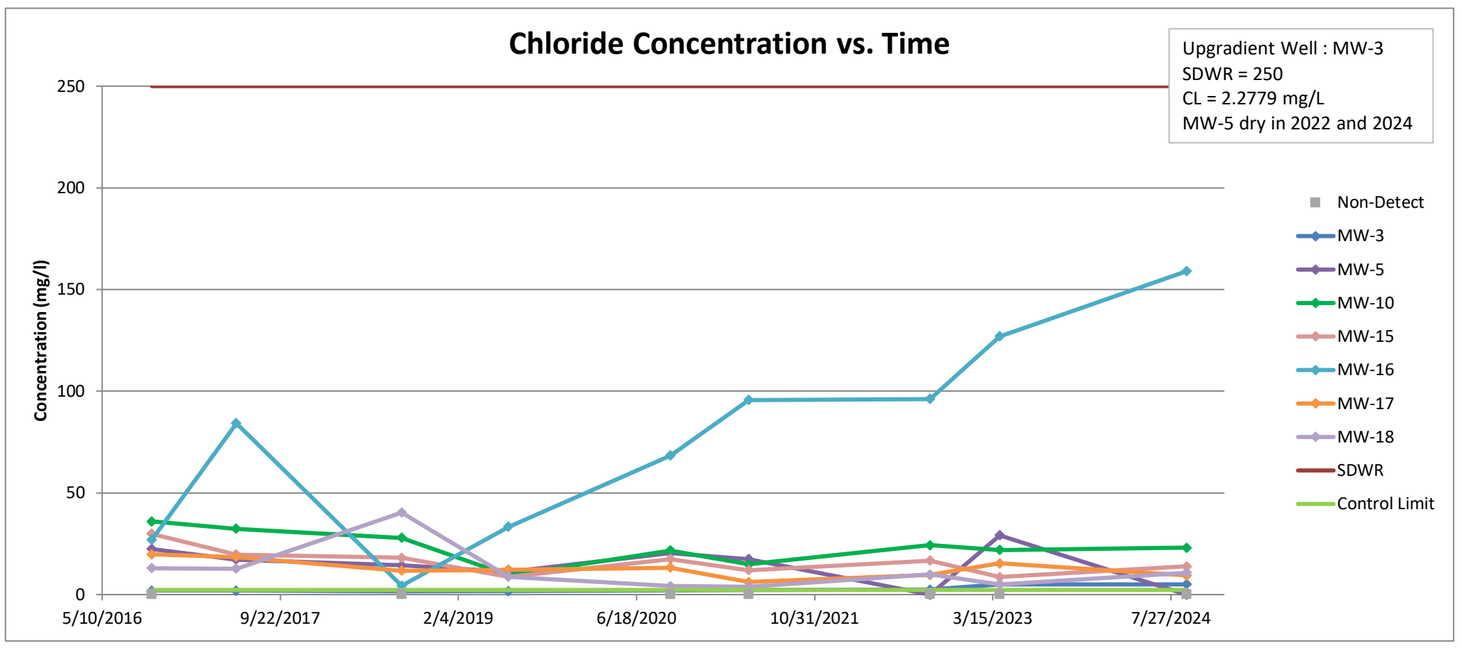


Appendix D
Background: MW-3









Appendix D
Background: MW-3