



# Private Well Sampling Report

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Erickson Power Station

*Lansing Board of Water & Light*

April 16, 2023



## Table of Contents

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1.0	Introduction.....	1
2.0	Facility Description.....	4
2.1	Hydrogeology.....	5
2.2	Erickson Monitoring Well Network.....	5
3.0	Private Well Monitoring.....	9
3.1.1	Frequency.....	9
3.1.2	Water Levels and Sample Collection.....	11
3.1.3	Analytical Testing.....	11
4.0	Private Well Sampling Results.....	12
4.1	Water Levels.....	12
4.2	Water Quality Results.....	12
4.2.1	Comparison to Background Water Quality.....	13
4.2.2	Spatial Variability and Concentrations Relative to Distance from Erickson.....	15
4.2.3	Concentrations Relative to Depth.....	16
4.2.4	Plume Geometry - Spreading of Pollutants in Groundwater.....	18
4.2.5	3-Dimensional Transport Solution for Continuous Release.....	21
4.2.6	Flow and Transport Model (Preliminary Findings).....	22
4.2.7	Groundwater Chemistry.....	24
5.0	Summary.....	37
6.0	References.....	40

## List of Tables

---

Table 1.	List of Parameters Analyzed.....	11
Table 2.	Background Values and Groundwater Protection Standards.....	14

## List of Figures

---

Figure 1.	Vicinity Map for Erickson Station.....	6
Figure 2.	Erickson Station Facility Layout.....	7
Figure 3.	Erickson Station CCR Units and On-Site Monitoring Wells.....	8
Figure 4.	BWL private well sampling area downgradient of the Erikson CCR impoundments, also referred to as the focus area.....	10



Figure 5. Boron concentrations in private wells with distance from Erickson Former Impoundment. .... 16

Figure 6. Lithium concentrations in private wells with distance from Erickson Former Impoundment. .... 16

Figure 7. Boron concentrations in private wells with well depth. .... 17

Figure 8. Lithium concentrations in private wells with well depth. .... 18

Figure 9. BWL sampled private well locations and boron concentrations. .... 20

Figure 10. Transport model simulated boron plume in the bedrock aquifer relative to the BWL sampled private wells. .... 23

Figure 11. Concentrations of boron and sulfate in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells..... 25

Figure 12. Piper diagram showing general water chemistry of BWL sampled bedrock private wells grouped by street/neighborhood and Erickson bedrock monitoring wells plus the deeper downgradient glacial monitoring well MW-7C. .... 26

Figure 13. Groundwater chemistry associated with shale bedrock aquifer. The BWL bedrock monitoring wells and BWL sampled private wells are completed in a shale dominated bedrock aquifer..... 28

Figure 14. Boron and sodium concentrations in Ingham County Study bedrock wells (Rowe et al., 2021). .... 29

Figure 15. Concentrations of boron and sodium in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells..... 30

Figure 16. Concentrations of boron and pH in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells..... 31

Figure 17. Concentrations of boron and lithium in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells..... 35

Figure 18. Concentrations of boron and calcium in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells..... 36

## List of Appendices

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Appendix A: Lab Results Summary Tables

Appendix B: Lab Reports and Data Validation Reports

# Executive Summary

The Environmental Protection Agency (EPA) and the State of Michigan both have established regulations to manage the disposal of Coal Combustion Residuals (CCR, or coal ash), which includes groundwater monitoring. In compliance with both the federal CCR Rule and Part 115 solid waste rules, the Lansing Board of Water & Light (BWL) has been conducting a groundwater monitoring investigation to evaluate the potential for groundwater to be impacted by the CCR waste impoundments at the Erickson Power Station in Delta Township. BWL has 17 monitoring wells that are monitored frequently, and semiannual reports are available on BWL's website. In 2021 BWL measured exceedances in the glacial aquifer (upper aquifer) over groundwater protection standards (GPS) from the CCR impoundments for boron, calcium, lithium, sulfate, and total dissolved solids. In response to public concern, in February 2022 BWL initiated a sampling program of private wells in a focus area downgradient (i.e., downstream) of the Erickson CCR impoundments. This report describes the private well sampling program and results for the 52 private wells sampled. Descriptions of data collected are through the end of 2022. Consistent with most drinking water wells in the region, the private wells sampled in the focus area are between 100 and 400 feet in depth and in the Saginaw bedrock aquifer (composed primarily of shale), which lies below the glacial aquifer (composed of clays, silts, and sands). Because the minerals of different rock types impact the groundwater quality, it is important to monitor groundwater in both the bedrock and the glacial materials separately. BWL installed monitoring wells in the bedrock at Erickson and sampled throughout 2022 to evaluate background and downgradient bedrock groundwater quality. While the shallow groundwater in the glacial sediments at Erickson does appear to be impacted, the deeper bedrock groundwater well at Erickson does not exceed background bedrock concentrations.

Boron concentrations in private wells in the focus area ranged between 0.15 and 6.3 mg/L. Lithium concentrations in private wells in the focus area range between 0.007 and 0.096 mg/L. The report reviews the private well water quality using multiple approaches, which provide multiple lines of evidence, to consider the potential for the observed boron and lithium concentrations in private wells to be impacted by the Erickson CCR impoundments. For example, the private well water quality was compared to the Ingham County and Delta Township bedrock groundwater quality studies. These studies also observed similar concentrations of boron and lithium. The water quality at the private wells sampled downgradient of Erickson has the same or similar characteristics that the Ingham County and Delta Township studies characterized as "naturally occurring" and associated the high boron with the shale that the groundwater flows through. While this is significant, in effort to be as thorough as possible, this report reviews the data using multiple approaches:

- **Comparison to Erickson bedrock background groundwater quality-** There were no exceedances over groundwater protection standards observed in the bedrock aquifer at Erickson in proximity to the impoundments, while there are exceedances in the glacial aquifer at Erickson in proximity to the impoundments. It would not typically be expected that there would be exceedances over GPS a mile (i.e., 5,280 feet) downgradient in the bedrock with no exceedances in closer proximity.
- **Concentrations relative to distance from Erickson-** Groundwater velocity was used to estimate travel time in the glacial sediments, and it is estimated that the groundwater would travel

approximately 4,200 feet from the Erickson impoundments over 50 years. Over 80% of private wells with concentrations of boron over 2.0 mg/L (health advisory level for children) are 5,650-8,500 feet from the Erickson impoundments. Most private wells are farther away than the groundwater is thought to have traveled.

- **Concentrations relative to depth-** For metal contaminants, typical migration away from a shallow source is significantly less in the vertical direction (depth) than horizontal direction (vertical is only 1 percent of the horizontal migration). Therefore, the majority of the plume would remain shallow. This is not what was observed in sampled private wells, where boron and lithium concentrations relative to private well depth appear random.
- **Plume geometry-** If the boron values observed in private wells represented a boron plume from the Erickson impoundments, the plume shape would not match what is typically seen in contaminant transport, because the observed exceedances are wider and deeper than what a typical plume would be.
- **Transport solution for a continuous release to groundwater-** There is an equation that can be used to estimate what the Erickson impoundments boron concentration would have been if it was acting as a constant source to groundwater. To get the maximum boron concentration observed in the private wells sampled, the impoundments would have had to be leaking boron to groundwater at a concentration of over 11,000 mg/L for 50 years. This is a high concentration (by orders of magnitude) and requires a constant source, conservative aquifer parameters, and no sorption or retardation. This indicates that the impoundments would have had to leach an unrealistically high boron concentration to be the source observed at private wells given this set of aquifer parameters.
- **Flow and transport model-** A groundwater flow and transport model is in progress for Erickson. The preliminary model simulated bedrock boron plume outer-most edge, which is known to be overly conservative, is approximately 3,000 feet away from the closest private well. The simulated glacial boron plume outer-most edge, which is shallower and calibrated closer to the observed concentrations in monitoring wells, is approximately 1,500 feet away from the closest private well. These simulations indicate the plume would not have travelled far enough to be near any private well.
- **General water quality-** The private well water quality was reviewed and compared to that of the glacial groundwater closer to Erickson, where impacts to groundwater have been observed. Based on the impacts to groundwater near the impoundments, sulfate concentrations would be expected to correlate with the boron in the private wells if the Erickson impoundments were the source of the boron; and this is not observed, which provides evidence that the boron in these private wells may be naturally occurring. Piper diagrams are a tool to visualize and compare the chemistry of water samples. A review of the private well data on a piper diagram demonstrated that private bedrock well water quality, even neighboring lots, plot in two or three different quadrants of the diagram, indicating they are different classes of waters. This is a visual representation of the water quality variability in the wells sampled, and this kind of variability is more commonly indicative of natural variability, as opposed to an indication of impact by a contaminant source.
- **Similarities to Ingham County and Delta Township bedrock groundwater quality studies-** The water quality at the private wells has the same or similar characteristics that Rowe et al. (2021) in Ingham County and Rowe (2022) in Delta Township characterized as “naturally occurring” and associated the higher boron with the shale bedrock.

These various data review approaches each suggest a similar interpretation that the boron and lithium concentrations in the private wells appear to be likely naturally occurring and representative of the shale bedrock aquifer. This is particularly plausible given the similarities observed in the Ingham County and Delta Township groundwater studies with the comparable aquifer lithology (shale). BWL has presented to the regulatory agencies their intent not to sample the private wells further at this time, which was met with verbal approval; however, several questions remain in the investigation that BWL will continue to study in cooperation with EGLE.

# 1.0 Introduction

In compliance with Federal Coal Combustion Residuals (CCR) Rule and Michigan Part 115 solid waste rules, the Lansing Board of Water & Light (BWL) has been conducting a groundwater monitoring program to evaluate the potential for groundwater to be impacted by the the CCR impoundments at the Erickson Power Station located at 3725 South Canal Road in Delta Township, Eaton County, Michigan (Figure 1). In 2021 BWL measured statistically significant exceedances in the glacial aquifer (upper aquifer) from the CCR impoundments for boron, calcium, lithium, sulfate, and total dissolved solids (TDS). In response to public concern, in February 2022, BWL initiated a sampling program to sample 52 private wells in a focus area generally downgradient of the potential source area at the Erickson Power Station (Erickson). This report describes the private well sampling program and results. Because the groundwater monitoring program at Erickson is ongoing and will continue for years, descriptions of data collected are through the end of 2022.

# 2.0 Background

The U.S. Environmental Protection Agency's (EPA) final CCR Rule 40 CFR §257 and Michigan's Part 115 Solid Waste Management, of the Natural Resources and Environmental Protection Act, 1994 PA 451 (Part 115), establishes a comprehensive set of requirements for the management and disposal of CCR (or coal ash) in surface impoundments by electric utilities. The Erickson Power Station contained a single coal-fired generator capable of producing 165 megawatts of electricity, which was retired from operations on November 27, 2022. Erickson has three CCR impoundments: the Forebay, Retention Basin, and Clear Water Pond (CWP) (Figure 2 and 3). The three CCR impoundments are currently inactive, with ongoing dewatering and CCR removal.

The BWL CCR surface impoundments, Forebay, Retention Basin, and CWP, are not licensed under Part 115 because Michigan Department of Environment, Great Lakes, and Energy (EGLE) denied BWL's permit application; however, BWL is continuing to work with EGLE and develop compliance documentation for EGLE as if the impoundments were permitted under an operating permit. BWL implements both the federal and state groundwater monitoring programs concurrently to comply with both the federal CCR Rule and Part 115 solid waste rules. The Part 115 permit application requirements included approval of a Hydrogeologic Monitoring Plan (HMP) (HDR, 2021a). The HMP was approved by EGLE and describes the monitoring network, sampling and analysis plan, and data validation and statical procedures for the monitoring program to comply with Part 115 solid waste rules. BWL has expanded the monitoring network in 2022; therefore the 2021 HMP is in the process of being revised for resubmission to EGLE to include the new background well data that was collected (eight sample events) in 2022 and the updated site-specific groundwater protection standards (GPS).

BWL installed seven additional monitoring wells in 2022, including background wells and bedrock and glacial downgradient wells to evaluate the horizontal and vertical extents of the

plume. BWL also sampled the wetland surface water on the eastern property boundary, downgradient of the CCR impoundments. Additionally, significant updates to the groundwater flow and transport model were made. A summary of the status of the groundwater monitoring program at Erickson, including laboratory data, can be reviewed in either of the two annual monitoring reports posted on BWL's CCR website, the *Groundwater Monitoring 2022 Annual Report for Compliance with the Michigan Part 115 CCR Solid Waste Regulations* and the *2022 Annual Groundwater Monitoring Report and Corrective Action Report and Semi-Annual Remedy Selection and Design Progress Report for Compliance with the Coal Combustion Residuals (CCR) Rule*.

### 3.0 Facility Description

From 1970 to 2014, fly ash and bottom ash were sluiced from the plant to a 33-acre impoundment (includes the area shown as the now Former Impoundment, the Forebay, and the Retention Pond in Figure 2). Water flowed to the CWP before returning to the plant for use. The 33-acre impoundment was physically closed in 2014 (CCR was removed from the impoundment and disposed off-site) and the Forebay and Retention Basin were installed within its footprint, leaving a 28-acre inactive area currently described as the Former Impoundment on Figure 2 and Figure 3. Between 2014 and 2022 bottom ash from the coal-fired boiler was sluiced from the plant to dewatering tanks (hydro-bins). The dewatered bottom ash from the hydro-bins was trucked to a sanitary landfill, which accounted for the majority of the CCR disposal. The decant water from the hydro-bins was hydraulically fed through the Forebay, Retention Basin, and then to the CWP to allow the minimal remaining CCR particles to settle out before returning to the plant. Fly ash is handled dry and collected in on-site silos and then shipped off-site for beneficial reuse or disposal in a regulated landfill. In addition to the flow from the hydro-bins, the CCR impoundments historically received non-CCR wastewater, including flows from the coal pile runoff sump and plant sumps, which was ceased January 3, 2023.

The interior embankments and floors of both the Forebay and Retention Basin are lined with a layer of geosynthetic clay overlain with a 40-millimeter-thick flexible polyvinylchloride membrane liner (FML). Each FML is protected with geofabric and a 6- to 12-inch layer of sand. The tops of the embankments that are subject to wave action are protected with an additional layer of geofabric and 6 to 12 inches of stone rip-rap. The tops of the interior embankments of the CWP are protected with approximately 6 inches of stone rip-rap. The Former Impoundment and the CWP are lined with compacted clay. There are no regulated outfalls associated with the impoundment system. In addition to the three active CCR impoundments (Forebay, Retention Basin, and CWP), the Site is bordered by Lake Delta on the southwest side (Figure 2).

Erickson Power Station was retired from operations on November 27, 2022. The plant pipelines were washed down and CCR waste disposal ceased to the CCR impoundments on December 29, 2022. The non-CCR stormwater flows to the impoundments ceased January 3, 2023. As part of closure self-implementation, an initial Closure Plan for the CCR impoundments was completed in 2019 (NTH, 2019). The CCR Impoundments Closure Work Plan for removal of CCR was completed in April 2022 and approved by EGLE on January 17, 2023. A contractor

has been selected and initiated dewatering for CCR excavation in February 2023. CCR removal is scheduled to be completed in October 2023.

### 3.1 Hydrogeology

The CCR impoundments at Erickson Power Station are in areas underlain with unconsolidated clay, silt, sand, and gravel of glacial origin which rest upon approximately 10,000 feet of consolidated bedrock sediments composed of primarily shale, some sandstone, and interbedded layers of coal and dolomite called the Saginaw Formation. Depth to the uppermost aquifer under the impoundments is determined to be approximately 6 to 20 feet below surface in the glacial sediments, which is referred to as the glacial aquifer. Given the bedrock surface between 36 and 61 feet below surface, the upper glacial aquifer thickness at the site is approximately between 16 and 47 feet thick. The groundwater flow direction is east-northeast under the impoundments and remains similar flow direction throughout the year. The glacial aquifer is above a thick bedrock aquifer, known as the Saginaw aquifer. There does not appear to be a confining unit between the glacial and Saginaw aquifers, and there is a downward vertical gradient between multilevel wells and therefore the conceptual site model assumes the potential for hydraulic connectivity from the glacial aquifer to the Saginaw Aquifer.

The private wells identified in the focus area were completed in the Saginaw bedrock aquifer. Of the wells that had well logs in the State well log database, Wellogic, the bedrock was dominated by shale and sandstone and were completed at varying depths between 100 and 460 feet below ground surface. The variable depth for well completion is consistent with shale dominated system with interbedded sandstone and coal and dolomite, where significant variations in permeability are expected. The Hydrogeologic Monitoring Plan, available on the BWL CCR website, includes a description of available literature on the geology and hydrogeologic unit parameters.

### 3.2 Erickson Monitoring Well Network

The monitoring network at Erickson is displayed on Figure 3 and as of the end of 2022, is composed of 17 monitoring wells. Of the 17 wells, three are completed on-site and in the bedrock aquifer (two background wells and one downgradient of the impoundment) and the remainder on-site and in the glacial aquifer. Seven of those monitoring wells were drilled in 2022 in response exceedances in groundwater (MW-7B, MW-7C, MW-11, MW-11B, MW-12, MW-12B, and MW-13).

Upon comparison of water quality data obtained from the bedrock wells installed in 2022 to the glacial wells, it is evident that background constituent concentrations differ between the glacial and bedrock aquifers. Therefore, it is prudent to establish bedrock background values separate from the glacial background values, which results in GPS values for each aquifer. As of December 2022, eight samples were collected from the two background bedrock wells and background values for the bedrock aquifer have recently been developed and are discussed in Section 4.2.1 below.



 **ERICKSON POWER STATION**  
EATON COUNTY, MICHIGAN  
GENERAL LOCATION

PATH: J:\RESOURCE\CENTER\USER\_WORKSPACE\AKAPLE\CONFIDENTIAL\_WELL\_DATABASE\7\_2\_WORK\_IN\_PROGRESS\MAP\_DOCS\DRAFT\FIGURE1\_GENERALLOCATION\_PORTRAIT.MXD USER: AKAPLE - DATE: 7/8/2019

**Figure 1. Vicinity Map for Erickson Station.**

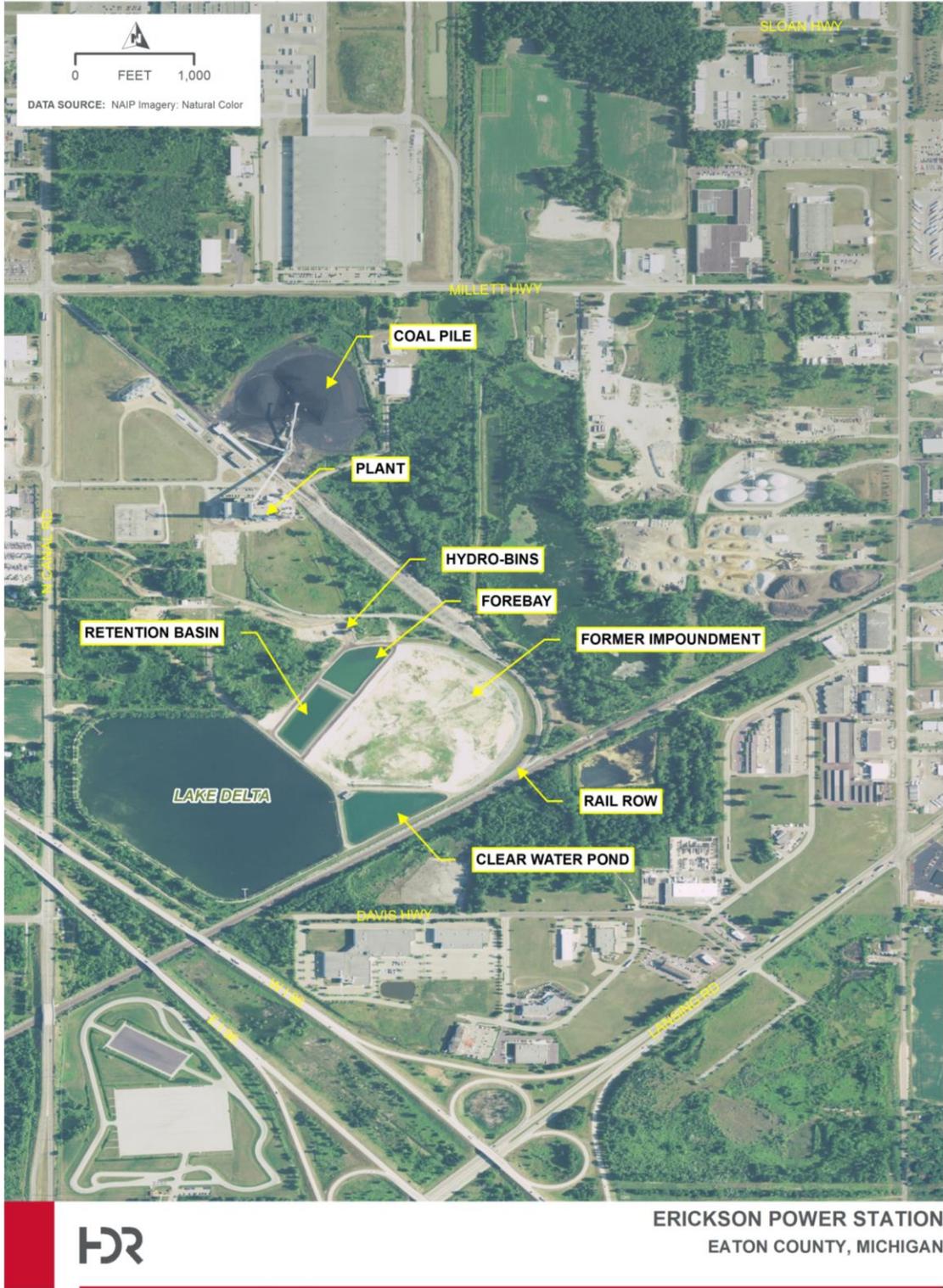


Figure 2. Erickson Station Facility Layout.



Figure 3. Erickson Station CCR Units and On-Site Monitoring Wells.

## 4.0 Private Well Monitoring

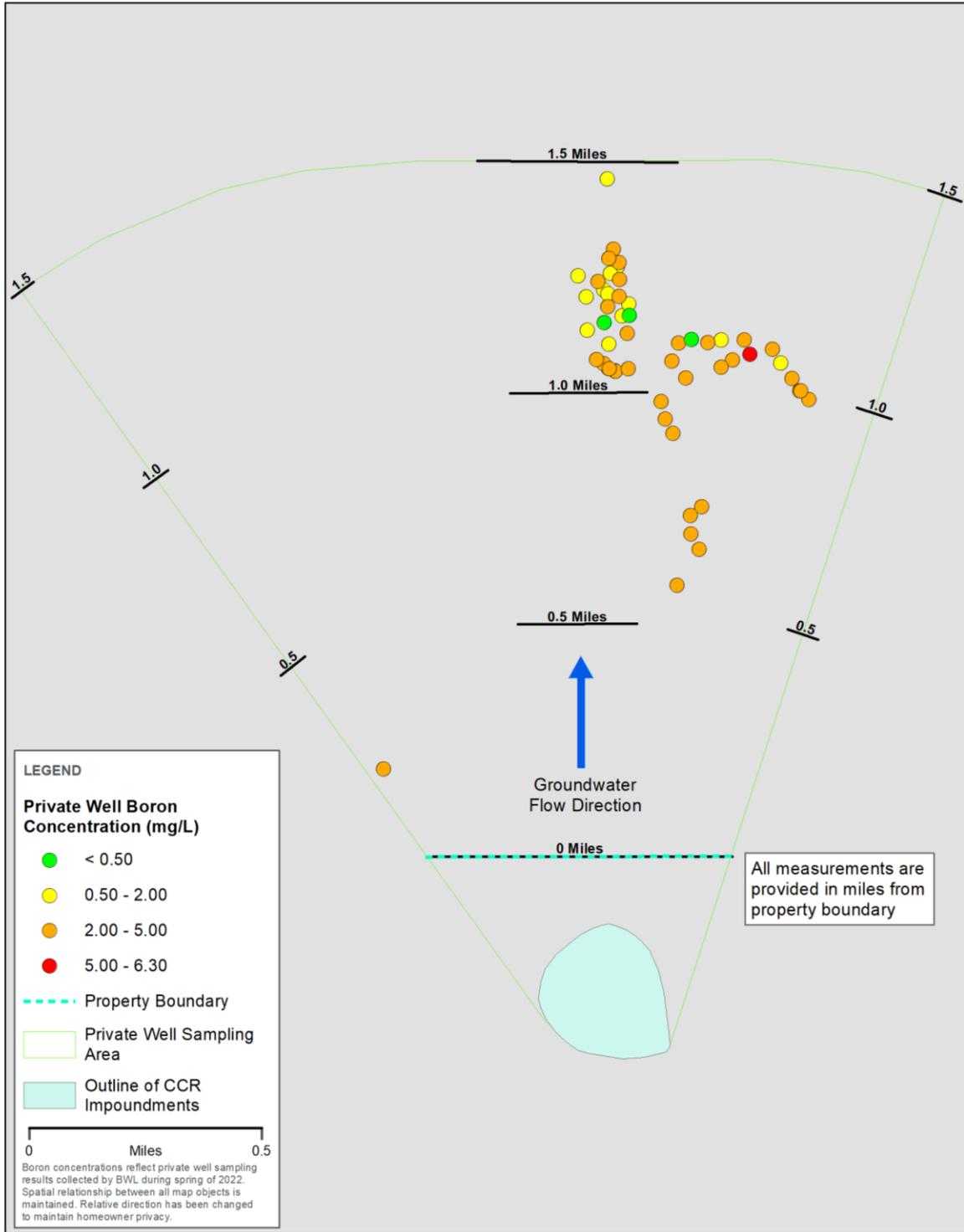
### 4.1.1 Frequency

In response to public concern, BWL initiated a sampling program of private wells in 2022. BWL retained HDR to define a focus area based on a conservative cone shape (or triangle) from the CCR impoundments initiating at the impoundments and extending in the direction of groundwater flow (Figure 4). There is no impact to private wells that are strictly upgradient or cross gradient of the CCR impoundments based on a well-established series of monitoring wells that were installed between 2019 and 2022 and monitored on a monthly basis for water levels. The measured groundwater flow direction from the site was consistent with the groundwater flow directions in literature for the area (Vanlier et al, 1973). The CCR impoundments outline shown on Figure 4 includes the three regulated CCR impoundments as well as the Former Impoundment area because while it is not a regulated CCR impoundment, nor store CCR currently, it is considered a potential source area from 1970 through 2014. The Erickson property boundary (referred to as mile 0 in the figure), street names, aerial photography and other similar landmarks are not shown on Figure 4 in an effort to retain private well owner privacy to the extent practical. The relative shape of the CCR impoundments, groundwater flow direction, focus area, and scale are retained.

A phased approach to private well sampling within the focus area was utilized. Phase I sampling was conducted by developing a map of homes and businesses within 0.75 mile downgradient of the Erickson property boundary and contacting all well owners in that area to request access for sampling. Six private wells were sampled on February 3, 2022, as part of Phase I.

Following Phase I, a map of homes and businesses within 1.5 mile potentially downgradient of the Erickson property boundary with a well were contacted to request access to sample the groundwater from their well. This group of wells is referred to as Phase II and is composed of 45 private wells that were sampled between February 21-24, 2022. An additional well within the focus area was sampled for the first time on April 13, 2022, for a total of 46 wells in Phase II. A total of 52 private wells were sampled.

In addition, nine of the Phase I and Phase II private wells were resampled by BWL between March 28 and May 16, 2022, depending upon owner scheduling. Approximately 66 private well owners were contacted (65 were contacted by BWL and 1 contacted BWL directly), and 14 either declined sampling or did not respond.



ERICKSON POWER STATION  
EATON COUNTY, MI

Figure 4. Private well sampling area downgradient of the Erickson CCR Impoundments, also referred to as the focus area.

### 4.1.2 Water Levels and Sample Collection

Prior to private well sampling, HDR developed the *Private Well Sampling - Standard Operating Procedure* (SOP) that describes the sampling methodology (HDR, 2022). Sampling was performed by HDR and TRC Consultants, both contracted by BWL.

Private well owners were asked if a water level could be collected prior to sampling. The well cover was removed in order to collect a measurement using a sonic water level meter. Water level measurements were collected at four private wells. To avoid potential damage to the well and existing pumping system, the private well SOP did not include direct well sampling. Instead, water taps were selected for sample collection based on proximity to the well and position upstream of treatment systems or storage/pressure tanks. Aerator, strainer, or hose attachments on the tap were removed before sampling. In accordance with the SOP, the taps were purged for a minimum of 10 to 15 minutes at each location prior to sample collection so that the water collected represented the formation, not the standing water in the well casing, pipes, or holding tanks. After purging, samples were collected and delivered under Chain of Custody to Merit Laboratories in East Lansing, Michigan for analysis.

### 4.1.3 Analytical Testing

Samples were analyzed for the parameters listed in Table 1. This list of parameters was chosen to evaluate potential impacts from the Erickson CCR impoundment and characterize the bedrock groundwater parameters. The metals selected for analysis represented those constituents in the glacial aquifer with exceedances of the site-specific GPS (boron, calcium, lithium, molybdenum, sulfate, and TDS). Groundwater character parameters included bicarbonate, carbonate, chloride, magnesium, potassium, and sodium. Total suspended solids were added to the list in order to evaluate if the total versus dissolved metals was a factor in the concentration. Lastly, fluoride was added after a review of the Rowe et al. (2021) Ingham County Groundwater Study, which reviewed the relationship between fluoride and boron.

Table 1. List of Parameters Analyzed
Parameter List
Bicarbonate
Carbonate
Boron, total and dissolved
Calcium
Chloride
Fluoride
Lithium, total and dissolved
Magnesium
Molybdenum, total and dissolved

**Table 1. List of Parameters Analyzed**

Parameter List
Potassium
Sodium
Sulfate
Total Dissolved Solids (TDS)
Total Suspended Solids (TSS)

## 5.0 Private Well Sampling Results

### 5.1 Water Levels

For the four groundwater levels collected from the private wells, the groundwater elevations collected were consistent with the conceptual site model groundwater flow direction based on measured data at Erickson and in literature for the area.

### 5.2 Water Quality Results

Sampling was completed for 52 private wells in the bedrock aquifer in 2022. Laboratory data is summarized in the data tables in Appendix A. Laboratory reports are provided in Appendix B, and each private well owner was provided the laboratory report with the data from their well. BWL presented the results of the private well sampling in conjunction with the ongoing Groundwater Model Update to representatives from Eaton/Barry County Health Department, EGLE Drinking Water Division, Michigan Department of Health and Human Services (MDHHS), and EGLE Material Management Division on April 7, 2022, and again on September 20, 2022. BWL presented interpretation of the data during these meetings, and no concerns were made from the regulatory representative. The following sections describe the groundwater quality findings observed at the private wells.

Boron concentrations in private wells in the focus area ranged between 0.15 and 6.3 mg/L. This data is displayed on Figure 4. The EPA and the State of Michigan do not have a drinking water standard for boron. This means that community water suppliers are not required to analyze for boron. The EPA Lifetime Health Advisory Level of boron for adults is 5.0 mg/L and for children is 2.0 mg/L. The Health Advisory Level was recommended by the MDHHS. Of the 52 sampled private wells, 38 (or 73 percent) had concentrations of boron greater than the 2.0 mg/L EPA Lifetime Health Advisory Level for children.

Lithium concentrations in private wells in the focus area range between 0.007 and 0.096 mg/L. The EPA and the State of Michigan do not have a drinking water standard for lithium. This means that community water suppliers are not required to analyze for lithium. The EPA Regional Screening Level for Lithium is 0.040 mg/L. This value was recommended by the

MDHHS. There were 16 private wells sampled (or 31 percent) with concentrations of lithium greater than the 0.040 mg/L EPA adopted health-based value.

Molybdenum concentrations were non-detect in private wells in the focus area.

Because the groundwater in the private wells had concentrations of boron and lithium that are greater than EPA health advisory and screening level, respectively, the particular focus of the data analysis is to evaluate the potential for the observed boron and lithium concentrations to be impacted by the CCR impoundments at Erickson. In an effort to focus the report, boron is used as the primary indicator because:

- At the time of the private well sampling the only statistically significant exceedances over GPS measured in the glacial aquifer and downgradient of the CCR impoundments were for boron, calcium, lithium, sulfate, and TDS. Thus, it was established that the CCR impoundments had impacted the glacial aquifer with boron.
- Of those constituents listed in the first bullet, boron is a primary indicator of CCR and known to be leachable from CCR (Izquierdo and Querol, 2012).
- Of those constituents listed in the first bullet, boron is the most conservative in groundwater, meaning it is the least affected by sorption and retardation through natural processes and therefore has the greatest potential to migrate.

Therefore, boron becomes an appropriate indicator to evaluate.

The following sections review the private well water quality, using multiple approaches that provide multiple lines of evidence, to consider the potential for the observed boron and lithium concentrations in private wells to be impacted by the Erickson CCR impoundments.

### 5.2.1 Comparison to Background Water Quality

As required in Michigan Rule R 299.4441(9), the CCR owner must establish GPS for each constituent detected in the groundwater. The GPS for the State Part 115 compliance program is defined as the lowest of the following:

- U.S. EPA Maximum Contaminant Level (MCL) for constituents for which an MCL has been established;
- The applicable cleanup criteria for that constituent for groundwater as established pursuant to section 20120a of the act; or
- For constituents for which the background level (UTL) is higher than the MCL or applicable cleanup criteria for groundwater, the background concentration will be the GPS.

BWL installed three monitoring wells at Erickson completed in the bedrock aquifer. Monitoring well MW-7B is downgradient of the CCR impoundments, and monitoring wells MW-11B and MW-12B are upgradient of the CCR impoundments. Because wells MW-11B and MW-12B are upgradient of the impoundments, groundwater from these locations represents background bedrock aquifer conditions. These wells were sampled eight times between March and December 2022 and the data was statistically evaluated to develop upper tolerance limits (UTLs) to represent the background threshold values for boron and lithium (Table 2).



**Table 2** provides the background level, the MCL, the cleanup criteria, and the GPS values for Erickson for boron and lithium (as the focus of this report) in both the glacial aquifer and the bedrock aquifer.

Table 2. Background Values and Groundwater Protection Standards					
Parameter	Aquifer	Site-Specific Background Level Upper Tolerance Limit (UTL) (mg/L)	Federal Maximum Contaminant Level (mg/L)	State Non-Residential Drinking Water Cleanup Criteria for Groundwater (mg/L)*	Groundwater Protection Standards for Site (mg/L)
Boron, total	Glacial	0.480	NV	0.500	0.500
Boron, total	Bedrock	3.50	NV	0.500	3.50
Lithium, total	Glacial	0.0475	No MCL, 0.040*	0.350	0.0475
Lithium, total	Bedrock	0.0550	No MCL, 0.040*	0.350	0.0550

NV = no value. \*EPA adopted health-based value for constituent with no MCL.

Per the CCR Rule and the State Part 115 regulations, generally downgradient monitoring data is compared to the site-specific GPS to determine if there is an exceedance. If there is an exceedance, it is interpreted as “groundwater contamination” or as having a “plume”. As previously described, BWL identified exceedances over GPS in the glacial aquifer.

The on-site downgradient bedrock well MW-7B had boron concentrations ranging between 2.88 and 3.17 and lithium concentrations ranging from 0.028 to 0.035 with no trend in the concentrations. As shown in Table 2, both boron and lithium bedrock concentrations are below established bedrock groundwater protection standards. The same is true for the other monitored constituents, that the concentrations at MW-7B are lower than the bedrock GPS. Therefore, there is no indication in data collected to date that there is an impact to the bedrock aquifer from the CCR impoundments. While there are exceedances in the glacial aquifer at Erickson, and no exceedances observed in the bedrock aquifer at Erickson with proximity to the CCR impoundments, it would not typically be expected that there would be exceedances over a mile downgradient in the bedrock.

The background bedrock values for Erickson are based on two monitoring wells at Erickson completed to a similar depth in the shale dominated bedrock. Like the private well boron data, as will be described further in the report, these two monitoring wells have boron concentrations that are unlike. One well has boron concentrations that are below 1 mg/L and the other well has boron concentrations between 3 and 4 mg/L. This variability is consistent with the spatial variability observed at the private wells. This brings into the question whether or not the site-specific bedrock background value is truly representative of the variability observed in the shale aquifer.

### 5.2.2 Spatial Variability and Concentrations Relative to Distance from Erickson

The boron concentrations observed at the private wells is shown in Figure 4. The data was reviewed for potential patterns that may be expected if there was impact to the groundwater from a contaminant source, such as the CCR impoundments. Figure 4 displays the spatial variability in the boron concentrations. For example, private wells associated with residences immediately adjacent to each other vary significantly. A residence with a concentration of 6.3 mg/L boron is only a couple of lots away from a residence with a concentration of 0.19 mg/L. If the bedrock aquifer were impacted by the CCR impoundments, generally speaking, a contaminant plume would be expected, and the higher concentrations would be expected nearer to each other with less spatial variability in such close proximity.

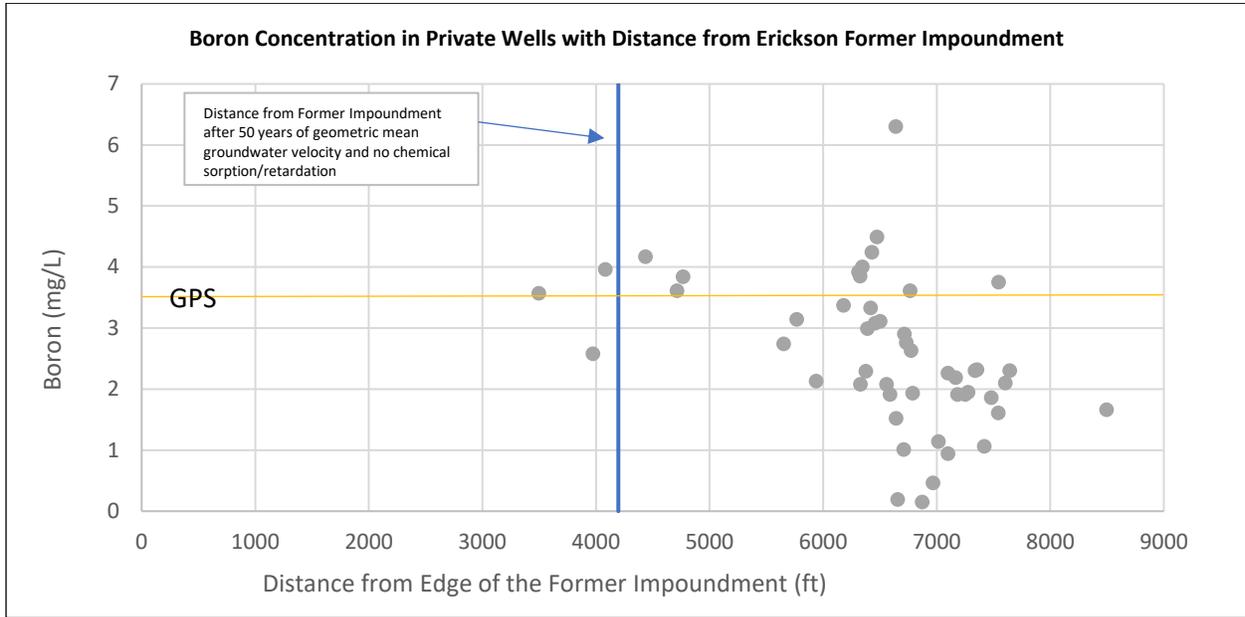
The average boron concentration measured at the private wells was 2.68 mg/L. This concentration is less than the statistical bedrock background concentration calculated for Erickson (3.50 mg/L). This difference illustrates the variability of boron concentrations in the shale aquifer.

Figures 5 and 6 display the boron and lithium concentrations in private wells relative to the private well distance from Erickson Former Impoundment waste boundary. The Former Impoundment area is used because it was a potential source area from 1970 through 2014. This figure illustrates that there is no correlation between the distance from the CCR impoundments and the boron or lithium concentrations. If the private well concentrations were the result of an impact from the CCR impoundments, a pattern or correlation may be anticipated.

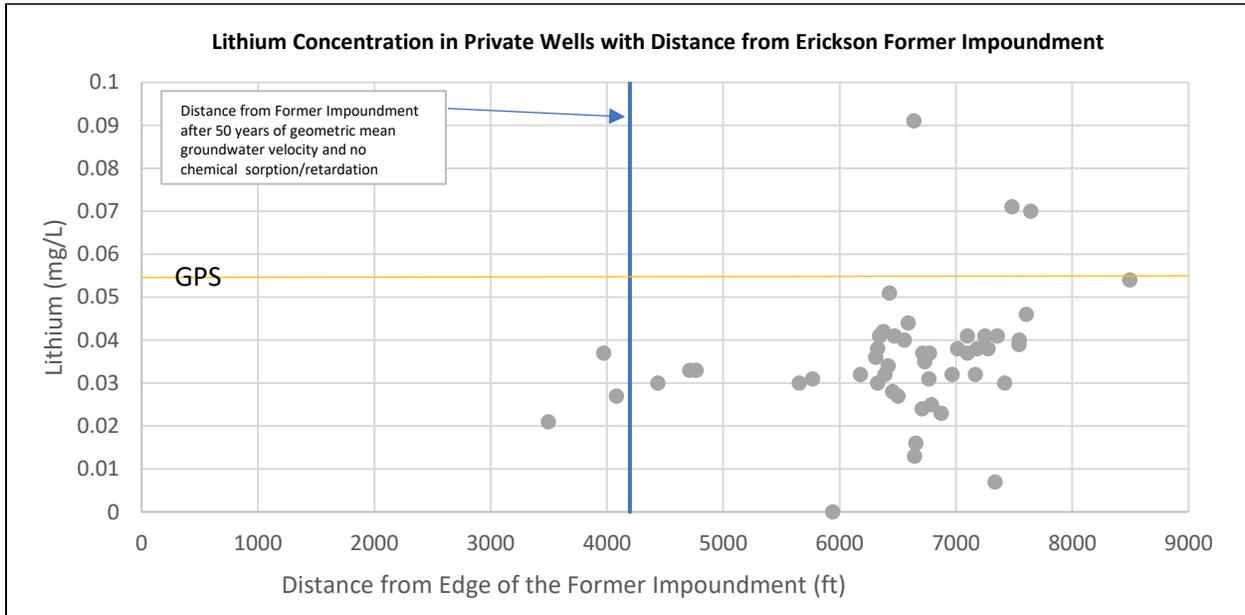
These graphs may also be useful to consider the potential for CCR-impacted groundwater to reach the private wells sampled by evaluating groundwater travel time and private well distance from the impoundment. The blue line on the graphs represents an approximate calculated distance groundwater has traveled from the Former Impoundment after 50 years (since it was constructed) assuming a calculated groundwater velocity of 0.23 feet per day<sup>1</sup>. With this estimate of velocity, after 50 years (assuming the Former Impoundment was leaching to groundwater since it was first constructed in 1970) groundwater from under the Former Impoundment in the glacial sediments would be approximately 4,200 feet from the Former Impoundment (blue line on Figure 5 and 6). Figures 5 and 6 display the concentrations over GPS in the private wells are 7,500 to 8,500 feet from the CCR Impoundments. This groundwater travel distance line is conservative from a private well perspective because the line represents groundwater velocity of the glacial sediments. The shale bedrock material has a lower hydraulic conductivity and therefore potentially lower velocity, and thus the travel distance would be smaller. Consideration of groundwater travel time instead of contaminant migration also assumes that the contaminant is completely conservative in groundwater (no dilution, sorption, or retardation).

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<sup>1</sup> This was estimated using the geometric mean hydraulic conductivity of the glacial sediments as measured in slug tests (4.63 feet per day), the gradient of 0.006 ft/ft and a porosity of 12 percent (to match the calibrated groundwater flow and transport model).



**Figure 5. Boron concentrations in private wells with distance from Erickson Former Impoundment.**



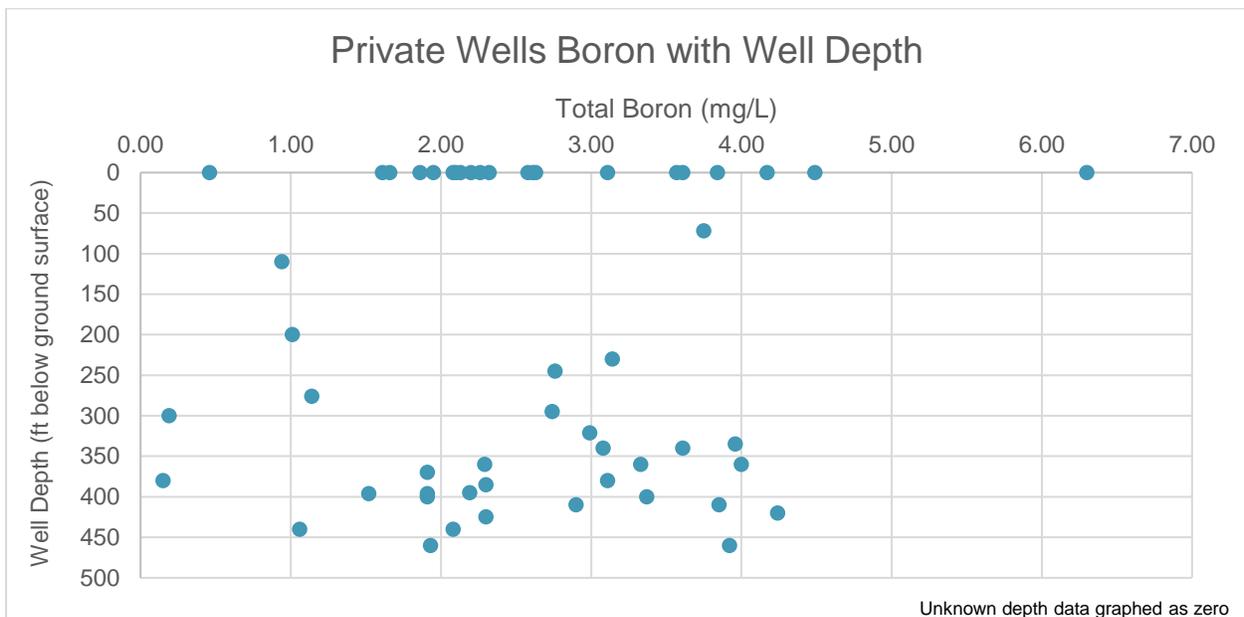
**Figure 6. Lithium concentrations in private wells with distance from Erickson Former Impoundment.**

### 5.2.3 Concentrations Relative to Depth

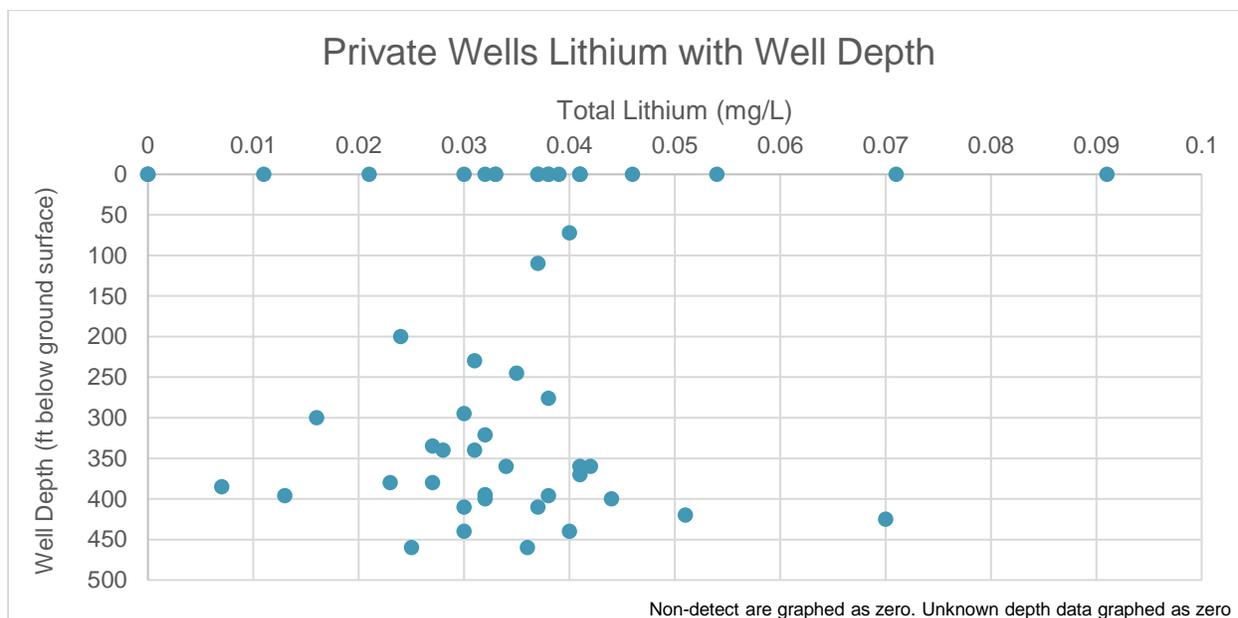
The private well water quality was also reviewed for potential patterns with depth. For example, because the source of the potential contamination in question (CCR impoundments at Erickson) is shallow (from approximately ground surface to 25 feet below ground surface), impacts to



groundwater would be expected in shallow wells downgradient of the impoundments. Typically, for metal contaminants, vertical (or downward) contaminant migration away from a contaminant source is approximately 1 percent of the horizontal migration. Therefore, unless the contaminant is dense, a steep vertical migration away from the source is not typical. Figures 7 and 8 display the concentrations of boron and lithium in bedrock private wells relative to the depth of the wells. Well log information was searched on Wellogic, the State of Michigan's statewide groundwater database. Most drinking water wells in the region are between 100 and 400 feet in depth in the Saginaw aquifer. Where no well log is available, the depth was plotted as zero on the graphs. Both the boron and lithium graphs illustrate there is no pattern with respect to the concentration and well depth.



**Figure 7. Boron concentrations in private wells with well depth.**



**Figure 8. Lithium concentrations in private wells with well depth.**

#### 5.2.4 Plume Geometry - Spreading of Pollutants in Groundwater

Compounds in leachate from a contaminant source entering an aquifer will be subjected to advection and dispersion (dilution) as the leachate mixes with the groundwater (Freeze and Cherry, 1979). For nonreactive components, like boron, dilution is the primary mechanism. Dilution is the interaction of the leachate flow in the aquifer with the flow of groundwater and results in a three-dimensional plume where gradients, permeabilities, and physical boundaries determine the migration velocity of the plume. Dispersion is the mathematical term in the solute transport equation (Freeze and Cherry, 1979) accounting for dilution or mixing according to concentration gradients. The dispersivity has a longitudinal component (in the flow direction), a transverse component, and a vertical component (Figure 9). The magnitude of the transverse dispersivity controls the transverse spreading of the plume. Literature data from field experiments show small transverse dispersivities indicating limited transverse spreading of contaminant plumes. Transverse dispersivity values are commonly assumed to be about a tenth of the longitudinal dispersivity (Adams and Gelhar, 1992; Gelhar et al., 1992; Jensen et al., 1993). Vertical dispersivities are expected to be extremely small, which means very limited vertical mixing due to dispersion. Vertical dispersivity values are commonly assumed to be about a hundredth of the longitudinal dispersivity (Gelhar et al., 1992; Jensen et al., 1993).

Reviewing the scale in Figure 9, if a plume was able to extend 6,000 feet from the source with longitudinal dispersivity, the plume geometry would only be expected to be on the order of 600 feet on either side of the contaminant source width in the transverse direction; however, this is not what is observed in the private well data. The boron data in the private wells is spread significantly wider than typical plume geometry expected and described in literature. The private well data has boron concentrations between 3 and 5 mg/L up to 1,600 feet in the transverse direction at 6,000 feet from the source in the longitudinal direction. The groundwater flow direction shown in Figure 9 uses the groundwater elevation data from both the onsite monitoring

wells and the private wells. If the measured groundwater flow direction were incorrect and were shifted 20 degrees to the right (using Figure 9) the plume width would be closer to typical plume geometry, though still slightly wider. Additionally, it is recognized there is potential for preferential pathways that may not be exactly demonstrated with the measured flow direction. However, there is a private well with a concentration of boron of 3.96 mg/L less than 2,000 feet from the CCR impoundments in the longitudinal direction and is 1,700 feet in the transverse direction, and there are no groundwater potentiometric surface contours that show groundwater flow in that direction to explain this. Similarly, vertical dispersivity is commonly assumed to be extremely small (if plume had spread 6,000 feet in longitudinal direction the plume geometry would be expected to be on the order of 60 feet deep), which would not match the private well sampling results that show wells with well depths of greater than 400 feet with the same boron concentrations as those much shallower.

If the boron values observed in private wells represented a boron plume from the CCR impoundments, the plume geometry would not match what is typically seen in contaminant transport, because the plume is wider and deeper.

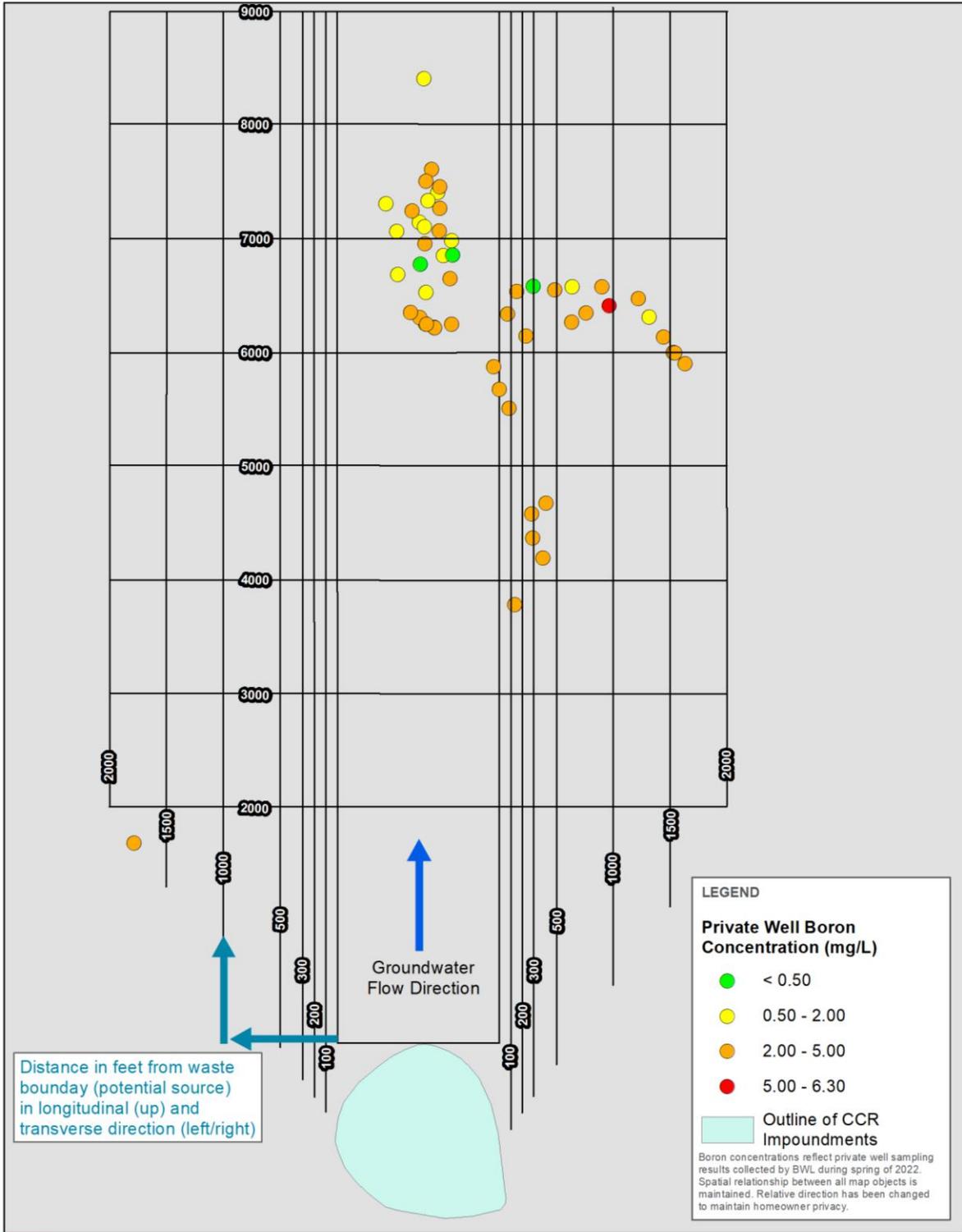


Figure 9. BWL sampled private well locations and boron concentrations.

### 5.2.5 3-Dimensional Transport Solution for Continuous Release

The Domenico and Robbins (1985) three-dimensional solution for a non-reacting species was used to calculate an estimate of what the source concentration of boron would have to be at the CCR impoundment in order to see concentrations in groundwater downgradient at the private wells of 6.3 mg/L approximately 6,500 feet away from the CCR impoundments (the highest observed private well boron concentration). The highest observed boron concentrations in Erickson monitoring wells, close to the source, is 7.24 mg/L in glacial sediments. This analytical solution is used in the field of hydrogeology to estimate a concentration downgradient from a constant source at specific distance from the contact source over a specific time. To be conservative and allow the longest potential period of a source contribution to groundwater, the Former Impoundment was assumed to be the constant source.

The following assumptions are implicit to the solution or were either observed or literature-based aquifer parameters:

- Constant groundwater velocity, aquifer is homogenous and isotropic
- Constant source – Former Impoundment geometry
  - Width – 1500 feet
  - Thickness – 10 feet (pond bottom elevation is 870 feet, the water table at MW-4 is 870, therefore this thickness is higher than actual and is a conservative value)
  - Time of constant source release – 50 years (Former Impoundment was constructed in 1970)
- Hydraulic conductivity - 2.0 feet per day (described below)
- Porosity - 4 percent (Chilingar, 1963; Manger, 1963)
- Hydraulic gradient - 0.006 ft/ft (measured onsite)
- Retardation factor – 1 (no sorption/retardation)

From the CCR impoundments to the private wells, boron would have to migrate through heterogeneous glacial materials (lenses of sands, silts, and clays) and through shale and sandstone bedrock both horizontally and vertically. While measured hydraulic conductivity in glacial sediments at Erickson ranges from 2.8E-06 to 141 feet per day due to the glacial sediment heterogeneity, the bedrock measured hydraulic conductivity ranges from 0.34 to 1.7 feet per day. To be conservative, a higher end hydraulic conductivity value was used in the solution to reflect faster groundwater velocity. While this value could be a realistic value for the glacial sediments, this value becomes high for groundwater flow through the bedrock and is therefore considered a conservative value for this solution

Using the assumptions above, the analytical transport solution indicates that to observe a boron concentration of 6.30 mg/L at 6,500 feet away from the constant source (as was observed at one of the private wells), the CCR Impoundments would have to be a constant source to groundwater with a concentration of boron over 24,000 mg/L for 50 years. If it is assumed that the Erickson bedrock background value is actually representative of all bedrock background concentrations of boron at 3.5 mg/L, and that concentration was subtracted from the 6.3 mg/L target value downgradient, then the CCR Impoundments would have to be a constant source to groundwater with a concentration of boron over 11,000 mg/L for 50 years. This is a high concentration (by orders of magnitude) and requires a constant source, conservative aquifer parameters, and no sorption or retardation. This transport solution indicates that the CCR impoundments would have had to leach an unrealistically high boron concentration to be the source of the highest boron concentrations observed at private wells downgradient given this set of aquifer parameters.

The average total concentration of boron measured in the Forebay, Retention Basin, and Clearwater Pond ash is 69.1 mg/kg. In order to compare this total solid concentration to groundwater, the concentration of the leachate from the coal ash needs to be estimated, which can be accomplished using the “Rule of 20”, where the leachate from a solid is typically assumed to be approximately 20 times less the solid concentration when all of the solid is dissolved. For example, the Michigan Part 201 cleanup standard for total boron in soil is exactly 20 times higher than the groundwater cleanup concentration (10 mg/kg versus 0.5 mg/L). Using the total boron ash concentration and the “Rule of 20”, it can be roughly estimated that the average leachate concentration from the Forebay, Retention Basin, and Clearwater Pond is on the order of 3.5 mg/L.

### 5.2.6 Flow and Transport Model (Preliminary Findings)

HDR is developing a flow and transport model for Erickson. The details associated with the construction of the numerical flow and transport model will not be presented herein. The model is considered preliminary at this time because as new wells are drilled, additional geologic conditions are observed and hydrogeologic conditions are tested and the model is refined and improved. In addition, while the model has been presented to EGLE in a PowerPoint presentation format, the model has not been approved by EGLE at this time and may be many months to a year before “approved” model findings would be shared. The model findings are presented herein to demonstrate BWL’s progress on the model and demonstrate the preliminary model simulations are consistent with the other data reviews discussed herein.

The model applied source concentrations to the three regulated CCR impoundments from 2014 through 2022, and also to the Former Impoundment area as a potential source from 1970 through 2014. Figure 10 displays the transport model simulated boron plume in the bedrock aquifer relative to the private wells. This simulated bedrock boron plume is known to be overly conservative because it currently simulates concentrations of boron at the downgradient bedrock monitoring well 2.5x higher than actual measured concentrations. The downgradient bedrock monitoring well concentration of boron is lower than the background value, thus a boron exceedance is not anticipated to be in the bedrock. Therefore, this simulated plume is not expected in reality; and is shared to illustrate that even the overly conservative modeled boron plume does not approach the private wells. Even with this overly conservative preliminary model results, the simulated plume (concentrations greater than the bedrock GPS) is approximately 3,000 feet from the closest private well. Additionally, the simulated glacial boron plume, which is shallower and calibrated closer to the observed concentrations of boron in monitoring wells is approximately 1,500 feet away from the closest private well.

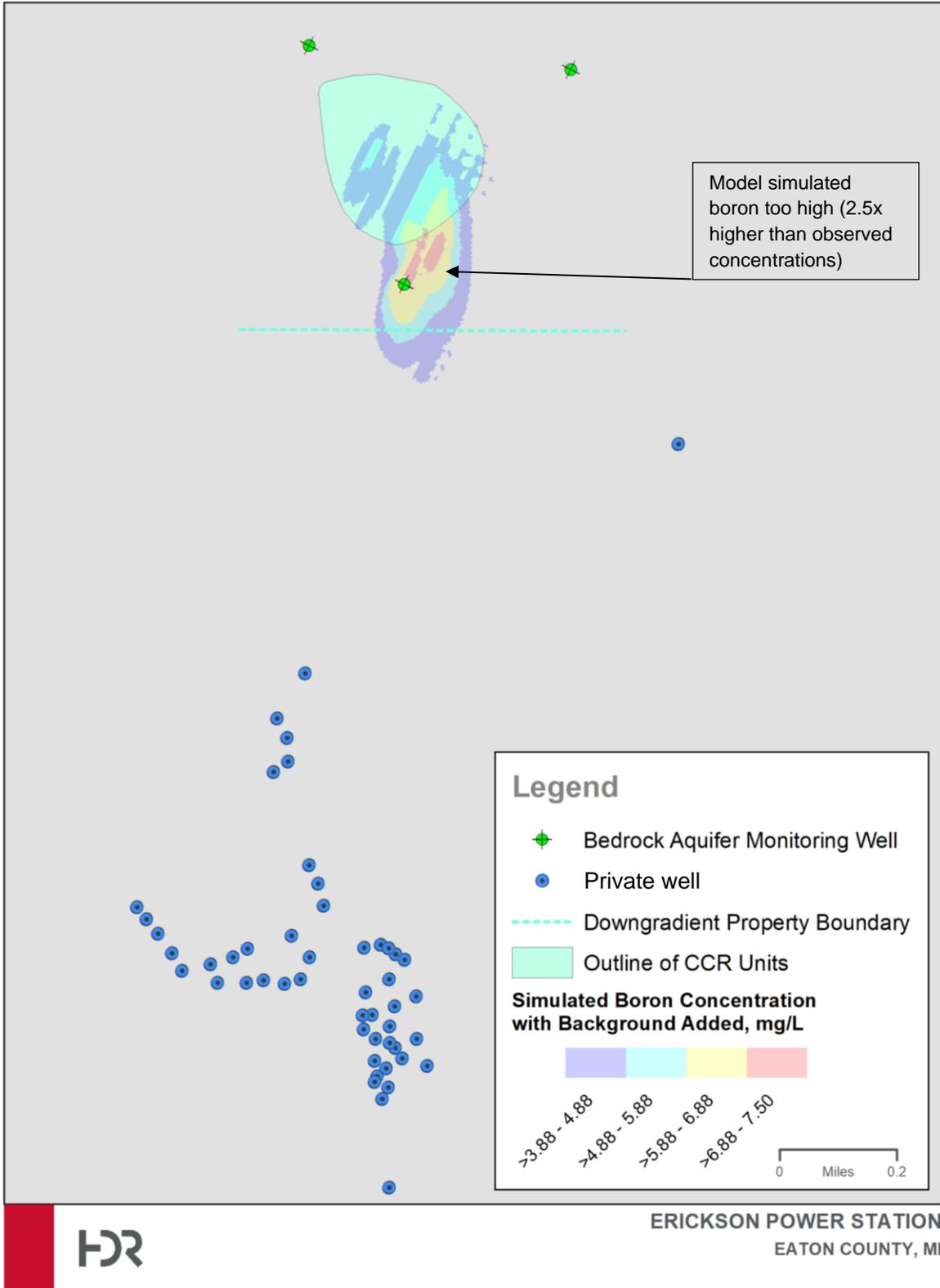
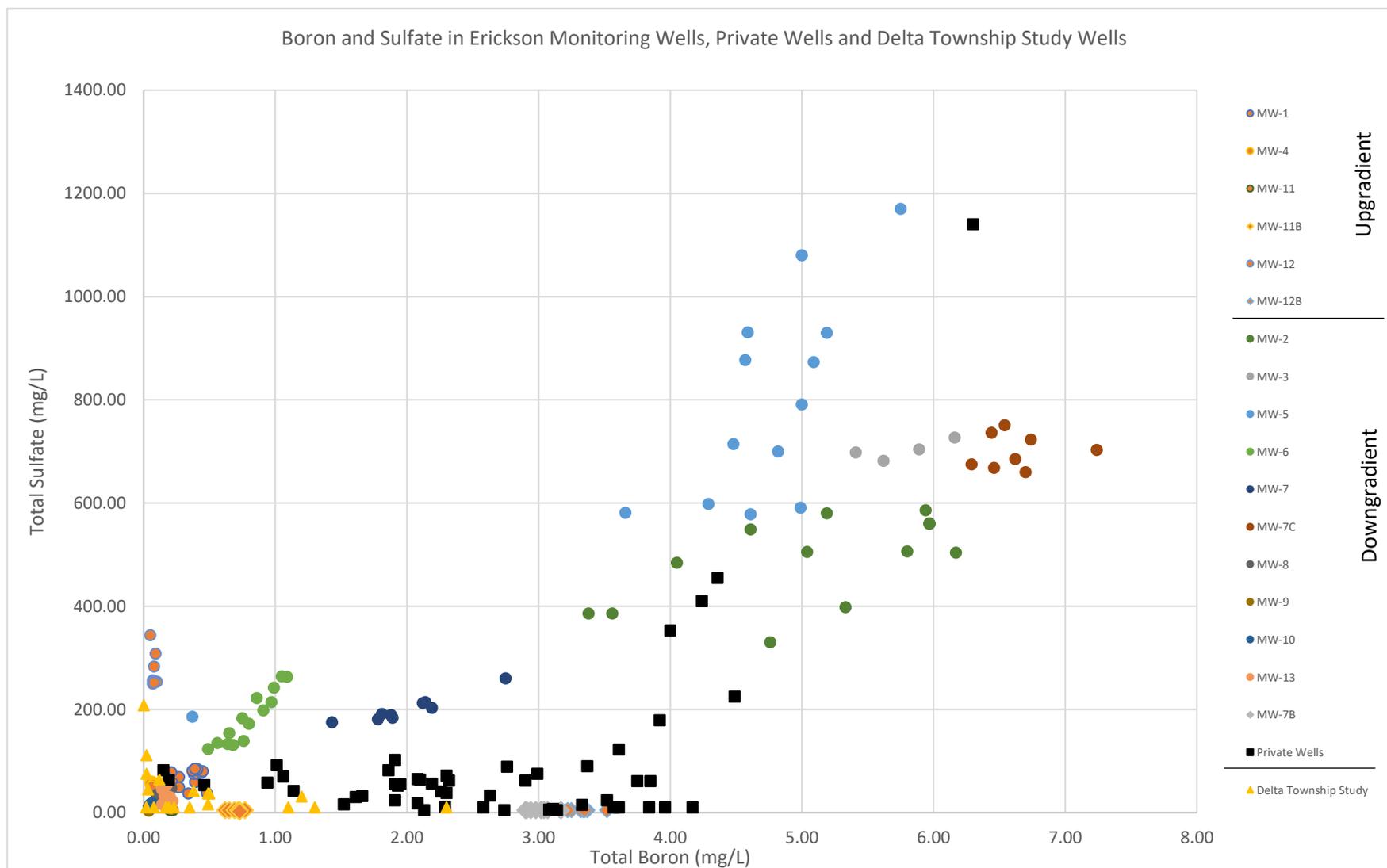


Figure 10. Transport model simulated boron plume in the bedrock aquifer relative to the private wells.

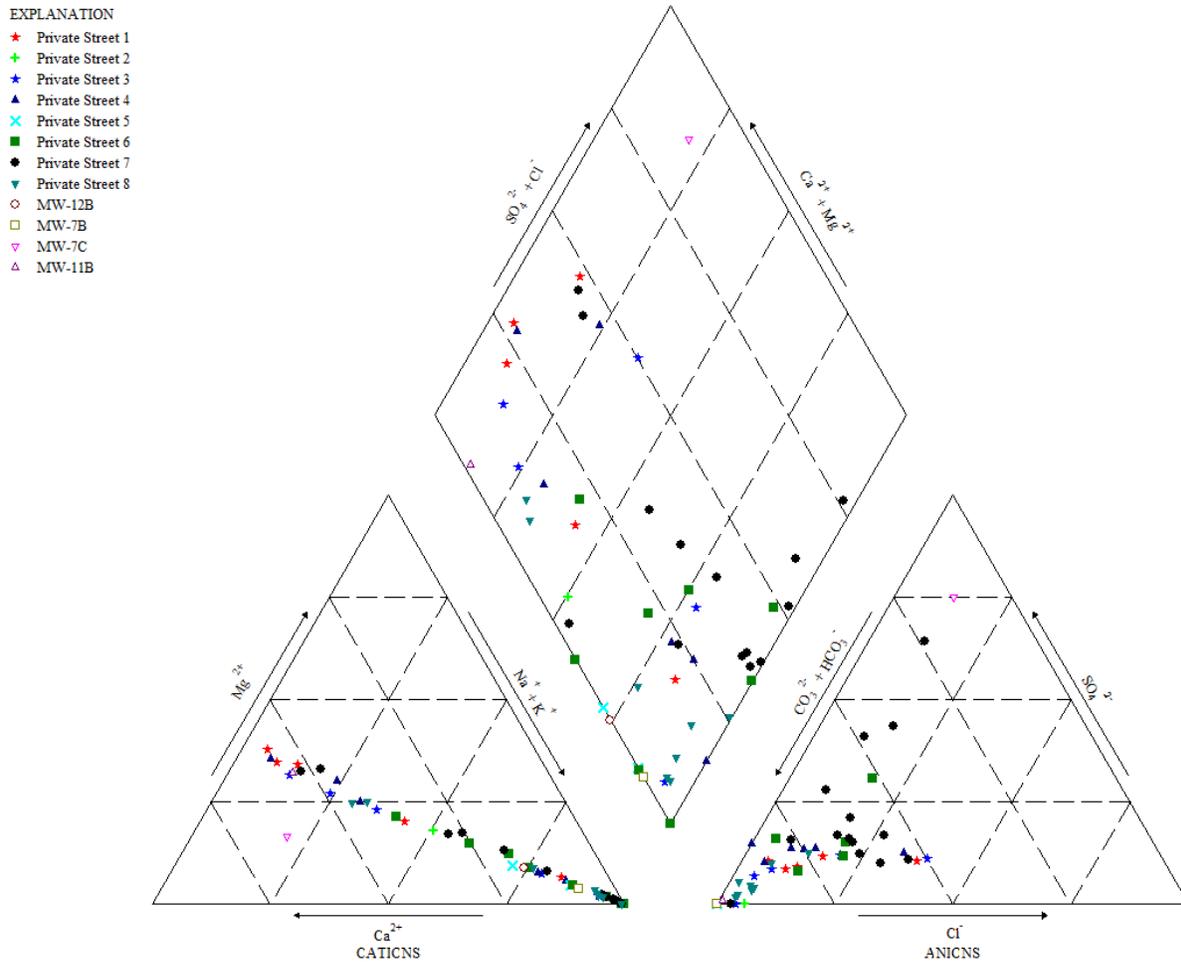
### 5.2.7 Groundwater Chemistry

The private well sampling identified 13 samples with boron concentrations greater than the background bedrock concentration (3.50 mg/L) observed at Erickson's bedrock upgradient wells. Of these 13 samples, sulfate concentrations varied between <5.0 and 1,140 mg/L. The downgradient groundwater wells closest to the CCR impoundments that are impacted (glacial) consistently show a boron and sulfate correlate (Figure 11). However, sulfate and boron at private bedrock wells largely do not correlate like the Erickson monitoring wells with the exception of four wells. Similarly, the Ingham County data, which is described in the next section, had two out of the 431 sampled wells with naturally occurring high sulfate and boron concentrations. If the CCR impoundments were the source of the boron in the private wells, the sulfate concentrations would be expected to correlate, which provides evidence that the boron in these private wells may be naturally occurring.

A piper diagram was developed to display the general water quality parameters to classify waters of the sampled wells and evaluate if mixing of waters could be identified. If the symbols plot near each other, the water quality types are similar. If the symbols do not plot near each other, the water quality may be characterized as different types of water. Figure 12 shows that the private bedrock wells, even in the same neighborhood (wells located very near to each other), plot in two or three different quadrants of the piper diagram, indicating they are different classes of waters. There also does not appear to be two obvious "end members" of water types with direct mixing between the two. This indicates significant water quality variability in the bedrock private wells sampled, and this kind of variability is indicative of natural variability, as opposed to an indication of impact by a contaminant source.



**Figure 11. Concentrations of boron and sulfate in Erickson on-site monitoring wells, the private bedrock wells, and the Delta Township Study bedrock wells.**



**Figure 12. Piper diagram showing general water chemistry of private wells grouped by street/neighborhood and Erickson bedrock monitoring wells plus the deeper downgradient glacial monitoring well MW-7C.**

**COMPARISON TO INGHAM COUNTY GROUNDWATER QUALITY STUDY**

Rowe et al. (2021) completed a groundwater quality study of Ingham County for a baseline water chemistry database for the area. Residents with wells in Ingham County obtain their drinking water from wells completed in the Saginaw bedrock groundwater aquifer. This is the same bedrock aquifer as the private wells sampled downstream of BWL’s Erickson site. A total of 326 wells were sampled across the county in 1987 and another round of sampling was conducted between 2015-2020 with 262 wells sampled, of which 157 were from the original study. A total of 431 wells were sampled in Ingham County. Concentrations of boron in the Ingham County bedrock private wells were highly variable, similar to the private well sampling, varying from non-detect to 5.5 mg/L (Rowe et al., 2021). Wells in the northeast quadrant, in

addition to a few in the northwest and southwest quadrants, tested for boron at levels greater than 1.00 mg/L.

According to Rowe et al. (2021), the highest boron concentrations were observed in the northeastern part of the county and correlate to wells completed in shale dominated bedrock:

*“Most wells in Ingham County are located in a predominant sandstone-type bedrock material that produces hard water. Wells with a higher percentage of shale material will often demonstrate **naturally [emphasis added]** softened water chemistry with higher sodium, fluoride, and boron levels. The shale material appears to act like a natural water softener via a membrane filtration mechanism (Slayton, 1982). This type of water chemistry is often seen in the northeast area of Ingham County which includes Williamstown, Wheatfield, Locke, and parts of Meridian, Alaiedon, and Vevay Townships.” From Rowe et al., 2021.*

An illustration of this bedrock type and water chemistry connection is shown in Figure 13, and a graph of the boron and sodium correlation is shown in Figure 14 made from the data included in the Ingham County report. Well logs from private wells sampled generally downstream of the Erickson Station were reviewed and the majority are completed in shale dominated bedrock. To compare against the Ingham County naturally occurring high boron concentrations, the private well boron and sodium data is graphed in Figure 15. As seen in Figure 15, there is a correlation between the high boron and high sodium concentrations in the private wells, which is similar to the relationship observed in naturally occurring Ingham County wells. Similarly, there is a correlation between high boron and higher pH in both private wells sampled downstream of the Erickson Station and those that Rowe et al. (2021) also observed. This same relationship is not observed in the Erickson glacial wells that are impacted by the CCR (Figure 16).

Only four wells from the Ingham County study were analyzed for lithium and therefore insufficient lithium data is available for comparison.

### GROUNDWATER CHEMISTRY COMPARISON OF TWO BEDROCK WELLS

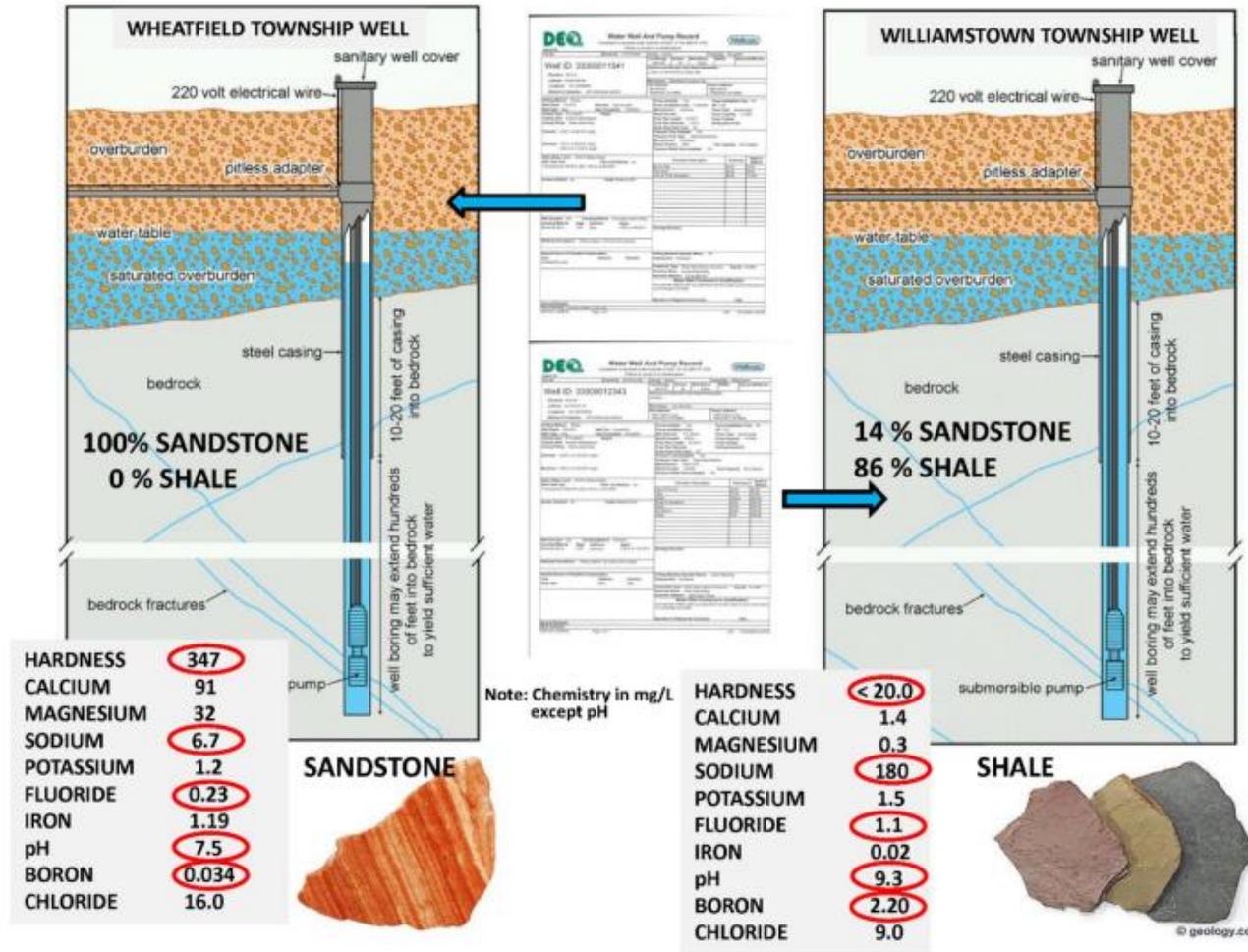
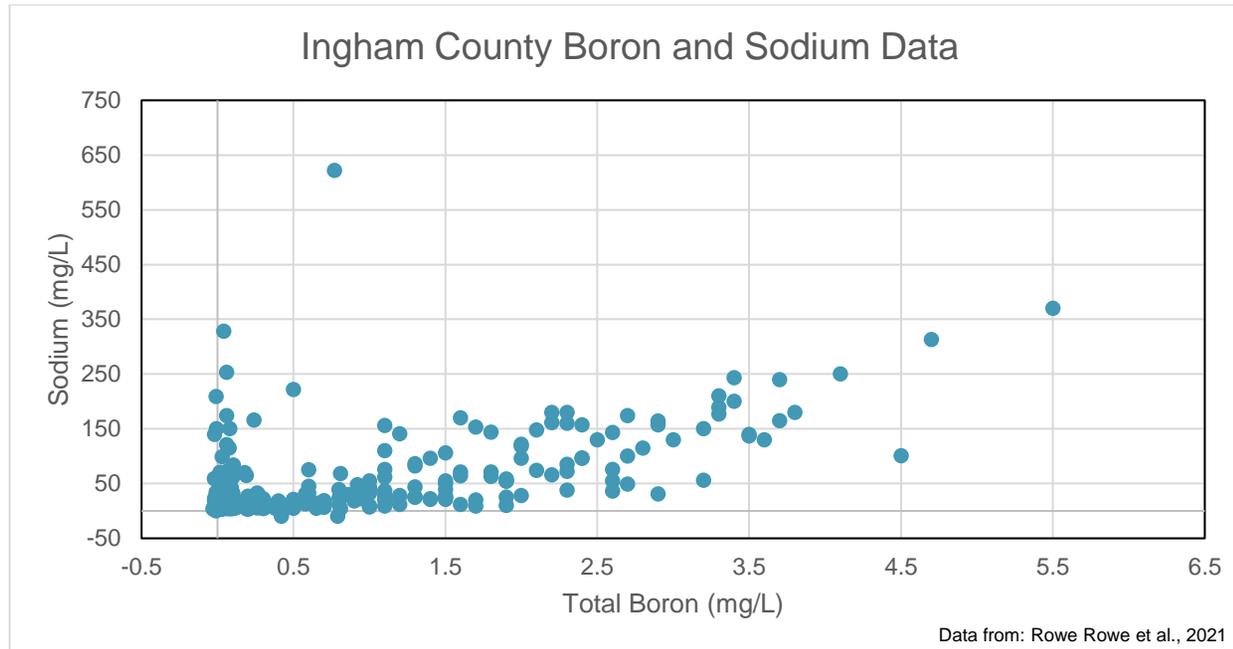
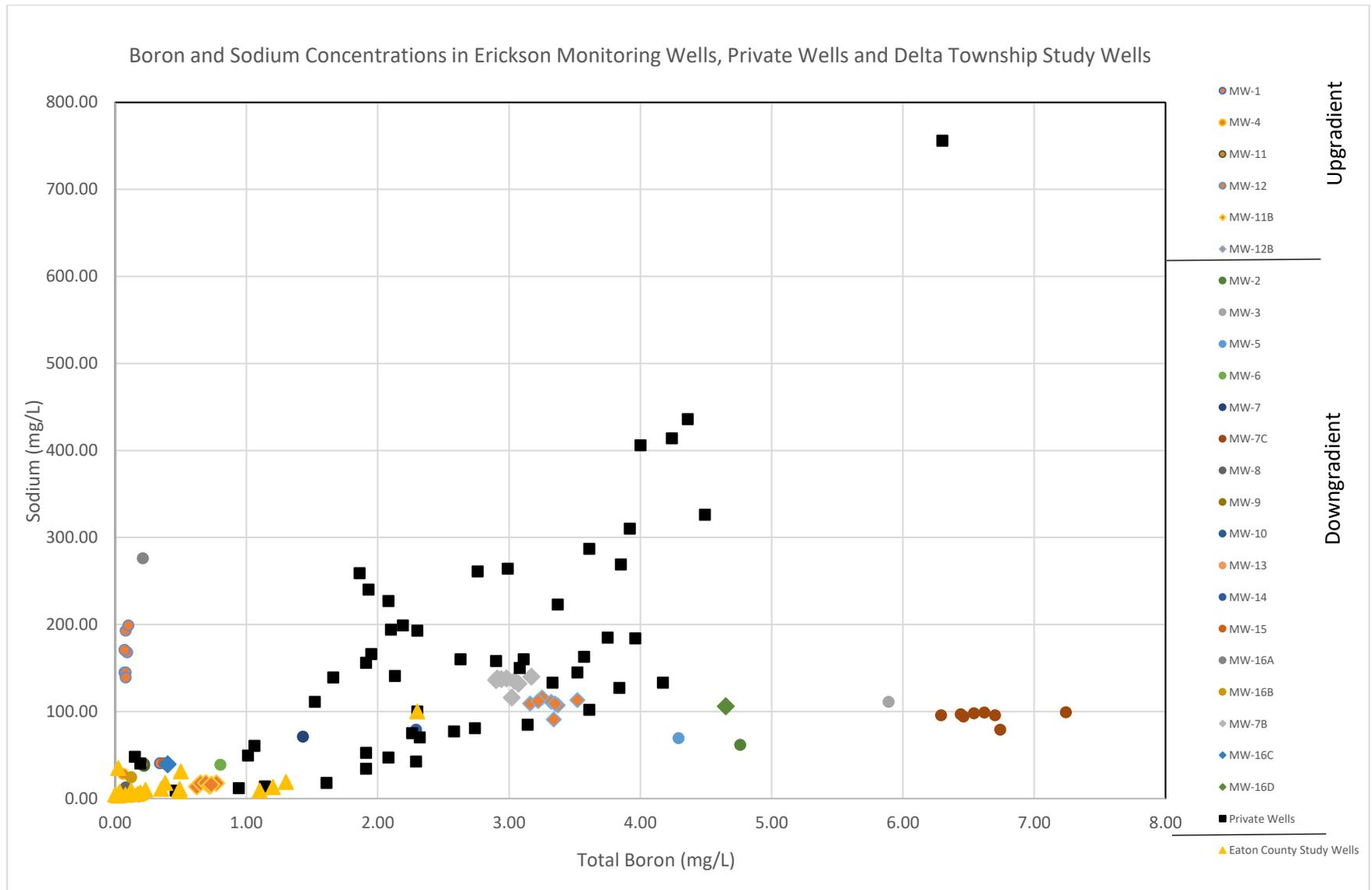


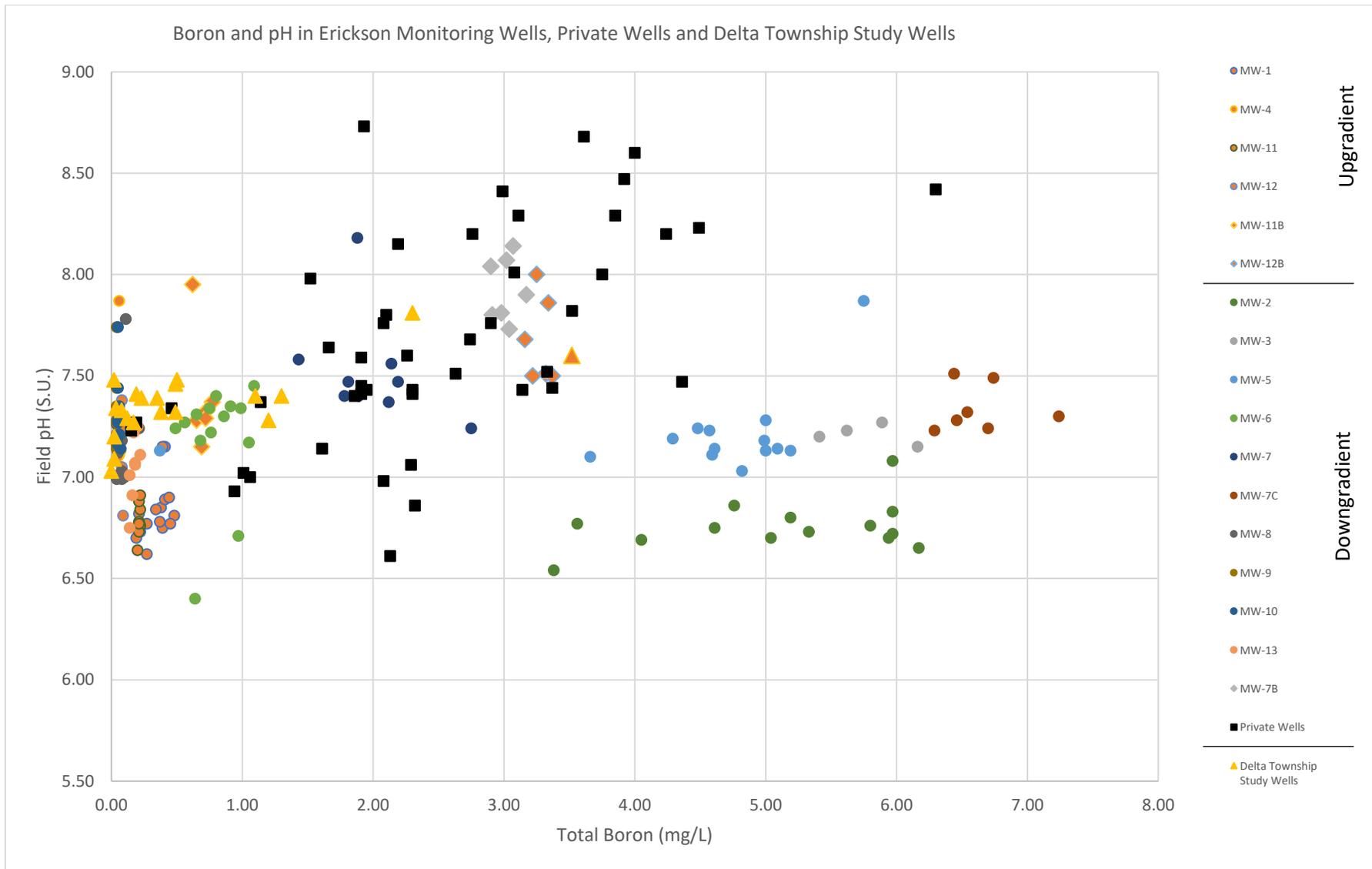
Figure 13. Groundwater chemistry associated with shale bedrock aquifer. The BWL bedrock monitoring wells and private wells are completed in a shale dominated bedrock aquifer.



**Figure 14. Boron and sodium concentrations in Ingham County Study bedrock wells (Rowe et al., 2021).**



**Figure 15. Concentrations of boron and sodium in Erickson on-site monitoring wells, the private bedrock wells, and the Delta Township Study bedrock wells.**



**Figure 16. Concentrations of boron and pH in Erickson on-site monitoring wells, the private bedrock wells, and the Delta Township Study bedrock wells.**

#### COMPARISON TO DELTA TOWNSHIP GROUNDWATER QUALITY STUDY

Rowe (2022) completed a groundwater quality study in Delta Township to sample the aquifer for a baseline water chemistry database for the area. Residents with wells in Delta Township obtain their drinking water from wells completed in the Saginaw bedrock groundwater aquifer. A total of 19 wells were sampled for this Delta Township 2022 study, distributed around the township (Rowe, 2022). Most wells are upgradient or cross-gradient of Erickson, and one sampled well is in the downgradient direction of Erickson. Private wells sampled were analyzed for total boron and lithium, along with other parameters.

Concentrations of boron in the 19 bedrock private wells sampled by Rowe were highly variable, similar to the private well sampling conducted generally downstream of Erickson Station, varying from non-detect to 2.3 mg/L. Four wells sampled had higher boron concentrations than the State non-residential drinking water cleanup criteria (Section 20120a) for groundwater (0.50 mg/L). All four were located in the southern half of the Delta Township area and only one of those four wells was located downgradient of Erickson. None of the concentrations exceeded the background bedrock boron value for Erickson. The highest concentration of boron observed (2.3 mg/L) was downgradient of Erickson. The second highest boron concentration observed by Rowe (2022) (1.3 mg/L) was in a well upgradient of Erickson. This is consistent with the private wells sampled generally downstream of Erickson water quality and consistent with the water quality being controlled by the lithology (wells completed in predominantly shale). Rowe (2022) concludes the boron observed in the wells sampled is naturally occurring (see quote below).

*“Four wells had levels of boron above the average level of 0.472 ppm and above what is normally seen in this region, or above 1.00 ppm. One well demonstrated a water chemistry often seen in the Williamstown Township area of Ingham County, where several wells are also testing for boron above 1.0 ppm. These wells usually have a naturally softened water chemistry with high sodium levels, very low water hardness, fluoride levels above 1.0 ppm, boron above 1.0 ppm, and pH levels above 8.0, (Rowe, Garry, 1986). The naturally soft water chemistry is due in part to the high percentage of shale bedrock from a process called shale membrane filtration, (Slayton, D.E., 1982), (Long, D.T., and Larson, G. J., 1983). The other 3 wells with high levels of boron did not fit this pattern, but still had a water chemistry similar to other wells in the Township, with an average water hardness of 334 ppm, and a lower pH below 7.5. A similar pattern was also seen in Bath, DeWitt, and Watertown Townships with wells having boron above 1.0 ppm but still having a hard water chemistry. These wells may be considered transition wells between average hard water wells and naturally soft water wells seen in the Williamstown Township area. **The boron levels found in these 4 bedrock wells is considered to be naturally occurring [emphasis added].***

*Boron levels of 1.00 parts per million or greater is above a drinking water standard or guideline found in several other states, California, Florida, Maine, Minnesota, New Hampshire and Wisconsin, (Office of Water, EPA, 1996). At this time the Federal Government and the State of Michigan do not regulate boron in drinking water. The EPA does provide a long-term health advisory of 2.0 parts per million for children and 5.0 parts per million for adults. Updated information from the World Health Organization, (World Health Organization, 2009), also provided a guideline of 2.4 parts per million.*

*Delta Township is primarily a sandstone type bedrock aquifer area from which hard drinking water is commonly found. Wells with a higher percentage of shale material will often demonstrate naturally softened water chemistry with higher sodium, fluoride and*

*boron levels. The shale material appears to act like a natural water softener or as mentioned in a paper by Slayton, like a membrane filtration mechanism, (Slayton, D.E., 1982). Because naturally softened water wells do have a higher level of boron, sodium and fluoride in their water, it is recommended that homeowners share these results with a family doctor and dentist. This would be important for dental care as it relates to fluoride treatment, and with doctors who are helping patients on sodium restrictive diets, women who are pregnant, and other patients with reproductive concerns.*

*Boron may have health benefits for women, (Nielsen, F.H. et al.), and boron has some important significance with agricultural crops, (Sprague, R.W., 1972). The Environmental Protection Agency, (Office of Water, EPA, 1996), has information regarding a health advisory for boron in drinking water. A water distillation filter may be a possible unit for treating drinking water for boron."*

Regarding the concentrations of lithium observed in Delta Township bedrock groundwater, Rowe (2022) identified concentrations of lithium between non-detect and 0.042 mg/L (or 0.042 ppm) with an average of 0.022 mg/L, and stated:

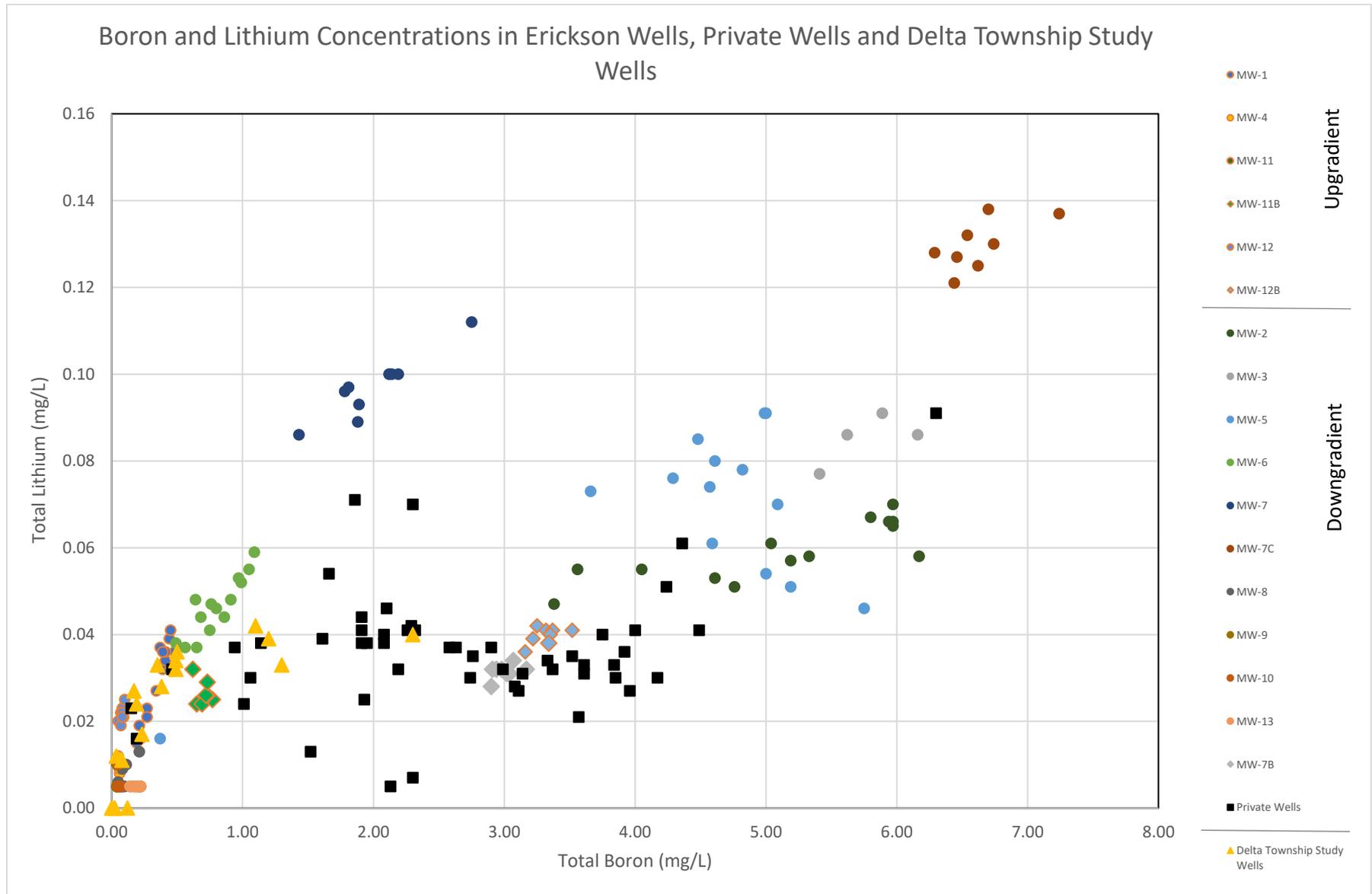
*"Presently lithium is not regulated in drinking water in the U.S. The USGS, in collaboration with the EPA, calculated a non-regulatory Health-Based Screening Level (HBSL) for drinking water of 10 micrograms per liter ( $\mu\text{g/L}$ ) or parts per billion, to provide context for evaluating lithium concentrations in groundwater, (USGS, February 11, 2021). Several of the wells tested at levels above this Health-Based Screening level and it is recommended that lithium be monitored for future testing in this area. A charcoal type filter device or a reverse osmosis, or RO unit, are recommended for removing lithium in drinking water."*

The private wells sampled generally downstream of Erickson had a range of non-detect to 0.09 mg/L, with an average lithium concentration of 0.04 mg/L. This average is lower than the lithium bedrock background concentration for Erickson (0.0550 mg/L). Because the downgradient wells closest to the CCR impoundments that show an impact to groundwater consistently show correlation between high boron and high lithium exceedances (See Figure 17 wells MW-2, MW-3, MW-5, MW-7C), a similar relationship of high boron/high lithium would be expected if the private wells were also impacted by the CCR impoundments. However, this is not observed. While the highest concentration of lithium observed in the private wells was at the same well as had the highest concentration of boron; other wells with high concentrations of lithium (0.07 mg/L) did not have corresponding high concentrations of boron (1.86 and 2.3 mg/L, lower than the background for boron) (Figure 17), indicating that there is not a clear correlation between boron and lithium in the private wells similar to the on-site Erickson impacted glacial monitoring wells. In addition, the private well water quality relationship between boron and calcium was similar to the Delta Township study water quality and dissimilar to the Erickson impacted monitoring well boron/calcium relationship. Figure 18 displays that the Delta Township wells and the private wells had in inverse relationship between boron and calcium, where boron was high, calcium concentrations were lower. This is not true of the Erickson impacted monitoring wells, where boron and calcium were both high (See Figure 18 wells MW-2, MW-3, MW-5, and MW-7C).

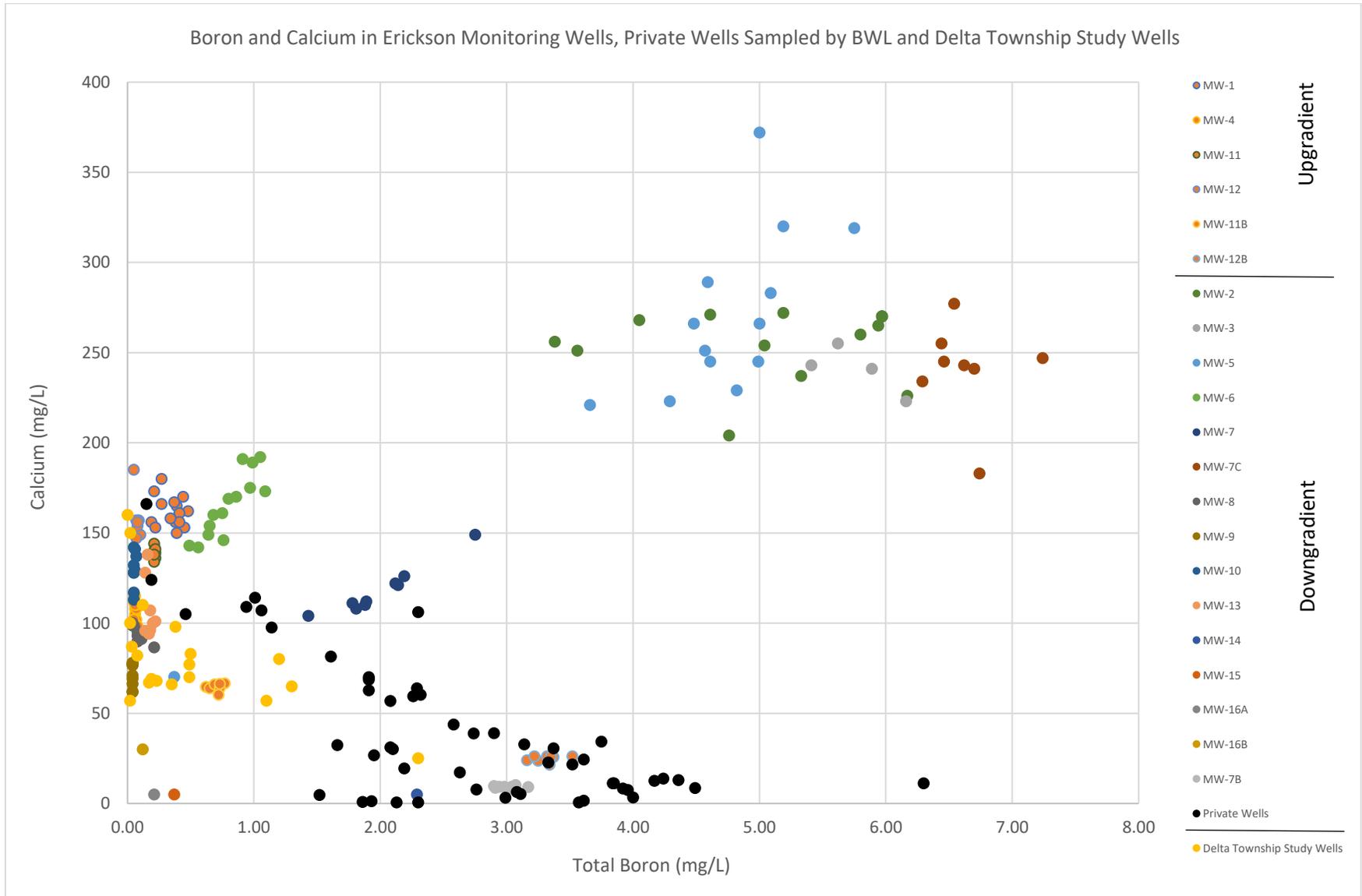
The highest concentrations of boron observed in Delta Township are associated with the BWL study, both in upgradient monitoring wells and downgradient private wells. However, one of the private wells (Figure 9 located within 2000 in longitudinal direction and more than 1,500 feet in

transverse direction) is not directly downgradient and would therefore not be expected to have significant boron impacts; and this well had a concentration (3.96 mg/L) greater than the Erickson background value (3.50 mg/L). This variability again appears to point to the spatial variability of the boron in the bedrock aquifer.

The water quality at the private wells, which includes boron concentrations at levels higher than EPA health advisory levels, has the same or similar characteristics that Rowe et al. (2021) in Ingham County and Rowe (2022) in Delta Township characterized as “naturally occurring” and associated with the shale bedrock aquifer.



**Figure 17. Concentrations of boron and lithium in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells.**



**Figure 18. Concentrations of boron and calcium in Erickson on-site monitoring wells, the private bedrock wells sampled by BWL, and the Delta Township Study bedrock wells.**

## 6.0 Summary

To date (this study incorporates data through 2022) there is no measured impact to the bedrock aquifer from the CCR impoundments at the Erickson monitoring wells. The following methods were used to evaluate the private wells water quality with a focus on the potential for the concentrations of boron and lithium in the private wells to be impacted by the Erickson CCR impoundments:

Data Review Approach	Data Review Interpretation
Comparison to Erickson bedrock background groundwater quality	It would not typically be expected that there would be exceedances over GPS a mile downgradient in the bedrock with no exceedances in closer proximity. There were no GPS exceedances observed in the bedrock aquifer at Erickson in proximity to the CCR impoundments, while there are exceedances in the glacial aquifer at Erickson in proximity to the CCR impoundments.
Concentrations relative to distance from Erickson	If the bedrock aquifer were impacted by the CCR impoundments, generally speaking, a contaminant plume would be expected, and the higher concentrations would be expected nearer to each other with less variability in such close proximity. Groundwater velocity was used to estimate travel time in the glacial sediments as 4,200 feet from the Former Impoundment after 50 years. The concentrations of boron and lithium over GPS in the private wells are 7,500 to 8,500 feet from the CCR Impoundments.
Concentrations relative to depth, comparing shallow CCR impoundment location	Typically, for metal contaminants, vertical (or downward) contaminant migration away from a contaminant source is approximately 1 percent of the horizontal migration. Unless the contaminant is dense, a steep vertical migration away from the source is not typical. Because the source of the potential contamination in question (CCR impoundments at Erickson) is very shallow (from approximately ground surface to 25 feet below ground surface), impacts to groundwater would be expected in shallow wells downgradient of the impoundments. Neither boron nor lithium have a pattern with respect to the concentration and well depth.
Plume geometry	If the boron values observed in BWL sampled private wells represented a boron plume from the CCR impoundments, the plume geometry would not match what is typically seen in contaminant transport, because the plume is wider and deeper than anticipated.
3-D analytical transport solution for continuous release	Using an analytical transport solution, the CCR Impoundments would have to be a constant source to groundwater with a concentration of boron over 11,000 mg/L for 50 years to get the concentration observed in the private well maximum concentration. This is a high concentration (by orders of magnitude) and requires a constant source, conservative aquifer parameters, and no sorption or retardation. This transport solution indicates that the CCR impoundments would have had to leach an unrealistically high boron concentration to be the source of the highest boron concentrations observed at private wells downgradient given this set of aquifer parameters.

Data Review Approach	Data Review Interpretation
Numerical flow and transport model	The preliminary numerical transport model simulated bedrock boron plume is known to be overly conservative, and the simulated plume (concentrations greater than the bedrock GPS) is approximately 3,000 feet away from the closest private well. The simulated glacial boron plume, which is shallower and calibrated closer to the observed concentrations in monitoring wells is approximately 1,500 feet away from the closest private well.
General water quality	<p>If the CCR impoundments were the source of the boron in the private wells, the sulfate concentrations would be expected to correlate with the boron, which provides evidence that the boron in these private wells may be naturally occurring.</p> <p>A review of the private well data on a piper diagram demonstrated that private bedrock wells, even in the same neighborhood (wells located very near to each other), plot in two or three different quadrants of the piper diagram, indicating they are different classes of waters. There does not appear to be two obvious “end members” of water types with direct mixing between the two. This indicates water quality variability in the bedrock private wells sampled, and this kind of variability is commonly indicative of natural variability, as opposed to an indication of impact by a contaminant source.</p>
Similarities to Ingham County and Delta Township bedrock groundwater quality studies	The water quality at the private wells has the same or similar characteristics that Rowe et al. (2021) in Ingham County and Rowe (2022) in Delta Township characterized as “naturally occurring” for boron and associated with the shale bedrock aquifer.

These various data review approaches each suggested a similar interpretation that the boron and lithium concentrations in the private wells appear to be likely naturally occurring and representative of the shale bedrock aquifer. This is particularly plausible given the similarities observed in the Ingham County groundwater study with the comparable aquifer lithology.

Several questions remain in the bedrock investigation that BWL will continue to study in cooperation with EGLE. For example, BWL has plans to install additional monitoring wells in 2023 that will investigate the shallow bedrock to confirm the groundwater impact and delineate it both horizontally and vertically. In addition, BWL and EGLE will likely need to address the question of whether the site-specific bedrock background values (based on two wells) are representative of the variability observed in the shale aquifer. BWL has presented to the regulatory agencies their intent not to sample the private wells further at this time, which was met with verbal approval.

BWL has documented glacial groundwater impacts. The groundwater investigations are ongoing. BWL continues to respond in the following ways:

- BWL retired the Erickson coal-fired power plant on November 27, 2022 and is no longer disposing CCR waste into the CCR impoundments.
- In 2022 BWL completed the Closure Plan design for the CCR Impoundments for removal of the CCR from the three impoundments. This Plan was submitted, reviewed,

and approved by EGLE. CCR impoundment source removal began in February 2023 and should be completed in October 2023.

- BWL continues to evaluate the extent of constituent of concern impacts to the glacial aquifer system. In 2022, BWL installed seven new monitoring wells, and in the first month of January 2023, BWL installed six additional monitoring wells. This has been in coordination and communication with EGLE. BWL is planning to install offsite monitoring wells, pending landowner agreements, to evaluate the potential extent of contamination horizontally and vertically. Some landowners denied access for monitoring well installation on their property and therefore this process is iterative and can be lengthy.
- BWL is also in the process of evaluating feasible groundwater corrective measure alternatives to address glacial groundwater impacts.
- BWL continues groundwater assessment monitoring and reporting associated with both the State and Federal compliance programs.
- BWL continues to compare and/or update preliminary predictive modeling when new data is gathered.

As BWL continues the investigation and corrective measures assessments, reports will continue to be available on BWL's public CCR webpage.

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# **Appendix A**

## **Lab Reports Summary Tables**

	Private Well No.:	Private Well #1	Private Well #1	Private Well #2	Private Well #2	Private Well #3	Private Well #3	Private Well #4	Private Well #4	Private Well #5
	Sample ID:	S32583.01	S36018.01	S32578.01	S36021.01	S32581.01	S36019.01	S32582.01	S36020.01	S32580.01
	Sample Date:	2/3/2022	5/16/2022	2/3/2022	5/16/2022	2/3/2022	5/16/2022	2/3/2022	5/16/2022	2/3/2022
Constituent	Unit									
<b>Field Parameters</b>										
Turbidity	NTU	0.64	No data	0.02	0.02	5.25	No data	0.13	0.45	1.46
Temperature	°C	10.0	No data	10.3	13.6	11.5	No data	10.5	14.3	10.2
Dissolved Oxygen (DO)	mg/L	1.95	No data	2.03	3.41	2.14	No data	3.06	1.97	4.50
Conductivity	mS/cm	0.643	No data	0.576	0.604	0.870	No data	0.580	0.606	0.563
pH	s.u.	7.62	No data	7.99	7.66	7.07	No data	7.59	7.72	7.86
Oxidation-Reduction Potential	mV	92.9	No data	30	56.2	121	No data	83.4	14.3	37.3
<b>Laboratory</b>										
Boron, total	mg/L	2.58	2.83	3.57	3.32	3.96	3.72	4.17	3.80	3.61
Calcium	mg/L	43.7	44.9	<0.50	25.1	7.43	6.62	12.5	23.5	24.3
Chloride	mg/L	15	12	<10	<5	12	16	<10	<5	<10
Fluoride	mg/L	NA	<1.0	NA	<1.0	NA	1.5	NA	<1.0	NA
Sulfate	mg/L	<10	5	<10	<5	<10	<5	<10	<5	<10
Total Dissolved Solids	mg/L	380	304	380	348	364	486	378	362	348
Lithium, total	mg/L	0.037	0.044	0.021	0.042	0.027	0.029	0.030	0.036	0.033
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	<3	<3	<3	<3	<3	<3	<3	<3
Bicarbonate	mg/L	399	380	401	380	482	500	390	380	387
Carbonate	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	2.5	2.71	3.27	3.33	3.62	3.68	3.61	3.7	3.61
Lithium, Dissolved	mg/L	0.038	0.043	0.02	0.042	0.026	0.03	0.032	0.036	0.032
Magnesium	mg/L	15.0	15.3	<0.50	10.7	2.20	2.04	3.87	7.12	7.43
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	5.82	6.47	2.24	7.25	4.17	3.80	4.83	5.73	6.89
Sodium	mg/L	77	63.2	163	94.2	184	188	133	103	102
Well Depth	ft	Not in wellogic	Not in wellogic	Not in wellogic	Not in wellogic	335	335	Not in wellogic	Not in wellogic	Not in wellogic

	Private Well No.:	Private Well #5	Private Well #6	Private Well #6	Private Well #7	Private Well #8	Private Well #9	Private Well #10	Private Well #11	Private Well #12
	Sample ID:	S36022.01	S32579.01	S36023.01	S33027.01	S33098.01	S33097.01	S33096.01	S33095.01	S33094.01
	Sample Date:	5/16/2022	2/3/2022	5/16/2022	2/13/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022
Constituent	Unit									
<b>Field Parameters</b>										
Turbidity	NTU	1.47	3.89	3.74	NA	0.42	0.84	0.31	0.02	0.02
Temperature	°C	14.2	9.8	13.6	NA	11.1	11.3	10.5	11.2	11.1
Dissolved Oxygen (DO)	mg/L	3.88	3.17	1.18	NA	37.00	63.30	0.42	7.20	4.91
Conductivity	mS/cm	0.593	0.564	0.612	NA	1.000	0.930	1.030	0.730	0.730
pH	s.u.	7.85	7.89	7.93	NA	7.43	8.73	7.40	7.45	7.60
Oxidation-Reduction Potential	mV	25.2	-13.5	-116.9	NA	133.7	83.1	53.3	11.3	41.3
<b>Laboratory</b>										
Boron, total	mg/L	3.65	3.84	3.87	1.51	1.95	1.93	1.86	1.91	2.26
Calcium	mg/L	24.7	11.1	11.9	NA	26.7	1.18	0.86	68.6	59.4
Chloride	mg/L	<5	<10	<5	NA	27	40	80	<5	16
Fluoride	mg/L	<1.0	NA	<1.0	NA	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	<5	<10	<5	NA	55	52	82	55	41
Total Dissolved Solids	mg/L	352	368	368	NA	514	584	634	420	418
Lithium, total	mg/L	0.040	0.033	0.037	NA	0.038	0.025	0.071	0.041	0.041
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	4	6	NA	<3	<3	<3	<3	<3
Bicarbonate	mg/L	370	384	380	NA	400	390	453	406	415
Carbonate	mg/L	<10	<10	<10	NA	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	3.48	3.77	3.77	NA	1.90	1.85	1.80	1.85	2.21
Lithium, Dissolved	mg/L	0.038	0.031	0.036	NA	0.038	0.024	0.068	0.041	0.039
Magnesium	mg/L	7.79	3.7	3.86	NA	8.92	<0.50	<0.50	24.2	19.8
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	NA	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	6.88	6.08	6.05	NA	5.13	2.19	1.17	8.77	9.18
Sodium	mg/L	99.6	127	122	NA	166	240	259	52.5	75.0
<b>Well Depth</b>	ft	Not in wellogic	Not in wellogic	Not in wellogic	200	Not in wellogic	460	Not in wellogic	370	Not in wellogic

	Private Well No.:	Private Well #13	Private Well #14	Private Well #15	Private Well #16	Private Well #17	Private Well #18	Private Well #18	Private Well #19	Private Well #20
	Sample ID:	S33104.01	S33103.01	S33102.01	S33101.01	S33100.01	S33099.01	S33167.01	S33093.01	S33092.01
	Sample Date:	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/21/2022	2/23/2022	2/21/2022	2/21/2022
Constituent	Unit									
<b>Field Parameters</b>										
Turbidity	NTU	0.02	0.34	2.15	24.8	2.24	0.02	10.1	9.78	0.63
Temperature	°C	12.2	12.4	11.6	13.3	13.1	12.3	11.4	11.1	11.6
Dissolved Oxygen (DO)	mg/L	1.19	4.55	1.85	2.65	2.90	5.16	3.45	2.81	0.98
Conductivity	mS/cm	0.617	0.840	0.820	1.090	1.090	0.463	0.770	1.460	0.810
pH	s.u.	6.61	6.93	7.64	7.00	7.02	8.15	7.23	8.23	7.51
Oxidation-Reduction Potential	mV	248.5	167.8	97.4	166.0	121.0	127.1	122.5	147.5	83.7
<b>Laboratory</b>										
Boron, total	mg/L	2.13	0.94	1.66	1.06	1.01	2.19	0.15	4.49	2.63
Calcium	mg/L	<0.50	109	32.3	107	114	19.4	166	8.51	17.2
Chloride	mg/L	<5	44	39	137	109	37	211	96	29
Fluoride	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.2	<1.0
Sulfate	mg/L	<5	58	32	70	92	56	82	225	33
Total Dissolved Solids	mg/L	304	470	484	642	638	566	850	948	472
Lithium, total	mg/L	<0.005	0.037	0.054	0.030	0.024	0.032	0.023	0.041	0.037
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	<3	<3	14	<3	<3	<3	<3	<3
Bicarbonate	mg/L	415	388	401	382	390	403	512	482	398
Carbonate	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	1.98	0.86	1.56	1.04	0.95	2.08	0.14	4.21	2.43
Lithium, Dissolved	mg/L	<0.005	0.034	0.050	0.028	0.024	0.030	0.021	0.037	0.035
Magnesium	mg/L	<0.50	41	13.4	42.4	47.5	7.30	65.8	2.97	6.66
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	2.38	6.32	6.35	5.93	6.21	4.15	3.77	4.22	5.70
Sodium	mg/L	141	11.9	139	60.6	49.4	199	48.0	326	160
Well Depth	ft	Not in wellogic	110	Not in wellogic	440	200	395	380	Not in wellogic	Not in wellogic

	Private Well No.:	Private Well #21	Private Well #22	Private Well #23	Private Well #23	Private Well #24	Private Well #24	Private Well #25	Private Well #26	Private Well #27
	Sample ID:	S33091.01	S33136.01	S33135.02	S33135.01	S33134.01	S33134.02	S33133.01	S33132.01	S33131.01
	Sample Date:	2/21/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022
Constituent	Unit				RO System		RO System			
<b>Field Parameters</b>										
Turbidity	NTU	0.02	0.02	0.02	0.02	0.02	0.02	189	17.4	224
Temperature	°C	10.3	12.2	12.0	15.5	12.0	13.1	7.5	12.2	11.9
Dissolved Oxygen (DO)	mg/L	24.80	1.69	2.00	1.69	3.66	3.76	12.11	1.92	6.17
Conductivity	mS/cm	0.665	0.720	0.616	0.602	0.357	0.130	0.120	0.612	0.643
pH	s.u.	8.01	8.29	7.06	7.23	7.52	6.75	7.98	6.98	7.14
Oxidation-Reduction Potential	mV	59.4	135.3	109.0	116.0	112.0	104.6	161.4	3.1	89.2
<b>Laboratory</b>										
Boron, total	mg/L	3.08	3.11	2.29	2.20	3.33	3.11	1.52	2.08	1.61
Calcium	mg/L	6.27	5.28	63.9	3.90	22.7	<0.50	4.63	56.8	81.5
Chloride	mg/L	8	8	14	12	16	<5	13	5	19
Fluoride	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Sulfate	mg/L	6	7	11	10	15	<5	16	18	30
Total Dissolved Solids	mg/L	408	418	354	398	430	50	310	362	380
Lithium, total	mg/L	0.028	0.027	0.042	0.011	0.034	<0.005	0.013	0.038	0.039
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	<3	<3	<3	<3	NA	141	8	61
Bicarbonate	mg/L	409	387	381	376	424	44	415	389	377
Carbonate	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	3.00	2.95	2.07	2.17	3.21	2.80	1.44	1.97	1.47
Lithium, Dissolved	mg/L	0.028	0.025	0.039	0.011	0.035	<0.005	0.010	0.039	0.035
Magnesium	mg/L	1.78	1.51	21.2	0.66	8.36	<0.50	1.60	20.8	28.2
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	3.80	3.84	9.65	1.96	5.99	<0.50	3.32	8.55	7.48
Sodium	mg/L	150	160	42.5	162	133	7.48	111	47.0	18.0
Well Depth	ft	340	380	360	360	360	360	396	Not in wellogic	Not in wellogic

	Private Well No.:	Private Well #28	Private Well #29	Private Well #30	Private Well #31	Private Well #32	Private Well #33	Private Well #34	Private Well #35	Private Well #35
	Sample ID:	S33142.01	S33140.01	S33141.01	S33139.01	S33138.01	S33137.01	S33170.01	S33171.01	S34322.01
	Sample Date:	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/22/2022	2/23/2022	2/23/2022	3/28/2022
Constituent	Unit									
<b>Field Parameters</b>										
Turbidity	NTU	0.31	0.01	0.1	0.02	0.04	0.48	0.1	1.1	0.02
Temperature	°C	10.8	12.00	11.0	11.5	11.6	10.1	10.9	11.8	11.6
Dissolved Oxygen (DO)	mg/L	5.02	6.43	0.90	2.77	7.13	47.30	10.57	7.36	2.19
Conductivity	mS/cm	1.130	1.150	1.260	0.620	0.870	0.050	NA	3.000	3.300
pH	s.u.	8.41	7.27	7.43	7.68	7.34	7.59	8.00	8.42	8.34
Oxidation-Reduction Potential	mV	-16.8	8.2	-3.9	37.9	7.2	41.0	60.2	53.3	322.6
<b>Laboratory</b>										
Boron, total	mg/L	2.99	0.19	2.30	2.74	0.46	1.91	3.75	6.30	5.68
Calcium	mg/L	3.23	124	106	38.8	105	70.0	34.3	11.1	11.9
Chloride	mg/L	77	154	189	7	56	12	81	157	140
Fluoride	mg/L	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	1.1	1.4	1.4
Sulfate	mg/L	75	63	72	<5	53	24	61	1,140	1120
Total Dissolved Solids	mg/L	682	650	726	344	492	384	624	604	2250
Lithium, total	mg/L	0.032	0.016	0.070	0.030	0.032	0.038	0.040	0.091	0.096
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	<3	<3	<3	<3	<3	<3	<3	<3
Bicarbonate	mg/L	401	406	414	382	415	394	448	536	410
Carbonate	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	2.96	0.19	2.20	2.66	0.44	1.86	3.79	6.02	5.45
Lithium, Dissolved	mg/L	0.031	0.015	0.066	0.028	0.030	0.038	0.042	0.085	0.092
Magnesium	mg/L	1.30	46.5	36.1	14.1	42.3	23.5	11.6	4.71	4.59
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	3.30	3.36	12.6	6.14	5.03	8.96	6.48	5.78	5.74
Sodium	mg/L	264	40.2	100	80.9	8.91	34.1	185	756	752
Well Depth	ft	321	300	425	295	Not in welllogic	396	72	Not in welllogic	Not in welllogic

	Private Well No.:	Private Well #36	Private Well #37	Private Well #38	Private Well #39	Private Well #40	Private Well #40	Private Well #41	Private Well #42	Private Well #43
	Sample ID:	S33172.01	S33173.01	S33174.01	S33163.01	S33164.01	S34900.01	S33165.01	S33166.01	S33168.01
	Sample Date:	2/23/2022	2/23/2022	2/23/2022	2/23/2022	2/23/2022	4/13/2022	2/23/2022	2/23/2022	2/23/2022
Constituent	Unit									
<b>Field Parameters</b>										
Turbidity	NTU	0.51	0.01	0.02	0.02	0.02	4.62	0.02	0.02	8.08
Temperature	°C	10.4	12.5	10.6	11.0	10.3	12.4	10.1	11.3	10.6
Dissolved Oxygen (DO)	mg/L	7.70	3.43	4.31	0.89	1.55	3.27	2.97	3.07	2.60
Conductivity	mS/cm	1.140	7.010	0.830	1.260	1.930	1.960	0.608	0.970	1.150
pH	s.u.	8.20	7.76	7.37	8.47	8.20	7.47	8.29	7.80	7.76
Oxidation-Reduction Potential	mV	43.8	43.2	18.9	104.0	215.1	152.0	181.2	114.00	76.0
<b>Laboratory</b>										
Boron, total	mg/L	2.76	2.90	1.14	3.92	4.24	4.36	3.85	2.10	2.08
Calcium	mg/L	7.64	39	97.5	8.27	13.7	13.0	11.1	30.1	31.1
Chloride	mg/L	83	90	43	45	111	119	30	79	142
Fluoride	mg/L	<1.0	<1.0	<1.0	1.3	1.1	<1.0	1.4	<1.0	<1.0
Sulfate	mg/L	89	62	42	179	410	455	61	64	65
Total Dissolved Solids	mg/L	2260	592	436	820	1250	1280	726	596	704
Lithium, total	mg/L	0.035	0.037	0.038	0.036	0.051	0.061	0.030	0.046	0.040
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	<3	<3	<3	<3	<3	<3	<3	<3
Bicarbonate	mg/L	459	407	464	516	489	470	650	464	495
Carbonate	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	2.84	2.72	1.08	3.91	4.16	4.02	3.59	1.98	1.99
Lithium, Dissolved	mg/L	0.037	0.035	0.034	0.035	0.051	0.057	0.029	0.042	0.038
Magnesium	mg/L	3.03	16.3	36.5	3.07	5.29	4.56	5.15	9.71	12.4
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	4.37	7.06	6.96	4.23	5.12	4.95	3.35	7.13	6.08
Sodium	mg/L	261	158	14.0	310	414	436	269	194	227
Well Depth	ft	245	410	276	460	420	420	410	Not in wellogic	440

	Private Well No.:	Private Well #44	Private Well #45	Private Well #46	Private Well #47	Private Well #47	Private Well #48	Private Well #49	Private Well #50	Private Well #51
	Sample ID:	S33169.01	S33293.01	S33294.01	S33295.01	S34321.01	S33292.01	S33292.02	S33291.01	S33290.01
	Sample Date:	2/23/2022	2/24/2022	2/24/2022	2/24/2022	3/28/2022	2/24/2022	2/24/2022	2/24/2022	2/24/2022
Constituent	Unit							RO System		
<b>Field Parameters</b>										
Turbidity	NTU	0.02	0.05	3.00	0.02	3.53	0.02	0.02	0.02	0.02
Temperature	°C	10.2	10.2	11.9	10.7	12.2	11.0	18.0	11.0	10.8
Dissolved Oxygen (DO)	mg/L	2.68	1.55	2.82	2.30	7.76	1.27	2.14	1.44	1.64
Conductivity	mS/cm	1.320	1.060	0.319	1.650	1.820	1.250	0.082	0.850	0.890
pH	s.u.	8.68	7.41	7.43	8.6	6.94	7.44	5.91	6.86	7.41
Oxidation-Reduction Potential	mV	244.0	100.2	132.6	181.4	311.3	114.9	160.2	155.3	145.3
<b>Laboratory</b>										
Boron, total	mg/L	3.61	1.91	3.14	4.00	3.62	3.37	2.61	2.32	2.30
Calcium	mg/L	1.51	62.7	32.7	3.37	3.25	30.6	<0.50	60.2	<0.50
Chloride	mg/L	77	77	<5	70	71	34	<5	13	14
Fluoride	mg/L	1.2	<1.0	<1.0	1.2	1.3	1.2	<1.0	<1.0	<1.0
Sulfate	mg/L	122	102	<5	353	305	90	<5	62	38
Total Dissolved Solids	mg/L	840	646	328	1120	1040	694	28	418	458
Lithium, total	mg/L	0.031	0.044	0.031	0.041	0.041	0.032	<0.005	0.041	0.007
Molybdenum, total	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Total Suspended Solids	mg/L	<3	<3	<3	<3	<3	<3	<3	<3	<3
Bicarbonate	mg/L	453	512	378	531	530	559	22	390	403
Carbonate	mg/L	<10	<10	<10	<10	<10	<10	<10	<10	<10
Boron, Dissolved	mg/L	3.34	1.86	2.80	3.82	3.47	3.37	2.58	2.28	2.24
Lithium, Dissolved	mg/L	0.027	0.043	0.029	0.038	0.039	0.033	<0.005	0.042	0.006
Magnesium	mg/L	<0.50	25.9	11.6	1.28	1.07	11.8	<0.50	20.6	<0.50
Molybdenum, Dissolved	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium	mg/L	2.65	7.43	6.16	3.47	3.27	5.02	<0.50	8.95	3.36
Sodium	mg/L	287	156	84.8	406	401	223	5.90	70.2	193
Well Depth	ft	340	400	230	360	360	400	400	Not in wellogic	385

	Private Well No.:	Private Well #52
	Sample ID:	S34901.01
	Sample Date:	4/13/2022
Constituent	Unit	
<b>Field Parameters</b>		
Turbidity	NTU	2.48
Temperature	°C	12.7
Dissolved Oxygen (DO)	mg/L	2.25
Conductivity	mS/cm	0.660
pH	s.u.	7.82
Oxidation-Reduction Potential	mV	116.7
<b>Laboratory</b>		
Boron, total	mg/L	3.52
Calcium	mg/L	21.6
Chloride	mg/L	10
Fluoride	mg/L	<1.0
Sulfate	mg/L	24
Total Dissolved Solids	mg/L	444
Lithium, total	mg/L	0.035
Molybdenum, total	mg/L	<0.005
Total Suspended Solids	mg/L	<3
Bicarbonate	mg/L	430
Carbonate	mg/L	<10
Boron, Dissolved	mg/L	3.34
Lithium, Dissolved	mg/L	0.035
Magnesium	mg/L	7.04
Molybdenum, Dissolved	mg/L	<0.005
Potassium	mg/L	5.46
Sodium	mg/L	145
<b>Well Depth</b>	ft	426

## **Appendix B**

### **Lab Reports**



Report ID: S32578.01(02)  
Generated on 02/08/2022  
Replaces report S32578.01(01) generated on 02/07/2022

**Report to**

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Additional Contacts: Cheryl Louden

**Report produced by**

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

**Report Summary**

---

Lab Sample ID(s): S32578.01  
Project: Monitoring  
Collected Date(s): 02/03/2022  
Submitted Date/Time: 02/03/2022 14:40  
Sampled by: Tanten Buszka  
P.O. #:

**Table of Contents**

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- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

All analyses completed



## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S32578.01	[REDACTED]	Drinking Water	02/03/22 12:28



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32578.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/03/2022 12:28

Matrix: Drinking Water

COC Reference: 147676

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
2	1L Plastic	None	Yes	6.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/04/22 09:46, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	Not detected	10	0.13	mg/L	10	16887-00-6	
Sulfate	Not detected	10	1.0	mg/L	10	14808-79-8	

Method: SM2320B, Run Date: 02/05/22 08:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bicarbonate*	401	10		mg/L	1	71-52-3	
Carbonate*	Not detected	10		mg/L	1	3812-32-6	

Method: SM2540C, Run Date: 02/04/22 13:42, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids*	380	20		mg/L	2		

Method: SM2540D, Run Date: 02/03/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids*	Not detected	3		mg/L	1		

### Metals

Method: E200.8, Run Date: 02/07/22 11:55, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	Not detected	0.50		mg/L	5	7440-70-2	
Magnesium*	Not detected	0.50		mg/L	5	7439-95-4	
Potassium*	2.24	0.50		mg/L	5	7440-09-7	
Sodium*	163	0.50		mg/L	5	7440-23-5	

Method: E200.8, Run Date: 02/07/22 12:53, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron*	3.57	0.04		mg/L	5	7440-42-8	
Lithium*	0.021	0.005		mg/L	5	7439-93-2	
Molybdenum*	Not detected	0.005		mg/L	5	7439-98-7	

Method: E200.8, Run Date: 02/07/22 12:56, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron, Dissolved*	3.27	0.04		mg/L	5	7440-42-8	f

f-Filtered and preserved in lab



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32578.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 02/07/22 12:56, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium, Dissolved*	0.020	0.005		mg/L	5	7439-93-2	f
Molybdenum, Dissolved*	Not detected	0.005		mg/L	5	7439-98-7	f

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S32578

Client:MISC01 (HDR Inc.)

Project: Monitoring

Submitted:02/03/2022 14:40 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 6.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S32578      Submitted: 02/03/2022 14:40

Client: MISC01 (HDR Inc.)

Project: Monitoring

Initial Preservation Check: 02/03/2022 15:17 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S32578.01	125ml Plastic HNO3	<2			





Report ID: S32579.01(02)  
Generated on 02/08/2022  
Replaces report S32579.01(01) generated on 02/07/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Additional Contacts: Cheryl Louden

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S32579.01  
Project: Monitoring  
Collected Date(s): 02/03/2022  
Submitted Date/Time: 02/03/2022 14:40  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

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When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

All analyses completed

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
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x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

Final Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S32579.01	[REDACTED]	Drinking Water	02/03/22 11:33



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32579.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/03/2022 11:33

Matrix: Drinking Water

COC Reference: 147675

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
2	1L Plastic	None	Yes	6.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/04/22 09:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	Not detected	10	0.13	mg/L	10	16887-00-6	
Sulfate	Not detected	10	1.0	mg/L	10	14808-79-8	

Method: SM2320B, Run Date: 02/05/22 08:10, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bicarbonate*	384	10		mg/L	1	71-52-3	
Carbonate*	Not detected	10		mg/L	1	3812-32-6	

Method: SM2540C, Run Date: 02/04/22 13:42, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids*	368	20		mg/L	2		

Method: SM2540D, Run Date: 02/03/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids*	4	3		mg/L	1		

### Metals

Method: E200.8, Run Date: 02/07/22 11:58, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	11.1	0.50		mg/L	5	7440-70-2	
Magnesium*	3.70	0.50		mg/L	5	7439-95-4	
Potassium*	6.08	0.50		mg/L	5	7440-09-7	
Sodium*	127	0.50		mg/L	5	7440-23-5	

Method: E200.8, Run Date: 02/07/22 12:59, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron*	3.84	0.04		mg/L	5	7440-42-8	
Lithium*	0.033	0.005		mg/L	5	7439-93-2	
Molybdenum*	Not detected	0.005		mg/L	5	7439-98-7	

Method: E200.8, Run Date: 02/07/22 13:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron, Dissolved*	3.77	0.04		mg/L	5	7440-42-8	f

f-Filtered and preserved in lab



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32579.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 02/07/22 13:01, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium, Dissolved*	0.031	0.005		mg/L	5	7439-93-2	f
Molybdenum, Dissolved*	Not detected	0.005		mg/L	5	7439-98-7	f

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S32579

Client:MISC01 (HDR Inc.)

Project: Monitoring

Submitted:02/03/2022 14:40 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 6.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S32579      Submitted: 02/03/2022 14:40

Client: MISC01 (HDR Inc.)

Project: Monitoring

Initial Preservation Check: 02/03/2022 15:17 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S32579.01	125ml Plastic HNO3	<2			





Report ID: S32580.01(02)  
Generated on 02/08/2022  
Replaces report S32580.01(01) generated on 02/07/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Additional Contacts: Cheryl Louden

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S32580.01  
Project: Monitoring  
Collected Date(s): 02/03/2022  
Submitted Date/Time: 02/03/2022 14:40  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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All analyses completed



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

Final Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S32580.01	[REDACTED]	Drinking Water	02/03/22 10:56



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32580.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/03/2022 10:56

Matrix: Drinking Water

COC Reference: 147674

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
2	1L Plastic	None	Yes	6.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/04/22 10:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	Not detected	10	0.13	mg/L	10	16887-00-6	
Sulfate	Not detected	10	1.0	mg/L	10	14808-79-8	

Method: SM2320B, Run Date: 02/05/22 08:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bicarbonate*	387	10		mg/L	1	71-52-3	
Carbonate*	Not detected	10		mg/L	1	3812-32-6	

Method: SM2540C, Run Date: 02/04/22 13:42, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids*	348	20		mg/L	2		

Method: SM2540D, Run Date: 02/04/22 17:22, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids*	Not detected	3		mg/L	1.00		

### Metals

Method: E200.8, Run Date: 02/07/22 12:00, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	24.3	0.50		mg/L	5	7440-70-2	
Magnesium*	7.43	0.50		mg/L	5	7439-95-4	
Potassium*	6.89	0.50		mg/L	5	7440-09-7	
Sodium*	102	0.50		mg/L	5	7440-23-5	

Method: E200.8, Run Date: 02/07/22 13:03, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron*	3.61	0.04		mg/L	5	7440-42-8	
Lithium*	0.033	0.005		mg/L	5	7439-93-2	
Molybdenum*	Not detected	0.005		mg/L	5	7439-98-7	

Method: E200.8, Run Date: 02/07/22 13:05, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron, Dissolved*	3.61	0.04		mg/L	5	7440-42-8	f

f-Filtered and preserved in lab



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32580.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 02/07/22 13:05, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium, Dissolved*	0.032	0.005		mg/L	5	7439-93-2	f
Molybdenum, Dissolved*	Not detected	0.005		mg/L	5	7439-98-7	f

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S32580

Client:MISC01 (HDR Inc.)

Project: Monitoring

Submitted:02/03/2022 14:40 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 6.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S32580      Submitted: 02/03/2022 14:40

Client: MISC01 (HDR Inc.)

Project: Monitoring

Initial Preservation Check: 02/03/2022 15:17 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S32580.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 147674

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Molly Reeves and Cheryl Iouden  
 COMPANY HDR Inc  
 ADDRESS 5405 Dater Ct  
 CITY Ann Arbor STATE MI ZIP CODE 48108  
 PHONE NO. 517-263-7138 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Molly.Reeves@HDRinc.com QUOTE NO. \_\_\_\_\_

CONTACT NAME Cheryl Iouden  SAME  
 COMPANY LBWL  
 ADDRESS 1201 S Washington Ave  
 CITY Lansing STATE MI ZIP CODE 48910  
 PHONE NO. 517-763-1465 E-MAIL ADDRESS Cheryl.iouden@LBWL.com

PROJECT NO./NAME \_\_\_\_\_ SAMPLER(S) - PLEASE PRINT/SIGN NAME Tamara Buschen  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 CODE: SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	# Containers & Preservatives							OTHER						
	DATE	TIME					HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER								
<u>32580.01</u>	<u>2-3-22</u>	<u>16:56</u>		<u>DW</u>	<u>4</u>	<u>3</u>		<u>1</u>												

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

<u>B, Li, Mo Totals</u>	<u>Calcium, Chloride</u>	<u>SO<sub>4</sub>, Mg, Na, K, CO<sub>3</sub></u>	<u>TDS, TSS</u>	<u>NaHCO<sub>3</sub></u>
<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>	<u>X</u>

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other \_\_\_\_\_  
 Special Instructions

Report all results at same time to Molly and Cheryl.

RELINQUISHED BY: [Signature]  Sampler DATE 2-3-22 TIME 14:40  
 RECEIVED BY: [Signature] DATE 2/3/22 TIME 1440

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 6.0



Report ID: S32581.01(02)  
Generated on 02/08/2022  
Replaces report S32581.01(01) generated on 02/07/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Additional Contacts: Cheryl Louden

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S32581.01  
Project: Monitoring  
Collected Date(s): 02/03/2022  
Submitted Date/Time: 02/03/2022 14:30  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

All analyses completed



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

Final Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S32581.01	[REDACTED]	Drinking Water	02/03/22 09:29



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32581.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/03/2022 09:29

Matrix: Drinking Water

COC Reference: 147673

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
2	1L Plastic	None	Yes	6.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/04/22 10:16, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	12	10	0.13	mg/L	10	16887-00-6	
Sulfate	Not detected	10	1.0	mg/L	10	14808-79-8	

Method: SM2320B, Run Date: 02/05/22 08:16, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bicarbonate*	482	10		mg/L	1	71-52-3	
Carbonate*	Not detected	10		mg/L	1	3812-32-6	

Method: SM2540C, Run Date: 02/04/22 13:42, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids*	364	20		mg/L	2		

Method: SM2540D, Run Date: 02/04/22 17:22, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids*	Not detected	3		mg/L	1.00		

### Metals

Method: E200.8, Run Date: 02/07/22 12:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	7.43	0.50		mg/L	5	7440-70-2	
Magnesium*	2.20	0.50		mg/L	5	7439-95-4	
Potassium*	4.17	0.50		mg/L	5	7440-09-7	
Sodium*	184	0.50		mg/L	5	7440-23-5	

Method: E200.8, Run Date: 02/07/22 13:08, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron*	3.96	0.04		mg/L	5	7440-42-8	
Lithium*	0.027	0.005		mg/L	5	7439-93-2	
Molybdenum*	Not detected	0.005		mg/L	5	7439-98-7	

Method: E200.8, Run Date: 02/07/22 13:10, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron, Dissolved*	3.62	0.04		mg/L	5	7440-42-8	f

f-Filtered and preserved in lab



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32581.01 (continued)

Sample Tag: XXXXXXXXXX

Method: E200.8, Run Date: 02/07/22 13:10, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium, Dissolved*	0.026	0.005		mg/L	5	7439-93-2	f
Molybdenum, Dissolved*	Not detected	0.005		mg/L	5	7439-98-7	f

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S32581

Client:MISC01 (HDR Inc.)

Project: Monitoring

Submitted:02/03/2022 14:30 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 6.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S32581      Submitted: 02/03/2022 14:30

Client: MISC01 (HDR Inc.)

Project: Monitoring

Initial Preservation Check: 02/03/2022 15:17 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S32581.01	125ml Plastic HNO3	<2			





Report ID: S32582.01(02)  
Generated on 02/08/2022  
Replaces report S32582.01(01) generated on 02/07/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Additional Contacts: Cheryl Louden

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S32582.01  
Project: Monitoring  
Collected Date(s): 02/03/2022  
Submitted Date/Time: 02/03/2022 14:30  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

All analyses completed



Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

Final Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S32582.01	[REDACTED]	Drinking Water	02/03/22 10:15



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32582.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/03/2022 10:15

Matrix: Drinking Water

COC Reference: 147672

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
2	1L Plastic	None	Yes	6.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/04/22 10:26, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	Not detected	10	0.13	mg/L	10	16887-00-6	
Sulfate	Not detected	10	1.0	mg/L	10	14808-79-8	

Method: SM2320B, Run Date: 02/05/22 08:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bicarbonate*	390	10		mg/L	1	71-52-3	
Carbonate*	Not detected	10		mg/L	1	3812-32-6	

Method: SM2540C, Run Date: 02/04/22 13:42, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids*	378	20		mg/L	2		

Method: SM2540D, Run Date: 02/04/22 17:22, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids*	Not detected	3		mg/L	1.00		

### Metals

Method: E200.8, Run Date: 02/07/22 12:04, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	12.5	0.50		mg/L	5	7440-70-2	
Magnesium*	3.87	0.50		mg/L	5	7439-95-4	
Potassium*	4.83	0.50		mg/L	5	7440-09-7	
Sodium*	133	0.50		mg/L	5	7440-23-5	

Method: E200.8, Run Date: 02/07/22 13:22, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron*	4.17	0.04		mg/L	5	7440-42-8	
Lithium*	0.030	0.005		mg/L	5	7439-93-2	
Molybdenum*	Not detected	0.005		mg/L	5	7439-98-7	

Method: E200.8, Run Date: 02/07/22 13:24, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron, Dissolved*	3.61	0.04		mg/L	5	7440-42-8	f

f-Filtered and preserved in lab



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32582.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 02/07/22 13:24, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium, Dissolved*	0.032	0.005		mg/L	5	7439-93-2	f
Molybdenum, Dissolved*	Not detected	0.005		mg/L	5	7439-98-7	f

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S32582

Client:MISC01 (HDR Inc.)

Project: Monitoring

Submitted:02/03/2022 14:30 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 6.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |   |
|-----|--|---|
| 06. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out<br>Sampler name missing |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab            |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC                   |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to:          |

## Preservation

- |     |  |  |
|-----|--|--|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                         |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)                  |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?<br>Dissolved metals |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact  |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                   |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used  |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                         |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration<br>Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                     |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace             |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S32582      Submitted: 02/03/2022 14:30

Client: MISC01 (HDR Inc.)

Project: Monitoring

Initial Preservation Check: 02/03/2022 15:17 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S32582.01	125ml Plastic HNO3	<2			





Report ID: S32583.01(02)  
Generated on 02/08/2022  
Replaces report S32583.01(01) generated on 02/07/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Additional Contacts: Cheryl Louden

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S32583.01  
Project: Monitoring  
Collected Date(s): 02/03/2022  
Submitted Date/Time: 02/03/2022 14:30  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

All analyses completed



## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

Final Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S32583.01	[REDACTED]	Drinking Water	02/03/22 13:28



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32583.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/03/2022 13:28

Matrix: Drinking Water

COC Reference: 147671

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	6.0	IR
1	125ml Plastic	None	Yes	6.0	IR
2	1L Plastic	None	Yes	6.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	
Metal Digestion	Completed	SW3015A	02/07/22 10:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/04/22 10:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Chloride	15	10	0.13	mg/L	10	16887-00-6	
Sulfate	Not detected	10	1.0	mg/L	10	14808-79-8	

Method: SM2320B, Run Date: 02/05/22 08:20, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Bicarbonate*	399	10		mg/L	1	71-52-3	
Carbonate*	Not detected	10		mg/L	1	3812-32-6	

Method: SM2540C, Run Date: 02/04/22 13:42, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Dissolved Solids*	380	20		mg/L	2		

Method: SM2540D, Run Date: 02/04/22 17:22, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Total Suspended Solids*	Not detected	3		mg/L	1.00		

### Metals

Method: E200.8, Run Date: 02/07/22 12:05, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Calcium*	43.7	0.50		mg/L	5	7440-70-2	
Magnesium*	15.0	0.50		mg/L	5	7439-95-4	
Potassium*	5.82	0.50		mg/L	5	7440-09-7	
Sodium*	77.0	0.50		mg/L	5	7440-23-5	

Method: E200.8, Run Date: 02/07/22 13:13, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron*	2.58	0.04		mg/L	5	7440-42-8	
Lithium*	0.037	0.005		mg/L	5	7439-93-2	
Molybdenum*	Not detected	0.005		mg/L	5	7439-98-7	

Method: E200.8, Run Date: 02/07/22 13:16, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron, Dissolved*	2.50	0.04		mg/L	5	7440-42-8	f

f-Filtered and preserved in lab



# Analytical Laboratory Report

Final Report

Lab Sample ID: S32583.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 02/07/22 13:16, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Lithium, Dissolved*	0.038	0.005		mg/L	5	7439-93-2	f
Molybdenum, Dissolved*	Not detected	0.005		mg/L	5	7439-98-7	f

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S32583

Client:MISC01 (HDR Inc.)

Project: Monitoring

Submitted:02/03/2022 14:30 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 6.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S32583      Submitted: 02/03/2022 14:30

Client: MISC01 (HDR Inc.)

Project: Monitoring

Initial Preservation Check: 02/03/2022 15:17 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S32583.01	125ml Plastic HNO3	<2			





# Analytical Laboratory Report

Report ID: S33027.01(01)  
Generated on 02/21/2022

Report to  
Attention: Jennifer Caporale  
Board of Water & Light  
P.O. Box 13007  
Lansing, MI 48901  
  
Phone: 517-702-6372 FAX:  
Email: Environmental\_Laboratory@LBWL.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33027.01  
Project: General Customer-General Lab  
Collected Date(s): 02/13/2022  
Submitted Date/Time: 02/18/2022 11:56  
Sampled by: ██████████  
P.O. #:

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33027.01	[REDACTED]	Groundwater	02/13/22 21:00



# Analytical Laboratory Report

Lab Sample ID: S33027.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/13/2022 21:00

Matrix: Groundwater

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	500ml Plastic	HNO3	Yes	14.9	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	02/18/22 13:00	CCM	

### Metals

Method: E200.8, Run Date: 02/18/22 15:16, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags
Boron	1.51	0.04		mg/L	5	7440-42-8	

# Merit Laboratories Login Checklist

Lab Set ID:S33027

Client:BWL01 (Board of Water & Light)

Project: General Customer-General Lab

Submitted:02/18/2022 11:56 Login User: JRM

Attention: Jennifer Caporale

Address: Board of Water & Light

P.O. Box 13007

Lansing, MI 48901

Phone: 517-702-6372

FAX:

Email: Environmental\_Laboratory@LBWL.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 14.9
02.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33027      Submitted: 02/18/2022 11:56

Client: BWL01 (Board of Water & Light)

Project: General Customer-General Lab

Initial Preservation Check: 02/18/2022 13:27 JRM

Preservation Recheck (E200.8): N/A

Attention: Jennifer Caporale  
Address: Board of Water & Light  
P.O. Box 13007  
Lansing, MI 48901

Phone: 517-702-6372      FAX:  
Email: Environmental\_Laboratory@LBWL.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33027.01	500ml Plastic HNO3	<2			





# Analytical Laboratory Report

Report ID: S33091.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33091.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Henry Schnaidt  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33091.01	[REDACTED]	Drinking Water	02/21/22 11:55



# Analytical Laboratory Report

Lab Sample ID: S33091.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 11:55

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 08:22, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	8	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	6	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	409	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	408	20		mg/L	2			

Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 11:59, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.08	0.04		mg/L	2	7440-42-8		
Lithium*	0.028	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.00	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.028	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33091.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 13:48, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	6.27	0.50		mg/L	2	7440-70-2		
Magnesium*	1.78	0.50		mg/L	2	7439-95-4		
Potassium*	3.80	0.50		mg/L	2	7440-09-7		
Sodium*	150	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33091

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab Not signed by courier
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33091      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:23 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33091.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Molly Reeves  
 COMPANY HDR  
 ADDRESS 5405 Data Court  
 CITY Ann Arbor STATE MI ZIP CODE 48108  
 PHONE NO. 734-263-7138 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS molly.reeves@hdrinc.com QUOTE NO. \_\_\_\_\_

CONTACT NAME Cheryl Louden  SAME  
 COMPANY Lansing Board of Water & Light (BWL)  
 ADDRESS On File  
 CITY On File STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. 517-763-1465 E-MAIL ADDRESS Cheryl.Louden@LBWL.COM

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME Private Well Sampling - Phase II SAMPLER(S) - PLEASE PRINT/SIGN NAME Henry Schnaidt  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other Lansing, MI  
 Special Instructions \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives									
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER			
<u>33091.01</u>	<u>2/21/22</u>	<u>1155</u>		<u>DW</u>	<u>4</u>	<u>3</u>		<u>1</u>							

See attached list

Flowite

RELINQUISHED BY: Henry Schnaidt <sup>Sampler</sup> DATE 2/21/22 TIME 1237  
 RECEIVED BY: LBWL conference room DATE 2/21/22 TIME 1237

RELINQUISHED BY: Merit Drop Box DATE 2/21/22 TIME 1600  
 RECEIVED BY: M. Calcutt DATE 2/21/22 TIME 1600

SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_

NOTES: TEMP. ON ARRIVAL 3.3

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33092.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33092.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Henry Schnaidt  
P.O. #:

## Table of Contents

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Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33092.01	[REDACTED]	Drinking Water	02/21/22 11:12



# Analytical Laboratory Report

Lab Sample ID: S33092.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/21/2022 11:12

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/22/22 08:32, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	29	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	33	5	0.52	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 08:10, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	398	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	472	20		mg/L	2			

**Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 12:03, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.63	0.04		mg/L	2	7440-42-8		
Lithium*	0.037	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 12:05, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.43	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.035	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33092.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 13:50, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	17.2	0.50		mg/L	2	7440-70-2		
Magnesium*	6.66	0.50		mg/L	2	7439-95-4		
Potassium*	5.70	0.50		mg/L	2	7440-09-7		
Sodium*	160	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33092

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab Not signed by courier
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33092      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:24 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33092.01	125ml Plastic HNO3	<2			



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 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Molly Reeves  
 COMPANY HDR  
 ADDRESS 5405 Data Court  
 CITY Ann Arbor STATE MI ZIP CODE 48108  
 PHONE NO. 734-263-7138 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS molly.reeves@hdrinc.com QUOTE NO. \_\_\_\_\_

CONTACT NAME Cheryl Louden  SAME  
 COMPANY Lansing Board of Water & Light (BWL)  
 ADDRESS On File  
 CITY On File STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. 517-763-1465 E-MAIL ADDRESS Cheryl.Louden@LBWL.COM

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME Private Well Sampling - Phase II SAMPLER(S) - PLEASE PRINT/SIGN NAME Henry Schmidt  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER
	DATE	TIME										
<u>33092.01</u>	<u>2/2/22</u>	<u>11:52</u>		<u>DW</u>	<u>4</u>	<u>3</u>		<u>1</u>				

See attached list  
 Fluoride  
 Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other Lansing, MI  
 Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION Henry Schmidt \*Sampler DATE 2/2/22 TIME 12:37  
 RECEIVED BY: SIGNATURE/ORGANIZATION LBWL Conference Room DATE 2/2/22 TIME 12:37

RELINQUISHED BY: SIGNATURE/ORGANIZATION Merit Drop Box DATE 2/21/22 TIME 16:00  
 RECEIVED BY: SIGNATURE/ORGANIZATION M Chilcote DATE 2/21/22 TIME 16:00  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 3.3

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33093.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33093.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Henry Schnaidt  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33093.01	[REDACTED]	Drinking Water	02/21/22 10:19



# Analytical Laboratory Report

Lab Sample ID: S33093.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 10:19

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 08:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	1.2	1.0	0.08	mg/L	5	16984-48-8		4.0

Method: E300.0, Run Date: 02/22/22 10:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	96	10	0.13	mg/L	10	16887-00-6		
Sulfate	225	10	1.0	mg/L	10	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	482	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	948	20		mg/L	2			

Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 12:07, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	4.49	0.04		mg/L	2	7440-42-8		
Lithium*	0.041	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:09, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	4.21	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.037	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33093.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 13:52, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	8.51	0.50		mg/L	2	7440-70-2		
Magnesium*	2.97	0.50		mg/L	2	7439-95-4		
Potassium*	4.22	0.50		mg/L	2	7440-09-7		
Sodium*	326	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33093

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab Not signed by courier
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33093      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:24 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33093.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33094.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33094.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33094.01	[REDACTED]	Drinking Water	02/21/22 14:05



# Analytical Laboratory Report

Lab Sample ID: S33094.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 14:05

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 08:52, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	16	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	41	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:16, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	415	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	418	20		mg/L	2			

Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 12:10, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.26	0.04		mg/L	2	7440-42-8		
Lithium*	0.041	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:12, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.21	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.039	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33094.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 13:53, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	59.4	0.50		mg/L	2	7440-70-2		
Magnesium*	19.8	0.50		mg/L	2	7439-95-4		
Potassium*	9.18	0.50		mg/L	2	7440-09-7		
Sodium*	75.0	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33094

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out No Sampler Listed
07.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab Not signed by courier
08.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC No sample tags on bottles - nothing to identify bottles
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33094      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:31 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33094.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO. \_\_\_\_\_

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME \_\_\_\_\_

TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_

DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

**# Containers & Preservatives**

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCL	HNO3	H2SO4	NaOH	MeOH	OTHER	See attached list
	DATE	TIME											
33094.01	2/21/22	1405		DW	4	3	1						✓

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other Lansing, MI  
 Special Instructions

RELINQUISHED BY: *Neil Tre*  Sampler DATE **2/21/22** TIME **1430**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RECEIVED BY: *Bridgson Service Center* DATE **2/21/22** TIME **1430**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: *Miss Drop box* DATE **2/21/22** TIME **1600**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL \_\_\_\_\_

RECEIVED BY: *Johanna Murray* DATE **2/21/22** TIME **1630**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: **3.3**

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33095.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33095.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Jen Reed  
P.O. #:

## Table of Contents

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Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33095.01	[REDACTED]	Drinking Water	02/21/22 13:30



# Analytical Laboratory Report

Lab Sample ID: S33095.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 13:30

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 09:02, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	55	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	406	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	420	20		mg/L	2			

Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 12:13, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.91	0.04		mg/L	2	7440-42-8		
Lithium*	0.041	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:15, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.85	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.041	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33095.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 13:55, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	68.6	0.50		mg/L	2	7440-70-2		
Magnesium*	24.2	0.50		mg/L	2	7439-95-4		
Potassium*	8.77	0.50		mg/L	2	7440-09-7		
Sodium*	52.5	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33095

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out No Sampler Listed
07.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab Not signed by courier
08.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC No sample tags on bottles - nothing to identify bottles
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33095      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:39 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33095.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33096.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33096.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33096.01	[REDACTED]	Drinking Water	02/21/22 11:00



# Analytical Laboratory Report

Lab Sample ID: S33096.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 11:00

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 10:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	80	10	0.16	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/22/22 09:12, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	82	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:20, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	453	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	634	20		mg/L	2			

Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 12:26, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.86	0.04		mg/L	2	7440-42-8		
Lithium*	0.071	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:27, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.80	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.068	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33096.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:02, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	0.86	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	1.17	0.50		mg/L	2	7440-09-7		
Sodium*	259	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33096

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out No Sampler Listed
07.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab Not signed by courier
08.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC No sample tags on bottles - nothing to identify bottles
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33096      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:39 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33096.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33097.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33097.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33097.01	[REDACTED]	Drinking Water	02/21/22 10:35



# Analytical Laboratory Report

Lab Sample ID: S33097.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/21/2022 10:35

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/22/22 09:22, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	40	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	52	5	0.52	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 08:22, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	390	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	584	20		mg/L	2			

**Method: SM2540D, Run Date: 02/22/22 16:05, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 12:29, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.93	0.04		mg/L	2	7440-42-8		
Lithium*	0.025	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 12:30, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.85	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.024	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33097.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:03, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	1.18	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	2.19	0.50		mg/L	2	7440-09-7		
Sodium*	240	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33097

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

**Sample Receiving**

- |     |  |  |        |
|-----|--|--|--------|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer #        | IR 3.3 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |        |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |        |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |        |

**Chain of Custody**

- |     |  |  |   |
|-----|--|--|---|
| 06. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                | No Sampler Listed                                       |
| 07. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   | Not signed by courier                                   |
| 08. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          | No sample tags on bottles - nothing to identify bottles |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |   |

**Preservation**

- |     |  |   |                  |
|-----|--|---|------------------|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |                  |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |                  |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    | Dissolved metals |

**Bottle Conditions**

- |     |  |   |                  |
|-----|--|---|------------------|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |                  |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |                  |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |                  |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |                  |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         | Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |                  |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33097      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:40 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33097.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO. \_\_\_\_\_

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME \_\_\_\_\_

TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_

DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

**# Containers & Preservatives**

MERIT LAB NO. FOR LAB USE ONLY	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list
	DATE	TIME											
33097.01	2/21/22	1635	[REDACTED]	DW	4	3	1						Fluoride

**Certifications**  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
**Project Locations**  
 Detroit  New York  
 Other Lansing, MI  
**Special Instructions**

RELINQUISHED BY: *[Signature]* DATE **2/21/22** TIME **1430**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: *[Signature]* DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RELINQUISHED BY: *[Signature]* DATE **2/21/22** TIME **1600**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: *[Signature]* DATE **2/21/22** TIME **1600**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL **3.3**

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33098.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33098.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

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'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33098.01		Drinking Water	02/21/22 10:00



# Analytical Laboratory Report

Lab Sample ID: S33098.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/21/2022 10:00

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/22/22 09:32, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	27	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	55	5	0.52	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 08:24, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	400	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	514	20		mg/L	2			

**Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 12:32, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.95	0.04		mg/L	2	7440-42-8		
Lithium*	0.038	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 12:33, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.90	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.038	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33098.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:05, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	26.7	0.50		mg/L	2	7440-70-2		
Magnesium*	8.92	0.50		mg/L	2	7439-95-4		
Potassium*	5.13	0.50		mg/L	2	7440-09-7		
Sodium*	166	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID: S33098

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted: 02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer #	IR 3.3
02. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun	
03. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped	
04. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box	
05. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked	
<b>Chain of Custody</b>		
06. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out	No Sampler Listed
07. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab	Not signed by courier
08. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC	No sample tags on bottles - nothing to identify bottles
09. <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:	
<b>Preservation</b>		
10. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation	
11. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)	
12. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?	Dissolved metals
<b>Bottle Conditions</b>		
13. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact	
14. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used	
15. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used	
16. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received	
17. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration	Dissolved metals
18. <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time	
19. <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace	

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33098      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:42 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33098.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33099.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33099.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33099.01	[REDACTED]	Drinking Water	02/21/22 14:22



# Analytical Laboratory Report

Lab Sample ID: S33099.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 14:22

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 09:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	37	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	56	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:26, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	403	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/22/22 18:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	566	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 12:35, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.19	0.04		mg/L	2	7440-42-8		
Lithium*	0.032	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:37, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.08	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.030	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33099.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:07, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	19.4	0.50		mg/L	2	7440-70-2		
Magnesium*	7.30	0.50		mg/L	2	7439-95-4		
Potassium*	4.15	0.50		mg/L	2	7440-09-7		
Sodium*	199	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33099

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33099      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:45 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33099.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33100.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33100.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33100.01	[REDACTED]	Drinking Water	02/21/22 13:40



# Analytical Laboratory Report

Lab Sample ID: S33100.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 13:40

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 10:45	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 11:33, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	109	10	0.13	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/22/22 09:52, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	92	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:28, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	390	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 19:46, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	638	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 12:38, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.01	0.04		mg/L	2	7440-42-8		
Lithium*	0.024	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 12:40, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	0.95	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.024	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33100.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:08, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	114	0.50		mg/L	2	7440-70-2		
Magnesium*	47.5	0.50		mg/L	2	7439-95-4		
Potassium*	6.21	0.50		mg/L	2	7440-09-7		
Sodium*	49.4	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33100

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

**Sample Receiving**

- |     |  |  |        |
|-----|--|--|--------|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer #        | IR 3.3 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |        |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |        |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |        |

**Chain of Custody**

- |     |  |  |  |
|-----|--|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |  |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |  |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |  |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |  |

**Preservation**

- |     |  |   |                  |
|-----|--|---|------------------|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |                  |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |                  |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    | Dissolved metals |

**Bottle Conditions**

- |     |  |   |                  |
|-----|--|---|------------------|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |                  |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |                  |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |                  |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |                  |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         | Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |                  |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33100      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:47 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33100.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

	Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33101.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33101.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33101.01	[REDACTED]	Drinking Water	02/21/22 12:44



# Analytical Laboratory Report

Lab Sample ID: S33101.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 12:44

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 11:43, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	137	10	0.13	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/22/22 10:52, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	70	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:32, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	382	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 19:46, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	642	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	14	3		mg/L	1.333			

### Metals

Method: E200.8, Run Date: 03/07/22 13:00, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.06	0.04		mg/L	2	7440-42-8		
Lithium*	0.030	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.04	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.028	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33101.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:25, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	107	0.50		mg/L	2	7440-70-2		
Magnesium*	42.4	0.50		mg/L	2	7439-95-4		
Potassium*	5.93	0.50		mg/L	2	7440-09-7		
Sodium*	60.6	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33101

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33101      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:48 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33101.01	125ml Plastic HNO3	<2			



Table 1. Water Quality Parameters to be Analyzed

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Boron, total						
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Boron, dissolved						
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Calcium						
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Chloride						
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Lithium, total						
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Lithium, dissolved						
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Molybdenum, total						
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Molybdenum, dissolved						
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
Sulfate						
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
Total Dissolved Solids						
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Total Suspended Solids						
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Magnesium						
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
Sodium						
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
Potassium						
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
Carbonate						
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2
Bicarbonates						



# Analytical Laboratory Report

Report ID: S33102.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33102.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33102.01	[REDACTED]	Drinking Water	02/21/22 11:52



# Analytical Laboratory Report

Lab Sample ID: S33102.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 11:52

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/22/22 11:02, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	39	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	32	5	0.52	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 08:34, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	401	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/24/22 19:46, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	484	20		mg/L	2			

**Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 13:03, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.66	0.04		mg/L	2	7440-42-8		
Lithium*	0.054	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 13:04, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.56	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.050	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33102.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:27, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	32.3	0.50		mg/L	2	7440-70-2		
Magnesium*	13.4	0.50		mg/L	2	7439-95-4		
Potassium*	6.35	0.50		mg/L	2	7440-09-7		
Sodium*	139	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33102

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33102      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:50 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33102.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

	Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33103.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33103.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33103.01	[REDACTED]	Drinking Water	02/21/22 11:10



# Analytical Laboratory Report

Lab Sample ID: S33103.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 11:10

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 11:13, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	44	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	58	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	388	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 19:46, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	470	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 13:06, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	0.94	0.04		mg/L	2	7440-42-8		
Lithium*	0.037	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:08, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	0.86	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.034	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33103.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:28, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	109	0.50		mg/L	2	7440-70-2		
Magnesium*	41.0	0.50		mg/L	2	7439-95-4		
Potassium*	6.32	0.50		mg/L	2	7440-09-7		
Sodium*	11.9	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33103

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 3.3
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33103      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:51 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33103.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33104.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33104.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/21/2022  
Submitted Date/Time: 02/21/2022 16:00  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33104.01	[REDACTED]	Drinking Water	02/21/22 10:22



# Analytical Laboratory Report

Lab Sample ID: S33104.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/21/2022 10:22

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	3.3	IR
1	125ml Plastic	None	Yes	3.3	IR
2	1L Plastic	None	Yes	3.3	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/22/22 11:23, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	415	10		mg/L	1	71-52-3		

Method: SM2320B, Run Date: 03/01/22 08:38, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 19:46, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	304	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 13:09, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.13	0.04		mg/L	2	7440-42-8		
Lithium*	Not detected	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:11, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.98	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	Not detected	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33104.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:30, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	Not detected	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	2.38	0.50		mg/L	2	7440-09-7		
Sodium*	141	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33104

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/21/2022 16:00 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 3.3 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33104      Submitted: 02/21/2022 16:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/21/2022 16:53 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33104.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

	Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33131.01(01)  
Generated on 03/08/2022

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**Report to**

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

---

**Report produced by**

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

**Contacts for report questions:**

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

---

**Report Summary**

Lab Sample ID(s): S33131.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Tanten Buszka  
P.O. #:

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**Table of Contents**

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33131.01	[REDACTED]	Drinking Water	02/22/22 13:07



# Analytical Laboratory Report

Lab Sample ID: S33131.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 13:07

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 08:04, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	19	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	30	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:51, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	377	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	380	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	61	3		mg/L	1.333			

### Metals

Method: E200.8, Run Date: 03/07/22 13:12, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.61	0.04		mg/L	2	7440-42-8		
Lithium*	0.039	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:14, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.47	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.035	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33131.01 (continued)

Sample Tag: XXXXXXXXXX

Method: E200.8, Run Date: 03/08/22 14:32, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	81.5	0.50		mg/L	2	7440-70-2		
Magnesium*	28.2	0.50		mg/L	2	7439-95-4		
Potassium*	7.48	0.50		mg/L	2	7440-09-7		
Sodium*	18.0	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33131

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33131      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:55 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33131.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33132.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33132.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33132.01	[REDACTED]	Drinking Water	02/22/22 12:28



# Analytical Laboratory Report

Lab Sample ID: S33132.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 12:28

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 08:17, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	5	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	18	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 08:55, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	389	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	362	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	8	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 13:28, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.08	0.04		mg/L	2	7440-42-8		
Lithium*	0.038	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:29, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.97	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.039	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33132.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:35, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	56.8	0.50		mg/L	2	7440-70-2		
Magnesium*	20.8	0.50		mg/L	2	7439-95-4		
Potassium*	8.55	0.50		mg/L	2	7440-09-7		
Sodium*	47.0	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33132

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33132      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:55 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33132.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33133.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33133.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33133.01	[REDACTED]	Drinking Water	02/22/22 11:39



# Analytical Laboratory Report

Lab Sample ID: S33133.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/22/2022 11:39

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/23/22 08:30, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	13	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	16	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 08:59, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	415	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	310	20		mg/L	2			

**Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	141	3		mg/L	10			

**Metals**

**Method: E200.8, Run Date: 03/07/22 13:31, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.52	0.04		mg/L	2	7440-42-8		
Lithium*	0.013	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 13:32, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.44	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.010	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33133.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:36, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	4.63	0.50		mg/L	2	7440-70-2		
Magnesium*	1.60	0.50		mg/L	2	7439-95-4		
Potassium*	3.32	0.50		mg/L	2	7440-09-7		
Sodium*	111	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33133

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33133      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 10:10 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33133.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. P.O. NO.  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO.

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE ZIP CODE  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Tawnten Buszka**  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives														
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER								
33133.01	2-22-22	11:39		DW	3		1													

See attached list

Fluoride

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES

Project Locations  
 Detroit  New York  
 Other Lansing, MI

Special Instructions  
High turbidity

RELINQUISHED BY: SIGNATURE/ORGANIZATION *[Signature]* DATE **2-22-22** TIME **15:00**  
 RECEIVED BY: SIGNATURE/ORGANIZATION *[Signature]* DATE **2/22/22** TIME **15:00**

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME  
 RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME

SEAL NO. SEAL INTACT YES  NO  INITIALS  
 SEAL NO. SEAL INTACT YES  NO  INITIALS

NOTES: TEMP. ON ARRIVAL **5.4**

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33134.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33134.01-S33134.02  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

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Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33134.01	[REDACTED]	Drinking Water	02/22/22 10:28
S33134.02	[REDACTED]	Drinking Water	02/22/22 10:55



# Analytical Laboratory Report

Lab Sample ID: S33134.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 10:28

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 08:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	16	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	15	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:01, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	424	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	430	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 13:34, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.33	0.04		mg/L	2	7440-42-8		
Lithium*	0.034	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:36, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.21	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.035	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33134.01 (continued)

Sample Tag: XXXXXXXXXX

Method: E200.8, Run Date: 03/08/22 14:38, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	22.7	0.50		mg/L	2	7440-70-2		
Magnesium*	8.36	0.50		mg/L	2	7439-95-4		
Potassium*	5.99	0.50		mg/L	2	7440-09-7		
Sodium*	133	0.50		mg/L	2	7440-23-5		



# Analytical Laboratory Report

Lab Sample ID: S33134.02

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 10:55

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
1	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 08:55, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:03, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	44	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	50	20		mg/L	2			

### Metals

Method: E200.8, Run Date: 03/07/22 13:37, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.11	0.04		mg/L	2	7440-42-8		
Lithium*	Not detected	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:39, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.80	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	Not detected	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

Method: E200.8, Run Date: 03/08/22 14:39, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	Not detected	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	Not detected	0.50		mg/L	2	7440-09-7		
Sodium*	7.48	0.50		mg/L	2	7440-23-5		

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S33134

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33134 Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:57 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33134.01	125ml Plastic HNO3	<2			
S33134.02	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Boron, total						
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Boron, dissolved						
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Calcium						
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Chloride						
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Lithium, total						
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Lithium, dissolved						
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Molybdenum, total						
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Molybdenum, dissolved						
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
Sulfate						
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
Total Dissolved Solids						
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Total Suspended Solids						
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Magnesium						
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
Sodium						
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
Potassium						
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
Carbonate						
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2
Bicarbonates						



# Analytical Laboratory Report

Report ID: S33135.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33135.01-S33135.02  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33135.01	[REDACTED]	Drinking Water	02/22/22 09:32
S33135.02	[REDACTED]	Drinking Water	02/22/22 09:48



# Analytical Laboratory Report

Lab Sample ID: S33135.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 09:32

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 11:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 09:08, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	14	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	11	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:05, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	381	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	354	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 13:40, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.29	0.04		mg/L	2	7440-42-8		
Lithium*	0.042	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 13:42, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.07	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.039	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33135.01 (continued)

Sample Tag: XXXXXXXXXX

Method: E200.8, Run Date: 03/08/22 14:41, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	63.9	0.50		mg/L	2	7440-70-2		
Magnesium*	21.2	0.50		mg/L	2	7439-95-4		
Potassium*	9.65	0.50		mg/L	2	7440-09-7		
Sodium*	42.5	0.50		mg/L	2	7440-23-5		



# Analytical Laboratory Report

Lab Sample ID: S33135.02

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 09:48

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 09:21, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	12	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	10	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:07, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	376	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	398	20		mg/L	2			

Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 14:04, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.20	0.04		mg/L	2	7440-42-8		
Lithium*	0.011	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 14:06, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.17	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.011	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33135.02 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:50, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	3.90	0.50		mg/L	2	7440-70-2		
Magnesium*	0.66	0.50		mg/L	2	7439-95-4		
Potassium*	1.96	0.50		mg/L	2	7440-09-7		
Sodium*	162	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33135

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33135      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:57 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33135.01	125ml Plastic HNO3	<2			
S33135.02	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. P.O. NO.  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO.

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE ZIP CODE  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Tantien Buscka**

TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER

DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

**# Containers & Preservatives**

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list	Flouvide
	DATE	TIME												
33135.01	2-22-22	9:32	[REDACTED]	DW	4	3		1					✓	x
.02	2-22-22	9:48	[REDACTED]	DW	4	3		1					✓	✓

**Certifications**  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
**Project Locations**  
 Detroit  New York  
 Other **Lansing, MI**  
**Special Instructions**

RELINQUISHED BY: SIGNATURE/ORGANIZATION *[Signature]*  Sampler DATE **2-22-22** TIME **15:00**  
 RECEIVED BY: SIGNATURE/ORGANIZATION *[Signature]* DATE **2/22/22** TIME **1500**

RELINQUISHED BY: SIGNATURE/ORGANIZATION DATE TIME  
 RECEIVED BY: SIGNATURE/ORGANIZATION DATE TIME  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 NOTES: TEMP. ON ARRIVAL **5.4**

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33136.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33136.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33136.01	[REDACTED]	Drinking Water	02/22/22 08:56



# Analytical Laboratory Report

Lab Sample ID: S33136.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/22/2022 08:56

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/23/22 09:34, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	8	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	7	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 09:09, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	387	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	418	20		mg/L	2			

**Method: SM2540D, Run Date: 02/23/22 19:05, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 14:08, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.11	0.04		mg/L	2	7440-42-8		
Lithium*	0.027	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 14:10, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.95	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.025	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33136.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:52, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	5.28	0.50		mg/L	2	7440-70-2		
Magnesium*	1.51	0.50		mg/L	2	7439-95-4		
Potassium*	3.84	0.50		mg/L	2	7440-09-7		
Sodium*	160	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID: S33136

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted: 02/22/2022 15:00 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

**Sample Receiving**

- |     |   |  |   |  |        |
|-----|---|--|---|--|--------|
| 01. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | Samples are received at 4C +/- 2C Thermometer #        | IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | Received on ice/ cooling process begun                 |        |
| 03. | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples shipped  |        |
| 04. | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples left in 24 hr. drop box                        |        |
| 05. | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |        |

**Chain of Custody**

- |     |   |  |                              |  |  |
|-----|---|--|------------------------------|--|--|
| 06. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A | COC adequately filled out                |  |
| 07. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |  |
| 08. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A | Sample tag on bottles match COC          |  |
| 09. | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |  |

**Preservation**

- |     |   |                             |                              |   |                  |
|-----|---|-----------------------------|------------------------------|---|------------------|
| 10. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |                  |
| 11. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |                  |
| 12. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    | Dissolved metals |

**Bottle Conditions**

- |     |   |                             |   |   |                  |
|-----|---|-----------------------------|---|---|------------------|
| 13. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | All bottles intact                            |                  |
| 14. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Appropriate analytical bottles are used       |                  |
| 15. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Merit bottles used                            |                  |
| 16. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Sufficient sample volume received             |                  |
| 17. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples require laboratory filtration         | Dissolved metals |
| 18. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples submitted within holding time         |                  |
| 19. | <input type="checkbox"/> Yes            | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |                  |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33136 Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:58 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33136.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33137.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33137.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33137.01	[REDACTED]	Drinking Water	02/22/22 12:05



# Analytical Laboratory Report

Lab Sample ID: S33137.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/22/2022 12:05

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/23/22 09:47, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	12	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	24	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 09:11, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	394	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/24/22 21:10, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	384	20		mg/L	2			

**Method: SM2540D, Run Date: 02/25/22 13:03, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 14:11, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.91	0.04		mg/L	2	7440-42-8		
Lithium*	0.038	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 14:13, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.86	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.038	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33137.01 (continued)

Sample Tag: XXXXXXXXXX

Method: E200.8, Run Date: 03/08/22 14:54, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	70.0	0.50		mg/L	2	7440-70-2		
Magnesium*	23.5	0.50		mg/L	2	7439-95-4		
Potassium*	8.96	0.50		mg/L	2	7440-09-7		
Sodium*	34.1	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID: S33137

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted: 02/22/2022 15:00 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

**Sample Receiving**

- |     |   |  |   |  |        |
|-----|---|--|---|--|--------|
| 01. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | Samples are received at 4C +/- 2C Thermometer #        | IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A            | Received on ice/ cooling process begun                 |        |
| 03. | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples shipped  |        |
| 04. | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples left in 24 hr. drop box                        |        |
| 05. | <input type="checkbox"/> Yes            | <input type="checkbox"/> No            | <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |        |

**Chain of Custody**

- |     |   |  |                              |  |  |
|-----|---|--|------------------------------|--|--|
| 06. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A | COC adequately filled out                |  |
| 07. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |  |
| 08. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No            | <input type="checkbox"/> N/A | Sample tag on bottles match COC          |  |
| 09. | <input type="checkbox"/> Yes            | <input checked="" type="checkbox"/> No | <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |  |

**Preservation**

- |     |   |                             |                              |   |                  |
|-----|---|-----------------------------|------------------------------|---|------------------|
| 10. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |                  |
| 11. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |                  |
| 12. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    | Dissolved Metals |

**Bottle Conditions**

- |     |   |                             |   |   |                  |
|-----|---|-----------------------------|---|---|------------------|
| 13. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | All bottles intact                            |                  |
| 14. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Appropriate analytical bottles are used       |                  |
| 15. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Merit bottles used                            |                  |
| 16. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Sufficient sample volume received             |                  |
| 17. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples require laboratory filtration         | Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes | <input type="checkbox"/> No | <input type="checkbox"/> N/A            | Samples submitted within holding time         |                  |
| 19. | <input type="checkbox"/> Yes            | <input type="checkbox"/> No | <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |                  |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33137      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:54 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33137.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33138.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
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Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33138.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33138.01	[REDACTED]	Drinking Water	02/22/22 09:30



# Analytical Laboratory Report

Lab Sample ID: S33138.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 09:30

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 10:00, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	56	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	53	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:13, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	415	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 14:28, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	492	20		mg/L	2			

Method: SM2540D, Run Date: 02/25/22 13:03, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 14:14, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	0.46	0.04		mg/L	2	7440-42-8		
Lithium*	0.032	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 14:16, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	0.44	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.030	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33138.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:55, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	105	0.50		mg/L	2	7440-70-2		
Magnesium*	42.3	0.50		mg/L	2	7439-95-4		
Potassium*	5.03	0.50		mg/L	2	7440-09-7		
Sodium*	8.91	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33138

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33138      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:58 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33138.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33139.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33139.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33139.01	[REDACTED]	Drinking Water	02/22/22 08:45



# Analytical Laboratory Report

Lab Sample ID: S33139.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 02/22/2022 08:45

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/23/22 11:04, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	7	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 09:17, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	382	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/25/22 14:28, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	344	20		mg/L	2			

**Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 14:17, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.74	0.04		mg/L	2	7440-42-8		
Lithium*	0.030	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 14:19, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.66	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.028	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33139.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:57, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	38.8	0.50		mg/L	2	7440-70-2		
Magnesium*	14.1	0.50		mg/L	2	7439-95-4		
Potassium*	6.14	0.50		mg/L	2	7440-09-7		
Sodium*	80.9	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33139

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33139      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:59 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33139.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33140.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33140.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Jen Reed  
P.O. #:

## Table of Contents

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Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33140.01	[REDACTED]	Drinking Water	02/22/22 10:30



# Analytical Laboratory Report

Lab Sample ID: S33140.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 10:30

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 13:11, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	154	25	0.40	mg/L	25	16887-00-6		

Method: E300.0, Run Date: 02/23/22 11:17, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	63	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:19, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	406	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 14:28, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	650	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 14:35, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	0.19	0.04		mg/L	2	7440-42-8		
Lithium*	0.016	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 14:36, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	0.19	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.015	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33140.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 14:58, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	124	0.50		mg/L	2	7440-70-2		
Magnesium*	46.5	0.50		mg/L	2	7439-95-4		
Potassium*	3.36	0.50		mg/L	2	7440-09-7		
Sodium*	40.2	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33140

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33140      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:59 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33140.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33141.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33141.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33141.01	[REDACTED]	Drinking Water	02/22/22 11:00



# Analytical Laboratory Report

Lab Sample ID: S33141.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 11:00

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 14:03, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	189	25	0.40	mg/L	25	16887-00-6		

Method: E300.0, Run Date: 02/23/22 11:30, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	72	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:21, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	414	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 14:28, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	726	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 14:38, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.30	0.04		mg/L	2	7440-42-8		
Lithium*	0.070	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 14:39, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.20	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.066	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33141.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:00, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	106	0.50		mg/L	2	7440-70-2		
Magnesium*	36.1	0.50		mg/L	2	7439-95-4		
Potassium*	12.6	0.50		mg/L	2	7440-09-7		
Sodium*	100	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33141

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

### Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

### Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

### Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

### Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33141      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:59 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33141.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33142.01(01)  
Generated on 03/08/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S33142.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/22/2022 15:00  
Sampled by: Jen Reed  
P.O. #:

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33142.01	[REDACTED]	Drinking Water	02/22/22 11:15



# Analytical Laboratory Report

Lab Sample ID: S33142.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 11:15

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR
2	1L Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/23/22 12:21, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	77	10	0.16	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/23/22 11:43, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	75	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 09:23, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	401	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 14:28, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	682	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 14:41, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.99	0.04		mg/L	2	7440-42-8		
Lithium*	0.032	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 14:43, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.96	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.031	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33142.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:02, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	3.23	0.50		mg/L	2	7440-70-2		
Magnesium*	1.30	0.50		mg/L	2	7439-95-4		
Potassium*	3.30	0.50		mg/L	2	7440-09-7		
Sodium*	264	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33142

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/22/2022 15:00 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33142      Submitted: 02/22/2022 15:00

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/22/2022 15:59 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33142.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33163.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33163.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33163.01	[REDACTED]	Drinking Water	02/23/22 10:00



# Analytical Laboratory Report

Lab Sample ID: S33163.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 10:00

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	44.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 10:01, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sulfate	179	10	0.59	mg/L	10	14808-79-8		

Method: E300.0, Run Date: 02/24/22 06:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	45	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	1.3	1.0	0.13	mg/L	5	16984-48-8		4.0

Method: SM2320B, Run Date: 03/01/22 15:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	516	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	820	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 14:44, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.92	0.04		mg/L	2	7440-42-8		
Lithium*	0.036	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 14:46, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.91	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.035	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33163.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:03, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	8.27	0.50		mg/L	2	7440-70-2		
Magnesium*	3.07	0.50		mg/L	2	7439-95-4		
Potassium*	4.23	0.50		mg/L	2	7440-09-7		
Sodium*	310	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33163

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.8 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33163      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 14:47 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33163.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33164.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33164.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33164.01	[REDACTED]	Drinking Water	02/23/22 10:38



# Analytical Laboratory Report

Lab Sample ID: S33164.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 10:38

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 12:15	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 06:48, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	1.1	1.0	0.13	mg/L	5	16984-48-8		4.0

Method: E300.0, Run Date: 02/24/22 10:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	111	25	0.40	mg/L	25	16887-00-6		
Sulfate	410	25	1.5	mg/L	25	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:40, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	489	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	1,250	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/08/22 15:09, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	414	5.0		mg/L	100	7440-23-5		

Method: E200.8, Run Date: 03/07/22 14:47, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	4.24	0.04		mg/L	2	7440-42-8		
Lithium*	0.051	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		



# Analytical Laboratory Report

Lab Sample ID: S33164.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/07/22 14:49, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	4.16	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.051	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

Method: E200.8, Run Date: 03/08/22 15:06, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	13.7	0.50		mg/L	2	7440-70-2		
Magnesium*	5.29	0.50		mg/L	2	7439-95-4		
Potassium*	5.12	0.50		mg/L	2	7440-09-7		

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S33164

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33164      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 14:55 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33164.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO** **CHAIN OF CUSTODY RECORD** **INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. P.O. NO.  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO.

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE ZIP CODE  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Tanten Buszka**  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list
	DATE	TIME											
33164.01	2-23-22	10:38		DW	4	3		1					✓
													X

Certifications	<input type="checkbox"/> OHIO VAP	<input type="checkbox"/> Drinking Water
	<input type="checkbox"/> DoD	<input type="checkbox"/> NPDES
Project Locations	<input type="checkbox"/> Detroit	<input type="checkbox"/> New York
	<input checked="" type="checkbox"/> Other <u>Lansing, MI</u>	
Special Instructions		

RELINQUISHED BY: *[Signature]*  Sampler DATE **2-23-22** TIME **13:55**  
 RECEIVED BY: *[Signature]* DATE **2/23/22** TIME **1355**  
 RELINQUISHED BY: DATE TIME  
 RECEIVED BY: DATE TIME

RELINQUISHED BY: DATE TIME  
 RECEIVED BY: DATE TIME  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 SEAL NO. SEAL INTACT YES  NO  INITIALS  
 NOTES: TEMP. ON ARRIVAL \_\_\_\_\_

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33165.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33165.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33165.01	[REDACTED]	Drinking Water	02/23/22 11:11



# Analytical Laboratory Report

Lab Sample ID: S33165.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 11:11

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 07:01, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	30	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	1.4	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	61	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:44, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	650	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	726	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 15:57, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.85	0.04		mg/L	2	7440-42-8		
Lithium*	0.030	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 15:59, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.59	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.029	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33165.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:20, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	11.1	0.50		mg/L	2	7440-70-2		
Magnesium*	5.15	0.50		mg/L	2	7439-95-4		
Potassium*	3.35	0.50		mg/L	2	7440-09-7		
Sodium*	269	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33165

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33165      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:00 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33165.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33166.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33166.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/22/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

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Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33166.01	[REDACTED]	Drinking Water	02/22/22 15:56



# Analytical Laboratory Report

Lab Sample ID: S33166.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/22/2022 15:56

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 07:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	79	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	64	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:46, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	464	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	596	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:00, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.10	0.04		mg/L	2	7440-42-8		
Lithium*	0.046	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.98	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.042	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33166.01 (continued)

Sample Tag: XXXXXXXXXX

Method: E200.8, Run Date: 03/08/22 15:22, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	30.1	0.50		mg/L	2	7440-70-2		
Magnesium*	9.71	0.50		mg/L	2	7439-95-4		
Potassium*	7.13	0.50		mg/L	2	7440-09-7		
Sodium*	194	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID: S33166

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted: 02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

**Sample Receiving**

- |     |   |        |
|-----|---|--------|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Samples are received at 4C +/- 2C Thermometer #        | IR 4.8 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Received on ice/ cooling process begun                 |        |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A                 Samples shipped  |        |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A                 Samples left in 24 hr. drop box                        |        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A                 Are there custody seals/tape or is the drop box locked |        |

**Chain of Custody**

- |     |   |  |
|-----|---|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 COC adequately filled out                |  |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 COC signed and relinquished to the lab   |  |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Sample tag on bottles match COC          |  |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A                 Subcontracting needed? Subcontracted to: |  |

**Preservation**

- |     |  |                  |
|-----|--|------------------|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Do sample have correct chemical preservation        |                  |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Completed pH checks on preserved samples? (no VOAs) |                  |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Did any samples need to be preserved in the lab?    | Dissolved Metals |

**Bottle Conditions**

- |     |  |                  |
|-----|--|------------------|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 All bottles intact                            |                  |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Appropriate analytical bottles are used       |                  |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Merit bottles used                            |                  |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Sufficient sample volume received             |                  |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Samples require laboratory filtration         | Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A                 Samples submitted within holding time         |                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A                 Do water VOC or TOX bottles contain headspace |                  |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33166 Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:06 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33166.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33167.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33167.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33167.01	[REDACTED]	Drinking Water	02/23/22 08:49



# Analytical Laboratory Report

Lab Sample ID: S33167.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 08:49

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 10:27, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	211	25	0.40	mg/L	25	16887-00-6		

Method: E300.0, Run Date: 02/24/22 07:27, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	82	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:48, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	512	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	850	20		mg/L	2			

Method: SM2540D, Run Date: 02/28/22 16:10, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:02, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	0.15	0.04		mg/L	2	7440-42-8		
Lithium*	0.023	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:03, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	0.14	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.021	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33167.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:24, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	166	0.50		mg/L	2	7440-70-2		
Magnesium*	65.8	0.50		mg/L	2	7439-95-4		
Potassium*	3.77	0.50		mg/L	2	7440-09-7		
Sodium*	48.0	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33167

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33167      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:08 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33167.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO** **CHAIN OF CUSTODY RECORD** **INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO. \_\_\_\_\_

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Tawnten Buszka**

TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_

DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list
	DATE	TIME											
33167.01	2-23-22	8:44		DW	4	3	1						Fluoride

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES

Project Locations  
 Detroit  New York  
 Other Lansing, MI

Special Instructions

RELINQUISHED BY: SIGNATURE/ORGANIZATION *[Signature]* DATE **2-23-22** TIME **13:55**  Sampler  
 RECEIVED BY: SIGNATURE/ORGANIZATION *[Signature]* DATE **2/23/22** TIME **13:55**  
 RELINQUISHED BY: SIGNATURE/ORGANIZATION \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: SIGNATURE/ORGANIZATION \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: SIGNATURE/ORGANIZATION \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: SIGNATURE/ORGANIZATION \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL **4.8**

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33168.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33168.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

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J	Estimated value less than reporting limit, but greater than MDL
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M	Result reported to MDL not RDL
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S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
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x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33168.01	[REDACTED]	Drinking Water	02/23/22 09:20



# Analytical Laboratory Report

Lab Sample ID: S33168.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 09:20

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/24/22 10:40, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	142	10	0.16	mg/L	10	16887-00-6		

**Method: E300.0, Run Date: 02/24/22 07:40, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	65	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 15:50, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	495	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	704	20		mg/L	2			

**Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 16:04, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.08	0.04		mg/L	2	7440-42-8		
Lithium*	0.040	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 16:05, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.99	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.038	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33168.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:26, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	31.1	0.50		mg/L	2	7440-70-2		
Magnesium*	12.4	0.50		mg/L	2	7439-95-4		
Potassium*	6.08	0.50		mg/L	2	7440-09-7		
Sodium*	227	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33168

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC No Sample Tag on bottles
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33168      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:11 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33168.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Boron, total						
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Boron, dissolved						
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Calcium						
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Chloride						
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Lithium, total						
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Lithium, dissolved						
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Molybdenum, total						
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Molybdenum, dissolved						
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
Sulfate						
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
Total Dissolved Solids						
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Total Suspended Solids						
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Magnesium						
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
Sodium						
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
Potassium						
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
Carbonate						
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2
Bicarbonates						



# Analytical Laboratory Report

Report ID: S33169.01(01)  
Generated on 03/08/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S33169.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33169.01	[REDACTED]	Drinking Water	02/23/22 12:36



# Analytical Laboratory Report

Lab Sample ID: S33169.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 12:36

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 07:53, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	1.2	1.0	0.13	mg/L	5	16984-48-8		4.0

Method: E300.0, Run Date: 02/24/22 10:53, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	77	10	0.16	mg/L	10	16887-00-6		
Sulfate	122	10	0.59	mg/L	10	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:52, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	453	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	840	20		mg/L	2			

Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:07, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.61	0.04		mg/L	2	7440-42-8		
Lithium*	0.031	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:08, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.34	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.027	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33169.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:27, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	1.51	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	2.65	0.50		mg/L	2	7440-09-7		
Sodium*	287	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33169

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.8 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33169      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:13 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33169.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33170.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33170.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33170.01	[REDACTED]	Drinking Water	02/23/22 08:45



# Analytical Laboratory Report

Lab Sample ID: S33170.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 08:45

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 11:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	81	10	0.16	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/24/22 08:05, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	1.1	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	61	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:54, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	448	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	624	20		mg/L	2			

Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:20, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.75	0.04		mg/L	2	7440-42-8		
Lithium*	0.040	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:21, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.79	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.042	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33170.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:29, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	34.3	0.50		mg/L	2	7440-70-2		
Magnesium*	11.6	0.50		mg/L	2	7439-95-4		
Potassium*	6.48	0.50		mg/L	2	7440-09-7		
Sodium*	185	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33170

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33170      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:16 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33170.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. P.O. NO.  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO.

CONTACT NAME **Cheryl Loudon**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE ZIP CODE  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Jen Reed**  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other **Lansing, MI**  
 Special Instructions

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list	Fluoride
	DATE	TIME												
33170.01	2/23/22	0845	[REDACTED]	DW	4	3		1					<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

RELINQUISHED BY: *Jen Reed*  Sampler DATE **2/23/22** TIME **12:00**  
 RECEIVED BY: *Tanton Busella* DATE **2/23/22** TIME **12:00**  
 RELINQUISHED BY: *Shirley H.* DATE **2/23/22** TIME **13:55**  
 RECEIVED BY: *Johanna Murray* DATE **2/23/22** TIME **13:55**

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL **4.8**

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33171.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33171.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Jen Reed  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33171.01	[REDACTED]	Drinking Water	02/23/22 11:45



# Analytical Laboratory Report

Lab Sample ID: S33171.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 11:45

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 11:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	157	10	0.16	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/24/22 08:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	1.4	1.0	0.13	mg/L	5	16984-48-8		4.0

Method: E300.0, Run Date: 02/24/22 11:31, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sulfate	1,140	500	30	mg/L	500	14808-79-8		

Method: SM2320B, Run Date: 03/01/22 15:56, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	536	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	604	20		mg/L	2			

Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/08/22 15:38, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	756	5.0		mg/L	100	7440-23-5		

Method: E200.8, Run Date: 03/07/22 16:22, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	6.30	0.04		mg/L	2	7440-42-8		
Lithium*	0.091	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		



# Analytical Laboratory Report

Lab Sample ID: S33171.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/07/22 16:23, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	6.02	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.085	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

Method: E200.8, Run Date: 03/08/22 15:31, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	11.1	0.50		mg/L	2	7440-70-2		
Magnesium*	4.71	0.50		mg/L	2	7439-95-4		
Potassium*	5.78	0.50		mg/L	2	7440-09-7		

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S33171

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33171      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:19 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33171.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33172.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33172.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Jen Reed  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33172.01	[REDACTED]	Drinking Water	02/23/22 11:20



# Analytical Laboratory Report

Lab Sample ID: S33172.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 11:20

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/24/22 11:44, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	83	10	0.16	mg/L	10	16887-00-6		

**Method: E300.0, Run Date: 02/24/22 08:31, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	89	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/01/22 15:58, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	459	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 02/25/22 15:00, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	2,260	20		mg/L	2			

**Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 16:25, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.76	0.04		mg/L	2	7440-42-8		
Lithium*	0.035	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 16:26, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.84	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.037	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33172.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:32, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	7.64	0.50		mg/L	2	7440-70-2		
Magnesium*	3.03	0.50		mg/L	2	7439-95-4		
Potassium*	4.37	0.50		mg/L	2	7440-09-7		
Sodium*	261	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33172

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33172      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:22 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33172.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33173.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33173.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Jen Reed  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

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Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33173.01	[REDACTED]	Drinking Water	02/23/22 10:00



# Analytical Laboratory Report

Lab Sample ID: S33173.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 10:00

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 11:57, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	90	10	0.16	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/24/22 09:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	62	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/03/22 08:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	407	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/28/22 19:17, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	592	20		mg/L	2			

Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:27, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.90	0.04		mg/L	2	7440-42-8		
Lithium*	0.037	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:28, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.72	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.035	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33173.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:34, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	39.0	0.50		mg/L	2	7440-70-2		
Magnesium*	16.3	0.50		mg/L	2	7439-95-4		
Potassium*	7.06	0.50		mg/L	2	7440-09-7		
Sodium*	158	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33173

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.8
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33173      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:29 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33173.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33174.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33174.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/23/2022  
Submitted Date/Time: 02/23/2022 13:55  
Sampled by: Jen Reed  
P.O. #:

## Table of Contents

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Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33174.01	[REDACTED]	Drinking Water	02/23/22 09:20



# Analytical Laboratory Report

Lab Sample ID: S33174.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/23/2022 09:20

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.8	IR
1	125ml Plastic	None	Yes	4.8	IR
1	125ml Plastic	HNO3	Yes	4.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 13:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/24/22 09:48, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	43	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	42	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/03/22 08:16, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	464	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 02/28/22 19:17, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	436	20		mg/L	2			

Method: SM2540D, Run Date: 03/01/22 14:13, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:29, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.14	0.04		mg/L	2	7440-42-8		
Lithium*	0.038	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:30, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.08	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.034	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33174.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:36, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	97.5	0.50		mg/L	2	7440-70-2		
Magnesium*	36.5	0.50		mg/L	2	7439-95-4		
Potassium*	6.96	0.50		mg/L	2	7440-09-7		
Sodium*	14.0	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33174

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/23/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.8 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33174      Submitted: 02/23/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/23/2022 15:31 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33174.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33290.01(01)  
Generated on 03/08/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S33290.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/25/2022  
Submitted Date/Time: 02/25/2022 14:50  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33290.01	[REDACTED]	Drinking Water	02/25/22 13:25



# Analytical Laboratory Report

Lab Sample ID: S33290.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 13:25

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/28/22 09:24, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	14	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	38	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/03/22 08:18, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	403	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	458	20		mg/L	2			

Method: SM2540D, Run Date: 03/03/22 20:45, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:50, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.30	0.04		mg/L	2	7440-42-8		
Lithium*	0.007	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:52, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.24	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.006	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33290.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:51, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	Not detected	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	3.36	0.50		mg/L	2	7440-09-7		
Sodium*	193	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33290

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/25/2022 14:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33290      Submitted: 02/25/2022 14:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/25/2022 15:39 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33290.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO** **CHAIN OF CUSTODY RECORD** **INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO. \_\_\_\_\_

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Tamten Buszka**  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other **Lansing, MI**  
 Special Instructions

MATRIX GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 CODE SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list	Fluoride
	DATE	TIME												
33290.01	2.25.02	13:25		DW	4	3	1						✓	X

RELINQUISHED BY: \_\_\_\_\_ DATE **2.25.02** TIME **14:50**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE **2/25/02** TIME **1450**  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. \_\_\_\_\_ SEAL INTACT YES  NO  INITIALS \_\_\_\_\_

NOTES: TEMP. ON ARRIVAL **4.0**

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33291.01(01)  
Generated on 03/08/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S33291.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/25/2022  
Submitted Date/Time: 02/25/2022 14:50  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33291.01	[REDACTED]	Drinking Water	02/25/22 12:47



# Analytical Laboratory Report

Lab Sample ID: S33291.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 12:47

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/28/22 09:36, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	13	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	62	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/03/22 08:20, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	390	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	418	20		mg/L	2			

Method: SM2540D, Run Date: 03/03/22 20:45, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:53, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.32	0.04		mg/L	2	7440-42-8		
Lithium*	0.041	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:54, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.28	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.042	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33291.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:54, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	60.2	0.50		mg/L	2	7440-70-2		
Magnesium*	20.6	0.50		mg/L	2	7439-95-4		
Potassium*	8.95	0.50		mg/L	2	7440-09-7		
Sodium*	70.2	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33291

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/25/2022 14:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33291      Submitted: 02/25/2022 14:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/25/2022 15:39 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33291.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33292.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33292.01-S33292.02  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/25/2022  
Submitted Date/Time: 02/25/2022 14:50  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

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FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (2 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33292.01	[REDACTED]	Drinking Water	02/25/22 13:54
S33292.02	[REDACTED]	Drinking Water	02/25/22 14:21



# Analytical Laboratory Report

Lab Sample ID: S33292.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 13:54

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/28/22 09:49, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/03/22 08:22, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	22	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	28	20		mg/L	2			

Method: SM2540D, Run Date: 03/03/22 20:45, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 16:55, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.61	0.04		mg/L	2	7440-42-8		
Lithium*	Not detected	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 16:56, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.58	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	Not detected	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33292.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:55, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	Not detected	0.50		mg/L	2	7440-70-2		
Magnesium*	Not detected	0.50		mg/L	2	7439-95-4		
Potassium*	Not detected	0.50		mg/L	2	7440-09-7		
Sodium*	5.90	0.50		mg/L	2	7440-23-5		



# Analytical Laboratory Report

Lab Sample ID: S33292.02

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 14:21

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/28/22 10:02, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	34	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	1.2	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	90	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/03/22 08:24, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	559	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	694	20		mg/L	2			

**Method: SM2540D, Run Date: 03/03/22 20:45, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 16:58, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.37	0.04		mg/L	2	7440-42-8		
Lithium*	0.032	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 16:59, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.37	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.033	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33292.02 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:57, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	30.6	0.50		mg/L	2	7440-70-2		
Magnesium*	11.8	0.50		mg/L	2	7439-95-4		
Potassium*	5.02	0.50		mg/L	2	7440-09-7		
Sodium*	223	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33292

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/25/2022 14:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out Missing Sampler name
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33292      Submitted: 02/25/2022 14:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/25/2022 15:39 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33292.01	125ml Plastic HNO3	<2			
S33292.02	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33293.01(01)  
Generated on 03/08/2022

Report to

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary

Lab Sample ID(s): S33293.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/25/2022  
Submitted Date/Time: 02/25/2022 14:50  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33293.01	[REDACTED]	Drinking Water	02/25/22 10:20



# Analytical Laboratory Report

Lab Sample ID: S33293.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 10:20

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

### Inorganics

Method: E300.0, Run Date: 02/28/22 11:32, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	77	10	0.16	mg/L	10	16887-00-6		

Method: E300.0, Run Date: 02/28/22 10:15, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	102	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 03/03/22 08:26, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	512	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	646	20		mg/L	2			

Method: SM2540D, Run Date: 03/03/22 20:45, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 03/07/22 17:00, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	1.91	0.04		mg/L	2	7440-42-8		
Lithium*	0.044	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 03/07/22 17:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	1.86	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.043	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33293.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 15:58, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	62.7	0.50		mg/L	2	7440-70-2		
Magnesium*	25.9	0.50		mg/L	2	7439-95-4		
Potassium*	7.43	0.50		mg/L	2	7440-09-7		
Sodium*	156	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33293

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/25/2022 14:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33293      Submitted: 02/25/2022 14:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/25/2022 15:40 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33293.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

<b>REPORT TO</b>			<b>CHAIN OF CUSTODY RECORD</b>			<b>INVOICE TO</b>		
CONTACT NAME <b>Molly Reeves</b>			CONTACT NAME <b>Cheryl Louden</b>			<input type="checkbox"/> SAME		
COMPANY <b>HDR</b>			COMPANY <b>Lansing Board of Water &amp; Light (BWL)</b>					
ADDRESS <b>5405 Data Court</b>			ADDRESS <b>On File</b>					
CITY <b>Ann Arbor</b>		STATE <b>MI</b>	ZIP CODE <b>48108</b>		CITY <b>On File</b>		STATE	ZIP CODE
PHONE NO. <b>734-263-7138</b>	FAX NO.	P.O. NO.		PHONE NO. <b>517-763-1465</b>		E-MAIL ADDRESS <b>Cheryl.Louden@LBWL.COM</b>		
E-MAIL ADDRESS <b>molly.reeves@hdrinc.com</b>			QUOTE NO.			<b>ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)</b>		

PROJECT NO./NAME **Private Well Sampling - Phase II**      SAMPLER(S) - PLEASE PRINT/SIGN NAME **Tanten Busuk**

TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_

DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX    GW=GROUNDWATER    WW=WASTEWATER    S=SOIL    L=LIQUID    SD=SOLID  
 CODE:    SL=SLUDGE    DW=DRINKING WATER    O=OIL    WP=WIPE    A=AIR    W=WASTE

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives									
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER			
<b>33293.01</b>	<b>2-25-22</b>	<b>10:20</b>		DW	4	1	1								

See attached list

Fluoride

Certifications  
 OHIO VAP     Drinking Water  
 DoD             NPDES

Project Locations  
 Detroit         New York  
 Other Lansing, MI

Special Instructions

RELINQUISHED BY: *Tanten Busuk*       Sampler      DATE **2-25-22** TIME **14:30**

SIGNATURE/ORGANIZATION \_\_\_\_\_

RECEIVED BY: *Patricia*      DATE **2/25/22** TIME **1430**

SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_      DATE \_\_\_\_\_ TIME \_\_\_\_\_

SIGNATURE/ORGANIZATION \_\_\_\_\_

RECEIVED BY: \_\_\_\_\_      DATE \_\_\_\_\_ TIME \_\_\_\_\_

SIGNATURE/ORGANIZATION \_\_\_\_\_

SEAL NO.      SEAL INTACT      INITIALS      NOTES:      TEMP. ON ARRIVAL \_\_\_\_\_

                  YES  NO

SEAL NO.      SEAL INTACT      INITIALS

                  YES  NO

**4.0**

**Table 1. Water Quality Parameters to be Analyzed**

Parameter,	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33294.01(01)  
Generated on 03/08/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S33294.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/25/2022  
Submitted Date/Time: 02/25/2022 14:50  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33294.01	[REDACTED]	Drinking Water	02/25/22 09:02



# Analytical Laboratory Report

Lab Sample ID: S33294.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 09:02

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/28/22 10:28, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 03/03/22 08:28, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	378	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	328	20		mg/L	2			

**Method: SM2540D, Run Date: 03/03/22 20:45, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/07/22 17:13, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.14	0.04		mg/L	2	7440-42-8		
Lithium*	0.031	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 03/07/22 17:14, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.80	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.029	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

f-Filtered and preserved in lab



# Analytical Laboratory Report

Lab Sample ID: S33294.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 03/08/22 16:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	32.7	0.50		mg/L	2	7440-70-2		
Magnesium*	11.6	0.50		mg/L	2	7439-95-4		
Potassium*	6.16	0.50		mg/L	2	7440-09-7		
Sodium*	84.8	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S33294

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/25/2022 14:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33294      Submitted: 02/25/2022 14:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/25/2022 15:40 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33294.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S33295.01(01)  
Generated on 03/08/2022

---

**Report to**

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

---

**Report produced by**

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

**Contacts for report questions:**

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

---

**Report Summary**

Lab Sample ID(s): S33295.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 02/25/2022  
Submitted Date/Time: 02/25/2022 14:50  
Sampled by: Tanten Buszka  
P.O. #:

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**Table of Contents**

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2011
SM2540D	Standard Method 2540 D 2011
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S33295.01	[REDACTED]	Drinking Water	02/25/22 09:40



# Analytical Laboratory Report

Lab Sample ID: S33295.01

Sample Tag: [REDACTED]

Collected Date/Time: 02/25/2022 09:40

Matrix: Drinking Water

COC Reference:

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	4.0	IR
1	125ml Plastic	HNO3	Yes	4.0	IR
1	125ml Plastic	None	Yes	4.0	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	
Metal Digestion	Completed	SW3015A	03/07/22 14:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 02/28/22 11:45, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sulfate	353	25	1.5	mg/L	25	14808-79-8		

**Method: E300.0, Run Date: 02/28/22 10:41, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	70	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	1.2	1.0	0.13	mg/L	5	16984-48-8		4.0

**Method: SM2320B, Run Date: 03/03/22 08:32, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	531	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 03/04/22 19:15, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	1,120	20		mg/L	2			

**Method: SM2540D, Run Date: 03/04/22 17:50, Analyst: SSM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 03/08/22 16:05, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	406	5.0		mg/L	100	7440-23-5		

**Method: E200.8, Run Date: 03/07/22 17:15, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	4.00	0.04		mg/L	2	7440-42-8		
Lithium*	0.041	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		



# Analytical Laboratory Report

Lab Sample ID: S33295.01 (continued)

Sample Tag: [REDACTED]

**Method: E200.8, Run Date: 03/07/22 17:17, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.82	0.04		mg/L	2	7440-42-8	f	
Lithium, Dissolved*	0.038	0.005		mg/L	2	7439-93-2	f	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	f	

**Method: E200.8, Run Date: 03/08/22 16:02, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	3.37	0.50		mg/L	2	7440-70-2		
Magnesium*	1.28	0.50		mg/L	2	7439-95-4		
Potassium*	3.47	0.50		mg/L	2	7440-09-7		

f-Filtered and preserved in lab

# Merit Laboratories Login Checklist

Lab Set ID:S33295

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:02/25/2022 14:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 4.0
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S33295      Submitted: 02/25/2022 14:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 02/25/2022 15:40 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S33295.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S34321.01(01)  
Generated on 04/05/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S34321.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 03/28/2022  
Submitted Date/Time: 03/28/2022 11:35  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S34321.01	[REDACTED]	Drinking Water	03/28/22 10:05



# Analytical Laboratory Report

Lab Sample ID: S34321.01

Sample Tag: [REDACTED]

Collected Date/Time: 03/28/2022 10:05

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	11.5	IR
1	125ml Plastic	HNO3	Yes	11.5	IR
1	125ml Plastic	None	Yes	11.5	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	04/05/22 14:00	CCM	
Metal Digestion	Completed	SW3015A	04/05/22 14:00	CCM	

### Inorganics

Method: E300.0, Run Date: 03/29/22 09:53, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sulfate	305	25	1.5	mg/L	25	14808-79-8		

Method: E300.0, Run Date: 03/29/22 09:02, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	71	25	0.40	mg/L	25	16887-00-6		
Fluoride (Undistilled)	1.3	1.0	0.13	mg/L	5	16984-48-8		4.0

Method: SM2320B, Run Date: 03/31/22 16:06, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	530	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 03/31/22 16:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	1,040	50		mg/L	2			

Method: SM2540D, Run Date: 03/29/22 17:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 04/05/22 15:59, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	401	1.0		mg/L	10	7440-23-5		

Method: E200.8, Run Date: 04/05/22 15:13, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.62	0.04		mg/L	2	7440-42-8		
Lithium*	0.041	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		



# Analytical Laboratory Report

Lab Sample ID: S34321.01 (continued)

Sample Tag: [REDACTED]

**Method: E200.8, Run Date: 04/05/22 15:15, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.47	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.039	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 04/05/22 16:00, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	3.25	0.50		mg/L	2	7440-70-2		
Magnesium*	1.07	0.50		mg/L	2	7439-95-4		
Potassium*	3.27	0.50		mg/L	2	7440-09-7		

# Merit Laboratories Login Checklist

Lab Set ID:S34321

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:03/28/2022 11:35 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S34321 Submitted: 03/28/2022 11:35

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 03/28/2022 12:09 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S34321.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S34322.01(01)  
Generated on 04/05/2022

**Report to**

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

**Report produced by**

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

**Report Summary**

---

Lab Sample ID(s): S34322.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 03/28/2022  
Submitted Date/Time: 03/28/2022 11:35  
Sampled by: Tanten Buszka  
P.O. #:

**Table of Contents**

---

- Cover Page (Page 1)
- General Report Notes (Page 2)
- Report Narrative (Page 2)
- Laboratory Certifications (Page 3)
- Qualifier Descriptions (Page 3)
- Glossary of Abbreviations (Page 3)
- Method Summary (Page 4)
- Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S34322.01	[REDACTED]	Drinking Water	03/28/22 11:00



# Analytical Laboratory Report

Lab Sample ID: S34322.01

Sample Tag: [REDACTED]

Collected Date/Time: 03/28/2022 11:00

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	11.5	IR
1	125ml Plastic	HNO3	Yes	11.5	IR
1	125ml Plastic	None	Yes	11.5	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	04/05/22 14:00	CCM	
Metal Digestion	Completed	SW3015A	04/05/22 14:00	CCM	

### Inorganics

Method: E300.0, Run Date: 03/29/22 10:06, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	140	25	0.40	mg/L	25	16887-00-6		

Method: E300.0, Run Date: 03/29/22 09:14, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	1.4	1.0	0.13	mg/L	5	16984-48-8		4.0

Method: E300.0, Run Date: 03/29/22 10:19, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sulfate	1,120	100	5.9	mg/L	100	14808-79-8		

Method: SM2320B, Run Date: 03/31/22 16:10, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	410	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 03/31/22 16:00, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	2,250	50		mg/L	2			

Method: SM2540D, Run Date: 03/29/22 17:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 04/05/22 16:12, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	752	5.0		mg/L	50	7440-23-5		

Method: E200.8, Run Date: 04/05/22 15:17, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	5.68	0.04		mg/L	2	7440-42-8		
Lithium*	0.096	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		



# Analytical Laboratory Report

Lab Sample ID: S34322.01 (continued)

Sample Tag: [REDACTED]

**Method: E200.8, Run Date: 04/05/22 15:18, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	5.45	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.092	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 04/05/22 16:09, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	11.9	0.50		mg/L	2	7440-70-2		
Magnesium*	4.59	0.50		mg/L	2	7439-95-4		
Potassium*	5.74	0.50		mg/L	2	7440-09-7		

# Merit Laboratories Login Checklist

Lab Set ID:S34322

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:03/28/2022 11:35 Login User: MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 4.0 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S34322      Submitted: 03/28/2022 11:35

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 03/28/2022 12:09 MMC

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S34322.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME **Molly Reeves**  
 COMPANY **HDR**  
 ADDRESS **5405 Data Court**  
 CITY **Ann Arbor** STATE **MI** ZIP CODE **48108**  
 PHONE NO. **734-263-7138** FAX NO. P.O. NO.  
 E-MAIL ADDRESS **molly.reeves@hdrinc.com** QUOTE NO.

CONTACT NAME **Cheryl Louden**  SAME  
 COMPANY **Lansing Board of Water & Light (BWL)**  
 ADDRESS **On File**  
 CITY **On File** STATE ZIP CODE  
 PHONE NO. **517-763-1465** E-MAIL ADDRESS **Cheryl.Louden@LBWL.COM**

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME **Private Well Sampling - Phase II** SAMPLER(S) - PLEASE PRINT/SIGN NAME **Kaiten Buszka**

TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER

DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list
	DATE	TIME											
34322.01	3-28-22	11:00		DW	4	3	1						✓
													X

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES

Project Locations  
 Detroit  New York  
 Other Lansing, MI

Special Instructions

RELINQUISHED BY: *[Signature]*  Sampler DATE **3-28-22** TIME **11:35**  
 RECEIVED BY: *[Signature]* DATE **3/28/22** TIME **11:30**

RELINQUISHED BY: DATE TIME  
 RECEIVED BY: DATE TIME

SEAL NO. SEAL INTACT INITIALS NOTES: TEMP. ON ARRIVAL **11.5**  
 YES  NO   
 SEAL NO. SEAL INTACT INITIALS  
 YES  NO

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S34900.01(01)  
Generated on 04/20/2022

## Report to

---

Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108

Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

## Report produced by

---

Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823

Phone: (517) 332-0167 FAX: (517) 332-6333

## Contacts for report questions:

John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

## Report Summary

---

Lab Sample ID(s): S34900.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 04/13/2022  
Submitted Date/Time: 04/13/2022 15:50  
Sampled by: Tanten Buszka  
P.O. #:

## Table of Contents

---

Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S34900.01	[REDACTED]	Drinking Water	04/13/22 14:28



# Analytical Laboratory Report

Lab Sample ID: S34900.01

Sample Tag: [REDACTED]

Collected Date/Time: 04/13/2022 14:28

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	5.4	IR
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	04/20/22 10:00	CCM	
Metal Digestion	Completed	SW3015A	04/20/22 10:00	CCM	

### Inorganics

Method: E300.0, Run Date: 04/14/22 09:32, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0

Method: E300.0, Run Date: 04/14/22 10:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	119	25	0.32	mg/L	25	16887-00-6		
Sulfate	455	25	2.6	mg/L	25	14808-79-8		

Method: SM2320B, Run Date: 04/14/22 11:06, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	470	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 04/15/22 13:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	1,280	50		mg/L	2			

Method: SM2540D, Run Date: 04/18/22 15:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1.00			

### Metals

Method: E200.8, Run Date: 04/18/22 16:04, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	436	5.0		mg/L	100	7440-23-5		

Method: E200.8, Run Date: 04/18/22 16:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	13.0	0.50		mg/L	2	7440-70-2		
Magnesium*	4.56	0.50		mg/L	2	7439-95-4		
Potassium*	4.95	0.50		mg/L	2	7440-09-7		



# Analytical Laboratory Report

Lab Sample ID: S34900.01 (continued)

Sample Tag: [REDACTED]

**Method: E200.8, Run Date: 04/20/22 11:27, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	4.36	0.04		mg/L	2	7440-42-8		
Lithium*	0.061	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 04/20/22 11:30, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	4.02	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.057	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

# Merit Laboratories Login Checklist

Lab Set ID:S34900

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:04/13/2022 15:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 5.4
02.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? Dissolved Metals
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration Dissolved Metals
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S34900      Submitted: 04/13/2022 15:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 04/13/2022 16:42 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S34900.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S34901.01(01)  
Generated on 04/20/2022

**Report to**  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

**Report produced by**  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

**Report Summary**  
Lab Sample ID(s): S34901.01  
Project: Private Well Sampling - Phase II  
Collected Date(s): 04/13/2022  
Submitted Date/Time: 04/13/2022 15:50  
Sampled by: Tanten Buszka  
P.O. #:

**Table of Contents**  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein, acrylonitrile, and 2-chlorovinylethyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S34901.01	[REDACTED]	Drinking Water	04/13/22 15:24



# Analytical Laboratory Report

Lab Sample ID: S34901.01

Sample Tag: [REDACTED]

Collected Date/Time: 04/13/2022 15:24

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	5.4	IR
1	125ml Plastic	HNO3	Yes	5.4	IR
1	125ml Plastic	None	Yes	5.4	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	04/20/22 10:00	CCM	
Metal Digestion	Completed	SW3015A	04/20/22 10:00	CCM	

### Inorganics

Method: E300.0, Run Date: 04/14/22 09:42, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	10	5	0.06	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.08	mg/L	5	16984-48-8		4.0
Sulfate	24	5	0.52	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 04/14/22 11:10, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	430	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 04/15/22 13:25, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	444	50		mg/L	2			

Method: SM2540D, Run Date: 04/18/22 15:15, Analyst: SSM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1.00			

### Metals

Method: E200.8, Run Date: 04/18/22 16:09, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Sodium*	145	5.0		mg/L	100	7440-23-5		

Method: E200.8, Run Date: 04/18/22 16:06, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	21.6	0.50		mg/L	2	7440-70-2		
Magnesium*	7.04	0.50		mg/L	2	7439-95-4		
Potassium*	5.46	0.50		mg/L	2	7440-09-7		

Method: E200.8, Run Date: 04/20/22 11:32, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.52	0.04		mg/L	2	7440-42-8		
Lithium*	0.035	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		



# Analytical Laboratory Report

Lab Sample ID: S34901.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 04/20/22 11:35, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.34	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.035	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

# Merit Laboratories Login Checklist

Lab Set ID:S34901

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Submitted:04/13/2022 15:50 Login User: PFD

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |  |
|-----|--|--|
| 01. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 5.4 |
| 02. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                 |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped  |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                        |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation                      |
| 11. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)               |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? Dissolved Metals |

## Bottle Conditions

- |     |  |  |
|-----|--|--|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                                     |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used                |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                                     |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received                      |
| 17. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration Dissolved Metals |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time                  |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace          |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S34901      Submitted: 04/13/2022 15:50

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase II

Initial Preservation Check: 04/13/2022 16:43 PFD

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S34901.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S36018.01(01)  
Generated on 06/01/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S36018.01  
Project: Private Well Sampling - Phase I  
Collected Date(s): 05/16/2022  
Submitted Date/Time: 05/16/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1 (1993)
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S36018.01	[REDACTED]	Drinking Water	05/16/22 11:00



# Analytical Laboratory Report

Lab Sample ID: S36018.01

Sample Tag: [REDACTED]

Collected Date/Time: 05/16/2022 11:00

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	19.8	IR
1	125ml Plastic	HNO3	Yes	19.8	IR
1	125ml Plastic	None	Yes	19.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	

### Inorganics

Method: E300.0, Run Date: 05/17/22 11:35, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	12	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	5	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 05/18/22 08:24, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	380	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 05/18/22 14:30, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	304	50		mg/L	2			

Method: SM2540D, Run Date: 05/18/22 16:40, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 06/01/22 10:44, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	2.83	0.04		mg/L	2	7440-42-8		
Lithium*	0.044	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 06/01/22 10:46, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	2.71	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.043	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 06/01/22 12:05, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	44.9	0.50		mg/L	2	7440-70-2		
Magnesium*	15.3	0.50		mg/L	2	7439-95-4		



# Analytical Laboratory Report

Lab Sample ID: S36018.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 06/01/22 12:05, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Potassium*	6.47	0.50		mg/L	2	7440-09-7		
Sodium*	63.2	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S36018

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Submitted:05/16/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |   |
|-----|--|---|
| 01. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 19.8 |
| 02. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                  |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped   |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                         |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked  |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S36018      Submitted: 05/16/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Initial Preservation Check: 05/16/2022 15:16 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S36018.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Molly Reeves  
 COMPANY HDR  
 ADDRESS 5405 Data Court  
 CITY Ann Arbor STATE MI ZIP CODE 48108  
 PHONE NO. 734-263-7138 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS molly.reeves@hdrinc.com QUOTE NO. \_\_\_\_\_

CONTACT NAME Cheryl Louden  SAME  
 COMPANY Lansing Board of Water & Light (BWL)  
 ADDRESS On File  
 CITY On File STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. 517-763-1465 E-MAIL ADDRESS Cheryl.Louden@LBWL.COM

**ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)**

PROJECT NO./NAME Private Well Sampling - Phase 4 SAMPLER(S) - PLEASE PRINT/SIGN NAME Tuitten Busch  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 CODE: SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER	See attached list
	DATE	TIME											
<u>36018.01</u>	<u>5-16-22</u>	<u>11:00</u>		<u>DW</u>	<u>4</u>	<u>3</u>		<u>1</u>					<input checked="" type="checkbox"/>

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES  
 Project Locations  
 Detroit  New York  
 Other Lansing, MI  
 Special Instructions

RELINQUISHED BY: [Signature]  Sampler DATE 5-16-22 TIME 13:55  
 RECEIVED BY: Johanna Murray DATE 5/16/22 TIME 1355  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 NOTES: TEMP. ON ARRIVAL 19.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

Table 1. Water Quality Parameters to be Analyzed

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits	
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S36019.01(01)  
Generated on 06/01/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S36019.01  
Project: Private Well Sampling - Phase I  
Collected Date(s): 05/16/2022  
Submitted Date/Time: 05/16/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1 (1993)
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S36019.01	[REDACTED]	Drinking Water	05/16/22 10:22



# Analytical Laboratory Report

Lab Sample ID: S36019.01

Sample Tag: [REDACTED]

Collected Date/Time: 05/16/2022 10:22

Matrix: Drinking Water

COC Reference:

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	19.8	IR
1	125ml Plastic	HNO3	Yes	19.8	IR
1	125ml Plastic	None	Yes	19.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	

### Inorganics

Method: E300.0, Run Date: 05/17/22 11:48, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	16	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	1.5	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 05/18/22 08:26, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	500	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 05/18/22 14:30, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	486	50		mg/L	2			

Method: SM2540D, Run Date: 05/18/22 16:40, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 06/01/22 10:48, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.72	0.04		mg/L	2	7440-42-8		
Lithium*	0.029	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 06/01/22 10:50, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.68	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.030	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 06/01/22 12:08, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	6.62	0.50		mg/L	2	7440-70-2		
Magnesium*	2.04	0.50		mg/L	2	7439-95-4		



# Analytical Laboratory Report

Lab Sample ID: S36019.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 06/01/22 12:08, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Potassium*	3.80	0.50		mg/L	2	7440-09-7		
Sodium*	188	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S36019

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Submitted:05/16/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 19.8
02.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab?
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S36019      Submitted: 05/16/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Initial Preservation Check: 05/16/2022 15:17 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S36019.01	125ml Plastic HNO3	<2			



2680 East Lansing Dr., East Lansing, MI 48823  
 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1

**REPORT TO**

**CHAIN OF CUSTODY RECORD**

**INVOICE TO**

CONTACT NAME Molly Reeves  
 COMPANY HDR  
 ADDRESS 5405 Data Court  
 CITY Ann Arbor STATE MI ZIP CODE 48108  
 PHONE NO. 734-263-7138 FAX NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS molly.reeves@hdrinc.com QUOTE NO. \_\_\_\_\_

CONTACT NAME Cheryl Louden  SAME  
 COMPANY Lansing Board of Water & Light (BWL)  
 ADDRESS On File  
 CITY On File STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. 517-763-1465 E-MAIL ADDRESS Cheryl.Louden@LBWL.COM

PROJECT NO./NAME Private Well Sampling - Phase 1 SAMPLER(S) - PLEASE PRINT/SIGN NAME Jennifer Suszka  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX CODE: GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIFE A=AIR W=WASTE

# Containers & Preservatives

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	YEAR		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER
	DATE	TIME										
<u>36019.01</u>	<u>5-16-22</u>	<u>10:22</u>		<u>DW</u>	<u>4</u>	<u>3</u>		<u>1</u>				

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

See attached list

Certifications  
 OHIO VAP  Drinking Water  
 DoD  NPDES

Project Locations  
 Detroit  New York  
 Other Lansing, MI

Special Instructions

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION [Signature]  Sampler

RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION Johanna Murray 5/16/22 1355

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SIGNATURE/ORGANIZATION \_\_\_\_\_

SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_  
 SEAL NO. SEAL INTACT YES  NO  INITIALS \_\_\_\_\_

NOTES: TEMP. ON ARRIVAL 19.8

PLEASE NOTE: SIGNING ACKNOWLEDGES ADHERENCE TO MERIT'S SAMPLE ACCEPTANCE POLICY ON REVERSE SIDE

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
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Li, diss	Lithium, dissolved 250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total 250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved 250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate 250 mL plastic	mg/L	Chill	300.0	28 d	10
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TSS	Total Suspended Solids 1 L plastic	mg/L	None	SM 2540D	NA	3
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Na	Sodium 250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium 250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate 250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates 250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S36020.01(01)  
Generated on 06/01/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S36020.01  
Project: Private Well Sampling - Phase I  
Collected Date(s): 05/16/2022  
Submitted Date/Time: 05/16/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

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PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
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R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1 (1993)
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S36020.01	[REDACTED]	Drinking Water	05/16/22 12:10



# Analytical Laboratory Report

Lab Sample ID: S36020.01

Sample Tag: [REDACTED]

Collected Date/Time: 05/16/2022 12:10

Matrix: Drinking Water

COC Reference: 150818

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	19.8	IR
1	125ml Plastic	HNO3	Yes	19.8	IR
1	125ml Plastic	None	Yes	19.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	

### Inorganics

Method: E300.0, Run Date: 05/17/22 12:01, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 05/18/22 08:28, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	380	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 05/18/22 14:30, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	362	50		mg/L	2			

Method: SM2540D, Run Date: 05/18/22 16:40, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 06/01/22 10:53, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.80	0.04		mg/L	2	7440-42-8		
Lithium*	0.036	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 06/01/22 10:55, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.70	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.036	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

Method: E200.8, Run Date: 06/01/22 12:10, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	23.5	0.50		mg/L	2	7440-70-2		
Magnesium*	7.12	0.50		mg/L	2	7439-95-4		



# Analytical Laboratory Report

Lab Sample ID: S36020.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 06/01/22 12:10, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Potassium*	5.73	0.50		mg/L	2	7440-09-7		
Sodium*	103	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S36020

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Submitted:05/16/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |   |
|-----|--|---|
| 01. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 19.8 |
| 02. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                  |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped   |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                         |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked  |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S36020      Submitted: 05/16/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Initial Preservation Check: 05/16/2022 15:21 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S36020.01	125ml Plastic HNO3	<2			



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 Phone (517) 332-0167 Fax (517) 332-4034  
 www.meritlabs.com

C.O.C. PAGE # 1 OF 1 150818

**REPORT TO** **CHAIN OF CUSTODY RECORD** **INVOICE TO**

CONTACT NAME Molly Reeves  
 COMPANY HDR  
 ADDRESS 5404 Data Ct  
 CITY Ann Arbor STATE MI ZIP CODE 48108  
 PHONE NO. 734-263-7138 CELL NO. \_\_\_\_\_ P.O. NO. \_\_\_\_\_  
 E-MAIL ADDRESS Molly.Reeves@HDRinc.com QUOTE NO. \_\_\_\_\_

CONTACT NAME Cheryl Loudon  SAME  
 COMPANY BWL  
 ADDRESS On File  
 CITY On File STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_  
 PHONE NO. 517-763-1465 E-MAIL ADDRESS Cheryl.Loudon@LBWL.com

PROJECT NO./NAME Bwl- Private Well Phase 1 SAMPLER(S) - PLEASE PRINT/SIGN NAME Tanthen Buszka  
 TURNAROUND TIME REQUIRED  1 DAY  2 DAYS  3 DAYS  STANDARD  OTHER \_\_\_\_\_  
 DELIVERABLES REQUIRED  STD  LEVEL II  LEVEL III  LEVEL IV  EDD  OTHER \_\_\_\_\_

MATRIX W=WATER GW=GROUNDWATER WW=WASTEWATER S=SOIL L=LIQUID SD=SOLID  
 CODE: SL=SLUDGE DW=DRINKING WATER O=OIL WP=WIPE A=AIR WS=WASTE

ANALYSIS (ATTACH LIST IF MORE SPACE IS REQUIRED)

# Containers & Preservatives										Certifications	
NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER					
											<input type="checkbox"/> OHIO VAP <input type="checkbox"/> Drinking Water
											<input type="checkbox"/> DoD <input type="checkbox"/> NPDES
											Project Locations
											<input type="checkbox"/> Detroit <input type="checkbox"/> New York
											<input type="checkbox"/> Other _____
											Special Instructions

MERIT LAB NO. <small>FOR LAB USE ONLY</small>	COLLECTION		SAMPLE TAG IDENTIFICATION-DESCRIPTION	MATRIX	# OF BOTTLES	# Containers & Preservatives													
	DATE	TIME				NONE	HCl	HNO <sub>3</sub>	H <sub>2</sub> SO <sub>4</sub>	NaOH	MeOH	OTHER							
<u>36020.01</u>	<u>5-16-22</u>	<u>12:10</u>		<u>GW</u>	<u>4</u>	<u>1</u>		<u>3</u>											

See list


RELINQUISHED BY: Tanthen Buszka  Sampler DATE 5-16-22 TIME 13:55  
 RECEIVED BY: Johanna Murray DATE 5/16/22 TIME 1355  
 RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE \_\_\_\_\_ TIME \_\_\_\_\_  
 SEAL NO. SEAL INTACT INITIALS NOTES: TEMP. ON ARRIVAL \_\_\_\_\_  
 YES  NO  19.8  
 SEAL NO. SEAL INTACT INITIALS  
 YES  NO

**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S36021.01(01)  
Generated on 06/01/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S36021.01  
Project: Private Well Sampling - Phase I  
Collected Date(s): 05/16/2022  
Submitted Date/Time: 05/16/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

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Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

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There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1 (1993)
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S36021.01	[REDACTED]	Drinking Water	05/16/22 11:35



# Analytical Laboratory Report

Lab Sample ID: S36021.01

Sample Tag: XXXXXXXXXX

Collected Date/Time: 05/16/2022 11:35

Matrix: Drinking Water

COC Reference: 150817

Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	19.8	IR
1	125ml Plastic	HNO3	Yes	19.8	IR
1	125ml Plastic	None	Yes	19.8	IR

**Extraction / Prep.**

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	

**Inorganics**

**Method: E300.0, Run Date: 05/17/22 12:14, Analyst: JDP**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

**Method: SM2320B, Run Date: 05/18/22 08:30, Analyst: JKB**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	380	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

**Method: SM2540C, Run Date: 05/18/22 14:30, Analyst: PJH**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	348	50		mg/L	2			

**Method: SM2540D, Run Date: 05/18/22 16:40, Analyst: PJH**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

**Metals**

**Method: E200.8, Run Date: 06/01/22 10:56, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.32	0.04		mg/L	2	7440-42-8		
Lithium*	0.042	0.005		mg/L	2	7439-93-2		
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 06/01/22 10:58, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.33	0.04		mg/L	2	7440-42-8		
Lithium, Dissolved*	0.042	0.005		mg/L	2	7439-93-2		
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7		

**Method: E200.8, Run Date: 06/01/22 12:11, Analyst: CCM**

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	25.1	0.50		mg/L	2	7440-70-2		
Magnesium*	10.7	0.50		mg/L	2	7439-95-4		



# Analytical Laboratory Report

Lab Sample ID: S36021.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 06/01/22 12:11, Analyst: CCM (continued)

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Potassium*	7.25	0.50		mg/L	2	7440-09-7		
Sodium*	94.2	0.50		mg/L	2	7440-23-5		

# Merit Laboratories Login Checklist

Lab Set ID:S36021

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Submitted:05/16/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |   |
|-----|--|---|
| 01. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 19.8 |
| 02. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                  |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped   |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                         |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked  |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation        |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs) |
| 12. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab?    |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S36021      Submitted: 05/16/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Initial Preservation Check: 05/16/2022 15:21 JRM

Preservation Recheck (E200.8): N/A

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court  
Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S36021.01	125ml Plastic HNO3	<2			



**Table 1. Water Quality Parameters to be Analyzed**

	Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	mg/L	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	mg/L	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	mg/L	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	mg/L	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	mg/L	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	mg/L	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S36022.01(01)  
Generated on 06/01/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S36022.01  
Project: Private Well Sampling - Phase I  
Collected Date(s): 05/16/2022  
Submitted Date/Time: 05/16/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

Full accreditation certificates are available upon request. Starred (\*) analytes are not NELAP accredited.

Samples are held by the lab for 30 days from the final report date unless a written request to hold longer is provided by the client.

Report shall not be reproduced except in full, without the written approval of Merit Laboratories, Inc.

Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1 (1993)
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S36022.01	[REDACTED]	Drinking Water	05/16/22 12:40



# Analytical Laboratory Report

Lab Sample ID: S36022.01

Sample Tag: [REDACTED]

Collected Date/Time: 05/16/2022 12:40

Matrix: Drinking Water

COC Reference: 150819

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	19.8	IR
1	250ml Plastic	HNO3	Yes	19.8	IR
1	250ml Plastic	None	Yes	19.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	

### Inorganics

Method: E300.0, Run Date: 05/17/22 12:27, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 05/18/22 08:32, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	370	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 05/18/22 14:30, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	352	50		mg/L	2			

Method: SM2540D, Run Date: 05/18/22 16:40, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	Not detected	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 06/01/22 11:00, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.65	0.04		mg/L	2	7440-42-8	x	
Lithium*	0.040	0.005		mg/L	2	7439-93-2	x	
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7	x	

Method: E200.8, Run Date: 06/01/22 11:01, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.48	0.04		mg/L	2	7440-42-8	x	
Lithium, Dissolved*	0.038	0.005		mg/L	2	7439-93-2	x	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	x	

x-Preserved from bulk sample



# Analytical Laboratory Report

Lab Sample ID: S36022.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 06/01/22 12:13, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	24.7	0.50		mg/L	2	7440-70-2	x	
Magnesium*	7.79	0.50		mg/L	2	7439-95-4	x	
Potassium*	6.88	0.50		mg/L	2	7440-09-7	x	
Sodium*	99.6	0.50		mg/L	2	7440-23-5	x	

x-Preserved from bulk sample

# Merit Laboratories Login Checklist

Lab Set ID:S36022

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Submitted:05/16/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
-----------	-------------	------

## Sample Receiving

- |     |  |   |
|-----|--|---|
| 01. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples are received at 4C +/- 2C Thermometer # IR 19.8 |
| 02. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Received on ice/ cooling process begun                  |
| 03. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples shipped   |
| 04. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples left in 24 hr. drop box                         |
| 05. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Are there custody seals/tape or is the drop box locked  |

## Chain of Custody

- |     |  |  |
|-----|--|--|
| 06. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC adequately filled out                |
| 07. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | COC signed and relinquished to the lab   |
| 08. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sample tag on bottles match COC          |
| 09. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Subcontracting needed? Subcontracted to: |

## Preservation

- |     |  |   |
|-----|--|---|
| 10. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Do sample have correct chemical preservation HNO3     |
| 11. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Completed pH checks on preserved samples? (no VOAs)   |
| 12. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Did any samples need to be preserved in the lab? HNO3 |

## Bottle Conditions

- |     |  |   |
|-----|--|---|
| 13. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | All bottles intact                            |
| 14. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Appropriate analytical bottles are used       |
| 15. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Merit bottles used                            |
| 16. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Sufficient sample volume received             |
| 17. | <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A | Samples require laboratory filtration         |
| 18. | <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A | Samples submitted within holding time         |
| 19. | <input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A | Do water VOC or TOX bottles contain headspace |

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S36022      Submitted: 05/16/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Initial Preservation Check: 05/16/2022 15:32 JRM

Preservation Recheck (E200.8): 05/18/2022 08:32 MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S36022.01	250ml Plastic HNO3	7	1.0	<2	Lot# 280251



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	Nitric Acid	SM 2320B	14Days mos	2



# Analytical Laboratory Report

Report ID: S36023.01(01)  
Generated on 06/01/2022

Report to  
Attention: Molly Reeves  
HDR Inc.  
5405 Data Dourt  
Ann Arbor, MI 48108  
  
Phone: 517-263-7138 FAX:  
Email: Molly.Reeves@HDRinc.com

Report produced by  
Merit Laboratories, Inc.  
2680 East Lansing Drive  
East Lansing, MI 48823  
  
Phone: (517) 332-0167 FAX: (517) 332-6333  
  
Contacts for report questions:  
John Lavery (johnlavery@meritlabs.com)  
Barbara Ball (bball@meritlabs.com)

Report Summary  
Lab Sample ID(s): S36023.01  
Project: Private Well Sampling - Phase I  
Collected Date(s): 05/16/2022  
Submitted Date/Time: 05/16/2022 13:55  
Sampled by: Tanten Buszka  
P.O. #:

Table of Contents  
Cover Page (Page 1)  
General Report Notes (Page 2)  
Report Narrative (Page 2)  
Laboratory Certifications (Page 3)  
Qualifier Descriptions (Page 3)  
Glossary of Abbreviations (Page 3)  
Method Summary (Page 4)  
Sample Summary (Page 5)

Maya Murshak  
Technical Director



# Analytical Laboratory Report

## General Report Notes

---

Analytical results relate only to the samples tested, in the condition received by the laboratory.

Methods may be modified for improved performance.

Results reported on a dry weight basis where applicable.

'Not detected' indicates that parameter was not found at a level equal to or greater than the reporting limit (RL).

When MDL results are provided, then 'Not detected' indicates that parameter was not found at a level equal to or greater than the MDL.

40 CFR Part 136 Table II Required Containers, Preservation Techniques and Holding Times for the Clean Water Act specify that samples for acrolein and acrylonitrile, and 2-chloroethylvinyl ether need to be preserved at a pH in the range of 4 to 5 or if not preserved, analyzed within 3 days of sampling.

QA/QC corresponding to this analytical report is a separate document with the same Merit ID reference and is available upon request.

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Limits for drinking water samples, are listed as the MCL Limits (Maximum Contaminant Level Concentrations)

PFAS requirement: Section 9.3.8 of U.S. EPA Method 537.1 states "If the method analyte(s) found in the Field Sample is present in the

FRB at a concentration greater than 1/3 the MRL, then all samples collected with that FRB are invalid and must be recollected and reanalyzed."

Samples submitted without an accompanying FRB may not be acceptable for compliance purposes.

Wisconsin PFAs analysis: MDL = LOD; RL = LOQ. LOD and LOQ are adjusted for dilution.

## Report Narrative

---

There is no additional narrative for this analytical report



# Analytical Laboratory Report

## Laboratory Certifications

Authority	Certification ID
Michigan DEQ	#9956
DOD ELAP/ISO 17025	#69699
WBENC	#2005110032
Ohio VAP	#CL0002
Indiana DOH	#C-MI-07
New York NELAC	#11814
North Carolina DENR	#680
North Carolina DOH	#26702
Alaska CSLAP	#17-001
Pennsylvania DEP	#68-05884
Wisconsin DNR	FID# 399147320

## Qualifier Descriptions

Qualifier	Description
!	Result is outside of stated limit criteria
B	Compound also found in associated method blank
E	Concentration exceeds calibration range
F	Analysis run outside of holding time
G	Estimated result due to extraction run outside of holding time
H	Sample submitted and run outside of holding time
I	Matrix interference with internal standard
J	Estimated value less than reporting limit, but greater than MDL
L	Elevated reporting limit due to low sample amount
M	Result reported to MDL not RDL
O	Analysis performed by outside laboratory. See attached report.
R	Preliminary result
S	Surrogate recovery outside of control limits
T	No correction for total solids
X	Elevated reporting limit due to matrix interference
Y	Elevated reporting limit due to high target concentration
b	Value detected less than reporting limit, but greater than MDL
e	Reported value estimated due to interference
j	Analyte also found in associated method blank
p	Benzo(b)Fluoranthene and Benzo(k)Fluoranthene integrated as one peak.
x	Preserved from bulk sample

## Glossary of Abbreviations

Abbreviation	Description
RL/RDL	Reporting Limit
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
SW	EPA SW 846 (Soil and Wastewater) Methods
E	EPA Methods
SM	Standard Methods
LN	Linear
BR	Branched



# Analytical Laboratory Report

## Method Summary

Method	Version
E200.8	EPA Method 200.8 Revision 5.4
E300.0	EPA Method 300.0 Revision 2.1 (1993)
SM2320B	Standard Method 2320 B 2011
SM2540C	Standard Method 2540 C 2015
SM2540D	Standard Method 2540 D 2015
SW3015A	SW 846 Method 3015A Revision 1 February 2007



# Analytical Laboratory Report

## Sample Summary (1 samples)

Sample ID	Sample Tag	Matrix	Collected Date/Time
S36023.01	[REDACTED]	Drinking Water	05/16/22 13:15



# Analytical Laboratory Report

Lab Sample ID: S36023.01

Sample Tag: [REDACTED]

Collected Date/Time: 05/16/2022 13:15

Matrix: Drinking Water

COC Reference: 150820

### Sample Containers

#	Type	Preservative(s)	Refrigerated?	Arrival Temp. (C)	Thermometer #
2	1L Plastic	None	Yes	19.8	IR
1	250ml Plastic	HNO3	Yes	19.8	IR
1	250ml Plastic	None	Yes	19.8	IR

### Extraction / Prep.

Parameter	Result	Method	Run Date	Analyst	Flags
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	
Metal Digestion	Completed	SW3015A	06/01/22 09:30	CCM	

### Inorganics

Method: E300.0, Run Date: 05/17/22 12:39, Analyst: JDP

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Chloride	Not detected	5	0.08	mg/L	5	16887-00-6		
Fluoride (Undistilled)	Not detected	1.0	0.13	mg/L	5	16984-48-8		4.0
Sulfate	Not detected	5	0.30	mg/L	5	14808-79-8		

Method: SM2320B, Run Date: 05/18/22 08:34, Analyst: JKB

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Bicarbonate*	380	10		mg/L	1	71-52-3		
Carbonate*	Not detected	10		mg/L	1	3812-32-6		

Method: SM2540C, Run Date: 05/18/22 14:30, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Dissolved Solids*	368	50		mg/L	2			

Method: SM2540D, Run Date: 05/18/22 16:40, Analyst: PJH

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Total Suspended Solids*	6	3		mg/L	1			

### Metals

Method: E200.8, Run Date: 06/01/22 11:18, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron*	3.87	0.04		mg/L	2	7440-42-8	x	
Lithium*	0.037	0.005		mg/L	2	7439-93-2	x	
Molybdenum*	Not detected	0.005		mg/L	2	7439-98-7	x	

Method: E200.8, Run Date: 06/01/22 11:20, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Boron, Dissolved*	3.77	0.04		mg/L	2	7440-42-8	x	
Lithium, Dissolved*	0.036	0.005		mg/L	2	7439-93-2	x	
Molybdenum, Dissolved*	Not detected	0.005		mg/L	2	7439-98-7	x	

x-Preserved from bulk sample



# Analytical Laboratory Report

Lab Sample ID: S36023.01 (continued)

Sample Tag: [REDACTED]

Method: E200.8, Run Date: 06/01/22 12:15, Analyst: CCM

Parameter	Result	RL	MDL	Units	Dilution	CAS#	Flags	Limits
Calcium*	11.9	0.50		mg/L	2	7440-70-2	x	
Magnesium*	3.86	0.50		mg/L	2	7439-95-4	x	
Potassium*	6.05	0.50		mg/L	2	7440-09-7	x	
Sodium*	122	0.50		mg/L	2	7440-23-5	x	

x-Preserved from bulk sample

# Merit Laboratories Login Checklist

Lab Set ID:S36023

Client:HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Submitted:05/16/2022 13:55 Login User: JRM

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Dourt

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Selection	Description	Note
<b>Sample Receiving</b>		
01.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples are received at 4C +/- 2C Thermometer # IR 19.8
02.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Received on ice/ cooling process begun
03.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples shipped
04.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples left in 24 hr. drop box
05.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Are there custody seals/tape or is the drop box locked
<b>Chain of Custody</b>		
06.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC adequately filled out
07.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	COC signed and relinquished to the lab
08.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sample tag on bottles match COC
09.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Subcontracting needed? Subcontracted to:
<b>Preservation</b>		
10.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Do sample have correct chemical preservation HNO3
11.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Completed pH checks on preserved samples? (no VOAs)
12.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Did any samples need to be preserved in the lab? HNO3
<b>Bottle Conditions</b>		
13.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	All bottles intact
14.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Appropriate analytical bottles are used
15.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Merit bottles used
16.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Sufficient sample volume received
17.	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	Samples require laboratory filtration
18.	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	Samples submitted within holding time
19.	<input type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A	Do water VOC or TOX bottles contain headspace

Corrective action for all exceptions is to call the client and to notify the project manager.

Client Review By: \_\_\_\_\_ Date: \_\_\_\_\_

# Merit Laboratories Bottle Preservation Check

Lab Set ID: S36023      Submitted: 05/16/2022 13:55

Client: HDR (HDR Inc.)

Project: Private Well Sampling - Phase I

Initial Preservation Check: 05/16/2022 15:34 JRM

Preservation Recheck (E200.8): 05/18/2022 08:33 MMC

Attention: Molly Reeves

Address: HDR Inc.

5405 Data Court

Ann Arbor, MI 48108

Phone: 517-263-7138

FAX:

Email: Molly.Reeves@HDRinc.com

Sample ID	Bottle / Preservation	pH (Orig)	Add ml	pH (New)	Notes
S36023.01	250ml Plastic HNO3	7	1.0	<2	Lot# 280251



**Table 1. Water Quality Parameters to be Analyzed**

Parameter	Sample Bottle*	Units to be reported	Preservation	Method	Holding Time	Laboratory Reporting Limits
B	Boron, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
B, diss	Boron, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.04
Ca	Calcium	250 mL plastic	Nitric Acid	200.8	6 mos	2.5
Cl	Chloride	250 mL plastic	Chill	300.0	28 d	10
Li	Lithium, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Li, diss	Lithium, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo	Molybdenum, total	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
Mo, diss	Molybdenum, dissolved	250 mL plastic	Nitric Acid	200.8	6 mos	0.005
SO <sub>4</sub>	Sulfate	250 mL plastic	Chill	300.0	28 d	10
TDS	Total Dissolved Solids	1 L plastic	None	SM 2540C	NA	20
TSS	Total Suspended Solids	1 L plastic	None	SM 2540D	NA	3
Mg	Magnesium	250 mL plastic	Nitric Acid	200.8	6 mos	0.1
Na	Sodium	250 mL plastic	Nitric Acid	200.8	6 mos	0.05
K	Potassium	250 mL plastic	Nitric Acid	200.8	6 mos	0.10
CO <sub>3</sub>	Carbonate	250 mL plastic	Nitric Acid	SM 2320B	14 days	2
NaHCO <sub>3</sub>	Bicarbonates	250 mL plastic	Nitric Acid	SM 2320B	14Days mos	2